City of Sandy

Agenda
City Council Meeting
Meeting Date: Tuesday, June 20, 2023
Meeting Time: 6:00 PM

Page

1. CITY COUNCIL REGULAR MEETING

This meeting will be conducted in a hybrid in-person / online format. The Council will be present in-person in the Council Chambers and members of the public are welcome to attend in-person as well. Members of the public also have the choice to view and participate in the meeting online via Zoom.

To attend the meeting in-person
Come to Sandy City Hall (lower parking lot entrance).
39250 Pioneer Blvd., Sandy, OR 97055

To attend the meeting online via Zoom
Please use this link: https://us02web.zoom.us/j/84787120238
Or by phone: (253) 215-8782; Meeting ID: 84787120238

Please also note the public comment signup process below.

2. CITY COUNCIL WORK SESSION - 6:00 PM

2.1. **Clear and Objective Code Audit Project** 4 - 337

Staff Report and Consultant Memo
Chapter 17.02 through 17.44
Chapter 17.46 through 17.88
Chapter 17.90 through 17.102, and Chapter 15.30
Consultant Presentation Slides

3. CITY COUNCIL REGULAR MEETING - 7:00 PM

4. PLEDGE OF ALLEGIANCE

5. ROLL CALL

6. CHANGES TO THE AGENDA

7. PUBLIC COMMENT

Please note: this is the appropriate time to offer comments on the City Manager Position Profile and Hiring Procedures. There will be opportunities to provide testimony on the fees and charges, revised moratorium, and updated TSP during public hearings later in the agenda.

If you are attending the meeting in-person
Please submit your comment signup form to the City Recorder before the regular meeting begins at 7:00 p.m. Forms are available on the table next to the Council Chambers door.

If you are attending the meeting via Zoom
Please complete the online comment signup webform by 3:00 p.m. on the day of the meeting.

The Mayor will call on each person when it is their turn to speak for up to three minutes.

8. RESPONSE TO PREVIOUS PUBLIC COMMENTS

9. CONSENT AGENDA

9.1. **City Council Minutes** 338 - 358
City Council - 05 Jun 2023 - Minutes - Pdf
City Council - 12 Jun 2023 - Minutes - Pdf

9.2. **Adoption of Financial Sustainability Plan for Parks and Recreation** 359 - 372
Resolution 2023-26
Policy Adoption for a Financial Sustainability Plan for Parks and Recreation - Pdf

9.3. **SandyNet Advisory Board Appointments** 373 - 377
SandyNet Advisory Board Appointments - Pdf

9.4. **Requests for Street Closures and Exclusive Use of Meinig Park: 2023 Mountain Festival** 378 - 381
2023 Mountain Festival Requests for Street Closures and Exclusive Use of Meinig Park - Pdf

9.5. **Loan Authorization: Drinking Water Transmission Line Design** 382 - 407
Resolution 2023-23
Business Oregon Funding For Design of Portland-Sandy Filtration Plant Transmission System - Pdf

9.6. **Contract Amendment: Leeway Engineering Solutions, Owner's Representative Services** 408 - 417
Amendment: Leeway Engineering Solutions Phase 1A Owners Representative Services - Pdf

9.7. **Adoption of City Manager Recruitment Position Profile and Hiring Procedures** 418 - 428

Adoption of City Manager Position Profile and Hiring Procedures - Pdf

10. NEW BUSINESS

10.1. **PUBLIC HEARING: 2023-24 Master Fees and Charges** 429 - 453
Resolution 2023-28
2023-24 Master Fees and Charges - Pdf

10.2. **PUBLIC HEARING: Revised Moratorium Raising Limit on New Wastewater Connections** 454 - 565
Resolution 2023-27
Revised Moratorium Raising Limit on New Wastewater Connections - Pdf

10.3. **PUBLIC HEARING: Transportation System Plan (TSP) Adoption** 566 - 1235
Ordinance 2023-24
Staff Report
Ordinance 2023-24
2023 Sandy Transportation System Plan
2023 Sandy Transportation System Plan Appendix
ODOT Comment Letter
Consultant Presentation Slides

11. REPORT FROM THE CITY MANAGER

12. COMMITTEE /COUNCIL REPORTS

13. STAFF UPDATES

13.1. Monthly Reports

14. ADJOURN

Staff Report

Meeting Date:	June 20, 2023
From	Kelly O'Neill Jr., Development Services Director
SUBJECT:	Clear and Objective Audit Work Session

PURPOSE / OBJECTIVE:
Provide direction to the project team prior to reconvening in September for another work session.

BACKGROUND / CONTEXT:
As a reminder, the purpose of the Sandy Clear and Objective Code Project is to ensure that the City of Sandy's Development Code (SDC) complies with and implements certain Oregon state laws and legislation, primarily Oregon Revised Statue (ORS) section 197.307. ORS 197.307 requires that local governments adopt and apply only clear and objective standards, conditions and procedures for the development of housing. Local governments are also allowed to offer a discretionary review path for housing applications (i.e., one that relies more on guidelines, rather than objective standards), provided it is an optional alternative to the clear and objective review path.

Project Team
The project team includes City planning staff and project consultant, MIG|APG. The consultant team for this project includes Catherine Corliss, Kate Rogers, and Brandon Crawford. The consultant team recently worked together on similar "clear and objective standards" projects for the cities of Hillsboro, Albany, and West Linn as well as a range of other code projects.

Project Schedule
The consultant and City staff have made good progress on the project to date. As shown on the schedule in the attached memo, we hope to be back before the City Council in a joint work session with the Planning Commission in September of 2023.

KEY CONSIDERATIONS / ANALYSIS:
Most of the proposed amendments are "policy neutral" (i.e., they are intended to result in outcomes that are consistent with outcomes resulting from the current Development Code).

However, the proposed amendments highlighted in this memo are more substantive and are therefore highlighted for your specific consideration and direction. **The project team is seeking feedback and direction on the eighth (8) policy amendments as**

highlighted in the attached memo, Exhibit A. The policy amendments include the following:

1) Do you agree with our recommendation to remove the allowance for standalone multi-family housing in the C-1 and C-3 zoning districts?

2) Do you agree with our recommendation to limit residential development to above the ground floor in the C-1 and C-3 zoning districts?

3) Do you agree with our recommendation to remove the option for zero lot line dwellings in the SFR zoning district?

4) Do you agree with our recommendation to establish a maximum setback as part of the transit street orientation requirements?

5) Do you agree with our recommendation to modify the dwelling unit and congregate housing definitions to comply with HB 2583?

6) Do you agree with our recommendation to remove the Type I Adjustment process?

7) Do you agree with our recommendation to incorporate provisions of SB 8 into a new chapter of the Sandy Development Code to control height and density?

8) Do you agree with our recommendation to exempt parks maintenance outside a wetland or creek from the tree removal permit requirement outside a wetland or creek?

RECOMMENDATION:
Provide feedback on the eight policy amendments in Exhibit A. Prior to our work session in September, please review all code amendments in Exhibit B in preparation for discussion of concerns or additional edits you believe are needed.

LIST OF ATTACHMENTS/EXHIBITS:
Exhibit A. Memo from MIG/APG
Exhibit B. Draft Code Amendments for Clear and Objective Audit

EXHIBIT A.

memo

to	Sandy City Council (CC) and Planning Commission (PC)
from	Kate Rogers and Cathy Corliss, MIG|APG
re	Sandy Clear and Objective Code Audit
	Cover Memo for Draft Code Amendments
date	6/7/2023

Introduction

This memorandum summarizes key issues and decision points for the Sandy Clear and Objective Code Audit project. Included in your agenda packet is the full public review draft of the proposed Sandy Development Code amendments for the project (294 pages). Most of the proposed amendments are "policy neutral" (i.e., they are intended to result in outcomes that are consistent with outcomes resulting from the current Development Code). However, the proposed amendments highlighted in this memo are more substantive and are therefore highlighted for your specific consideration and direction.

This memo also provides a brief summary of some of the other issues addressed in the draft Code amendments.

Project Background and Schedule

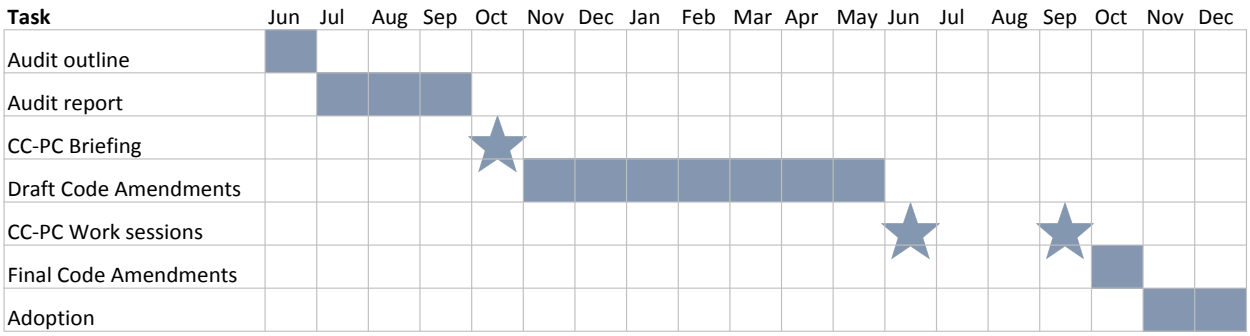
The purpose of the Sandy Clear and Objective Code Audit is to ensure that the City of Sandy's Development Code (SDC) complies with and implements certain Oregon state laws and legislation, primarily Oregon State statute (ORS 197.307). ORS 197.307 requires that local governments provide an approval pathway for housing developments that includes only clear and objective standards, conditions, and procedures (with some exceptions for historic districts).

The Clear and Objective Code Audit kicked off in summer 2022. Since that time, the consultants and City staff have completed the following project tasks:

- Annotated outline of audit report.
- Draft and final code audit report – A detailed review of the SDC, highlighting potential areas of concern.
- Initial and revised draft code amendments – A compiled draft of proposed code amendments. The revised version of this draft is included in your work session packet.

- Staff work sessions – The consultant team held several meetings with City staff, including the City Attorney and representatives of other departments, to discuss key issues and potential solutions. NOTE: The project team is made up of the City Planning staff and the consultant (MIG|APG).

PROJECT TIMELINE (UPDATED)



Key Decision Points for CC / PC Direction

Note: The recommended approaches for items 1 – 3, below, may require the City to provide Measure 56 notice to property owners in affected zones, since the proposed amendments would limit some types of residential development beyond the limitations in the current Code.

1. Standalone Multi-Family Housing in the C-1 and C-3 Zones

Multi-family housing that is "not contained within a commercial building" is a Conditional Use in the C-1 zone and a Minor Conditional Use in the C-3 zone (Section 17.42.20 and 17.46.20). Conditional Use review is a discretionary review procedure. However, under the state's clear and objective requirements, if a housing type is allowed in a zone, there must be a clear and objective path to approval. This means the City can no longer require Conditional Use review as the only option for approving multi-family housing in the C-1 and C-3 zones.

The project team considered a few options to address this issue:

A. **Recommended Option:** The project team's recommended approach is to **remove the option for standalone multi-family in the C-1 and C-3 zones**. All residential development in these zones would need to be part of a mixed-use development (horizontal or vertical mixed use, see item #2, below). This is consistent with the intent of these zones, which is to allow some housing while ensuring adequate space is reserved for commercial uses. (This approach is reflected in the draft Code amendments.)

B. **Allow multi-family housing as a permitted use in the C-1 and C-3 zones and establish a new clear and objective review path.** Instead of creating a whole new set of standards for this use, the most straightforward way to achieve a clear and objective path would be to apply the multi-family design standards (SDC 17.90.160) in lieu of the Downtown and Village Commercial Design Standards in SDC 17.90.110. Note, however, that the multi-family standards are much less detailed than the Downtown design standards and could lead to different built outcomes.

Question for CC/PC: Do you agree with the project team's recommended approach for Item #1 – to remove the allowance for standalone multi-family housing in the C-1 and C-3 zones?

2. Mixed-Use Residential in the C-1 and C-3 Zones

Currently, residential dwellings are allowed in the Central Business District (C-1) and Village Commercial (C-3) zones only as part of a mixed-use development:

- C-1 – Dwellings must be "attached" to a commercial business (Section 17.42.10).
- C-3 – Dwellings must be "above, beside or behind" a commercial business (Section 17.46.10).

The Downtown and Village Commercial Design Standards in SDC 17.90.110, which apply in these zones, must be updated to be clear and objective when applied to housing development. However, this gets complicated when applying the standards to a mixed-use development. The project team's intent is to revise only those standards that need to be revised to comply with clear and objective requirements – i.e., keep any discretionary standards intact as long as they only apply to non-residential development. However, parsing out what applies only to non-residential development is a challenge when residential development could be built anywhere on a site, as long as it is "above, beside or behind" a commercial business.

The project team considered a few options to address this issue:

A. **Recommended Option:** The project team's recommended approach is to **further limit residential development in the C-1 and C-3 zones, so it is only permitted above a commercial business.** This would mean that any standards that apply only to the ground floor of a building – e.g., ground floor window standards – would not need to be updated to be clear and objective. (This approach is reflected in the draft Code amendments.)

B. Keep the current allowances for residential uses, but **apply the multi-family design standards (SDC 17.90.160) to the residential portion of a development**. This would require applicants to apply a different set of standards to different portions of a development, which could be a challenge (both for applicants and staff). However, it would maintain the current allowance for residential uses on the ground floor of a mixed-use development.

C. **Hybrid of A and B:** Prohibit ground floor residential uses only in buildings with **frontage on major streets (Pioneer and Proctor Boulevards).** Residential-only buildings would be allowed on side streets or located behind other buildings subject to the multi-family design standards (SDC 17.90.160) as part of a mixed-use development.

Question for CC/PC: Do you agree with the project team's recommended approach for Item #2 – to limit residential development to above the ground floor in the C-1 and C-3 zones?

3. Zero Lot Line Dwellings in the SFR Zone

The Single-Family Residential (SFR) zone currently requires Minor Conditional Use review for "single detached or attached zero lot line dwellings" (SDC 17.34.20). Attached zero lot line dwellings are also known as townhouses. Detached zero lot line housing involves dwellings being built with no setback from one side lot line; it is a means to achieve more efficient use of narrower lots as well as more usable side yards but is not very common. Zero lot line (attached and detached) development is permitted by right in the other residential zones (R-1, R-2, and R-3)—just not in the SFR zone.

Similar to item #1, above, requiring Conditional Use review for this type of housing conflicts with the state's clear and objective requirements. The options for addressing the issue are also similar:

A. **Recommended Option:** The project team's recommended approach is to **remove the option for zero lot line dwellings in the SFR zone**. This would retain the permitted uses in the SFR zones as single detached and duplex dwellings. (This approach is reflected in the draft Code amendments.)

B. **Allow attached and detached zero lot line dwellings as permitted uses in the SFR zone and establish a clear and objective review path.** The R-1, R-2, and R-3 zones include objective standards for such dwellings, which could be adapted for the SFR zone. However, this would introduce a new form of housing (namely, townhomes) allowed by right in the zone.

C. **Hybrid Option:** Allow detached zero lot line dwellings in the SFR zone, but remove the option for attached zero lot line dwellings.

Question for CC/PC: Do you agree with the project team's recommended approach for Item #3 – to remove the option for zero lot line dwellings in the SFR zone?

4. Transit Street Building Orientation

Chapter 17.82 Special Setbacks on Transit Streets establishes a set of requirements for orienting residential buildings toward the street when on a transit street. "Transit street" is defined as a collector, arterial, or other transit street designated in the Transportation System Plan. The stated intent of the standards in Chapter 17.82 is to enhance pedestrians' experience on transit streets by

improving safety, comfort, and interest and to promote the use of pedestrian, bicycle, and transit modes of transportation.

The current requirements are somewhat discretionary and need to be revised to be clear and objective. This includes the need to define what it means to be "oriented toward" a transit street in a clear and objective manner. City staff have had a difficult time interpreting this requirement because it is somewhat vague. The proposed new language requires building entrances to face the street (up to a 45 degree angle). Whether there is more to this requirement is a question for the Council and Commission. Options include:

A. **Recommended Option: Establish a maximum distance between the building entrance and the transit street (i.e., maximum setback)**. City staff has interpreted the building orientation requirement to mean that building entrances must be relatively close to the street in addition to generally facing the street. (This approach is reflected in the draft Code amendments, except the draft includes a placeholder for the setback dimension.)

   If the preferred approach is Option A, then the standard must include an appropriate maximum setback. In general, maximum setbacks should be somewhat greater than the minimum setback in the zone to provide some flexibility in the placement of the building entrance (the entrance must be located no closer than the minimum and no farther than the maximum).

   Maximum setbacks in the range of 20-30 feet are common for similar regulations in other development codes. Entrances that are within 20-30 feet of the street are generally going to be clearly visible and reachable from the street. These distances also provide some flexibility as the minimum setback in most zones that allow housing is 10 feet. The relationship of the front entrance to garage door and driveway is also a consideration. For example, in the R-2 zone there is a required *minimum* setback of 20 feet for vehicle access. If the code required a 25-foot *maximum* setback for the front entrance, then in no case could the front entrance be located more five feet further from the street than the vehicle entry (e.g., garage door).

B. **No maximum distance requirement**. Only require buildings to face the transit street.

Question for CC/PC: Do you agree with the project team's recommendation to establish a maximum setback as part of the transit street orientation requirements?

If so, do you have direction for an appropriate maximum setback standard (e.g., 25 feet)?

5. Changes to Comply with HB 2583

Oregon House Bill 2583 (2021) prohibits jurisdictions from establishing or enforcing occupancy limits for dwelling units that are based on the familial or nonfamilial relationships among any occupants.

The SDC definition of "family" limits the number of unrelated occupants to five persons; the term "family" is then used in the definition of "dwelling unit" to limit occupancy of a dwelling unit to one family. With the passage of HB 2583, this limitation can no longer be enforced. (Note, however, that Planning staff are not aware of such occupancy limits being enforced in Sandy.)

The proposed revisions to the term "family" would remove the limitations related to familial/non-familial relations:

> *Family: Any number of individuals, related or unrelated, living together in a dwelling unit.*

However, removing the limit on unrelated people in the definition of "family" blurs the distinction between "congregate housing" (a type of group living arrangement) and dwelling units. Since there would no longer be a limit on the number of unrelated occupants, the City could not prevent, for example, a large house with multiple bedrooms from being rented out separately, either for boarding or congregate living purposes.

Potential solutions:

A. **Recommended Option**: Use the number of bedrooms in a dwelling unit as a proxy for the number of persons/occupants. **Limit dwelling units to 8 bedrooms** – this would provide an allowance for some bedrooms to be occupied by related individuals while considering additional rooms being used for unrelated individuals. This is the approach used by several other cities, including West Linn and Hillsboro. Anything over 8 bedrooms would be considered "congregate housing." (Note: Congregate housing would also need to provide shared food preparation service to qualify.)

   > *Dwelling unit: An independent living unit containing eight or fewer bedrooms within a dwelling structure designed and intended for residential occupancy by not more than one family and having independent living facilities including permanent provisions for cooking, eating, sanitation and sleeping.*
   >
   > *Congregate housing: A structure containing nine or more bedrooms and providing shared food preparation service.*
   >
   > (This approach is reflected in the draft Code amendments.)

B. **Keep the definition of dwelling unit as-is**. If there are concerns about precluding very large homes with 9+ bedrooms in Sandy, this would avoid that outcome. However, with the necessary change to the "family" definition, there would also be nothing in the Code to preclude larger congregate-style living from being permitted as one dwelling unit.

Question for CC/PC: Do you agree with the project team's recommendation to modify the dwelling unit and congregate housing definitions to comply with HB 2583?

Note: In the course of investigating this issue, City staff recommended removing the age and disability restrictions for Congregate Housing, which is currently limited to those aged 55 years and older or "handicapped persons." The proposed amendments make "congregate housing" a more general term for group living uses, while still retaining the special standards in Chapter 17.72 Congregate Housing.

6. Type I Adjustments

Adjustments are procedures that "provide a means to vary the quantifiable development standards normally applied in a particular district." The City has two types of Adjustments, as outlined in SDC Chapter 17.66—Type I and Type II. Type I Adjustments are available when an applicant only wants to vary a standard by up to 10 percent (e.g., 10% of a minimum setback requirement). Type II Adjustments allow variations of up to 20 percent. The Adjustment review criteria are discretionary – using phrases such as "will not substantially reduce the amount of privacy enjoyed by users of nearby structures." Oregon state statute requires local governments to provide public notice and the opportunity to appeal for all "land use decisions" and "limited land use decisions"—those decisions which require interpretation or the exercise of policy or legal judgment (per ORS 197.195 and ORS 227.175(10)). This is not a problem for the City's Type II Adjustments; however, the current Type I procedure does not include all of the required notice.

Recommended Solution: As suggested by the City Attorney, the project team recommends that the City simply remove the Type I Adjustment process entirely (leaving just Type II, which is already defined in a way that would allow it to substitute for Type I). This means there would no longer be an Adjustment process with a lower review threshold, but it would also eliminate the current inconsistency with State law and protect the City from legal challenge on this matter.

Question for CC/PC: Do you agree with the project team's recommendation to remove the Type I Adjustment process?

7. Affordable Housing Under Senate Bill 8

Senate Bill 8 (SB 8, 2021 legislative session) requires local governments to allow affordable housing, which meets a specific definition and criteria, on a wide range of sites. Affordable housing that is owned by a public body or religious nonprofit must be allowed in any zone. Affordable housing that is owned by other types of organizations must be allowed on property zoned for commercial uses, religious institutions, public lands, or industrial lands except those specifically for "heavy industrial."

SB 8 provides height and density bonuses in areas zoned for residential uses. **However, it does not specify any densities for those zones that do not otherwise allow housing.**

Recommendation: As part of the proposed amendments package, the project team recommends adding a new SDC chapter – Chapter 17.88 Affordable Housing – to address these requirements. The provisions of SB 8 will apply in Sandy regardless of whether the City chooses to incorporate them into the Development Code. However, adding standards to the SDC will make them much easier for staff to interpret and apply, in case an application is submitted.

In addition, this gives the City the ability to fill in the gaps left by SB 8 and establish density limits in nonresidential zones. Without local provisions, an affordable housing development could theoretically have unlimited density (limited only by heigh maximums and other siting standards) in nonresidential zones where it is now allowed under SB 8. The proposed standards in SDC 17.88.10.B.3 would use the height and density standards applicable to the Medium Density Residential (R-2) zone (maximum height 35 feet; maximum density 14 units per acre). NOTE: SB 8 does not specify what type of housing could be constructed under the new requirements, but presumably, applicants would build multi-family housing to take advantage of the density provisions.

Alternative: The alternative to adopting new provisions for SB 8 would be to apply the statutory requirements directly to an application. As noted above, SB 8 applies regardless of whether it is incorporated into the local code. An applicant could still apply for a development under the new allowances and the City could not deny the application if all the criteria and standards were met. However, SB 8 is somewhat difficult to interpret and leaves certain issues open to interpretation, which is solved by adopting regulations into the Code.

Question for CC/PC: Do you agree with the project team's recommendation to incorporate the provisions of Senate Bill 8 into a new chapter of the SDC?

8. Tree Removal for Parks Maintenance

The Urban Forestry standards in Chapter 17.102 require properties larger than one acre to obtain a tree removal permit before removing trees 11 inches DBH or greater. However, the Code allows exceptions for "tree removal as required by the city or public utility for the installation or maintenance or repair of roads, utilities, or other structures" as well as hazard trees that pose an imminent threat.

City staff recommends also adding a new exception for tree removal from City-owned parks and natural areas for trail installation/maintenance, safety improvements, and general park maintenance. This would allow the City Parks Department to maintain its facilities as needed without having to go through the tree removal permit process. However, the tree replanting requirements in SDC 17.102.60 would still apply. Also, permits would still be required from the

Planning Division when tree removal is within resource areas as defined in Chapter 17.60, such as within the riparian corridor of creeks and wetlands.

Question for CC/PC: Do you agree with City staff's recommendation to exempt parks maintenance from the tree removal permit requirement?

Summary of Other Code Topics

The majority of the draft amendments in the attached agenda packet are related to clear and objective revisions for compliance with ORS 197.307. However, the packet also includes amendments that implement other Oregon statutes and legislation, as well as implementing the City's soon to be adopted Transportation System Plan. Below is a summary of these other Code topics.

- **House Bill 2583 (2021)** – This legislation prohibits local governments from establishing or enforcing occupancy limits for dwelling units that are based on the familial or nonfamilial relationships among any occupants. Changes needed for compliance are proposed primarily in Chapter 17.10 Definitions. See Item #5 under Key Decision Points, above, for additional discussion.
- **House Bill 4064 (2022)** – This legislation prohibits local governments from subjecting manufactured homes to standards that do not apply to site-built single-family dwellings on the same land, except:
    - Protections related to statewide land use planning goals; and
    - Regulations related to thermal envelope performance standards.

  To comply, the standards in SDC 17.90.140 regulating minimum floor area, foundation style, roof pitch, and siding for manufactured homes outside of manufactured dwelling parks are proposed for deletion. Manufactured homes will continue to be subject to the single-family design standards in SDC 17.90.150.

  HB 4064 also addresses "prefabricated structures," which are equivalent to what the SDC defines as "modular homes." The legislation requires local governments to allow prefabricated structures on land zoned for single-family homes and within manufactured home parks. The proposal for addressing this requirement is to include prefabricated and modular homes in the definition of single detached dwellings, which already includes manufactured homes.
- **Senate Bill 8 (2021)** – SB 8 requires local governments to allow affordable housing, which meets a specific definition and criteria, on a wide range of sites. See Item #7 under Key Decision Points, above.

- **House Bill 2008 (2021) –** HB 2008 is similar to SB 8 but limited to affordable housing on property that is owned by religious nonprofits and also provides a somewhat different definition of affordable housing. It requires local governments to allow the development of affordable housing on property that is not zoned for housing, provided the property is contiguous to a zone that does allow housing and is not zoned for industrial uses. Density is based on standards for the contiguous zone that allows housing.

  The provisions of HB 2008 are also incorporated into the proposed new Chapter 17.88.

- **Dark Sky Ordinance, Sandy Municipal Code Chapter 15.30** – The Development Code frequently references the lighting standards in SMC Chapter 15.30; therefore, it is necessary to make these regulations clear and objective to comply with ORS 197.307. In addition to the clear and objective updates proposed in that chapter, the project team has added the following in response to specific requests by City Council members and staff:
  - Provisions for LED lighting – and associated color range limits (maximum 4125K).
  - Provisions permitting the use of laser lights for holiday decorations – with limitations to prevent safety concerns.

- **Transportation System Plan (TSP)** – The draft code packet includes amendments associated with implementation of the City's soon to be adopted TSP. The Planning Commission and City Council reviewed these draft amendments at the April 17, 2023, joint work session. The amendments are being integrated with the Clear and Objective Code Audit project to ensure that all of the transportation-related Code language that applies to housing is clear and objective. The TSP amendments and Clear and Objective amendments will be adopted as a single Code package.

- **Food and Beverage Carts, Section 17.74.90 –** The draft code packet also incorporates amendments to the Food and Beverage Cart regulations section that are proposed as part of a separate City effort. The proposal includes allowing motorized food trucks for short duration events as requested by the City Council. The draft amendments also include administrative modifications that are needed to properly process food and beverage cart permits.

CHAPTER 17.02 THE CITY COUNCIL, ITS AGENCIES AND OFFICERS[1]

Sec. 17.02.00. The City Council authority and responsibility.

The State has delegated to the City Council responsibility for adopting land use plans and controls. In addition, the State has authorized the Council to act upon applications for development or to delegate its authority to act upon such applications. In addition, the State has authorized the Council to act upon applications for development or to delegate its authority to act upon such applications. The City has adopted this Code pursuant to its responsibilities to secure the health, safety, and welfare of its citizens and also pursuant to its home rule authority. The City Council has created a Planning Commission for the purpose of implementing such plans and controls.

Sec. 17.02.10. Powers and duties.

The City Council has the following powers and duties in addition to any others it may now have, be given, or confer upon itself. The City Council:

A. May adopt, amend, supplement, or repeal plans and policies for development of the community;

B. May adopt, amend, supplement, or repeal the text of any provision or regulation of this Code;

C. May amend the boundaries of zoning districts established on the Official Zoning Map;

D. Shall review decisions of the Planning Commission upon appeal;

E. Shall appoint members of the Planning Commission; and

F. May establish a reasonable schedule of fees with respect to matters under this Code.

Sec. 17.02.20. The Planning Commission.

The Planning Commission shall be appointed in accordance with the Sandy Municipal Code. The Commission shall have the powers and duties provided therein and provided by this Code. The Commission shall also hear and act on appeals resulting from alleged errors in orders, requirements, decisions, and interpretations of the Director or designated administrative officers charged with the enforcement of this Code and such other matters as required by this Code.

Sec. 17.02.30. Quorum of the Planning Commission.

Four members shall constitute a quorum.

[1]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2019-01, effective January 7, 2019. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

Sec. 17.02.40. Director.

A. *Position.* The Director referenced in this Code is the ~~Director of Planning and~~ Development Services Director or any other member of staff designated by the City Manager to supervise, organize, direct, and control activities defined under this Code. For brevity, the ~~Planning and~~ Development Services Director shall be referred to as Director throughout the Code.

B. *Powers and Duties.* The Director provides professional planning assistance to the citizens, City Council, Planning Commission, and City Manager and is hereby authorized to interpret provisions of this Code and to perform such other duties in the administration of the Development Code as are required herein. Such powers and duties may be accomplished by person(s) as designated by the Director.

C. *Floodplain Administrator.* The Director is hereby appointed to administer and implement the City of Sandy flood ordinance by granting or denying development permit applications in accordance with its provisions.

Sec. 17.02.50. Conflict of interest.

A member of the hearing authority shall not participate in any proceedings or action in which the member has a legal conflict of interest defined in State law that would bar participation in a decision by a Planning Commissioner or City Councilor. Any actual or potential interest shall be disclosed at the meeting of the hearing authority where the action is being taken. Examples of conflict of interest include: a) the member has a direct economic interest in the proposal; or b) for any other valid reason, the member has determined that participation in the hearing and decision cannot be accomplished in an impartial manner.

Sec. 17.02.60. Participation by interested officers or employees.

No officer or employee of the City who has a financial interest in a land use decision shall participate in discussions with or give an official opinion to the hearing body without first declaring for the record the nature and extent of such interest.

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CHAPTER 17.08 NONCONFORMING DEVELOPMENT

Sec. 17.08.00. Intent.

These regulations are intended to permit nonconforming uses and structures to continue, but not to encourage their perpetuation. The regulation of nonconforming development is intended to bring development into conformance with this Code and the Comprehensive Plan.

As used in this chapter, nonconforming development includes nonconforming structures and nonconforming uses. A nonconforming structure is a structure that does not fully comply with the zoning district provisions because of setbacks, building height, off-street parking, or with some other standard of the district.

Within the zoning districts established by this Code, development may exist that was lawful at the time it began, but would be prohibited in the future under the terms of this Code or future amendments.

In order to avoid undue hardship, nothing in this Code shall be deemed to require a change in the plans, construction, or designated use of any building on which actual substantial construction was lawfully begun prior to the effective date of adoption or amendment of this Code and upon which actual building construction has been carried on diligently. Construction is considered to have started if excavation, demolition, or removal of an existing building has begun in preparation of rebuilding, and a building permit has been acquired, prior to the effective date of adoption or amendment of this Code.

Sec. 17.08.10. General provisions.

A. *Alterations of a Nonconforming Use.* No building, structure, or land area devoted to a nonconforming use shall be enlarged, extended, reconstructed, moved, or structurally altered unless such development conforms to the provisions of this Code. Nothing in this chapter shall be construed to prohibit normal repair, maintenance, and nonstructural alterations to such development, nor the alteration, strengthening, or restoration to safe condition as may be required by law.

B. *Alteration of a Nonconforming Structure.* Where the use of a structure is permitted by the applicable development district but the structure is nonconforming, an alteration, expansion, enlargement, extension, reconstruction, or relocation may be administratively approved if the improvement, evaluated separately from the existing structure, would be in compliance, and is not within a vision clearance area.

Sec. 17.08.20. Discontinuance of a nonconforming use.

Whenever a nonconforming use is discontinued for more than one year, further use shall be in conformity with the provisions of this Code. For purposes of this Code, rental payments or lease payments and taxes shall not be considered a continued use. "Discontinued" shall mean nonuse and shall not require a determination of the voluntary or involuntary nature of the discontinuance or the intent to resume the nonconforming use.

Sec. 17.08.30. Damage to a nonconforming use.

If a structure with a nonconforming use is damaged by any means to an extent exceeding 80 percent of its most recent, pre-damage assessed valuation as indicated by the Clackamas County Assessor's office, any future development on the site shall conform to the requirements of the zoning district in which it is located.

Sec. 17.08.40. Reclassification to conditional development.

Whenever a nonconforming use is classified as a use that may be permitted conditionally, it shall be reclassified as conforming upon receipt of an approved conditional use permit in accordance with Chapter 17.68.

Sec. 17.08.50. Exceptions.

A. *Multi-Family Dwellings, Office Uses, Automotive Fueling Stations, Car Washes, and Retail Auto Dealerships in the C-1 Zoning District.*

1. Multi-family dwellings in existence as of September 30, 1997 shall not be classified as nonconforming development. However, any redevelopment or expansion shall require compliance with current landscaping, access and parking standards and shall be processed as a conditional use permit.
2. Office uses in existence as of September 30, 1997 shall not be classified as nonconforming development. However, any redevelopment or expansion shall require compliance with current landscaping, access and parking standards and shall be processed as a conditional use permit.
3. Automotive fueling stations and car washes in existence as of September 30, 1997 shall not be classified as nonconforming development. However, any redevelopment or expansion shall require compliance with current landscaping, access and parking standards and shall be processed as a conditional use permit.
4. Retail auto dealerships in existence as of September 30, 1997 shall not be classified as nonconforming development. Redevelopment of the existing dealership shall require compliance with current landscaping, lighting and access requirements. Expansion of an existing dealership shall be permitted only on property contiguous to the existing auto dealership and in the same ownership as the auto dealership on the effective date of the ordinance from which this chapter is derived. Expansion shall be processed as a conditional use permit. If the existing auto dealership building is proposed to be altered or if a new building is proposed to be constructed on the expansion property, the entire dealership shall be required to conform to current applicable criteria and standards in the Sandy Development Code. If the expansion is proposed to include only parking for the display of automobiles, landscaping, light standards and signage, only the expansion property shall be required to conform to current applicable criteria and standards in the Sandy Development Code.

B. *Self-Service Storage in the C-1, C-2, and I-1 Zoning Districts.*

1. Self-service storage facilities in the C-1 or C-2 zoning districts in existence as of February 16, 2023, shall not be classified as nonconforming development. Permitted expansion of an existing self-service storage facility shall be limited to an increase in building footprint of 20 percent and shall be permitted only on the subject property.
2. Self-service storage facilities in the I-1 zoning district in existence as of February 16, 2023, shall not be classified as nonconforming development. Expansion of an existing self-service storage facility shall be permitted only on the same property or on property contiguous to and in the same ownership as the existing self-service storage facility as of February 16, 2023. If the existing self-service storage building is proposed to be altered or expanded on the subject property or if a new building is proposed to be constructed on the subject property, the application shall be processed as a conditional use permit.

C. *Nonconforming Duplexes.* Where a duplex is a nonconforming building type in the zoning district where it is located and has been damaged as described in 17.08.30 above, a duplex may be reconstructed provided such reconstruction commences within one year of the damage and complies with required development standards.

D. *Nonconforming Lots ~~of Record~~.* An existing legal lot ~~of record~~ may not meet the lot size requirements of the zoning district in which it is located. Such a lot may be occupied by a use permitted in the district. If, however, the lot is smaller than the size required in its district, residential use shall be limited to ~~one dwelling unit~~ a single detached dwelling or duplex or to the number of dwelling units consistent with density requirements of the district. Also, other applicable requirements of the zoning district must be met.

E. *Street and Drainageway Dedications.* The act of conveyance to or appropriation by the City for street, drainage, or other public purposes shall not in itself render as nonconforming the use of land, structure, or other improvement maintained upon a lot.

F. *Residential Uses.* Any residential dwelling permitted prior to adoption of this Code, but which is no longer allowed as a new use, may be modified or enlarged, provided it complies with required development standards of the district.

G. *Legally Required Alterations.* Alterations of any nonconforming use shall be permitted when necessary to comply with any lawful requirement for alteration in the use.

(Ord. No. 2000-02, 2000)

CHAPTER 17.10 DEFINITIONS[2]

Sec. 17.10.30. Meaning of specific words and terms.

The listed specific words and terms are defined as follows:

Abandonment: To cease or discontinue a use or activity without intent to resume, but excluding temporary or short-term interruptions to a use or activity during periods of remodeling, maintaining or otherwise improving or rearranging a facility, or during normal periods of vacation or seasonal closure. An "intent to resume" can be shown through continuous operation of a portion of the facility, maintenance of sewer, water and other public utilities, or other outside proof of continuance such as bills of lading, delivery records, etc.

Abandonment, discontinued use: Discontinued use shall mean nonuse and shall not require a determination of the voluntary or involuntary use or intent to resume the use.

Abutting lots: Two or more lots joined by a common boundary line or point. For the purposes of this definition, ~~no boundary line shall be deemed interrupted~~lots that are separated by a road, street, alley, or public way are not considered abutting. ~~it being the intent of this definition to treat property lying on the opposite sides of a road, street, alley or public way as having a common boundary line or point.~~

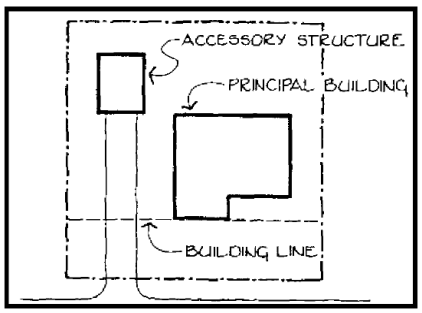
Access: The place, means, or way by which pedestrians or vehicles shall have ~~safe, adequate, and usable~~ ingress and egress to a property, use or parking space.

Accessway: A pathway, shared-use path, walkway, or pedestrian way connecting two rights-of-way to one another where no vehicle connection is made.

Accessory dwelling unit: A second dwelling unit either in or added to an existing single-family detached dwelling, or in a separate accessory structure on the same lot as the single-family dwelling, for use as a complete, independent living facility with provisions within the accessory apartment for cooking, eating, sanitation and sleeping. Such a dwelling is an accessory use to the single-family dwelling.

Accessory structure (detached): A structure that is ~~clearly~~ incidental to and subordinate to the main use of property and located on the same lot as the main use; freestanding and structurally separated from the main use.

[2]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2020-24, effective September 21, 2020. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.



Accessory Structure Example

Accessory structure (attached): A structure that is clearly incidental to and subordinate to the main use of the property; attached to the principal structure by the wall or roof of the latter or by the roof over a breezeway connecting the accessory and principal structures.

Accessory use: A use on the same lot with and of a nature customarily incidental and subordinate to the principal use.

Acre, gross: A~~Gross acre means a~~n acre area of land~~,~~ which includes in its measurement public streets or other areas to be dedicated or reserved for public use.

Acre, Net: A~~Net acre means a~~n acre area of land~~,~~ which does not include ~~in its measurement~~ public streets or other areas to be dedicated or reserved for public use.

Activate (as in "activate wall"): To m~~M~~ake the exterior of a building inviting to pedestrians through a combination of elements, such as an enhanced customer entrance, weather protecting features (such as canopies or awnings), pedestrian-scale signage, and transparent windows allowing for views into and from interior building spaces. As used in Chapter 17.90, an elevation is "activated" when it meets applicable window transparency requirements, and contains a public entrance with a pedestrian shelter extending at least five feet over an adjacent sidewalk, walkway, or civic space.

Actual Construction: The placing of construction materials in a permanent position and fastened in a permanent manner.

Adjacent lot: Adjacent means the same as abutting lot.

AE zone (floodway): Area of special flood hazard with water surface elevations determined as depicted on the Flood Insurance Rate Map (FIRM).

Affordable housing: Housing for households with incomes at or below the Clackamas County median, as determined by the U.S. Department of Housing and Urban Development (HUD), on the assumption that these households do not spend more than 30 percent of their income for housing costs. Housing costs for renters include rent and heating. Housing cost for homeowners includes principal on the mortgage plus interest, taxes, insurance, and heating. Note: Median income figures depend upon the household size assumed. These numbers are updated annually by HUD.

A. For the purposes of Section 17.88.10, Affordable Housing Allowed Outright Under ORS 197.308, "affordable housing" is defined as residential property in which:

1. Either each unit on the property is made available to own or rent to families with incomes of 80 percent or less of the Clackamas County median, or the average of all units on the property is made available to families with incomes of 60 percent or less of the Clackamas County median; and

2. Whose affordability is enforceable, including as described in ORS 456.270 to 456.295, for a duration of no less than 30 years.

B. For the purposes of Section 17.88.20, Affordable Housing Developed by Religious Corporation Under ORS 197.311 (5), "affordable housing" is defined as housing in which all units are affordable to households with incomes equal to or less than 60 percent of the Clackamas County median and whose affordability is enforceable by an affordable housing covenant, as described in ORS 456.270 to 456.295, for a duration of no less than 30 years.

C. For the purposes of Section 17.88.30, Conversion of a Hotel or Motel to an Emergency Shelter or Affordable Housing Under ORS 197.748, "affordable housing" has the meaning given that term in ORS 197.311.

A-frame building: A building with steeply angled sides that meet at the top of the building in the shape of an "A"; more than half of the two side elevations comprise the primary roof form.

After school program: A program designed to provide care for and educational enhancement to children immediately following school release.

Agriculture: Nursery activity, horticulture and similar activities for the cultivation of commercial crops in addition to pasturing, breeding, dairying, and similar uses of animals, and poultry for commercial use; does not include processing, slaughtering, large scale poultry raising, commercial forestry and similar uses.

Aisle: The driving portion of the parking area. The aisle provides access to each space.

Alley: A public or private way permanently reserved as a means of access to abutting property, usually with principal access from another street.

Alteration: Any change, addition, or modification in construction or occupancy of an existing building or structure.

Amendment: A change in the wording, context, or substance of the Development Code, or a change in the zone boundaries or area district boundaries upon the zoning map.

Anchor space/store/building: The largest single use, or the largest space designed for a single store or use, on a site.

Ancillary structure/store/building: An accessory structure, store, or building. See also, Accessory Use.

Angled: Any parking space that is not parallel to the curb or driving aisle.

Apartment: A dwelling unit~~,~~ which is located within a multi-family dwelling but excluding condominiums. (Multi-family dwelling is defined under Building Types.)

Appeal, floodplain: A request for a review of the Floodplain Administrator's interpretation of any provision of this chapter or a request for a variance.

Application: ~~For purposes of this Code, application is defined as d~~Documents and materials submitted or to be submitted to the ~~c~~City by a person which are related to that person's request for a decision under the Development Code.

Area of shallow flooding: A designated Zone AO or AH on a community's Flood Insurance Rate Map (FIRM) with a one percent or greater annual chance of flooding to an average depth of one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Area of special flood hazard: The land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. It is shown on the Flood Insurance Rate Map (FIRM) as Zone A, AO,

AH, A1-30, AE, A99, AR. "Special flood hazard area" is synonymous in meaning with the phrase "area of special flood hazard."

Assisted living: Assisted living facilities are places that provide housing, personal care, or assistance to residents that need help with activities of daily living, who are usually elderly or disabled persons. At least one person responsible for providing daytime care, protection, supervision, monitoring and/or training or treatment of residents is present on the site at all times. Larger group-living facilities may offer shared facilities for eating, hygiene, and/or recreation. Tenancy is for longer than one month.

Automobile fueling station: Automotive fueling station means any premises used primarily for supplying motor fuel, oil, minor servicing, excluding body and fender repair, and the sale of accessories as a secondary service for automobiles, at retail direct to the customer.

Automobile wrecking yard: The dismantling or wrecking of used motor vehicles or trailers, or the storage, sale or dumping of dismantled, partially dismantled, obsolete or wrecked vehicles or their parts.

Average daily traffic (ADT): Two-direction, 24-hour total count of vehicles crossing a line perpendicular to the road on an average weekday.

Base flood: A flood having a one percent chance of being equaled or exceeded in any given year.

Base flood elevation (BFE): The elevation to which floodwater is anticipated to rise during the base flood.

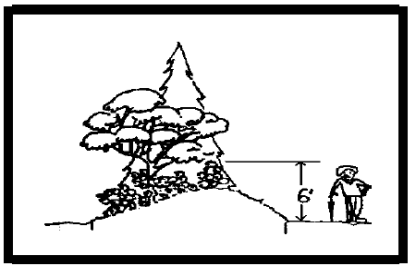
Basement: Any area of a building having its floor subgrade below ground level on all sides.

Batten seam: Application of a batten where two exterior boards or panels adjoin (e.g., board and batten siding).

Bay (building design): The division of a building (usually repeating) between vertical lines or planes, especially the entire space included between two adjacent supports.

Bed and breakfast inn: A house, or portion thereof, where short-term lodging rooms and meals are provided. The operator of the inn shall live on the premises or in adjacent premises.

Berm: An earthen mound designed to provide a visual interest, screen undesirable views, and/or decrease noise.

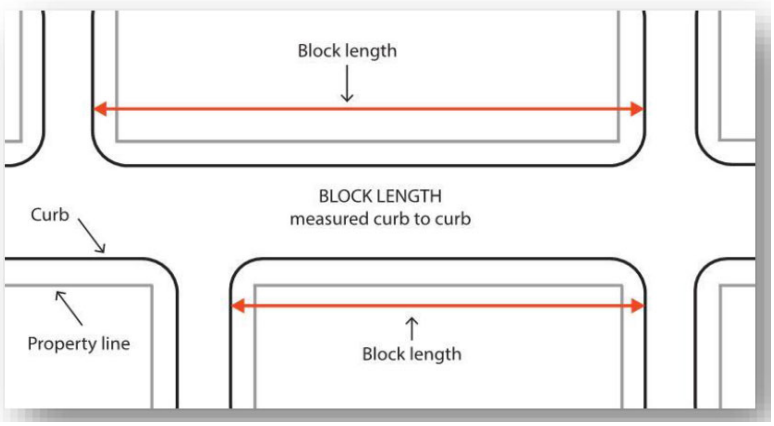


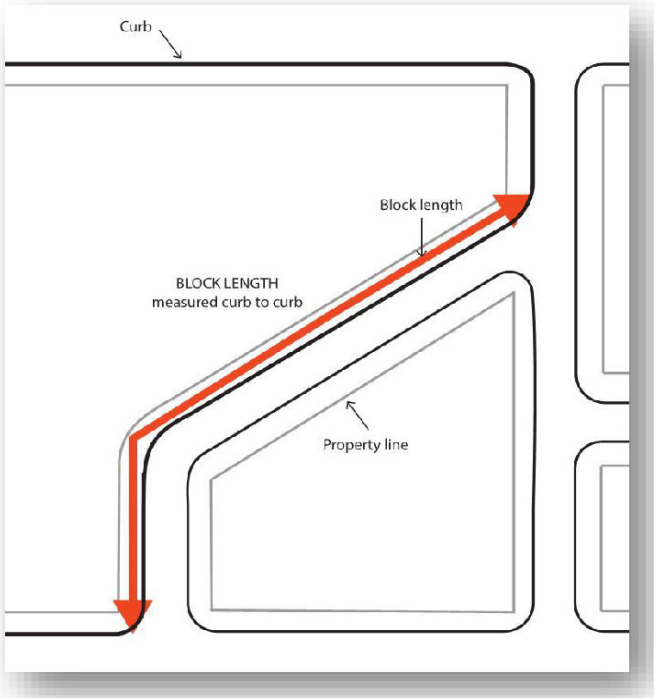
Berm Example

Big-box, or large-format commercial/industrial: Any single building containing more than 30,000 square feet of gross floor area in the C-1 zone, or greater than 60,000 square feet of gross floor area in any other commercial or industrial zone.

Block: A tract of land bounded by street or by a combination of streets and public parks, cemeteries, railroad rights-of-way, drainageways, or unsubdivided land.

Block length: The distance along a block face measured from curb to curb between the edges of the two bounding intersections.



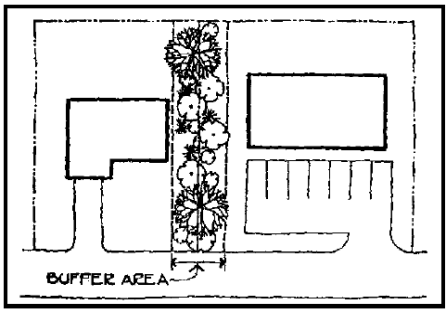


~~*Boarding, lodging or rooming house:* An establishment with lodging for not less than five persons nor more than ten persons not including members of the owner-occupant or tenant-occupant family, other than a hotel or motel, where lodging, with or without meals, is provided.~~

Bond: Any form of security (including a cash deposit, surety bond, collateral, property, or instrument of credit) in an amount and form satisfactory to the City.

Breezeway: A structure for the principal purpose of connecting the ~~main~~primary building or buildings on a property with other ~~main~~primary buildings or accessory buildings.

Buffer: A combination of physical space and vertical elements, such as plants, berms, fences or walls, designed to provide space or distance, obstruct undesirable views, serve as an acoustic barrier, generally reduce impacts of adjacent development, or separate and screen incompatible land uses from each other.



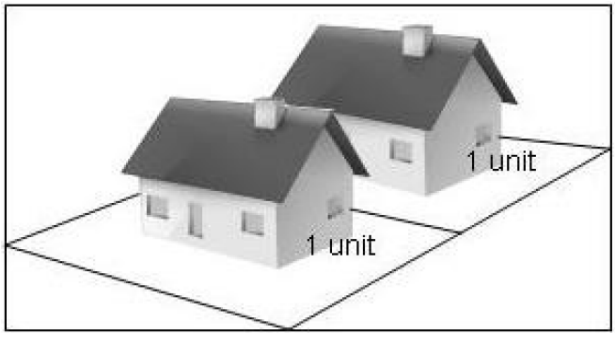
Buffer Example

Building: Any structure used or intended for support, shelter or enclosure of any persons, animals, goods, equipment or chattels and property of any kind. If within an Area of Special Flood Hazard then the definition of "Structure" provided in Chapter 17.10 shall apply.

Building Types:

A. *Nonresidential:* That group of building types comprising the following:

1. *Detached:* A single ~~main~~ building, freestanding and structurally separated from other buildings.

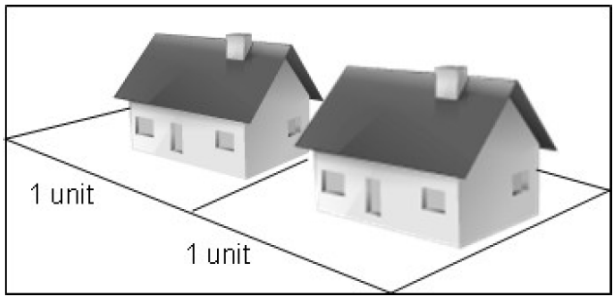


2. *Attached:* Two or more ~~main~~ buildings placed side by side so that some structural parts are touching one another.

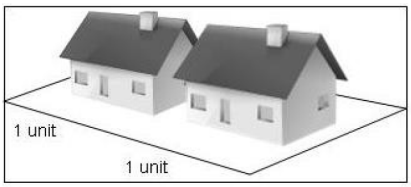
B. *Residential:* That group of building types comprising the following:

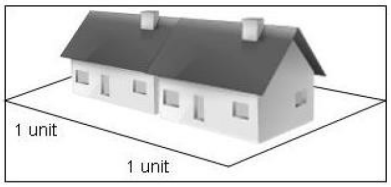
1. *Single detached:* One dwelling unit, freestanding and structurally separated from any other dwelling unit or buildings, located on a lot or development site, including manufactured homes as defined in this chapter and modular and prefabricated structures as defined in ORS 197.286. Also referred to as "single-family dwelling."

2. *Single detached (zero lot line):* A single detached structure with no setback from one lot line.

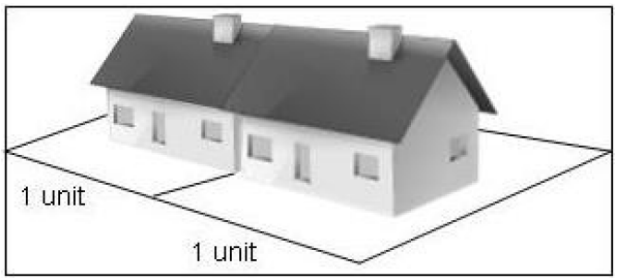


3. *Duplex:* ~~A dwelling containing t~~Two independent dwelling units located on one lot or development site. The two dwelling units may be attached or detached, as shown in the images below. A duplex could be two units on a single lot, or on separate lots if divided pursuant to a middle housing land division.

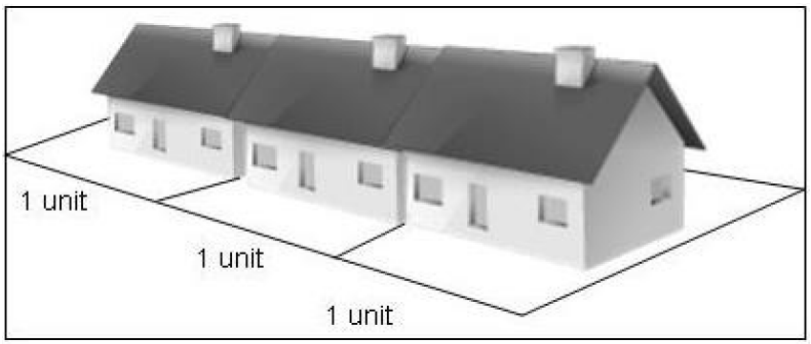




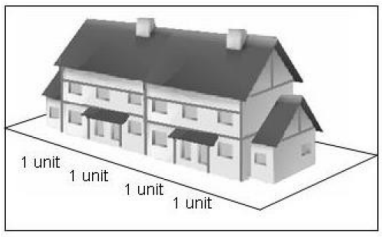
4. *Single attached (zero lot line):* Two dwelling units located on separate lots but attached side by side sharing some structural parts at a common property line with no setback from one lot line.

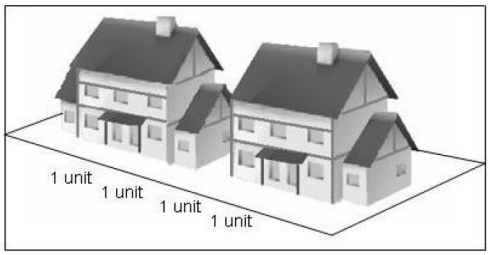


5. *Attached (row house):* More than two dwelling units, each unit located on its own separate lots, and placed side by side but sharing some structural parts at a common property line.



6. *Multi-family dwelling:* At least three dwelling units in any vertical or horizontal arrangement, located on a lot or development site. An existing dwelling may be utilized as part of a multi-family dwelling when redevelopment of the site occurs and does not have to be attached to another structure. Apartment and condominium are synonymous in reference to multi-family dwellings in the development code.





~~7. *Manufactured dwelling park:* A place where four or more manufactured or mobile homes are located within 500 feet of one another on a lot, tract, or parcel of land under the same ownership, the primary purpose of which is to rent or keep space for rent or to offer space free in connection with securing the trade or patronage of such person.~~

C. The following commonly used terms are not considered building types for purposes of this Code.

1. *Cluster:* An arrangement of building types designed to retain open space areas equal to or greater than the cumulative total open space areas normally required and maintaining the permitted gross density of a site.

2. *Condominium:* A form of ownership where the owner has a deed to a volume of space, and is governed by the provisions of ORS Chapter 100.

Building envelope: That portion of a lot or development site exclusive of the areas required for front, side, and rear yards and other required open spaces; and which is available for siting and constructing a building or buildings.

Building height: See Height of Buildings definition.

Building line: A line on a plat indicating the limit beyond which buildings or structures may not be erected, or the minimum or maximum distance as prescribed by this Code between the property line abutting a street and the closest point of the foundation of any building or structure related thereto. Building line means a line established by this title to govern the placement of a building with respect to the front lot line through the setback requirements of a minimum front yard. A building line is ordinarily parallel to the front lot line and at a distance in accordance with the setback requirement.

Bulk plant: An establishment where commodities, including both liquids and solids, are received by pipelines, tank car, tank vehicle, or other container, and are stored or blended in bulk for the purpose of distribution by pipeline, tank car, tank vehicle or container.

Carport: A stationary-roofed structure or a portion of a building open on two or more sides primarily used for the parking of motor vehicles.

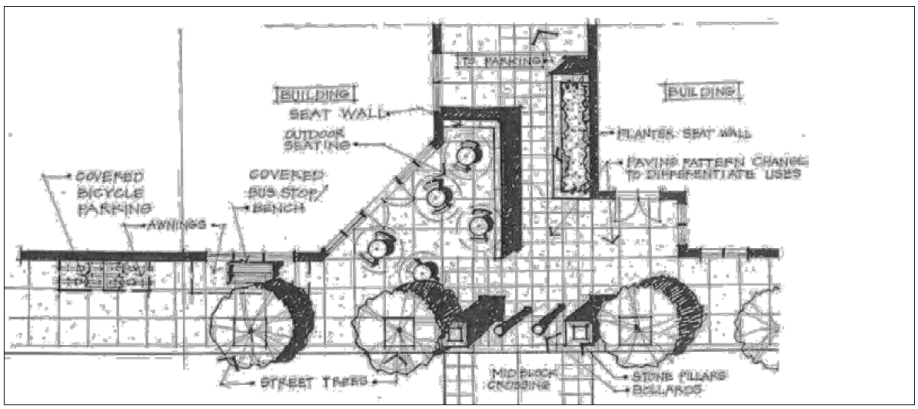
Cemetery: Land used or intended to be used for the burial of the dead and related cemetery activities, including: columbarium, crematoriums, mausoleums, and mortuaries, when operated in conjunction with and within the boundary of such cemetery.

Change of zone: The legislative act of rezoning one or more lots or parcels.

Church: An institution that people regularly attend to participate in or hold religious services, meetings and other activities.

City: The City of Sandy, a municipal corporation of the State of Oregon~~, where the provision involves a duty owed the City in either its governmental or its corporate capacity; otherwise, that officer, department, or agency of the City indicated by the context, or where the context does not clearly indicate a specific officer, department, or agency, then the City Manager of the City~~.

Civic space: A public or quasi-public gathering space, such as a plaza, square, outdoor seating area, bus waiting area, garden, fountain, sculpture or public art display, or similar space, oriented to pedestrians and connecting one or more developments to the adjacent streetscape.



Civic Space Example

Clinic: A building or portion of a building designed and used for the diagnosis and treatment of human patients that does not include overnight care facilities, including medical, dental and psychiatric services.

Commercial day care facility: Any business other than a family day care home providing adult supervision for children or adolescents.

Commission: The Planning Commission.

Common open space: An area within a development designed and intended for the use or enjoyment of all residents of the development or for the use and enjoyment of the public in general.

Comprehensive plan: The comprehensive development plan for the City of Sandy, comprising plans, maps or reports, or any combination thereof relating to the future economic and physical growth and development or redevelopment of the city.

Community service use: A community use, including but not limited to, schools, churches, community centers, fire stations, libraries, parks and playgrounds, cemeteries, or government buildings.

Concrete form: A method of concrete construction where members are cast horizontally near their eventual location and integrate textures or patterns replicating other materials.

Conditional use: A use that would not be generally appropriate within a zoning district but which, if controlled as to number, area, location, or relation to the neighborhood, would not be detrimental to the public health, safety, or general welfare.

Condominium: A form of ownership where the owner has a deed to a volume of space, and is governed by the provisions of ORS Chapter 100.

Congregate housing: A structure containing nine or more bedrooms ~~two or more dwelling units or rooming units limited in occupancy to persons 55 years or older or handicapped persons, their spouses, except for rooms or units occupied by resident staff personnel,~~and providing ~~indoor, conveniently located,~~ shared food preparation service~~, dining areas, and common recreation, social and service facilities for the exclusive use of all residents~~.

Conservation easement: An easement granting a right or interest in real property that is appropriate to retaining land or water areas predominately in their natural, scenic, open or wooded condition; retaining such areas as suitable habitat for fish, plants, or wildlife; or maintaining existing land uses.

Consolidation: The elimination of a property line or lines of unplatted land to create a single unit of land where more than one unit previously existed.

Contiguous: ~~The same as abutting.~~Having a property line, zoning boundary or wall in common. For the purposes of this definition, no boundary line shall be deemed interrupted by a road, street, alley or public way, it being the intent of this definition to treat property lying on the opposite sides of a road, street, alley or public way as contiguous.

Cooperative: A group or association which has taken a deed or lease to property and which issues stock upon which the tenant's rights to proprietary leases are based. The stock, or other evidence of interest in the cooperative corporation or association, shall be purchased by persons who are tenants in the occupancy of at least 80 percent of the accommodations in the structure and are entitled by reason of such ownership to proprietary leases of such accommodations.

Critical facilities (floodway): Hospitals, fire stations, police stations, storage of critical records, and similar facilities.

Critical root zone: A protection area beneath a tree containing sufficient roots required for future tree health and stability and delineated by a circle with a minimum radius of 1' for each 1" of trunk diameter (see DBH), measured horizontally from the base of the tree.

Cross-gable: Where one gable-ending roof intersects another gable-ending roof. (See graphic below.)

Gables (cross-gables) Example

Curtain windows (flush glazing): Preassembled wall units or continuous window glazing providing a flush surface; windows may be separated by metal framing members which may be set entirely behind the glass panes or units. This type of glazing does not allow for the division of windows into small panes with trim.

Day care facility: A child care facility certified to care for 13 or more children, or a facility that is certified to care for 12 or fewer children and located in a building constructed other than a single family dwelling. Also known as a "Certified Child Care Center" as defined in OAR 414, Division 300.

Day care, family: Baby-sitting, care of 12 or fewer children, including resident family members, as accessory to any residential use regardless of full-time or part-time status. Family day care is subject to the definition of home business.

Day(s): Shall mean calendar days unless working days are specified.

DBH: Diameter at Breast Height is the diameter of a tree at 4.5 feet (54 inches) above the highest natural ground level at the base of the trunk.

Density, gross: The number of residential dwelling units per gross acre of land

Density, net: The number of dwelling units per net acre (based on the total area of the parcel) excluding areas dedicated or reserved for public use.

Density transfer receiving areas: Unconstrained buildable land on the same site as land that is partially covered by the FSH overlay zone. Density may be transferred from constrained and unbuildable land to buildable density transfer receiving areas as prescribed in Section 17.60.120.

Detached: A single ~~main~~ building, freestanding and structurally separated from other buildings.

Detention, stormwater: The release of surface and stormwater runoff from a site at a slower rate than it is collected by the drainage facility system, the difference being held in temporary storage.

Detention facility, stormwater: A facility that collects water from developed areas and releases it at a slower rate than it enters the collection systems.

Developer: The person, or the person's ~~owners of property or their~~ agents ~~or~~, contractors, ~~or their~~ successors, or assigns, who have undertaken or are proposing development of a development site.

Development Code: Title 17 of the Sandy Municipal Code.

Development site: One or more adjacent, ~~A~~ legally established lots or parcels of land on which a developer proposes or undertakes a development ~~occupied or capable of being occupied by a building or group of buildings including accessory structure(s) and accessory use(s), together with such yards or open spaces, and setback areas as are required by this Code and having frontage upon a street.~~

Development: Any human-made change to improved or unimproved real estate, including but not limited to, construction of buildings or other structures, mining, dredging, filling, grading, compaction, paving, excavation or drilling operations, storage of equipment or materials, stream alteration or channeling, vegetation removal or other similar activities.

Director: ~~Planning and~~ Development Services Director of the City of Sandy, or the Director's official designee, with responsibility for administration of this Code.

Discretionary land use review: A land use review procedure that relies on standards or criteria that require interpretation or the exercise of policy or legal judgment. Discretionary land use reviews are processed under the Type II, III, or IV review procedures, as defined in Chapter 17.12.

Disturbance Area. For the purposes of Chapter 17.60, FSH Overlay District, an area identified in an approved development permit that contains, or will contain, all legally allowed temporary and permanent development, exterior improvements, and staging and storage areas on the site. A disturbance area may contain two subareas, the permanent disturbance area and the temporary disturbance area.

- *Permanent Disturbance Area.* The permanent disturbance area includes all areas occupied by existing or proposed structures or exterior improvements (including landscaping). The permanent disturbance area also includes areas where vegetation must be managed to accommodate overhead utilities, existing or proposed landscaped areas, and roadside areas subject to regular vegetation management to maintain safe visual or vehicle clearance.
- *Temporary Disturbance Area.* The temporary disturbance area is the portion of the site that will be disturbed for the proposed development but not permanently occupied by structures or exterior improvements. It includes staging and storage areas used during construction and all areas graded to facilitate proposed development on the site, but will not be covered by permanent development. It also includes areas disturbed during construction to place underground utilities, where the land above the utility will not otherwise be occupied by structures or exterior improvements.

District: A land use area or zone established by this title for the designated intent.

Drainageway: A natural or artificial watercourse, including adjacent riparian vegetation, that has the specific function of transmitting natural stream water or storm runoff water from a point of higher elevation to a point of lower elevation.

Drip line (of a tree): A line projected to the ground delineating the outermost extent of foliage in all directions.

Drive-in facility: Any portion of a building or structure from which business is transacted, or is capable of being transacted, directly with customers located in a motor vehicle.

Dwelling unit: An independent living unit containing eight or fewer bedrooms within a dwelling structure designed and intended for residential occupancy by not more than one family and having independent living facilities including permanent provisions for cooking, eating, sanitation and sleeping. ~~its own housekeeping and kitchen facilities. Hotel, motel, and rooming and boarding units, which are used primarily for transient tenancy, shall not be considered as dwelling units.~~

Easement: A right that a person has to use someone's land for a specific purpose such as for access or for utilities.

Effects of buoyancy: Uplift force of water on a submerged or partially submerged object.

Erosion: Detachment and movement of soil, rock fragments, refuse, or any other material, organic or inorganic.

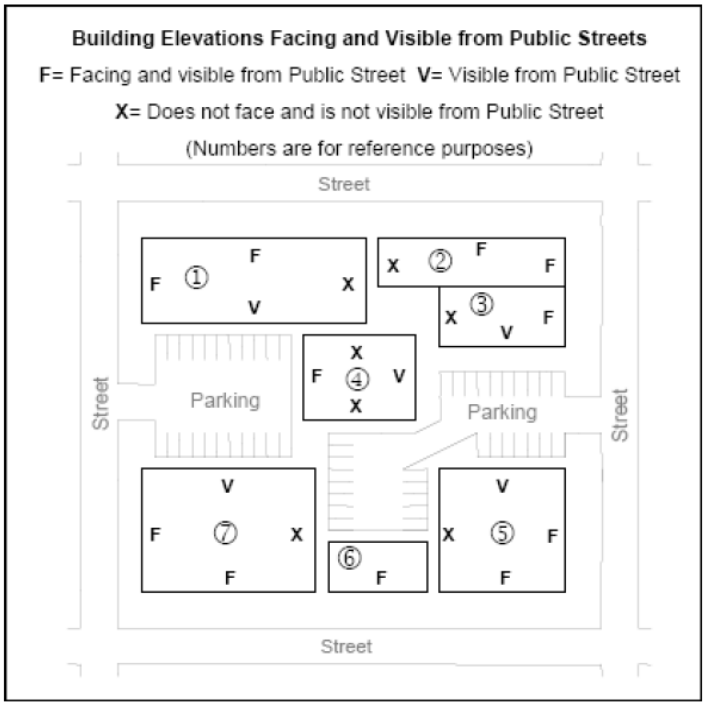
Established grade: The curb line grade established by the City.

Excavation: The process of altering the natural (grade) elevation by cutting and/or filling the earth or any activity by which soil or rock is cut, dug, quarried, uncovered, removed, displaced or relocated.

Expedited land division: A division of land under ORS Sections 197.360 to 197.380. Middle housing land divisions shall be processed pursuant to the expedited land division procedures set forth in ORS Chapters 197.360 to 197.380.

Exterior Display: Exterior display includes the outdoor display of products, vehicles, equipment, and machinery for sale or lease. Exterior display is an outdoor showroom for customers to examine and compare products. It does not include damaged or inoperable vehicles, vehicles or equipment being serviced, bulk goods and materials, and other similar products. Examples of uses that often have exterior display are car and boat sales and leasing, and plant nurseries.

Facing (building elevation): A building elevation that is ~~typically~~ parallel to, or at an angle of up to 45 degrees from, a specific reference point such as ~~and adjacent to~~ a public street or civic space.



Facing and visible from a Public Street example

Family: Any number of individuals, related or unrelated, living together in a dwelling unit ~~related by blood, marriage, legal adoption or guardianship; or a group of not more than five persons all or part of whom are not so related by blood or marriage living together as a single housekeeping unit in a dwelling unit~~.

Fast-food restaurant: This type of restaurant is characterized by a large carryout clientele and high turnover rates for eat-in customers. These limited service eating establishments do not provide table service.

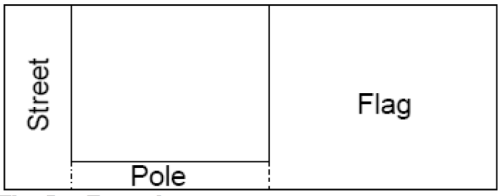
Fence: Any artificially constructed barrier of any material or combination of materials erected to enclose or screen areas of land, serve as a boundary, or means of protection or confinement.

Fence, sight-obscuring: A fence or evergreen planting of such density and so arranged as to obstruct vision.

Fill: Placement of any soil, sand, gravel, clay, mud, debris, refuse, or any other material, organic or inorganic.

Finished grade (ground level): The average of finished ground levels at the center of all walls of the building unless otherwise specified.

Flag lot: A lot that has access to a public right-of-way by means of a narrow strip of land.



Flag Lot Example

Flood or *flooding:*

A. A general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters.

2. The unusual and rapid accumulation of runoff of surface waters from any source.

3. Mudslides (i.e., mudflows) which are proximately caused by flooding as defined in Subsection A.2. of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

B. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph A.1. of this definition.

Flood insurance rate map (FIRM): The official map of a community, on which the Federal Insurance Administrator has delineated both the special flood hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a Digital Flood Insurance Rate Map (DFIRM).

Flood insurance study: An examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.

Floodplain or flood-prone area: Any land area susceptible to being inundated by water from any source. See "Flood or Flooding." The lowland and relatively flat areas adjoining inland waters including, at a minimum, that area identified as the Area of Special Flood Hazard.

Flood-proofing: Any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Flood, slope and hazard areas (FSH):

A. Buildable areas: Accessible lands of less than 25 percent slope that lie outside steep slope and water quality setback areas as defined in Chapter 17.60, Flood and Slope Hazard (FSH).

B. Restricted development areas: As shown on the City of Sandy Zoning Map including:

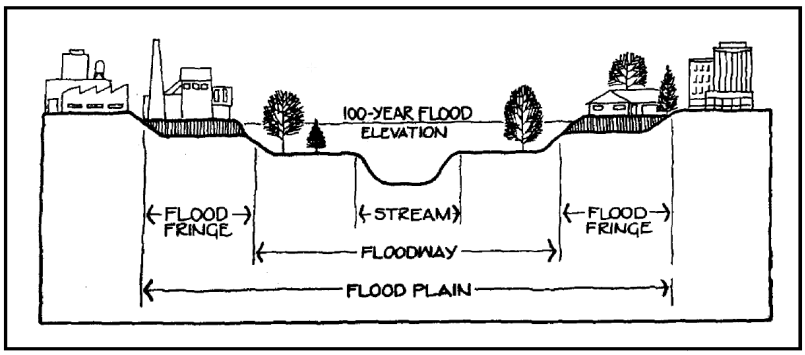
1. Slopes of 25 percent or greater that (a) encompass at least 1,000 square feet and (b) have an elevation differential of at least ten feet.

2. Protected water features, including locally significant wetlands, wetland mitigation areas approved by the Division of State Lands, and perennial streams.

3. Required setback areas as defined in section 17.60.30.

Floodway (regulatory floodway): The channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Floodway: The channel of a river or stream and those portions of the adjoining floodplains required to carry and discharge the base flood flow.



Floodway Example

Floor area: The sum of the area of ~~several~~ all floors of a building ~~including areas used for human occupancy. It does not include cellars~~, except basements, unenclosed porches, or attics not designed for human occupancy, or any floor space in any accessory building or any interior building parking areas, exclusive of vent shafts.

Floor, habitable: A floor usable for living purposes, which includes working, sleeping, eating, cooking or recreation, or a combination of the above. A floor used only for storage or parking is not a "habitable floor."

Foster home, adult: Any family home or facility in which residential care is provided for five or fewer adults who are not related to the provider by blood or marriage.

Frontage: That portion of a development site that abuts a public or private street. For the purposes of determining yard requirements on corner lots, all sides of a lot adjacent to a street shall be considered frontage, and yards shall be provided as indicated under "yards" in the definition section.

Flood and slope hazard (FSH) overlay district: An overlay zoning district defining water quality, flood, and slope hazard areas within the City identified on the City of Sandy Zoning Map.

Gabled roof: The generally triangular portion of a wall between the lines of a sloping roof. The shape of the gable and how it is detailed depends on the structural system being used (which is often related to climate and materials) and aesthetic concerns. The City of Sandy requires minimum roof pitch on some buildings which supports the use of gables.

Garage, private: A portion of a ~~main~~ primary building or an accessory building, shelter or carport used for the parking or temporary storage of private automobiles, trailers, mobile homes, boats or other vehicles owned or used by occupants of the main building.

Garage, public: A building designed and used for the storage, care, or repair of motor vehicles, including both minor and major mechanical overhauling, paint, and body work or where such vehicles are parked or stored for compensation, hire or sale.

Grade: Given in reference to the slope of land or in reference to construction: is the lowest point of elevation of the finished surface of the ground, paving or sidewalk within the area between the building and the property line, or, when the property line is more than five feet from the building, between the building and a line five feet from the building.

Gross area: The total usable area including accessory space dedicated to such things as streets, easements and uses out of character with the principal use, but within a unit of area being measured.

Ground floor: The floor of a building that is at or nearest the ground level.

Ground floor elevation: The elevation of a building that is at or nearest the ground level measured from the ground to a point 10~~12~~ feet above the ground. (This definition is used to measure the ground floor area subject to window requirements in Chapter 17.90).

Group care home: A home or residential institution maintained and operated for the supervision, care or training of physically, mentally, or socially handicapped persons, but not including foster homes or detention facilities.

Grove (tree): A stand of three or more native trees at least 11 inches DBH, or Oregon white oak trees or Pacific madrone trees that are at least 6 inches DBH, and that form a generally continuous canopy, or are spaced as appropriate for that species or species assemblage~~of the same species or mix, which form a visual and biological unit~~.

Guest house: An accessory, detached dwelling without kitchen facilities, designed for and used to house transient visitors or guests of the occupants of the main building without compensation.

Half-story: A space under a sloping roof which has the line of intersection of roof decking and exterior wall face not more than five feet above the top floor level. A half-story containing one or more dwelling units shall be counted as a full story.

Half-street improvement: A one-half-street improvement includes curb and pavement two feet beyond the centerline of the right-of-way. A three-quarter street improvement includes curbs on both sides of the street and full pavement between curb faces.

Health/recreation facility: An indoor facility including uses such as game courts, exercise equipment, locker rooms, Jacuzzi, and/or sauna and pro shop.

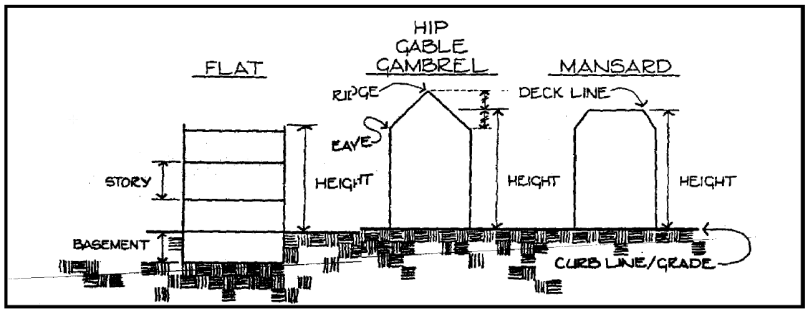
Hearing authority: The City Council, Planning Commission, or ~~an~~other agency or officer ~~of the Council~~ designated by ~~this~~ the Development Code to conduct public hearings prior to acting on an application~~s for development~~.

Heavy timber: Exposed timber framing or detailing consisting of larger wooden members, ~~commonly~~ with minimum dimensions ~~in the range~~ of six inches by six inches ~~to 12 inches~~, as opposed to common wood framing which uses many more timbers with smaller dimensions ~~usually in the two inches to ten inches range~~. The methods of fastening the frame members also differ; in conventional framing the members are joined using nails or other mechanical fasteners while timber framing uses mortice and tenon (wood joint) or metal fasteners.

Height of buildings: The vertical distance above a reference datum measured to the highest point of the coping of a flat roof or to the deck line of a mansard roof or to the average height of the highest gable of a pitched or hipped roof. The reference datum shall be selected by either of the following, whichever yields a greater height of building:

A. The elevation of the highest adjoining sidewalk or ground surface within a five-foot horizontal distance of the exterior wall of the building when such sidewalk or ground surface is not more than ten feet above lowest grade.

B. An elevation ten feet higher than the lowest grade when the sidewalk or ground surface described in Item "A" above is more than ten feet above lowest grade.

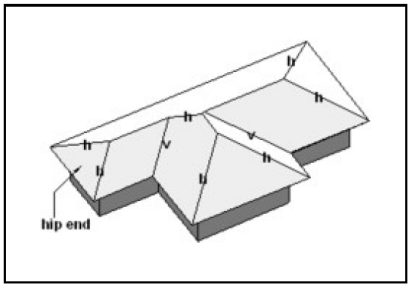


Determining Building Height Example

High-turnover sit down restaurant: This type of restaurant consists of a sit-down, full-service eating establishment with turnover rates of approximately one hour or less. This type of restaurant is usually moderately priced and frequently belongs to a restaurant chain. This restaurant type is different than fast-food and quality restaurants as defined in the Institute of Transportation Engineers, Trip Generation manual.

Highest adjacent grade: The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Hipped roof: A type of roof where all sides slope downwards to the walls~~, usually with a fairly gentle slope.~~ Thus, it is a roof with no gables or other vertical sides to the roof. ~~a square hip roof is shaped like a pyramid. hip roofs on rectangular houses will have two triangular sides and two trapezoidal ones. hip roofs often have dormers.~~ ~~w~~Where two hipped ("h") roof forms adjoin, the edge is called a valley ("v"). ~~s~~See graphic.



Hipped Roof Example

Historic resource alteration: Historic resource alteration means the change, addition, removal, physical modification or repair, which affects the exterior appearance of a landmark, excluding, however, routine maintenance and painting.

Historic resource alteration, major: Means exterior alteration, which is not a minor alteration.

Historic resource alteration, minor: Means exterior alteration which does not change the appearance or material of the landmark or contributing resource as it exists, or duplicates or restores the affected exterior features and material as determined from historic photos, building plan or other evidence or original features or material.

Historic structure (area of special flood hazard): Any structure that is:

A. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

B. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

C. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or

D. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

1. By an approved state program as determined by the Secretary of the Interior or

2. Directly by the Secretary of the Interior in states without approved programs.

Home business: A lawful commercial activity commonly carried on within a dwelling or attached or detached accessory structure.

Homeowners association (HOA): Has the meaning set forth in ORS 94.550(15). ~~An incorporated, nonprofit organization operating under recorded land agreements through which a) each lot owner of a described land area is a) automatically a member; and b) subject to a charge for a proportionate share of the expenses for the organization's activities, such as maintaining a common property.~~

Hospital: An establishment, which provides sleeping and eating facilities to persons receiving medical, obstetrical or surgical care and nursing service.

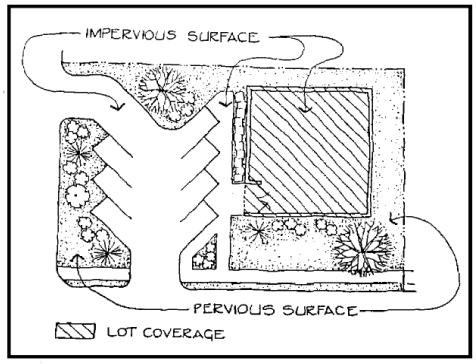
Hotel: A facility offering transient lodging accommodations at a daily rate to the general public. A hotel may provide additional services, such as restaurants, meeting rooms, and recreational facilities.

Household: ~~A domestic establishment including a member or members of a family and/or others living under the same roof~~. See definition for "Family."

Hydrodynamic load: Force of water in motion.

Hydrostatic load: Force of water at rest.

Impervious surface: ~~Any~~ Surface materials, including concrete, asphalt, pavers, plastics, and gravel, which ~~that~~ substantially reduce~~s~~ or prevent~~s~~ the infiltration of stormwater into previously undeveloped land. ~~Impervious area shall include graveled driveways and parking areas.~~



Impervious Surface Example

Irrigation system: Method of supplying water (which can be manually or mechanically controlled) to a needed area.

Junkyard: An area used for the dismantling, storage or handling in any manner of junked vehicles or other machinery, or for the purpose of storage of dismantled material, junk and scrap, and/or where wastes and used or secondhand materials are bought, sold, exchanged, stored, processed, or handled. Materials include, but are not limited to, scrap iron and other metals, paper, rags, rubber tires, and bottles, if such activity is not incidental to the principal use of the same lot.

Kennel: Any premises or building in which four or more dogs or cats at least four months of age are kept commercially for board, propagation or sale.

Kitchen: Any room used, intended or designed for preparation and storage of food, including any room having a sink and provision for a range or stove.

Land area, net: That land area remaining after all area covered by impervious surfaces has been excluded (subtracted).

Land division: Land divided to create legally separate parcels in one of the following ways:

A. *Partition:* A division of land that creates three or fewer lots within a calendar year when such parcel exists as a unit or contiguous units of land under single ownership at the beginning of the year. See also, "replat, minor."

   A partition does not include division of land resulting from any of the following:

   1. Establishment or modifications of a "tax lot" by the County Assessor;
   2. A lien foreclosure, foreclosure of a recorded contract for the sale of real property or creation of cemetery lots;
   3. An adjustment of a property line by relocation of a common boundary where an additional unit of land is not created and where the existing unit of land reduced in size by the adjustment complies with any applicable development district criteria established by this Code;
   4. Sale or grant by a person to a public agency or public body for state highway, county road, city street or other right-of-way purposes provided that such road or right-of-way complies with the applicable Comprehensive Plan policies and ORS 215.213 (2)(q)—(s) and 215.283 (2)(p)—(r). See "property line adjustment."

B. *Subdivision:* Division of an area or tract of land into four or more lots within a calendar year when such area or tract of land exists as a unit or contiguous units of land under a single ownership at the beginning of such year. See also, "Replat, Major."

Land, intensity of: Relative measure of development impact as defined by characteristics such as the number of dwelling units per acre, amount of traffic generated, and amount of site coverage.

Land, parcel of: Any quantity of land capable of being described with such definiteness that its location and boundaries may be established. Also, a unit of land created by a partition.

Landscape management corridor: The required yards abutting Highway 26 within the C-2, I-I and I-2 zoning districts where the Development Code requires native conifer and deciduous landscaping, creating the appearance of a forested corridor; openings or breaks in the landscape corridor are minimized, allowing for transportation access and framed views into development sites.

Landscaping: The arrangement of trees, grass, bushes, shrubs, flowers, gardens, fountains, patios, decks, outdoor furniture, and paving materials in a yard space. It does not include the placing or installation of artificial plant materials.

~~*Legislative decision:* Involves formulation of policy and as such, it is characteristic of the actions by a city council. Ex-parte contact requirements are not applicable to legislative hearings. Personal notice to citizens~~

~~advising them of proposed changes is not required in most cases, although the Sandy Development Code specifies that in some cases notice shall be mailed to property owners if a decision will change the land use designation. In general, the burden of being informed rests on the citizen. (See definition for "limited land use decision" and "quasi-judicial decision.")~~

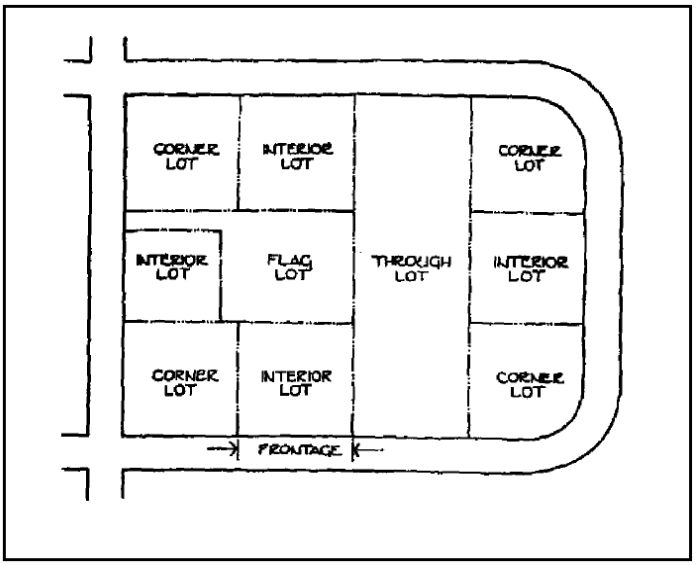
Lien foreclosure: A lien foreclosure, foreclosure of a recorded contract for the sale of real property or creation of cemetery lots.

Limited land use decision: ~~A land use decision made by staff through an administrative process and that qualifies as a Limited Land Use Decision under~~ Has the meaning set forth in ORS 197.015.

Loading space: An off-street space within a building or on the same lot with a building for the temporary parking of commercial vehicles or trucks while loading or unloading merchandise or materials and which space has direct access to a street.

Lot area: The total horizontal area within the lot lines of a lot.

Lot, corner: A lot situated at the intersection of TWO streets, the interior angle of such intersection not exceeding 135 degrees.



Lot Corner Example

Lot coverage/building site coverage: Unless otherwise noted in a zoning district, percent of a development site covered, including all gravel and paved surface areas and areas encompassed by buildings.

Lot depth: The distance from the midpoint of the front lot line to the midpoint of the rear lot line. The term "average lot depth" has the same meaning as "lot depth" as defined here.

Lot, interior: A lot other than a corner lot having frontage on only one street.

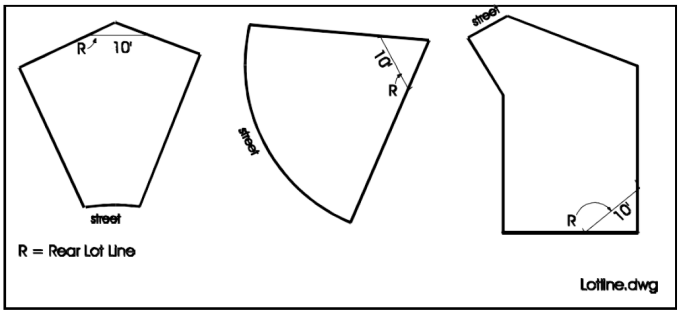
Lot line: The property line bounding a lot.

Lot line, front: In the case of an interior lot, a property line that abuts the street. In the case of a corner lot with frontage on one transit street, the lot line abutting the transit street shall be the front lot line, pursuant to Section 17.82.20. For all other corner lots, the applicant or property owner can choose which lot line is to be the

front.~~, the front line shall be determined by orientation of the structure based on at least two of the following factors: location of the front door, location of the driveway, or legal street address.~~

Lot line, side: Any lot boundary not a front or rear lot line (see figure under "lot line, rear").

Lot line, rear: The recorded lot line or lines most distant from and ~~generally~~ opposite the front lot line. In the case of an interior triangular lot or lot with more than four sides, however, the rear lot line shall mean a straight line ten feet in length that: a) is parallel to the front lot line or its chord and, b) intersects the other lot lines at points most distant from the front line (see figure below).



Rear Lot Line Example

Lot of record: A lot or parcel created through applicable land division regulations before adoption of this Code.

Lot, reversed corner: A corner lot whose rear line borders the side yard of another lot, whether or not separated by an alley.

Lot, tax: One parcel of real property shown on the County Assessor's map, and identified by a tax lot number. A tax lot may not necessarily be a lot of record.

Lot, through: A lot ~~of record~~ whose front and rear lot lines both abut streets.

Lot width: The horizontal distance between the midpoints of the side lot lines. The term "average lot width" has the same meaning as "lot width" as defined here.

Lowest floor: The lowest floor of the lowest enclosed area (including a "basement"). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor if the building falls within the "Area of Special Flood Hazard," provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this chapter.

Mansard roof: A style of hip roof characterized by two slopes on each of its four sides with the lower slope being much steeper, almost a vertical wall, while the upper slope, usually not visible from the ground, is pitched at the minimum needed to shed water. This form may accommodate an additional building story. Often the decorative potential of the Mansard is expressed through the use of convex or concave curvature and with elaborate dormer window surrounds.

Mansard Roof Example

Manufactured dwelling park (also mobile home park or trailer park): As defined in ORS 446.003, any place where four or more manufactured dwellings or prefabricated structures, as defined in ORS 455.010, that are relocatable and more than eight and one-half feet wide, are located within 500 feet of one another on a lot, tract or parcel of land under the same ownership, the primary purpose of which is to rent or lease space or keep space for rent or lease to any person for a charge or fee paid or to be paid for the rental or lease or use of facilities or to offer space free in connection with securing the trade or patronage of such person. ~~A parcel (or contiguous parcels) of land with two or more manufactured dwelling lots for rent or sale. A parcel under single ownership that has been planned and improved for the placement of manufactured housing for dwelling purposes. Manufactured home park means a privately owned place where four or more manufactured homes, mobile homes, or any combination of the above, used for human occupancy are placed on a lot, tract of parcel of land under the same ownership.~~

Manufactured dwelling. As defined in ORS 446.003, a residential trailer, mobile home or manufactured home. Within a "Special Flood Hazard Area" a manufactured dwelling shall mean a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured dwelling" does not include a "recreational vehicle."

Manufactured home~~dwelling~~: A dwelling constructed to U.S. Department of Housing and Urban Development (HUD) standards since June 15, 1976, but not to State Building Code standard and constructed for movement on public highways that has sleeping, cooking and plumbing facilities, that is intended for human occupancy, that is used for residential purposes and was constructed, and met the requirements of federal manufactured housing construction and safety standards and regulations in effect at the time of construction. All manufactured homes are to meet the requirements of the National Manufactured Home Construction and Safety Standards Act of 1974, as amended on August 22, 1981, consistent with HB 2863 Oregon Laws, 1989, and current Department of Housing and Urban Development (HUD) Manufactured Home Construction and Safety Standards as embodied in the most recent Federal Register. ~~Within a "Special Flood Hazard Area" a manufactured dwelling shall mean a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured dwelling" does not include a "recreational vehicle."~~

Manufactured dwelling space: Any portion of a manufactured dwelling park (See "Manufactured Dwelling Park") which is designated or used for occupancy of one manufactured home or mobile home, including its accessory structures and its outdoor living areas, but exclusive of space provided for the common use of tenants such as roadways and guest parking.

Manufactured dwelling stand: That portion of the manufactured ~~home~~ dwelling space reserved for the location of the manufactured home or mobile home.

Marijuana dispensary: Those facilities registered and/or licensed by the state of Oregon as medical marijuana dispensaries and marijuana retailers.

Mean sea level: For purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which Base Flood Elevations shown on a community's Flood Insurance Rate Map are referenced.

Medical facility: A building or portion of a building designed and used for the diagnosis and treatment of human patients or animals including clinic, hospital, and laboratory, but excluding medical marijuana facility, as authorized by state law.

Medical marijuana grow site: Those facilities defined, registered and/or licensed by Oregon Health Authority to grow medical marijuana for more than one registered medical marijuana cardholder.

Middle housing: Middle housing refers to duplexes, triplexes, quadplexes, cottage clusters, and townhouses as defined in ORS 197.758. For the purposes of middle housing land division, middle housing only refers to duplexes.

Middle housing land division: A partition or subdivision of a lot or parcel on which the development of middle housing is allowed under ORS 197.758(2) or (3). Middle housing land division applications shall be processed pursuant to the expedited land division procedures set forth in ORS Sections 197.360 to 197.380 and Section 17.18.120 of this development code.

Mobile home: A residential structure intended for permanent human occupancy and constructed for movement on the public highways, constructed prior to adoption of June 15, 1976 U.S. Housing and Urban Development (HUD) standards, but meeting the requirements of Oregon's mobile home laws in effect between January 1, 1962 and June 15, 1976 which met the construction requirements of Oregon Mobile Home Law in effect at the time of construction and which exhibits an Oregon Department of Commerce Insignia of Compliance that indicates conformance with U.S. Department of Housing and Urban Development, HUD, standards.

Modular structure: A structure not built on-site, but which is placed on a permanent foundation and meets the State Building Code standards. "Modular structure" has the same meaning as "prefabricated structure," as defined in ORS 455.010.

Motel: A building or group of buildings on the same lot designed or used primarily for providing sleeping accommodations for automobile travelers and providing automobile parking conveniently located on the premises.

National geodetic vertical datum: An elevation reference mark used in determining a flood boundary and floodway maps, formerly referred to as Mean Sea Level.

New construction (area of special flood hazard): For the purposes of determining insurance rates, structures for which the "start of construction" commenced on or after the effective date of an initial Flood Insurance Rate Map or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, "new construction" means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

Nonconforming development: A lawful existing structure or use that does not conform to requirements of the district, but which was already in existence on the effective date of this Code or any amendment to it became effective.

Notice of decision: A written communication that specifies the action of a hearing authority or Director concerning a development proposal.

Nuisance: Activity or use that is annoying, unpleasant or obnoxious.

Nursing home: Any home, place, or institution which operates and maintains facilities providing convalescent or nursing care, or both, for a period exceeding 24 hours for six or more ill or infirm patients not related to the nursing home administrator or owner.

Office: A place where the following civic and commercial uses are conducted: Administrative services; business support services; financial, insurance and real estate services; medical services; professional and research services.

~~*On the record:* Refers to review by the Planning Commission or City Council based on written submissions received by the Director or at the hearing and/or review of a non-verbatim transcript of the prior proceedings and decision. If requested, the Planning Commission or City Council shall allow the applicant and/or appellant to present an oral summary of the evidence and Code sections that support their position. No new evidence shall be allowed. The Planning Commission or City Council may allow further oral comments of a summary nature.~~

Open space, group: Areas intended for common use either privately owned and maintained or dedicated to the City, designed for outdoor living and recreation or the retention of an area in its natural state. Group open spaces may include swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian, equestrian, and bicycle trails but do not include off-street parking, maneuvering or loading areas or driveways.

Open space, private: Areas intended for the private use by residents of an individual dwelling unit, designed for outdoor living and recreation or the retention of an area in its natural state.

Private open spaces may include patios and landscaped areas but does not include off-street parking, maneuvering, loading or delivery areas.

Final *Order:* A written statement of the decision on an application.~~Final disposition of a case. It can be affirmative, negative, injunctive, or declaratory in form. The grant, denial, or grant with conditions of an application for development is an order.~~

Other marijuana facility: Those facilities defined, registered and/or licensed by the state of Oregon including marijuana processing sites, marijuana producers, marijuana processors, marijuana wholesalers, and marijuana testing laboratories.

Overlay district: A development district created by ordinance in recognition of an area's unique characteristics such as environmental or historic resources, natural hazards, or an identified need for redevelopment.

Overnight lodging: A building or group of buildings designed and used primarily for overnight lodging. This definition includes hotels, motels, hostels, bed breakfast inns and similar uses.

Owner: For the purpose of notice, t~~T~~he record owner of the real property as shown on the latest tax rolls of the county. For all other purposes, any ~~or~~ person with a legal or equitable interest in the real property. ~~that entitles the person to conduct the proposed activity, or a person who is purchasing property under contract. In terms of violations and binding agreements between the city and owner, the owner shall also mean leaseholder, tenant, or other person in possession or control of the premises or property at the time of agreement or of violation of agreement or the provisions of this Code. Owner shall also mean authorized representative.~~

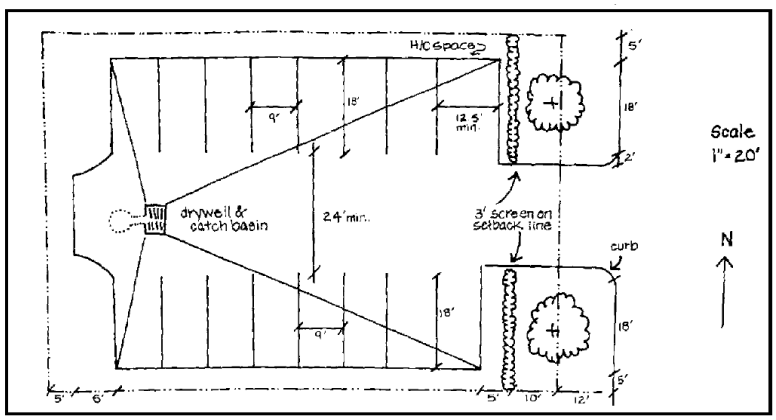
Parapet: An extended wall surrounding a roof, typically a decorative wall constructed of the same materials as the supporting wall. The parapet serves as building cap and may be stepped (Stepped Parapet) to provide visual relief (articulation) and a transition between buildings of dissimilar height.

Parking area, private: A privately owned property, other than public streets and alleys, on which parking spaces are defined, designated, or otherwise identified for use by the tenants, employees, or owners of the property for which the parking area is required by this title and not open for use by the general public.

Parking area, public: An area permanently available, other than public streets and alleys, on which parking spaces are defined, designated, or otherwise identified for use by the general public which is open for use by the general public, either free or for remuneration. Public parking areas may include parking lots, which may be required by this title for retail customers, patrons, and clients.

Parking bay: Rows of parking separated by an aisle. A parking bay may be single-loaded (parking on one side only) or double-loaded (on both sides).

Parking space: Parking space means an area permanently available for the parking of an automobile.



Typical Parking Area Example

~~*Participant:* A person or entity that submitted written or oral comments in compliance with the time lines set in the procedure type, or at the public hearing. Merely signing a petition does not constitute participation.~~

Pathway: A paved public or private route separated from the street right-of-way that is intended to provide pedestrian or bicycle access to adjacent streets and properties. Pathways can serve both recreational and commuter needs. Pathways may also be known as shared-use paths, walkways or pedestrian ways, and these terms may be used interchangeably throughout the SMC.

Pedestrian-scale: The placement, proportioning, and detailing of building and site design elements resulting in an environment that is comfortable and inviting to pedestrians. Examples of elements that are regulated with the intent of creating pedestrian scale include, but are not limited to: pedestrian ways, parking facilities, street furnishings, civic spaces, building entrances, building articulation, divisions between first and second building stories, weather protecting canopies or awnings, transparent storefront windows, fences, walls, and landscape screening and buffering.

Pedestrian way: A paved public or private route separated from the street right-of-way that is intended to provide pedestrian or bicycle access to adjacent streets and properties. Pedestrian ways can serve both recreational and commuter needs. Pedestrian ways may also be known as shared-use paths, walkways or pathways, and these terms may be used interchangeably throughout the SMC.

Percent of slope: The ratio of vertical distance to horizontal distance (rise divided by run times 100). For example, a 1:4 slope (one-foot rise over a four foot run times 100) is a 25 percent slope.

Pergola: A structure forming a shaded walk or passageway. Pillars support cross beams and a sturdy open lattice, upon which woody vines are typically trained. It may also be part of a building, as protection for an open terrace or civic space.

Pergola Example

Person: An individual~~, corporation, governmental agency, business trust, estate, trust, partnership, association, two or more people having a joint or common interest,~~ or any other legal entity.

Plat: Refers to a final subdivision plat, replat, or partition plat.

Plat, partition: A final map, diagram, drawing, replat, or other writing containing all the descriptions, locations, specifications, provisions, and information concerning a partition.

Plat, subdivision: A final map, diagram, drawing, replat, or other writing containing all the descriptions, locations, specifications, dedications, provisions, and information concerning a subdivision.

Portico: A porch leading to the entrance of a building, or extended as a colonnade, with a roof structure over a walkway, supported by columns or enclosed by walls.

Practicable: Capable of being effected, feasible.

Preschool: A facility providing care for children 36 months of age to school age that is primarily educational for four hours or less per day and where no preschool child is present at the facility for more than four hours per day.

Primary entrance: A building entrance accessible to building users, including employees, customers, residents, and visitors. A primary entrance is typically emphasized over other entrances by architectural features such as weather protection, materials changes, massing changes, and/or special features such as lobbies, reception areas, and other semi-public interior spaces designed to receive building users.

Primary structure/store/building: The structure or building housing the largest use on a site, as determined by floor area, occupancy rating, trip generation, or similar criteria.

Private outdoor area: See "Open space, private."

Professional office: An office of a practitioner of an occupation or calling requiring the practice of an art or science through specialized knowledge based on a degree issued by an institution of higher learning.

Property line adjustment: The relocation of a common property boundary where an additional unit of land is not created and where an existing unit of land reduced in size by the adjustment complies with any applicable development district regulation.

Public facility: Public facilities include, but are not limited to, sanitary sewer, water, storm drainage, street, communication, electrical and natural gas facilities necessary to support development. There are two types of public facilities:

Public facility, major: Any public service improvement or structure developed by or for a public agency that is not defined as a minor public facility, including but not limited to electrical substations, sewer and water treatment plants, water reservoirs, trunk lines, regional stormwater detention facilities, new or expanded public buildings designed for human occupancy that increase traffic within a neighborhood, and active park improvements such as ball fields or restroom facilities.

Public facility, minor: Minor utility structures (e.g., poles, lines, pipes); minor sewer, water and storm drainage structures and collection system improvements (e.g., pump stations, lines, maintenance holes, valves, hydrants, drains, on-site detention facilities); new or extended public streets (including lane additions); minor improvements to existing streets (e.g., overlays, catch basins, signs, control devices, widening, curbs, gutter, sidewalks); minor transit improvements (e.g., bus stops or shelters); passive park improvements (e.g., trails, benches, native plantings or picnic areas); and transportation improvements identified in the adopted Transportation System Plan.

Public transit stop: An existing or planned transit stop as shown in Figure 8 of the 2023 Sandy Transportation System Plan or the 2020 Sandy Transit Master Plan.

~~*Quasi-judicial decision:* Similar to a court proceeding where affected parties are afforded more procedural safeguards. The quasi-judicial process is characteristic of most meetings of the Planning Commission. Personal notice must be mailed to property owners and occupants living within a prescribed distance of the affected area. Unlike legislative decisions, Planning Commission members are expected to avoid outside discussion of the business at hand, and they must declare ex parte contacts. (See "Legislative Decision.")~~

Recreational vehicle: A vacation trailer or other vehicle or portable unit built on a single chassis, which is either self-propelled or towed or is carried by a motor vehicle and which is designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel or seasonal use.

Recreational vehicle (area of special flood hazard): A vehicle which is:

A. Built on a single chassis;

B. Four hundred square feet or less when measured at the largest horizontal projection;

C. Designed to be self-propelled or permanently towable by a light duty truck; and

D. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Recreational vehicle park: Any lot of land upon which two or more recreational vehicle sites are located, established, or maintained for occupancy for recreational vehicles of the general public as temporary living quarters, for recreation or vacation purposes. An RV park is intended for use on a temporary basis by campers, vacationers, or travelers.

~~*Remand:* A remand shall be conducted in compliance with the procedure type issued by the decision maker upon its initial review of the application unless otherwise specified in the remand order.~~

Replat, major: The reconfiguring of lots in a recorded subdivision plat that results in either the creation of four or more additional lots, deletion of four or more lots, or reconfiguring of four or more lots.

Replat, minor: The reconfiguring of a portion of the lots in a recorded subdivision or partition plat that results in three or fewer lots being created, deletion of three or fewer lots, or reconfiguring of three or fewer lots.

Reserve strip: A narrow strip of land overlaying a dedicated street reserved to the City for control of access until such time as additional right-of-way is accepted by the City for continuation or widening of the street.

Residential facility: A residential care facility, residential training facility, residential treatment facility, residential training facility, residential training home or residential treatment home licensed by or under the authority of the Department of Human Resources under ORS 443.000 to 443.825 which provides residential care

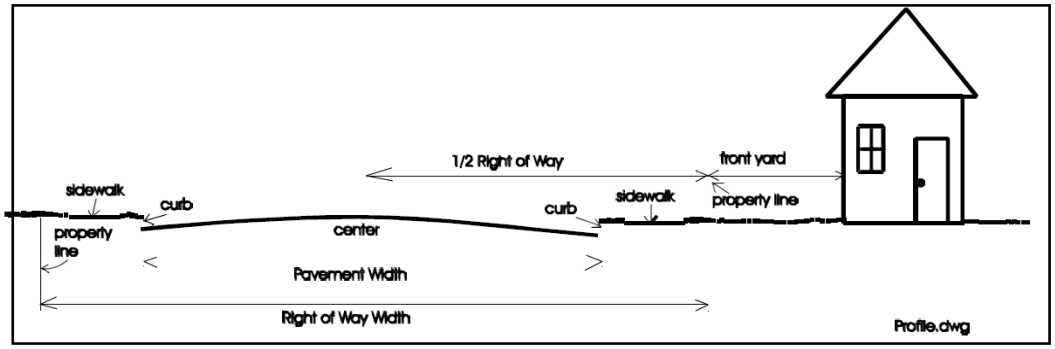
alone or in conjunction with treatment or training or a combination thereof for five or fewer individuals who need not be related. Required staff persons shall not be counted in the number of residents and need not be related to each other, the residents or the facility owner or operator. This definition includes adult foster homes. All exclusions set forth in ORS 443.715 are excluded from this definition.

Restaurant, drive-in: A retail outlet where food or beverages are sold to a substantial extent for consumption by customers in parked motor vehicles.

Restaurant, fast food: An establishment that offers quick food service of items already prepared and held for service, or prepared, fried, griddled quickly, or heated in a device such as a microwave oven. Orders are not generally taken at the customer's table and food is generally served in disposable wrapping or containers.

Retention facility: A facility to collect and hold stormwater runoff with no surface outflow.

Right-of-way: A public way dedicated for vehicular, bicycle, or pedestrian use.



Right-of-way example

Riparian area: The area adjacent to a river, lake, or stream, consisting of the area of transition from an aquatic ecosystem to a terrestrial ecosystem.

Row house: More than two attached units, often with two stories and with ground floor access, on individual lots.

Rusticated: A texture produced in ashlar (i.e., dressed stone work) masonry with deep cut 'V' or square joints to contrast with smooth masonry.

Rusticated stone work example

Sandy Style: An architectural style developed in the City of Sandy, Oregon that expresses elements of or reflects Cascadian Architecture by adapting appropriate elements of English Arts and Crafts Style (1900—1920) and Oregon Rustic Style (1915—1940) or similar elements.

School: A facility that provides a curriculum of elementary and secondary academic instruction, including kindergartens, elementary schools, junior high or middle schools, and high schools.

Sediment: Any material that is in suspension, is being transported, or has been moved from its site of origin by water, wind, or gravity as a result of erosion.

Self-service storage facility: Real property that is designed and used for renting or leasing individual storage space to occupants who have exclusive access to the storage space to store or remove personal property. A self-service storage facility does not include a transfer and storage business where there are no individual storage areas or where employees are the primary movers of the goods to be stored or transferred.

~~*Senior housing complex:* A housing development designed for or occupied solely of persons over the age of 60 years.~~

Service building: A structure in a manufactured (mobile) home or recreational vehicle park containing laundry, restrooms or showers, intended to serve the needs of the residents of the park.

Setback: The minimum allowable horizontal distance from a given point or line of reference, which for purposes of this chapter shall be the property line, to the nearest vertical wall of a building or structure, fence, or other elements as defined by this Code. For the purposes of Chapter 17.60, the point of reference is the protected feature in the FSH Overlay District; setbacks are measured horizontally from, parallel to, and upland from the protected feature.

Shared outdoor recreation area: Areas planned and improved to provide opportunities for active recreation, passive relaxation, or community interaction, and which are accessible to all residents of a development. Examples include, but are not limited to, playgrounds, exercise trails, swimming pools, play fields, tennis courts, community gardens, plazas, picnic areas, passive seating areas, and natural areas.

Shared-use path: A paved public or private route separated from the street right-of-way that is intended to provide pedestrian or bicycle access to adjacent streets and properties. Shared-use paths can serve both recreational and commuter needs. Shared-use paths may also be known as walkways, pathways, or pedestrian ways, and these terms may be used interchangeably throughout the SMC.

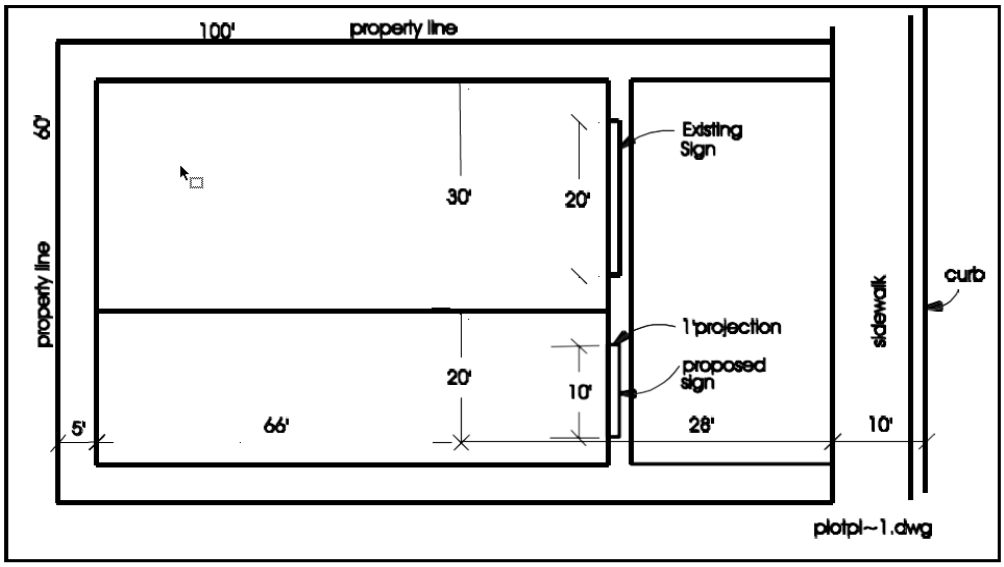
Shed dormer: Often used in gable-roofed structures, a shed dormer has a single-planed roof, pitched (sloping away from the structure) at a shallower angle than the main roof.

Shopping center: A grouping of retail business and service uses on a single site with common parking facilities.

Sidewalk: A paved pedestrian way, pathway, or walkway within a public right-of-way that is generally located adjacent to and separated from the roadway by a curb, drainage facility (e.g., ditch or swale), or planter strip.

Sidewalk café: An area adjacent to and directly in front of a street-level eating or drinking establishment located within the sidewalk area or pedestrian plaza area of the public right-of-way and used exclusively for dining, drinking, and pedestrian circulation.

Site plan: A plan, prepared at an approved engineering ~~to~~ scale, showing accurately and with complete dimensioning, the boundaries of a site and the location of all buildings, structures, uses, natural resources such as creeks, wetlands, and topography, and ~~principal~~ site development features proposed for a specific parcel of land.



Site Plan Example

Site: ~~The property subject to a development permit or erosion control plan.~~ See "Development site."

Span (roof): The horizontal distance between the outside faces of bearing wall plates measured at the shortest dimension across the building.

Special flood hazard area (SFHA): See "area of special flood hazard."

Split-face concrete: Concrete masonry units or blocks with a split face, a technique that results in two blocks being manufactured as one unit and later split into two. This gives the blocks a rough face replicating the appearance of natural, quarried stone.

Split-face Concrete Example

Standing seam: A raised joint or rib on a sheet of metal roofing; provides visual relief and may help manage rainwater and snow.

Start of construction (area of special flood hazard): Includes substantial improvement and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days from the date of the permit. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Stepped parapet: A parapet with breaks in elevation, usually in a symmetrical pattern, that provides visual relief along a building elevation and a transition between buildings of dissimilar height. May also screen rooftop equipment such as electrical and mechanical equipment.

Stockpile: On-site storage of any soil, sand, gravel, clay, mud, debris, vegetation, refuse or any other material, organic or inorganic, in a concentrated state.

Story: That portion of a building included between the upper surface of any floor and the upper surface of the floor next above, except that the top story shall be that portion of a building included between the upper surface of the top floor and the ceiling above.

Stream bank, top of: The land area immediately above and regularly confining a water body, including a stream, river or associated wetland. The bank has a notably steeper slope than the surrounding landscape. The "bankfull stage" means the stage or elevation at which water overflows the natural banks or streams or other waters of this state and begins to inundate the upland. In the absence of physical evidence, the two-year recurrence interval flood elevation may be used to approximate the bankfull state. The first major break in the slope between the top of the bank at waterline and the surrounding landscape shall be the "top of bank."

Stream: A channel such as a river or creek that carries flowing surface water, including perennial streams and intermittent streams with defined channels, and excluding human-made irrigation and drainage channels.

Street: Designated in the 2023 City of Sandy Transportation System Plan as follows:

A. *Arterial, ~~major~~principal:* These roadways serve the highest volume of motor vehicle traffic and are primarily used for longer distance regional trips. The only roadway in the city classified as a principal arterial is US 26.~~These consist of state highways, which carry nearly all vehicle trips entering, leaving, or passing through the Sandy area.~~

B. *Arterial, minor:* These interconnect and support the major arterial system and link major commercial, residential, industrial, and institutional areas. These roads have a typical capacity between 8,000 and 16,000 ADT.

~~C. *Residential minor arterial:* A hybrid between minor arterial and collector street which allows moderate to high traffic volumes on streets where over 90 percent of the fronting lots are residential. Intended to provide some relief to the strained arterial system while ensuring a safe residential environment. Right-of-way width shall not be less than 62 feet nor more than 82 feet (or 88 feet if it's a green street with swales on both sides), street shall be a minimum three-lane cross section, and may include on-street parking.~~

C~~D~~. *Collector streets:* These provide both access and circulation within residential neighborhoods and commercial/industrial areas. These roads have a typical capacity between 2,000 and 6,000 ADT. Right-of-way width shall not be less than 44 feet nor more than 78 feet (or 82 feet if it's a green street with swales on both sides).

D~~E~~. *Local streets:* The primary function is to provide access to immediately adjacent land. Service to through-traffic movement on local streets is discouraged. Right-of-way width shall be ~~50~~54 feet (or up to ~~56~~ 60 feet if it's a green street with swales on both sides). ~~Average daily traffic (~~ADT~~)~~ shall not exceed 1,000 vehicles/day. Proposed ~~projects~~ developments that result in more than 1,000 ADT on an existing or proposed local street shall be modified to not exceed the 1,000 ADT threshold on the local street or the proposal may be processed through the procedures in Chapter 17.66 of the Sandy Development Code. Proposed outright permitted projects in the C-1, Central Business District, are exempt from adherence to the ADT standards on local streets.

E~~F~~. *Cul-de-sac:* A local street with only one outlet and having a bulb at the opposite end. ~~A cul-de-sac shall not exceed 400 feet in length nor serve more than 20 dwelling units unless a proposal is successfully processed through the procedures in Chapter 17.66 of the Sandy Development Code.~~

F~~G~~. *Green street:* A street with a water quality treatment and/or conveyance swale on either one or both sides. Swales shall be a minimum of eight feet wide. ADT standards and dimensional standards shall adhere to the standards of ~~above classifications depending on~~ the street classification.

G. *Complete Street*: A street with facilities to support multiple modes of transportation, including motor vehicles, bicycles, and pedestrians. Complete streets are designed to accommodate multiple users and abilities.

Structure: A building or other improvement that is built, constructed or installed, not including minor improvements, such as fences, utility poles, flagpoles, or irrigation system components that are not customarily regulated through zoning ordinances.

Structure (area of special flood hazard): For floodplain management purposes, a structure is a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured dwelling.

Substantial damage: Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial improvement: Any reconstruction, rehabilitation, addition, repair, or other improvement of a structure the cost of which equals or exceeds 50 percent of the market value of the structure, before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage," regardless of the actual repair work performed.

This term does not, however, include either:

A. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the Director or their designee and which are the minimum necessary to assure safe living conditions; or

B. Any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure."

Surface water management system: All natural and constructed facilities used to regulate the quantity and quality of surface water, including drainage easements, culverts, storm drains, catch basins, drainage ditches, natural drainage ways, stream corridors, rivers, ponds, wetlands and impoundments. A surface or stormwater facility serves one or more of three primary functions:

Detention facility: A facility to temporarily store stormwater runoff and subsequently release it at a slower rate than would otherwise occur.

Retention facility: A facility to collect and hold stormwater runoff with no surface outflow.

Water quality facility: A facility, which physically, chemically or biologically removes pollutants and sediments from stormwater before reaching natural wetlands or streams.

T1-11 siding: A composite panel (plywood) siding material with vertical grooves used extensively in the 1980s; prone to dry rot if not sealed and maintained properly.

Temporary use: A use, intended for limited duration, to be located in a zoning district not permitting such use and not constituting or continuing a nonconforming use or building.

Top of bank: See "Stream bank, top of."

Trailer: A structure constructed for movement on public highways that has sleeping, cooking, and plumbing facilities, that is intended for human occupancy, that is being used for residential purposes and that was constructed before January 1, 1962, and, in the case of a mobile home, met the construction requirements of Oregon Mobile Home Law in effect at the time of construction, but has not been demonstrated to conform to the requirements of the building code for other residences.

~~*Transfer of development rights:* The conveyance of development rights by deed, easement, or other legal instrument authorized by local or state law to another parcel of land and the recording of that conveyance.~~

Tree: A woody perennial plant usually having one dominant trunk, the capacity to achieve a mature height greater than 16 feet, and primarily referred to as a tree in scientific literature.~~Any living, standing woody plant having a trunk six inches or more in diameter, maximum cross section, at a point 24 inches above mean ground level at the base of the trunk.~~

Truck terminal: Land and buildings used as a relay station for the transfer of a load from one vehicle to another or one party to another. The terminal cannot be used for permanent or long-term accessory storage for principal land uses at other locations. The terminal facility may include storage areas for trucks and buildings or areas for the repair of trucks associated with the terminal.

Use: An activity or a purpose, for which land or a structure is designed, arranged or intended, or for which it is occupied or maintained.

Variance, area: A dispensation permitted on individual parcels of property as a method of alleviating unnecessary hardship by allowing a deviation from dimensional (i.e., height, bulk, yard, setbacks) requirements of the Code because of unusual or unique conditions.

Variance (area of special flood hazard): A grant of relief by a community from the terms of a floodplain management regulation.

Variance, special: A dispensation permitted for use of structures or buildings as a method of alleviating unnecessary hardship by allowing a reasonable use of a building or structure, which because of unusual or unique circumstances, is denied by the terms of the Code. This type of variance should not be utilized as a substitute for the rezoning process.

Vegetation, native: Vegetation that appears on a list of native vegetation species on file in the Planning Department. In contrast to native vegetation, invasive, exotic or introduced vegetation was imported to Sandy over the last few centuries, and can crowd out native vegetation species.

Vegetation removal: Removal of vegetation within constrained or unbuildable areas governed by the FSH Overlay District.

Vehicle: A device in, upon, or by which any person or property is or may be transported upon a public highway, except devices moved by human power or used exclusively upon stationary rails or tracks.

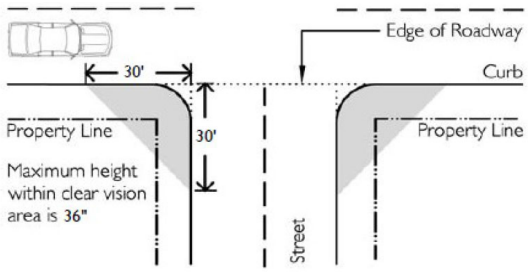
Vicinity map: A drawing or diagram, to scale, showing the location of the proposed development in relation to abutting properties, major streets and other known landmarks.

Violation (area of special flood hazard): The failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this chapter is presumed to be in violation until such time as that documentation is provided.

Visible (building elevation): A building elevation that can be seen from an abutting public street or civic space. See related figure for "Facing (Building Elevation)."

Visible transmittance: A measure of the amount of visible light transmitted through a material (typically glass). Information about visible transmittance typically is, or can be, provided by window manufacturers.

Vision clearance area: A triangular area located at the intersection of two streets or a street and an alley; two sides of which are measured from the curb line, or when curbs are absent from the edge of asphalt. Specific distances and prohibitions on visual obstructions within vision clearance areas are contained in Chapter 17.74. The third side of the triangle is a line across the corner of the lot joining the ends of the other two sides.



Vision Clearance Example

Visual obstruction: Any fence, hedge, tree, shrub, device, wall, or structure between the elevations of three feet and eight feet above the adjacent curb height or above the elevation of gutter line of street edge where there is no curb, as determined by the City Engineer, and so located at a street, drive, or alley intersection as to limit the visibility of pedestrians or persons in motor vehicles on said streets, drives, or alleys.

Walkway: A paved public or private route separated from the street right-of-way that is intended to provide pedestrian or bicycle access to adjacent streets and properties. Walkways can serve both recreational and commuter needs. Walkways may also be known as shared-use paths, pedestrian ways, or pathways, and these terms may be used interchangeably throughout the SMC.

Warehousing and distribution: A use engaged in storage, wholesale and distribution of manufactured products, supplies and equipment, but excluding bulk storage or materials that are inflammable or explosive or that create hazardous or commonly recognized offensive conditions.

Water area: The area between the banks of a lake, pond, river, perennial stream, or fish-bearing intermittent stream, excluding human-made farm ponds.

Water quality: Water quality for any stream or wetland is measured in terms of the Oregon Water Quality Index (OWQI). The higher the OWQI score, the higher the quality of the water. The OWQI considers the following parameters:

A. Water temperature;

B. Percentage and concentration of dissolved oxygen;

C. Biochemical oxygen demand;

D. pH;

E. Total suspended solids;

F. Ammonia and nitrate nitrogens~~s~~;

G. Total phosphorous; and

H. Fecal coliforms.

Water quality is degraded when the mean OWQI score for a stream or wetland decreases (or can be expected to decrease) below existing conditions as a result of development.

Wetland: Wetlands generally include, but are not limited to, swamps, marshes, bogs, and similar wet areas. Wetlands are areas inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation. Hydrophytic vegetation typically is adapted for life in saturated soils, and under normal circumstances would be found in wetlands.

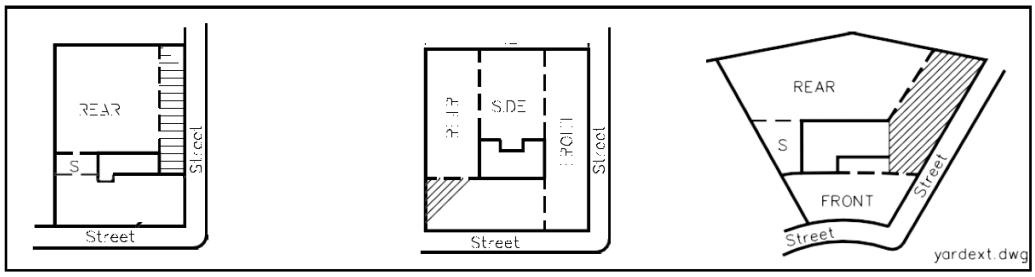
Wetland, locally significant: A wetland that meets the criteria for a "locally significant wetland" in OAR 141-86-340 "Procedures for Identifying Locally Significant Wetlands" and which is identified as such on the City of Sandy Local Wetlands Inventory (2001).

Wheel stop: A physical obstruction used to prevent a car from moving beyond a predetermined point, usually installed on the pavement.

Yard: An open space unobstructed from the ground upward except as otherwise provided in this Code.

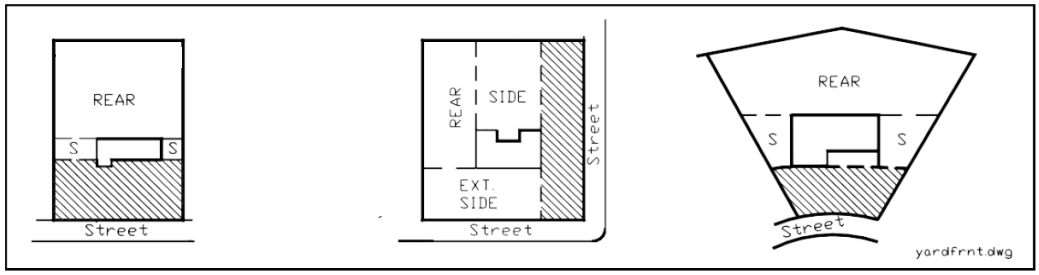
X zone (floodway): Area of minimal to moderate flood hazards as depicted on the FIRM.

Yard, exterior side: A yard extending from the front lot line to the rear lot line on the street side of a corner lot.



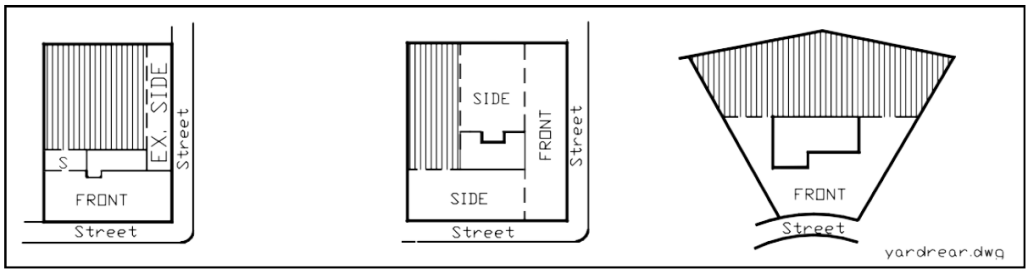
Side Yard (Exterior) Example

Yard, front: A yard extending across the full width of the lot, the depth of which is the minimum horizontal distance between the front lot line and a line parallel thereto at the nearest point of the ~~main~~ primary building.



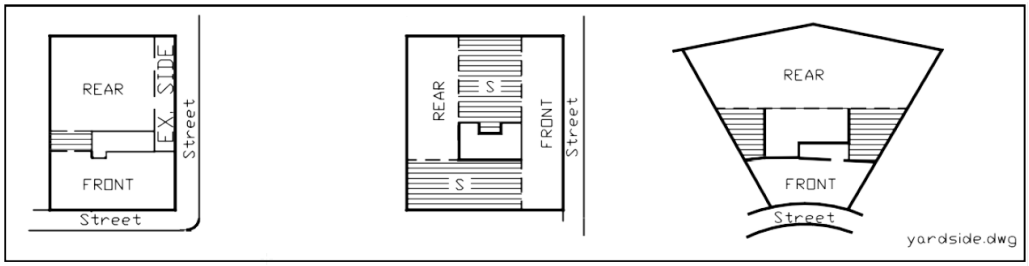
Front Yard Example

Yard, rear: A yard extending across the full width of the lot between the ~~rear main~~ primary building and the nearest point of the rear lot line.



Rear Yard Example

Yard, side: A yard between the ~~main~~ primary building and the side lot line extending from the front yard or front lot line where no front yard is required, to the rear lot line. The width of the required side yard shall be measured horizontally from the nearest point of the side lot line to the nearest part of the ~~main~~ primary building.



Side Yard Example

Zoning district: An area of land ~~within the Sandy City limits,~~ designated for specific types of permitted developments~~,~~ and subject to ~~the~~ specified development requirements ~~of that district~~ as set forth in Chapter 17.30 of this Code.

(Ord. No. 2021-03 , § 1(Exh. A), 5-17-2021; Ord. No. 2021-16 , § 1(Exh. A), 8-16-2021; Ord. No. 2022-07 , § 1(Exh. A), 5-2-2022)

CHAPTER 17.12 PROCEDURES FOR DECISION MAKING[3]

Sec. 17.12.00. Types of procedures for taking public action.

Three separate procedures are established for processing quasi-judicial development applications (Types I, II, and III) and one procedure (Type IV) is established for processing both legislative public actions which do not involve land use permits or which require consideration of a plan amendment, land use regulation or city policies and quasi-judicial applications.

Sec. 17.12.10. Type I—Administrative review.

Type I decisions are made by the Planning Director or someone he or she designates without public notice or a public hearing. The Type I procedure is used when applying standards and criteria to an application requires no use of discretion. A decision of the Director under the Type I procedure may be appealed by an affected party or referred by the Director in accordance with Chapter 17.28.

Administrative Decision Requirements. The City Planning Official or designee's decision shall address all of the approval criteria, including applicable requirements of any road authority. Based on the criteria and the facts contained within the record, the City Planning Official shall approve or deny the requested permit or action. A written record of the decision shall be provided to the applicant and kept on file at City Hall.

Type of Applications:

A. Design review for single-family dwellings, duplex dwellings, manufactured homes on individual lots, manufactured homes within MH parks, accessory dwellings and structures.

B. Design review for exterior building remodel or addition on a commercially or industrially zoned lot, where the proposed remodel or addition meets criteria in Subsection 17.90.40.A.

~~C. Adjustments less than ten percent of a quantifiable dimension which does not increase density.~~

C~~D~~. Flood Slope and Hillside Development-Uses listed in Subsection 17.60.40.A.

D~~E~~. Minor Alteration of an Historic Resource.

E~~F~~. Property Line Adjustments.

F~~G~~. Tree removal involving less than 50 trees.

G~~H~~. Type I FSH Review.

H~~I~~. Minor Partition (no new street created).

I~~J~~. Administrative Variance.

Sec. 17.12.20. Type II—Noticed administrative review.

Type II decisions are made by the Planning Director or designee with public notice, and an opportunity for a public hearing if appealed. An appeal of a Type II decision is heard by the Planning Commission according to the

[3]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-11, effective December 18, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

provisions of Chapter 17.28. Notification of a Type II decision is sent according to the requirements of Chapter 17.22. If the Director contemplates persons other than the applicant can be expected to question the application's compliance with the Code, the Director may elevate an application to a Type III review.

Types of Applications:

A. Design Review, except Type I Design Reviews under Subsection 17.12.10.B. and Type III Design Reviews under 17.12.30.

B. Historic Preservation Provisions Procedures for Alteration of an Historic Resource.

C. Adjustments and Variances of up to 20 percent of a Quantifiable Dimension which does not increase density.

D. Subdivisions in compliance with all standards of the Development Code.

E. Partitions and Minor Replats.

F. Flood, Slope and Hillside Development and Density Transfer-Uses listed in 17.60.40.

G. Request for Interpretation.

H. Tree Removal Permit (greater than 50 trees).

I. Minor Conditional Use Permit.

Sec. 17.12.30. Type III.

Type III decisions generally use discretionary approval criteria and are made by the Planning Commission after a public hearing, in accordance with the provisions of Chapter 17.20. Appeal of a Type III decision is heard by the City Council according to the provisions of Chapter 17.28. Notification of a Type III decision is sent according to the requirements in Chapter 17.22. The Planning Commission may attach certain development or use conditions beyond those warranted for compliance with the standards in granting an approval if the Planning Commission determines the conditions are necessary to avoid imposing burdensome public service obligations on the City, to mitigate detrimental effects to others where such mitigation is consistent with an established policy of the City, and to otherwise fulfill the criteria for approval. If the application is approved, the Director will issue any necessary permits when the applicant has complied with the conditions set forth in the Final Order and other requirements of this Code.

Types of Applications:

A. Appeal of a Director's decision.

B. Conditional Use Permit.

C. Design Review for projects on commercially or industrially zoned lots where the applicant has requested Type III Design Review or the Director has determined that the request involves one or more deviations from the design standards in Chapter 17.90.80 or 17.90.90 (C-1 Design Standards and C-2/I-1/I-2 Design Standards) and such deviation is not subject to an Adjustment or Variance process under 17.66.

D. Flood, Slope, and Hillside Development-Uses not listed in 17.60.20 A. and B.

E. Major Amendment to a Specific Area Plan.

F. Special Variance.

G. Subdivisions and Major Replats that are elevated by the Director or not in conformance with the Development Code.

H. Variances greater than 20 percent of a quantifiable dimension or variances which increase density.

I. Village Concept Plan and Village Master Plan.

J. Zoning map amendment, where the proposal comprises one parcel (or multiple parcels covering a small area) and the proposed zoning conforms to the Comprehensive Plan Map.

Sec. 17.12.40. Type IV.

Type IV decisions are usually legislative but may be quasi-judicial.

Type IV (Quasi-Judicial) procedures apply to individual properties. This type of application is generally considered initially by the Planning Commission with final decisions made by the City Council.

Type IV (Legislative) procedures apply to legislative matters. Legislative matters involve the creation, revision, or large-scale implementation of public policy (e.g., adoption of land use regulations, zone changes, and comprehensive plan amendments that apply to entire districts, not just one property). Type IV matters are typically considered first by the Planning Commission with final decisions made by the City Council. Occasionally, the Planning Commission will not consider a legislative matter prior to its consideration by the City Council.

Applications processed under a Type IV procedure involve a public hearing pursuant to the requirements of Chapter 17.20. Notification of this public hearing shall be noticed according to the requirements of Chapter 17.22 with appeal of a Type IV decision made to the state Land Use Board of Appeals according to the provisions of Chapter 17.28.

A. The City Council shall consider the recommendation of the Planning Commission and shall conduct a public hearing pursuant to Chapter 17.20. The Director shall set a date for the hearing. The form of notice and persons to receive notice are as required by the relevant sections of this Code. At the public hearing, the staff shall review the report of the Planning Commission and provide other pertinent information, and interested persons shall be given the opportunity to present new testimony and information relevant to the proposal that was not heard before the Planning Commission and make final arguments why the matter should or should not be approved and, if approved, the nature of the provisions to be contained in approving action.

B. To the extent that a finding of fact is required, the City Council shall make a finding for each of the applicable criterion and in doing so may sustain or reverse a finding of the Planning Commission. The City Council may delete, add or modify any of the provisions pertaining to the proposal or attach certain development or use conditions beyond those warranted for compliance with standards in granting an approval if the City Council determines the conditions are appropriate to fulfill the criteria for approval.

C. To the extent that a policy is to be established or revised, the City Council shall make its decision after information from the hearing has been received. The decision shall become effective by passage of an ordinance.

D. Types of Applications:

1. Appeal of Planning Commission decision.
2. Comprehensive Plan text or map amendment.
3. Zoning District Map changes.
4. Village Specific Area Plan (master plan).
5. Annexations.
6. Extension of City Services Outside the City Limits.

7. Vacating of Public Lands and Plats.

8. Zoning Map Overlay Districts.

E. *Timing of Requests.* The City accepts legislative requests twice yearly, in March and September. The City Council may initiate its own legislative proposals at any time.

(Ord. No. 2021-16 , § 2(Exh. B), 8-16-2021)

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CHAPTER 17.18 PROCESSING APPLICATIONS[4]

Sec. 17.18.00. Procedures for processing land use applications.

An application shall be processed under a Type I, II, III or IV procedure. The differences between the procedures are associated with the different nature of the decisions as described in Chapter 17.12.

When an application and proposed development is submitted, the Director shall determine the type of procedure the Code specifies for its processing and the potentially affected agencies.

If a development proposal requires an applicant to file a land use application with the City (e.g. a design review application) and if there is a question as to the appropriate procedure to guide review of the application (e.g. a Type II versus a Type III design review process), the question will be resolved in favor of the lower type number.

If a development proposal requires an applicant to file more than one land use application with the City (e.g. a design review application and a variance) and if the development code provides that the applications are to be reviewed under separate types of procedures (e.g. a Type II design review and a Type III variance):

The Director shall elevate all of the required applications to the highest number procedure for review (e.g. the Type II design review application would be reviewed by the Planning Commission along with the Type III variance).

(Ord. No. 2022-07 , § 2(Exh. B), 5-2-2022)

Sec. 17.18.10. Coordination of permit procedure.

The Director shall be responsible for the coordination of the permit application and decision-making procedure and shall issue any necessary permits to an applicant whose application and proposed development is in compliance with the provisions of this Code. Sufficient information shall be submitted to resolve all determinations that require furnishing notice to persons other than the applicant. ~~In the case of a Type II or Type III procedure, an applicant may defer submission of details demonstrating compliance with standards where such detail is not relevant to the approval under those procedures. Before issuing any permits, the Director shall be provided with the detail required to establish full compliance with the requirements of this Code.~~

Sec. 17.18.20. Pre-application conference.

A pre-application conference is required for all Type II, III, and IV applications unless the Director determines a conference is not needed. A request for a pre-application conference shall be made on the form provided by the ~~c~~City and will be scheduled following submittal of required materials and payment of fees. The purpose of the pre-application conference is to acquaint the applicant with the substantive and procedural requirements of the Code, provide for an exchange of information regarding applicable elements of the Comprehensive Plan and

[4]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-11, effective December 18, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

development requirements, and to otherwise identify policies and regulations that create opportunities or pose significant constraints for the proposed development. The Director will provide the applicant with notes from the pre-application conference typically within 10 working days of the pre-application conference. These notes may include confirmation of the procedures to be used to process the application, a list of materials to be submitted, and the applicable code sections and criteria that may apply to the application. Any opinion expressed by the Director or City staff during a pre-application conference regarding substantive provisions of the City's code is advisory and is subject to change upon official review of the application.

(Ord. No. 2022-07 , § 2(Exh. B), 5-2-2022)

Sec. 17.18.30. Land use application materials.

Unless otherwise specified in this Code, an application shall consist of the materials specified in this section, plus any other materials required by this Code.

A. A completed application form and payment of fees.

B. List and two sets of mailing labels of ~~Affected Property Owners~~persons entitled to notice, pursuant to Chapter 17.22.

C. An explanation of intent, stating the nature of the proposed development, reasons for the request, pertinent background information, information required by the Development Code and other material that may have a bearing in determining the action to be taken.

D. Proof that the applicant is the owner of the property, that the applicant has the consent of all parties in ownership of the affected property, the applicant is the contractual owner, or the applicant is an entity with condemnation authority.

E. Legal description of the property affected by the application.

F. Written narrative addressing applicable code chapters and approval criteria.

G. Vicinity Map showing site in relation to local and collector streets, plus any other significant features in the nearby area.

H~~F~~. Site plan of proposed development. The site plan shall be drawn at an approved engineering scale (e.g., 1"=100'; 1"=50'; 1"=20'; or 1"=10') and shall include the applicant's entire property including:

1. Dimensions of the property;
2. Proposed building location;
3. Easements of record;
4. Parcel boundaries;
5. Driveway location;
6. Contour lines at the following minimum intervals;

a. Two foot intervals for slopes zero percent—14.9 percent.

b. Five foot or ten foot intervals for slopes between 15 percent—25 percent.

c. Identification of areas exceeding 25 percent.

7. Flood and Slope Hazard Overlay District boundaries;
8. Drainage, including adjacent lands;

9. Natural hazard areas, including potential flood or high ground water, landslides, erosion, drainage ways, and weak foundation soils;

10. Marsh or wetland areas, underground springs, wildlife habitat areas, including those areas detailed in DSL's Statewide Wetlands Inventory and ODFW's Conservation Opportunity Areas maps, wooded areas, and surface features such as earth mounds and large rock outcroppings;

11. Streams and stream corridors;

12. Location of trees 11-inches or greater DBH (6-inches or greater DBH in FSH Overlay District);

13. Additional information necessary to properly evaluate the proposal, including soils, geology, hydrologic study, photometric analysis, etc., unless waived by the Director. The requirement for additional information shall be communicated to the applicant during the pre-application conference or prior to the application being deemed complete.

~~G~~I. Number of Copies to be Submitted:

1. One ~~hard copy and one~~ digital copy of ~~items A through D listed above~~all items listed above;

2. ~~*Type I through Type IV:*~~ Two hard copies of all plans and elevations. ~~and one digital copy of the site plan and other materials required by the Code.~~

The Director may vary the quantity of materials to be submitted as deemed necessary, provided the required quantity is communicated to the applicant during the pre-application conference or prior to the application being deemed complete.

(Ord. No. 2022-07 , § 2(Exh. B), 5-2-2022)

Sec. 17.18.40. Application acceptance and completeness review.

A. *Acceptance.* When an application is received by the City, the Director or designee shall determine whether the following essential items are present. If the following items are not present, the application shall not be accepted by the City and it shall be returned to the applicant:

1. The required form;

2. The required fee;

3. The signature of the applicant on the required form and signed written authorization of the property owner or other entity described in Subsection 17.18.30.D. if the applicant is not the owner.

B. *Completeness Review.* After an application is accepted, the Director or designee shall review the application for completeness. If the application is incomplete, the Director or designee shall notify the applicant in writing of what information is missing within 30 days of receipt of the application, except for expedited land divisions pursuant to Section 17.18.120, and allow the applicant to submit the missing information.

C. *Application deemed complete for review.* In accordance with the application submittal requirements, the application shall be deemed complete upon the receipt by the Director or designee of:

1. All of the missing information identified by the Director; or

2. Some of the missing information and written notice that no other information will be provided to the City; or

3. Written notice that none of the missing information will be provided to the City.

D. *Application void.* On the 181st day after first being submitted, including expedited land divisions, the application is void if the Director has notified the applicant of missing information and the applicant has not responded as described in subsection C.1., C.2., or C.3., above.

(Ord. No. 2022-07 , § 2(Exh. B), 5-2-2022)

Sec. 17.18.50. Referral and review of applications.

~~Within ten working days of~~ After accepting an application as complete, the Director shall:

A. Transmit one copy of the application, or appropriate parts of the application, to each referral agency for review and comment, including those responsible for determination of compliance with state and federal requirements.

B. If a Type II, III or IV procedure is required, provide for notice and hearing as set forth in Chapters 17.20 and 17.22.

Sec. 17.18.60. Staff evaluation.

The Director shall prepare a report that evaluates whether the proposal complies with the review criteria.

Sec. 17.18.70. Type II development decision.

A. Within 60 days of the date of accepting an application, the Director shall ~~grant~~ approve or deny the request. The decision of the Director shall be based upon the application, the evidence, comments from referral agencies and affected property owners, and approvals required by others. After the decision is made, the Director shall notify the applicant and, if required, others entitled to notice of the disposition of the application. The notice shall indicate the date that the decision will take effect and describe the right of appeal pursuant to Chapter 17.28.

B. The Director shall approve a development if ~~he~~ the Director finds that applicable approvals by other agencies with review authority have been granted and the proposed development otherwise conforms to the requirements of this Code. The notice of decision in accordance with Chapter 17.24 shall describe the reason for approval.

C. The Director shall deny the development if required approvals are not obtained or the application otherwise fails to comply with Code requirements. The notice of decision in accordance with Chapter 17.24 shall describe the reason for denial.

Sec. 17.18.80. Type III or IV decision.

The Director shall schedule a public hearing in accordance with procedures listed in Chapter 17.20.

Sec. 17.18.90. Reapplication following denial.

Upon final denial of a development proposal or a denial of an annexation request by the City Council or the voters, a new application for the same development or any portion thereof or the same annexation or any portion thereof may not be heard for a period of one year from the date of denial. Upon consideration of a written statement by the applicant showing how the proposal has been sufficiently modified to overcome the findings for denial or that conditions have changed sufficiently to justify reconsideration of the original of a similar proposal, the Director may waive the one-year waiting period.

Sec. 17.18.100. Legislative enactments not restricted.

Nothing in Title 17 shall limit the authority of the City Council to make changes in zoning districts or requirements as part of some more extensive revision of the Comprehensive Plan or the implementing ordinances. Nothing in this article shall relieve a use or development from compliance with other applicable laws.

(Ord. No. 2022-07 , § 2(Exh. B), 5-2-2022)

Sec. 17.18.110. 120-day rule; time computation.

A. Final Decision. Except as allowed for Type IV decisions and applications subject to Section 17.18.120, a land use decision on a "permit" as that term is defined in state law must be finalized, including resolution of any local appeal by the City Council, no later than 120 days from the date the application is deemed complete, unless the applicant requests an extension in writing.

B. Time Computation. In computing any period of time prescribed or allowed by this Code, the day of the act or event from which the specified period of time begins to run shall not be included. The last day of the period so computed shall be included, unless it is a Saturday, Sunday, or legal holiday, including a holiday falling on Sunday, in which event, the period runs until close of business the next day which is not a Saturday, Sunday, or legal holiday.

(Ord. No. 2022-07 , § 2(Exh. B), 5-2-2022)

Editor's note(s)—Ord. No. 2022-07 , § 2(Exh. B), adopted May 2, 2022, renumbered former § 17.18.110 as § 17.18.120, and renumbered former § 17.18.120 as § 17.18.110.

Sec. 17.18.120. Expedited land division.

A land division shall be processed pursuant to the expedited land division procedures set forth in ORS Chapter 197 if (a) the land division qualifies as an expedited land division as that term is defined in ORS Chapter 197 and (b) the applicant requests the land division to be processed as an expedited land division. Middle housing land division applications shall be processed pursuant to the expedited land division procedures set forth in ORS Chapter 197.360 to 197.380.

A. *Expedited land division/middle housing land division application materials.*

1. An expedited land division or middle housing land division application shall consist of the materials specified in Subsection 17.100.50.C.

B. *Expedited land division/middle housing land division application acceptance.*

1. When an expedited land division or middle housing land division application is received by the City, the Director or designee shall determine whether the following essential items are present. If the following items are not present, the application shall not be accepted by the City and it shall be returned to the applicant:

   a. The required form;

   b. The required fee;

   c. The signature of the applicant on the required form and signed written authorization of the property owner of record if the applicant is not the owner.

C. *Expedited land division/middle housing land division completeness.*

1. The City shall review an application for an Expedited Land Division or Middle Housing Land Division, and, within 21 days of its receipt, notify the applicant as to whether the application is complete. If the City determines that the application contains sufficient information for review, the City shall advise the applicant in writing that the application is deemed complete and begin the application review process. If the City determines that the application is incomplete, the City shall advise the applicant in writing of the necessary missing information. The City shall begin review of the application either:

    a. Upon receipt of all of the missing information requested by the City; or

    b. Upon receipt of some of the missing information and a written statement from the applicant indicating that none of the other missing information will be provided; or

    c. Upon receipt of a written statement from the applicant indicating that none of the missing information will be provided.

2. If the application was complete when first submitted or the applicant submits the missing information identified by the City within 180 days of the date the application was first submitted, approval or denial of the application will be based on the standards and criteria that were applicable at the time the application was first submitted.

D. *Expedited land division/middle housing land division notice of application.* Within ten days of the City's determination that an application is complete, but at least 20 days before the Director makes a decision, written notice of the application shall be mailed in accordance with the procedures in Section 17.22.80.

E. *Expedited land division/middle housing land division decision.* Within 63 days of the City's determination that an application is complete, the Director shall approve, conditionally approve, or deny an Expedited Land Division or Middle Housing Land Division application. The decision shall: include a brief statement that explains the criteria and standards considered relevant to the decision; state the facts relied upon in rendering the decision; and explain the justification for the decision based upon the criteria, standards, and facts set forth. After seven days' notice to the applicant, the Planning Commission may, at a regularly scheduled public meeting, take action to extend the 63-day time period to a date certain for one or more applications for an expedited land division or a middle housing land division prior to the expiration of the 63-day period, based on a determination that an unexpected or extraordinary increase in applications makes action within 63 days impracticable. In no case shall an extension be to a date more than 120 days after the application was deemed complete. The decision to approve or not approve an extension is not a land use decision or limited land use decision.

F. *Expedited land division/middle housing land division notice of decision.* Within five days after the Director renders a decision, but within the 63 days as noted in Subsection 17.18.120.C., notice of the decision shall be mailed in accordance with the procedures in Section 17.22.100. Unless appealed according to the procedures in Chapter 17.28, the Director's decision is effective on the 15th day after notice of the decision is mailed.

(Ord. No. 2022-07 , § 2(Exh. B), 5-2-2022)

Editor's note(s)—See the editor's note to § 17.18.110.

CHAPTER 17.20 PUBLIC HEARINGS[5]

Sec. 17.20.00. Background.

The following procedures are established for the conduct of legislative and quasi-judicial public hearings where such hearings are required by the provisions of this Code. In the event that this Code and a specific provision of State law address the same subject, then the requirement of State law shall be fulfilled in lieu of the procedure provided by this Code.

Sec. 17.20.10. Purpose.

A. Describe rules of conduct, notice requirements, order of proceedings, and action required for legislative and quasi-judicial hearings; and

B. Provide clear and consistent rules to ensure the legal rights of individual property owners and the general public are protected.

Sec. 17.20.20. Determination of hearing type.

Within seven days from the date of the Director's request, the City Attorney shall determine whether a legislative or a quasi-judicial hearing is required. Such decision shall be based upon a construction of applicable State regulations and relevant court decisions.

When more than one application has been filed at one time for a specific property or development, and any of those applications would ordinarily be heard by the Planning Commission, all of the applications (Type II and Type III) may be heard by the Planning Commission at the same meeting.

Sec. 17.20.30. Responsibility of director for hearings.

A. Schedule and assign the matter for review and hearing;

B. Conduct the correspondence of the hearing body;

C. Give notice;

D. Maintain a record and enter into the record relevant dates such as those of giving notice, hearings, postponement and continuances and a summary of action taken by the hearings body;

E. Prepare minutes to include the decision on the matter heard and the reasons for the decision;

F. Reduce the decisions of the hearings body to writing within a reasonable time;

G. Mail a copy of the decision to the party requesting the same upon payment of a reasonable fee, if a fee has been established.

[5]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2008-05, effective April 2, 2008. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

Sec. 17.20.40. Applicant's responsibility.

A. *Documents and Evidence.* All documents or evidence relied upon by the applicant shall be submitted to the local government and be made available to the public. All documents and evidence should be submitted at least 20 days in advance of the public hearing. If the applicant submits additional information, any party with standing may request that the scheduled public hearing be postponed to allow opportunity for noticed persons to review and comment.

B. *Burden and Nature of Proof.* Except for legislative determinations, the burden of proof is upon the applicant. The proposal must be supported by proof that it conforms to any applicable elements of the Comprehensive Plan and to provisions of this Code, especially the specific criteria set forth for the particular type of decision under consideration.

C. *Neighborhood Meetings.* Applicants intending to develop a major project within the City are strongly urged to conduct their own informational meetings in the neighborhood affected prior to submitting their application to the City.

Sec. 17.20.50. Public hearing order of proceedings.

A. The presiding officer shall state the case and call the public hearing to order. The presiding officer may establish the time allowed for presentation of information;

B. Any objections on jurisdictional grounds shall be noted in the record. If there is objection, the person presiding has the discretion to proceed or terminate;

C. Disqualification shall be determined. Members shall announce all potential conflicts of interest;

D. *Declaration of Ex Parte Contacts.* Members of the hearing body may view the area in dispute with or without notification to the parties, shall place the time, manner and circumstances of such view in the record;

E. At the commencement of a hearing under a Comprehensive Plan or land use regulation, a statement shall be made to those in attendance that:

   1. Lists the applicable substantive criteria;

   2. States that testimony and evidence must be directed toward the criteria in the Plan or land use regulations which the person believes to apply to the decision; and

   3. States that failure to raise an issue accompanied by statements or evidence sufficient to afford the decision maker and the parties an opportunity to respond to the issue precludes an appeal to the Council based on that issue.

F. *Staff reports shall be presented.* City staff may also present additional information whenever allowed by the presiding officer during the proceedings;

E. Presentation of information or inquiries by the applicant or applicant's representative(s);

F. Presentation of information or inquiries by those persons who support the proposed action;

G. Presentation of information or inquiries by those persons who oppose the proposed action;

H. Presentation of information or inquiries by those persons who do not necessarily support or oppose the proposed action;

I. Persons who have testified supporting or opposing the proposed change may present rebuttal testimony. The scope of material presented during rebuttal shall be limited to matters raised during the course of the

hearing. The applicant or the applicant's representative followed by those opposed to the proposed change shall first present rebuttal. The presiding officer shall limit rebuttal to avoid repetition and redundancy;

J. Prior to the conclusion of the initial evidentiary hearing, any participant may request an opportunity to present additional evidence or testimony regarding the application. For the purposes of this section, a "participant" shall mean a person or entity that submitted written or oral comments at the public hearing; merely signing a petition does not constitute participation. The Planning Commission or City Council, as applicable, shall grant such request by either continuing the public hearing or leaving the record open for additional written evidence or testimony. A continuance or extension granted pursuant to this subsection shall be subject to the limitations of ORS 227.178 unless the continuance or extension is requested or agreed to by the applicant. A party other than the applicant has the right to request only one extension and this right is waived if it is not raised at the initial evidentiary hearing;

K. If the Planning Commission or City Council grants a continuance, the hearing shall be continued to a date, time and place certain at least seven days from the date of the initial evidentiary hearing. An opportunity shall be provided at the continued hearing for persons to present and rebut new evidence and testimony. If new written evidence is submitted at the continued hearing, any person may request, prior to the conclusion of the continued hearing, that the record be left open for at least seven days to submit additional written evidence or testimony for the purpose of responding to the new written evidence;

L. If requested by any participant in the initial hearing, when the public hearing is not to be continued, the record shall remain open for submittal of additional written testimony for a period of seven days after the close of the hearing and may be permitted for a longer period at the discretion of the hearing authority. If the Planning Commission or City Council leaves the record open for additional written evidence or testimony, the record shall be left open for at least seven days. Any participant may file a written request with the City for an opportunity to respond to new evidence submitted during the period that the record is left open. If such a request is filed, the Planning Commission or City Council shall reopen the record pursuant to this section;

M. When the hearing has ended, the hearing body shall openly discuss the issue and may further question a person submitting information or the staff if opportunity for rebuttal is provided;

N. Once a hearing has been closed, no further evidence shall be received except in response to specific questions directed to staff or one of the parties to clarify earlier evidence.

O. If the hearing is closed, it shall be reopened only upon a majority vote of the hearing authority and only after a reasonable showing that:

1. There is evidence that was not reasonably available at the time of the hearing;
2. Evidence is now available to the person seeking to reopen the hearing; and
3. The evidence is factual, substantial, and material.

P. When the Planning Commission or City Council reopens a record to admit new evidence or testimony, any person may raise new issues, which relate to the new evidence, testimony or criteria for decision-making, which apply to the matter at issue.

Q. The above requirements generally refer to quasi-judicial hearings. Except as may be necessary under state law, these requirements do not apply to legislative hearings.

Sec. 17.20.60. Action by hearing authority.

A. Following the hearing procedure, the hearing body shall approve or deny the application or if the hearing is in the nature of an appeal, affirm, reverse or remand the decision that is on appeal. If the applicant requests or assents to an extension, the 120-day rule is tolled for the duration of the extension. Processing of a matter

under consideration may be extended for a reasonable period of time by the applicant but the total of all extensions may not exceed 245 days.

B. If a quorum of the hearing authority does not appear for a hearing, the hearing shall automatically be continued to the date and time of the next regularly scheduled meeting.

C. The hearing body or its designee shall approve findings of fact to include:

1. A statement of the applicable criteria and standards against which the proposal was tested, and of the hearing body's interpretation of what would be required to achieve compliance with the criteria and standards;

2. Findings and conclusions individually numbered. The findings may require an explanation of possible conflict between provisions of identified legal criteria and an explanation of how any such conflicts were resolved;

3. A statement of the facts which the hearing body found establishing compliance or noncompliance with each applicable criteria and assurance of compliance with applicable standards;

4. The decision to deny or approve the proposed change with or without conditions.

All parties shall be encouraged to prepare and submit written findings for the consideration of the hearing authority. The authority may direct staff to prepare proposed findings or, in the event that the authority does not follow staff's recommendation, the prevailing party may be directed to prepare findings.

Sec. 17.20.70. Notice of decision.

Following the signing of the Final Order and Findings of Fact, the Director shall issue a Notice of Decision that describes the decision of the hearing authority, a reference to findings leading to it, any conditions of approval, and application appeal period deadline. Subject to any requirements of state law, the notice of decision will be issued to persons who submitted written testimony and were not in attendance at the hearing, in addition to those persons who are entitled to receive a notice of decision by other provisions of this Code.

Sec. 17.20.80. Public information.

A. A copy of these provisions shall be made available to any interested person requesting such a copy.

B. Copies of the Rules of Procedure shall be available to the public within the hearing room prior to and during every public hearing conducted pursuant to this chapter.

Sec. 17.20.90. Rules of procedure.

A. Formal rules of evidence shall not apply.

B. Written exhibits, visual aids, affidavits, maps, and the like may be submitted as part of the evidence. Any signed writing presented to or received by any member of the hearing authority or by any other city agency or official outside the public hearing may be received as argument and placed in the record. Unless the hearing authority specifically allows later filing of argument, no writings received after the close of the hearing will be considered.

C. All information received by the hearing authority shall be retained and preserved and shall be transmitted to an appellate body in the event an appeal is filed in accordance with Chapter 17.28—Appeals. True copies of original information may be substituted for original documents.

D. All evidence and argument shall be as brief as possible, consistent with full presentation.

E. Redundancy shall be avoided.

F. Each person presenting information or argument shall be permitted to complete the presentation without interruption except by the presiding officer to enforce this Code.

G. Discussion of personalities shall be avoided to the extent possible in making a complete presentation.

H. No person present shall engage in applause, cheers, or other vocal or outward expressions of approval, or disapproval, agreement or disagreement. If any person persists in such conduct after warning by the presiding officer, such person may be expelled from the hearing.

I. The presiding officer has complete authority to enforce these provisions to assure that a fair hearing is held including the authority to expel from the public hearing and to bar from further appearance at the public hearing any person who willfully violates any one or more of these provisions.

Sec. 17.20.100. Failure to receive notice.

The failure of an affected property owner to receive notice as provided in this section shall not invalidate such proceedings if the City can demonstrate by affidavit that such notice was given. The notice provisions of this section shall not restrict the giving of notice by other means, including posting, newspaper publication, radio and television.

Sec. 17.20.110. Rights and responsibility of hearing body and City employees.

A. *Impartiality.* Except for Type IV legislative hearings conducted by the governing body, a party to a hearing or a member of a hearing body may challenge the qualifications of a member of the hearing body to participate in the hearing and decision regarding the matter. The challenge shall state the facts relied upon by the challenger relating to a person's bias, pre-judgment, personal interest, or other facts from which the challenger has concluded that the member of the hearing body cannot participate in an impartial manner.

B. *Disqualification.* Except for Type IV legislative hearings conducted by the governing body, no member of a hearing body shall participate in a discussion of the proposal or vote on the proposal when any of the following conditions exist:

1. The hearing body member or the member's spouse, brother, sister, child, parent, father-in-law, mother-in-law, any business in which the member is then serving or has served within the previous two years, or any business with which the member is negotiating for or has an arrangement or understanding concerning prospective partnership or employment;

2. The member has a direct private interest in the proposal;

3. For any other valid reason, the member has determined that participation in the hearing and decision cannot be done in an impartial manner.

C. *Ex Parte Contacts.* Except for Type IV legislative hearings conducted by the governing body, the general public has a right to have hearing body members free from pre-hearing or ex parte contacts on matters heard by them. It is recognized that a countervailing public right is free access to public officials on any matter. Therefore, hearing body members shall reveal any significant pre-hearing or ex parte contacts with regard to any matter at the commencement of the public hearing on the matter. If such contacts have not impaired the member's impartiality or ability to vote on the matter, the member shall so state and shall participate or abstain in accordance with Chapter 17.20.120.

Ex parte contacts with a member of the decision making body shall not invalidate a final decision or action of the decision making body, provided that the member receiving the contact places the substance of the content of the ex parte communication in the record of the hearing and makes a public announcement of the content of the

communication and of the right of the parties to rebut the content at the first hearing where action will be considered or taken.

D. *Abstention or Disqualification.* Except for Type IV hearings conducted by the governing body, disqualification for reasons other than the member's own judgment may be ordered by a majority of the members of a hearing body present and voting. The member who is the subject of the motion for disqualification may not vote on the motion.

E. *Rights of Disqualified Member of the Hearing Body.*

1. An abstaining or disqualified member of the hearing body may be counted for purposes of forming a quorum. A member who represents personal interest at a hearing may do so only by physically joining the audience and vacating the seat on the hearing body. He shall make full disclosure of his status and position at the time of addressing the hearing body and shall not vote;

2. If all members of a hearing body disqualify themselves all members present after stating their reasons for abstention or disqualification shall by so doing be re-qualified and proceed to resolve the issues;

3. Except for Type IV legislative hearings conducted by the governing body, a member absent during the presentation of evidence in a hearing may not participate in the deliberations or final decision regarding the matter of the hearing unless the member has reviewed the evidence received.

F. *Voting Eligibility.* When a member of the hearing authority becomes ineligible to vote due to absence from a portion of the public hearing on the proposed development, the member may revive voting eligibility by listening to the completed audio or video tape recording of the portion of the hearing missed. The member shall then announce to the hearing authority that the tapes have been listened to, thus reviving voter eligibility.

Sec. 17.20.120. Record of proceedings.

The secretary to the hearing body shall be present at each hearing and shall cause the proceedings to be recorded stenographically or electronically.

A. Testimony shall only be transcribed if required for judicial review or if ordered by the hearing body;

B. The hearing body shall, where practicable, retain as part of the hearing record each item of physical or documentary evidence presented and shall have the items marked to show the identity of the person offering the same and whether presented on behalf of a proponent or opponent. Exhibits received into evidence shall be retained in the hearing file until after the applicable appeal period has expired, at which time the exhibits may be released to the person identified thereon, or otherwise disposed of;

C. The findings and order shall be included in the record;

D. A person shall have access to the record of the proceeding at reasonable times.

CHAPTER 17.22 NOTICES[6]

Sec. 17.22.00. Intent.

The requirement for notice to affected property owners, governmental agencies, public utility or service providers, and any other person, agency, or organization that has filed with the Director a request to receive notices of hearings and has paid a reasonable fee to cover the cost of providing notice is intended to provide those persons and entities an opportunity to comment on a proposed development and to afford interested parties the opportunity to participate in the land use decision making process.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.22.10. Type II quasi-judicial notice.

Where a Type II quasi-judicial decision is required by this Code, notice shall be mailed to the following:

A. The applicant or authorized agent;

B. Any person who owns property within 300 feet of the development site;

C. ODOT, when the site is located within 200 feet of an ODOT facility, including right-of-way, and maintenance yards;

D. Sandy Area Metro (SAM), when the site is located within 200 feet of a SAM facility;

E~~C~~. Any other person, agency, or organization that may be designated by the Code;

F~~D~~. Interested parties, such as counties, state agencies, or public utility or service providers that may be affected by the specific development proposal shall receive notice of the scheduled public hearing;

G~~E~~. Additional notices may also be mailed to other property owners or posted as determined appropriate by the Director and based on the impact of the proposed development.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.22.20. Type III and type IV quasi-judicial notice.

Where a Type III quasi-judicial decision is required by this Code, notice shall be mailed to the following:

A. The applicant or authorized agent;

B. Any person who owns property within 500 feet of the development site, except an application for annexation requires notice to the owner(s) of property that is within 1,000 feet of the subject property;

C. ODOT, when the site is located within 200 feet of an ODOT facility, including right-of-way, and maintenance yards;

D. Sandy Area Metro (SAM), when the site is located within 200 feet of a SAM facility.

[6]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2018-29, effective December 5, 2018. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

E~~C~~. Tenants of any existing manufactured-dwelling park for which a zoning district change is proposed;

F~~D~~. Any other person, agency, or organization that has filed with the Director a request to receive notices of hearings and has paid a reasonable fee to cover the cost of providing notice;

G~~E~~. Any other person, agency, or organization that may be designated by the Code;

H~~F~~. Any other person, agency, or organization that may be designated by the City Council or its agencies;

I~~G~~. Any other resident owner of property whom the Director determines is affected by the application;

J~~H~~. Any neighborhood or community organization recognized by the governing body and whose boundaries include the site;

K~~I~~. Interested parties, such as counties, state agencies, or public utility or service providers that may be affected by the specific development proposal shall receive notice of the scheduled public hearing;

L~~J~~. Additional notices may also be mailed to other property owners or posted as determined appropriate by the Director and based on the impact of the proposed development.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.22.30. Type IV legislative hearing notice.

A. The Oregon Department of Land Conservation and Development (DLCD) shall be notified in writing of proposed Comprehensive Plan amendments and Development Code amendments before the first evidentiary hearing in accordance with OAR 660-018-0020. The notice to DLCD shall include an affidavit of transmittal.

B. Notice shall be sent by mail at least 20 days, but not more than 40 days, prior to the first evidentiary hearing to owners of property if the proposed action would "rezone" the property according to ORS 227.186.

C. Additional notices may be mailed to other property owners or posted as determined appropriate by the Director based on the impact of the proposed development.

Sec. 17.22.40. Contents of notice.

The notice provided by the City shall:

A. Explain the nature of the application and the proposed use or uses which could be authorized;

B. List the applicable criteria from the Comprehensive Plan, if any, and the Development Code that apply to the application:

1. Nature of the proposed development and the proposed uses that could be authorized;
2. Legal description, address, or tax map designations;
3. Map showing the location of a zoning change, subdivision, or proposed development;
4. Name and telephone number of a staff member from whom additional information can be obtained;
5. Where a zone change or subdivision is proposed, the notice shall include the statement that the hearing body may consider modifications to what was requested by the applicant.

C. Set forth the street address or other easily understood geographical reference to the subject property;

D. State the date, time, and location of the hearing or the date by which written comments may be submitted, as applicable to the type of land use action;

E. For quasi-judicial notices, state that failure to raise an issue, in person or by letter, or failure to provide statements or evidence sufficient to afford the decision maker an opportunity to respond to the issue, prior to the closing of the record of the proceeding, precludes an appeal based on that issue;

F. State that a copy of the application, all documents and evidence submitted by or on behalf of the applicant and applicable criteria are available for inspection at no cost and will be provided at a reasonable cost;

G. For quasi-judicial notices, state that a copy of the staff report will be available for inspection at no cost at least seven calendar days prior to the hearing and will be provided at a reasonable cost; and

H. Include a general explanation of the requirements for submission of testimony and the procedures for conducting the hearing.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.22.50. Mailing of notices.

A. Type III and Type IV notices must be mailed at least:

1. Twenty days before the evidentiary hearing; or

2. If two or more evidentiary hearings are allowed, ten days before the first evidentiary hearing.

B. Type II Limited Land Use Decision notices must be mailed at least:

1. Fourteen days in advance of a pending Type II decision.

Sec. 17.22.60. Publication of notices.

A general legal notice containing a link to the City's webpage that lists upcoming public hearings shall be published in a newspaper of general circulation at least once per month. Upcoming Type III and IV public hearings, except for hardship permits per Chapter 17.70, shall be posted to the City's social media page a minimum of five days prior to the hearing.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.22.70. Continued hearings.

Where a hearing is continued to a date certain, no additional notice need be given.

Sec. 17.22.80 List of property owners

The applicant shall provide a certified list of property owners and mailing labels as required by notice provisions of this Code. Unless otherwise provided, addresses for a mailed notice shall be obtained from the County's real property tax records. Unless the address is on file with the Director, a person whose name is not in the tax records at the time of filing of an application, or of initiating other action not based on an application, need not be furnished mailed notice.

Sec. 17.22.90. Notice of decision.

A. Notice of the final decision for a Type II, III, or IV application shall be mailed to the following:

1. Applicant.
2. Owner of the subject property.
3. Any group or individual who submitted written or verbal testimony during the comment period or at a hearing on the application.
4. Those groups or individuals who requested notice of the decision.

B. The notice shall include all of the following:

1. A description of the nature of the decision.
2. An explanation of the nature of the application and the proposed use or uses which could be authorized.
3. The street address or other easily understood geographical reference to the subject property.
4. The name of a City representative to contact and the telephone number where additional information may be obtained.
5. A statement that a copy of the application, all documents and evidence submitted by or on behalf of the applicant, and applicable criteria are available for inspection at no cost and will be provided at reasonable cost.
6. A statement that the applicant and any person or organization that submitted written comments during the comment period may appeal as provided in Chapter 17.28.
7. A statement that the decision will not become final until the period for filing a local appeal has expired.

C. Unless appealed according to the procedures in Chapter 17.28, the decision is effective on the 12th day after the final order is issued and the notice of the decision is mailed.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.22.100. Expedited land division/middle housing land division notice of application.

A. Within ten days of the City's determination that an application is complete, but at least 20 days before the Director makes a decision, written notice of the application shall be mailed to all of the following, using information from the most recent property tax assessment roll:

1. Applicant.
2. Owners of the subject property.
3. Owners of properties located within 100 feet of the perimeter of the subject property.
4. Interested parties that have submitted written requests for notification.
5. Any state agency, local government, or special district responsible for providing public facilities or services to the subject property.

B. The notice shall include all of the following:

1. The street address or other easily understood geographical reference to the subject property.

2. The applicable criteria for the decision.
3. The place, date, and time that comments are due.
4. A statement that copies of all evidence relied upon by the applicant are available for review and can be obtained at cost.
5. A statement that issues that may provide the basis for an appeal to the municipal judge must be raised in writing prior to the end of the comment period and with sufficient specificity to enable the municipal judge to respond to the issue.
6. The name and phone number of a City contact person.
7. A brief summary of the local decision-making process for the decision being made.

C. The notice shall allow a 14-day period for the submission of written comments, starting from the date of mailing. All comments must be received by the City within that 14-day period.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.22.110. Expedited land division/middle housing land division notice of decision.

A. Within 63 days from the date an expedited or middle housing land use application was deemed complete, notice of the decision shall be mailed to the following:
1. Applicant.
2. Owners of the subject property.
3. Owners of properties located within 100 feet of the perimeter of the subject property.
4. Interested parties that have submitted written requests for notification.
5. Any state agency, local government, or special district responsible for providing public facilities or services to the subject property.

B. The notice shall include all of the following:
1. A description of the nature of the Director's decision.
2. An explanation of the nature of the application and the proposed use or uses which could be authorized.
3. The street address or other easily understood geographical reference to the subject property.
4. The name of a City representative to contact and the telephone number where additional information may be obtained.
5. A statement that a copy of the application, all documents and evidence submitted by or on behalf of the applicant, and applicable criteria are available for inspection at no cost and will be provided at reasonable cost.
6. A statement that the applicant and any person or organization that submitted written comments during the comment period may appeal as provided in Chapter 17.28.
7. A statement that the decision will not become final until the 14-day period for filing a local appeal has expired.

C. Unless appealed according to the procedures in Chapter 17.28, the Director's decision is effective on the 15th day after the final order is issued and the notice of the decision is mailed.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

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CHAPTER 17.28 APPEALS[7]

Sec. 17.28.00. Intent.

This chapter sets forth procedures for processing an appeal of a decision made by staff, the Planning Commission, or the City Council.

(Ord. No. 2022-07 , § 4(Exh. D), 5-2-2022)

Sec. 17.28.10. Request for review-appeal of decision.

A. *Type I or Type II Procedure.* An affected party may appeal a Type I or Type II decision to the Planning Commission. Except for an expedited land division, the party must file an appeal with the Director within 12 calendar days of the date the City mails notice of the decision. The notice of appeal shall indicate the nature of the decision that is being appealed. The Director may create and periodically amend an appeal form and require affected parties to use this form to appeal Type I and II decisions. Appeal of an expedited land division is subject to Section 17.28.70.

B. *Type III Procedure.* An affected party may appeal a decision of the Planning Commission to the City Council. The party must file an appeal within 12 calendar days of notice of the decision. The notice of appeal shall indicate the decision that is being appealed. The Director may create and periodically amend an appeal form and require affected parties to use this form to appeal Type III decisions. The City Council's decision regarding an appeal of a Planning Commission decision is final for the purposes of an appeal to the Land Use Board of Appeals.

C. *Type IV Procedure.* A Type IV decision of the City Council may be appealed to the Land Use Board of Appeals (LUBA) or to other tribunals in accordance with Oregon law.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.28.20. Requirements of appeal application.

A. An application for an appeal shall contain at least the following:

1. An identification of the decision sought to be reviewed, including the date of the decision;
2. A statement of the interest of the person seeking review and that he/she was a party to the initial proceedings;
3. The specific grounds relied upon for review;
4. If de novo review or review by additional testimony and other evidence is requested, a statement relating the request to the factors listed in Section 17.28.50;
5. *Payment of required filing fees.* Payment of required filing fees is jurisdictional and must accompany an appeal at the time it is filed;

[7]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2018-29, effective December 5, 2018. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

6. The name and mailing address of the person or entity appealing the decision; and

7. List and two sets of mailing labels for property owners within 300 feet of the subject property (for appeal of a Type I decision), 500 feet of the subject property for appeal of a Type II, III, or IV decision, or 1,000 feet for appeal of an annexation request. The property owner list and labels shall be obtained from a Title Company no more than seven days prior to submitting the appeal.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.28.30. Scope of review.

Except where a de novo hearing is required, an appeal is limited to a review of the record and a hearing for receipt of oral arguments regarding the record. At its discretion, the hearing body may allow an appeal to include new evidence on specific issues, or it may allow a full de novo hearing.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.28.40. Review on the record.

Unless otherwise provided under Section 17.28.50, review of the decision on appeal shall be confined to the record of the proceeding as specified in this section. The record shall include:

A. A factual report prepared by the Director;

B. All exhibits, materials, pleadings, memoranda, stipulations and motions submitted by any party and received or considered in reaching the decision under review; and,

C. The transcript of the hearing below, if previously prepared; otherwise, a detailed summary of the evidence, but the details need not be set forth verbatim.

The reviewing body shall make its decision based upon the record after first granting the right of argument but not the introduction of additional evidence to any party who has filed a notice of appeal. If requested, the reviewing body shall allow the applicant and/or appellant to present an oral summary of the evidence and Code sections that support their position.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.28.50. Review consisting of additional evidence or de novo review.

A. Except where a de novo hearing is required, the reviewing body may hear the entire matter de novo or it may admit additional testimony and evidence on specific issues if it determines that the additional testimony or other evidence could not reasonably have been presented and included in the earlier decision. The reviewing body shall consider all of the following in making such a decision:

1. Prejudice to the parties;

2. Convenience or availability of evidence at the time of the initial hearing;

3. Surprise to opposing parties; and,

4. The competency, relevancy, and materiality of the proposed testimony or other evidence.

B. De novo hearing means a hearing at which the issues, evidence and testimony are not limited. All testimony, evidence, and other material from the prior decision shall be included in the record of the review.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

Sec. 17.28.60. Review body decision.

Upon review, the review body may by order affirm, reverse or modify in whole or in part a determination or requirement of the decision that is under review. When the review body modifies or renders a decision that reverses a decision of the hearing body, the review body, in its order, shall set forth its finding and state its reasons for taking the action encompassed in the order. When the review body elects to remand the matter back to the hearing body for such further consideration as it deems necessary, it shall include a statement explaining the error found to have materially affected the outcome of the original decision and the action necessary to rectify it.

Sec. 17.28.70. Expedited land division or middle housing land division appeal.

A. *Filing an Appeal of the Director's Decision on Expedited Land Division or Middle Housing Land Division Application.*

1. Within 14 days of the date of the mailing of notice of the Director's decision on an Expedited Land Division application or a Middle Housing Land Division application, the decision may be appealed to the municipal judge by:
    a. The applicant.
    b. Any group or individual who submitted written comments during the 14-day comment period identified in the notice mailed pursuant to Chapter 17.22.
2. The appeal shall be submitted on a form approved by the Director, be accompanied by a deposit for costs established by the City's Master Fee Schedule and two sets of mailing labels for property owners within 100 feet of the subject property, and be received by the city no later than 5:00 p.m. on the 14th day after the notice of decision is mailed. The record from the Director's proceeding shall be forwarded to the municipal judge. New evidence shall be accepted.
3. The appeal shall include a statement of issues on appeal. The appeal statement shall explain specifically how:
    a. The Director's decision violates the substantive provisions of land use regulations applicable to the application;
    b. The Director's decision is unconstitutional;
    c. The application is not eligible for review under the procedures for an expedited or middle housing land division review in Chapter 17.18; or
    d. The parties' substantive rights have been substantially prejudiced by an error in procedure made by the City.

B. *Notice of Appeal Procedure for an Expedited Land Division or Middle Housing Land Division.*

1. Within seven days of the date an appeal is filed, City staff, on behalf of the municipal judge, shall mail written notice of the appeal to all of the following:
    a. Applicant.
    b. Owner of the subject property.
    c. Appellant.
    d. Any person or organization entitled to notice under Section 17.22.80 that provided written comments prior to the close of the public comment period identified in the notice mailed pursuant to Section 17.22.80.

e. Any state agency, local government, or special district responsible for providing public facilities or services to the subject property.

2. The notice shall include all of the following:

a. The street address or other easily understood geographical reference to the subject property.

b. The applicable criteria for the decision.

c. The nature of the application and the proposed use or uses which could be authorized.

d. An explanation of the requirements for submission of testimony and appeal procedures.

e. A statement that copies of the application and all evidence and documents submitted by or on behalf of the applicant are available for review, and that copies can be obtained at cost.

f. The name and telephone number of a City contact person.

g. A statement that a person or organization that provided written comments to the Director prior to the close of the public comment period identified in Section 17.22.80, but did not file an appeal within the time set by Subsection 17.28.70.A.1., may participate in the appeal only with respect to the issues raised in the written comments submitted to the Director by that person or organization.

C. *Appeal Procedure for an Expedited Land Division or Middle Housing Land Division.*

1. Only written evidence and argument will be accepted unless the municipal judge conducts a public hearing, in which case those parties who submitted comments on the original middle housing land division application (Director's decision) may testify.

2. The municipal judge may use any appeal procedure that is consistent with the interests of the parties and will ensure a fair opportunity to present information and argument.

3. The municipal judge shall provide the City an opportunity to explain the Director's decision, but the municipal judge is not limited to reviewing the Director's decision and may consider information not presented to the Director.

4. A person or organization that provided written comments to the Director prior to the close of the public comment period identified in Section 17.22.80, but did not file an appeal within the time set by Subsection 17.28.70.A.1., may participate in the appeal only with respect to the issues raised in the written comments submitted to the Director by that person or organization.

D. *Decision for an Expedited Land Division or Middle Housing Land Division.*

1. The municipal judge shall issue a written decision on an appeal of an Expedited Land Division application or a Middle Housing Land Division application within 42 days of the date the appeal is received by the City.

2. Except as provided in Subsection 17.28.70.D.5., the municipal judge shall affirm, reverse, or modify the decision of the Director. Before reversing or modifying the Director's decision, the municipal judge shall make findings and conclusions clearly stating how the Director failed to properly evaluate the application or render a decision consistent with applicable criteria. The municipal judge shall seek to identify means by which the application can satisfy the applicable approval criteria.

3. The decision of the municipal judge is final.

4. The municipal judge's decision is not a land use decision or limited land use decision.

5. If the municipal judge finds that the application does not qualify as an Expedited Land Division application or a Middle Housing Land Division application, the municipal judge shall remand the

application to the appropriate initial decisionmaker for consideration as a land use application or limited land use application.

6. The municipal judge's decision may not reduce the density of an Expedited Land Division application.

7. The municipal judge shall assess the costs of the appeal as follows:

   a. If the municipal judge's decision materially improves the appellant's position in comparison to the Director's decision, the municipal judge shall order the City to refund the deposit for costs required by Subsection 17.28.70.A.2. to the appellant.

   b. If the municipal judge's decision does not materially improve the appellant's position in comparison to the Director's decision, the municipal judge shall order the appellant to pay to the City the costs of the appeal that exceed deposit required by Subsection 17.28.70.A.2., up to a maximum of $500.00.

8. As used in subsection (7), "costs of the appeal" include the compensation paid the municipal judge and other costs incurred by the City, but not the costs incurred by other parties.

E. *Notice of Decision of an Appeal of an Expedited Land Division or Middle Housing Land Division.*

1. Within five days after the date of the municipal judge's decision on the appeal of an Expedited Land Division application or a Middle Housing Land Division application, notice of the decision shall be mailed to all of the following:

   a. Applicant.

   b. Appellant.

   c. Any person who provided testimony or evidence in a timely manner during the appeal.

   d. Any person who requested notice of the appeal decision.

2. The notice shall:

   a. Summarize the decision of the municipal judge.

   b. State that the decision may be appealed as provided in ORS 197.375.

(Ord. No. 2022-07 , § 3(Exh. C), 5-2-2022)

CHAPTER 17.30 ZONING DISTRICTS[8]

Sec. 17.30.00. Zoning district designations.

For the purposes of this title, the city is divided into districts designated as follows:

District	Symbol
Parks and Open Space	POS
Residential	
Single Family Residential	SFR
Low Density Residential	R-1
Medium Density Residential	R-2
High Density Residential	R-3
Commercial	
Central Business District	C-1
General Commercial	C-2
Village Commercial	C-3
Industrial	
Industrial Park	I-1
Light Industrial	I-2
General Industrial	I-3
Overlay Districts	
Cultural and Historic Resource	CHR
Flood Slope Hazard	FSH
Specific Area Plan Overlay	SAP

(Ord. No. 2021-16 , § 4(Exh. D), 8-16-2021)

Sec. 17.30.10. Zoning Map.

The Zoning Map is incorporated herein and is deemed as much a part of this Code as if fully set forth. If a conflict appears between the Zoning Map and the written portion of this Code, the written portion shall control. The map and each amendment shall remain on file ~~in the Planning Director's Office~~in the City's document archives.

The boundaries of all districts are established as shown on the Zoning Map, which is made a part of this Code. All notations and references and other matters shown shall be and are hereby made part of this Code.

Sec. 17.30.20. Residential density calculation procedure.

The number of dwelling units permitted on a parcel of land is calculated after the determination of the net site area and the acreage of any restricted development areas (as defined by Chapter 17.60). Limited density

[8]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-04, effective July 3, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

transfers are permitted from restricted development areas to unrestricted areas ~~consistent~~in accordance with the provisions of the Flood and Slope Hazard Area Overlay District, Chapter 17.60.

Calculation of Net Site Area (NSA): Net site area ~~should~~ shall be calculated in acres based upon a survey of the property boundaries excluding areas dedicated for public use.

A. *Minimum and Maximum Dwelling Units for Sites with No Restricted Areas.* The allowable range of housing units on a piece of property is calculated by multiplying the net site area (NSA) in acres by the minimum and maximum number of dwelling units allowed in that zone.

For example: A site (NSA) containing ten acres in the Single Family Residential Zoning District requires a minimum of 30 units and allows a maximum of 58 units. (NSA x three units/acre = 30 units minimum.) (NSA x 5.8 units/acre = 58 units maximum.)

B. *Minimum and Maximum Dwelling Units for Sites with Restricted Areas.*

1. *Unrestricted Site Area:* To calculate unrestricted site area (USA): subtract all restricted development areas (RDA) as defined by Subsection 17.60.20.A. from the net site area (NSA), if applicable.

NSA - RDA = USA

2. *Minimum Required Dwelling Units:* The minimum number of dwelling units required for the site is calculated using the following formula:

USA (in acres) x Minimum Density (Units per Acre) of Zoning District = Minimum Number of Dwelling Units Required.

3. *Maximum Allowed Dwelling Units:* The maximum number of dwelling units allowed on a site is the lesser of the results of these two formulas:

a. NSA (in acres) x Maximum Density of Zoning District (units/acre)

b. USA (in acres) x Maximum Density of Zoning District (units/acre) x 1.5 (maximum allowable density transfer based on Chapter 17.60)

For example: suppose a site in a zone with a maximum density of eight units per acre has six acres of unrestricted site area (USA = six) and two acres of restricted development area (RDA = two), for a total net site area of eight acres (NSA = eight). Then NSA (eight) x eight units/acre = 64 and USA (six) x eight units/acre x 1.5 = 72, so the maximum permitted number of dwelling units is 64 (the lesser of the two results).

C. *Lot Sizes:* Lot sizes shall comply with any minimum lot size standards of the underlying zoning district.

D. *Rounding:* A dwelling unit figure is rounded down to the nearest whole number for all total maximum or minimum figures less than four dwelling units. For dwelling unit figures greater than four dwellings units, a partial figure of one-half or greater is rounded up to the next whole number.

For example: A calculation of 3.7 units is rounded down to three units. A calculation of 4.2 units is rounded down to four units and a calculation of 4.5 units is rounded up to five units.

E. *Duplexes:* For the purpose of calculating maximum density, duplexes shall be counted the same as a single-family residence (i.e., duplexes shall count as one dwelling unit). Accessory dwelling units (ADUs) do not count towards maximum density.

(Ord. No. 2021-03 , § 2(Exh. B), 5-17-2021)

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CHAPTER 17.34 SINGLE-FAMILY RESIDENTIAL (SFR)[9]

Sec. 17.34.00. Intent.

This district is intended to implement the Low Density Residential Comprehensive Plan designation by providing for low-density residential development in specific areas of the city. The purpose of this district is to primarily allow single-family dwellings and duplexes, as urban services become available. Density shall not be less than three or more than 5.8 units per net acre.

(Ord. No. 2022-07 , § 5(Exh. E), 5-2-2022)

Sec. 17.34.10. Permitted uses.

A. *Primary Uses Permitted Outright:*

1. Single detached dwelling subject to design standards in Chapter 17.90;
2. Single detached manufactured dwelling subject to design standards in Chapter 17.90;
3. Duplex.

B. *Accessory Uses Permitted Outright:*

1. Accessory dwelling unit subject to the provisions in Chapter 17.74;
2. Accessory structure, detached or attached subject to the provisions in Chapter 17.74;
3. Family day care, as defined in Chapter 17.10 subject to any conditions imposed on the residential dwellings in the zone;
4. Home business subject to the provisions in Chapter 17.74;
5. Livestock and small animals, excluding carnivorous exotic animals: The keeping, but not the propagating, for solely domestic purposes on a lot having a minimum area of one acre. The structures for the housing of such livestock shall be located within the rear yard and at a minimum distance of 100 feet from an adjoining lot in any residential zoning district;
6. Minor utility facility;
7. Other development customarily incidental to the primary use.

(Ord. No. 2021-03 , § 3(Exh. C), 5-17-2021)

[9]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-11, effective December 18, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

Sec. 17.34.20. Minor conditional uses and conditional uses.

A. *Minor Conditional Uses:*

1. Accessory structures for agricultural, horticultural or animal husbandry use in excess of the size limits in Chapter 17.74;

~~2. Single detached or attached zero lot line dwelling;~~

2~~3~~. Projections or free-standing structures such as chimneys, spires, belfries, domes, monuments, fire and hose towers, observation towers, transmission towers, flagpoles, radio and television towers, masts, aerials, cooling towers and similar structures or facilities not used for human occupancy exceeding 35 feet in height;

3~~4~~. Other uses similar in nature.

B. *Conditional Uses:*

1. Community services;
2. Funeral and interment services, cemetery, mausoleum or crematorium;
3. Golf course and club house, pitch-and-putt, but not garden or miniature golf or golf driving range;
4. ~~Hospital or home for the aged, retirement, rest or convalescent home~~ Group care and assisted living;
5. Lodges, fraternal and civic assembly;
6. Major utility facility;
7. Preschool, orphanage, kindergarten or commercial day care;
8. Residential care facility (ORS 443.000 to 443.825);
9. Schools (public, private, parochial or other educational institution and supporting dormitory facilities, excluding colleges and universities);
10. Other uses similar in nature.

(Ord. No. 2021-03 , § 3(Exh. C), 5-17-2021)

Sec. 17.34.30. Development standards.

Type		Standard
A. Minimum Lot Area	Single detached dwelling or duplex	7,500 square ft.
	Other permitted uses	No minimum
B. Minimum Average Lot Width	Single detached dwelling or duplex	60 ft.
C. Minimum Lot Frontage		20 ft.
D. Minimum Average Lot Depth	No minimum	
E. Setbacks (~~Main Building~~except Garage/Carport)	Front yard	10 ft. minimum
	Rear yard	20 ft. minimum
	Side yard (interior)	7.5 ft. minimum
	Corner Lot	10 ft. minimum on side abutting the street[1]
F. Setbacks (Garage/Carport)		22 ft. minimum for front vehicle access

	15 ft. minimum if entrance is perpendicular to street 5 ft. minimum for alley or rear access
G. Projections into Required Setbacks	See Chapter 17.74
H. Accessory Structures in Required Setbacks	See Chapter 17.74
I. Structure Height	35 ft. maximum
J. Building Site Coverage	No minimum
K. Off-Street Parking	See Chapter 17.98

Footnote:

[1] Shall comply with the ~~clear~~ vision clearance area requirements of Chapter 17.74.

(Ord. No. 2021-03 , § 3(Exh. C), 5-17-2021; Ord. No. 2022-07 , § 5(Exh. E), 5-2-2022)

Sec. 17.34.40. Minimum requirements.

A. Shall connect to municipal water in accordance with the 2022 Water System Master Plan.

B. Shall connect to municipal sewer if service is currently within 200 feet of the site, as measured from the nearest property line. Sites more than 200 feet from municipal sewer, ~~may~~ shall only be approved to connect to an alternative disposal system provided all of the following are satisfied:

1. A county septic permit is secured and a copy is provided to the City;
2. The property owner executes a waiver of remonstrance to a local improvement district and/or signs a deed restriction agreeing to complete improvements, including but not limited, to curbs, sidewalks, sanitary sewer, water, storm sewer or other improvements required under Chapter 17.84~~which directly benefit the property~~;
3. The minimum size of the property is one acre or is a pre-existing ~~buildable~~ legal lot, as determined by the City;
4. Site consists of a ~~buildable parcel~~ legal lot(s) created through dividing property in the city, which is less than five acres in size.

~~C. The location of any real improvements to the property shall provide for a future street network to be developed.~~

C~~D~~. Shall have frontage or approved access to public streets.

(Ord. No. 2022-07 , § 5(Exh. E), 5-2-2022)

Sec. 17.34.50. Additional requirements.

A. Design review as specified in Chapter 17.90 is required for all uses.

B. Lots with 40 feet or less of street frontage shall be accessed by a rear alley or a shared private driveway.

C. Lots with alley access may be up to ten percent smaller than the minimum lot size of the zone.

~~D. *Zero Lot Line Dwellings:* Prior to building permit approval, the applicant shall submit a recorded easement between the subject property and the abutting lot next to the yard having the zero setback. This easement~~

~~shall be sufficient to guarantee rights for maintenance purposes of structures and yard, but in no case shall it be less than five feet in width.~~

CHAPTER 17.36 LOW DENSITY RESIDENTIAL (R-1)[10]

Sec. 17.36.00. Intent.

This district is intended to implement the Low Density Residential Comprehensive Plan designation by providing low-density residential development. It is to be used as a transition between the ~~Single~~ Single-Family Residential zone and the higher density zones. ~~of a village area.~~ The uses are to be fully serviced by public facilities. ~~This zone is intended to provide walkable neighborhoods with excellent linkage between residential areas, schools, parks, and village commercial. This zone is one of four zones allowed in a "Village" as designated on the Comprehensive Plan Map.~~ Density shall not be less than five or more than eight units per net acre.

(Ord. No. 2022-07 , § 6(Exh. F), 5-2-2022)

Sec. 17.36.10. Permitted uses.

A. *Primary Uses Permitted Outright:*

1. Single detached dwelling (subject to design standards in Chapter 17.90);
2. Single detached manufactured dwelling (subject to design standards in Chapter 17.90);
3. Single detached or attached zero lot line dwelling;
4. Duplex;
5. Row houses;
6. Manufactured ~~home~~ dwelling parks (see Chapter 17.96).

B. *Accessory Uses Permitted Outright:*

1. Accessory dwelling unit;
2. Accessory structure, detached or attached in accordance with specified size limitations (see Chapter 17.74);
3. Family day care homes, subject to any conditions imposed on the residential dwellings in the zone;
4. Home business (see Chapter 17.74);
5. Livestock and small animals, excluding carnivorous exotic animals: The keeping, but not the propagating, for solely domestic purposes on a lot having a minimum area of one acre. The structures for the housing of such livestock shall be located within the rear yard and at a minimum distance of 100 feet from an adjoining lot in any residential zoning district;
6. Minor utility facility;

[10]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-11, effective December 18, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

7. Other development customarily incidental to the primary use.

Sec. 17.36.20. Minor conditional uses and conditional uses.

A. *Minor Conditional Uses:*

1. Accessory structures for agricultural, horticultural or animal husbandry use in excess of the size limits in Chapter 17.74;
2. Projections or free-standing structures such as chimneys, spires, belfries, domes, monuments, fire and hose towers, observation towers, transmission towers, flagpoles, radio and television towers, masts, aerials, cooling towers and similar structures or facilities not used for human occupancy exceeding 35 feet in height;
3. Other uses similar in nature.

B. *Conditional Uses:*

1. Community services;
2. Funeral and interment services, cemetery, mausoleum or crematorium;
3. Golf course and club house, pitch-and-putt, but not garden or miniature golf or golf driving range;
4. ~~Hospital or home for the aged, retirement, rest or convalescent home~~Group care and assisted living;
5. Lodges, fraternal and civic assembly;
6. Major utility facility;
7. Preschool, orphanage, kindergarten or commercial day care;
8. Residential care facility (ORS 443.000 to 443.825);
9. Schools (public, private, parochial or other educational institution and supporting dormitory facilities, excluding colleges and universities);
10. Other uses similar in nature.

Sec. 17.36.30. Development standards.

Type		Standard
A. Minimum Lot Area	Single detached dwelling	5,500 square ft.
	Single detached zero lot line	5,000 square ft.
	Other permitted uses	No minimum
B. Minimum Average Lot Width	Single detached dwelling	50 ft.
	Single detached zero lot line dwelling	40 ft.
	Single attached zero lot line dwelling	30 ft.
	Other permitted uses	No minimum
C. Minimum Lot Frontage		20 ft.
D. Minimum Average Lot Depth		No minimum
E. Setbacks	Front yard	10 ft. minimum
	Rear yard	15 ft. minimum
	Side yard (interior)	5 ft. minimum[1]

	Corner Lot	10 ft. minimum on side abutting the street[2]
	Garage	22 ft. minimum for front vehicle access 15 ft. minimum if entrance is perpendicular to the street 5 ft. minimum for alley or rear access
Projections into Required Setbacks		See Chapter 17.74
Accessory Structures in Required Setbacks		See Chapter 17.74
Structure Height		35 ft. maximum
Building Site Coverage		No minimum
Off-Street Parking		See Chapter 17.98

Footnotes:

[1] Excluding zero-lot line development.

[2] Shall comply with the ~~clear~~ vision clearance area requirements of Chapter 17.74.

(Ord. No. 2022-07 , § 6(Exh. F), 5-2-2022)

Sec. 17.36.40. Minimum requirements.

A. Shall connect to municipal water in accordance with the 2022 Water System Master Plan.

B. Shall connect to municipal sewer if service is currently within 200 feet of the site, as measured from the nearest property line. Sites more than 200 feet from municipal sewer, may be approved to connect to an alternative disposal system provided all of the following are satisfied:

1. A county septic permit is secured and a copy is provided to the City;
2. The property owner executes a waiver of remonstrance to a local improvement district and/or signs a deed restriction agreeing to complete improvements, including but not limited, to curbs, sidewalks, sanitary sewer, water, storm sewer or other improvements required under Chapter 17.84~~which directly benefit the property~~;
3. The minimum size of the property is one acre or is a pre-existing ~~buildable~~ legal lot, as determined by the City;
4. Site consists of a ~~buildable parcel~~ legal lot(s) created through dividing property in the ~~City~~city, which is less than five acres in size.

~~C. The location of any real improvements to the property shall provide for a future street network to be developed.~~

C~~D~~. Shall have frontage or approved access to public streets.

(Ord. No. 2022-07 , § 6(Exh. F), 5-2-2022)

Sec. 17.36.50. Additional requirements.

A. Design review as specified in Chapter 17.90 is required for all uses.

B. Lots with 40 feet or less of street frontage shall be accessed by a rear alley or a shared private driveway.

C. Lots with alley access may be up to ten percent smaller than the minimum lot size of the zone.

D. *Zero Lot Line Dwellings:* Prior to building permit approval, the applicant shall submit a recorded easement between the subject property and the abutting lot next to the yard having the zero setback. This easement shall be sufficient to guarantee rights for maintenance purposes of structures and yard, but in no case shall it be less than five feet in width.

CHAPTER 17.38 MEDIUM DENSITY RESIDENTIAL (R-2)[11]

Sec. 17.38.00. Intent.

This district is intended to implement the Medium Density Residential Comprehensive Plan designation by providing for medium density single-family and multi-family uses in suitable locations, where public sewer, water, and other services are readily accessible. All development shall also provide access to the surrounding neighborhood with excellent linkage between residential areas, schools, and parks. Density shall not be less than eight or more than 14 units per net acre.

(Ord. No. 2022-07 , § 7(Exh. G), 5-2-2022)

Sec. 17.38.10. Permitted uses.

A. *Primary Uses Permitted Outright:*

1. Single detached dwelling (subject to design standards in Chapter 17.90);
2. Single detached manufactured dwelling (subject to design standards in Chapter 17.90);
3. Single detached or attached zero lot line dwelling (subject to design standards in Chapter 17.90);
4. Row house;
5. Duplex;
6. Multi-family dwelling;
7. Manufactured ~~home~~ dwelling parks (see Chapter 17.96).

B. *Accessory Uses Permitted Outright:*

1. Accessory dwelling unit subject to the provisions in Chapter 17.74;
2. Accessory structure, detached or attached subject to the provisions in Chapter 17.74;
3. Family day care homes, subject to any conditions imposed on the residential dwellings in the zone (see Chapter 17.74);
4. Home business (see Chapter 17.74);
5. Livestock and small animals, excluding carnivorous exotic animals: The keeping, but not the propagating, for solely domestic purposes on a lot having a minimum area of one acre. The structures

[11]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-11, effective December 18, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

for the housing of such livestock shall be located within the rear yard and at a minimum distance of 100 feet from an adjoining lot in any residential zoning district;

6. Minor utility facility;

7. Other development customarily incidental to the primary use.

Sec. 17.38.20. Minor conditional uses and conditional uses.

A. *Minor Conditional Uses:*

1. Accessory structures for agricultural, horticultural or animal husbandry use in excess of the size limits in Chapter 17.74;

2. Projections or free-standing structures such as chimneys, spires, belfries, domes, monuments, fire and hose towers, observation towers, transmission towers, flagpoles, radio and television towers, masts, aerials, cooling towers and similar structures or facilities not used for human occupancy exceeding 35 feet in height;

3. Other uses similar in nature.

B. *Conditional Uses:*

1. Community services;

2. Congregate housing;

3. Funeral and interment services, cemetery, mausoleum or crematorium;

4. Golf course and club house, pitch-and-putt, but not garden or miniature golf or golf driving range;

5. ~~Hospital or home for the aged, retirement, rest or convalescent home~~Group care and assisted living;

6. Lodges, fraternal and civic assembly;

7. Major utility facility;

8. Preschool, orphanage, kindergarten or commercial day care;

9. Residential care facility (ORS 443.000 to 443.825);

10. Schools (public, private, parochial or other educational institution and supporting dormitory facilities, excluding colleges and universities);

11. Other uses similar in nature.

Sec. 17.38.30. Development standards.

Type		Standard
Minimum Lot Area		No minimum
Minimum Average Lot Width	Single detached dwelling	50 ft.
	Single detached zero lot line dwelling	40 ft.
	Single attached zero lot line dwelling	30 ft.
	Other permitted uses	No minimum
Minimum Lot Frontage		20 ft.
Minimum Average Lot Depth		No minimum

Setbacks	Front yard	10 ft. minimum
	Rear yard	15 ft. minimum
	Side yard (interior)	5 ft. minimum[1]
	Corner Lot	10 ft. minimum on side abutting the street[2]
	Garage	20 ft. minimum for front vehicle access 15 ft. minimum if entrance is perpendicular to the street 5 ft. minimum for alley or rear access
Projections into Required Setbacks		See Chapter 17.74
Accessory Structures in Required Setbacks		See Chapter 17.74
Multi-family	Landscaping	25% minimum
Structure Height		35 feet maximum
Building Site Coverage		No minimum
Off-Street Parking		See Chapter 17.98

Footnotes:

[1] Excluding zero lot line development.

[2] Shall comply with ~~clear~~ the vision clearance area requirements of Chapter 17.74.

(Ord. No. 2022-07 , § 7(Exh. G), 5-2-2022)

Sec. 17.38.40. Minimum requirements.

A. Shall connect to municipal water in accordance with the 2022 Water System Master Plan.

B. Shall connect to municipal sewer if service is currently within 200 feet of the site, as measured from the nearest property line. Sites more than 200 feet from municipal sewer, may be approved to connect to an alternative disposal system provided all of the following are satisfied:

1. A county septic permit is to be secured and a copy is provided to the City.
2. The property owner executes a waiver of remonstrance to a local improvement district and/or signs a deed restriction agreeing to complete improvements required under Chapter 17.84.
3. The minimum size of the property is one acre or is a pre-existing ~~buildable~~ legal lot, as determined by the City.
4. Site consists of a ~~buildable parcel~~ legal lot(s) created through dividing property in the ~~City~~city, which is less than five acres in size.

~~C. The location of any real improvements to the property shall provide for a future street network to be developed.~~

C~~D~~. Shall have frontage or approved access to public streets.

(Ord. No. 2022-07 , § 7(Exh. G), 5-2-2022)

Sec. 17.38.50. Additional requirements.

A. Design review as specified in Chapter 17.90 is required for all uses.

B. Lots with 40 feet or less of street frontage shall be accessed by a rear alley or a shared private driveway.

C. Zero Lot Line Dwellings: Prior to building permit approval, the applicant shall submit a recorded easement between the subject property and the abutting lot next to the yard having the zero setback. This easement shall be sufficient to guarantee rights for maintenance purposes of structures and yard, but in no case shall it be less than five feet in width.

CHAPTER 17.40 HIGH DENSITY RESIDENTIAL (R-3)[12]

Sec. 17.40.00. Intent.

This district is intended to implement the High Density Residential Comprehensive Plan designation by providing for housing in close proximity to retail, public amenities; major transportation routes and transit services where public sewer, water and other services are readily accessible. R-3 uses are designed to be a transition area between commercial and industrial uses and low density single family uses. Pedestrian connections are required to ensure a direct walking route to retail shops. All development shall also provide access to the surrounding neighborhood with excellent linkage between residential areas, schools, parks, and commercial. Density shall not be less than ten or more than 20 units per net acre.

Sec. 17.40.10. Permitted uses.

A. *Primary Uses Permitted Outright:*

1. Single Detached, if located on an existing legal lot ~~of record~~;
2. Single Attached Zero Lot Line;
3. Duplex;
4. Row houses;
5. Multi-family dwellings;
6. Manufactured ~~home~~ dwelling parks;
7. ~~Boarding houses and rooming houses;~~
8. ~~8~~7. Residential facility.

B. *Accessory Uses Permitted Outright:*

1. Accessory dwelling unit (see Chapter 17.74);
2. Accessory structure, detached or attached (see Chapter 17.74);
3. Family day care homes, subject to any conditions imposed on the residential dwellings in the zone;

[12]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-11, effective December 18, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

4. Home business (see Chapter 17.74);
5. Livestock: The keeping, but not the propagating, of one horse, or one cow, or two sheep for solely domestic purposes on a lot having a minimum area of one acre. The structures for the housing of such livestock shall be located within the rear yard and at a minimum distance of 100 feet from an adjoining lot in any residential zoning district;
6. Minor utility facility;
7. Other development customarily incidental to the primary use.

(Ord. No. 2021-16 , § 5(Exh. E), 8-16-2021)

Sec. 17.40.20. Minor conditional uses and conditional uses.

A. *Minor Conditional Uses:*

1. Accessory structures for agricultural, horticultural or animal husbandry use in excess of the size limits in Chapter 17.74;
2. Projections or free-standing structures such as chimneys, spires, belfries, domes, monuments, fire and hose towers, observation towers, transmission towers, flagpoles, radio and television towers, masts, aerials, cooling towers and similar structures or facilities not used for human occupancy exceeding 35 feet in height;
3. Other uses similar in nature.

B. *Conditional Uses:*

1. Community services;
2. Congregate housing;
3. Funeral and interment services, cemetery, mausoleum or crematorium;
4. Golf course and club house, pitch-and-putt, but not garden or miniature golf or golf driving range;
5. ~~Hospital or home for the aged, retirement, rest or convalescent home~~Group care and assisted living;
6. Lodges, fraternal and civic assembly;
7. Major utility facility;
8. Preschool, orphanage, kindergarten or commercial day care;
9. Residential care facility (ORS 443.000 to 443.825);
10. Schools (public, private, parochial or other educational institution and supporting dormitory facilities, excluding colleges and universities);
11. Other uses similar in nature.

Sec. 17.40.30. Development standards.

Type		Standard
Minimum Average Lot Width	Single detached dwelling	40 ft.
	Single detached zero lot line dwelling	30 ft.

	Single attached zero lot line dwelling	20 ft.
	Other permitted uses	No minimum
Minimum Lot Frontage		20 ft.
Minimum Average Lot Depth		No minimum
Setbacks	Front yard	10 ft. minimum
	Rear yard	15 ft. minimum
	Side yard (interior)	5 ft. minimum[1]
	Corner Lot	10 ft. minimum on side abutting the street[2]
	Garage	20 ft. minimum for front vehicle access 15 ft. minimum if entrance is perpendicular to the street 5 ft. minimum for alley or rear access
Projections into Required Setbacks		See Chapter 17.74
Accessory Structures in Required Setbacks		See Chapter 17.74
~~Multi-family~~	~~Landscaping~~	~~25% minimum~~
Structure Height		35 ft. maximum
Building Site Coverage		No maximum
Landscaping		25% minimum (See Chapter 17.92)
Off-Street Parking		See Chapter 17.98

Footnotes:

[1] Excluding zero lot line development.

[2] Shall comply with the ~~clear~~ vision clearance area requirements of Chapter 17.74.

(Ord. No. 2022-07 , § 8(Exh. H), 5-2-2022)

Sec. 17.40.40. Minimum requirements.

A. Shall connect to municipal water in accordance with the 2022 Water System Master Plan.

B. Shall connect to municipal sewer if service is currently within 200 feet of the site, as measured from the nearest property line. Sites more than 200 feet from municipal sewer, may be approved to connect to an alternative disposal system provided all of the following are satisfied:

1. A county septic permit is to be secured and a copy is provided to the City.
2. The property owner executes a waiver of remonstrance to a local improvement district and/or signs a deed restriction agreeing to complete improvements required under Chapter 17.84.
3. The minimum size of the property is one acre or is a pre-existing legal lot, as determined by the City.
4. Site consists of a legal lot(s) created through dividing property in the city, which is less than five acres in size.

~~Shall connect to municipal sewer.~~

~~C. The location of any real improvements to the property shall provide for a future street network to be developed.~~

C~~D~~. Shall have frontage or approved access to public streets.

(Ord. No. 2022-07 , § 8(Exh. H), 5-2-2022)

Sec. 17.40.50. Additional requirements.

A. Design review as specified in Chapter 17.90 is required for all uses.

B. Lots with 40 feet or less of street frontage shall be accessed by a rear alley or a shared private driveway.

C. *Zero Lot Line Dwellings:* Prior to building permit approval, the applicant shall submit a recorded easement between the subject property and the abutting lot next to the yard having the zero setback. This easement shall be sufficient to guarantee rights for maintenance purposes of structures and yard, but in no case shall it be less than five feet in width.

CHAPTER 17.42 CENTRAL BUSINESS DISTRICT (C-1)[13]

Sec. 17.42.00. Intent.

This district is intended to provide the community with a mix of retail, personal services, offices, and residential uses ~~needs of the community and its trade area~~ in the city's ~~traditional~~ historic commercial core. This district is not intended for intensive automobile or industrial uses. ~~This district is intended to provide the principal focus for civil and social functions within the community.~~

This commercial district is intended for civic uses and to provide all basic services and amenities required to keep the downtown ~~the~~ a vital center of ~~our~~ the community. While the district does not permit new low density building types, it is not intended to preclude dwelling units in buildings containing commercial ~~activities~~uses. ~~All development and uses shall be consistent with the intent of the district, as well as compatible with the space, access and exposure constraints and opportunities of the central city.~~

Sec. 17.42.10. Permitted uses.

A. *Primary Uses Permitted Outright—Residential:*

1. Attached row houses existing prior to adoption of this Code;
2. Duplexes existing prior to adoption of this Code;
3. Residential Care Facility;
4. Residential dwellings ~~attached to~~above a commercial business;
5. Single Attached (Zero Lot Line, 2 Units) existing prior to adoption of this Code;
6. Single Detached existing prior to adoption of this Code;
7. Single Detached (Zero Lot Line) existing prior to adoption of this Code.

B. *Primary Uses Permitted Outright—Commercial in buildings with up to 30,000 square feet of gross floor area and without drive-through facilities:*

1. Retail uses, including but not limited to:
   a. Automotive trailer, recreational vehicle, motorcycle sales and rental;
   b. Convenience market/store;
   c. Eating and drinking establishment including fast-food and high-turnover sit down restaurants but excluding drive-up/drive-through uses;
   d. Grocery store or supermarket.
2. Service and professional businesses and organizations, including but not limited to:
   a. Athletic club, indoor recreation, or entertainment;

[13]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-11, effective December 18, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

b. Automotive repair and service;

c. Commercial day care facility;

d. Community services;

e. Education facility (e.g., pre-school, school, college);

f. Financial institution;

g. Medical facility (e.g., clinic, hospital, laboratory);

h. Professional or general business office;

i. Social organization.

3. Manufacturing, assembly, processing, and production that do not produce significant levels of noise or odor beyond the boundaries of the site:

a. Brewery, distillery, or winery with pub/tasting room.

4. Bus station or terminal.

5. Group care and assisted living.

6. Minor public facility.

7. Nursery/greenhouse.

8. Outdoor recreation.

9. Overnight lodging.

10. Park and ride station.

11. Parking lot or garage (when not an accessory use).

12. Public park, plaza, playground or recreational area, and buildings.

13. Warehousing and distribution facilities for wholesale merchandise.

14. Other uses similar in nature.

C. *Accessory Uses Permitted Outright:*

1. A use customarily incidental and subordinate to a principal use permitted outright.

2. Outdoor display or storage of merchandise covering no more than ten percent of the total retail sales area.

3. Accessory dwelling unit.

4. Accessory structures, detached or attached.

5. Family day care homes, subject to any conditions imposed on the residential dwellings in the zone.

6. Home businesses.

7. Parking lot or garage (when associated with development).

Sec. 17.42.20. Minor conditional uses and conditional uses.

A. *Minor Conditional Uses:*

1. Brewery, distillery, or winery without pub/tasting room;

2. Congregate housing;
3. Outdoor product display or storage of merchandise covering greater than ten percent of the total retail sales area;
4. Other uses similar in nature.

B. *Conditional Uses:*

1. Automotive fueling station;
2. Buildings designed for one or more occupants with more than 30,000 square ft. of gross floor area;
3. Drive-up/drive-in/drive-through (drive-up windows, kiosks, ATM, restaurants, car wash, quick vehicle servicing, and similar uses);
4. Major public facility;
5. ~~Multi-family dwellings not contained within a commercial building;~~
6. ~~5~~. Wholesale lumber or building materials;
7. ~~6~~. Other uses similar in nature.

Sec. 17.42.30. Development standards.

A.

Type	Standard
~~*Residential—Not Above Commercial Building*~~	
~~Density/Lot Dimension~~	~~In conformance with Chapter 17.40 (R-3)~~
~~Setbacks~~	~~In conformance with Chapter 17.40 (R-3)~~
~~Lot Coverage~~	~~No maximum~~
~~Structure Height~~	~~45 ft. maximum~~
~~Landscaping~~	~~20% minimum~~
~~Off-Street Parking~~	~~See Chapter 17.98~~
~~*Commercial*~~	
Lot Area	No minimum
Lot Dimension	No minimum
Setbacks	No minimum[1]; maximum 10 ft.
Lot Coverage	No maximum
Landscaping	10% minimum (includes required civic space in Section 17.90.110.)
Structure Height	45 ft. maximum
Off-Street Parking	See Chapter 17.98
Design Review Standards	See Section 17.90.110

Footnote:

[1] Unless abutting a more restrictive zoning district or as required to maintain the vision clearance area.

B. *Special Setbacks—Side or Rear Yard Abutting a More Restrictive District.*

1. Property abutting a more restrictive zoning district shall have the same yard setback as required by the abutting district. An additional ten feet shall be added for each ten foot increment in building height over 35 feet.
2. Measurement of the height transition area shall be made between the foundation of the proposed building and the property line of the abutting district.
3. When the proposed structure has different sections that have different heights, the height transition area shall be measured for each vertical surface as if it were to be freestanding. The building then must be located on the site so that no section is closer to the abutting property line than it would be if the section was freestanding.
4. The required buffering and screening and utilities may be located within the height transition area. Off-street parking, accessory structures and incidental development may be located within the height transition area but not any areas designated as buffering and screening area.

CHAPTER 17.44 GENERAL COMMERCIAL (C-2)[14]

Sec. 17.44.00. Intent.

This district is intended to provide for a wide range of commercial ~~activities in a community scale shopping center and for commercial~~ uses and related services and businesses, which require large land areas for structures and parking facilities, and rely on direct automobile access. This district is not intended ~~for~~ exclusively for residential uses, although mixed-use developments are encouraged.

Sec. 17.44.10. Permitted uses.

A. *Primary Uses Permitted Outright—Residential:*

1. Multi-family dwellings above a commercial business.

B. *Primary Uses Permitted Outright in buildings with less than 60,000 square ft. of gross floor area:*

1. Retail businesses, including but not limited to:
   a. Automotive fueling station;
   b. Automotive, trailer, recreational vehicle, and motor cycle sales and rental;
   c. Convenience market/store;
   d. Drive-up/drive-in/drive-through (drive-up windows, kiosks, ATM, restaurants, car wash, quick vehicle servicing, and similar uses);
   e. Eating and drinking establishments including fast-food and high-turnover sit down restaurants;
   f. Grocery store or supermarket.
2. Service and professional businesses and organizations, including but not limited to:
   a. Athletic club, indoor recreation, or entertainment;
   b. Automotive repair and service;
   c. Commercial day care facility;
   d. Community services;
   e. Education facility (e.g., pre-school, school, college);
   f. Financial institution;
   g. Medical facility (e.g., clinic, hospital, laboratory);
   h. Professional or general business office;
   i. Social organization.

[14]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2019-21, effective November 20, 2019. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

3. Manufacturing, assembly, processing, and production that do not produce significant levels of noise or odor beyond the boundaries of the site, including but not limited to:

    a. Brewery, distillery, or winery, with or without pub or tasting room.

4. Bus station or terminal.
5. Group care and assisted living.
6. Minor public facility.
7. Nursery/greenhouse.
8. Outdoor recreation.
9. Overnight lodging.
10. Park and ride station.
11. Parking lot or garage (when not an accessory use).
12. Public park, plaza, playground or recreation area, and buildings.
13. Trucking terminal, distribution center, or transit center.
14. Warehousing and distribution facilities for wholesale merchandise.
15. Wholesale lumber or building materials yard.
16. Other uses similar in nature.

C. *Accessory Uses Permitted Outright:*

1. A use customarily incidental and subordinate to a use permitted outright;
2. Outdoor product display or storage of merchandise covering no more than 20 percent of the total lot area;
3. Parking lot or garage (when associated with development).

Sec. 17.44.20. Minor conditional uses and conditional uses.

A. *Minor Conditional Uses:*

1. Outdoor product display or storage of merchandise covering greater than 20 percent of the total lot area.
2. Other uses similar in nature.

B. *Conditional Uses:*

1. Buildings designed for one or more occupants with more than 60,000 square ft. of gross floor area.
2. Major public facility.
3. Traveler accommodation facilities including campgrounds, overnight travel parks, and recreational vehicle parks.
4. Other uses similar in nature.

(Ord. No. 2021-16 , § 6(Exh. F), 8-16-2021)

Sec. 17.44.30. Development requirements.

A.

Type	Standard
Lot Area	No minimum
Lot Dimension	No minimum
Setbacks[1]	
Front	10 ft. minimum; 50 ft. maximum
Side	None
Rear	None
Corner	15 ft. minimum
Outside Display/Sales Lot Area	80% maximum
Lot Coverage—Impervious Area	No maximum
Landscaping	20% minimum (includes required civic space in Section 17.90.120)
Structure Height	55 ft. maximum
Off-Street Parking	See Chapter 17.98
Design Review Standards	See Section 17.90.120

Footnote:

[1] Unless abutting a more restrictive zoning district, or as required under Section 17.90.120 Design Standards for C-2.

B. *Special Setbacks—Side or Rear Yard Abutting a More Restrictive District.*

1. Property abutting a more restrictive zoning district shall have the same yard setback as required by the abutting district. An additional ten feet shall be added for each ten foot increment in building height over 35 feet;
2. Measurement of the height transition area shall be made between the foundation of the proposed building and the property line of the abutting district;
3. When the proposed structure has different sections that have different heights, the height transition area shall be measured for each vertical surface as if it were to be freestanding. The building then must be located on the site so that no section is closer to the abutting property line than it would be if the section was free-standing;
4. The required buffering and screening and utilities may be located within the height transition area. Off-street parking, accessory structures and incidental development may be located within the height transition area but not any areas designated as buffering and screening area.

CHAPTER 17.46 VILLAGE COMMERCIAL (C-3)[15]

Sec. 17.46.00. Intent.

The intent of the village commercial district is primarily oriented to serve residents of the village and the ~~immediately~~ surrounding residential area. The Village Commercial ~~area~~ zoning district is intended to help form the core of the villages. Allowing a mixture of residential uses beside and/or above commercial uses will help create a mixed-use environment, which integrates uses harmoniously and increases the intensity of activity in the area. The orientation of the uses should integrate pedestrian access and provide linkages to adjacent residential areas, plazas and/or parks, and amenities.

Sec. 17.46.10. Permitted uses.

A. *Primary Uses Permitted Outright—Residential:*

~~1. Single family dwelling or duplex above, beside or behind a commercial business;~~

1~~2~~. ~~Multi-family~~Residential dwellings above~~, beside or behind~~ a commercial business.

B. *Primary Uses Permitted Outright—Commercial (in buildings with up to 7,500 square feet of gross floor area):*

1. Retail uses, including but not limited to:
    a. Automotive, trailer, recreational vehicle, motorcycle sales and rental;
    b. Convenience market/store;
    c. Eating and drinking establishment including fast-food and high-turnover sit down restaurant but excluding drive-through;
    d. Grocery store or supermarket.
2. Service and professional businesses and organizations, including but not limited to:
    a. Athletic club, indoor recreation, or entertainment;
    b. Automotive repair and service;
    c. Commercial day care facility;
    d. Community services;
    e. Education facility (e.g., pre-school, school, college);
    f. Financial institution excluding drive-through;
    g. Medical facility (e.g., clinic, hospital, laboratory);
    h. Professional or general business office;
    i. Social organization.

[15]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-11, effective December 18, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

3. Manufacturing, assembly, processing, and production that do not produce significant levels of noise or odor beyond the boundaries of the site;

   a. Brewery, distillery, or winery with pub/tasting room.

4. Bus station or terminal.
5. Group care and assisted living.
6. Minor public facility.
7. Overnight lodging.
8. Park and ride station.
9. Parking lot or garage (when not an accessory use).
10. Other uses similar in nature.

C. *Accessory Uses Permitted Outright:*

1. A use customarily incidental and subordinate to a principal use permitted outright.
2. Outdoor display or storage of merchandise covering no more than ten percent of the total retail sales area.
3. Accessory dwelling units, detached or attached.
4. Accessory structures.
5. Family day care homes, subject to any conditions imposed on the residential dwellings in the zone.
6. Home businesses.
7. Parking lot or garage (when associated with development).

(Ord. No. 2021-03 , § 4(Exh. D), 5-17-2021)

Sec. 17.46.20. Minor conditional uses and conditional uses.

A. *Minor Conditional Uses:*

1. Congregate housing.
~~2. Multi-family dwellings not located above a commercial business and occupying no more than 30 percent of the C-3 district area in a village.~~
2~~3~~. Nursery/greenhouse.
3~~4~~. Outdoor product display or storage of merchandise covering greater than ten percent of the total retail sales area.
4~~5~~. Outdoor recreation.
5~~6~~. Public park, plaza, playground or recreational area, and associated buildings.
6~~7~~. Other uses similar in nature.

B. *Conditional Uses:*

1. Automotive fueling stations.
2. Buildings designed for one or more occupants with more than 7,500 square feet of gross floor area.

3. Drive-through facilities in conjunction with a bank, savings and loan, credit union, or an eating and drinking establishment on a site abutting a state highway, subject to all other applicable provisions of the Sandy Development Code and the following special conditions:

   a. No drive-through facility will be permitted unless the development site is at least two acres in size and only one drive-through facility shall be allowed on each development site.

   b. Each drive-through facility shall be oriented to the adjacent public street and shall be otherwise designed to prioritize pedestrian access and circulation over vehicular access and circulation. Pedestrians shall not have to cross drive-through lanes to access entry doors.

   c. A drive-through facility may be conditioned to operate during hours that do not negatively impact adjacent residential uses in terms of noise and lighting.

   d. Each drive-through facility may have only one drive-through lane, which shall not be positioned between the primary building and a local residential street.

4. Major public facility.

5. Other uses similar in nature.

Sec. 17.46.30. Development standards.

A.

Type	Standard
~~*Residential—Not in Conjunction with a Commercial Business*~~	
~~Lot Dimension~~	~~In conformance with Chapter 17.40 (R-3)~~
~~Setbacks~~	~~In conformance with Chapter 17.40 (R-3)~~
~~Lot Coverage~~	~~No minimum~~
~~Structure Height~~	~~45 ft. maximum~~
~~Landscaping~~	~~20%~~
~~Off-Street Parking~~	~~See Chapter 17.98~~
~~*Commercial*~~	
Lot Area	No minimum or maximum
Lot Width	No minimum
Lot Depth	Maximum 100 ft.~~ recommended;~~
Lot Coverage	No maximum
Setbacks[1]	No minimum; maximum 20 ft.
Structure Height	45 ft. maximum
Landscaping	10% minimum (includes required civic space per 17.90.110.)
Off-Street Parking	See Chapter 17.98
Design Review Standards	See Section 17.90.110

Footnote:

[1] Unless abutting a more restrictive zoning district or as required to maintain the vision clearance area.

B. Special Setbacks—Side or Rear Yard Abutting a More Restrictive District

1. Property abutting a more restrictive zoning district shall have the same yard setback as required by the abutting district. An additional ten feet shall be added for each ten foot increment in building height over 35 feet;
2. Measurement of the height transition area shall be made between the foundation of the proposed building and the property line of the abutting district. When the proposed structure has different sections that have different heights, the height transition area shall be measured for each vertical surface as if it were to be free-standing. The building then must be located on the site so that no section is closer to the abutting property line than it would be if the section was free-standing;
3. The required buffering and screening and utilities may be located within the height transition area. Off-street parking, accessory structures and incidental development may be located within the height transition area but not any areas designated as buffering and screening area.

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CHAPTER 17.54 SPECIFIC AREA PLAN OVERLAY[16]

Sec. 17.54.00. Specific area plan development and approval process.

A. *Purpose.* The purpose of a specific area plan overlay zone is to allow development and approval of specific area plans in the city. A specific area plan is a master plan coordinating and directing development in terms of transportation, utilities, open space and land use, however, no phasing or timeline is required. Specific area plans may be located anywhere within the Urban Growth Boundary and are intended to promote coordinated planning concepts and pedestrian-oriented mixed-use development.

B. *Initiation.* The process to establish a specific area plan shall be initiated by the City Council. The Planning Commission or interested property owners may submit requests to the City Council to initiate the specific area plan process. If owners request initiation of a specific area plan process, the City Council may require an application fee to cover the cost of creating the plan.

C. *Advisory Committee.* The City Council may appoint an advisory committee to guide development of the plan. The advisory committee may include persons representing affected property owners, neighbors, ~~e~~City staff, agencies, special districts and the community at large. The role of the committee is advisory to the Planning Commission and the City Council.

D. *Adoption.* A specific area plan shall be adopted through a Type IV process~~,~~ and shall be evaluated for compliance with the criteria for zoning district amendments and/or comprehensive plan amendments where applicable.

E. *Map identification.* A specific area plan overlay zone is identified on the City of Sandy Zoning Map with a specific border around the perimeter of the plan area and a letter "S" depicted approximately in the center of the plan area. A report that includes the specific area plan and relevant development standards shall be adopted as an exhibit to the ordinance approving the overlay zone district.

F. *Comprehensive Plan Amendment.* A specific area plan is similar to a master plan and does not automatically require a comprehensive plan amendment. A comprehensive plan amendment shall only be required if a need for such an amendment is identified during development of the specific area plan.

G. *Compliance with Specific Area Plan Standards and Procedures.* New construction and land divisions shall meet any development, land division and design standards of the applicable specific area plan. Base zone and land division standards shall apply where no different standard is referenced for the specific plan area.

H. *Specific Area Plan Standards.* Specific standards for adopted specific area plans are defined below.

Sec. 17.54.10. Specific area plan content.

At a minimum, a specific area plan shall include the following text and diagrams:

A. *Plan Objectives.* A narrative shall set forth the goals and objectives of the plan.

B. *Site and Context.* A map of the site and existing context shall identify the project area.

C. *Land Use Diagram.* The land use diagram shall indicate the distribution and location of planned land uses, including open space and parks, within the area covered by the specific area plan.

D. *Density.* If residential uses are proposed, a narrative shall describe planned residential densities.

E. *Facilities Analysis.* The plan shall include an analysis of the general location and extent of major components of sanitary sewer, water, and other essential facilities proposed to be located within the specific plan area and needed to support the land uses and densities described in the plan. A review of existing facilities master plans shall be sufficient if these master plans indicate there is adequate capacity to serve the specific plan area.

F. *Circulation/Transportation Diagram.* The circulation diagram shall indicate the proposed street pattern for the specific area plan area, including pedestrian pathways and bikeways. Design standards and street cross sections shall be included, if different than normal City standards.

G. *Market Analysis.* Specific are plans that include amendments to the zoning map affecting the acreage of Village Commercial (C-3) land within the plan area shall include a market analysis of supportable retail space that verifies demand for the proposed acreage of C-3 land. The analysis should include a market delineation, a regional and local economic review, and a retail market evaluation.

H. *Design and Development Standards.* If standards differ from normal City standards, design and development standards shall be included in the plan.

Sec. 17.54.20. Land use review.

The review procedures outlined in Chapter 17.12, Procedures for Decision Making, shall apply for all development subject to a specific area plan overlay zone, unless modified below.

A. *Type I.* The Director, at his or her discretion, may refer a Type I application to the Planning Commission for a public hearing. In addition to the procedures detailed in Section 17.12.10, the following activities shall be reviewed administratively.

1. Administrative amendments to a specific area plan, as defined by Section 17.54.30.A.

B. *Type II.* The Director, at his or her discretion, may refer a Type II application to the Planning Commission for a public hearing. In addition to the procedures detailed in Section 17.12.20, the following activities shall be reviewed administratively with notices to neighboring property owners.

1. Minor amendments to a specific area plan, as defined by Section 17.54.30.B.

C. *Type III.* In addition to the procedures detailed in Section 17.12.30, the following activities shall be reviewed by the Planning Commission as either a quasi-judicial or legislative amendment.

1. Major amendments to the specific area plan, as defined by Section 17.54.30.C.

Sec. 17.54.30. Amendments and adjustments to the specific area plan.

Amendments to an approved specific area plan are classified as administrative, minor, or major amendments.

A. *Administrative Amendments.* The ~~City Planning~~ Director may approve administrative amendments pursuant to the Type I procedures of the Sandy Development Code. Administrative amendments include:

1. Street, easement, sidewalk, and trail relocations that result in a location change of less than 50 feet from what is depicted on specific area plan diagrams.

2. Public park relocations that result in a location change of less than 100 feet from what is depicted on specific area plan diagrams.

3. Increases in the size of public neighborhood parks, provided that transportation connections remain consistent with the specific area plan.

4. Reductions in the size of public neighborhood parks, provided the reductions are less than ten percent of park area depicted on specific area plan diagrams.

5. Changes related to street trees, street furniture, fencing, or signage that were approved as part of the specific area plan.

6. A change in the utility plan other than what would be necessary for other authorized adjustments.

B. *Minor Amendments.* A minor amendment to a specific area plan shall be processed as a Type II land use decision. The decision shall include findings demonstrating that the change will not adversely affect:

1. The purpose and objectives of the specific area plan, and

2. The functioning of the specific area plan, and

3. The coordination of transportation and infrastructure provision to properties within the specific plan area.

Minor amendments are those that result in any of the following:

a. A change in the circulation/transportation plan that requires a required transportation element including local street, easement, sidewalk or trail to be shifted 50 to 100 feet in any direction from what is depicted on the specific area plan circulation/transportation diagram.

b. A change in the land use diagram that reduces the size of a public park or facility more than ten percent, or moves the location more than 100 feet from the location depicted on the land use diagram.

C. *Major Amendment.* A major amendment to a specific area plan shall be processed as a Type III Procedure affecting the existing specific area plan. The amendment shall follow either quasi-judicial or legislative procedures and meet plan amendment and zone change criteria. Findings must demonstrate that the change will not adversely affect:

1. The purpose and objectives of the specific area plan, and

2. The functioning of the specific area plan, and

3. The coordination of transportation and infrastructure provision to properties within the specific plan area.

Major amendments are those that result in any of the following:

a. A change in a land use plan boundary or density, unless as part of the original approvals an alternative design was approved outlining acceptable plan designation options (e.g. a residential use may be approved on a park site).

b. A change in the circulation/transportation plan that causes a required transportation element, including a trail, to be added, eliminated or moved more than 100 feet from the location depicted on the specific area plan circulation/transportation diagram.

c. A change in the Bornstedt Village Overlay Parks Plan that adds or eliminates a designated public park or facility.

d. A change in development standards, except those set forth as minor or administrative amendments.

e. Increase or decrease in density, as much as 20 percent over or under density permitted by an underlying zoning district.

f. Other amendments to the specific area plan not defined as administrative or minor amendments.

Sec. 17.54.40. Bornstedt Village Overlay (BVO) district.

The City of Sandy developed a specific area plan for the Bornstedt Village, a mixed-use neighborhood located south of downtown Sandy surrounding the intersection of Hwy 211 and Bornstedt Road, as depicted on the City of Sandy Zoning Map. The Bornstedt Village Specific Area Plan Report, the background document that includes Figures referenced in this Chapter, is available for review in ~~the~~ City ~~of Sandy Planning Department~~Hall.

Sec. 17.54.50. BVO intent.

The Bornstedt Village Overlay (BVO) district is intended to guide the development of a new, pedestrian-oriented neighborhood in Sandy, and, implement the Comprehensive Plan's village policies. The district is intended to integrate land use, transportation, natural resource and infrastructure planning in a way that recognizes and enhances the unique qualities of Bornstedt Village. The district references other chapters within the Sandy Development Code in combination with provisions that apply solely within Bornstedt Village. Where there is a conflict between a referenced section of the Code and this chapter, the BVO district provisions supersede.

The planning objectives for Bornstedt Village are to:

A. *Create a Livable Village.* Create a neighborhood-oriented village that fulfills the village definition in the 1997 Sandy Comprehensive Plan, and, responds to the unique opportunities and site conditions of Bornstedt Village.

B. *Provide Transportation Options and a Local Street Network.* Provide for transportation improvements and a village setting that is conducive to walking, bicycling and transit, while accommodating automobile traffic. Integrate planned land uses with existing and future transportation modes.

C. *Plan for a New, Village-Oriented Character for Hwy 211, Bornstedt Road, and Jacoby Road~~s~~.* Evaluate ways to calm traffic, improve safety, create an attractive character, protect natural resources and generally minimize adverse impacts from traffic on these high-speed roads.

D. *Protect, Restore, and Enhance Natural Resources in Balance with Creating an Urban Village.* Plan for integration for land use, transportation, and natural resources in the village. This objective seeks to protect, restore, and enhance key resources and implement appropriate green and sustainable development practices, all in balance with creating an urban village.

E. *Plan for ~~a~~ Parks and Open Space.* Provide parks that implement the ~~City of Sandy~~2022 Parks and Trails Master Plan, and other open space opportunities that enhance the livability of the village.

F. *Provide Housing Choices.* Provide a variety of housing choices that meet the needs of a broad spectrum of Sandy residents.

G. *Ensure Attractive and Village-Oriented Design.* Identify zoning and design guidelines that will result in attractive design that supports the creation of a walkable village.

Sec. 17.54.60. BVO applicability.

Development and land use within the Bornstedt Village Overlay district, as shown on the City of Sandy Zoning Map (reflecting Figure 5 in the Bornstedt Village Specific Area Plan), shall be in conformance with the provisions outlined in this chapter. Cascadia Village Subdivisions #1 through #6 are exempt from Sections 17.54.70—17.54.110.

Sec. 17.54.70. BVO permitted uses.

Within the Bornstedt Village Overlay district, all uses shall be consistent with the underlying zoning district, as referenced below. Uses are determined through the referenced zone district unless specifically modified or exempted herein.

A. Single Family Residential (SFR)—See SDC 17.34. Single-family detached zero-lot-line dwellings are not permitted. All other uses shall be consistent with Section 17.34.10 and 17.34.20.

B. Low Density Residential (R1)—See SDC 17.36. Single-family detached zero-lot-line dwellings are not permitted. All other uses shall be consistent with Section 17.36.10 and 17.36.20.

C. Medium Density Residential (R2)—See SDC 17.38.

D. High Density Residential (R3)—See SDC 17.40.

E. Village Commercial (C-3)—See SDC 17.46. Multi-family dwellings above, beside or behind a commercial business are permitted except as modified as follows: residential dwellings shall only be permitted to be located above, beside or behind the commercial use(s) if a minimum of 80 percent of the ground floor of each building footprint is occupied by the commercial use(s). In such cases where the 80 percent standard is met, a maximum of 20 percent of the ground floor of each building footprint may be used for residential purposes and to provide access to residential dwellings located above, beside or behind the commercial uses(s).

Sec. 17.54.80. BVO development standards.

Residential Development Standards

Type	SFR	R1	R2	R3
Minimum Average Lot Width	50 ft. single family detached or duplex	40 ft. single family detached or duplex; 30 ft. zero lot line; 30 ft. row house	40 ft. single family detached or duplex; 30 ft. zero lot line; 20 ft. row house	40 ft. single family detached or duplex; 20 ft. zero lot line and row house
Minimum Lot Width at Building Line	40 ft. single family detached or duplex	40 ft. single family detached or duplex; 20 ft. zero lot line; 20 ft. row house	40 ft. single family detached or duplex; 20 ft. zero lot line and row house	40 ft. single family detached or duplex; 20 ft. zero lot line and row house
Minimum Lot Frontage	20 ft.	20 ft.	20 ft.	20 ft.
Minimum Ave. Lot Depth	No minimum	No minimum	No minimum	No minimum
Setbacks				
Front Yard	10 ft. min.	10 ft. min.	10 ft. min.	10 ft. min.
Rear Yard	20 ft. min.	15 ft. min.	15 ft. min.	15 ft. min.

Side Yard (interior)	7.5 ft. min.	5 ft. min.	5 ft. min.	5 ft. min.
Corner Lot Setback	10 ft. min. on side abutting the street	10 ft. min. on side abutting the street	10 ft. min. on side abutting the street	10 ft. min. on side abutting the street
Garage Setback	20 ft. min.	20 ft. min.	20 ft. min.	20 ft. min.
Projection into Required Setbacks	See Chapter 17.74	See Chapter 17.74	See Chapter 17.74	See Chapter 17.74
Accessory Structures	See Chapter 17.74	See Chapter 17.74	See Chapter 17.74	See Chapter 17.74
Structure Height	35 ft. max.	35 ft. max.	35 ft. max.	35 ft. max.
Building Site Coverage	No maximum	Maximum—80 percent maximum for manufactured ~~home~~ dwelling parks	Maximum—75 percent maximum for multi-family; 80 percent for manufactured ~~home~~ dwelling parks	Maximum—75 percent maximum for multi-family; 80 percent for manufactured ~~home~~ dwelling parks
Off-Street Parking	See Chapter 17.98	See Chapter 17.98	See Chapter 17.98	See Chapter 17.98

(Ord. No. 2021-03 , § 5(Exh. E), 5-17-2021)

Sec. 17.54.90. BVO Village Commercial development standards.

Lot Area	No minimum or maximum
Lot Width	No minimum
Lot Depth	Maximum 100 ft.~~2~~
Lot Coverage	No maximum
Setbacks*	No minimum front, side or corner setback; 10 ft. maximum. Additional setbacks of up to 20 ft. may be provided to accommodate small plazas and outdoor seating
Structure Height	45 ft. maximum
Landscaping	10% minimum
Off-Street Parking	See Chapter 17.98
*Unless abutting a more restrictive zoning district, then match abutting district's setback	

(Ord. No. 2021-03 , § 5(Exh. E), 5-17-2021)

Sec. 17.54.100. BVO Village Commercial—Residential in conjunction with a commercial business.

Type	Standard
Lot Dimension	In conformance with Chapter 17.40 (R3)
Setbacks	In conformance with Chapter 17.40 (R3)
Lot Coverage	No minimum

Structure Height	45 ft. maximum
Landscaping	20% minimum

Sec. 17.54.110. BVO design standards.

A. *Design Review.* Design review is required for all new uses and structures, and for exterior remodels of commercial uses. The provisions of Chapter 17.90 and other relevant chapters apply unless modified by the following provisions.

B. *Single Family Residential and Duplex Design Standards*. All single family dwellings, manufactured dwellings, and duplexes on individual lots ~~of record~~ shall follow the design standard calculations in Chapter 17.90.

C. *Variety of Housing Standard for Subdivisions.* In order to reduce repetition of the same building type and promote housing choices, all subdivisions exceeding 40 platted lots, in the R-1, R-2 and R-3 zones, must demonstrate that a variety of lot sizes and/or building types have been provided. This standard is met by providing a different lot size or housing type for at least one-third of the dwellings, by one or more of the following:

1. A mix of attached and detached dwellings.
2. A variety of lot sizes for detached dwellings where the "varied" lot sizes are at least 20 percent larger or smaller than the average lot size for the remaining lots.
3. A mix of one and two story dwellings.
4. A mix of multi-family housing and detached dwellings, where allowed by the underlying zoning district.
5. Other techniques as approved by the Planning Commission through a Type III review process.

D. *Garage Standards.* The following standards apply to new single-family, duplex and zero-lot-line residential development.

1. The purpose for these standards is to:

   a~~1~~. Ensure that there is a physical and visual connection between the living area and entrance of the dwelling and the street.

   b~~2~~. Enhance public safety for residents and visitors and provide opportunities for community interaction.

   c~~3~~. Provide for a more pleasant pedestrian environment by preventing garages and vehicle areas from dominating the views of the neighborhood from the sidewalk.

2. *Standards.* Garages that are accessed from the front lot area of the dwelling must meet one of the four options listed below, unless the garage is placed behind the dwelling.

   a. The length of the garage wall may be up to 60 percent of the length of the street-facing building façade when the garage does not extend closer to the front lot line than the longest wall of the street-facing façade (Figure 10a in the Bornstedt Village SAP).

   b. The length of the garage may be up to 70 percent of the length of the street-facing building façade when the garage is recessed at a minimum of two feet from the longest wall of the street-facing façade (Figure 10a in the Bornstedt Village SAP).

   c. The garage may extend up to six feet in front of the longest street-facing wall when its width does not exceed 50 percent of the total street-facing façade, and, the garage is not closer to the street lot line than the front of the porch. As referenced here, the porch must be at least 48

square feet in area, have a solid roof that is not more than 12 feet above the porch (Figure 10b in the Bornstedt Village SAP).

d. A garage door that is oriented at least 90 degrees to the street lot line is not subject to standards a.—c. above. Such side-oriented garages must have at least 15 percent of their street-facing wall (measured in square feet) in windows (Figure 10b in the Bornstedt Village SAP).

E. *Access to Narrow Lots.* In order to minimize the extent of curb cuts on each block, to de-emphasize front-facing garages, and mitigate turning movement conflicts, lots with less than 40 feet of frontage shall receive access from a rear public alley or a shared private driveway. ~~A shared private driveway shall adhere to the standards in Chapter 17.100, Land Division.~~ The Planning Commission may grant exceptions through a Type III Variance process where the applicant demonstrates topography or other conditions preclude compliance with this standard.

F. *Landscaping Standards Adjacent to Highway 211.* The street-side yard adjacent to the Highway 211 Parkway (Figure 6 of the Bornstedt Village Specific Area Plan) shall be landscaped to complement the parkway character. At a minimum, two trees ~~(minimum two)~~ shall be planted in accordance with spacing standards in Section 17.92.30 ~~on 50-foot centers~~, together with contiguous groundcover. ~~Less than 50-foot center spacing for trees is encouraged.~~

(Ord. No. 2021-03 , § 5(Exh. E), 5-17-2021; Ord. No. 2021-16 , § 8(Exh. H), 8-16-2021)

Sec. 17.54.120. BVO circulation.

New streets and vehicle access shall be developed consistent with the Bornstedt Village Circulation Plan (Figure 7 of the Bornstedt Village Specific Area Plan). Through-roads shown on the circulation plan are considered "required" street connections, however, there is flexibility regarding the specific alignment of the streets. Required street alignments shall be located within 100 feet of the location depicted in Figure 7, unless an amendment is requested pursuant to Section 17.54.30. Proposed road "arrows" (shown on Circulation Plan) are considered suggested locations for additional connections between the through streets, recognizing that flexibility is needed for the specific number and location of additional streets. The combination of development of the through streets and additional connections shall provide circulation resulting in a logical and connected network of local neighborhood streets in accordance with the standards in Chapter 17.84 and Figure 11 of the 2023 Sandy Transportation System Plan. Figure 8 of the Bornstedt Village Specific Area Plan is an illustrative, non-binding, plan of how this standard could be implemented. Within the Bornstedt Village Overlay District, changes in the Circulation/Transportation Plan that cause a required transportation element, including a trail, to be added or moved more than 100 feet from the location depicted on the specific area plan Circulation diagram, shall be subject to the amendment procedures of Subsection 17.54.30.B. rather than Subsection 17.54.30.C. Changes in the Circulation/Transportation Plan that cause a required transportation element, including a trail, to be eliminated, shall be subject to the amendment procedures of Subsection 17.54.30.C.

A. *Highway 211 Parkway Section.* Development shall be consistent with the design of the Highway 211 Parkway cross-section (Figure 6 of the Bornstedt Village Specific Area Plan) ~~, subject to ODOT approval~~. The parkway cross-section may be modified, as needed, to adjust to topographic and other constraints. Modifications as part of the review of any land use application or development permit shall be approved by the City Engineer ~~and are subject to ODOT approval~~.

B. *Traffic Calming on Bornstedt Road.* The intersection of Bornstedt Road and Cascadia Village Drive shall be stop controlled. The applicant shall present a review of o~~O~~ther traffic calming methods ~~such as~~ including striping, reflectors, narrowing of the pavement section, regrading, and landscaping ~~and other traffic calming techniques shall~~ to be considered during land use reviews and approvals ~~public improvement projects~~.

C. *Boulevards.*

1. For the purposes of this section, a building entrance is considered to be "oriented toward" a street when it faces the street or is at an angle of up to 45 degrees from the street.

2~~1~~. The ~~concept for~~following standards apply to the Barlow Road Boulevard ~~is to build a~~, which shall be designed as a neighborhood street ~~that~~:

a. ~~Follows the~~The street shall follow the general alignment of the historic Barlow Road, as shown on Figures 7 and 11 of the Bornstedt Village Specific Area Plan; ~~and~~

b. The street shall ~~i~~include~~s~~ a landscaped park-block section that is a minimum of 20 feet wide and shall include~~s~~ interpretive signage and a trail within the median. The conceptual design recognizes that the historic road is no longer visible, but is still valuable and important to incorporate into the design of the neighborhood; ~~and~~

c. ~~Minimizes access points by requiring r~~Residential access shall be provided from a side street, rear public alley, or from a shared private driveway, in order to minimize access points; and

d. ~~Encourages pedestrian accessibility by requiring t~~The primary entrance of all residential development on lots adjacent to the boulevard ~~to~~ shall be oriented toward the boulevard street, in order to encourage pedestrian accessibility. Buildings on lots adjacent to the boulevard shall have a primary entrance connecting directly between the boulevard street and building interior, with a walkway connection whose length is not more than 20 feet longer or 120 percent of the straight line distance, whichever is less.

3~~2~~. The ~~concept for~~following standards apply to the Village Boulevard ~~is to build~~shall be designed as a neighborhood street ~~that~~:

a. The street shall e~~E~~xtends from the signalized intersection at Highway 211 approximately 1,000 feet to the south and approximately 260 feet to the north; ~~and~~

b. This street ~~should~~ shall include a landscaped park-block median that is a minimum of 20 feet wide; ~~and~~

c. The existing hedgerow of trees located at south end of the boulevard ~~should~~ shall be incorporated into this street design; ~~and~~

d. ~~Minimizes access points by requiring r~~Residential access shall be provided from a side street, rear public alley, or from a shared private driveway, in order to minimize access points onto the Village Boulevard; ~~and~~

e. ~~Encourages pedestrian accessibility by requiring t~~The primary entrance of all residential and commercial development on lots adjacent to the boulevard ~~to~~ shall be oriented toward the boulevard street, in order to encourage pedestrian accessibility. Buildings on lots adjacent to the boulevard shall have a primary entrance connecting directly between the boulevard street and building interior, with a walkway connection whose length is not more than 20 feet longer or 120 percent of the straight line distance, whichever is less.

4~~3~~. The ~~concept for~~following standards apply to Cascadia Village Drive, west of Bornstedt Road, ~~is to build~~which shall be designed as a neighborhood street ~~that~~:

a. The street shall f~~F~~eature~~s~~ a landscaped park-block median that is a minimum of 20 feet wide, except where the street must avoid areas regulated by Chapter 17.60, the FSH Overlay District; ~~and~~

b. ~~Minimizes access points by requiring r~~Residential access shall be provided from a side street, rear public alley, or from a shared private driveway, in order to minimize access points onto Cascadia Village Drive; ~~and~~

c. ~~Encourages pedestrian accessibility by requiring t~~The primary entrance of all residential development on lots adjacent to the boulevard ~~to~~ shall be oriented toward the boulevard street, in order to encourage pedestrian accessibility. Buildings adjacent to the boulevard shall have a primary entrance connecting directly between the boulevard street and building interior.

D. *Green Streets.* Vegetated swales and other green street features~~, per SDC 17.100,~~ approved by the City Engineer shall be used ~~where practicable~~ in Bornstedt Village.

Sec. 17.54.130. BVO parks.

The Open Space, Parks and Trails Map (Figure 9 of the Bornstedt Village Specific Area Plan) illustrates both existing parks and the location of new neighborhood parks. The proposed parks are conceptually located. The parks are an important element of the BVO district~~,~~; however, the conceptual locations~~y~~ do not bind the subject properties to uses solely for ~~as only~~ parkland. Rather, the exact location and size of the parks shall be established through acquisition by the City, parkland dedication during development reviews as required by Chapter 17.86, development agreements, or other means that involve property owner participation. Within the Bornstedt Village Overlay District, changes in the parks plan that cause a required park, path or trail to be added or moved more than 100 feet from the location depicted on the specific area plan parks diagram, shall be subject to the Amendment procedures of Section 17.54.30.B. rather than 17.54.30.C. Changes in the parks plan that cause a required park, path or trail to be eliminated, shall be subject to the Amendment procedures of 17.54.30.C.

Sec. 17.54.140. BVO environmental standards.

The BVO district shall utilize the existing environmental standards in the Sandy Development Code. The principal regulations are:

A. Flood Slope and Hazard (FSH) Overlay—See Chapter 17.60

B. Hillside Development—See Chapter 17.56

C. Urban Forestry—See Chapter 17.102, except ~~where~~ as modified by ~~this~~ Chapter 17.54.

1. Tree Retention—The landowner is responsible for retention and protection of retained trees as specified below:

a. Within the Bornstedt Village Overlay, at least nine trees, 11 inches DBH or greater, shall be retained for every one-acre of land under contiguous ownership within 300 feet of the FSH Overlay District as depicted on the Zoning Map, and six trees per acre in other areas of the Bornstedt ~~v~~Village Overlay.

All other standards of Chapter 17.102, including Subsection 17.102.50.A.3-5, shall remain in effect.

CHAPTER 17.56 HILLSIDE DEVELOPMENT

Sec. 17.56.00. Intent.

The intent of this chapter is to comply with Statewide Planning Goal 7 (Natural Hazards) by minimizing seismic and landslide hazards, and soil erosion associated with development on steep or unstable slopes. Development may be permitted on ~~potentially hazardous areas~~steep slopes, provided that the recommendations of approved studies are implemented as conditions of building permit or land use approval.

Sec. 17.56.10. Applicability.

These regulations shall apply to any parcel with slopes greater than 25 percent as shown on the Hillside Development Overlay District Map or with slope hazards mapped by the Department of Geology and Mineral Industries (DOGAMI). This chapter shall apply only to activities and uses that require a building, grading, tree removal, and/or land use permit.

A. *General.* No person shall develop property in areas designated by SDC 17.56.10, without first demonstrating compliance with this chapter.

1. As a condition of permit issuance or land use approval, the applicant shall agree to implement the recommendations of approved studies and to allow all inspections to be conducted.

2. Where a bond, letter of credit, or other guarantee is required, the permit shall not be issued until the bond or guarantee has been obtained and approved.

3. Applicability for residential development applications is specified in Section 17.56.50.

B. *Exemptions:*

1. An activity or use that avoids slopes of 25 percent or greater, DOGAMI slope hazard areas, natural drainageways, and potentially hazardous analysis areas as defined in Section 17.56.30.A.

2. The following activities, regardless of location:

a. An excavation that is less than three feet in depth, or which involves less than 50 cubic yards of volume;

b. A fill that does not exceed three feet in depth or 50 cubic yards of volume;

c. New construction or expansion of a structure resulting in a net increase in ground floor area of less than 1,000 square feet that does not involve grading;

d. Emergency actions required to prevent an imminent threat to public health or safety, or prevent imminent danger to public or private property, as determined by the Director; or

e. Any land use or activity that does not require a building, grading permit, or land use approval.

Sec. 17.56.20. Approval procedures.

A. *Land Use Reviews.* All applications for land use approval under the Sandy Development Code shall be reviewed under the highest numbered procedure required for the development proposal. For example, a Type II design review combined with hillside development review would be considered under the Type II

procedure; similarly, a Type III conditional use permit combined with hillside development review would be considered under the Type III procedure.

B. *Building Permits.* The Building Official will process requests for building permit or grading permit applications that do not require land use review under the Sandy Development Code.

Sec. 17.56.30. Required map and studies.

A. *Topographic Map Required.* To determine the location of potentially hazardous areas, the applicant shall submit a scaled topographic map at two-foot contour intervals for the subject property (site) and for land within 25 feet of the site perimeter. In addition to DOGAMI slide hazard areas and slopes of 25 percent or greater, potentially hazardous "analysis areas" include land within 25 feet of the top or toe of slopes of 25 percent or greater and the area 25 feet on either side of drainageways that drain 20 acres or more. This map shall be prepared by a registered engineer or land surveyor and shall show:

1. Slopes of 25—34 percent;
2. Slopes of 35 percent and greater;
3. The analysis that is within 25 feet of slopes that are 25 percent or greater parallel to and within 25 feet of the top of the 25 percent slope break;
4. Mapped DOGAMI slide hazard areas;
5. The analysis area within 25 feet of the centerline of drainageways that drain at least 20 acres; and
6. The area (in square feet) for each category listed above for the subject property.

B. *Types of Required Studies.* There are three types of geological and engineering studies that may be required by this chapter. See Table 1 under Section 17.56.40, below.

1. Geological Assessments are prepared and stamped by a Certified Engineering Geologist and describe the surface and subsurface conditions of a site, delineate areas of a property that may be subject to specific geologic hazards, and assess the suitability of the site for development. Geotechnical Reports shall be conducted according to the requirements of Appendix A (Geological Assessments), shall make recommendations as to whether further studies are required, and may be incorporated into or included as an appendix to the geotechnical report.
2. Engineering Geology Reports are prepared and stamped by a Certified Engineering Geologist and provide detailed descriptions of the geology of the site, professional conclusions and recommendations regarding the effect of geological conditions on the proposed development, and opinions and recommendations covering the adequacy of the site to be developed. Engineering Geology Reports shall be prepared in accordance with the requirements of Appendix B (Guidelines for Preparing Engineering Geology Reports in Oregon adopted by the Oregon State Board of Geologist Examiners) and may be incorporated into or included as an appendix to the geotechnical report.
3. Geotechnical Reports are prepared and stamped by a Geotechnical Engineer, evaluate site conditions, and recommend design measures necessary to reduce the development risks and facilitate safe and stable development. Geotechnical Reports shall be conducted according to the requirements of Appendix C (Geotechnical Reports), and may be incorporated into or included as an appendix to the Engineering Geology Report.

Sec. 17.56.40. Where studies required.

Additional geological or engineering studies shall be required, or not required, under the following circumstances:

Table 1: Where Studies are Required or not Required

Situation	Type I Development Applications; Single Family Homes, Duplexes and Accessory Uses	NON-EXEMPT Grading; Type II or III Development Applications
A. Proposed development avoids slopes of 25 percent or greater, drainageways, DOGAMI slope hazard areas and all analysis areas:	1. No further requirements	2. No further requirements
B. Development proposed on slopes of 25—35 percent or analysis areas, but avoids drainageways, DOGAMI hazard areas and slopes of 35 percent or greater:	1. Geological Assessment required; Engineering Geology or Geotechnical Reports may be required*	2. Engineering Geology Report required; Geotechnical Report may be required*
C. Development proposed on DOGAMI hazard areas, slopes of 35% or greater, or drainageway areas:	1. Engineering Geology Report required; Geotechnical Report may be required*	2. Engineering Geology Report and Geotechnical Report required

* Whether additional studies are necessary depends on recommendations of base required study.

Sec. 17.56.50. Compliance with study conclusions and recommendations required.

A. *Professional Standards.* The ~~d~~Director shall determine whether Geological Assessments, Engineering Geology Reports, or Geotechnical Reports have been prepared in accordance with Section 17.56.30. The ~~d~~Director may require additional information or analysis necessary to meet study requirements.

B. *Peer Review.* The ~~d~~Director may require peer review of any required report, in which case regulated activities and uses shall be reviewed and accepted through the peer review process before any regulated activity will be allowed.

1. A professional or professional firm of the ~~c~~City's choice that meets the qualifications listed in this chapter shall perform the review.

2. The review shall be at the applicant's expense.

3. Review of report submittals shall determine whether required elements are completed, geologic report procedures and assumptions are accepted, and all conclusions and recommendations are supported and reasonable.

C. *Review Criteria.*

1. *Residential Development Criteria*. Applications subject to Hillside Development review that are proposing new residential dwelling units or the creation of residential lots on properties that include areas designated by SDC 17.56.10 must comply with either the clear and objective criteria in Subsection C.1.a. or the discretionary criteria in Subsection C.1.b, below.

a. Clear and Objective Criteria. No development, including creation of lots, is permitted within areas with slopes greater than 25 percent, as designated by SDC 17.56.10. An application to develop property that has slopes greater than 25 percent, but where no development is proposed within the areas designated by SDC 17.56.10 the application will be processed as otherwise required in this Code.

b. Alternative Criteria. Residential development is permitted within areas designated by SDC 17.56.10 subject to the discretionary criterion in Subsection C.2 of this section and the provisions of this chapter.

2. *Non-residential Development / Discretionary Criteria*. The approval authority shall rely on the conclusions and recommendations of required reports, as modified by peer review, to determine compliance with this chapter.

D. *Conditions of Approval.* Conclusions and recommendations stated in approved reports shall be directly incorporated as permit conditions or provide the basis for conditions of approval for the regulated activity or use.

E. *Expiration.* Where an approved assessment or report as defined and required by this chapter has been prepared within ~~the last~~ five years of submission of the land use application for a specific site, and where the proposed land use activity and surrounding site conditions are unchanged, that report may be utilized and a new report is not required, provided the applicant submits a letter prepared and stamped by a Certified Engineering Geologist or Geotechnical Engineer stating that the report is still valid. If a Certified Engineering Geologist or Geotechnical Engineer cannot provide such a letter due to changes to the ~~Should~~ environmental conditions associated with the site or surrounding the site change, or ~~if~~ due to material changes to the proposed land use activity or development ~~has materially changed~~, the applicant shall submit an amendment to the required assessment or report, which may be reviewed and approved through the peer review process. A new assessment or report is required after five years from submission of the land use application.

CHAPTER 17.60 FLOOD AND SLOPE HAZARD (FSH) OVERLAY DISTRICT[17]

Sec. 17.60.00. Intent.

This chapter is intended to promote the public health, safety and general welfare by minimizing public and private adverse impacts from flooding, erosion, landslides or degradation of water quality consistent with Statewide Planning Goals 6 (Air, Land and Water Resources Quality) and 7 (Areas Subject to Natural Disasters and Hazards) and the Sandy Comprehensive Plan (SCP). This chapter is also intended to minimize public and private losses due to flooding in flood hazard areas by provisions designed to:

A. Protect human life and health;

B. Minimize expenditure of public money for costly flood control projects;

C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

D. Minimize prolonged business interruptions;

E. Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in flood hazard areas;

F. Help maintain a stable tax base by providing for the sound use and development of flood hazard areas so as to minimize blight areas caused by flooding;

G. Notify potential buyers that the property is in a Special Flood Hazard Area;

H. Notify those who occupy flood hazard areas that they assume responsibility for their actions; and

I. Participate in and maintain eligibility for flood insurance and disaster relief.

Sec. 17.60.10. Interpretation and mapping.

The Director has the ultimate responsibility for maintaining the FSH Overlay District on the City of Sandy Zoning Map, determining on-site measuring methods, and otherwise interpreting the provisions of this chapter. Technical terms used in this chapter are defined in Chapter 17.10, Definitions. This chapter does not regulate development on lots or parcels entirely outside the FSH Overlay District.

A. *FSH Overlay District.* The only areas subject to the restrictions and prohibitions of the FSH overlay district are those indicated on the City of Sandy Zoning Map on file in the Planning Department and areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled, "Flood Insurance Study (FIS) for Clackamas County, Oregon and Incorporated Areas," dated January 18, 2019, with accompanying Flood Insurance Rate Maps (FIRMs). This chapter does not regulate lots or parcels entirely outside the FSH Overlay District.

   1. The FIS and FIRMs are hereby adopted by reference and declared to be a part of Section 17.60 and are on file at the City of Sandy.

[17]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2019-01, effective January 7, 2019. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

B. *Development Approval Required.* No development shall occur within the FSH overlay district without first obtaining City approval under the provisions of this chapter. The Director shall notify the Oregon Division of State Lands whenever any inventoried wetland is proposed for development, in accordance with ORS 227.350. In riverine situations, the Director shall notify adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notification to the administrator.

C. *Interpretation.* All provisions of the FSH overlay code shall be:

1. Considered as minimum requirements;
2. Liberally construed in favor of the governing body; and
3. Deemed neither to limit nor repeal any other powers granted under state statutes.

D. *Applicant Responsibilities.* The applicant for alteration or development within the FSH overlay district shall be responsible for preparing a survey of the entire site, based on site-specific field surveys or Corps of Engineers data that precisely maps and delineates the following areas:

1. The name, location and dimensions of affected streams or rivers, and the tops of their respective banks.
2. Area of Special Flood Hazard boundaries and elevations as determined by the January 18, 2019 FIS for Clackamas County and Incorporated Areas.
3. The City of Sandy FSH overlay district boundary as depicted on the City of Sandy FSH Map.
4. The water quality and slope setback area(s) as defined in Section 17.60.30.
5. The size and location of locally significant wetlands shall be determined based on the City of Sandy Locally Significant Wetland Inventory (2002) unless modified by a wetland delineation approved by the Oregon Division of State Lands and submitted to the City. Wetland delineations that have formal concurrence from the Division of State Lands shall be valid for the period specified in that agency's administrative rules.
6. Steep slope areas where the slope of the land is 25 percent or greater within the FSH overlay district boundary.
7. The area enclosed by a continuous line, measured 25 feet horizontally, parallel to and upland from the top of a steep slope area, where the top of the steep slope is within the FSH overlay district boundary.
8. Existing public rights-of-way, structures, roads and utilities.
9. Natural vegetation, including trees six inches DBH or greater or tree groves clusters and understory within the FSH Overlay District boundary.
10. Existing and proposed contours at two-foot intervals.

Sec. 17.60.20. Permitted uses and activities.

This chapter lists permitted uses, or uses allowed under prescribed conditions, within the FSH overlay district. Where there are conflicts, this chapter supersedes the use provisions of the underlying district.

A. *Restricted Development Areas.* Restricted development areas within the FSH overlay district as shown on the City of Sandy Zoning Map include:

1. Slopes of 25 percent or greater that (a) encompass at least 1,000 square feet and (b) have an elevation differential of at least ten feet.

2. Protected water features, including locally significant wetlands, wetland mitigation areas approved by the Division of State Lands, and perennial streams.

3. Required setback areas as defined in Section 17.60.30.

B. *Permitted Uses.* Permitted uses within restricted development areas are limited to the following:

1. Open space and trails provided they are constructed consistent with standards ~~on file in the Planning Department~~in the 2022 Parks and Trails Master Plan.

2. Removal of refuse and permitted fill.

3. Planting of native vegetation species included in the City of Portland Plant List.~~on a list maintained by the Director.~~

4. Removal of non-native/invasive vegetation, dead or dying trees, or vegetation that is hazardous to the public.

5. Removal of up to two trees of six inches or greater ~~dbh~~ DBH in a calendar year, provided that each tree removed is replaced with two native trees, each of which must meet the standards in Section 17.92.50 ~~be one and one-half inches or greater caliper~~ and be placed within the restricted development area of the site.

6. Construction or expansion of public facilities or private roads necessary to support permitted development.

~~7. Construction or expansion of a single-family residence on a lot of record, under the following prescribed conditions:~~

~~a. The applicant must demonstrate that the lot has received planning approval from either Clackamas County or the City of Sandy and that there is insufficient buildable land on the same lot to allow the proposed construction or expansion.~~

~~b. The site review, engineering, erosion control, water quality and re-vegetation standards of this chapter have been fully satisfied.~~

~~c. The residence or addition has been sited so as to minimize excavation and disturbance to native vegetation on restricted development areas.~~

~~d. The maximum impervious surface coverage resulting from development on restricted development areas shall be 2,500 square feet. Exception: This standard may be exceeded to allow a superior private driveway design and location that reduces adverse impacts to protected areas. To exceed the standard, the applicant must demonstrate that a longer driveway will avoid required setbacks from protected water features, and that driveway construction will either: (a) more closely follow hillside contours and thereby reduce overall cut and fill area by at least 20 percent; or (b) avoid tree clusters and thereby reduce the number of six-inch or greater dbh trees that must be removed by at least 20 percent.~~

~~e. The option of an adjustment under Section 17.60.100 has been considered as a means of avoiding or minimizing impacts on restricted development areas.~~

~~f. Development shall not result in cuts or fills in excess of three feet except for basement construction unless specifically approved by the Director.~~

7. Construction or expansion of a single-family residence or duplex on a legal lot, provided the standards in Subsections a. through d., below, are met. If these standards cannot be met, exceptions may be approved in accordance with Subsection e.

a. The site review, engineering, erosion control, water quality, and re-vegetation standards of this chapter shall be fully satisfied

b. The maximum disturbance area (permanent and temporary) allowed within the restricted development areas on a lot is determined by subtracting the area of the Buildable Portion of the lot from 4,000 square feet.

i. For purposes of this subsection, the Buildable Portion of the lot is the largest single contiguous area of the lot outside of the restricted development area.

ii. Except as specified in subsection iii, below, if the Buildable Portion of the lot is less than 4,000 square feet, encroachment into the restricted development area shall be limited to the amount of area needed to make up for the deficit.

iii. If the dimensions of the Buildable Portion of the lot are such that a 40-foot by 40-foot area cannot be located within the Buildable Portion of the lot, encroachment into the restricted development area shall be limited to the minimum area needed to accommodate a 40-foot by 40-foot area.

c. In addition to the maximum disturbance area established by Subsection b., a stormwater facility serving only a single residential lot may be located on the site provided there is no disturbance to existing tree canopy, and it is located outside the critical root zone of existing trees over six inches DBH.

d. Development shall not result in cuts or fills in excess of three feet except for basement construction.

e. Exceptions to Subsections a. through d. may be approved by the Director through a Type II review provided the applicant demonstrates that:

i. There is insufficient buildable land on the lot to allow the proposed construction or expansion.

ii. An adjustment under Section 17.60.110 is not sufficient to avoid impacts on restricted development areas.

iii. The design and location of the proposed construction or expansion minimizes adverse impacts to restricted development areas to the extent feasible.

iv. If the additional impervious area is for a driveway, a longer driveway will avoid required setbacks from protected water features, and the driveway will either: (a) more closely follow hillside contours and thereby reduce overall cut and fill area by at least 20 percent; or (b) avoid tree clusters and thereby reduce the number of six-inch or greater DBH trees that must be removed by at least 20 percent.

v. In no case shall the total disturbance area within restricted development areas exceed 10,000 square feet.

8. Replacement of a single-family dwelling constructed over substantially the same footprint as the original single-family dwelling. "Substantially the same footprint" means that the replacement footprint is relocated no more than 10 feet from the original footprint in any direction except closer to the stream/wetland/steep slope.

9. Repair or stabilization of unstable slopes.

10. Stream bank restoration, subject to a stream bank restoration plan. This plan must:

a. Be prepared by a team of specialists in the fields of stream morphology, water quality, and riparian vegetation approved by the ~~Planning~~ Director.

b. Remove invasive vegetation and replace it with multi-layered native vegetation that provides for stream shading within the entire stream bank.

c. Reduce the steepness of the bank along reaches that have been highly eroded.

d. Reduce the velocity of water carried by the stream.

e. Include guarantees and funding to assure at least a 90 percent survival rate of native plants over a three-year period. This guarantee shall be in one of the following forms:

i. A surety bond executed by a surety company authorized to transact business in the state of Oregon in a form approved by the City Attorney.

ii. In lieu of the surety bond, the applicant may:

A. Deposit with the City cash money to be released only upon authorization of the Director;

B. Supply certification by a bank or other reputable lending institution that an irrevocable letter of credit in compliance with the International Chamber of Commerce Uniform Customs and Practice for Documentary Credits, UCP 600 or most current revision has been established to cover the cost of required improvements, to be released only upon authorization of the Director; or

iii. Such assurance of full and faithful performance shall be for a sum determined by the Director as sufficient to cover the cost of required restoration.

iv. If the applicant fails to construct one or more of the guaranteed restoration improvements and the City has expenses resulting from such failure, the City shall call on the performance guarantee for reimbursement. If the amount of the performance guarantee exceeds the expense incurred, the remainder shall be released. If the amount of the performance guarantee is less than the amounts of expense incurred by the City, the applicant shall be liable to the City for the excess costs. If the applicant fails to reimburse the City for expenses incurred to complete the public improvements, the City shall place a lien on the property in an amount equal to the City's costs.

11. Maintenance of existing landscaping on existing lots of record is permitted and is exempt from the requirements of the FSH Overlay District.

12. Appurtenant structures as permitted under Section 17.60.70.J.

C. *Platting of New Lots.* No new lot shall be platted or approved for development that is exclusively in restricted development areas as defined in ~~s~~Subsection 17.60.20.A.

Sec. 17.60.30. Required setback areas.

Setback areas shall be required to protect water quality and maintain slope stability near stream corridors and locally significant wetlands. Setbacks are measured horizontally from, parallel to, and upland from the protected feature.

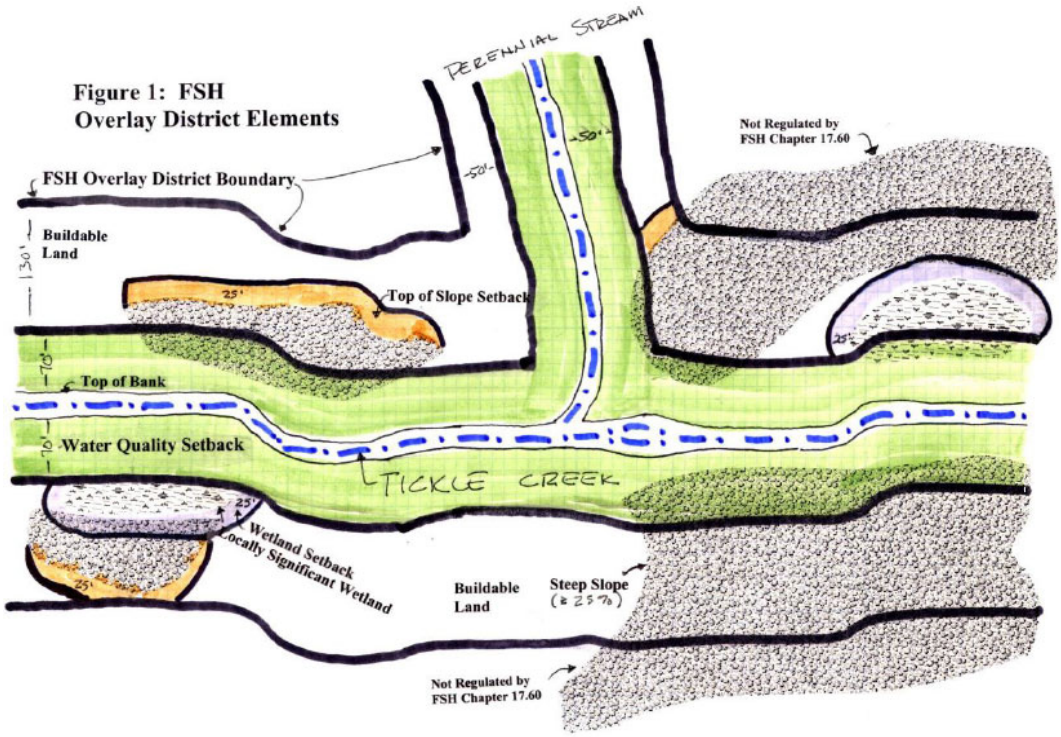
A. *Required Setbacks.* The required special setback(s), as illustrated in Figure 1, shall be:

1. Eighty feet from the top of bank of Tickle Creek and other fish-bearing streams (this supersedes the setback in Figure 1).~~;~~

2. Fifty feet from the top of bank along other perennial streams, except for "No Name Creek" east of Towle Drive, as provided in Subsection 17.60.30.C.2 ~~below~~.

3. Twenty-five feet around the edge of any mapped locally significant wetland~~; and~~.

4. Twenty-five feet from the top of any 25 percent slope break where the slope break occurs within the FSH overlay district as mapped by the ~~c~~City.



B. *Minimize Impacts.* Natural vegetation shall be preserved and enhanced, and excavation minimized within required water quality setback areas.

C. *Exceptions, Intent.* Exception 1 below recognizes that existing hillside, stormwater detention, and erosion control measures are sufficient to maintain water quality and quantity in areas of steep slopes separated from streams and wetlands by improved public streets in existing rights-of-way. Exception 2 recognizes that "No Name Creek" east of Towle Drive has been severely impacted by culverting, erosion, and invasive plants, and has only a few remaining infill sites adjacent to its banks. This exception is intended to encourage appropriate development of these infill sites and the opening and restoration of No Name Creek.~~this stream reach over time.~~

1. Land lying within the FSH overlay district, but upland from an existing public right-of-way with an improved public street, shall not be subject to the steep slope restrictions of this chapter. Such land shall remain subject to applicable Section 17.56 Hillside Regulations and shall comply with required setbacks set forth in ~~s~~Subsection 17.60.30.A.3.~~ above.~~

   a. Applications for development that include only areas that meet this exception and have existing improved public streets and have no locally significant mapped wetlands are not subject to the provisions of this chapter.

2. The required setback for "No Name Creek" east of the Towle Drive crossing may be reduced to 25 feet, subject to approval of a "stream bank restoration plan" that meets the standards of Subsection 17.60.20.B.10.

Sec. 17.60.40. Review procedures.

Review of development requests within the FSH Overlay District shall occur subject to the following procedures. ~~Unless otherwise indicated below, the Director may approve Type I permits over the counter or following a field check.~~ Type II and III development applications shall be reviewed by the Director to ensure consistency with Sections 17.60.60-17.60.70. Section 17.60.50 special reports shall also be required, unless specifically exempted by the Director.

A. *Type I Procedure.* The following uses shall be reviewed under a Type I procedure:

1. Planting of native plant species identified in the City of Portland Plant List~~ on the Native Plant list on file with the Director.~~

2. Removal of permitted fill.

3. Removal of non-native/invasive vegetation, dead, or dying vegetation that is hazardous to the public~~; or~~

4. Removal of up to two trees of six inches or greater ~~dbh~~ DBH in a calendar year.

~~4~~5. Appurtenant structures as permitted under Subsection 17.60.70.J.

B. *Type II Procedure.* The following uses shall be reviewed under a Type II review procedure:

1. Construction or expansion of major public facilities identified in sanitary, storm, water, ~~or~~ street, or parks master plans or of minor public facilities necessary to support development, where no other practical alternative exists.

2. Construction or expansion of trails.

3. Construction, expansion, or replacement of a ~~new~~ single-family residence or duplex within a restricted development area or floodway on a legal lot~~ of record.~~

4. Repair and stabilization of unstable slopes. If emergency slope stabilization is required and authorized by the City Engineer, a Type II ~~review~~ development application shall be ~~required~~ submitted to the City within 60 days of having taken the emergency action.

5. Stream bank restoration plans, consistent with the requirements of Subsection 17.60.20.B.10.

6. Exemption of Type II development applications from one or more required reports.

7. Development that is completely outside restricted development areas, as determined by ~~the Director~~available mapping based on site-specific information provided by the applicant and reviewed by a third-party professional consistent with Subsection 17.60.10.C. Such site-specific information shall remain valid for five years from the date approved by the Director, provided that topographical or hydrological changes have not occurred on the site that could invalidate such information.

8. Development requests that are similar in scope and impact, as determined by the Director, except that no other residential uses shall be considered beyond the provisions of Subsection B.3. The Director shall include the justification for the classification decision in the required notice to affected property owners.

C. *Type III Procedure.* The Planning Commission shall review all other public and private development requests under a Type III procedure.

D. *Establishment of Development ~~Permit~~Decision.* A development ~~permit~~ decision shall be obtained before construction or development begins, within any Area of Special Flood Hazard. Application for a development permit may be made on forms provided by the Director and may include, but not be limited to, plans in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question, existing or proposed structures, fill storage of materials, drainage facilities and the location of the aforementioned. Specifically, the following information is required:

1. Proposed elevation in relation to mean sea level of the lowest floor (including basement of all structures).
2. Proposed elevation in relation to mean sea level to which any non-residential structure will be floodproofed.
3. Certification by a registered professional engineer or architect that the floodproofing methods for any non-residential structure meet the floodproofing criteria detailed in Subsection 17.60.70.F. below.
4. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

Sec. 17.60.50. Special reports.

Where development is proposed on restricted development areas within the FSH overlay district as defined in Subsection 17.60.20.A., ~~the Director shall require submission of~~ the following special reports shall be submitted. These reports shall be in addition to other information required for specific types of development~~,~~ and shall be prepared by professionals in their respective fields.

The Director may require one ~~of~~ or more of these reports where necessary to address potential adverse impacts from development on buildable land within the FSH overlay district. Applications for residential construction allowed under Subsection 17.60.40.B.3 that are not requesting any exceptions or adjustments are exempt from requirements to submit these reports. The Director may exempt Type II permit applications from one or more of these reports where impacts are minimal and the exemption is consistent with the purpose of the FSH overlay zone as stated in Section 17.60.00.

A. *Hydrology and Soils Report.* This report shall include information on the hydrological conditions on the site, the effect of hydrologic conditions on the proposed development, the proposed development's impact on surface and groundwater flows to wetlands and streams, and any hydrological or erosion hazards. This report shall also include soils characteristics of the site, their suitability for development, carrying capacity, and erosion or slumping characteristics that might present a hazard to life and property, or adversely affect the use or stability of a public facility or utility. Finally, this report shall include information on the nature, distribution, and strength of existing soils; the adequacy of the site for development purposes; and an assessment of grading procedures required to impose the minimum disturbance to the natural state. A licensed professional engineer registered in Oregon shall prepare the hydrology and soils report.

B. *Grading Plan.* The grading plan shall be specific to a proposed physical structure or use and shall include information on terrain (two-foot intervals of property), drainage, direction of drainage flow, location of proposed structures and existing structures which may be affected by the proposed grading operations, water quality facilities, finished contours or elevations, including all cut and fill slopes and proposed drainage channels. Project designs including but not limited to locations of surface and subsurface devices, walls, dams, sediment basins, storage reservoirs, and other protective devices shall form part of the submission. The grading plan shall also include: 1) construction phase erosion control plan consistent with the provisions of Chapter 15.44; and 2) schedule of operations. A licensed professional engineer registered in Oregon shall prepare the grading and erosion control plan.

C. *Native Vegetation Report.* This report shall consist of a survey of existing vegetative cover, whether it is native or introduced, and how it will be altered by the proposed development. Measures for re-vegetation with native plant species will be clearly stated, as well as methods for immediate and long-term stabilization of slopes and control of soil erosion. A landscape architect, landscape designer, botanist, or arborist with specific knowledge of native plant species, planting and maintenance methods, survival rates, and their ability to control erosion and sedimentation shall prepare the vegetation report. The applicant shall be responsible for replacing any native plant species that do not survive the first two years after planting, and for ensuring the survival of any replacement plants for an additional two years after their replacement.

Sec. 17.60.60. Approval standards and conditions.

The approval authority may approve, approve with conditions, or deny an application based on the provisions of this chapter. The approval authority may require conditions necessary to comply with the intent and provisions of this chapter. Residential construction allowed under Subsection 17.60.40.B.3 is subject to the approval standards in ~~s~~Subsection B. All other uses are subject to the approval standards in ~~s~~Subsection A.

A. *Approval Standards.* The following approval standards apply to development proposed within restricted development areas of the FSH overlay district.

1. *Cumulative Impacts.* Limited development within the FSH overlay district, including planned vegetation removal, grading, construction, utilities, roads and the proposed use(s) of the site will not measurably decrease water quantity or quality in affected streams or wetlands below conditions existing at the time the development application was submitted.

2. *Impervious Surface Area.* Impervious surface area within restricted development areas shall be the minimum necessary to achieve development objectives consistent with the purposes of this chapter.

3. *Construction Materials and Methods.* Construction materials and methods shall be consistent with the recommendations of special reports, or third-party review of special reports.

4. *Cuts and Fills.* Cuts and fills shall be the minimum necessary to ensure slope stability, consistent with the recommendations of special reports, or third-party review of special reports.

5. *Minimize Wetland and Stream Impacts.* Development on the site shall maintain the quantity and quality of surface and groundwater flows to locally significant wetlands or streams regulated by the FSH Overlay District.

6. *Minimize Loss of Native Vegetation.* Development on the site shall minimize the loss of native vegetation. Where such vegetation is lost as a result of development within restricted development areas, it shall be replaced on-site on a two:one basis according to type and area. Two native trees meeting the standards in Section 17.92.50 ~~of at least one and one-half inch caliper~~ shall replace each tree removed. Disturbed understory and groundcover shall be replaced by native understory and groundcover species that effectively covers the disturbed area.

B. *Approval Standards for Residential Construction.* The following standards apply to residential construction allowed under Subsection 17.60.40.B.3.

1. *Cumulative Impacts.* Limited development within the FSH overlay district will not measurably decrease water quantity or quality in affected streams or wetlands below conditions existing at the time the development application was submitted.

2. *Impervious Surface Area.* The maximum impervious surface coverage within restricted development areas shall be 2,500 square feet, unless an exception is granted as part of a discretionary review, pursuant to Subsection 17.60.20.B.7.d.

3. *Construction Materials and Methods.* Construction materials and methods shall be consistent with the recommendations of special reports, or third-party review of special reports.

4. *Cuts and Fills.* Development shall not result in cuts or fills in excess of three feet except for basement construction, unless specifically approved by the Director as part of a discretionary review.

5. *Minimize Wetland and Stream Impacts.* Development on the site shall maintain the quantity and quality of surface and groundwater flows to locally significant wetlands or streams regulated by the FSH Overlay District, consistent with the recommendations of special reports, or third-party review of special reports.

6. *Minimize Loss of Native Vegetation.* Where native vegetation is lost as a result of development within restricted development areas, it shall be replaced on-site on a two:one basis according to type and area. Two native trees meeting the standards in Section 17.92.50 shall replace each tree removed. Disturbed understory and groundcover shall be replaced by native understory and groundcover species that effectively covers the disturbed area.

~~B~~C. All development permits for areas partially or fully within the Area of Special Flood Hazard shall be reviewed by the Director to determine that:

1. The permit requirements of Chapter 17.60 have been satisfied;

2. All other required state and federal permits have been obtained; and,

3. For residential construction allowed under Subsection 17.60.40.B.3, the standards in Section 17.60.70.E have been met; or

4. For all other uses, t~~T~~he site is reasonably safe from flooding.

~~C~~D. *Conditions.* The required reports shall include design standards and recommendations necessary for the engineer and landscape expert to certify that the standards of this chapter can be met with appropriate mitigation measures. These measures, along with third party reviewer and staff recommendations, shall be incorporated as conditions into the final decision approving the proposed development.

~~D~~E. *Assurances and Penalties.* Assurances and penalties for failure to comply with mitigation, engineering, erosion, and water quality plans required under this chapter shall be as stated in Chapter 17.06.

Sec. 17.60.70. Floodplain regulations.

This section regulates development within the Area of Special Flood Hazard.

A. *Residential and Non-residential Structures.* No new residential structures (including manufactured dwellings) with the exception of Subsection 17.60.40.B.3., non-residential structures or critical facilities shall be permitted in the Area of Special Flood Hazard.

B. *Flood Storage Capacity.* On-site flood storage capacity shall not decrease as a result of development. The cumulative effects of any proposed development shall not reduce flood storage capacity or raise base flood elevations on- or off-site.

C. *Public Facilities and Private Roads.* Generally, public facilities and private roads shall avoid restricted development areas. However, where avoidance cannot be achieved consistent with City-approved facilities master plans and sound engineering principles, the following standards shall be met.

1. The facility shall be designed, located and constructed to minimize flood damage, excavation and loss of native vegetation and to avoid raising flood levels. Facilities and roads located within a floodway may be permitted only where a registered professional engineer certifies based on hydrologic and hydraulic analysis performed in accordance with standard engineering practice that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge. Utilities necessary to serve permitted development, or a single family home on a legally-approved lot-of-record, may be permitted only where a registered professional engineer or architect certifies based on hydrologic and hydraulic analysis performed in accordance with standard engineering practice that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge, and that water quality will not be adversely affected.

2. Water supply and sanitary sewer facilities shall be designed, located and constructed to avoid infiltration of floodwaters into the system, and to avoid discharges from such facilities to floodwaters, streams and wetlands.

3. On-site septic systems, waste disposal systems, and private wells shall be prohibited within the FSH overlay district.

D. *Structural Elevation Report.* An application for any substantially improved structure, nonresidential structure or manufactured dwelling within the area of special flood hazard shall include the elevation, referenced to mean sea level, of the lowest floor, of the bottom of the lowest horizontal structural member (for manufactured dwellings), or the elevation to which the structure will be flood-proofed. The elevation of the lowest floor, and any basement area and the elevation of the service facilities/mechanical equipment shall also be provided. A professional engineer registered in Oregon shall prepare the structural elevation certificate.

E. *Existing Residential Structures (including new construction allowed per Subsection 17.60.40.B.3.).* Improvements and substantial improvements to an existing residential structure (including manufactured dwellings) or replacement of a single family residence per Subsection 17.60.20.B.8. in a flood-prone area shall comply with the following:

1. Improvements shall be adequately anchored to prevent flotation, collapse, or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;

2. Materials used shall be resistant to flood damage;

3. Utilities shall be designed and/or located to prevent water from entering or accumulating within the components during flooding;

4. The lowest floor (including basement) shall be elevated at least one foot above the base flood level;

5. Fully enclosed areas below the lowest floor used solely for vehicle parking or building access or storage in an area other than a basement shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters and shall either be designed and certified by a registered professional engineer or architect or meet or exceed the following minimum criteria;

   a. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

F. *Existing Non-Residential Structures.* Improvements and substantial improvements to existing non-residential structures within the floodplain shall comply with one of the following:

1. Elevate the lowest floor (including basement) at least one foot above the base flood level and ensure that any area below the elevated lowest floor meets the requirements of paragraph E.5. and E.5.a., above;

2. Walls and utilities of structures below the base flood level shall be floodproofed so that the structure is watertight with walls substantially impermeable to the passage of water and structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the applicable provisions of NFIP Regulations per Volume 44 of the Code of Federal Regulations.

Upon completion of the structure, certification by a registered professional engineer or surveyor that the elevation requirements of the lowest floor, including basement, of this section have been satisfied shall be provided to the Director for verification; or certification by a registered professional engineer or architect that the floodproofing requirements of this section are satisfied, including the specific elevation in relation to mean sea level to which such structures are floodproofed, shall be provided to the Director for verification.

G. *Recreational Vehicles.* Recreational Vehicles within the floodplain shall comply with one of the following:

1. Be located on the site for fewer than 180 consecutive days; and

2. Be fully licensed and ready for highway use; or

3. Meet the elevation and anchoring requirements for manufactured homes dwellings and permit requirements of NFIP Regulations.

H. *Anchoring.* All new construction and substantial improvements (including manufactured dwellings) shall be anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.

I. *Construction materials and methods.*

1. All new construction and substantial improvements shall be constructed with materials resistant to flood damage;

2. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage; and,

3. All new construction and substantial improvement shall be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

J. *Appurtenant Structures (Detached Garages and Storage Structures).* Appurtenant structures used solely for parking of vehicles or storage may be constructed such that the floor is below the Base Flood Elevation, provided the structure is designed and constructed in accordance with the following requirements:

1. Use of the appurtenant structure must be limited to parking of vehicles or storage;

2. The portions of the appurtenant structure located below the Base Flood Elevation must be built using flood resistant materials;

3. The appurtenant structure must be adequately anchored to prevent flotation, collapse and lateral movement;

4. Any machinery or equipment servicing the appurtenant structure must be elevated or floodproofed to or above the Base Flood Elevation;

5. The appurtenant structure must meet the floodway requirements of Chapter 17.60 and must not result in any increase in base flood elevations and this shall be demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practices;

6. The appurtenant structure must be designed to allow for the automatic entry and exit of flood waters in accordance with Subsection 17.60.70.E.5.;

7. The appurtenant structure must not be used to store toxic material, oil or gasoline, or any priority persistent pollutant identified by the Oregon Department of Environmental Quality unless confined in a tank elevated at least one foot above Base Flood Elevation; and

8. Shall not exceed the size requirements in the State of Oregon Residential and Structural Specialty Codes and shall not exceed one story.

Detached garages, storage structures and other appurtenant structures not meeting the above standards must be constructed in accordance with all applicable standards of Chapter 17.60.

Sec. 17.60.80. Notification to other entities and recordkeeping.

A. Whenever a watercourse is to be altered or relocated, notification shall be sent to Clackamas County and DLCD prior to such alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administrator through appropriate notification means (i.e. submittal of a Letter of Map Revision (LOMR)), and assure that the flood carrying capacity of the altered or relocated portion of said watercourse is maintained.

B. Base Flood Elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the Director shall notify the Federal Insurance Administrator of the changes by submitting technical or scientific data in accordance with Volume 44 Code of Federal Regulations Section 65.3. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data.

C. Notify the Federal Insurance Administrator in writing of acquisition by means of annexation, incorporation or otherwise, of additional areas of jurisdiction.

D. Obtain and maintain the following for public inspection and make available as needed:

1. Obtain and record the actual elevation (in relation to the mean sea level) of the lowest floor (including basements) of all new or substantially improved structures, and whether or not the structure contains a basement.

2. For all new or substantially improved floodproofed structures:

a. Verify and record the actual elevation (in relation to mean sea level), and

b. Maintain the floodproofing certifications required in Subsection 17.60.70.F.

3. Obtain and maintain certification for flood openings when certification is required under Subsection 17.60.70.E.5.

Sec. 17.60.90. Water quality treatment facilities.

Tickle Creek, the Sandy River, and associated natural drainage ways are vital to Sandy's recreationally based economy and to the quality of life of Sandy residents. Placement of water quality facilities shall be limited as follows:

A. The water quality facility shall not be constructed in restricted development areas, except where necessary to serve approved development within restricted development areas (e.g., a road) and where no reasonable alternative exists in buildable areas of the site.

B. Where the approval authority determines that a more efficient and effective regional site exists within the sub-basin, the water quality facility may be constructed off-site.

Sec. 17.60.100. Density transfer provisions.

Residential density transfer may be approved subject to the following:

A. *Required Setback Areas.* Density may be transferred from restricted development areas (i.e., steep slopes, protected water features and required setbacks) to buildable portions of the site.

B. *Density Maximum.* The maximum gross density for the buildable area of the site shall not exceed 150 percent of the maximum density allowed by the underlying zoning district for that buildable area.

C. *Housing Types Not Permitted in Underlying Zoning District.* Housing types not permitted in the underlying zoning district may only be approved through the SAP (specific area plan) process.

D. *Transfer Area.* Transfer of density may only occur within the same property and/or to properties contiguous to the primary property. The terms "primary property" identifies the legal lot from which density is to be transferred to "secondary property(s)." Further development or land use action on the primary or secondary properties shall be reviewed together in the same application.

(Ord. No. 2021-16 , § 9(Exh. I), 8-16-2021)

Sec. 17.60.110. Adjustments.

Variances to Chapter 17.60 provisions are not permitted. In contrast, adjustments to dimensional standards of the underlying zoning district may be approved when necessary to further the intent of this overlay district.

A. *Adjustment Option.* One or more adjustments to the setback, height, or lot area standards of the underlying zoning district may be approved to allow development consistent with the intent of the FSH overlay district. The intent of the adjustment process is to reduce adverse impacts on water quantity and quality, locally significant wetlands and perennial streams, and on the potential for slope or flood hazards.

B. *Adjustment Criteria.* A special FSH adjustment may be requested when development is proposed within the FSH overlay district. Adjustments are reviewed under the procedure type applicable to the primary application. The applicant shall demonstrate that the following criteria are fully satisfied:

1. The adjustment is the minimum necessary to allow a permitted use, while at the same time minimizing disturbance to restricted development areas.
2. Explicit consideration has been given to maximizing vegetative cover, minimizing excavation, and minimizing impervious surface area on restricted development areas.
3. Design options have been considered to reduce the impacts of development, including but not limited to multi-story construction, siting of residences close to streets to reduce driveway distance, maximizing the use of native landscaping materials, minimizing parking area and garage space.
4. In no case shall the impervious surface area (including the building footprint, parking areas, accessory structures, swimming pools and patios) exceed 2,500 square feet of restricted development area except for a private drive that reduces the disturbance to restricted development areas.
5. Assurances are in place to guarantee that future development will not encroach further onto restricted development areas under the same ownership.
6. The Planning Commission or Director may impose any reasonable condition necessary to mitigate identified impacts resulting from development on otherwise restricted development areas.

Sec. 17.60.120. Disclaimer.

The degree of hazard protection afforded by adherence to the provisions of this chapter is considered reasonable for regulatory purposes~~,~~ and is based on the best available engineering and scientific information available to the City. Larger floods than those anticipated by the chapter may occur. Landslides may occur ~~on rare occasions~~ in areas outside of the delineated steep slope and constrained slope boundaries. This chapter does not imply that areas outside the FSH overlay district or land use permitted within FSH boundaries will be free from any significant flooding, mass movement, landslide damage, erosion, or water pollution. This chapter shall not create liability on the part of the City of Sandy for any damage that results from reliance on the provisions of this chapter or any administrative decision lawfully made thereunder.

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CHAPTER 17.66 ADJUSTMENTS AND VARIANCES

Sec. 17.66.00. Intent.

Adjustments and variances are procedures to vary development standards normally applied to a particular district.

Sec. 17.66.10. Adjustments.

Adjustments are a ~~Type I or~~ Type II procedure that provide a means to vary the quantifiable development standards ~~normally~~ applied in a particular district or design standard. This option exists for those circumstances where uniform~~,~~ unvarying rules would prevent a more efficient use of a lot. An ~~typical~~ example is permitting a structure to be located closer to a ~~property boundary~~lot line than ~~normally~~ allowed by the zoning district regulations.

Adjustments apply only to individual lots and therefore cannot be used by applicants seeking to vary development standards for lots to be created through a ~~subdivision~~ land division process. Modifications to land division~~s~~ standards ~~should~~ shall be sought through the Type II or Type III Variance process.

An adjustment is intended to:

A. Allow more efficient use of land.

B. Provide flexibility and innovation in site planning and architectural design on individual lots.

C. Permit building location and/or construction techniques that conserve energy.

D. Minimize procedural delays and ensure due process in the review of unique development situations.

E. Provide relief from the strict adherence of land division development standards where site-specific physical or functional land development conditions warrant a variance.

(Ord. No. 2021-16 , § 11(Exh. J), 8-16-2021)

~~Sec. 17.66.20. Type I adjustments.~~

~~In issuing a permit the Director may grant or deny an adjustment under the Type I procedure if the request involves only the expansion or reduction by not more than ten percent of one or more quantifiable provisions of this Code.~~

~~Sec. 17.66.30. Type II adjustments.~~

Except in the case of a nonconforming development or use, the Director may grant or deny an adjustment ~~under the Type II procedure~~ if the request involves only the expansion or reduction by not more than 20 percent of one or more quantifiable provisions of this Code.

Sec. 17.66.40. ~~Type I and II a~~Adjustment criteria.

A. The proposed development will not be contrary to the purposes of this chapter, policies of the Comprehensive Plan, and any other applicable policies and standards adopted by the City;

B. The proposed development will not substantially reduce the amount of privacy enjoyed by users of nearby structures when compared to the same development located as specified by this Code;

C. The proposed development will not adversely affect existing physical systems and natural systems, such as ~~traffic~~the existing or planned transportation network, ~~drainage~~stormwater facilities, slopes greater than 25 percent, wetlands, creeks, ~~dramatic land forms,~~ or parks; and

D. Architectural features of the proposed development will be compatible to the design character of existing structures on adjoining properties and on the proposed development site.

Sec. 17.66.50. Adjustment limitations.

Adjustments may not be utilized to:

A. Reduce width of accessways required for flag lots created through the land partition or minor replat process.

B. Reduce the area reserved for private outdoor space and/or usable open space by more than ten percent.

C. Reduce project site amenities such as screening and/or landscaping provisions by more than ten percent.

D. Increase fence height inside clear-vision areas.

Sec. 17.66.60. Variances.

Variances are a means of requesting a complete waiver or major adjustment to certain development standards. They may be requested for a specific lot or as part of a land division application. The Type II variance process is ~~generally~~ reserved for major adjustments on individual lots, while variances to development standards proposed as part of a land division are processed as a Type III application. ~~(requiring a public hearing).~~

Sec. 17.66.70. Type II and type III variance criteria.

The authority to grant a variance does not include authority to approve a development that is designed, arranged, or intended for a use not otherwise approvable in the location. The criteria are as follows:

A. The circumstances necessitating the variance are not of the applicant's making.

B. The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.

C. Granting of the variance will not adversely affect implementation of the Comprehensive Plan.

D. The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.

E. The development will be the same as development permitted under this Code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.

F. Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.

Sec. 17.66.80. Type III special variances.

The Planning Commission may grant a special variance waiving a specified provision ~~for~~ under the Type III procedure if it finds that the provision is unreasonable and unwarranted due to the specific nature of the proposed development. In submitting an application for a Type III Special Variance, the proposed development explanation shall provide facts and evidence sufficient to enable the Planning Commission to make findings in compliance with the criteria set forth in this section while avoiding conflict with the Comprehensive Plan.

One of the following sets of criteria shall be applied as appropriate.

A. The unique nature of the proposed development is such that:

1. The intent and purpose of the regulations and of the provisions to be waived will not be violated; and

2. Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

B. The variance approved is the minimum variance needed to permit practical compliance with a requirement of another law or regulation.

C. When restoration or replacement of a nonconforming development is necessary due to damage by fire, flood, or other casual or natural disaster, the restoration or replacement will decrease the degree of the previous noncompliance to the greatest extent possible.

Sec. 17.66.90. Application.

The application shall include all of the items listed in Chapter 17.18 for submission of a land use application. ~~An application for an adjustment or variance shall be made on forms provided by the Director and include the following, where applicable~~:

~~A. Description of the land (address, lot, block, tract, or similar description) on which the proposed development is to take place.~~

~~B. Narrative addressing how the application meets the specified review criteria.~~

~~C. Site plan no larger than 11 inches by 17 inches (include a reduced copy if drawn larger) suitable for photocopy reproduction. The site plan shall be drawn to scale and show:~~

~~1. Relationship of the site to adjoining properties, streets, alleys, structures, public utilities, and drainageways;~~

~~2. Lot line dimensions;~~

~~3. Existing and proposed structures;~~

~~4. Structures on adjacent property(ies) affected by the request;~~

~~5. Vehicle and pedestrian access points and accessways;~~

~~6. Drainageways and any other prominent features;~~

~~7. Location of trees and shrubs over three feet in height;~~

~~8. Fences and walls;~~

~~9. Off-street parking facilities;~~

~~10. Any other information relevant to the proposal.~~

~~The Director may modify the submission requirements as necessary.~~

Sec. 17.66.100. Elevation of application type.

Prior to the decision date, the review of a Type ~~I or~~ II adjustment or variance, and any comments received, may cause the Director to elevate the request to a Type III Variance. In this case, the Director shall notify the Applicant and any parties in writing, giving the reason(s) that the application is found to qualify as a Type III Variance, requesting any additional information required by this Chapter, and requesting any additional fees applicable under the redefined application type. Upon receipt of new application materials and payment of the revised application fee, the Director shall schedule a public hearing in accordance with Chapter 17.20 and serve public notice as required in ~~this~~ Chapter 17.22.

Sec. 17.66.190. Effective period of approval.

Approval of an adjustment or variance shall be effective for a two-year period from the date of approval, unless substantial construction has taken place. The Director (Type I and Type II) or Planning Commission (Type III) may grant a one-year extension if the applicant requests such an extension prior to expiration of the initial time limit.

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CHAPTER 17.72 CONGREGATE HOUSING

Sec. 17.72.00. Purpose.

The purpose of a CH district is to provide housing alternatives for senior citizens, ~~elderly or~~ handicapped persons, and others living in a congregate housing facility. The standards set forth in this section are intended to ensure that congregate housing developments provide a minimum of services and facilities to accommodate the needs of the ~~residents~~ occupants and to relieve any possible detrimental effects of the development on surrounding properties.

Sec. 17.72.10. Justification.

This chapter recognizes that congregate housing ~~for senior citizens and handicapped persons~~ customarily has less impact on surrounding properties than typical multi-family developments providing the same number, or fewer units, and therefore, deserves special consideration.

Sec. 17.72.20. Establishment of congregate housing.

Congregate housing facilities may be permitted as conditional uses in the R-2, R-3 and C-1 zoning districts.

Sec. 17.72.30. Density standards.

The Planning Commission may increase the underlying density of the zoning district through the conditional use permit process if warranted based on the size of the dwelling units, number of proposed occupants, lesser impact on surrounding properties, and other relevant factors. Density is limited to the increase in the following chart:

Zone	Percentage of Increase
R-2	25%
R-3	50%
C-1	50%

Sec. 17.72.40. Dimensional standards.

The setbacks and height limitations shall be in compliance with the standards of the underlying zoning district.

Type	Standard
Minimum Lot Width, Depth, Frontage, Setbacks, Projections, and Accessory Structures, and Height	Same as underlying district
Landscaping	20%
Off-Street Parking	See Chapter 17.98

Sec. 17.72.50. Additional requirements.

~~A. *Age Restriction.* Congregate housing is intended for persons 55 years of age and older or handicapped persons.~~

A~~B~~. *Any principal or accessory use allowed in the zoning district may be provided.* These uses shall be primarily for ~~residents~~ occupants and guests.

B~~C~~. *Community Space.* All complexes shall have a minimum of 15 square feet of community space for social and recreational opportunities per occupant, based on one person per bedroom. Community space may include, but is not limited to:

1. Game room, meeting rooms, music or craft rooms.
2. Congregate Dining Facilities. Complexes with or without kitchen facilities in each unit may include congregate dining facilities providing regular daily meals for ~~residents~~occupants. Areas used as congregate dining areas may be applied to the minimum community space requirements.

C~~D~~. *Laundry and Storage.* A minimum of ten square feet of general storage area (80 cubic feet) other than regular kitchen, bedroom and linen storage shall be provided within each unit. Complexes, which do not include laundry facilities in the units, shall have adequate laundry facilities accessible to all tenants.

D~~E~~. *Design Standards.* The design of the building and the site and landscaping plans shall be subject to review. Special considerations for this use may include, but are not limited to:

1. Compatibility in style, colors, materials, and scale with the general character of the neighborhood.
2. Defining semi-public, semi-private and private spaces.
3. Minimizing barriers to handicapped or elderly persons.
4. Security and protection for ~~residents~~occupants.

CHAPTER 17.74 ACCESSORY DEVELOPMENT—ADDITIONAL PROVISIONS AND PROCEDURES[18]

Sec. 17.74.00. Intent.

These provisions are intended to establish the relationship between ~~principal~~primary and accessory development and specify criteria for regulating accessory developments.

In addition to uses expressly included in each zoning district as primary or conditional uses, each district shall provide for accessory developments identified in ~~this~~ the underlying zoning district and as specified in this chapter. When a proposed accessory use is not specified, the Director shall determine the appropriateness of the use and whether it is customarily associated with, and subordinate to, the ~~principal~~primary development. The Director shall base the decision on the similarity of the proposed accessory development to those developments specifically identified as accessory to the ~~principal~~primary developments and the relationship between the proposed accessory development and ~~principal~~primary development. The Director's determination shall be made in accordance with procedures set forth in Chapter 17.14—Request for Interpretation.

Sec. 17.74.10. Residential accessory structures.

Accessory structures (e.g., sheds) may be constructed or installed when in conformance with the standards of this section. A detached accessory structure shall be separated from the primary structure by at least six feet. An accessory structure located closer than six feet from the primary structure shall be considered attached and is required to comply with the same setbacks as the primary structure.

A. *Detached Accessory Structure Setbacks.* Table 17.74.10 below and Figures 17.74.10.A. and B. specify setbacks for detached accessory structures. If not specified below, these structures are subject to the standards identified in the respective zoning district where the structure is to be located. For purposes of these regulations, solariums, greenhouses, garages, or other enclosed areas which are attached to the residential structure shall not be considered accessory but shall be considered part of the primary building~~main dwelling~~. Rigid frame fabric structures are considered accessory structures subject to these standards.

Table 17.74.10: Setbacks for Detached Accessory Structures (Sheds)

Accessory Structure Size	Interior Side Yard Setback	Rear Yard Setback
Up to 120 sq. ft., Up to 10 ft. tall	1 foot	1 foot
Up to 120 sq. ft., Up to 12 ft. tall	3 feet	3 feet
Larger than 120 sq. ft. up to 200 sq. ft. and up to 12 ft. in height	3 feet	3 feet
Larger than 200 sq. ft. or taller than 12 ft. in height	5 feet minimum or same as primary structure whichever is greater	15 feet minimum or same as primary structure whichever is greater

[18]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2014-05, effective June 2, 2014. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

Figure 17.74.10–A: Interior Lot

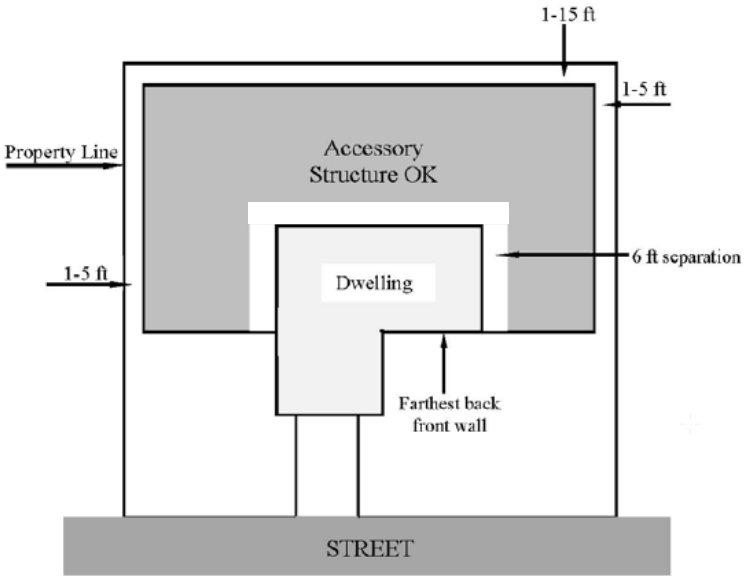
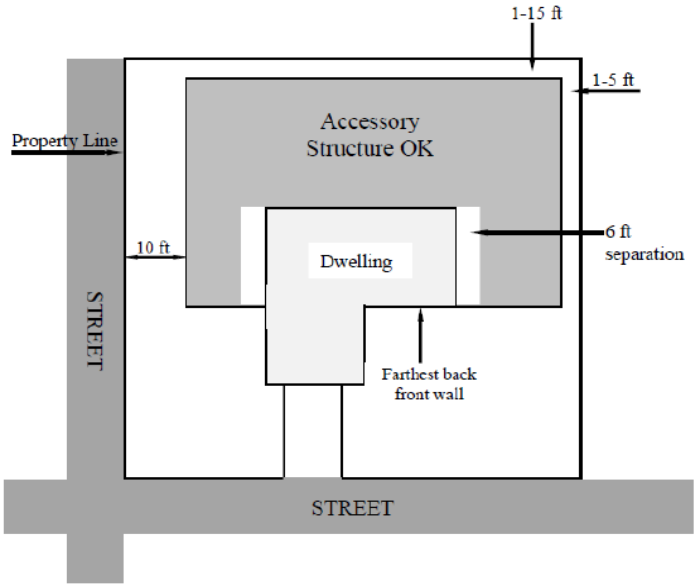


Figure 17.74.10-B: Corner Lot



B. *General Standards.*

1. No accessory structure shall be located in front of the ~~principal~~primary building. If located to the side of the ~~principal~~primary building on an interior lot, the structure shall not be placed closer to the front lot line than the farthest back front wall of the ~~principal~~primary building.
2. An accessory structure located on the street side of a corner lot shall follow the same setbacks as the ~~principal~~primary building. ~~(ten feet).~~
3. The roof of the structure shall be constructed so that water runoff from the structure does not flow onto an abutting parcel.
4. Accessory structures for private vehicle storage which have an entrance from the street side yard, ~~(~~except alleys~~)~~ shall have a minimum street side yard setback of 20 feet.
5. The total accumulative square footage of all accessory structures on an individual lot shall not exceed 1,200 square feet.
6. ~~No~~An accessory structure shall not exceed a maximum height of 16 feet.
7. An accessory structure may be located on an adjacent lot that does not contain a primary structure provided:
   a. Both lots are under the exact same ownership; and
   b. A deed restriction is recorded requiring the accessory structure to be removed within 30 days of transfer of ownership of either lot into separate ownership; and
   c. The accessory structure complies with setback requirements as applied to the lots under same ownership.
8. Exception for Temporary Use of Rigid Frame Fabric Membrane Structures. Exceptions to these standards may be made by the ~~Planning~~ Director for temporary storage of materials for not more than three days within any 30-day period.

Sec. 17.74.20. Projecting building features.

A. *Setback Projections.* The following building features may project into ~~portions of~~ a required yard setback by no more than the amount specified below:

Table 17.74.20: Projections into Setbacks for ~~Projecting~~ Building Features

Feature	Front Yard	Side Yard	Rear Yard
Architectural Appendages[1]	5 ft.	2½ ft.	5 ft.
Awnings	5 ft.	2½ ft.	5 ft.
Chimneys	5 ft.	2½ ft.	5 ft.
Decks (unroofed) - ground level 30 inches in height or less	5 ft.	2½ ft.	Footnote[2]
Decks (unroofed) - ground level more than 30 inches in height or second story (building permit required)	5 ft.	2½ ft.	Footnote[3]
Eaves	5 ft.	2½ ft.	5 ft.
Fire Escapes, Landings (unroofed) and Stairs	5 ft.	2½ ft.	5 ft.
Planters	5 ft.	2½ ft.	5 ft.
Porches (roofed)	5 ft.	2½ ft.	Footnote[3]
Windows (bow or bay)	5 ft.	2½ ft.	5 ft.

Footnotes:

[1] Architectural features shall not include any portion of a structure built for the support, conveyance, occupancy, shelter, or enclosure of persons, chattels, or property of any kind.

[2] Must maintain a minimum rear yard setback from rear property line of five feet.

[3] Must maintain a minimum rear yard setback from rear property line of ten feet.

B. *Vertical Projections.* Height limitations shall not apply to the following:

1. Fire and parapet walls.
2. Penthouses or roof structures for the housing of elevators, stairways, tanks, ventilating fans or similar equipment required to operate and maintain a structure. No penthouse or roof structure or any space above the height limitation shall be allowed for the purpose of providing additional floor space.
3. Smokestacks.
4. Steeples.
5. Windmills.
6. Other similar structures.

Sec. 17.74.30. Vision clearance area.

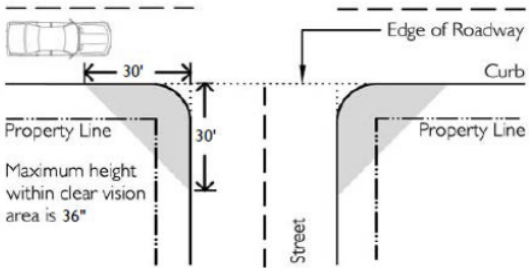
A. A vision clearance area shall be maintained on each corner of ~~property~~ a lot or tract at the intersection of two streets, or the intersection of a street with an alley. No visual obstruction (e.g., sign, structure, solid fence, or vegetation) shall be placed or located in the "vision clearance area" between the height of ~~36 inches (~~three feet~~)~~ and eight and one-half feet measured from the street grade or alley grade at the curb line, or where curbs are absent from the edge of asphalt as specified in the table below.

B. A vision clearance area shall consist of a triangular area formed by the intersection of the curb lines, measured from the street grade or alley grade at the curb line, or where curbs are absent from the edge of asphalt as specified below.

Table 17.74.30. Vision Clearance Distances

Functional Street Classification	Measurement along curb line
Intersection of a street and an alley	20 feet
Intersection of a street and another street	30 feet

Figure 17.74.20 – Vision Clearance Measurement



C. The foregoing provisions shall not apply to the following:

1. A public utility pole, signal pole, light pole, or other utility appurtenance.
2. A tree trimmed (to the trunk) to a line at least eight feet above the level of the intersection.
3. Vegetation that is not planted in the form of a hedge and which is so planted and trimmed to leave at all seasons a clear and unobstructed cross view.
4. A supporting member or appurtenance to a permanent building lawfully existing on the date this Code is adopted.
5. An official warning sign or signal.
6. A place where the natural contour of the ground is such that there can be no cross-visibility at the intersection.
7. A sign mounted ten feet or more above the ground with supports that do not encroach into the clear vision area.
8. A signalized intersection.

Sec. 17.74.40. Fences and retaining walls~~windscreens~~.

A. *Fences—Residential.*

1. *Fences on corner lots.* Any fence or retaining wall, constructed upon or adjacent to any property line that abuts two or more intersecting streets, shall not exceed three feet in height within the vision clearance area as specified in Section 17.74.30.
2. *Fences in a front yard.* The height of a fence or retaining wall in a front yard shall not exceed four feet.
3. *Fences—Side and rear yards abutting streets.* The height of a fence, ~~or~~ retaining wall, or a combination of the two in a side or rear yard abutting a public right-of-way shall not exceed six feet above the grade of the right-of-way.
4. *Fences—Side and rear yards abutting other lots.* The height of a fence, ~~or~~ retaining wall, or a combination of the two in a side or rear yard abutting other lots shall not exceed eight feet above the grade of the right-of-way.
5. *Sight Obscuring Hedges.* Trees or shrubs that form a sight-obscuring hedge shall comply with the same height requirement as a fence within the clear vision area. Deciduous trees separated by at least 15 feet may grow to any height.
6. *Front Yard Fences for Existing Dwellings on Major Arterials.* The height of a fence in a front yard for an existing dwelling (constructed prior to July 1, 1996) facing a major arterial shall not exceed a height of six feet outside the clear vision area.
7. *Fences on Through Lots.* Gates are required in rear-yard fences on through lots since it remains the property owners' responsibility to maintain the area from the curb or edge of pavement to a proposed fence.

B. *Fences—Commercial/Industrial.*

1. *Fences on corner lots.* Any fence or retaining wall, constructed upon or adjacent to any property line that abuts two or more intersecting streets, shall not exceed three feet in height within the clear vision area.
2. *Fences in a front yard (Commercial).* The height of a fence or retaining wall in a front yard shall not exceed four feet.

3. *Fences in a front yard (Industrial).* The height of a fence or retaining wall in a front yard shall not exceed six feet.

4. *Fences—Side and Rear Yards.* The height of a fence or retaining wall adjacent to a side or rear yard or a side or rear property line shall not exceed eight feet.

5. *Sight Obscuring Hedges.* Trees or shrubs that form a sight-obscuring hedge shall comply with the same height requirement as a fence within the clear vision area. Deciduous trees separated by at least 15 feet may grow to any height.

C. *Fence Regulations for Recreation Areas.* Any recreational court may be enclosed by a wire fence not exceeding 12 feet in height provided that no part of the court fence is within 20 feet of any street.

D. *Fence Regulations for Swimming Pool/Hot Tub Areas.* A swimming pool, hot tub, or other human-made outside body of water, which has a depth greater than 18 inches shall be enclosed with a fence not less than four feet and not more than eight feet in height. If located on or surrounded by a deck, the deck shall be enclosed with a railing with a height of not less than four feet and not more than eight feet. The fence or railing shall not have any openings, holes, or gaps larger than four inches square, except for doors or gates. Any gate shall be equipped with a self-closing, self-latching device. A dwelling unit and/or accessory building may form part of the enclosure.

~~Exception: This regulation does not apply to wetland areas and storm water detention facilities. However, fencing requirements may be imposed through the design review process.~~

E. *Fence Regulations for Stormwater Detention Facilities and Human-Made Wetlands.* A stormwater detention facility or human-made wetlands, which is designed for a water depth greater than 18 inches, shall be enclosed with a black coated chain link fence not less than six feet and not more than eight feet in height.

F~~E~~. *Wire Fences.*

1. Barbed wire fencing may be permitted for agricultural, community service, commercial or industrial uses when the wire is employed on the top of any other type of fencing, and when the barbed wire is a minimum of six feet above the finished ground surface~~,~~ and does not extend over a public right-of-way. The maximum height shall not exceed eight feet.

2. No electrically charged or sharp pointed fencing such as razor wire (other than barbed wire fencing) shall be constructed or maintained within the city limits.

G~~F~~. Fences in excess of ~~six~~ seven (7) feet in height require a building permit in accordance with Title 15.

(Ord. No. 2021-03 , § 6(Exh. F), 5-17-2021)

Sec. 17.74.50. Decks.

A. Decks may encroach into required yard areas as specified in Section 17.74.20, above.

B. Decks greater than 30 inches in height require a building permit ~~for structural~~ in accordance with Title 15. ~~and zoning review.~~

Sec. 17.74.60. Temporary uses or structures.

A. *Temporary Uses.* Temporary uses, as defined in Chapter 17.10—Definitions, not located within a structure, may be permitted for a period not to exceed 90 days, provided a temporary permit is first obtained under the Type I procedure. Renewal of a temporary permit shall be processed under the Type II procedure. ~~and may require a public hearing.~~

B. *Temporary Structures.* Temporary structures in connection with the building or sale of dwellings and land, and construction of industrial or commercial facilities may be permitted, for a period not to exceed one (1) year, provided a temporary permit is first obtained under the Type I procedure. Renewal of a temporary permit shall be processed under the Type II procedure. ~~and may require a public hearing.~~

C. *Portable Outdoor Storage Unit.* Portable outdoor storage units may be placed on a lot, including within the setback areas, for not more than 60 days (any portion of a day, between 12:00 a.m. and ending at 11:59 p.m., shall be counted as a day) within any 12 month period. Portable outdoor storage units shall not be located in the public right-of-way and shall not restrict access to any walkway.

Sec. 17.74.70. Accessory dwelling units.

Accessory dwelling unit (ADU) regulations are intended to:

- Provide a cost-effective means of serving development through the use of existing infrastructure, rather than requiring new infrastructure to serve development.
- Increase the supply of affordable housing without government subsidies.
- Benefit older homeowners, single parents, young homebuyers, and people with disabilities.
- Integrate affordable housing more uniformly in the community.
- Provide a means for adult children to give care and support to a parent in a semi-independent living arrangement.
- Help maintain the Urban Growth Boundary (UGB) by creating more housing opportunities within existing urban areas.

A. *Permitted Zoning Districts.* Accessory dwelling units (ADU) are permitted in the following zoning districts: Single-Family Residential (SFR), Low Density Residential (R-1), Medium Density Residential (R-2), High Density Residential (R-3), Central Business District (C-1) and Village Commercial District (C-3). An ADU shall not be permitted on the same lot as a duplex.

B. *Dimensional Standards.*

Type	Standard
Minimum Average Lot Width, Frontage, Depth	Same as underlying zoning district
Maximum square footage	720 sq. ft.
Maximum number of occupants	3
Setbacks	Same as underlying zoning district
Structure Height	Same as underlying zoning district
Building Site Coverage	No maximum
Off-Street Parking	No minimum
Landscaping	Same as underlying zoning district

C. *Design Standards.*

1. The accessory dwelling unit shall be accessory to the primary residence.
2. The ADU shall have a pedestrian walkway that connects the primary entrance of the ADU to the public sidewalk. The pedestrian walkway shall consist of ~~materials such as~~ concrete, asphalt, stone, brick, permeable pavers and shall be permanently affixed to the ground with gravel subsurface. ~~, or~~ O~~o~~ther materials may be requested as part of a discretionary review and ~~as~~

approved by the Director. ~~The pedestrian walkway shall be permanently affixed to the ground with gravel subsurface or a comparable subsurface as approved by the Director.~~

3. An ADU may be ~~either~~ stick-built, ~~or a~~ modular/prefabricated, or a manufactured home ~~dwelling unit~~ in compliance with Section 17.90.140.

4. Detached ADUs shall provide at least three of the Required Design Elements~~design standards consistent with~~ in Subsection 17.90.150.F on the street-facing façade(s) and shall provide at least ten percent windows on the ground floor elevation of the street facing façade(s). These standards apply even if the ADU is located behind the primary residence.

5. Primary entrances shall not be in front of the primary residence.

D. *Permit Issuance.*

1. A permit to construct or alter a dwelling to accommodate an ADU may be issued under a Type I procedure if the application is in compliance with the ADU standards.

2. Required permit information shall be limited to that for single-family dwellings.

3. Construction permit fees shall be based on the same fee schedule as a single-family dwelling.

4. An ADU~~s~~ may be added to an existing residential dwelling or built concurrently with a new residence.

E. *Additional Requirements.*

1. The ADU shall connect to municipal water in accordance with the 2022 Water System Master Plan. ~~and sanitary sewer if the primary dwelling is connected to the municipal water and sewer system.~~

2. The ADU shall connect to municipal sewer if service is currently within 200 feet of the site, as measured from the nearest property line. Sites more than 200 feet from municipal sewer, shall only be approved to connect to an alternative disposal system provided all of the following are satisfied:

   a. A county septic permit is secured and a copy is provided to the City;

   b. The property owner executes a waiver of remonstrance to a local improvement district and/or signs a deed restriction agreeing to complete improvements, including but not limited, to curbs, sidewalks, sanitary sewer, water, storm sewer or other improvements required under Chapter 17.84;

   c. The minimum size of the property is one acre or is a pre-existing legal lot, as determined by the City;

   d. Site consists of a legal lot(s) created through dividing property in the city, which is less than five acres in size.

~~2~~3. The accessory dwelling unit shall meet applicable building code requirements for two-family dwelling units, pursuant to SMC 15.04.120.

~~3~~4. ~~Illegal~~ Non-permitted ADUs may be ~~legalized~~ permitted if they ~~conform, or~~ are brought into conformance with the Sandy Municipal Code and the Building Code, pursuant to SMC 15.04.120, and including approval of a land use application. ~~Oregon Structural Specialty Code.~~

~~4. Periodic review of ADUs shall be conducted by the City to evaluate and reconsider existing densities.~~

(Ord. No. 2021-03 , § 6(Exh. F), 5-17-2021)

Sec. 17.74.80. Home businesses.

The provision for a home business is in recognition of the needs of many people who are engaged in small-scale business ventures, which cannot be expanded to a full-scale enterprise. It is the intent of this section that full-scale commercial or professional operations, which would ordinarily be conducted in a commercial or industrial district, continue to be conducted in the appropriate zoning district and not a dwelling. These regulations apply to family day care businesses.

A. *Home Business Regulations.*

1. No sign is used other than a nameplate indicating the name of the resident (not the business name) not over two sq. ft. in area.
2. There is no display that will indicate from the exterior that the building is being used in whole or in part for any purpose other than a dwelling.
3. There is no outside storage of materials other than plant materials.
4. The home occupation is licensed by the ~~c~~City.
5. There is no more than one non-resident employee working on the site.
6. The building retains the characteristics of a residence.
7. The use does not destroy the residential character of the neighborhood.

B. *Complaint Procedures.*

1. Complaints on Items 1 through 5 will be handled routinely by the Director.
2. Complaints on Items 6 and 7 will be dealt with as follows:
    a. Upon receipt of three written complaints specifically stating the nature of the objection from three separate households located within 300 feet of the boundary of the affected property, the Director shall:
        i. Investigate the complaints;
        ii. Prepare a report to the Planning Commission; and,
        iii. Schedule a public hearing before the Planning Commission to make a decision on the validity of the complaint.
3. Standards evaluating complaints shall include:
    a. Generation of excessive traffic;
    b. Monopoly of on-street parking spaces;
    c. Frequent deliveries and pickups by motor freight;
    d. Noise in excess of that created by normal residential use (either in terms of volume or hours of occurrence);
    e. Smoke, fumes, or odors in excess of those created by normal residential use;
    f. Other offensive activities not in harmony with a residential neighborhood.
4. Planning Commission Action. The Planning Commission, upon hearing the evidence may:
    a. Approve the use as it exists;
    b. Require the use to be terminated;

c. Impose appropriate restriction, such as limiting hours of operation, establishing a phase-out period or other measures insuring compatibility with the neighborhood.

Sec. 17.74.90. Food and beverage carts.

A. *Intent.* The purpose of these regulations is to permit food and beverage carts on a year-round basis where eating and drinking establishments are permitted outright.

B. *Applicability.* The provisions of this section apply to food and beverage carts used in the preparation and/or sales of food and beverage items to the general public. Drive-through uses are not permitted as food carts under this section. Carts must be mobile units but are not permitted to operate from a motorized vehicle. An example of a mobile unit that meets this standard includes a trailer modified for the purpose of selling food (but not a food truck or RV). Food and beverage carts used at temporary duration events of three days or less are not subject to the motorized vehicle restrictions but are subject to the requirements of Section 17.74.60 for a temporary use.

C. *Permit Required.*

1. Food and Beverage Carts are required to obtain a ~~Food Cart Permit~~land use approval and a City of Sandy Business License prior to operating.

2. The initial permit review for a Food Cart ~~Permit~~ Location shall follow a Type II review procedure per the requirements of Chapter 17.18.

~~3. Food Cart permits are valid for the calendar year in which they are issued and will be renewed through a Type I procedure, except if the use was the subject of a City Code Enforcement action. If an enforcement action has occurred, the use shall be reviewed at the time of renewal following the Type II review procedure.~~

D. *Submission Requirements for Food Cart Location.* An application for a permit to allow operation of one or more food carts on private property shall be on forms provided by the ~~Director~~ City and include materials listed as follows:

1. A completed General Land Use Application and application fee.

2. List and mailing labels for property owners within ~~200~~ 300 feet of the subject property.

3. Site plan drawn to scale including:

a. Site dimensions.

b. Relationship of the site to adjoining properties, streets, alleys, structures, public utilities, and drainage ways.

c. Number and location of food carts on the site.

d. Individual square footage of all food carts.

e. Accessible pedestrian route clearances.

f. Size, location, and clearances of customer seating areas.

g. Vehicular circulation and access points.

h. Parking, maneuvering and loading areas.

i. Location and design elevation of all structures.

j. Location and specification of landscaped areas.

k. Location and specifications of food cart pads.

l. Location and design of fences and walls.

m. Number and location of trash and recycling areas.

n. Location and type of auxiliary storage.

~~4. Pictures or architectural elevations of proposed food cart(s).~~

~~5~~4. Proximity to bathroom and written permission, if applicable.

~~6~~5. Disposal plan for wastewater and gray water.

~~7~~6. Exterior lighting plan indicating location, size, height, typical design, material, color, and method of illumination.

~~8. Written verification that the food cart has been inspected and meets applicable County Health regulations.~~

~~9~~7. Any additional information that may be required by the Director to properly evaluate the proposed site plan.

~~10~~8. The Director may waive any of the requirements above where determined that the information required is unnecessary to properly evaluate the proposal.

E. *Submission Requirements for Individual Food Cart*. An application for a permit to allow operation of a food cart on private property shall be on forms provided by the City and include materials listed as follows:

1. A completed Food Cart Permit Application and application fee.

2. City of Sandy Business License and fee.

3. Pictures or architectural elevations of the proposed food cart.

4. Written verification that the food cart has been inspected and meets applicable County Health regulations, and OLCC regulations, as necessary.

5. Written verification that the food cart has been inspected and approved by the Fire Marshal.

F. *Standards for Food and Beverage Carts.* An application for a food and beverage cart shall be reviewed for compliance with the following standards:

Location and Design.

1. Drive-through uses are not permitted in food carts.

2. Carts shall not exceed 20 feet in length, not including the trailer hitch, or be greater than 200 square feet.

3. All carts shall be placed on a paved surface such as but not limited to concrete, asphalt or pavers, or other approved material excluding gravel. If new paved surface is added to a site to accommodate a cart, the parking area shall comply with applicable parking design standards contained in Chapter 17.98.

4. Carts shall be located at least three feet from the public right-of-way or back of sidewalk, whichever provides the greater distance from the public right-of-way.

5. Carts shall be located at least five feet away from other carts.

6. Carts shall not be located within 25 feet of an active driveway entrance as measured in all directions from where the driveway enters the site at the edge of the street right-of-way.

7. Carts shall not occupy fire lanes or drive aisles necessary for vehicular circulation or fire/emergency vehicle access and shall be stabilized as approved by the Fire Marshal.

8. Customer service windows shall be located at least five feet from an active drive aisle used by cars.

9. Carts shall not occupy pedestrian walkways or required landscape areas.

10. Carts shall not occupy parking needed to meet minimum vehicle and bicycle parking requirements per Chapter 17.98. Blocking automobile access to parking spaces shall be considered occupying the spaces.

11. Each food cart shall provide a minimum of one paved off-street parking space for employee use or provide proof of written permission from an adjacent business or property owner within one-quarter mile of the subject site allowing the food cart operator to share parking facilities, unless exempt in accordance with Section 17.98.20 (A)(1).

12. The exterior surfaces of all carts shall be clean and free from dents, rust, peeling paint, and deterioration, and windows shall not be cracked or broken. Day-glo and highly reflective colors are prohibited.

13. Each cart shall provide an awning for shelter to customers with a minimum clearance of seven feet between the ground and the awning.

14. ~~Tents and canopies~~Awnings shall not have ~~not~~ tears, mold, or broken or non-functioning supports and shall be securely anchored.

15. Carts shall limit the visual effect of accessory items not used by customers, including but not limited to tanks, barrels, etc. by screening with a site-obscuring fence or landscaping, or containing them within a small storage shed.

16. All seating areas shall be located on the subject property at least ten feet from a food cart and seating areas shall be separated from parking areas by an approved fence or barrier.

17. Signage shall comply with Chapter 15.32, Sign Code regulations. Each cart is permitted one A-frame sign.

18. Auxiliary storage shall be provided on site when there are four or more food carts. The structure for auxiliary storage shall meet Chapter 17.90, Design Standards.

Fire Safety.

19. Carts shall meet Fire Code requirements regarding distances from other structures or combustible materials.

20. Any cooking ~~device~~ equipment producing smoke ~~within a food cart that creates~~or grease-laden vapors shall be equipped with an ~~provide an~~ approved ~~hood and~~ fire-extinguishing system and an exhaust system that complies with all equipment and performance standards found in NFPA or as otherwise ~~, or be the type with a self-closing lid as approved~~ approved by the Fire Marshall.

21. Appropriate fire extinguishers are required as approved by the Fire Marshal.

22. Propane tanks shall be stored and handled properly and be located at least ten feet from combustible vegetation and trash receptacles and 20 feet from a potential ignition source. Propane tanks shall remain outdoors and be secured from falling. LP-Gas systems on carts shall be certified for compliance with NFPA 58 by an approved company with expertise in installation, inspection, and maintenance of LP-Gas systems.

23. Carts shall not have any internal floor space available to customers.

Health and Sanitation.

24. Trash and recycle receptacles shall be provided on site, and must be emptied and maintained. Trash and recycle receptacles shall be provided at a rate of one receptacle for every food cart. Where the food cart operator proposes to provide a common seating area a minimum of one trash receptacle and one recycle receptacle shall be provided in the common seating area.

25. Restrooms with handwashing facilities shall be provided for employees and customers. The restroom can be on-site or within one-quarter mile or a five-minute walk (such as at a neighboring business) and must be available during the cart's hours of operation. If the restroom is not on-site, the food cart operator shall submit written permission from an adjacent business or property owner where the facility is located.

26. Sites containing more than one food cart shall provide a restroom facility on-site.

27. Wastewater and gray water shall be disposed of properly without harm to the environment or city infrastructure. An approved disposal plan shall detail storage and removal methods and meet the requirements of Title 13 of the Sandy Municipal Code.

28. Food carts that are fully contained; i.e., carts that provide their own water, power, and waste disposal, are permitted with no additional utility considerations beyond the permitting process and site plan approval described herein. Food carts that require a water source, power source, or waste disposal location are permitted only where the Director has approved site plans that show safe access and location of the aforementioned provisions. Such provisions may be subject to all applicable building permits and System Development Charge requirements.

~~F~~G. *Conditions of ~~Permit~~Land Use Decision. ~~. The permit issued shall be in a form deemed suitable by the Director.~~* In addition to naming the property owner as permittee and other information deemed appropriate, the ~~permit~~ land use decision shall contain the following minimum conditions.

1. ~~Permit~~ Land Use Decision requirements for individual food cart:

   a. An approved City of Sandy Business License.~~Each food cart permit issued shall terminate December 31 of the year in which it is issued.~~

   b. The permit issued shall be personal to the permittee only and is not transferable in any manner. The permittee will be responsible for compliance with all conditions of approval.

   c. The permit is specifically limited to the area approved or as modified by the Director.~~, and will include a site plan indicating the area approved for the operation of one or more food carts and the location of common seating areas, if provided.~~

2. Requirements for properties containing one or more food carts:

   a. The property containing one or more food carts and all things placed thereon shall at all times be maintained in a safe, clean, and orderly condition. Only those things authorized by the ~~permit~~ land use decision and shown on the site plan may be stored on the subject property.

3. Additional licensing requirements: All mobile food carts shall be appropriately licensed and approved for operation in Clackamas County as a Class I—IV mobile food cart. Additionally, each food cart ~~shall~~ may be inspected by the ~~Sandy~~ Fire Marshal ~~Department once per calendar year,~~ as warranted by the ~~Sandy Fire Department~~Fire Marshal. All food carts are subject to all applicable ~~c~~City, county, and state regulations. The property owner shall ensure that each food cart located on the subject site complies with these regulations.

~~G~~H. *Denial, Revocation or Suspension of Permit.*

1. A food cart permit shall be subject to revocation by the Director if the application is found to include false information or if the conditions of approval have not been complied with or are not being maintained.

2. Food carts that have not been in use for over 30 days are determined defunct and shall be removed from the private property which they are located.

3. Food carts that have not been in use for over 60 days are determined abandoned and shall be removed in accordance with nuisance regulations as described in Title 8 of the Sandy Municipal Code.

4. Reapplication for a food cart, which has been denied or revoked, cannot be made within one year from the date of the Director's action, except that the Director may schedule a hearing before the City Council if there is new evidence or a change in circumstances.

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CHAPTER 17.80 ADDITIONAL SETBACKS ON COLLECTOR AND ARTERIAL STREETS[19]

Sec. 17.80.00. Intent.

The requirement of additional special setbacks for development on arterial or collector is intended to provide better light, air, and vision on more heavily traveled streets. The additional setback~~,~~ on substandard streets~~,~~ will protect collector and arterial streets and permit the eventual widening of streets.

Sec. 17.80.10. Applicability.

These regulations apply to all collector and arterial streets as identified in the ~~latest adopted~~ 2023 City of Sandy Transportation System Plan (TSP). The Central Business District (C-1) is exempt from Chapter 17.80 regulations.

Sec. 17.80.20. Specific setbacks.

Any structure located on streets listed above or identified in the 2023City of Sandy Transportation System Plan as arterials or collectors shall have a minimum setback of 20 feet measured from the property line. This applies to applicable front, rear, and side yards.

CHAPTER 17.82 SPECIAL SETBACKS ON TRANSIT STREETS[20]

Sec. 17.82.00. Intent.

The intent is to provide for convenient, direct, and accessible pedestrian access to and from public sidewalks and transit facilities; provide a safe, pleasant, and enjoyable pedestrian experience by connecting activities within a structure to the adjacent sidewalk and/or transit street; and, promote the use of pedestrian, bicycle, and transit modes of transportation.

Sec. 17.82.10. Applicability.

This chapter applies to all residential development located adjacent to a transit street. A transit street is defined as any street designated as a collector or arterial, ~~unless otherwise designated in the~~ or other streets meeting the "transit street" definition in the 2020 Sandy Transit ~~System~~ Master Plan.

[19]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2018-29, effective December 5, 2018. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

[20]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2018-29, effective December 5, 2018. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

Sec. 17.82.20. Building orientation.

A. For the purposes of this section, a building entrance that is "oriented toward" a street or other feature shall:

1. Face the street/feature or be at an angle of up to 45 degrees from the street/feature; and

2. Be located within [XX] feet of the street/feature.

B~~A~~. All residential ~~dwellings~~buildings shall have at least one ~~their~~ primary entrance~~s~~ oriented toward a transit street rather than a parking area, or if not adjacent to a transit street, toward a public right-of-way or private walkway which leads to a transit street.

C~~B~~. Dwellings shall have a primary entrance connecting directly between the street and building interior. A ~~clearly marked, convenient, safe and~~ lighted pedestrian route shall be provided to the entrance, from the transit street. The connection may not be more than 20 feet longer or 120 percent of the straight line distance. The pedestrian route shall consist of ~~materials such as~~ concrete, asphalt, stone, brick, or permeable pavers and shall be permanently affixed to the ground with gravel subsurface.~~, or o~~ Other materials may requested as part of a discretionary review and ~~as~~ approved by the Director. ~~The pedestrian path shall be permanently affixed to the ground with gravel subsurface or a comparable subsurface as approved by the Director~~.

C. Primary dwelling entrances shall be ~~architecturally emphasized and~~ visible from the street~~, and~~ shall include a covered porch at least five feet in depth, and shall be architecturally emphasized using with one or more of the following features: transom windows (minimum area 3 square feet); at least two ornamental light fixtures flanking the entry; a larger door (125% of minimum door size); a door with at least 50% transparent glazing; or pilasters or columns that frame the doorway.

D. If the site has frontage on more than one transit street, the dwelling shall provide one ~~main~~ primary entrance oriented to a transit street or to a corner where two transit streets intersect.

E. *Exception for Flag Lots.* Single-family homes, duplexes, or a single-family home converted to a duplex on a flag lot where the driveway approach to the flagpole is on a transit street and the lot does not have additional frontage on a second transit street are exempt from the standards of Subsections 17.82.20.B. and C.

(Ord. No. 2021-03 , § 7(Exh. G), 5-17-2021)

CHAPTER 17.84 IMPROVEMENTS REQUIRED WITH DEVELOPMENT[21]

Sec. 17.84.00. Intent.

This chapter provides general information regarding improvements required with residential, commercial, and industrial development. It is intended to clarify timing, extent, and standards for improvements required in conjunction with development. In addition to the standards in this chapter, additional standards for specific situations are contained in other chapters.

Sec. 17.84.10. Exceptions.

Single family residential and duplex development on existing lots with existing public improvements ~~is~~ are exempt from this chapter, with the exception of 17.84.30 Pedestrian and Bicyclist Requirements.

Sec. 17.84.20. Timing of improvements.

A. All improvements required by the standards in this chapter shall be installed concurrently with development, as follows:

1. Where a land division is proposed, each proposed lot shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to approval of the final plat.
2. Where a land division is not proposed, the site shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to temporary or final occupancy of structures.

B. Where specific approval for a phasing plan has been granted for a subdivision, improvements may similarly be phased in accordance with that plan.

(Ord. No. 2021-16 , § 12(Exh. K), 8-16-2021)

Sec. 17.84.30. Pedestrian and bicyclist requirements.

A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:

1. Sidewalks shall be a minimum of ~~five~~ six feet wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, and that meets the dimensional standards of Subsection 17.92.10.D and of the 2023 City of Sandy Transportation System Plan Typical Street Cross Section Standards (TSP Figures 18-24 and TSP Table 4), unless modified in accordance with Subsection 3., below.
2. Sidewalks along arterial and collector streets shall be separated from curbs with a planting area, ~~except as necessary to continue an existing curb-tight sidewalk~~unless modified in accordance with Subsection

[21]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2020-24, effective September 21, 2020. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

3., below. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of six feet wide.

3. Sidewalk improvements shall be made according to City standards. However, if the improvements are made as part of a discretionary review, the City standards may be modified if ~~, unless~~ the Director ~~City~~ determines that the public benefit in the particular case does not warrant imposing a severe adverse impact to a natural or other significant feature such as requiring removal of a ~~mature~~ tree with a trunk 11 inches DBH or greater, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.

   a. ~~Narrow~~Reduce width of landscape strips to no less than four feet in width measured from the interior edge of the curb to the sidewalk.

   b. ~~Narrow~~Reduce width of sidewalk or portion of sidewalk to no less than four feet in width.

   c. Eliminate landscape strips.

   d. ~~Narrow~~ Reduce width of on-street improvements by eliminating on-street parking.

   e. Eliminate sidewalks.

4. The timing of the installation of sidewalks shall be as follows:

   a. Sidewalks and planted areas along arterial and collector streets shall be installed with street improvements, or with development of the site if street improvements are deferred.

   b. Sidewalks along local streets shall be installed in conjunction with development of the site, generally with building permits, except as noted in c., below.

   c. Where sidewalks on local streets abut common areas, tracts, drainageways, or other publicly owned or semi-publicly owned areas, the sidewalks and planted areas shall be installed with street improvements.

5. Sidewalks shall be designed in conformance with Title 12 of the Sandy Municipal Code and with the City of Sandy Sidewalks Utility Standard Details.

B. Safe and convenient pedestrian and bicyclist facilities that ~~strive to~~ minimize travel distance to the extent practicable shall be provided as follows:

1. ~~in conjunction with n~~New non-residential development shall provide safe and convenient bicycle and pedestrian facilities connecting to adjacent ~~within and between new subdivisions,~~ commercial developments, industrial areas, residential areas, public transit stops, ~~school transit stops,~~ and neighborhood activity centers such as schools and parks, as follows:

   ~~1~~a. For the purposes of this section, "safe and convenient" means pedestrian and bicyclist facilities that: are ~~reasonably~~ free from hazards ~~which~~ that would interfere with or discourage travel for short trips; provide a direct route of travel between destinations; and meet the travel needs of pedestrians and bicyclists considering destination and length of trip, and considering that the optimum trip length of pedestrians is 1/4 to 1/2 mile.

   ~~2~~b. To meet the intent of B., above, pedestrian rights-of-way connecting cul-de-sacs or passing through ~~unusually long or oddly shaped~~ blocks shall be a minimum of 15 feet wide with eight feet of pavement and seven feet of landscaping.

   ~~3~~c. Twelve foot~~feet~~ wide pathways shall be provided where multiuse paths are planned in the TSP ~~in areas with high bicycle volumes or multi-use by bicyclists, pedestrians, and joggers~~.

~~4~~d. Pedestrian connectivity~~Pathways and sidewalks~~ shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian ~~walkways~~ pathways shall be provided in accordance with the following standards:

~~a~~i. The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the ~~main~~ primary entrance of the primary structure on the site to minimize out of direction pedestrian travel.

~~b~~ii. Pathways~~Walkways~~ at least five feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities ~~which~~ that abut the site but are not adjacent to the streets abutting the site.

~~c~~iii. ~~Walkways shall be as direct as possible and avoid unnecessary meandering.~~Pathways shall be direct. A pathway is direct when it follows a route for which the length is not more than 20 feet longer or 120 percent of the straight-line distance, whichever is less.

~~d~~iv. Pathway~~Walkway~~/driveway crossings shall be minimized. Internal parking lot design shall comply with the standards in Section 17.98.60 to maintain ~~ease of~~safe and comfortable access for pedestrians from abutting streets, pedestrian facilities, and transit stops.

~~e~~v. With the exception of ~~walkway~~pathway/driveway crossings, ~~walkways~~ pathways shall be separated from vehicle parking or vehicle maneuvering areas by grade, different paving material, painted crosshatching or landscaping. They shall be constructed in accordance with the sidewalk construction standards in the Utility Standard Details adopted by the City in 2004. (This provision does not require a separated ~~walkway~~ pathway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).

~~f~~vi. Pedestrian amenities such as covered pathways~~walk-ways~~, awnings, visual corridors and benches ~~will be~~are encouraged. For every two benches provided, the minimum parking requirements ~~will~~ shall be reduced by one, up to a maximum ~~of four benches~~ reduction of two parking spaces per site. Benches shall have direct access to the pedestrian circulation system.

2. New multi-family developments and residential subdivisions shall meet the following pedestrian standards:

a. Internal connections. On sites larger than 10,000 square feet, an internal pedestrian connection system shall be provided. The system shall connect all main entrances (in the case of multi-family development) or lots (in the case of a subdivision) to the following:

i. Onsite shared facilities (if proposed) including parking areas, bicycle parking, recreational areas, and outdoor areas; and

ii. Adjacent offsite improvements including public transit stops, schools, and parks.

b. Public sidewalks shall be part of the pedestrian connection system for subdivisions and shall meet the standards in Section 17.100.270. Pedestrian and bicycle accessways, if required by Section 17.100.120.C, shall meet the minimum requirements of that section.

c. On-site circulation systems required by the standards of this section shall be hard surfaced and shall meet the following minimum width requirements:

i. The circulation system on sites with up to 20 residential units shall be at least 4 feet wide.

ii. The circulation system on sites with more than 20 residential units shall be at least 5 feet wide.

3. Where the system crosses driveways, parking areas, and loading areas, the system shall be clearly identifiable, through the use of elevation changes, speed bumps, a different paving material, or other similar method approved as part of a discretionary review. Striping does not meet this requirement. Elevation changes and speed bumps shall be at least 4 inches high.

4. Where the system is parallel and adjacent to an auto travel lane, the system shall be a raised path or be separated from the auto travel lane by a raised curb, bollards, landscaping, or other physical barrier approved as part of a discretionary review. If a raised path is used it shall be at least 4 inches high and the ends of the raised portions shall be equipped with curb ramps. Bollard spacing shall be no farther apart than 5 feet on center.

C. Where a development site is traversed by or adjacent to a future trail linkage identified ~~with~~in the 2023 City of Sandy Transportation System Plan, Figure 12, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with Subsection 17.84.90.D.

D. ~~To provide for orderly development of an effective pedestrian network, p~~Pedestrian facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).

E. To ensure improved access between a development site and an existing developed facility such as a commercial center, school, park, or trail system, as part of a discretionary land use review, the Planning Commission or Director ~~may~~ shall require off-site pedestrian facility improvements concurrent with development.

(Ord. No. 2021-16 , § 12(Exh. K), 8-16-2021)

Sec. 17.84.40. Transit ~~and school bus transit~~ requirements.

A. Development sites located along existing or planned public transit routes, as indicated in the 2020 Sandy Transit Master Plan, shall~~, where appropriate,~~ incorporate bus pull-outs and/or shelters into the site design, unless waived by the Transit Director because it is not needed to meet transit service standards. These improvements shall be installed in accordance with the guidelines and standards of the 2020 Sandy Transit Master Plan, pages 70-74. ~~transit agency. School bus pull-outs and/or shelters may also be required, where appropriate, as a condition of approval for a residential development of greater than 50 dwelling units where a school bus pick-up point is anticipated to serve a large number of children.~~

B. New developments at or near existing or planned transit ~~or school bus transit~~ stops shall design development sites to provide safe, convenient access to the transit system by meeting the following standards:~~, as follows:~~

1. Commercial and civic use developments shall provide a prominent entrance oriented towards arterial and collector streets, with front setbacks reduced as much as possible to provide access for pedestrians, bicycles, and transit.

2. All developments within 300 feet of a transit stop (as measured in walking distance from the nearest property line) shall provide ~~safe, convenient~~ pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of Subsection 17.84.30.B.

Sec. 17.84.50. Street requirements.

A. *Transportation Impact Study (No Dwellings).* For development applications that do not propose any dwelling units, the City may require a transportation impact study that evaluates the impact of the proposed development on the transportation system. Unless the City does not require a transportation impact study, the applicant shall prepare the study in accordance with the following:

1. A proposal establishing the scope of the study shall be submitted for review to the City Traffic Engineer. The scope shall reflect the magnitude of the project in accordance with accepted transportation planning and engineering practices. Large projects shall assess intersections and street segments where the development causes increases of more than 20 vehicles in either the AM or PM peak hours. Once the City Traffic Engineer has approved the scope of the study, the applicant shall submit the results of the study as part of its development application. Failure to submit a required study will result in an incomplete application. A traffic impact study shall bear the seal of a Professional Engineer licensed in the State of Oregon and qualified in traffic or civil engineering.

2. If the study identifies ~~level-of-service~~vehicle operating conditions less than the minimum mobility targets~~standard~~ established in the development code or the 2023 City of Sandy Transportation System Plan, or fails to demonstrate that average daily traffic on existing or proposed streets will meet the ADT standards established in the development code, the applicant shall propose improvements and funding strategies for mitigating identified problems or deficiencies that will be implemented concurrent with the proposed development.

B. *Transportation Impact Study (Dwellings).* For development applications that propose dwelling units, an applicant must submit a transportation impact study unless the application is exempt from this requirement pursuant to ~~s~~Subsection B.~~6~~7., below. Failure to submit the study will result in an incomplete application. A traffic impact study shall bear the seal of a Professional Engineer licensed in the State of Oregon and qualified in traffic or civil engineering. The applicant shall prepare the study in accordance with the following:

1. The study area must include all existing and proposed site accesses and all existing and proposed streets and intersections where the development adds more than 20 vehicles during any peak hour as determined by using the ~~most recent edition of the~~ Institute of Transportation Engineers Trip Generation Manual (11th edition). The determination of peak hour vehicle addition shall include the cumulative impact of the proposed development and development on abutting properties that received a certificate of occupancy or recorded a plat within the past five years.

2. The study must analyze existing conditions and projected conditions upon completion of the proposed development.

3. The study must be performed for the weekday a.m. peak hour (one hour between 7:00 a.m. and 9:00 a.m.) and p.m. peak hour (one hour between 4:00 p.m. and 6:00 p.m.). Analysis of other time periods may be required for uses that generate their highest traffic volumes at other times of the day or on weekends.

4. The study must demonstrate that the transportation impacts from the proposed development will comply with the City's ~~level-of-service~~mobility targets and average daily traffic standards and the Oregon Department of Transportation's (ODOT's) mobility targets~~standard~~.

5. If the study identifies ~~level-of-service~~vehicle operating conditions less than the minimum ~~standard~~ mobility targets established in the ~~development code or the~~ 2023 City of Sandy Transportation System Plan, or fails to demonstrate that average daily traffic on existing or proposed streets will meet the ADT standards established in Chapter 17.10 of the development code or fails to meet ~~the Oregon Department of Transportation~~ODOT's mobility ~~standard~~targets, the applicant shall propose improvements and funding strategies for mitigating identified problems or deficiencies that will be implemented concurrent with the proposed development.

6. If improvements and mitigation measures are necessary, pursuant to Subsection 5., above, the following criteria shall be met in order for the application to be approved:

   a. The improvements and funding strategies proposed as mitigation address the problems or deficiencies to the extent necessary to meet the City's mobility targets and average daily traffic standards and, if applicable, ODOT's mobility target.

b. If proposed mitigation requires improvements within City, County, or ODOT rights-of way, the design has been approved by the City Engineer, Clackamas County, and ODOT when applicable.

76. A transportation impact study is not required under this section if:

a. The cumulative impact of the proposed development and development on abutting properties that received a certificate of occupancy or recorded a plat within the past five years will generate no more than 20 vehicle trips in any weekday a.m. or p.m. peak hour as determined by using the ~~most recent edition of the~~ Institute of Transportation Engineers Trip Generation Manual (11th Edition); or

b. The proposed development completed a transportation impact study at the time of annexation within the past five years and that study assessed the impact of the same or more dwelling units than proposed under the new land use action; or

c. The application only proposes to convert an existing detached single family dwelling to a duplex.

C. *Transportation Impact Study (Dwellings)—Discretionary Track.* As an alternative to the process outlined in Section 17.84.50.B., an applicant may choose to follow the process in Section 17.84.50.A.

D. *Traffic Letter (Dwellings).* For development applications that propose dwelling units, an applicant must submit a traffic letter where the development adds 20 or fewer vehicles during any peak hour as determined by using the Institute of Transportation Engineers Trip Generation Manual (11th Edition). Failure to submit the traffic letter will result in an incomplete application. Development applications that add 2 or fewer vehicles during any peak hour as determined by using the Institute of Transportation Engineers Trip Generation Manual (11th Edition) are exempt from the traffic letter requirement.

E. *Street Requirements (Discretionary).* For development applications that do not propose dwelling units, or for applications that include dwellings and that elect to use the discretionary track, the following standards shall be met.

1.~~D.~~ Location of new arterial streets shall conform to the 2023 City of Sandy Transportation System Plan in accordance with the following:

a.~~1.~~ Arterial streets should generally be spaced in one-mile intervals.

b.~~2.~~ Traffic signals should generally not be spaced closer than 1,500 feet for reasonable traffic progression.

2.~~E.~~ Local streets shall be designed to discourage through traffic. NOTE: for the purposes of this section, "through traffic" means the traffic traveling through an area that does not have a local origination or destination. To discourage through traffic and excessive vehicle speeds the following street design characteristics shall be considered, as well as other designs intended to discourage traffic:

a.~~1.~~ Straight segments of local streets should be kept to less than a quarter mile in length. As practical, local streets should include traffic calming features, and design features such as curves and "T" intersections while maintaining pedestrian connectivity.

b.~~2.~~ Local streets should typically intersect in "T" configurations rather than four-way intersections to minimize conflicts and discourage through traffic. Adjacent "T" intersections shall maintain a minimum of 150 feet between the nearest edges of the two rights-of-way.

c.~~3.~~ Cul-de-sacs are prohibited unless the criteria and standards in Subsections 17.100.110.G and .H are met.~~shall not exceed 400 feet in length nor serve more than 20 dwelling units, unless a proposal is successfully processed through the procedures in Chapter 17.66 of the Sandy Development Code.. Cul-de-sacs longer than 400 feet or developments with only one access point may be required to provide an alternative access for emergency vehicle use only, install fire prevention sprinklers, or provide other mitigating measures, determined by the City.~~

3.~~F.~~ Development sites shall be provided with access from a public street improved to City standards in accordance with the following:

a.~~1.~~ Where a development site abuts an existing public street not improved to City standards, the abutting street shall be improved to City standards along the full frontage of the property concurrent with development.

b.~~2.~~ Half-street improvements are considered the minimum required improvement. Three-quarter-street or full-street improvements shall be required where traffic volumes generated by the development are such that a half-street improvement would cause safety and/or capacity problems. Such a determination shall be made by the City Engineer.

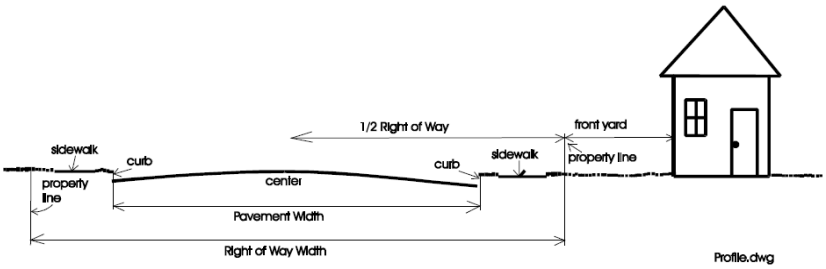
c.~~3.~~ To ensure improved access to a development site consistent with policies on orderly urbanization and extension of public facilities the Planning Commission or Director may require off-site improvements concurrent with development. Off-site improvement requirements upon the site developer shall be reasonably related to the anticipated impacts of the development.

i. When necessary to meet transportation operations and safety standards, the City of Sandy, and ODOT where access to a state roadway is proposed, will identify conditions of approval consistent with the planned transportation system. The City may deny, approve, or approve the proposal with appropriate conditions based on the transportation standards in Section 17.100.110 and consistent with the City's adopted mobility targets, which requires a minimum level of service (LOS) D for signalized and unsignalized intersections and maximum volume to capacity ratio of 0.90 for roundabout intersections.

ii. Improvements required as a condition of development approval, when not voluntarily provided by the applicant, shall be roughly proportional to the impact of the development on transportation facilities. Findings supporting development approval shall indicate how the required improvements directly relate to and are roughly proportional to the impact of development.

d.~~4.~~ Reimbursement agreements for three-quarter-street improvements (i.e., curb face to curb face) may be requested by the developer per Chapter 12 of the SMC.

e.~~5.~~ A half-street improvement includes curb and pavement two feet beyond the center line of the right-of-way. A three-quarter-street improvement includes curbs on both sides of the side and full pavement between curb faces.



4.~~G.~~ ~~As necessary to provide for orderly development of adjacent properties, p~~Public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property(ies) in accordance with the following:

a.~~1.~~ Temporary dead-ends created by this requirement to extend street improvements to the edge of adjacent properties may be installed without a turn-around, subject to the approval of the Fire Marshal.

b.~~2.~~ In order to assure the eventual continuation or completion of the street, reserve strips may be required.

5.~~H.~~ Where required by the Planning Commission or Director, public street improvements may be required through a development site to provide for the logical extension of an existing street network or to connect a site with a nearby neighborhood activity center, such as a school or park. Where this creates a land division incidental to the development, a land partition shall be completed concurrent with the development.

6.~~I.~~ Except for extensions of existing streets, no street names shall be used that will duplicate or be confused with names of existing streets. Street names and numbers shall conform to the established pattern in the surrounding area and be subject to approval of the Director.

7.~~J.~~ Location, grades, alignment, and widths for all public streets shall be considered in relation to existing and planned streets, topographical conditions, public convenience and safety, and proposed land use. Where topographical conditions present special circumstances, exceptions to these standards may be granted by the City Engineer provided the safety and capacity of the street network are not adversely affected. The following standards shall apply:

a.~~1.~~ Location of streets in a development shall not preclude development of adjacent properties. Streets shall conform to planned street extensions identified in the Transportation Plan and/or provide for continuation of the existing street network in the surrounding area.

b.~~2.~~ Grades shall not exceed six percent on arterial streets~~,~~ and ten percent on collector streets ~~streets, and 15 percent on~~ and local streets. Exceptions allowing local street grades over ten percent may be allowed with approval of a Variance, if approved by the Fire Marshal; however, in no case shall local street grades exceed 15 percent.

c.~~3.~~ As far as practical, arterial streets and collector streets shall be extended in alignment with existing streets by continuation of the street centerline. When staggered street alignments resulting in "T" intersections are unavoidable, they shall leave a minimum of 150 feet between the nearest edges of the two rights-of-way.

d.~~4.~~ Centerline radii of curves shall not be less than 500 feet on arterial streets, 300 feet on collector streets, and 100 feet on local streets.

e.~~5.~~ Streets shall be designed to intersect at angles of 75 to 105 degrees~~as near as practicable to right angles~~ and shall comply with the following:

i.~~a.~~ The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 feet of straight (tangent) alignment ~~perpendicular to~~approaching the intersection.

ii.~~b.~~ The intersection of a local street with another street shall have a minimum of 50 feet of straight (tangent) alignment ~~perpendicular to~~approaching the intersection.

~~c. Where right angle intersections are not possible, exceptions can be granted by the City Engineer provided that intersections not at right angles have a minimum corner radius of 20 feet along the right-of-way lines of the acute angle.~~

iii.~~d.~~ All i~~I~~ntersections ~~with arterial and collector streets~~ shall have a minimum curb corner radius of ~~20~~28 feet, per Oregon Fire Code standards for fire apparatus access roads. ~~All other intersections shall have a minimum curb corner radius of ten feet.~~

f.~~6.~~ Right-of-way and improvement widths shall be as specified by the Transportation System Plan. Exceptions to those specifications may be approved by the City Engineer to deal with specific unique physical constraints of the site.

~~K. Private streets may be considered within a development site provided all the following conditions are met:~~

~~1. Extension of a public street through the development site is not needed for continuation of the existing street network or for future service to adjacent properties;~~

~~2. The development site remains in one ownership, or adequate mechanisms are established (such as a homeowner's association invested with the authority to enforce payment) to ensure that a private street installed with a land division will be adequately maintained; and~~

~~3. Where a private street is installed in connection with a land division, paving standards consistent with City standards for public streets shall be utilized to protect the interests of future homeowners.~~

F. *Street Requirements (Dwellings/Clear and Objective Track)*. For development applications that propose dwelling units, all of the following standards shall be met, unless the applicant elects to use the discretionary standards under Subsection E., above.

1. Location of new arterial streets shall conform to the 2023 City of Sandy Transportation System Plan in accordance with the following:

   a. Arterial streets shall be spaced at minimum intervals of 5,280 feet and maximum intervals of 6,000 feet.

   b. Traffic signals shall not be spaced closer than 1,500 feet.

2. Local streets shall be designed to discourage through traffic. NOTE: for the purposes of this section, "through traffic" means the traffic traveling through an area without originating or stopping in that area. To discourage through traffic and excessive vehicle speeds the following street design characteristics shall be considered, as well as other designs intended to discourage traffic:

   a. Straight segments of local streets shall be kept to less than a quarter mile in length.

   b. Local streets may intersect in "T" configurations rather than four-way intersections to minimize conflicts and discourage through traffic. Adjacent "T" intersections shall maintain a minimum of 150 feet between the nearest edges of the two rights-of-way.

   c. Cul-de-sacs are prohibited unless the criteria and standards in Subsections 17.100.110.G and .H are met.

3. Development sites shall be provided with access from a public street improved to City standards in accordance with the following:

   a. Where a development site abuts an existing public street not improved to City standards, the abutting street shall be improved to City standards along the full frontage of the property concurrent with development.

   b. Half-street improvements are considered the minimum required improvement. Three-quarter-street or full-street improvements shall be required where traffic volumes generated by the development are such that a half-street improvement would result in the street failing to meet the level of service standards in the 2023 City of Sandy Transportation System Plan.

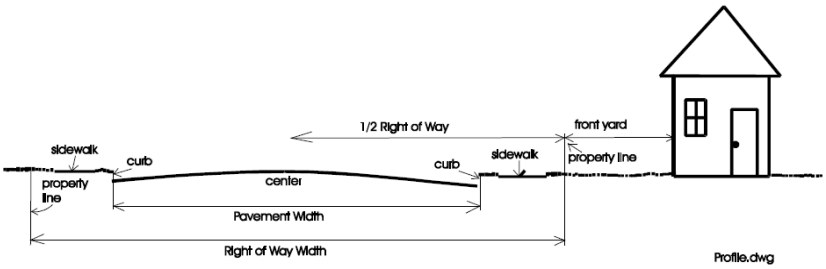
   c. To ensure improved access to a development site and extension of public facilities, off-site improvements concurrent with development shall be required if the Transportation Impact Analysis indicates they are necessary to mitigate problems or deficiencies in off-site facilities, pursuant to Section 17.84.50.B.

      i. If requested by the applicant, the City Engineer or designee may approve an alternative to the off-site improvements required under Subsection c., based upon information submitted

by the applicant showing that the improvements which would otherwise be required by this code would not be reasonably related or roughly proportional to the impact of the proposed development, as determined by the City.

d. Reimbursement agreements for three-quarter-street improvements (i.e., curb face to curb face) may be requested by the developer per Chapter 12 of the SMC.

e. A half-street improvement includes curb and pavement two feet beyond the center line of the right-of-way. A three-quarter-street improvement includes curbs on both sides of the side and full pavement between curb faces.



4. Public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property(ies) in accordance with the following:

a. Wherever a proposed development abuts unplatted land or a future development with an approved tentative plat, street stubs shall be provided to allow access to future abutting developments and to extend the street system into the surrounding area. If the abutting land has an approved tentative plat, streets shall align with streets in the approved tentative plat.

b. Where the stubbed street is over 100 feet long, street ends shall contain temporary turnarounds built to Oregon Fire Code standards and shall be designed to facilitate future extension in terms of grading, width, and temporary barricades, unless this requirement is waived by the Fire Marshal.

c. In order to ensure City control over the eventual continuation or completion of the street, reserve strips shall be granted to the City of Sandy.

5. Public street improvements shall be required through a development site to provide for the logical extension of an existing street network. Where this street extension has the effect of dividing a parcel of land, a land partition shall be completed concurrent with the development.

6. Except for extensions of existing streets, no street names shall be used that will duplicate or be confused with names of existing streets. Street names and numbers shall conform to the established pattern in the surrounding area and be subject to approval of the Director.

7. Location, grades, alignment, and widths for all public streets shall be considered in relation to existing and planned streets, topographical conditions, public convenience and safety, and proposed land use in accordance with standards a. through f. below. Where topographical conditions present special circumstances, exceptions to these standards may be granted through the procedures in Chapter 17.66 of the Sandy Development Code, provided the City Engineer determines that the safety and capacity of the street network are not adversely affected.

a. Location of streets in a development shall not preclude development of adjacent properties. Streets shall conform to planned street extensions identified in the 2023 City of Sandy

Transportation System Plan, Figure 11, and/or provide for continuation of the existing street network in the surrounding area.

b. Grades shall not exceed six percent on arterial streets and ten percent on collector streets and local streets. Exceptions allowing local street grades over ten percent may be allowed with approval of a Variance, if approved by the Fire Marshal; however, in no case shall local street grades exceed 15 percent.

c. Arterial streets and collector streets shall be extended in alignment with existing streets by continuation of the street centerline. When staggered street alignments resulting in "T" intersections are unavoidable, they shall leave a minimum of 150 feet between the nearest edges of the two rights-of-way.

d. Centerline radii of curves shall not be less than 500 feet on arterial streets, 300 feet on collector streets, and 100 feet on local streets.

e. Streets shall be designed to intersect at angles of 75 to 105 degrees and shall comply with the following:

i. The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 feet of straight (tangent) alignment approaching the intersection.

ii. The intersection of a local street with another street shall have a minimum of 50 feet of straight (tangent) alignment approaching the intersection.

iii. All intersections shall have a minimum curb corner radius of 28 feet, per Oregon Fire Code standards for fire apparatus access roads..

f. Right-of-way and improvement widths shall be as specified by the 2023 City of Sandy Transportation System Plan, Figures 18 through 24 and Table 4. Exceptions to those specifications may be granted through the procedures in Chapter 17.66 of the Sandy Development Code, if approved by the City Engineer, to deal with specific unique physical constraints of the site.

8. All public streets shall be designed in conformance with Title 12 of the Sandy Municipal Code and with the City of Sandy Utility Standard Details for Streets & Roads, Sidewalks, and Traffic Control Devices.

Sec. 17.84.60. Public facility extensions.

A. All development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage and shall meet the following requirements:~~.~~

1. The required improvements shall be installed at the expense of the developer.

2. Public water facilities shall meet the requirements of Title 13 of the Sandy Municipal Code and the 2022 City of Sandy Water System Master Plan and shall be designed in conformance with the City of Sandy Water Service Utility Standard Details.

3. Sanitary sewer facilities shall meet the requirements of Title 13 of the Sandy Municipal Code and shall be designed in conformance with the City of Sandy Sewer Service Utility Standard Details.

4. Storm drainage facilities meet the requirements of Title 13 of the Sandy Municipal Code and the City of Portland Stormwater Management Manual, as adopted by the City of Sandy, and shall be designed in conformance with the City of Sandy Stormwater Utility Standard Details.

B. Where necessary to serve property as specified in A. above, required public facility installations shall be constructed concurrent with development, and shall be completed prior to issuance of a Certificate of Occupancy.

C. Off-site public facility extensions necessary to fully serve a development site and ~~adjacent~~ abutting properties, as shown in the utility plan, shall be constructed concurrent with development.

1. If requested by the applicant, the City Engineer or designee may approve an alternative to the off-site public facility extensions required under Subsection C., based upon information submitted by the applicant showing that the extensions which would otherwise be required by this code would not be reasonably related or roughly proportional to the impact of the proposed development, as determined by the City.

D. ~~As necessary to provide for orderly development of adjacent properties, p~~Public facilities installed concurrent with development of a site shall be extended through the site and extended or stubbed out to adjacent undeveloped land or to a point in the street that allows for connection with ~~to the edge of~~ adjacent property(ies). If abutting land has an approved tentative plat, public facilities shall align with public facilities in the approved tentative plat.

~~E. All public facility installations required with development shall conform to the City's facilities master plans.~~

E~~F~~. Private on-site sanitary sewer and storm drainage facilities ~~may~~ shall only be considered ~~provided~~ if all the following conditions exist:

1. Extension of a public facility through the site is not necessary for the future ~~orderly~~ development of adjacent properties;

2. The development site remains in one ownership and land division does not occur (with the exception of land divisions that may occur under the provisions of 17.84.50.~~F.~~E.7. or 17.84.50.F.5., above);

3. The facilities are designed and constructed in accordance with the Uniform Plumbing Code and other applicable codes, and permits and/or authorization to proceed with construction is issued prior to commencement of work.

~~Sec. 17.84.70. Public improvement procedures.~~

~~It is in the best interests of the community to ensure public improvements installed in conjunction with development are constructed in accordance with all applicable City policies, standards, procedures, and ordinances. Therefore, prior to commencement of installation of public water, sanitary sewer, storm drainage, broadband (fiber), street, bicycle, or pedestrian improvements for any development site, developers shall contact the City Engineer to receive information regarding adopted procedures governing plan submittal, plan review and approval, permit requirements, inspection and testing requirements, progress of the work, and provision of easements, dedications, and as-built drawings for installation of public improvements. All work shall proceed in accordance with those adopted procedures, and all applicable City policies, standards, and ordinances.~~

~~Whenever any work is being done contrary to the provisions of this Code, the Director may order the work stopped by notice in writing served on the persons engaged in performing the work or causing the work to be performed. The work shall stop until authorized by the Director to proceed with the work or with corrective action to remedy substandard work already completed.~~

Sec. 17.84.80. Franchise utility installations.

These standards are intended to supplement, not replace or supersede, requirements contained within individual franchise agreements the City has with providers of electrical power, telephone, cable television, and natural gas services (hereinafter referred to as "franchise utilities").

A. Where a land division is proposed, the developer shall provide franchise utilities to the development site. Each lot created within a subdivision shall have an individual service available or financially guaranteed prior to approval of the final plat.

B. ~~Where necessary, in the judgment of the Director, to provide for orderly development of adjacent properties, f~~Franchise utilities shall be extended through the site to the edge of adjacent property(ies), whether or not the development involves a land division.

C. The developer shall have the option of choosing whether or not to provide natural gas or cable television service to the development site, providing all of the following conditions exist:

1. Extension of franchise utilities through the site is not necessary for the future orderly development of adjacent property(ies);

2. The development site remains in one ownership and land division does not occur (with the exception of land divisions that may occur under the provisions of 17.84.50.F., above); and,

3. The development is non-residential.

D. Where a land division is not proposed, the site shall have franchise utilities required by this section provided ~~in accordance with the provisions of 17.84.70~~ prior to occupancy of structures.

E. All franchise utility distribution facilities installed to serve new development shall be placed underground except as provided below. The following facilities may be installed above-ground:

1. Poles for street lights and traffic signals, pedestals for police and fire system communications and alarms, pad mounted transformers, pedestals, pedestal mounted terminal boxes and meter cabinets, concealed ducts, substations, or facilities used to carry voltage higher than 35,000 volts;

~~2. Overhead utility distribution lines may be permitted upon approval of the City Engineer when unusual terrain, soil, or other conditions make underground installation impracticable. Location of such overhead utilities shall follow rear or side lot lines wherever feasible.~~

F. The developer shall be responsible for making necessary arrangements with franchise utility providers for provision of plans, timing of installation, and payment for services installed. Plans for franchise utility installations shall be submitted concurrent with plan submittal for public improvements to facilitate review by the City Engineer.

G. The developer shall be responsible for installation of underground conduit for street lighting along all public streets improved in conjunction with the development in accordance with the following:

1. The developer shall coordinate with the City Engineer to determine the location of future street light poles. The street light plan shall be designed to provide illumination meeting standards in Chapter 15.30 of the Sandy Municipal Code~~set by the City Engineer~~.

2. The developer shall make arrangements with the serving electric utility for trenching prior to installation of underground conduit for street lighting.

Sec. 17.84.90. Land for public purposes.

A. Easements for public sanitary sewer, water, storm drain, pedestrian and bicycle facilities shall be provided whenever these facilities are located outside a public right-of-way in accordance with the following:

1. When located between adjacent lots, easements shall be provided on one side of a lot line.

2. The minimum easement width for a single utility is 15 feet. The minimum easement width for two adjacent utilities is 20 feet. The minimum easement width for utilities set at a depth below 12 feet is 25

feet. The easement width shall be centered on the utility. ~~to the greatest extent practicable. Wider easements may be required for unusually deep facilities.~~

B. Public utility easements with a minimum width of eight feet shall be provided adjacent to all street rights-of-way for franchise utility installations.

C. Where a development site is traversed by an open channel drainageway or water course, a drainage way dedication shall be provided to the City equivalent to the width of flow for a 25-year return interval rainfall event, plus 10 feet on each side.

D. Where a development is traversed by, or adjacent to, a future trail linkage identified within the 2023 City of Sandy Transportation System Plan, Figure 12, dedications of land ~~suitable width~~ to accommodate the full width of the trail linkage right-of-way shall be provided. This width shall be determined by the City Engineer, considering the type of trail facility involved.

E. Where existing rights-of-way and/or easements within or adjacent to development sites are nonexistent or of insufficient width to meet the standards identified in this chapter, dedications ~~may~~ shall be required. The need for and widths of those required dedications shall be ~~determined~~ communicated to the applicant by the Director or City Engineer.

F. Where easement or dedications are required in conjunction with land divisions, they shall be recorded on the plat. Where a development does not include a land division, easements and/or dedications shall be recorded by the developer on standard document forms provided by the City Engineer.

~~G. If the City has an interest in acquiring any portion of a proposed subdivision site for a public purpose, other than for those purposes listed above, or if the City has been advised of such interest by a school district or other public agency, and there is a reasonable assurance that steps will be taken to acquire the land, the Planning Commission may require those portions of the land be reserved for public acquisition for a period not to exceed one year.~~

G~~H~~. Prior to acceptance of lands to be dedicated to the public or City, the City shall require the applicant to submit a Phase I Environmental Site Assessment of the land completed by a qualified professional according to American Society of Testing and Materials (ASTM) standards (ASTM E 1527). The results of this study shall indicate a clean environmental record prior to dedication.

1. In the event that the Phase 1 Environmental Site Assessment detects the potential for contaminated soil, the applicant shall perform further assessment, testing and sampling as needed to determine the type and extent of contamination present, and potential remediation steps needed.

2. If contaminated conditions are present the applicant shall either remediate the condition and submit a report to the City documenting the procedures and final soil conditions or, select another area for dedication.

~~Environmental assessments for all lands to be dedicated to the public or City may be required to be provided by the developer. An environmental assessment shall include information necessary for the City to evaluate potential liability for environmental hazards, contamination, or required waste cleanups related to the dedicated land. An environmental assessment shall be completed prior to the acceptance of dedicated lands in accordance with the following:~~

~~1. The initial environmental assessment shall detail the history of ownership and general use of the land by past owners. Upon review of the information provided by the grantor, as well as any site investigation by the City, the Director will determine if the risks of potential contamination warrant further investigation. When further site investigation is warranted, a Level I Environmental Assessment shall be provided by the grantor.~~

(Ord. No. 2021-16 , § 12(Exh. K), 8-16-2021)

Sec. 17.84.100. Mail delivery facilities.

A. In establishing placement of mail delivery facilities, locations of sidewalks, bikeways, intersections, existing or future driveways, existing or future utilities, right-of-way and street width, and vehicle, bicycle and pedestrian movements shall be considered. The final location of these facilities shall meet the approval of the City Engineer and the Post Office. Where mail delivery facilities are being installed in conjunction with a land division, placement shall be indicated on the plat, shall ~~and~~ meet the U.S. Postal Service National Delivery Planning Standards, and shall be approved by ~~al of~~ the City Engineer and the Post Office prior to final plat approval.

B. Where mail delivery facilities are proposed to be installed in areas with an existing or future curb-tight sidewalk, a sidewalk transition shall be provided that maintains the required design width of the sidewalk around the mail delivery facility. If the right-of-way width will not accommodate the sidewalk transition, a sidewalk easement shall be provided adjacent to the right-of-way.

C. Mail delivery facilities and the associated sidewalk transition (if necessary) around these facilities shall conform to the City's standard construction specifications. Actual mailbox units shall conform to the ~~Post Office~~ U.S. Postal Service National Delivery Planning S~~s~~tandards for mail delivery facilities.

D. Installation of mail delivery facilities is the obligation of the developer. These facilities shall be installed concurrently with the public improvements. Where development of a site does not require public improvements, mail delivery facilities shall be installed concurrently with private site improvements.

Mail delivery facilities may not be placed on arterial or collector streets or in sight distance zones or vision clearance areas.

CHAPTER 17.86 PARKLAND AND OPEN SPACE[22]

Sec. 17.86.00. Intent.

The availability of parkland and open space is a critical element in maintaining and improving the quality of life in Sandy. Land that features trees, grass and vegetation provides not only an aesthetically pleasing landscape but also buffers incompatible uses, and preserves sensitive environmental features and important resources. Parks and open space, together with support facilities, also help to meet the active and passive recreational needs of Sandy residents. This chapter implements policies of Goal 5 and Goal 8 of the Comprehensive Plan and the 2022 Parks and Trails Master Plan by outlining provisions for parks and open space in the City of Sandy.

(Ord. No. 2022-10 , § 2(Exh. B), 6-6-2022)

Sec. 17.86.10. Minimum parkland dedication requirements.

Parkland Dedication: Residential subdivisions and partitions, single-family or multi-family developments, and manufactured home park developments are required to provide parkland to serve residents of those developments. Congregate multi-family housing development that provides services and/or facilities, as defined in Chapter 17.10 of the City's Municipal Code, are considered to be multi-family developments for the purpose of parkland dedication. Licensed adult congregate care living facilities, nursing homes, and all other residential care facilities that provide clients with individual beds and sleeping quarters, but in which all other care and services are communal and provided by facility employees, are exempt from parkland dedication. The dedication or provision of parks, open space, trails, and amenities shall be located in compliance with the 2022 Parks and Trails Master Plan Maps 8 and 14, dedicated pursuant to the formula in Subsection 17.86.10.B., and in compliance with the improvement standards in Section 17.86.20. The level of service standards as well as the park and trail level of service needs as identified in Chapter 4, Table 10, of the 2022 Parks and Trails Master Plan are specifically incorporated by this reference.

A. The required parkland shall be dedicated as a condition of approval for the following:

   1. Single-family and duplex building permits;
   2. Tentative plat for a subdivision or partition;
   3. Design review for a multi-family development or manufactured home park;
   4. Design review for a multi-family development accessory to commercial or industrial development; and,
   5. Replat or amendment of any site plan for multi-family development or manufactured home park where dedication has not previously been made or where the density of the development involved will be increased.

B. *Calculation of Required Dedication.* The required parkland acreage to be dedicated shall be based on the following formula:

[22]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-03, effective July 3, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

Required parkland dedication (acres) = (proposed dwelling units) x (persons/dwelling unit) x 0.0068 (per person park land dedication factor)

1. Population Formula: The following table shall be used to determine the number of persons per unit to be used in calculating required parkland dedication:

Type of Unit	Total Persons Per Dwelling Unit
Single family dwelling unit	3.0
Duplex dwelling unit	3.0*
Standard multi-family unit	2.0
Manufactured dwelling unit	2.0
Congregate multi-family unit	1.5

* The total persons per unit for the entire duplex (both units) would be six.

The specific formula for the dedication of land will, therefore, be subject to periodic review and amendment. A fee-in-lieu under Section 17.86.40 shall be based on the number and type of dwelling units proposed at time of plat, but an additional fee in-lieu will be required and calculated on a per lot basis if any lots are constructed or converted to add additional dwelling units. For example, if an existing single family dwelling unit is converted into a duplex dwelling unit the existing single family dwelling unit shall receive a credit, but the new dwelling unit shall pay the difference in persons per dwelling unit. This would equate to one proposed dwelling unit multiplied by three additional persons multiplied by 0.0068 for the above example.

2. Per Person Parkland Dedication Factor: The total parkland dedication requirement shall be 0.0068 of an acre per person based on the adopted standard of 6.8 acres of land per 1,000 of population per the 2022 Parks and Trails Master Plan.[23] This standard represents the citywide land-to-population ratio for city parks at 5.25 acres of land per 1,000 of population, and land for trails at 1.55 acres of land per 1,000 of population.

C. Notwithstanding Subsection 17.86.10.A. above, when the amount of land to be dedicated is less than one quarter acre, or the level of service standards for mini parks in the 2022 Parks and Trails Master Plan have been met for the subject site, the applicant shall pay a fee in lieu of dedication as provided in Subsection 17.86.40.B., with the following exceptions:

1. When the land to be dedicated is for a trail identified in Map 14 Proposed Trail System, Table 12 Tier 1 Capital Improvement Plan, or Table A-4 Proposed Trail Capital Improvement Plan of the 2022 Parks and Trails Master Plan;

2. When the land to be dedicated abuts existing or planned parkland that necessitates additional acreage to meet the identified parkland acreage needs as identified in Map 8 Proposed Park System, Table 12 Tier 1 Capital Improvement Plan, or Table A-3 Proposed Park Capital Improvement Plan of the 2022 Parks and Trails Master Plan.

(Ord. No. 2021-03 , § 8(Exh. H), 5-17-2021; Ord. No. 2021-16 , § 13(Exh. L), 8-16-2021; Ord. No. 2022-10 , § 2(Exh. B), 6-6-2022)

[23]Editor's note(s)—2022 Parks and Trails Master Plan, Section 4.2, Park and Trail Needs, Table 10 (Park and Trail Needs Analysis).

Sec. 17.86.20. Minimum parkland standards.

Land required or proposed for parkland dedication shall be contained within a continuous unit and shall accommodate use as a mini, neighborhood, or community-park, as defined in the 2022 Parks and Trails Master Plan, based on the following criteria:

A. The primary entrance of single-family homes and duplexes shall face towards parkland when separated by street right-of-way. Residential through lots or corner lots that abut more than one street with one of the streets defined as an arterial or collector street shall have the front door face the arterial or collector street as defined by Chapter 17.82.

B. On the sides of the parkland not fronting onto a street, a pedestrian and bicycle access way shall be provided with a minimum improved surface of ten feet within a 15-foot right-of-way or tract. Pedestrian and bicycle access ways shall be spaced at least once every 400 feet. If the parkland abuts land to be developed for multi-family development or a manufactured home park the multi-family development or manufactured home park shall include a pedestrian and bicycle access way in a public easement from any abutting street right-of-way through the property with multi-family development or a manufactured home park to the parkland.

C. In all zones, where real property abuts parkland, fence height shall not exceed six feet at the common property line with the parkland. Barbed wire is not permitted on fences abutting parks. This regulation supersedes Section 17.74.40.

D. A retaining wall constructed at the perimeter of a park adjacent to a public right-of-way or private street shall not exceed four feet in height.

E. The required parkland dedication for parks one acre or greater shall be abutted by street right-of-way for at least 400 linear feet, with the following exceptions for trails and parks less than one acre:

   1. Land dedicated for trails as identified in the 2022 Parks and Trails Master Plan only need to abut street right-of-way for a total of 15 linear feet.

   2. If the land dedication is between half-acre and one-acre the parkland shall be abutted by street right-of-way for at least 200 linear feet.

   3. If the land dedication is less than half-acre the parkland shall be abutted by street right-of-way for at least 100 linear feet.

F. The required dedication shall be contained as a contiguous unit and not separated into pieces or divided by streets or other pedestrian barriers.

G. The parkland shall provide for park facilities, such as play structures and play fields as described in the 2022 Parks and Trails Master Plan, subject to the following standards:

   1. *Neighborhood Parks or Community Parks:* Not more than 20 percent of the park may exceed 15 percent slope. Zero percent of the park shall include wetlands.

   2. *Mini Parks:* Not more than 10 percent of the park may exceed 15 percent slope. Zero percent of the park shall include wetlands.

(Ord. No. 2022-10 , § 2(Exh. B), 6-6-2022)

Sec. 17.86.30. Dedication procedures.

Land dedicated to the City as parkland shall be dedicated on the final plat, or by recording a deed, easement, or other appropriate document when there is not a plat. Dedication of land in conjunction with multi-family development shall be required prior to issuance of building permits.

A. Prior to final plat approval, the applicant shall complete the following items for all proposed dedication areas:

1. The applicant shall clear, fill, and/or grade all land in accordance with the approved grading plan, install curb, gutter, and sidewalks in accordance with the ~~2011~~ 2023 Transportation System Master Plan on the park land adjacent to any street, and seed the parkland. As an alternative to constructing sidewalks, the applicant may provide a financial guarantee for sidewalk construction, consistent with Subsection 17.100.340; and,

2. The applicant shall submit a Phase I Environmental Site Assessment of the parkland to the City, completed by a qualified professional according to American Society of Testing and Materials (ASTM) standards (ASTM E 1527). The results of this study shall indicate a clean environmental record prior to dedication.

a. In the event that the Phase 1 Environmental Site Assessment detects the potential for contaminated soil, the applicant shall perform further assessment, testing and sampling as needed to determine the type and extent of contamination present, and potential remediation steps needed.

b. If contaminated conditions are present the applicant shall either remediate the condition and submit a report to the City documenting the procedures and final soil conditions or select other property for the parkland dedication.

B. *Additional Requirements.*

1. Land dedicated or restricted for use as parkland shall not be subject to any other easements, reservations of record, or encumbrances of any kind that interfere with the use of the land for park, open space, or recreational purposes.

2. Where a reservation, encumbrance, or easement exists, the applicant may propose an alternative lot or parcel for parkland dedication or the City may require payment in lieu of the dedication of lands.

3. In a phased development, the required park land for the entire development shall be dedicated on the final plat for the first phase of the development. Improvements to the land as required by Subsection 17.86.30.A.1. shall be completed or bonded per the standards in Chapter 17.100 prior to approval of the final plat for the phase that includes the parkland.

(Ord. No. 2022-10 , § 2(Exh. B), 6-6-2022)

Sec. 17.86.40. Fee in lieu of dedication.

A payment in lieu of land dedication is separate from Park Systems Development Charges (SDCs) and is not eligible for a credit of Park SDCs. The amount of the fee in lieu of land dedication (in dollars per acre) shall be set by City Council Resolution based on relevant economic indices and the typical market value of developed property (finished lots) in Sandy net of related development costs.

A. The City shall accept a fee in lieu of dedication from an applicant if the land area proposed to be dedicated is not identified in Map 14 Proposed Trail System, Table 12 Tier 1 Capital Improvement Plan,

or Table A-4 Proposed Trail Capital Improvement Plan of the 2022 Parks and Trails Master Plan or is not in compliance with the improvement standards in Section 17.86.20.

B. The City shall accept a fee in lieu of dedication from an applicant if the land area proposed to be dedicated is not identified in Map 8 Proposed Park System, Table 12 Tier 1 Capital Improvement Plan, or Table A-3 Proposed Park Capital Improvement Plan of the 2022 Parks and Trails Master Plan or is not in compliance with the improvement standards in Section 17.86.20.

C. The City shall accept a fee in lieu of dedication from an applicant if the park area to be dedicated is less than one-quarter acre, or the level of service standard for mini parks described in the 2022 Parks and Trails Master Plan has been satisfied, with the following exceptions:

1. When the land to be dedicated is for a trail identified in Map 14 Proposed Trail System, Table 12 Tier 1 Capital Improvement Plan, or Table A-4 Proposed Trail Capital Improvement Plan of the 2022 Parks and Trails Master Plan;

2. When the land to be dedicated abuts existing or planned parkland that necessitates additional acreage to meet the identified parkland acreage needs as identified in Map 8 Proposed Park System, Table 12 Tier 1 Capital Improvement Plan, or Table A-3 Proposed Park Capital Improvement Plan of the 2022 Parks and Trails Master Plan.

D. The fee in lieu of parkland dedication for a residential subdivision shall be paid prior to approval of the final plat or as specified below:

1. Fifty percent of the payment shall be paid prior to final plat approval, and

2. The remaining 50 percent of the payment, plus an administrative surcharge specified by City Council resolution, shall be pro-rated equally among the lots and paid at the time of building permit issuance for each lot.

E. The fee in lieu of dedication for a single-family dwelling, duplex, or multi-family dwelling not in conjunction with a residential subdivision shall be paid at the time of building permit issuance for the subject lot or parcel.

(Ord. No. 2022-10 , § 2(Exh. B), 6-6-2022)

Sec. 17.86.50. Minimum standards for open space dedication.

An application for a subdivision, partition, replat or design review may propose the dedication and protection of open space areas as part of that process. However, this open space shall not be eligible to count toward the parkland dedication requirement of Sections 17.86.10 through 17.86.40.

A. The types of open space that may be provided are:

1. *Natural Areas:* areas of undisturbed vegetation, steep slopes, stream corridors, wetlands, wildlife habitat areas, riparian corridors, or areas replanted with native vegetation after construction.

2. *Greenways:* linear areas linking residential areas with open space areas. These greenways may contain bicycle paths or footpaths. Connecting greenways between residences and recreational areas is encouraged.

B. A subdivision, partition, replat, or design review application proposing designation of open space shall include the following information as part of the application:

1. Designate the boundaries of all open space areas; and

2. Specify the manner in which the open space shall be owned, maintained, and administered; and

3. Provide for public access to trails included in the 2022 Parks and Trails Master Plan, including but not limited to the Tickle Creek Trail.

C. Dedication of open space may occur concurrently with development of a project. For phased development, the open space may be set aside in totality and/or dedicated in conjunction with the first phase of the development or incrementally set aside and dedicated in proportion to the development occurring in each phase.

D. Open space areas shall be maintained so that the use and enjoyment thereof remain safe, healthy, and functional. Open space areas may be owned, preserved, and maintained by any of the following mechanisms or combinations thereof:

1. Dedication to the City of Sandy or another public agency, if there is a public agency willing to accept the dedication. Prior to acceptance of proposed open space, the City shall require the applicant to submit a Phase I Environmental Site Assessment of the open space area completed by a qualified professional according to American Society of Testing and Materials (ASTM) standards (ASTM E 1527). The results of this study shall indicate a clean environmental record prior to dedication.

a. In the event that the Phase 1 Environmental Site Assessment detects the potential for contaminated soil, the applicant shall perform further assessment, testing and sampling as needed to determine the type and extent of contamination present, and potential remediation steps needed.

b. If contaminated conditions are present the applicant shall either remediate the condition and submit a report to the City documenting the procedures and final soil conditions or, select another area for parkland dedication.

2. Common ownership by a homeowner's association that assumes full responsibility for its maintenance;

3. Dedication of development rights to another public agency with ownership remaining with the developer or homeowner's association. Maintenance responsibility will remain with the property owner; and/or

4. Deed-restricted private ownership preventing development and/or subsequent land division and providing for ongoing maintenance responsibilities.

E. In the event that an owner of private open space fails to maintain it according to the standards of this Code, the City of Sandy, following reasonable notice, may demand that the deficiency of maintenance be corrected, and may enter the open space for maintenance purposes. All costs thereby incurred by the City shall be charged to those persons having the primary responsibility for maintenance of the open space. The City shall enforce the maintenance requirement, pursuant to Sandy Municipal Code Chapters 1.18 or 8.16.

NOTE: This proposed Chapter 17.88 is composed of entirely new draft text. For the sake of readability, the text is displayed as standard black font, rather than blue underlined font.

CHAPTER 17.88 AFFORDABLE HOUSING

Sec. 17.88.00. Intent.

These regulations are intended to implement the provisions of Oregon Revised Statutes (ORS) 197.308, ORS 197.311 (5), and ORS 197.748 related to siting of affordable housing and emergency shelters.

Sec. 17.88.10. Affordable Housing Allowed Outright Under ORS 197.308

ORS 197.308 (added through Senate Bill 8 [2021]) requires local governments to allow affordable housing without requiring a zone change or conditional use permit if certain criteria and standards are met. These requirements are implemented by this section.

A. *Applicability Criteria.* Affordable housing projects allowed pursuant to this section must meet the affordability criteria in Subsection 1., and must meet either the ownership criteria in Subsection 2. or the zoning criteria in Subsection 3. below. Affordable housing provided pursuant to ORS 197.308 is only allowed on property zoned for industrial uses if the criteria in Subsection 4. are met.

1. *Affordability.*

    a. Units are made affordable pursuant to either Subsection i. or ii.

        i. Each unit on the property is made available to own or rent to families with incomes of 80 percent or less of the area median income as determined by the Oregon Housing Stability Council based on information from the United States Department of Housing and Urban Development; or

        ii. The average of all units on the property is made available to families with incomes of 60 percent or less of the area median income.

    b. The affordability of the units is enforceable, including as described in ORS 456.270 to 456.295, for a duration of no less than 30 years.

2. *Ownership*. The housing is owned by:

    a. A public body, as defined in ORS 174.109; or

    b. A nonprofit corporation that is organized as a religious corporation.

3. *Zoning*. The property is zoned (except as specified under Subsection 4, below):

    a. For commercial uses;

    b. To allow places of assembly for religious institutions; or

    c. As public lands.

4. *Exceptions for Industrial Property*. The requirements of this section do not apply on property zoned to allow industrial uses unless the property is:

    a. Publicly owned;

b. Adjacent to lands zoned for residential uses or schools; and

c. Not specifically designated for heavy industrial uses.

B. *Standards*. Only affordable housing developed pursuant to this section is subject to the following standards.

1. *Site Suitability.* The site shall be suitable for development of affordable housing. Affordable housing shall not be located on lands where the City determines that:

a. The development on the property cannot be adequately served by water, sewer, storm water drainage or streets, or will not be adequately served at the time that development on the lot is complete;

b. The property contains a slope of 25 percent or greater;

c. The property is within a 100-year floodplain;

d. The development of the property is constrained by land use regulations based on statewide land use planning goals relating to: natural disasters and hazards; or natural resources, including air, water, land or natural areas (but not including open spaces or historic resources); or

e. The property is zoned for industrial use and does not meet the criteria in Subsection 17.88.10.A.4 above.

2. *Density and height in areas that are zoned for residential uses*. Except as provided by Subsection c. below, the greater of density and height standards in Subsections a. or b. below, shall apply:

a. Any City density bonus for affordable housing; or

b. Without consideration of any local density bonus for affordable housing:

i. For property with existing maximum density of 16 or fewer units per net acre, based on the proposed housing type, 200 percent of the existing density and 12 additional feet; or

ii. For property with existing maximum density of 17 or more units per net acre, and 45 or fewer units per acre, based on the proposed housing type, 150 percent of the existing density and 24 additional feet.

c. Exceptions to the density and height bonuses.

i. The density and height bonuses provided by this section do not apply to housing in areas that are not zoned for residential uses.

ii. The City may reduce the density or height of the bonus as necessary to address a health, safety or habitability issue, including fire safety, or to comply with a protective measure adopted pursuant to a statewide land use planning goal provided the City adopts findings supported by substantial evidence demonstrating the necessity of this reduction.

3. *Density and height in nonresidential zones.* The maximum density and height shall be based on the density and height standards applicable to the Medium Density Residential (R-2) zone, as provided in Chapter 17.38.

4. Affordable housing projects allowed pursuant to this section are subject to the clear and objective development standards in the SDC applicable to multi-family development. A Type II approval is required.

Sec. 17.88.20. Affordable Housing Developed by Religious Corporation Under ORS 197.311 (5)

ORS 197.311 (5) (added through House Bill 2008 [2021]) and this section establish standards to allow a nonprofit corporation organized as a religious corporation to develop affordable housing.

A. *Applicability Criteria*. Affordable housing projects allowed pursuant to this section must meet subsection 1. and 2. below:

1. *Affordability*. The housing is affordable to households with incomes equal to or less than 60 percent of the median family income for Clackamas County or for the state, whichever is greater, that is subject to an affordable housing covenant, as provided in ORS 456.270 to 456.295, that maintains the affordability for a period of not less than 60 years from the date of the certificate of occupancy.

2. *Ownership*. The property is owned by a nonprofit corporation organized as a religious corporation.

B. *Standards.*

1. *Residential and nonresidential sites*. The City shall only apply restrictions or conditions of approval to the development of affordable housing that are:

   a. Clear and objective as described in ORS 197.307 (4); or

   b. Discretionary standards related to health, safety, habitability or infrastructure. For the purposes of this standard, that means that affordable housing shall not be located on lands where the City determines that the development on the property cannot be adequately served by water, sewer, storm water drainage or streets, or will not be adequately served at the time that development on the lot is complete.

2. *Nonresidential sites*.

   a. The City shall approve the development of affordable housing on property not zoned for housing if:

      i. The property is not zoned for industrial uses; and

      ii. The property is contiguous to property zoned to allow residential uses.

   b. Affordable housing allowed under this subsection shall be subject only to the restrictions applicable to the contiguously zoned residential property as limited by Subsection B.2.a. and without requiring that the property be rezoned for residential uses. If there is more than one contiguous residential property, the zoning of the property with the greatest density applies.

CHAPTER 17.90 DESIGN STANDARDS[24]

Sec. 17.90.00. Intent.

Chapter 17.90 is intended to implement the following design standards. In addition to these standards, several appendices are included to aid in the implementation of these standards. Applicable appendices are referenced in this chapter and kept on file by the ~~Planning~~ Director ~~at City Hall~~. In implementing these standards, the reviewing body shall refer to the following objectives in evaluating Design Review requests:

A. Protect and enhance the city's quality of life and community image.

B. Encourage functional, safe, and aesthetically pleasing development, while maintaining compatibility with the surrounding built and natural environment.

C. Implement the Sandy Style, as described by this chapter. The Sandy Style is based on the following guiding principles:

1. Celebrate Sandy as the Gateway to Mount Hood through contextually appropriate landscaping and building designs.

2. Protect and enhance Sandy's tree canopy, particularly along the Highway 26 Landscape Management Corridor.

3. Emphasize a "village" scale and character in new development. Village scale means development is compact and walkable, building entrances are oriented to the street sidewalk or a plaza, and large building masses are broken down through a combination of design elements such as articulation, combinations of complementary building materials and detailing.

4. Express elements of or reflect Cascadian architecture by adapting appropriate elements of English Arts and Crafts Style (1900—1920) and Oregon Rustic Style (1915—1940), and/or similar elements, into new buildings and exterior remodels, except in locations where this Code allows or requires a different architectural style (e.g., C-1 Historic Roadside Commercial District).

5. Encourage green building practices in new construction, such as the use of renewable energy (e.g., solar and wind), use of recycled materials, integration of water quality facilities in landscapes, capture of rainwater for irrigation, and similar practices.

D. The ~~c~~City considers the following elements to be incompatible with the Sandy Style. For residential developments that meet all applicable standards in this chapter, these elements shall serve as guiding principles only. For nonresidential developments, or for residential developments that do not meet all the standards of this chapter, t~~T~~he reviewing body may deny, or require modifications to, a project with any of the following:

1. Excessive tree removal and/or grading that may harm existing vegetation within a designated landscape conservation area.

2. Commercial development where buildings are setback from the street behind surface parking lots.

[24]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2013-04, effective July 3, 2013. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

3. Excessive surface parking lot paving and redundant driveways.
4. Drive-up facilities adjacent to a street that interrupt pedestrian circulation patterns or create potential safety hazards.
5. Disjointed parking areas, confusing or unsafe circulation patterns.
6. Box-like structures with large, blank, unarticulated wall surfaces.
7. Building materials or colors that do not conform to this Code.
8. Highly reflective surfaces or heavily tinted glass storefronts.
9. Strongly thematic architectural styles, forms, colors, materials, and/or detailing, that do not conform to the Sandy Style, including some forms of franchise architectural styles associated with some chain commercial establishments.
10. Inadequate landscape buffers adjacent to parking lots, walkways, and streets.
11. Visible outdoor storage, loading, and equipment areas.

Sec. 17.90.10. Applicability.

The provisions of this chapter apply to all zones and uses as follows except as specified in Sections 17.90.10.B., C., D., E., ~~and~~ F., and G. below:

A. All construction within a Commercial or Industrial Zoning District or a non-residential use in a Residential Zoning District including the following:
   1. New construction;
   2. Replacement of a building that is destroyed as specified in Section 17.08.30;
   3. Addition to an existing building;
   4. Exterior alterations other than general maintenance on an existing building;
   5. Site improvements including changes to landscaping, parking, civic spaces, etc.

B. Nonresidential development and the nonresidential components of mixed use development shall comply with all applicable standards in this chapter. Residential development and the residential components of a mixed use development are only required to comply with the clear and objective standards of this chapter unless the applicant is requesting a Design Deviation, in which case compliance with all standards is required for residential development.

C~~B~~. *General Maintenance Exception:* General maintenance activities including but not limited to the replacement of awnings, entryway covers, doors, windows, siding and roofing materials with like materials, and repainting with the same colors are exempt from these standards.

D~~C~~. *Residential Dwelling Exception:* Single ~~family~~ detached dwellings, duplexes, manufactured dwellings on individual lots ~~of record~~, and manufactured dwellings in parks are exempt from all requirements of this chapter except for Section 17.90.150.

E~~D~~. *Specific Building Exception:* Certain buildings contain architectural characteristics that contribute to the unique character of Sandy's business community. However, these buildings are not necessarily designed in conformance with the applicable design standards described in this chapter. This section allows these buildings to be maintained, repaired, painted or added on to, in a way that is consistent with the existing architectural design of these buildings. Additionally, in the event a portion or the entire building is damaged by any means, this section allows these buildings to be rebuilt as currently designed. This exemption does not allow the architectural design of these buildings to be changed or

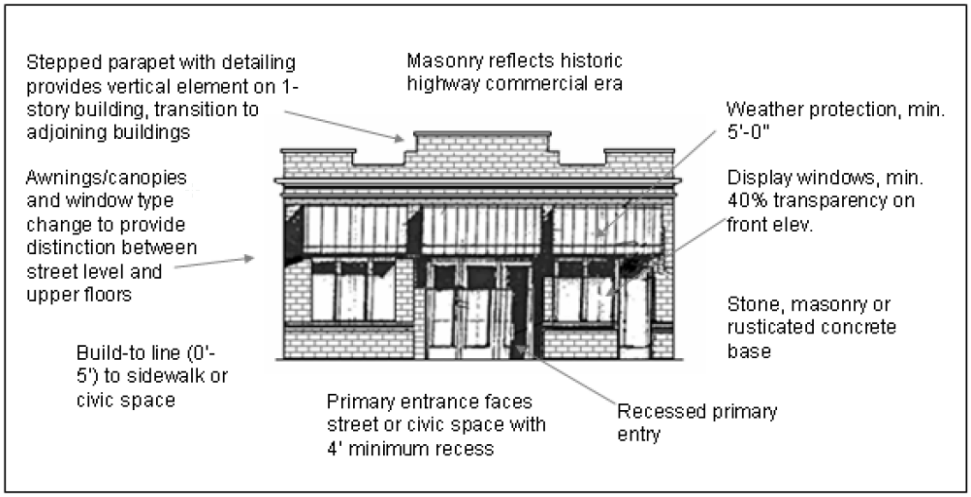
altered from the current design without compliance with the provisions of this Code. (as of February 1, 2008, see Appendix A) All other provisions in this chapter related to site design, landscaping, lighting, and external storage and screening are still applicable. This exception is applicable to the following buildings:

- _Tollgate Inn Restaurant and Bakery (38050 and 38100 Highway 26).
- _Joe's Donut Shop (39230 Pioneer Blvd.).

F~~E~~. *Downtown Area Exceptions:* Two areas within downtown Sandy contain several existing buildings or groupings of buildings that contribute to the unique character of Sandy's downtown (Appendix B). As such, new building construction within these areas may either comply with the Sandy Style design standards of this chapter, or with the details specified below. Examples of building elements that meet these standards are illustrated ~~as shown~~ in Figures 17.90.110-A and 17.90.110-B. All other provisions of this chapter related to site design, landscaping, lighting, and external storage and screening still apply.

1. Area A—South side of Pioneer Boulevard between Bruns Avenue and Meinig Avenue, including the lot at the southeast corner of Pioneer and Meinig (Figure 17.90.110-F):
   a. Use of flat roofs (See Section 17.90.110.C.8.) with detailed stepped parapet and regularly spaced picture windows (divided or undivided) framed by pilasters, transoms, and sills.
   b. Use of masonry block, brick or fluted concrete, consistent with the existing historic roadside commercial structures is allowed.
   c. Buildings may contain symmetrical forms based on a rectangular building plan and simple massing.
   d. Building articulation and detailing should express the physical structure of buildings in this area.

Figure 17.90.110-A: Typical Building Elements in Historic Roadside Commercial (Roadside Building Style)



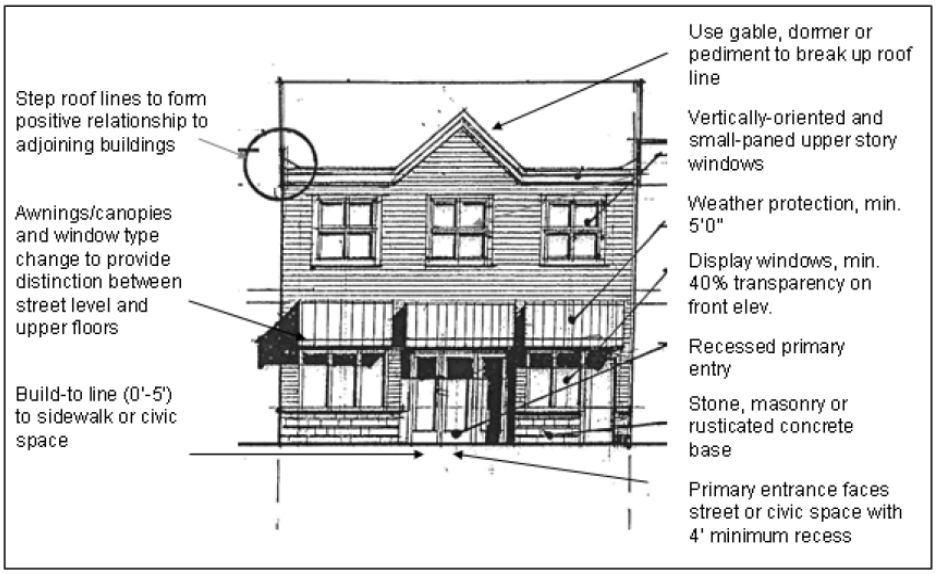
2. Area B—South side of Pioneer Boulevard between Scales Avenue and Bruns Avenue, and for the Odd Fellows Hall on the north side of Pioneer Boulevard:

a. The preferred siding material for building remodels is wood lap siding, consistent with the farm-style structures in that area.

b. Building forms and detailing should express a farmhouse vernacular; buildings should incorporate front-facing gables, covered porches, and divided or double hung sash windows.

c. Paint color should not contrast with the white-washed buildings on this block.

Figure 17.90.110-B: Typical Building Elements in Historic Roadside Commercial (Farmhouse-Style)



Sec. 17.90.30. Powers and duties.

Staff shall review plans for compliance with the Development Code and other applicable regulations. The ~~Planning~~ Director may tailor the extent of the review by deleting or combining steps when not warranted by the scale of the development.

Sec. 17.90.40. Type of review.

A. *Type I—Administrative.* Type I review applies to single family dwellings, duplex dwellings, manufactured homes on individual lots, manufactured homes within ~~MH~~ manufactured dwelling parks, and permitted residential accessory dwellings and structures.

Type I review also applies to exterior building alterations or additions on existing commercial or industrial buildings, multi-family dwellings, and non-residential uses on residentially zoned lots where the proposed alteration or addition meets the following criteria:

1. Exterior alterations other than general maintenance as defined in Section 17.90.10.B.

2. Modifications to the number of parking spaces by not more than ten percent~~;~~.

3. Modifications to the area devoted to landscaping or civic space by not more than ten percent~~;~~.

4. Building additions in the C-1 and C-3 zones containing less than 1,000 square feet.

5. Building additions in the C-2, I-1, and I-2 zones containing less than 3,000 square feet.

B. *Type II—Director's Review.* Type II review includes floor area expansions greater than the thresholds for a Type I review and all other multi-family, commercial, industrial development, and non-residential development on residentially zoned land that is in compliance with code standards, except where a Type III procedure is requested or required.

C. *Type III—Quasi-Judicial Public Hearing.* Type III review includes development where the applicant has requested one or more Design Deviations from the standards in this chapter or otherwise has requested a Type III Design Review~~ or the Director has determined the review will~~ Design Deviations involve ~~more than a nominal amount of~~ discretion in applying this chapter's standards to the application. For a Design Deviation to be approved, the applicant must demonstrate that the proposal meets or exceeds the intent of the standard(s) for which a deviation is requested. The more a request seeks to deviate from a standard, the greater the burden on the applicant to demonstrate the request complies with the standard's intent.

Sec. 17.90.70. Expiration of approval.

Design Review approval shall be void after two years from the date of the Final Order~~, or lesser time as the Planning Commission may specify~~, unless the applicant has submitted plans for building permit approval or demolition approval, as applicable, within this timeframe. The Director may grant one extension through a Type I procedure, not to exceed one year, upon a written request from the applicant prior to the expiration date of the approval~~ and a finding that the applicant has made a good faith effort to implement the approved plan.~~

Sec. 17.90.80. Modifying approvals.

A. *Major Modification.* A major modification to a Design Review approval shall be processed as a new application. Major Modifications include but are not limited to:

1. Changes in proposed land use;

2. Substantial change in building elevation and materials;

3. Changes in type and location of access ways and parking areas where off-site traffic would be affected;

4. Increase in the floor area proposed for nonresidential use by more than ten percent from what was previously specified;

5. Increase in the total ground area proposed to be covered by structures or parking by more than ten percent from what was previously specified;

6. Reduction of project amenities provided, such as civic space, recreational facilities, screening, and/or landscaping provisions by more than ten percent from what was previously specified, and;

7. Any other modification to a requirement established at the time of Design Review approval.

B. *Minor Modification.* Minor Modifications may include any of the changes listed above provided the change is below the quantifiable thresholds for a Major Modification, per Section 17.90.80.A. Minor modifications shall be processed as a Type I or Type II decision~~ at the Director's discretion~~; a Type II procedure shall be used where the modification requires interpretation of a discretionary standard.

Sec. 17.90.90. Submission requirements—Type I.

~~A. *Number of Copies:* 2~~ In addition to the items listed in Chapter 17.18.

~~B~~A. *Site Plan.* ~~As determined by the Planning Director, t~~The site plan shall be drawn at an approved engineering scale (e.g., 1'=100'; 1'=50'; 1'=20'; or 1'=10') and shall include the applicant's entire property including:

1. Dimensions of the property;
2. Proposed building location;
3. Easements of record;
4. Parcel boundaries;
5. Driveway location;
6. Contour lines at the following minimum intervals;
    a. Two foot intervals for slopes zero percent—14.9 percent.
    b. Five foot or ten foot intervals for slopes between 15 percent—25 percent.
    c. Identification of areas exceeding 25 percent.
7. Flood and Slope Hazard Overlay District boundaries;
8. Drainage, including adjacent lands;
9. Natural hazard areas, including potential flood or high ground water, landslides, erosion, drainage ways, and weak foundation soils;
10. Marsh or wetland areas, underground springs, wildlife habitat areas, wooded areas, and surface features such as earth mounds and large rock outcroppings, and including features detailed in DSL's Statewide Wetlands Inventory and ODFW's Conservation Opportunity Areas maps;
11. Streams and stream corridors;
12. Location of trees ~~over~~ 11-inches or greater DBH (~~six~~6-inches or greater DBH in FSH Overlay District);
13. Additional information ~~as required by the Director such as~~necessary to properly evaluate the proposal, including soils, geology, hydrologic study, photometric analysis, etc., unless waived by the Director. The requirement for additional information shall be communicated to the applicant at the pre-application conference or prior to the application being deemed complete.

~~C~~B. *Architectural Drawings.* The architectural drawings shall be drawn at an approved architectural scale and shall contain the following:

1. Building elevations;
2. Building materials: colors and type;
3. Retaining walls including type, architectural finish, and height;
4. Other drawings or studies (e.g., line-of-sight analysis, perspective, model, visual simulation, window glazing diagram etc.) necessary to evaluate the application as determined necessary by the Planning Director, and communicated to the applicant at the pre-application conference or prior to the application being deemed complete.

~~Building elevations showing the required design standards.~~

C. *Landscape Plan.* The landscape plan(s) shall be drawn at an approved engineering scale and shall contain the following:

1. Property and lot boundaries and rights-of-way;
2. Structures and impervious surfaces including parking lots;
3. General landscape development plan, including plant specifications keyed to plan map and including botanical names, common names, sizes, numbers, and methods of planting and maintenance, location of existing plants and groups of plants proposed;
4. Description of soil conditions and plans for soil treatment such as stockpiling of topsoil, addition of soil amendments, and plant selection requirements, relating to soil conditions;
5. Details of irrigation method;
6. Landscape-related structures such as fences, decks, terraces, patios, shelters, play areas, etc.;
7. Boundaries of open space, recreation or reserved areas;
8. Location of pedestrian or bicycle circulation.

D. Other Information or studies determined to be necessary by the Director prepared by qualified professionals to address specific site features or project impacts (e.g. arborist report, natural hazards, Geotechnical, etc.), and communicated to the applicant at the pre-application conference or prior to the application being deemed complete.

Sec. 17.90.100. Submission requirements—Type II and Type III.

~~A. *Number of Copies:* Type II: 8 copies, Type III: 15 copies.~~ In addition to the items listed in Chapter 17.18.

~~B. *Digital Version:* A compact disc containing a digital version of the required narrative in Microsoft Word format and a plan set in PDF format.~~

~~C~~A. Project Narrative documenting compliance with applicable code criteria. If the application involves any Design D~~d~~eviations from the Code standards (i.e., Type III Design Review), the narrative shall describe how the proposal meets or exceeds the intent of the standard(s) for which a deviation is requested.

~~D~~B. *Site Analysis Map.* An analysis of the site showing the relationship between the site and adjacent properties to contain the following:

1. Property boundaries, dimensions, and gross area;
2. Topographic contour lines at two-foot intervals for slopes zero—ten percent and five foot intervals for slopes greater than ten percent;
3. Location of approved Flood and Slope Hazard Overlay District boundaries and restricted development areas per Chapter 17.60;
4. Site features including existing structures, pavement, large surface features such as earth mounds and large rock outcroppings;
5. Contour lines at the following intervals:
    a. Two foot intervals for slopes zero—14.9 percent;
    b. Five foot or ten foot intervals for slopes between 15 percent—25 percent;

c. Identification of areas exceeding 25 percent;

6. Location and width of public and private streets, drives, sidewalks, rights-of-way, and easements;

7. Location, size, and species of trees 11-inches and greater DBH (~~six~~6-inches or greater DBH in FSH Overlay District);

8. North arrow, scale, names and addresses of all persons listed as owners of the subject property on the most recently recorded deed;

9. Name and address of project designer, engineer, surveyor, and/or planner, if applicable;

10. Additional information ~~as required by the Director such as~~necessary to properly evaluate the proposal, including soils, geology, hydrologic study, photometric analysis, etc., unless waived by the Director. The requirement for additional information shall be communicated to the applicant at the pre-application conference or prior to the application being deemed complete.

~~E~~C. *Proposed site plan.* The site plan shall contain the following information:

1. The proposed development site, including boundaries, dimensions, and gross area;

2. Features identified on the existing site analysis maps that are proposed to remain on the site;

3. Features identified on the existing site map, if any, which are proposed to be removed or modified by the development;

4. The location and dimensions of all proposed public and private streets, drives, rights-of-way, and easements;

5. The location and dimensions of all existing and proposed structures, utilities, pavement and other improvements on the site. Setback dimensions for all existing and proposed buildings shall be provided on the site plan;

6. The location and dimensions of entrances and exits to the site for vehicular, pedestrian, and bicycle access;

7. The location and dimensions of all parking and vehicle circulation areas (show striping for parking stalls and wheel stops);

8. Pedestrian and bicycle circulation areas, including sidewalks, internal pathways, pathway connections to adjacent properties, and any bicycle lanes or trails;

9. Loading and service areas for waste disposal, loading and delivery;

10. Outdoor recreation spaces, common areas, plazas, outdoor seating, street furniture, and similar improvements;

11. Location, type, and height of outdoor lighting;

12. Location of mail boxes, if known;

13. Name and address of project designer, if applicable;

14. Locations of bus stops and other public or private transportation facilities;

15. Locations, sizes, and types of signs;

16. Location of retaining walls.

~~F~~D. *Preliminary Utility Plan.* (Including the location of all electrical transformers and utility meters)

~~G~~E. Traffic Impact Study or Traffic Letter ~~(as determined by the Planning Director)~~ in compliance with City standards (if required).

~~H~~F. Photometric Analysis and cut sheets of proposed lighting demonstrating compliance with Chapter 15.30, Dark Sky Ordinance.

~~I~~G. *Preliminary Grading Plan.* A preliminary grading plan indicating where and to what extent grading will take place, including general contour lines, slope ratios, slope stabilization proposals, and natural resource protection proposals consistent with the provisions of this Code.

~~J~~H. *Architectural Drawings.* The ~~A~~architectural drawings shall be drawn at an approved architectural scale and shall contain the following:

1. Building elevations;
2. Building materials: colors and type ~~(including color board)~~;
3. Retaining walls including type, architectural finish, and height;
4. Other drawings or studies (e.g., line-of-sight analysis, perspective, model, visual simulation, window glazing diagram, etc.) ~~as deemed~~ necessary ~~for~~to evaluate~~ing~~ the application as determined necessary by the Planning Director, and communicated to the applicant at the pre-application conference or prior to the application being deemed complete.

~~K~~I. *Landscape Plan.* The ~~L~~landscape plan(s) shall be drawn at an approved engineering scale and shall contain the following:

1. Property and lot boundaries and rights-of-way;
2. Structures and impervious surfaces including parking lots;
3. General landscape development plan, including plant specifications keyed to plan map and including botanical names, common names, sizes, numbers, and methods of planting and maintenance, location of existing plants and groups of plants proposed;
4. Description of soil conditions and plans for soil treatment such as stockpiling of topsoil, addition of soil amendments, and plant selection requirements, relating to soil conditions;
5. Details of irrigation method;
6. Landscape-related structures such as fences, decks, terraces, patios, shelters, play areas, etc.;
7. Boundaries of open space, recreation or reserved areas;
8. Location of pedestrian or bicycle circulation.

~~L~~J. *Signs.* Proposed sign details and dimensions in conformance with Chapter 15.32.

~~M~~K. Other Information or studies determined to be necessary by the Director prepared by qualified professionals to address specific site features or project impacts (e.g. arborist report, natural hazards, Geotechnical, etc.), and communicated to the applicant at the pre-application conference or prior to the application being deemed complete.

Sec. 17.90.110. Downtown and Village Commercial (C-1 and C-3) design standards.

Development in the C-1 and C-3 zoning districts shall conform to all of the following standards, as applicable. Where a conflict exists between the requirements of this Chapter and any other code provision, this Chapter shall prevail.

A. *Site Layout and Vehicle Access.*

Intent: To provide for compact, walkable development, and to design and manage vehicle access and circulation in a manner that supports pedestrian safety, comfort and convenience. (Examples of site designs that meet these standards are illustrated in Figures 17.90.110-C and 17.90.110-D).

1. All lots shall abut or have cross access to a dedicated public street.
2. All lots that have access to a public alley shall provide for an additional vehicle access from that alley.
3. Off-street parking shall be located to the rear or side of buildings with no portion of the parking lot located within required setbacks or within ten feet of the public right-of-way, as shown in Figure 17.90.11-C. When access must be provided directly from a public right-of-way, driveways for ingress or egress shall be limited to one per 150 feet. For lots with frontage of ~~less than~~ 150 feet or less, shared access ~~may~~ shall be required if an individual access would not meet the 150-foot spacing requirement.
4. Adjacent parking lots shall be connected to one another ~~when the City determines it is practicable to do so~~unless such connections are impracticable due to physical constraints such as natural resource areas or steep topography. ~~Developments shall avoid creating barriers to inter-parcel circulation.~~
5. ~~Urban design details, such as r~~Raised or painted pedestrian crossings ~~and similar devices incorporating changes in paving materials, textures or color,~~ shall be used to calm traffic and protect pedestrians in parking areas. Similar devices for pedestrian safety that incorporate changes in paving materials, textures or color may be approved through Design Deviation.
6. Where openings occur between buildings facing Proctor Boulevard or Pioneer Boulevard, pedestrian ways shall connect the street sidewalk to any internal parking areas. ~~Development shall avoid creating barriers to pedestrian circulation.~~
7. Parking lots may include public alley accessed garages at the rear property line, except where a setback is required for vision clearance or to conform to other ~~c~~City standards.
8. Raised walkways or painted crossings from the public street sidewalk to the building entrance(s) are required. Crosswalks through parking lots and drive aisles shall be constructed of a material contrasting with the road surface or be painted (e.g., colored concrete inlay in asphalt).
9. Joint use of access points and interconnections and cross-over easements between parcels shall be required, where ~~the City determines it is practicable and~~ necessary to comply with access spacing and other applicable code requirements. A development approval may be conditioned to require a joint use access easement and interconnecting driveways or alleys to comply with access spacing and other applicable code requirements.
10. Connection to Adjacent Properties: The location of any real improvements to the property must provide for a future street if identified in the City of Sandy 2023 Transportation System Plan and pedestrian connections to adjacent properties ~~where the City determines this is practicable and necessary~~.
11. Through lots and corner lots may be permitted with two access points, one onto each abutting street, where necessary to serve a centralized, shared parking facility. Such access points must conform to the above access spacing requirements and parking must be internalized to the property.
12. Free-standing buildings shall be connected to one another with a ~~seamless~~ pedestrian network that provides access to building entrances and civic spaces.

Figure 17.90.110-C: Downtown Block Elements (Example)

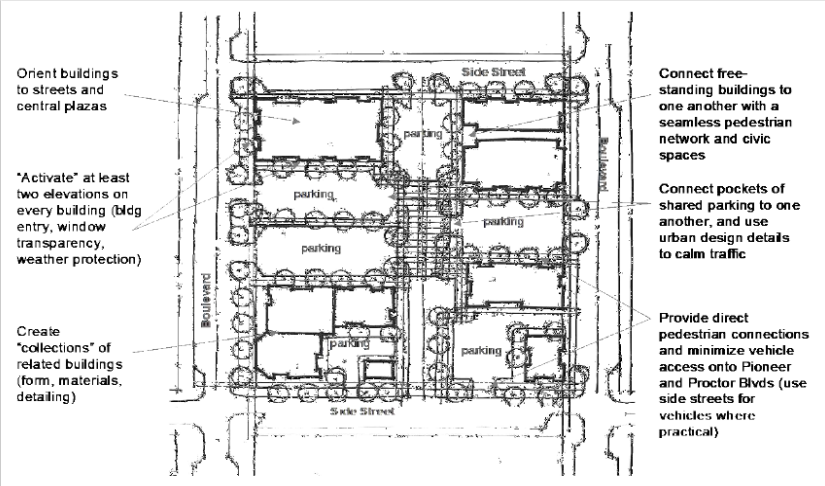
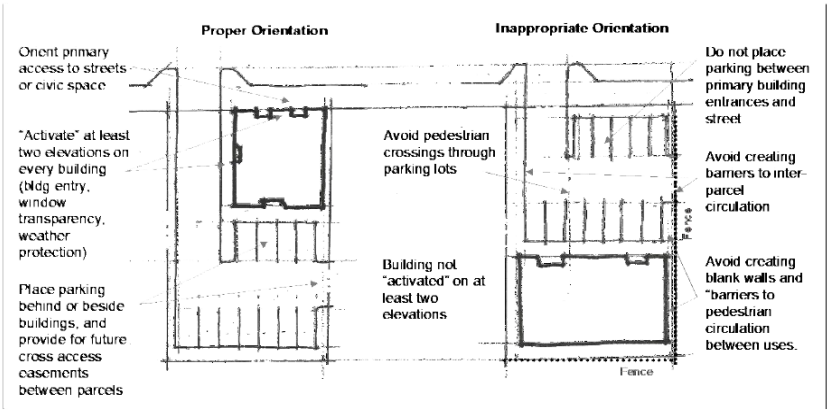


Figure 17.90.110-D: Downtown Building Orientation (Example)



B. *Building Facades, Materials, and Colors.*

Intent: To provide building façades, materials and colors consistent with the Sandy Style. For purposes of interpreting the Sandy Style, ~~representative~~ example illustrations and photos are provided. (Figures 17.90.110-C, 17.90.110-D, 17.90.110-E, 17.90.110-F, 17.90.110-G, 17.90.110-H, 17.90.110-I, Color Palettes (Appendices C and D), and photos (Appendix E). Compliance with Color Palettes in Appendices C and D is required; the figures in this chapter and photos in Appendix E are for illustrative purposes only.)

1. *Articulation.* The Sandy Style includes asymmetrical building forms, which by definition require buildings to be articulated, varied, and provide visual interest. This standard is met by dividing elevations of a structure visible from an abutting public street or pedestrian way into smaller areas or planes to minimize the appearance of bulk as viewed from the street as follows:

a. All elevations visible from an abutting public street or pedestrian way shall be divided into distinct planes no more than 30 lineal feet long to include the following:

i. Wall planes meeting this standard shall include a feature or variation in the wall plane that projects or recedes at least six inches from the adjacent plane, for a length of at least four feet. Changes in plane may include but are not limited to recessed entries, bays, secondary roof forms (e.g., gables, lower roof sheds, dormers and towers), canopies, awnings, projections, recesses, alcoves, pergolas, porticos, or roof overhangs~~, or o~~ Other features consistent with the Sandy Style may be approved through Design Deviation.

ii. Wall planes shall incorporate at least one ~~visually contrasting and complementary~~ change in materials or changes in texture or patterns, including trim~~,~~ or moldings~~, or other ornamental devices~~. Except for residential components of development (other than those requesting a Design Deviation), these changes shall be visually contrasting and complementary.

iii. The lower and upper floors of multi-story buildings shall be clearly delineated by using pedestrian shelters, change in siding materials, heavy timber or natural wood accents (e.g., brackets, paneling or other detailing).

2. *Pedestrian Shelters.* Buildings must incorporate pedestrian shelters, as follows:

a. Pedestrian shelters shall be provided over the building's primary entrance(s) and pedestrian areas (i.e., sidewalks and civic spaces) abutting the subject building.

b. Features such as canopies, arcades, awnings, roofs overhangs, covered porches, alcoves, and/or porticoes are required.

c. Pedestrian shelters must extend at least five feet over the pedestrian area.

d. Shelters shall be designed with gables ~~(e.g., over building entrances) are preferred over flat shelters,~~ and must comply with the roof pitch standards in Section 17.90.110.C. Dome or bubble shaped awnings are not permitted.

3. *Building Materials.* Exterior building materials shall convey an impression of strength and durability consistent with the Sandy Style, as follows:

a. The following standard does not apply to residential components of development, except those requesting a Design Deviation. Buildings on the same site shall be architecturally unified. This provision shall apply to new construction, additions, and remodeling such that buildings are related in architectural style and share some common elements, such as color scheme, materials, roof forms, and/or detailing. Unity does not mean repetition or mirroring of building elevations.

b. Strong base materials such as natural stone (e.g., basalt, granite, river stone), split-faced rusticated concrete block, or brick are required. Cultured stone may be allowed if it has a stone texture and is similar in appearance and durability to natural stone. A building's base must extend at least 36 inches but not more than 60 inches above the adjacent finished grade and be included on those sides of the building visible from the abutting public street. If the site contains a grade differential making construction of a minimum 36-inch base impracticable, the reviewing body may allow portions of the base to be less than 36-inches.

c. Foundations shall be designed to match the scale of the building being supported. Examples include sheathing the foundation structure with base materials and wall siding.

d. Siding shall consist of wood, composite-wood (e.g., concrete fiberboard, panels or shingles), stone, brick, split-faced or rusticated concrete block, or a combination of these materials. Stucco, synthetic stucco, and metal are permitted only as specified below. Vinyl~~,~~ and plastic ~~or similar siding~~ is not permitted:

   i. Where wood siding is used, it shall consist of horizontal (e.g., lap, v-groove, or tongue-and-groove) siding, vertical (board and batten) siding, shingles, or combinations thereof. Vertical grooved (i.e., T1-11) sheet siding and plain plywood ~~and similar materials~~ are prohibited.

   ii. Where board-and-batten siding is used, battens shall be a minimum of two-inches wide by one-inch deep and spaced 24 inches apart or closer; rough-sawn boards (specialty panel) are ~~preferred~~ required, as opposed to~~over~~ panels having a resin overlay.

   iii. Where masonry siding is used, it shall consist of brick, stone, or rusticated concrete block, and must incorporate decorative patterns over not less than 15 percent of every elevation where it is used. Examples of decorative patterns include multi-toned masonry units, such as brick, stone, or cast stone, in layered or geometric patterns or split-faced concrete block to simulate rusticated stone-type construction. Changes in pattern ~~should~~ shall be used to accentuate breaks in building stories, corners, windows, structural bays, and building tops (e.g., parapets where flat roofs are allowed).

   iv. Where metal siding is used, it shall be used as an accent only, comprising not more than 20 percent of the surface area of the building elevation (e.g., wainscoting or other accent paneling). Metal must be architectural grade and have a non-reflective (burnished or painted) finish conforming to the approved Color Palette. Metal may also be used for flashing, gutters, downspouts, brackets, lighting, and signage and similar functional elements.

   v. Where stucco or synthetic stucco is used, it shall be used as an accent only, comprising not more than 20 percent of the surface area of the building elevation.

e. Building elevations facing a public right-of-way or civic space shall incorporate at least three of the following features: Using these features may also address other code requirements, such as those related to building articulation, change in relief, pedestrian shelters, and storefront elements:

   i. Exposed, heavy timbers;

   ii. Exposed natural wood color beams, posts, brackets and/or trim (e.g., eaves or trim around windows);

   iii. Natural wood color shingles (e.g., used as siding or to accent gable ends);

   iv. Metal canopies;

   v. Heavy metal brackets (e.g., cast iron or similar appearance), which may be structural brackets or applied as cosmetic detailing; and,

   vi. Similar features, consistent with the Sandy Style, if approved through Design Deviation.

f. Materials required on elevations visible from an abutting public street must turn the building corner and incorporate ~~appropriate~~ transitions onto elevations not requiring these materials for a distance of not less than two feet.

4. *Colors.* Building exteriors shall comply with the following standards:

   a. Permitted colors include warm earth tones (tans, browns, reds, grays and greens) conforming to the Color Palette provided in Appendix C.

   b. High-intensity primary colors, metallic colors and black, may be utilized in non-residential components of development as trim and detail colors only, not to exceed one percent of the surface area of any elevation. Such color shall not be used as primary wall colors. All residential components of development shall conform to the Color Palette provided in Appendix C.

   c. ~~Day-glow colors, highly reflective colors, and similar colors~~Other colors not permitted under a. or b. are ~~not permitted~~prohibited.

Figure 17.90.110-E: Typical Building Elements in Sandy Style (Mixed Use Example)

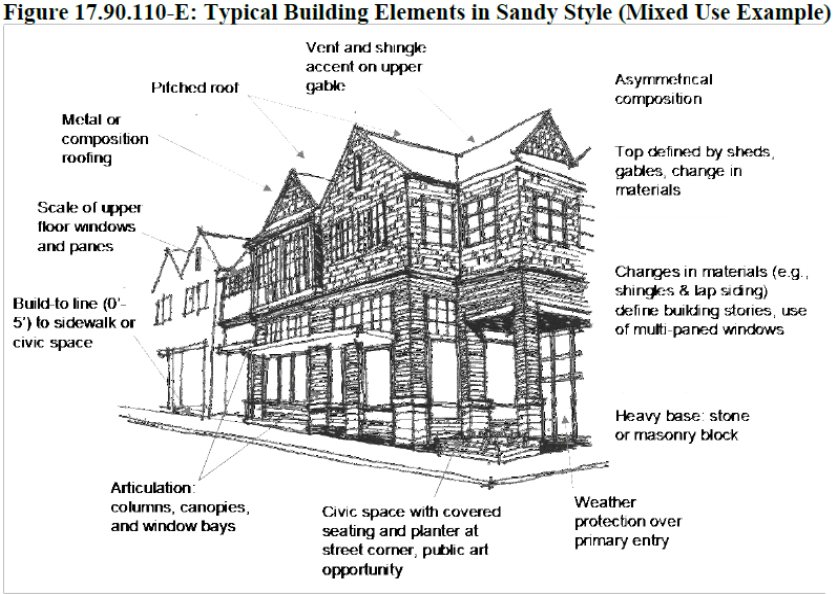


Figure 17.90.110-F: Typical Building Elements in Sandy Style (Mixed Use Example)

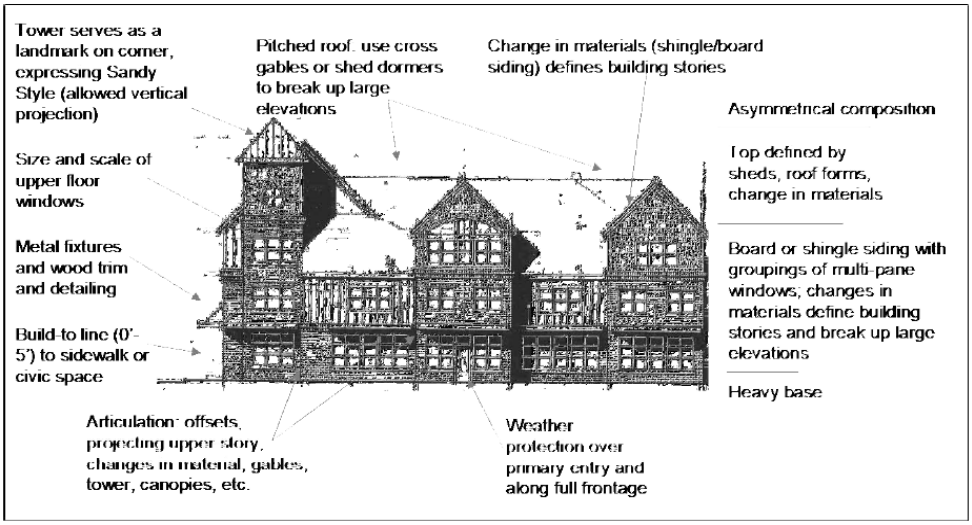
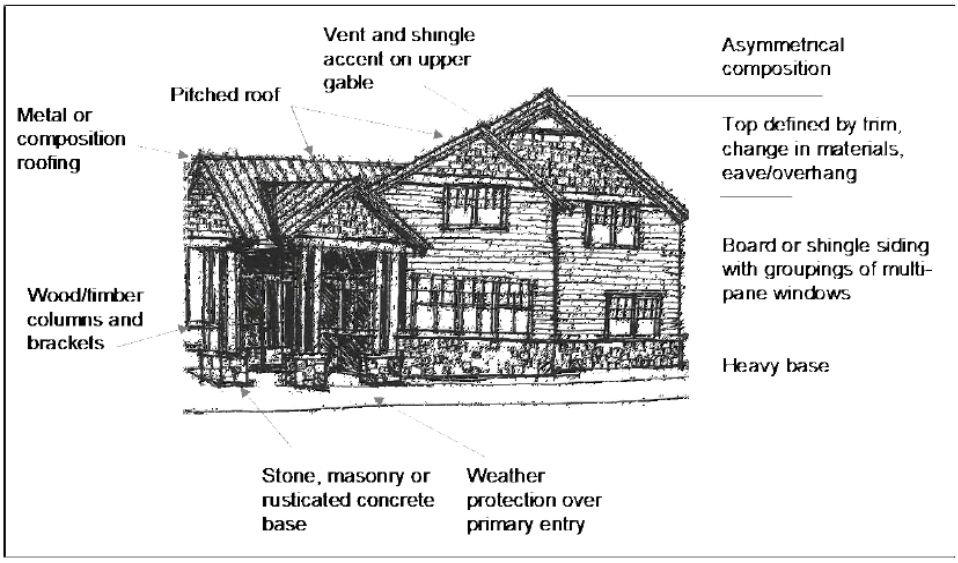


Figure 17.90.110-G: Typical Building Elements in Sandy Style (Commercial Building Example)



C. *Roof Pitch, Materials, and Parapets.*

Intent: To provide roof forms and detailing consistent with the Sandy Style. For purposes of interpreting the Sandy Style, ~~representative~~ example illustrations and photos are provided. (See Figures 17.90.110-C, 17.90.110-D, 17.90.110-E, 17.90.110-F, 17.90.110-G, 17.90.110-H, 17.90.110-I and representative photos in Appendix E)

1. Except as provided in subsections 17.90.110.C.8., below, pitched (gabled or hipped) roofs are required on all new buildings with a span of 50 feet or less. Gable and hipped roof forms must achieve a pitch not less than the following:

Zoning District	Primary Roof Forms (minimum)	Secondary Roof Forms (minimum)
C-1, C-3	6:12	4:12

2. As provided above, "Primary Roof Forms" are those that individually comprise 20 percent or more of the total surface area of a roof elevation. Secondary roof forms (e.g., dormers, towers, cupolas, etc.) are those that comprise less than 20 percent of the roof elevation. See also, Section 17.74.20 Vertical Projections.

3. ~~When practicable, b~~Buildings shall be oriented so the gable end of the roof faces the abutting street.

4. Pitched roof surfaces visible from an abutting public street shall provide a secondary roof form (e.g. dormer) in the quantity specified below. Secondary roof forms may be located anywhere on the roof, although grouping these features is preferred.

Roof Length	Number of Secondary Roof Forms
30—40 feet	1
41—80 feet	2
81 feet and greater	4

5. Visible roof materials must be ~~wood shingle or~~ architectural grade composition shingle, slate, or concrete tile. Metal with standing or batten seam may also be used conforming to the Color Palette in Appendix D.

6. All roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, shall be screened from view from public rights-of-way and civic spaces by parapets, walls or by other means approved through Design Deviation~~means~~. Roof plans and elevations must show proposed equipment locations, approximate dimensions, and line of sight from public rights-of-way and civic spaces. The reviewing body may require additional equipment setbacks, screen walls, or other mitigation to ensure compliance.

7. A-frame buildings and Mansard-style roofs are not permitted.

8. The following standard does not apply to residential components of development, except those requesting a Design Deviation. Exception to Pitched Roof: When a building requires a roof span greater than 50 feet, or the internal function of the building or a portion of the building makes construction of a pitched roof impractical, the reviewing body may allow an alternative roof form. An alternative roof form includes an "applied pitched roof" or flat roof constructed over the building or portion of the building as specified below. An example when a pitched roof is considered impractical would be the need to have large rooftop stove vents over the kitchen portion of a restaurant. Roof forms constructed under this exception shall comply with the standards below.

   a. Applied Pitched Roof: An "applied pitched roof" is the preferred alternative roof form and shall be considered first. An "applied pitched roof" is a roof form with the general appearance of a pitched roof in terms of materials, pitch, and overhang, but does not extend all the way from the eave of the building to the ridge of the roof as a typical pitched roof. An "applied pitched roof" shall be constructed according to the following:

i. For buildings with a span of less than 50 feet, the "applied pitched roof" shall extend at least 50 percent of the distance from the eave to the ridge as if had been constructed as a pitched roof;

ii. For buildings with a span of 50 feet or greater, the applied pitched roof shall extend at least 12 feet from eave.

iii. The reviewing body may require buildings with a span of 50 feet or greater to include an "applied pitched roof" in lieu of a flat roof along street facing elevations.

b. *Flat Roof:* Flat roofs shall comply with the following standards:

i. ~~Sandy Style s~~Stepped parapets and detailed coursing shall be provided on those elevations visible from an abutting public street. Parapets shall be varied so that the length of a parapet does not exceed 30 feet without a change in the parapet height of at least two feet or as necessary to hide rooftop equipment, pursuant to Subsection 17.90.110.C.6.

ii. Average parapet height shall not exceed 15 percent of the supporting wall height, and the maximum parapet height shall not at any point exceed ⅓ of the height of the supporting wall;

iii. A cornice projecting at least six inches from the building face shall be provided at the roofline of all elevations visible from abutting public rights-of-ways and pedestrian ways;

iv. Parapet corners shall be stepped and the parapet be designed to emphasize the center or primary entrance(s), unless the primary entrance is at the corner of the building.

D. *Building Orientation and Entrances.*

Intent: To maintain and enhance downtown and village commercial streetscapes as public spaces, emphasizing a pedestrian-scale and character in new development, consistent with the Sandy Style; and to provide for a continuous pedestrian network that promotes pedestrian safety, comfort and convenience, and provides materials and detailing consistent with the Sandy Style. (Figures 17.90.110-A, 17.90.110-B, 17.90.110-C, 17.90.110-D, 17.90.110-E, 17.90.110-F, 17.90.110-G, 17.90.110-H, 17.90.110-I and representative photos in Appendix E)

1. Buildings shall be oriented to a public street or civic space. This standard is met when at least 50 percent of the subject site's street frontage is comprised of building(s) placed within ten feet of a sidewalk or an approved civic space and not more than 20 percent of the off-street parking on a parcel as required by SDC 17.98, tract or area of land is located between a building's front façade and the adjacent street(s).

2. Where parking is placed between a front façade and a street, a landscaped berm and/or architectural features, such as a knee wall, colonnade, arbor, trellis and/or similar device if approved through Design Deviation, shall be placed behind the sidewalk to partially screen the parking area from the sidewalk. The partial screen shall be designed to achieve at least 50 percent opacity at the time of installation, with openings for walkways connecting to the building's primary entrance.

3. Ground floor spaces shall face a public street and shall be connected to it by a ~~direct~~ pedestrian route whose length is no more than 120 percent of the straight line distance (i.e., avoid out-of-direction travel). Where the reviewing authority determines as part of a Design Deviation that facing the building to a street is not practical, it may require the building to face a civic space.

4. The following standard applies to non-residential building entrances. Buildings located at the intersection of two streets shall use a corner building entrance; where a corner entrance is not practical due to the internal functioning of the building space or due to physical constraints of the site (e.g., topography, accessibility, or similar circumstances), a building entrance must be provided within 40 feet of the corner. The building corner must use detailing that emphasizes the corner location and is consistent with the Sandy Style. Examples of acceptable detailing include a rounded or chamfered (beveled) corner, weather protecting canopy, plaza, sculpture, and/or similar pedestrian-oriented features.

5. Upper story residential units shall have an entrance separate from the ground floor (commercial) space and conform to applicable building codes.

6. Buildings shall provide at least two elevations where the pedestrian environment is "activated." An elevation is "activated" when it meets the window transparency requirements in subsection 17.90.110.E., below, and contains a customer entrance with a pedestrian shelter extending at least five feet over an adjacent sidewalk, walkway or civic space. Where providing a customer entrance on two elevations is not practical, the reviewing body may allow a single entrance.

7. Primary entries shall face a public street or a civic space and shall be spaced not more than 30 feet apart on average. Ancillary shops shall provide entries every 30 feet, on average.

8. Primary non-residential entrances shall be architecturally emphasized and visible from the abutting public right-of-way or civic space and shall be sheltered with a canopy, overhang, or portico with a depth of at least five feet. Architectural emphasis should be provided by a gabled shelter where practical, consistent with the Sandy Style. Detailing around the base of the building, such as stonework, benches or art, should also be used to emphasize an entrance.

E. *Windows.*

Intent: To promote business vitality, public safety and aesthetics through effective window placement and design, consistent with the Sandy Style. (See Figures 17.90.110-C, 17.90.110-D, 17.90.110-E, 17.90.110-F, 17.90.110-G, 17.90.110-H, and 17.90.110-I, and representative photos in Appendix E.

1. *Unified Design.* The following standard does not apply to residential components of development, except those requesting a Design Deviation. Building plans must provide for unity in window placement and design so that all sides of a building relate to one another and multiple buildings on a development site relate to one another.

2. *Ground Floor Windows.* The ground floor elevation of all new buildings shall contain display areas, windows, and doorways along street frontages and where the building abuts a civic space as follows: Lots with multiple street frontages are required to meet this standard on only two frontages.

Building Size	Percentage Windows Required
0—10,000 sq. ft.	~~40~~35 percent of ground floor elevation
Greater than 10,000 sq. ft.	~~25~~20 percent of ground floor elevation

a. Windows shall contain clear glass to allow views to interior activity or display areas. The bottom edge of windows shall be no less than three feet above the adjacent finished grade. Where the internal functions of a building preclude windows at this height, the reviewing body may approve locating windows above or below this height. Display boxes affixed to a building's exterior are not counted in meeting the above standard.

b. Windows shall be square or vertically oriented and may consist of vertically stacked or horizontally banked window units. Windows located over a door or transom windows may be horizontally oriented.

c. Windows with any dimension exceeding six feet shall be divided into smaller panes (e.g., two foot by two foot grid) with real divided panes, vinyl inserts or applied dividers.

d. Windows shall have trim or moldings at least three inches in width around them, or have reveals of at least three inches in depth. Casings shall consist of a drip cap, head casing, side casings, and/or sills.

3. *Upper Floor Window Standards.*

a. For non-residential components of development, t~~T~~he reviewing authority may require buildings exceeding 20 feet in height to provide upper-story windows along "activated" frontages. Such windows may be required for attic space, or applied to roof forms where no second story exists, to meet the articulation requirements under Section 17.90.110.B.1.

b. For residential upper floors, windows shall cover a minimum of 15 percent of the elevation above the ground floor along "activated" frontages.

c~~b~~. Windows shall be square or vertically oriented. Individual window units shall not exceed five feet by seven feet. Any portion of a window unit with a dimension exceeding four feet shall be divided into smaller panes.

d~~c~~. At least half of all the window area in upper floors shall be made up of glass panes with dimensions no greater than two feet by three feet, unless approved by variance or adjustment. Upper story windows that have one foot by one foot grid inside double pane glass are appropriate and are encouraged.

e~~d~~. Window trim and moldings shall be ~~compatible with~~ the same as those used on the ground floor.

4. *Prohibited Windows.* The following window types are prohibited:

a. ~~Darkly tinted windows, mirrored windows, and similar w~~Windows with a visible transmittance (VT) of less than 0.6 are prohibited adjacent to street sidewalks, civic spaces and walkways.

b. Glass curtain windows are not permitted facing public rights-of-way~~, except where the reviewing body finds that such windows are consistent with the Sandy Style~~.

F. *Landscaping and Streetscape Design.*

Intent: To promote business vitality, public safety and aesthetics through effective landscaping and streetscape design, consistent with the Sandy Style; and to provide for a pedestrian network that promotes pedestrian safety, comfort and convenience, and provides materials and detailing consistent with the Sandy Style. (Figures 17.90.110-A, 17.90.110-B, 17.90.110-C, 17.90.110-D, 17.90.110-E, 17.90.110-F, 17.90.110-G, 17.90.110-H, 17.90.110-I, and Downtown Sandy Streetscape Design)

1. The provisions of Chapter 17.92, Landscaping and Screening General Standards shall apply except in the C-1 Zoning District where conformance with the Downtown Sandy Streetscape Design, as illustrated in Appendix F is required.

2. Where any conflict arises between provisions of the Sandy Streetscape Design and other ~~c~~City standards (e.g., sidewalk width, materials, or similar specifications), the Streetscape Design shall prevail. All applicable provisions of Chapter 17.92 Landscaping and Screening General Standards must be met, except as modified by the Downtown Sandy Streetscape Design.

G. *Civic Space.*

Intent: To connect buildings to the public realm and create comfortable and attractive gathering places and outdoor seating areas for the public, consistent with Sandy's Downtown Streetscape Design. (See Figures 17.90.110-H and 17.90.110-I).

1. Not less than three percent of the ground floor area of every development shall be improved as civic space.
2. All civic spaces shall have dimensions of not less than eight feet across and have a surface area of not less than 64 square feet. No civic space is required if the size of this space results in an area of less than 64 square feet.
3. Civic space improvements may include plazas, private extensions of sidewalks and walkways (i.e., to accommodate outdoor seating), public art, pedestrian-scale lighting, bus waiting areas, tourist amenities (e.g., way finding signs as approved by the ~~c~~City) or similar pedestrian amenities as approved through Design Review.
4. The highest priority locations for civic space are those areas with the highest pedestrian activity (e.g., street corners and mid-block pedestrian access ways) that have a western or southern exposure.
5. Unless impractical, civic spaces shall abut a public right-of-way or otherwise be connected to and visible from a public right-of-way by a sidewalk or pedestrian access way; access ways shall be identifiable with a change in paving materials (e.g., pavers inlaid in concrete or a change in pavement scoring patterns and/or texture) or painted. Where a right-of-way connection is not possible, the owner must provide a public access way easement to the civic space. Civic spaces shall not be gated or closed to public access, unless otherwise required by the ~~c~~City.
6. *Exceptions:* Building additions and remodels subject to Type I Design Review are not required to set aside or improve civic space, though they are encouraged to do so.

Figure 17.90.110-H: Civic Space Example 1

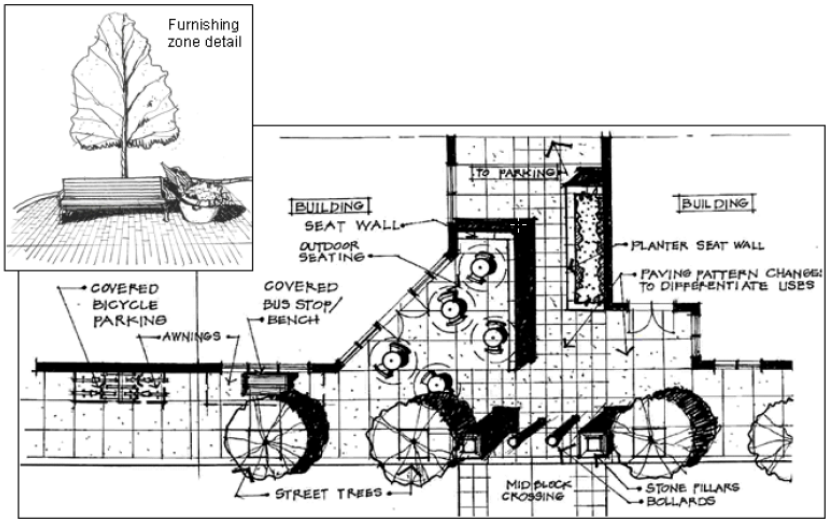
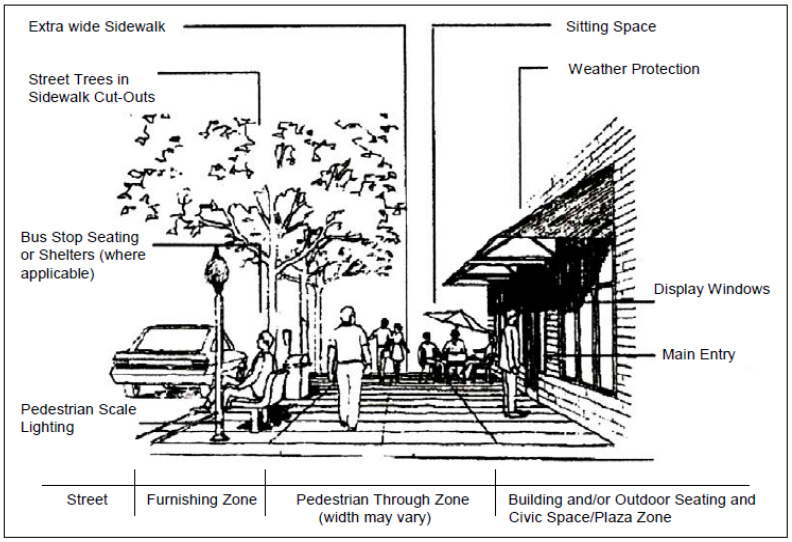


Figure 17.90.110-I: Civic Space Example 2



H. *Lighting.*

Intent: To promote business vitality, public safety and aesthetics through effective outdoor lighting, consistent with the Sandy Style.

1. Streetscape lighting shall conform to the Downtown Sandy Streetscape Design and the requirements of Chapter 15.30, Dark Sky Ordinance.
2. The following standard does not apply to residential components of development, except those requesting a Design Deviation. e~~E~~xterior lighting must be an integral part of the architectural design and must complement any ornamental street lighting and remain in context with the overall architectural character of the district. ~~On-site light fixtures conforming to the Sandy Style are encouraged.~~
3. Lighting must be adequate for safety purposes. Walkways, parking lots, and building entrances ~~should~~ shall be illuminated at a minimum of 1.5 ~~—2.0~~ foot candles.

I. *Safety and Security.*

Intent: To promote natural surveillance of public spaces for safety and security.

1. Locate windows ~~in a manner that enables tenants, employees and police to watch over~~ so that all pedestrian, parking, and loading areas are visible from at least one window.
2. In commercial, public and semipublic development, including civic spaces, locate windows in a manner that enables surveillance of interior activity from the public right-of-way.
3. Provide street address numbers measuring a minimum of six inches high, which clearly locates buildings and their entries for patrons and emergency services.
4. The following standard does not apply to residential components of development, except those requesting a Design Deviation. Locate, orient and select on-site lighting to facilitate surveillance of on-site activities from the public right-of-way and other public areas. (See also, subsection H Lighting.)

J. *External Storage and Screening.*

Intent: To promote land use compatibility and aesthetics, particularly where development abuts public spaces.

1. Exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited.
2. Where such storage is allowed, it must be screened from view from public rights-of-way and civic spaces.
3. Mechanical, electrical, communications equipment including meters and transformers, and service and delivery entrances and garbage storage areas shall be screened from view from public rights-of-way and civic spaces.
4. Trash collection and recycling storage areas must be located within the structure or otherwise screened from view in an enclosed facility. Such facilities must be screened from view from public rights-of-way and civic spaces behind a screening wall constructed to match the materials used on the primary building(s) on the subject site.
5. Exceptions to the above provisions may be allowed through Design Review where no other practical alternative exists and such equipment is made to be visually subordinate to the proposed building and landscape, for example, through the use of common materials for screening walls or landscape berms. The reviewing body may require additional setbacks, screening walls or other mitigation, for aesthetic reasons and to minimize odors or noise impacts on adjoining properties, public rights-of-way or civic spaces.

K. *Private Outdoor Areas.* This section applies only to residential uses.

Intent: Ensure that residential units have access to adequately-sized spaces for private outdoor recreation and relaxation.

1. A separate outdoor area of not less than 48 square feet in the form of balconies, terraces or porches shall be provided for each dwelling unit located above the ground level.

L. *Individual Storage Areas.* This section applies only to residential uses.

Intent: Ensure that residential units have adequate storage space, especially to store outdoor items.

1. Enclosed storage areas shall be provided that meet the minimum area and dimensions specified below. Storage areas may be attached to the exterior of each dwelling unit to accommodate garden equipment, patio furniture, barbecues, bicycles, and other items for outdoor use. Storage areas may be provided within garages if the required storage area is in addition to the required parking area for a standard parking space, per subsection 17.98.60.B.1.

Size of Dwelling	Minimum Square Feet	Minimum Height
Studio	24	6
1 Bedroom	24	6
2 Bedroom	36	6
3+ Bedroom	48	6

M. *Shared Outdoor Recreation Areas.* This section applies only to residential uses with more than five dwelling units.

Intent: Ensure that developments with multi-family units provide shared spaces for outdoor recreation and relaxation that are adequately sized, located, and functional.

1. Usable recreation areas shall be provided at the rate of 200 square feet per dwelling unit. Such areas shall be counted as part of the required landscaping.

2. Examples of usable recreation areas include, but are not limited to, playgrounds, exercise trails, swimming pools, play fields, tennis courts, community gardens, plazas, picnic areas, and passive seating areas. Usable recreation area may also include slopes, wetlands, FSH setback areas, and tree groves; however, at least 50 percent of the recreation area must be located outside the boundaries of such areas and slopes may not exceed 15 percent in the 50 percent usable recreation area. Gazebos and other outdoor covered spaces are encouraged and qualify as 1.25 square feet for every one square foot of required shared recreation area.

3. The shared outdoor recreation area(s) shall be located and designed to meet the following standards:

   a. At least 80 percent of dwelling units shall be located within 200 feet walking distance of a recreation area.

   b. Windows shall be located such that all entry areas, shared recreational areas, laundry areas, walkways and parking areas are visible from windows in at least two adjacent dwelling units. These windows must be located in kitchen, living room, dining room or other rooms besides bedrooms or bathrooms.

   b. Separation from parking and driveway areas shall be provided with a landscaped transition area measuring a minimum of ten feet wide.

   c. Access to shared outdoor areas from off-site as well as from on-site parking and entrance areas shall be controlled with fencing, walls, landscaping, or a building.

   d. All ground surfaces shall be improved with lawn, decks, wood chips, sand, hard surface materials (concrete/asphalt), or other surface appropriate to the use (e.g., rubber surface in playground area).

Sec. 17.90.120. General Commercial and Industrial (C-2 and I-1) and non-residential uses in residential zones design standards.

Development in the C-2 and I-1 zoning districts and non-residential uses in a residential zone shall conform to all of the following standards, as applicable. Where a conflict exists between the requirements of this Chapter and any other code provision, this Chapter shall prevail.

A. *Site Layout and Access.*

Intent: To provide for compact, walkable development, and to design and manage vehicle access and circulation in a manner that supports pedestrian safety, comfort and convenience. (Examples of site designs that meet these standards are illustrated in Figures 17.90.120-A and 17.90.120-B)

1. All lots shall abut or have cross access to a dedicated public street.

2. All lots that have access to a public alley shall provide for an additional vehicle access from that alley.

3. Off-street parking shall be located to the rear or side of buildings with no portion of the parking lot located within required setbacks or within ten feet of the public right-of-way, as shown in Figure 17.90.120-A. When access must be provided directly from a public right-of-way, driveways for ingress or egress shall be limited to one per 150 feet. For lots with frontage of ~~less than~~ 150

feet or less, shared access ~~may~~ shall be required if an individual access would not meet the 150-foot spacing requirement.

4. Adjacent parking lots shall be connected to one another ~~when the City determines it is practicable to do so~~ unless such connections are impracticable due to physical constraints such as natural resource areas or steep topography. ~~Developments shall avoid creating barriers to inter-parcel circulation~~.

5. ~~Urban design details, such as r~~Raised or painted pedestrian crossings ~~and similar devices incorporating changes in paving materials, textures or color,~~ shall be used to calm traffic and protect pedestrians in parking areas. Similar devices for pedestrian safety that incorporate changes in paving materials, textures or color may be approved through Design Deviation.

6. Parking lots may include public alley accessed garages at the rear property line, except where a setback is required for vision clearance or to conform to other ~~c~~City standards.

7. Walkways from the public street sidewalk to the building entrance(s) are required. Crosswalks through parking lots and drive aisles shall be constructed of a material contrasting with the road surface or painted (e.g., colored concrete inlay in asphalt).

8. Connection to Adjacent Properties: The location of any real improvements to the property must provide for a future street if identified in the City of Sandy 2011 Transportation System Plan and pedestrian connections to adjacent properties ~~where the City determines this is practicable and necessary~~. Where openings occur between buildings adjacent to Highway 26, pedestrian ways ~~should~~ shall connect the street sidewalk to any internal parking areas and building entrances. ~~Development should avoid creating barriers to pedestrian circulation.~~

9. Joint use of access points and interconnections and cross-over easements between parcels shall be required, where ~~the City determines it is practicable and~~ necessary to comply with access spacing and other applicable code requirements. A development approval may be conditioned to require a joint use access easement and interconnecting driveways or alleys to comply with access spacing and other applicable code requirements.

10. Through lots may be permitted with two access points, one onto each abutting street, where necessary to serve a centralized, shared parking facility. Such access points must conform to the above access spacing requirements and parking must be internalized to the property.

11. Free-standing buildings shall be connected to one another with a ~~seamless~~ pedestrian network that provides access to building entrances and adjacent civic spaces.

12. Minimum parking requirements are contained in Chapter 17.98. For developments containing more than 150 parking spaces, at least 20 percent of all parking spaces shall be constructed of permeable materials such as permeable asphalt, permeable concrete, pavers, and/or similar materials as approved by the City.

Figure 17.90.120-A: Typical Block Layout (Example)

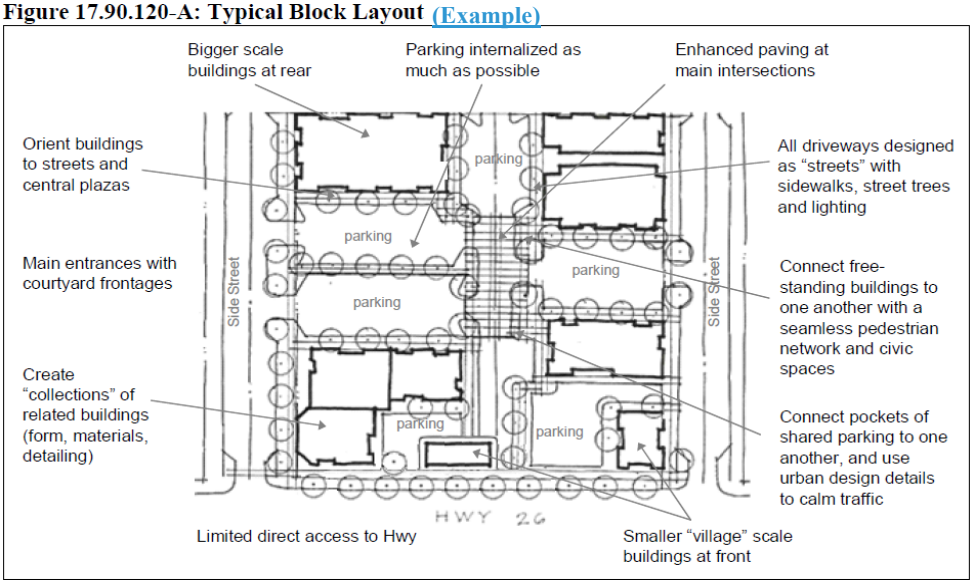
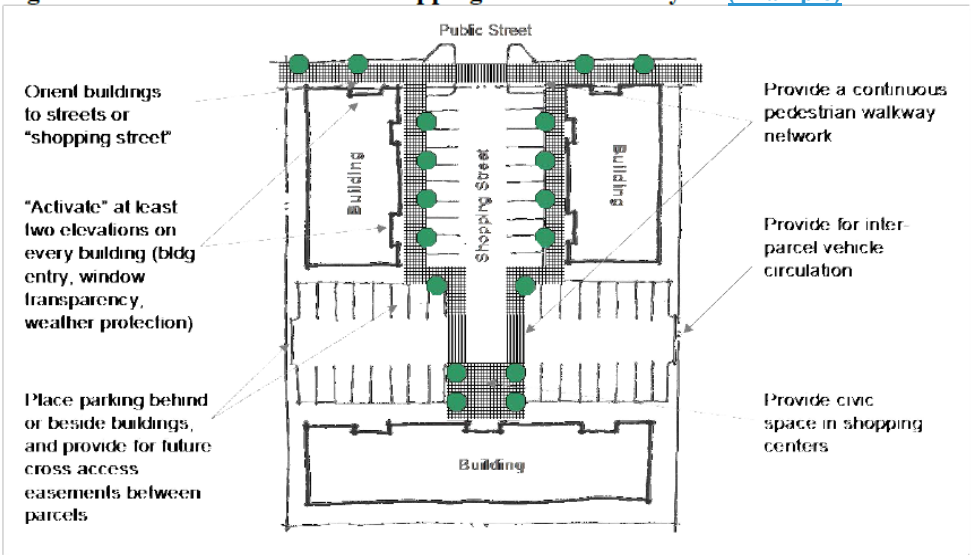


Figure 17.90.120-B: Alternative Shopping Street Block Layout (Example)



B. *Building Facades, Materials, and Colors.*

Intent: To provide building façades, materials and colors consistent with the Sandy Style. For purposes of interpreting the Sandy Style, representative illustrations and photos are provided. (Figures 17.90.120-C, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, 17.90.120-H, and 17.90.120-I; and the Color Palettes (Appendices C and D) and representative photos ~~provided in the~~ (Appendix E). Compliance with the Color Palettes in Appendices C and D is required; the photos in Appendix E are for illustrative purposes only.)

1. *Articulation.* The Sandy Style includes asymmetrical building forms, which by definition require buildings to be articulated, varied, and provide visual interest. This standard is met by dividing elevations visible from an abutting public street or pedestrian way into smaller areas or planes to minimize the appearance of bulk as follows:

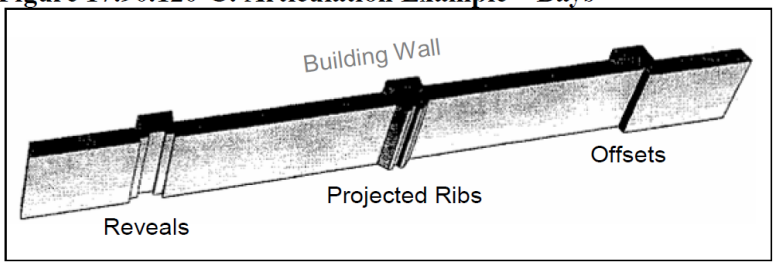
    a. All elevations visible from an abutting public street or pedestrian way shall be divided into distinct planes of no more than 40 lineal feet long to include the following:

        i. Wall planes meeting this standard shall include a feature or variation in the wall plane that are those that are entirely separated from other wall planes by a recessed or projecting section of the structure that projects or recedes at least six inches from the adjacent plane, for a length of at least four feet. Changes in plane may include but are not limited to recessed entries, bays, secondary roof forms (e.g., gables, lower roof sheds, dormers and towers), building bases, canopies, awnings, projections, recesses, alcoves, pergolas, porticos, or roof overhangs~~, or o~~ Other features consistent with the Sandy Style may be approved through Design Deviation.

        ii. Wall planes shall incorporate at least one ~~visually contrasting and complementary~~ change in materials or changes in texture or patterns, including trim~~,~~ or moldings~~, or other ornamental devices~~. Except for residential components of development (other than those requesting a Design Deviation), these changes shall be visually contrasting and complementary.

        iii. The lower and upper floors of multi-storied buildings shall be delineated by using pedestrian shelters, changes in siding materials, heavy timbers, or natural wood accents (e.g. brackets, paneling, or other detailing).

Figure 17.90.120-C: Articulation Example – Bays



2. *Pedestrian Shelters.* Buildings must incorporate pedestrian shelters, as follows:

    a. Pedestrian shelters shall be provided over the building's primary entrance(s) and all pedestrian areas (i.e., sidewalks, and civic spaces) abutting the subject building, where pedestrians are likely to use these facilities.

    b. Features such as canopies, arcades, awnings, roofs overhangs, covered porches, alcoves, and/or porticoes are required to protect pedestrians from the rain and sun.

    c. Pedestrian shelters must extend at least five feet over the pedestrian area.

    d. Shelters shall be designed with gables ~~(e.g., over building entrances) are preferred over flat shelters,~~ and must comply with the roof pitch standards in Section 17.90.110.C. Dome or bubble shaped awnings are not permitted.

3. *Building Materials.* Exterior building materials shall convey an impression of strength and durability consistent with the Sandy Style, as follows:

a. The following standard does not apply to residential components of development, except those requesting a Design Deviation. Buildings on the same site shall be architecturally unified. This provision shall apply to new construction, additions, and remodeling such that buildings are related in architectural style and share some common elements, such as color scheme, materials, roof forms, and/or detailing. Unity does not mean repetition or mirroring of building elevations.

b. Strong base materials such as natural stone (e.g., basalt, granite, river stone), split-faced rusticated concrete block, brick, or concrete form liner replicating these materials are required. Cultured stone may be allowed if it has a stone texture and is similar in appearance and durability to natural stone. A building's base must extend at least 36 inches but not more than 60 inches above the adjacent finished grade and be included on those sides of the building visible from an abutting public street. If the site contains a grade differential making construction of a minimum 36-inch base impracticable, the reviewing body may allow portions of the base to be less than 36 inches.

c. Foundations shall be designed to match the scale of the building being supported. Sheathing the foundation structure with base materials and wall siding are examples of methods which accomplish this purpose.

d. Siding shall consist of wood, composite-wood (e.g., concrete fiberboard, panels or shingles), stone, brick, split-faced or rusticated concrete block, concrete form liner or a combination of these materials. Stucco, synthetic stucco, or metal are only permitted as specified below. Vinyl~~,~~ and plastic ~~or similar siding~~ is not permitted.

    i. Where wood siding is used, it shall consist of horizontal (e.g., lap, v-groove, or tongue-and-groove) siding, vertical (board and batten) siding, shingles, or combinations thereof. Vertical grooved (i.e., T1-11) sheet siding and plain plywood ~~and similar materials~~ are prohibited.

    ii. Where board-and-batten siding is used, battens shall be a minimum of two-inches wide by one-inch deep and spaced 24 inches apart or closer; rough-sawn boards (specialty panel) are ~~preferred~~ required, as opposed to~~over~~ panels having a resin overlay.

    iii. Where masonry siding is used, it shall consist of brick, stone, or rusticated concrete block, and must incorporate decorative patterns over not less than 15 percent of every elevation where it is used. Examples of decorative patterns include multi-toned masonry units, such as brick, stone, or cast stone, in layered or geometric patterns or split-faced concrete block to simulate rusticated stone-type construction. Changes in pattern ~~should~~ shall be used to accentuate breaks in building stories, corners, windows, structural bays, and building tops (e.g., parapets where flat roofs are allowed).

    iv. Where metal siding is used, it shall be used as an accent only, comprising not more than 30 percent of the surface area of the building elevation (e.g., wainscoting or other accent paneling). Metal must be architectural grade and have a non-reflective (burnished or painted) finish conforming to the Color Palette in Appendix C. Metal may also be used for flashing, gutters, downspouts, brackets, lighting, and signage and similar functional elements.

    v. Where stucco or synthetic stucco is used, it shall only be used as an accent comprising not more than 30 percent of the surface of the building elevation.

vi. Where concrete form liner is used, it shall be limited to patterns replicating horizontal wood siding, stone, or brick as shown in Appendix H and shall not include ribbed, fluted, or similar patterns.

e. Building elevations facing a public street shall incorporate at least three of the following features: Using these features may also address other code requirements, such as those related to building articulation, change in relief, pedestrian shelters, storefront elements.

i. Exposed, heavy timbers;

ii. Exposed natural wood color beams, posts, brackets and/or trim (e.g., eaves or trim around windows);

iii. Natural wood color shingles (e.g., used as siding or to accent gable ends);

iv. Metal canopies;

v. Heavy metal brackets (e.g., cast iron or similar appearance), which may be structural brackets or applied as cosmetic detailing, and/or;

vi. Similar features, consistent with the Sandy Style, if approved through Design Deviation.

f. Materials required on elevations visible from an abutting public street must turn the building corner and incorporate ~~appropriate~~ transitions onto elevations not requiring these materials for a distance of not less than four feet.

4. *Colors.* Building exteriors shall comply with the following standards:

a. Permitted colors include warm earth tones (tans, browns, reds, grays and greens) conforming to Color Palette in Appendix C.

b. High-intensity primary colors, metallic colors and black, may be utilized in non-residential components of development as trim and detail colors only, not to exceed one percent of the surface area of any elevation. Such color shall not be used as primary wall colors. All residential components of development shall conform to the Color Palette provided in Appendix C.

c. ~~Day-glow colors, highly reflective colors, and similar colors~~Other colors not permitted under a. or b. are ~~not permitted~~prohibited.

Figure 17.90.120-D: Large-Scale Building with Sandy Style Elements (Example)

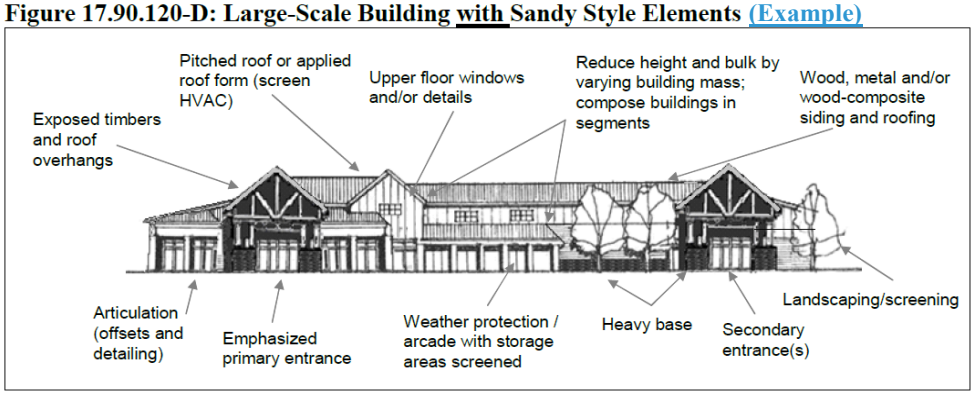


Figure 17.90.120-E: Large-Scale Building with Sandy Style Elements (Example)

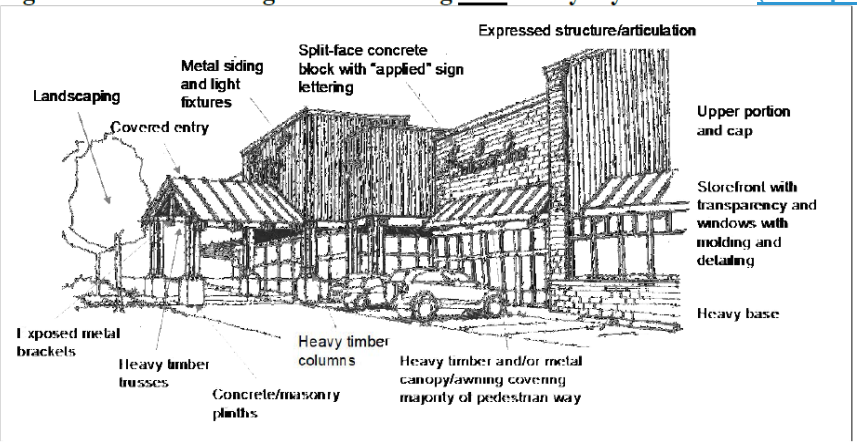


Figure 17.90.120-F: Large-Scale Building without Sandy Style Elements (Example)

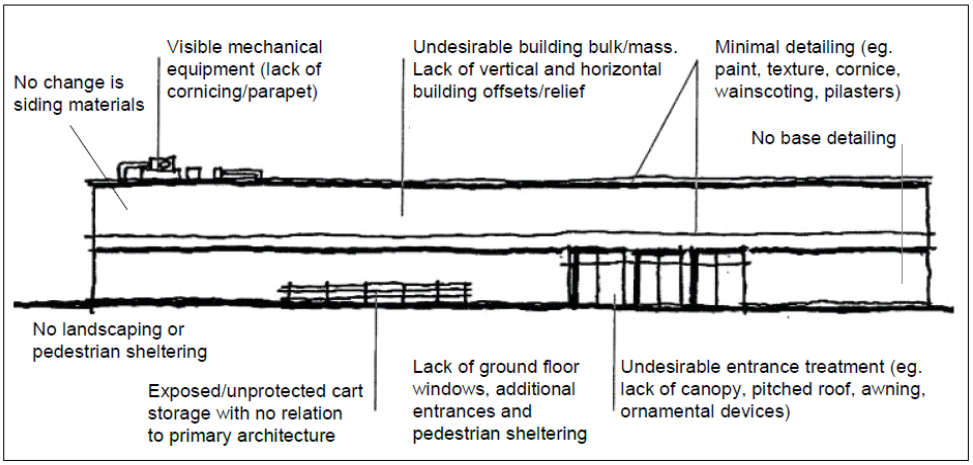


Figure 17.90.120-G: Small Building with Sandy Style Elements (Example)

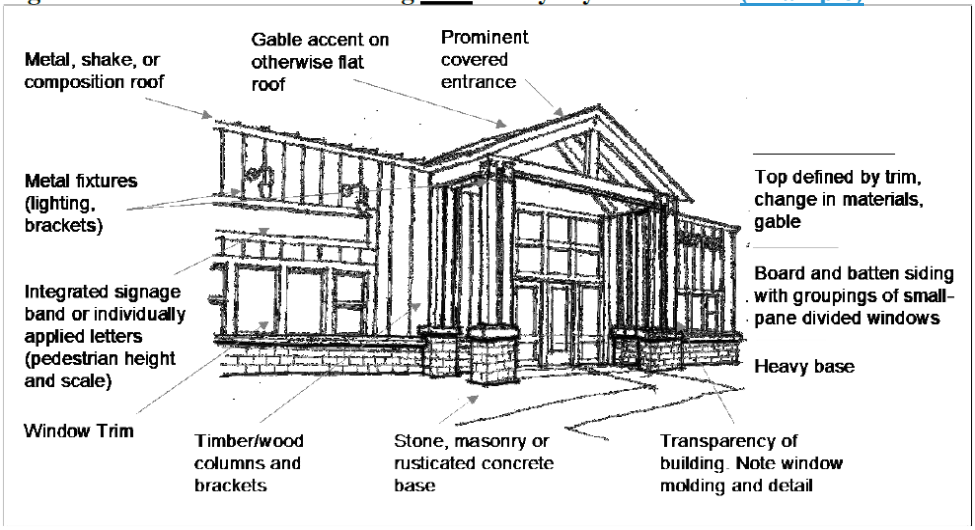
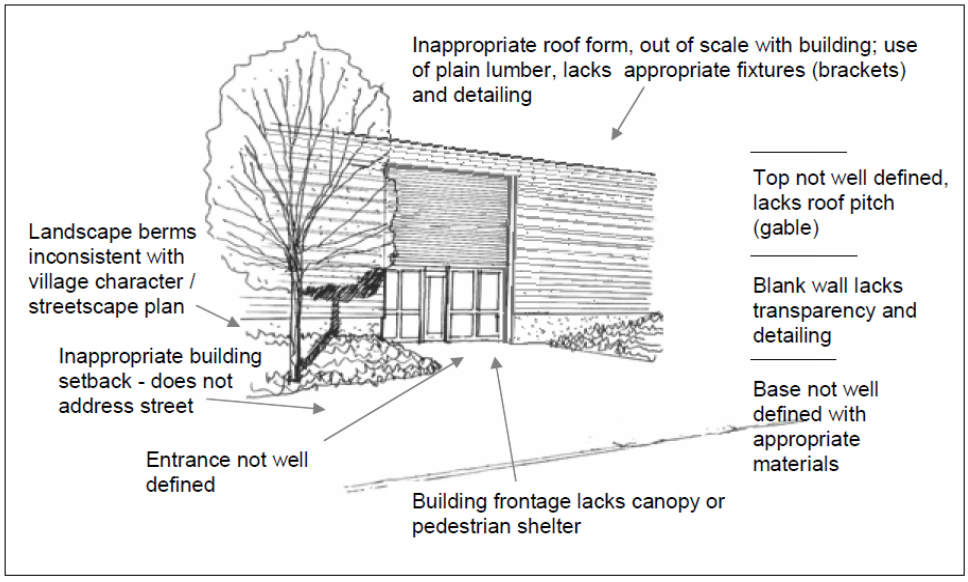


Figure 17.90.120-H: Small Building without Sandy Style Elements (Example)



C. *Roof Pitch, Materials, and Parapets.*

Intent: To provide roof forms and detailing consistent with the Sandy Style. For purposes of interpreting the Sandy Style, representative illustrations and photos are provided. (Figures 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, 17.90.120-H, and 17.90.120-I and representative photos in Appendix E)

1. Except as provided in subsections 17.90.120.C.8., below, pitched (gabled or hipped) roofs are required on all new buildings with a span of 50 feet or less. Gable and hipped roof forms must achieve a pitch not less than the following:

Zoning District	Primary Roof Forms (minimum)	Secondary Roof Forms (minimum)
C-2 and I-1	6:12	4:12

2. As provided above, "Primary Roof Forms" are those that individually comprise 20 percent or more of the total surface area of a roof elevation. Secondary roof forms (e.g., dormers, towers, cupolas, etc.) are those that comprise less than 20 percent of the roof elevation. See also, Section 17.74.20 Vertical Projections.

3. ~~When practicable, b~~Buildings shall be oriented so the gable end of the roof faces the abutting street.

4. Pitched roofs visible from an abutting public street shall provide a secondary roof form (e.g. dormer) in the quantity specified below. Secondary roof forms may be located anywhere on the roof, although grouping these features is preferred.

Roof Length	Number of Secondary Roof Forms
30—40 feet	1
41—80 feet	2
81 feet and greater	4

5. Visible roof materials must be ~~wood shingle or~~ architectural grade composition shingle, slate, or concrete tile. Metal with standing or batten seam may also be used conforming to the Color Palette in Appendix D.

6. All roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, shall be screened from view from all adjacent public rights-of-way and civic spaces by parapets, walls or by other means approved through Design Deviation~~means~~. Roof plans and elevations must show proposed equipment locations, approximate dimensions, and line of sight from public rights-of-way and civic spaces. The reviewing body may require additional equipment setbacks, screen walls, or other mitigation to ensure compliance.

7. A-frame buildings and Mansard-style roofs are not permitted.

8. The following standard does not apply to residential components of development, except those requesting a Design Deviation. *Exception to Pitched Roof:* When a building requires a roof span greater than 50 feet, or the internal function of the building or a portion of the building make construction of a pitched roof impractical, the reviewing body may allow an alternative roof form. An alternative roof form includes an "applied pitched roof" or flat roof constructed over the building or portion of the building as specified below. An example when a pitched roof is considered impractical would be the need to have large rooftop stove vents over the kitchen portion of a restaurant. Roof forms constructed under this exception shall comply with the standards below.

   a. *Applied Pitched Roof:* An "applied pitched roof" is the preferred alternative roof form and shall be considered first. An "applied pitched roof" is a roof form with the general appearance of a pitched roof in terms of materials, pitch, and overhang, but does not extend all the way from the eave of the building to the ridge of the roof as a typical pitched roof. An "applied pitched roof" shall be constructed according to the following:

i. For buildings with a span of less than 50 feet, the "applied pitched roof" shall extend at least 50 percent of the distance from the eave to the ridge as if had been constructed as a pitched roof;

ii. For buildings with a span of 50 feet or greater, the applied pitched roof shall extend at least 12 feet from eave.

iii. The reviewing body may require buildings with a span of 50 feet or greater to include an "applied pitched roof" in lieu of a flat roof along street facing elevations.

b. *Flat Roof:* Flat roofs shall comply with the following standards:

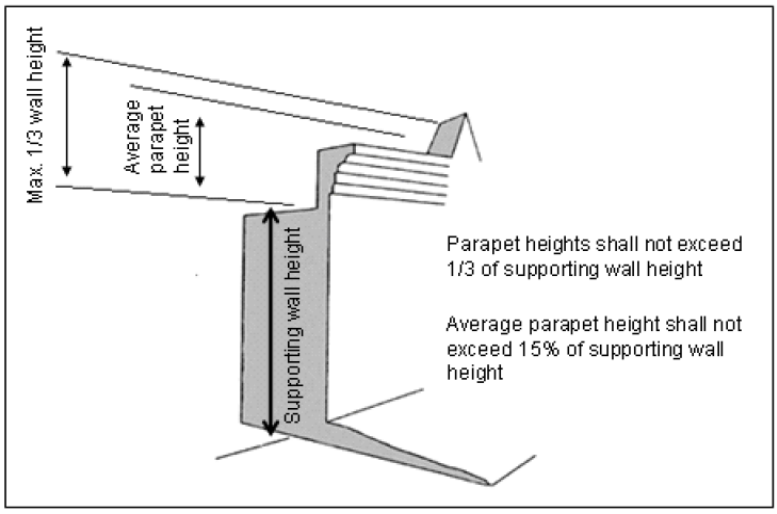
i. ~~Sandy Style s~~Stepped parapets and detailed coursing shall be provided on those elevations visible from a public street. Parapets shall be varied so that the length of a parapet does not exceed 40 feet without a change in the parapet height of at least two feet or as necessary to hide rooftop equipment pursuant to Subsection 17.90.120.C.6.

ii. Supporting wall height, and the maximum parapet height shall not at any point exceed ⅓ of the height of the supporting wall;

iii. A cornice projecting at least six inches from the building face shall be provided at the roofline of all elevations visible from public rights-of-way;

iv. Parapet corners shall be stepped and the parapet be designed to emphasize the center or primary entrance(s), unless the primary entrance is at the corner of the building;

Figure 17.90.120-I: Parapet Detailing (Example)



D. *Building Orientation and Entrances.*

Intent: To maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development, consistent with the Sandy Style. (Figures 17.90.120-A, 17.90.120-B, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, and 17.90.120-H) and representative photos in Appendix E.

1. Buildings shall be oriented to a public street or civic space. This standard is met when at least 50 percent of the subject site's street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and not more than 20 percent of the off-street parking on a parcel as required by SDC 17.98, tract or area of land is located between a building's front façade and the adjacent street(s).

2. Where parking is placed between a front façade and a street, a landscaped berm and/or architectural features, such as a knee wall, colonnade, arbor, trellis and/or similar device if approved through Design Deviation, shall be placed behind the sidewalk to partially screen the parking area from the sidewalk. The partial screen shall be designed to achieve at least 50 percent opacity at the time of installation, with openings for walkways connecting to the building's primary entrance.

3. Ground floor spaces shall face a public street or civic space and shall be connected to it by a ~~direct~~ pedestrian route whose length is no more than 120 percent of the straight line distance (i.e., avoid out-of-direction travel).

4. The following standard applies to non-residential building entrances. Buildings located at the intersection of two streets shall use a corner building entrance; where a corner entrance is not practical due to the internal functioning of the building space or due to physical constraints of the site (e.g., topography, accessibility, or similar circumstances), a building entrance must be provided within 40 feet of the corner. The building corner must use detailing that emphasizes the corner location and is consistent with the Sandy Style. Examples of acceptable detailing include a rounded or chamfered (beveled) corner, weather protecting canopy, plaza, sculpture, and/or similar pedestrian-oriented features.

5. For structures greater than 40,000 gross square feet, there shall be at least two clearly articulated non-residential public entrances on the structure; at least one such entrance shall be visible from a public street and connected to that street by a pedestrian sidewalk or walkway.

6. Retail buildings shall provide at least one customer entrance for every 200 lineal feet of anchor store space along at least one of the building's street-facing elevation(s). Such entrances may be oriented to a public street or designated civic space. Where ancillary stores or offices are provided, entrances to those spaces must be placed not more than 40 feet apart on average. For example, a 300 foot long building with one anchor store and four ancillary stores would provide no fewer than two anchor space entrances spaced not more than 200 feet apart and four ancillary entrances placed not more than 40 feet apart on average.

7. Buildings shall provide at least one elevation where the pedestrian environment is "activated." An elevation is "activated" when it meets the window transparency requirements in subsection 17.90.120.E., below, and contains a public entrance with a pedestrian shelter extending at least five feet over an adjacent sidewalk, walkway or civic space.

8. Primary non-residential entrances must be architecturally emphasized and visible from the public right-of-way and shall be sheltered with a canopy, overhang, or portico with a depth of at least five feet. Architectural emphasis should be provided by a gabled shelter where practical, consistent with the Sandy Style. Detailing around the base of the building, such as stonework, benches or art, should also be used to emphasize an entrance.

E. *Windows.*

Intent: To promote business vitality, public safety and aesthetics through effective window placement and design, consistent with the Sandy Style. (Figures 17.90.120-A, 17.90.120-B, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, and 17.90.120-H)

1. *Unified Design.* The following standard does not apply to residential components of development, except those requesting a Design Deviation. Building plans must provide for unity in window placement and design so that all sides of a building relate to one another and multiple buildings on a development site relate to one another.

2. *Ground Floor Windows.* The ground floor elevation of all new buildings shall contain ground floor display areas, windows, and doorways on the "activated" frontage as follows:

Building Size	Percentage Windows Required
0—10,000 sq. ft.	30 percent of elevation
10,000 sq. ft.—30,000 sq. ft.	25 percent of elevation
Greater than 30,000 sq. ft.	20 percent of elevation

   a. Windows shall contain clear glass to allow views to interior activity or display areas. The bottom edge of windows shall be no less than three feet above the adjacent finished grade. Where the internal functions of a building preclude windows at this height, the reviewing body may allow windows above or below this height. Display boxes affixed to a building's exterior are not counted in meeting the above standard.

   b. Windows shall be square or vertically oriented and may consist of vertically stacked or horizontally banked window units. Windows located over a door or transom windows may be horizontally oriented.

   c. Windows with any dimension exceeding six feet shall be divided to contain two or more smaller panes with real divided panes, vinyl inserts, or applied dividers.

   d. Windows shall have trim or moldings at least three inches in width around them, or have reveals of at least three inches in depth. Casings shall consist of a drip cap, head casing, side casings, and/or sills.

3. *Upper Floor Window Standards.*

   a. For non-residential components of development, t~~T~~he reviewing authority may require buildings exceeding 20 feet in height to provide upper-story windows along "activated" frontages. Such windows may be required for attic space, or applied to roof forms where no second story exists, to meet the articulation requirements under Section 17.90.110.B.1.

   b. For residential upper floors, windows shall cover a minimum of 15 percent of the elevation above the ground floor along "activated" frontages.

   c~~b~~. Windows shall be square or vertically oriented. Individual window units shall not exceed five feet by seven feet. Any portion of a window unit with a dimension exceeding four feet shall be divided into smaller panes.

   d~~c~~. At least half of all the window area in upper floors shall be made up of glass panes with dimensions no greater than two feet by three feet, unless approved by variance or adjustment. Upper story windows that have one foot by one foot grid inside double pane glass are appropriate and are encouraged.

   e~~d~~. Window trim and moldings shall be ~~compatible with~~the same as those used on the ground floor.

4. *Prohibited Windows.*

a. ~~Darkly tinted windows, mirrored windows, and similar w~~Windows with a visible transmittance (VT) of less than 0.6 are prohibited adjacent to street sidewalks, civic spaces and walkways.

b. Glass curtain windows are not permitted facing public rights-of-way~~, except where the reviewing body finds that such windows are consistent with the Sandy Style~~.

F. *Landscaping and Streetscape Design.*

Intent: To promote business vitality, public safety and aesthetics through effective landscaping and streetscape design, consistent with the Sandy Style, and to provide for a continuous pedestrian network that promotes pedestrian safety, comfort and convenience, and provides materials and detailing consistent with the Sandy Style. (See Figures 17.90.120-J and 17.90.120-K and Appendix G)

1. The provisions of Chapter 17.92 Landscaping and Screening General Standards shall apply.

2. Parcels abutting Highway 26 shall provide a landscape buffer comprising not less than 30 percent of the highway frontage, to a depth of not less than 20 feet. Within the buffer, existing trees 11-inches DBH or greater shall be preserved~~ to the extent practicable~~. New trees, shrubs, and groundcover shall be planted to create a landscape buffer and partial visual screen along the highway as specified below or as approved by the reviewing authority. If approved in writing by the Oregon Department of Transportation, this buffer may be located within the public right-of-way. Any new or modified access must fall outside the designated buffer. Landscape plans shall indicate proposed landscaping, signage and other proposed development.

3. Landscape buffer plantings shall contain a mixture of both deciduous and evergreen species selected from the list below and shall be of a sufficient quantity to provide a partial buffer within two years from the date they are planted:

• Trees—Deciduous (minimum one and one-half-inch caliper)—~~Autumn Blaze Maple, Red Sunset Maple, Scarlet Oak~~trees on the City of Sandy's Street Tree List. Evergreen (minimum eight—ten feet)—Hogan Cedar, Incense Cedar, Western Red Cedar, Douglas fir.

• Small Trees/Shrubs—Vine Maple, Serviceberry, Chinese Kousa Dogwood, Red flowering Currant, Ceanothus "Blue Blossom," Rhododendron, Pacific Wax Myrtle.

• Groundcover—Kinnickinick, Salal, Low Oregon Grape, Coastal Strawberry, Rock Rose.

4. All service and storage areas must be screened from view from all adjacent rights-of-way. (See Figure 17.90.120-K below.)

Figure 17.90.120-J: Landscape Management Area Detail – Plantings with Planned Openings (Example)

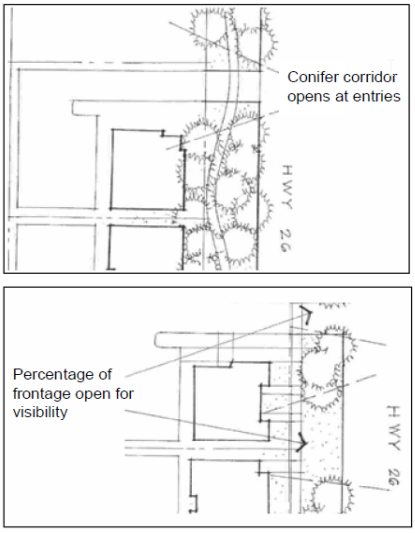
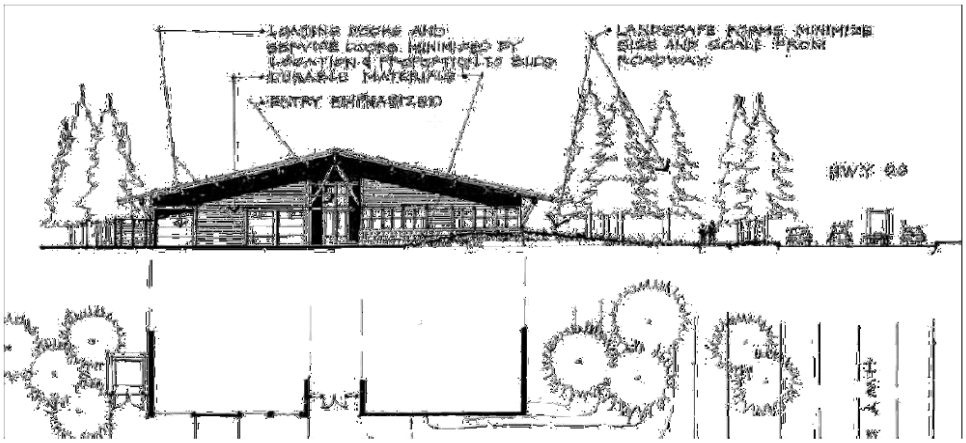


Figure 17.90.120-K: Landscape Management Area Detail – Screening of Parking and Loading Areas (Example)



G. *Civic Space.*

Intent: To connect buildings to the public realm and create comfortable and attractive gathering places and outdoor seating areas for customers and the public, consistent with Sandy's Downtown Streetscape Design. (See Figures 17.90.120-L and 17.90.120-M)

1. Not less than three percent of the building area of every development shall be improved as civic space.

2. All civic spaces shall have dimensions of not less than eight feet across and have a surface area of not less than 64 square feet. No civic space is required if the size of this space results in an area of less than 64 square feet.

3. Civic space improvements may include plazas, private extensions of sidewalks and walkways (i.e., to accommodate outdoor seating), public art, pedestrian-scale lighting, bus waiting areas, tourist amenities (e.g., way finding signs as approved by the ~~c~~City) or similar pedestrian amenities as approved through Design Review.

4. The highest priority locations for civic space are those areas with the highest pedestrian activity (e.g., street corners and mid-block pedestrian access ways) that have a western or southern exposure.

5. Civic spaces should abut a public right-of-way or otherwise be connected to and visible from a public right-of-way by a sidewalk or approved pedestrian access way; access ways shall be identifiable with a change in paving materials (e.g., pavers inlaid in concrete or a change in pavement scoring patterns and/or texture) or painted. Where a right-of-way connection is not possible, the owner must provide a public access way easement to the civic space. Civic spaces shall not be gated or closed to public access, unless otherwise required by the ~~c~~City.

6. The reviewing authority may consider the voluntary provision of civic space or pedestrian amenities in quantities exceeding the minimum standards of this Code in approving an adjustment or variance.

7. *Exceptions:*

   a. Building additions and remodels subject to Type I Design Review are not required to set aside or improve civic space, though they are encouraged to do so.

Figure 17.90.120-L: Civic Space Example 1

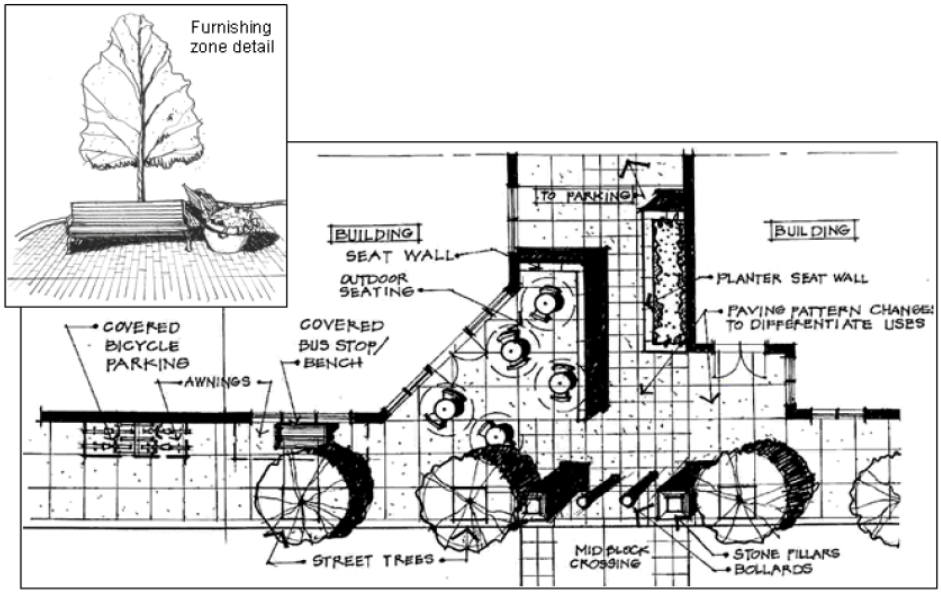
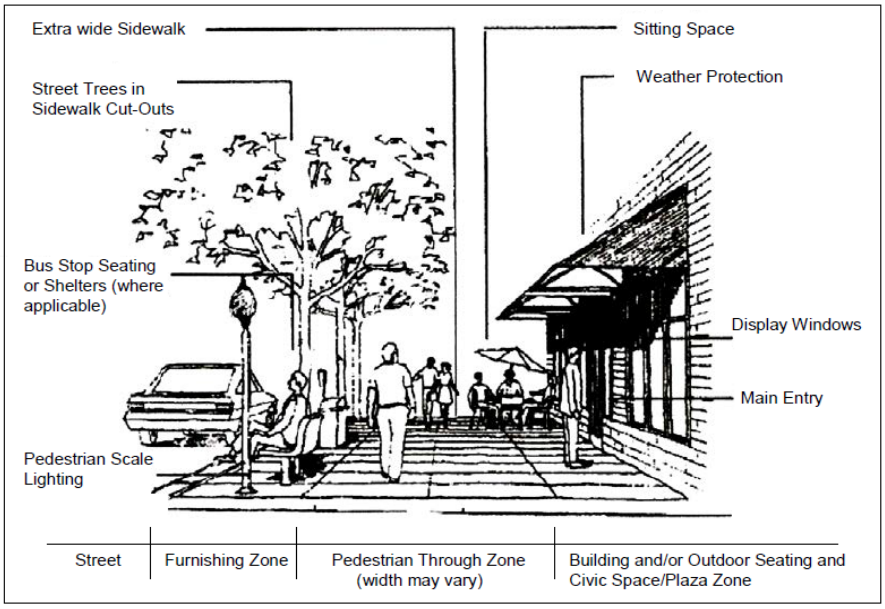


Figure 17.90.120-M: Civic Space Example 2



H. *Lighting.*

Intent: To promote business vitality, public safety and aesthetics through effective outdoor lighting, consistent with the Sandy Style. (Figures 17.90.120-G, 17.90.120-H, and 17.90.120-M)

1. Streetscape lighting shall conform to Chapter 15.30 Dark Sky Ordinance.
2. The following standard does not apply to residential components of development, except those requesting a Design Deviation. e~~E~~xterior lighting must be an integral part of the architectural design and must complement any ornamental street lighting and remain in context with the overall architectural character of the district. ~~On-site light fixtures conforming to the Sandy Style are encouraged.~~
3. Lighting must be adequate for safety purposes. Walkways and parking lots ~~should~~ shall be illuminated at a minimum of 1.5 ~~—2.0~~ foot candles.

I. *Safety and Security.*

Intent: To promote natural surveillance of public spaces for safety and security.

1. Locate windows ~~in a manner that enables tenants, employees and police to watch over~~so that all pedestrian, parking and loading areas are visible from at least one window.
2. In commercial, public and semipublic development, including civic spaces, locate windows in a manner that enables surveillance of interior activity from the public right-of-way.
3. Provide street address numbers measuring a minimum of six inches high, which clearly locates buildings and their entries for patrons and emergency services.
4. The following standard does not apply to residential components of development, except those requesting a Design Deviation. Locate, orient and select on-site lighting to facilitate surveillance of on-site activities from the public right-of-way and other public areas.

J. *External Storage.*

Intent: To promote land use compatibility and aesthetics, particularly where development abuts public spaces. (Figure 17.90.120-K)

1. The exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited.
2. Where such storage is allowed, it must be screened from view from public rights-of-way and civic spaces at least eight feet and not more than ten feet unless the screen is a continuation of the building wall.
3. Mechanical, electrical, and communications equipment including meters and transformers, service and delivery entrances, and garbage storage areas shall be screened from view from all public rights-of-way and civic spaces.
4. Trash collection and recycling storage areas must be located within the structure or otherwise screened from view in an enclosed facility. Such facilities must be screened from view from all public rights-of-way and civic spaces behind a screening wall constructed to match the materials used on the primary building(s) on the subject site.
5. Exceptions to the above provisions may be allowed through Design Review where no other practical alternative exists and such equipment is made to be visually subordinate to the proposed building and landscape, for example, through the use of common materials for screening walls or landscape berms. The reviewing body may require additional setbacks, screening walls or other mitigation, for aesthetic reasons and to minimize odors or noise impacts on adjoining properties, public rights-of-way or civic spaces.

K. *Private Outdoor Areas.* This section applies only to residential uses in the C-2 district.

Intent: Ensure that residential units have access to adequately-sized spaces for private outdoor recreation and relaxation.

1. A separate outdoor area of not less than 48 square feet in the form of balconies, terraces or porches shall be provided for each dwelling unit located above the ground level.

L. *Individual Storage Areas.* This section applies only to residential uses in the C-2 district.

Intent: Ensure that residential units have adequate storage space, especially to store outdoor items.

1. Enclosed storage areas shall be provided that meet the minimum area and dimensions specified below. Storage areas may be attached to the exterior of each dwelling unit to accommodate garden equipment, patio furniture, barbecues, bicycles, and other items for outdoor use. Storage areas may be provided within garages if the required storage area is in addition to the required parking area for a standard parking space, per subsection 17.98.60.B.1.

Size of Dwelling	Minimum Square Feet	Minimum Height
Studio	24	6
1 Bedroom	24	6
2 Bedroom	36	6
3+ Bedroom	48	6

M. *Shared Outdoor Recreation Areas.* This section applies only to residential uses with more than five dwelling units in the C-2 district.

Intent: Ensure that developments with multi-family units provide shared spaces for outdoor recreation and relaxation that are adequately sized, located, and functional.

1. Usable recreation areas shall be provided at the rate of 200 square feet per dwelling unit. Such areas shall be counted as part of the required landscaping.

2. Examples of usable recreation areas include, but are not limited to, playgrounds, exercise trails, swimming pools, play fields, tennis courts, community gardens, plazas, picnic areas, and passive seating areas. Usable recreation area may also include slopes, wetlands, FSH setback areas, and tree groves; however, at least 50 percent of the recreation area must be located outside the boundaries of such areas and slopes may not exceed 15 percent in the 50 percent usable recreation area. Gazebos and other outdoor covered spaces are encouraged and qualify as 1.25 square feet for every one square foot of required shared recreation area.

3. The shared outdoor recreation area(s) shall be located and designed to meet the following standards:

   a. At least 80 percent of dwelling units shall be located within 200 feet walking distance of a recreation area.

   b. Windows shall be located such that all entry areas, shared recreational areas, laundry areas, walkways and parking areas are visible from windows in at least two adjacent dwelling units. These windows must be located in kitchen, living room, dining room or other rooms besides bedrooms or bathrooms.

   b. Separation from parking and driveway areas shall be provided with a landscaped transition area measuring a minimum of ten feet wide.

   c. Access to shared outdoor areas from off-site as well as from on-site parking and entrance areas shall be controlled with fencing, walls, landscaping, or a building.

   d. All ground surfaces shall be improved with lawn, decks, wood chips, sand, hard surface materials (concrete/asphalt), or other surface appropriate to the use (e.g., rubber surface in playground area).

Sec. 17.90.130. Light Industrial (I-2) and General Industrial (I-3) design standards.

A. *Access.*

1. All lots shall abut or have legal access to a dedicated public street.

2. All lots that have access to a public alley shall provide for all personal and service access for vehicles from that alley.

3. Joint use of access points and interconnections shall be required, where deemed needed by the Director and Public Works Director.

4. Each lot shall be permitted one access point, except lots with street frontage of 150 feet or more may be permitted one or more additional access points, if approved by the Public Works Director.

B. *Pedestrian Accessibility.*

1. Special attention shall be given to designing a primary building entrance for each unit within a building that is both attractive and functional (e.g., SandyStyle).

2. Building entries shall comply with the accessibility requirements of the Oregon State Structural Specialty Code.

C. *Building Materials and Colors for All Structures.*

1. *Building Materials.* Exterior building materials shall convey an impression of durability. Materials such as masonry, stone, stucco, wood, composite siding, and metal are permitted. Vertical grooved (i.e., T1-11) sheet siding is prohibited.

2. *Masonry Finishes.* Where masonry is used for exterior finish, decorative patterns must be incorporated. Examples of these decorative patterns include multicolored masonry units, such as brick, stone, or cast stone, in layered or geometric patterns or split-faced concrete block to simulate a rusticated stone-type construction.

3. *Change in Relief.* Buildings must include changes in relief on ten percent of the facades facing public streets or residential development.

4. *Colors.* Building exteriors shall comply with the following standards:

   a. Permitted colors include warm earth tones (tans, browns, reds, grays, and greens).

   b. High-intensity primary colors, metallic colors and black, may be utilized as trim and detail colors only, not to exceed one percent of the surface area of any elevation. Such color shall not be used as primary wall colors.

   c. Day-glow colors, highly reflective colors, and similar colors are not permitted.

5. *Ornamental Devices.* Ornamental devices, such as molding, entablature and friezes, are encouraged at the roofline. Where such ornamentation is present in the form of a linear molding or board, the band must be at least eight inches wide.

D. *Roof Pitch, Materials, and Parapets.*

1.

Zoning District	Minimum Pitch (principal and accessory structures)
I-2 and I-3	1:12

2. Flat roofs (with minimum pitch for drainage) are permitted with detailed stepped parapets or detailed brick coursing.

3. Parapet corners shall be stepped or the parapet shall be designed to emphasize the center or primary entrance(s), unless the primary entrance is at the corner of the building.

4. Visible roof materials shall be architectural grade composition shingle, slate, concrete tile, or metal. Metal with standing or batten seam shall conform to the Color Palette in Appendix D.

5. All roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, must be screened from public view by parapets, walls or by other approved means.

E. *Building Orientation and Entrance Standards.*

1. Primary entries shall face a public street or designated pedestrian way that connects to a parking lot.

2. Secondary entries may face parking lots or loading areas.

3. Pedestrian entries, but not garage door entries, shall be sheltered with an overhang or portico with a depth of at least five feet.

F. *Windows.*

1. Windows shall be located in a manner that enables tenants, employees, and police to watch over pedestrian, parking and loading areas. Windows shall include sills at the bottom and pediments at the top. Glass curtain walls, reflective glass, and painted or darkly tinted glass are prohibited.

G. *Landscaping/Streetscape.*

1. All buildings (regardless of use) that are visible from a local street, collector street, arterial street, or highway shall be screened from view by a vegetative buffer as specified below:

   a. Minimum depth of the buffer shall be 20 feet measured from the property line and run the entire length of the property.

   b. Existing trees shall be preserved to the greatest extent possible.

   c. Evergreen trees at least eight feet in height and capable of growing to at least 30 feet in height shall be planted at a density that will create a visual screen within five years.

   d. If the property does not abut a local street, collector street, arterial street, or highway, the screening requirement can be met by an offsite screen that has the effect of screening the property from view from collector streets, arterial streets and highways.

2. Benches, outdoor seating, and trash receptacles shall complement the existing ornamental street lighting and be in keeping with the overall architectural character of the area.

Benches and other streetscape items may be placed within the public right-of-way but must not block free movement of pedestrians. A minimum pedestrian walkway width of five feet shall be maintained at all times.

H. *Lighting.*

1. Streetscape lighting shall conform to Chapter 15.30 Dark Sky Ordinance.

2. Exterior lighting shall be an integral part of the architectural design and shall complement any ornamental street lighting and remain in context with the overall architectural character of the district.

3. Lighting shall be adequate for safety purposes. Building entrances, walkways, and parking lots shall be illuminated to at least 1.5—2.0 foot candles.

I. *Safety and Security.*

1. Provide an identification system that clearly locates buildings and their entries for patrons and emergency services.

2. On-site lighting shall be located, oriented, and selected to facilitate surveillance of onsite activities from the public right-of-way or other public areas.

J. *External Storage.*

1. The exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited.

K. *Trash Collection/Recycling Areas.*

1. All trash collection/recycling areas shall be located within the structure or behind the building in an enclosure in accordance with the provisions of the City of Sandy Design Standards, Appendix A.

(Ord. No. 2023-01 , § 1(Exh. A), 2-6-2023)

Sec. 17.90.140. Manufactured homes~~dwellings~~ not in a manufactured ~~home~~ dwelling park requirements.

A. Manufactured homes that are not located in a manufactured ~~home~~ dwelling park shall comply with the following requirements:

~~1. Be multi-sectional (doublewide or wider) and enclose a floor area of not less than 1,000 square feet, excluding garages.~~

1~~2~~. ~~Have a backfill style foundation or skirting of pressure treated wood, masonry, or continuous concrete footing wall construction, c~~Comply~~ing~~ with the minimum set-up standards of the adopted Manufactured Dwelling Administrative Rules, Chapter 918.

~~3. Have a pitched roof with a minimum three feet in height for each 12 feet in width.~~

~~4. Have siding or roofing that is non-reflective.~~

2~~5~~. Be certified by the manufacturer to have an exterior thermal envelope meeting performance standards specified by State law for single-family dwelling constructed under the State one- and two-family dwelling code.

3~~6~~. In addition to these requirements manufactured homes shall comply with the design standards in Section 17.90.150.

Sec. 17.90.150. Residential design standards.

A. *Intent:* These design standards are intended to:

- Enhance the appearance of Sandy through the creation of attractively designed houses and streetscapes;
- Ensure there is a physical and visual connection between the living area and entrance of the dwelling and the street;
- Improve public safety for residents and visitors and provide opportunities for community interaction; and,
- Provide guidelines for good design at reasonable costs and with multiple options to achieve the purposes of this chapter.

B. *Applicability:* These standards apply to the street facing facades of all new single family dwellings and each half of duplexes with or without a garage, including additions or alterations.

Exemptions: The following are exempt from the design standards of this section:

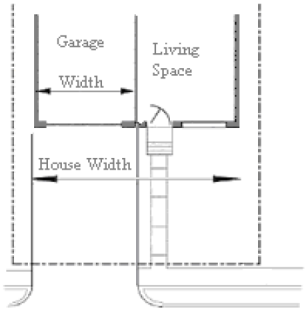
1. Additions and alterations adding less than 50 percent to the existing floor area of the structure.
2. Additions or alterations not facing a public street.

C. *Garage Width Formula:* The width of the garage relative to the total width of the street facing facade is used to determine the required number of design elements from the list specified in Section F. below:

1. *Formula:* width of garage divided by width of primary street facing façade multiplied by 100. For example: A 40 foot wide home with a 20 foot width garage would result in 50 percent (20/40 = 0.5 x 100 = 50 percent) garage to home ratio.
2. The width of the garage is measured from the outside of the garage walls. The width of the primary street facing façade is the entire width of the structure, including the garage, facing the front lot line.

3. A garage-under home design where the garage is on the lower level and the entrance to the home is above, is permitted in compliance with the design feature requirements as specified below.

Figure 17.90.150 – A: Measuring Garage Width



D. *General Provisions.*

1. For the purposes of subsections D, E, and F, "primary street facing façade" shall mean the façade facing the front lot line. "Secondary street facing façade" shall mean a façade facing a street lot line other than the front lot line.

2. In no case shall the width of the garage exceed 70 percent of the primary street facing façade except for a garage-under home design as specified in Subsection C.3 above.

3~~2~~. The primary building entrance of each structure shall meet either Subsection a or b, below, and shall meet both the standards in Subsections c and d:

a. Face the street; or

b. Be at an angle up to 45 degrees from the street; ~~or~~and

c. Open onto a covered porch that is at least 30 square feet with a minimum depth of five feet on the front or, in the case of a corner lot, the side of the residence; and~~.~~

d. Be a panel door, glass panel door, or French door. Sliding doors, bifold doors, and pocket doors are not permitted for the primary building entrance.

3. All windows and doors on the primary street facing façade and any secondary street facing facades shall be provided with trim (4-inch minimum nominal width).

4. ~~*Corner Lots:* Dwellings on corner lots~~ All facades facing a street shall provide windows and doors with trim (4 inch minimum nominal width) occupying a minimum of ten percent (excluding trim area). ~~on all secondary street facing facades.~~

5. A detached garage may not be located closer to the front lot line than the dwelling.

E. *Number of Required Design Elements.*

1. *Primary Street Facing Façade:* The number of design elements required on the primary street facing façade is specified in ~~the table below~~Table 17.90.150-A.

Table 17.90.150-A: Number of Required Design Elements

Garage Width Percent (Street Facing Attached Garage)	*Number of Required Design Elements*
Up to 50 percent	5 elements

Greater than 50 percent and up to 60 percent	6 elements
Greater than 60 percent and up to 70 percent or a garage under home design	7 elements
Other Garage Types	*Number of Required Design Elements*
Garage door 90 degrees to street	3 elements plus windows occupying 10 percent of garage wall facing the street
Detached Garage (An independent, self-supporting structure separated from the dwelling by at least 6 feet)	4 elements plus 4 elements on the garage
Rear-Loaded Garage or no Garage	4 elements

2. ~~Additional~~ Secondary Street Facing Façades: All additional street facing facades shall provide a minimum of three design elements.

F. *Required Design Elements.*

1. Dormer(s) at least three feet wide.
2. Covered porch entry~~—~~ with a minimum of a 40 square foot covered front porch and a~~,~~ minimum five feet deep.
3. ~~Front p~~Porch railing around at least two sides of the porch.
4. ~~Front facing s~~Second story balcony~~—projecting~~ that projects from the wall of the building a minimum of four feet and enclosed by a railing or parapet wall.
5. Building face containing two or more off-sets of 16 inches or greater from one exterior wall to the other.
6. Roof overhang of 16 inches or greater.
7. Columns, pillars, or posts at least four inches wide and containing ~~larger~~ base materials for a total width of at least eight inches.
8. Decorative gables ~~—C~~with cross or diagonal bracing, shingles, trim, corbels, exposed rafter ends, or brackets (does not include a garage gable if the garage projects beyond the remaining~~dwelling unit~~ portion of the primary street facing façade).
9. Decorative "belly-band" between building floors or gables (minimum nominal width of band is six inches) with a paint color or stain that is different from the siding paint color or stain. "Belly-band" means decorative trim or cladding that runs horizontally around a house or building.
10. ~~Decorative m~~Molding above windows and doors that is at least six inches wide.
11. ~~Decorative p~~Pilasters at least eight inches wide or chimneys.
12. Shakes, shingles, brick, or stone ~~or other similar decorative materials~~ occupying at least 60 square feet of the street façade.
13. Bay or bow window(s) that extend~~s—Extending~~ a minimum of 12 inches outward from the main wall of a building and form~~ing~~ a bay or alcove in a room within the building.
14. ~~Windows and front door—Occupying a minimum of ten percent of the primary street facing façade (not including the roof and excluding any windows in a garage door).~~
15. ~~15~~14. Sidelight and/or transom windows associated with the front door or windows in the front door.
16. ~~16~~15. Window grids on all façade windows. ~~(excluding any windows in the garage door or front door).~~

~~17~~16. Maximum ~~nine-foot-wide~~nine-foot-wide garage doors or a garage door designed to resemble two smaller garage doors and/or windows in the garage door (only applicable to street facing garages that are attached to the single family dwelling or duplex).

~~18~~17. ~~Decorative b~~Base materials ~~such as (~~natural stone, cultured stone, or brick) extending at least 36 inches above adjacent finished grade occupying a minimum of ten percent of the ~~overall primary~~ street facing façade.

~~19~~18. A front facing garage projecting out from the longest street facing facade not more than six feet. A front facing garage that is recessed or flush with the longest street facing façade may count as two of the required design elements.

~~20~~19. Other items meeting the intent of this section ~~as determined~~if approved ~~by the Director~~ through a Design Deviation.

G. *Dwellings ~~within Designated Villages~~ Adjacent to a~~n Arterial or Collector~~ Transit Street:*

All ~~The building elevation(s) of~~ dwellings adjacent to an arterial, ~~or~~ collector, or other transit street shall meet the standards set forth in Chapter 17.82. ~~within a designated Village (as identified on the City of Sandy Comprehensive Plan Map) shall comply with the requirements of this section and include all of the following:~~

~~1. A primary building entrance and covered porch oriented toward the arterial or collector street.~~

~~2. A sidewalk connecting directly between the arterial or collector street and the covered porch.~~

~~3. A building with frontage on more than one arterial or collector street shall provide a front entrance oriented to one street or to a corner where two streets intersect.~~

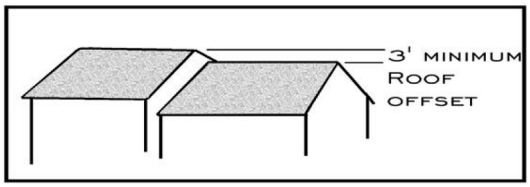
Sec. 17.90.160. Additional requirements—Multi-family developments.

Multi-family residential developments in residential zones shall comply with the requirements of this chapter as listed above and the following additional requirements:

A. *Roofs.* Roofs shall meet the following additional requirements:

1. Roofs shall be gabled or hip type roofs (minimum pitch 3:12) with at least a 30-inch overhang and using shingles or tiles, or other overlapping ~~similar~~ roofing materials. Alternatives may be approved through Design Deviation where the developer can demonstrate that abutting structures or the majority of structures within 300 feet have roofs similar to what is proposed.

2. Offsets or breaks in roof elevation shall be at least three or more feet in height.



B. *Entries.*

1. Entries shall be sheltered with an overhang, porch, portico or recessed entry that provides a minimum shelter depth of five feet. Porches and porticos shall have gabled shelters. ~~or otherwise articulated with an architecturally detailed entry.~~

2. At least one p~~P~~rimary ~~dwelling~~ entry~~ies~~ for each building shall either face a public street and be visible from the street or face a designated pedestrian way that is connected to a public street.

The pedestrian way shall avoid out-of-direction travel by having a length that is no more than 20 feet longer or 120 percent of the straight line distance to the street.~~and be visible from the street whenever feasible.~~

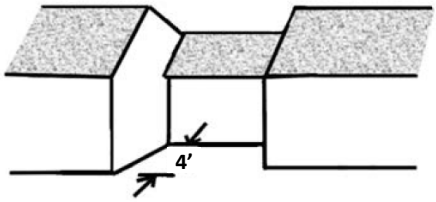
3. Individual entries~~Multiple units~~: Where g~~G~~round floor units have individual entries, each primary entry shall meet the standard in subsection B.2.~~shall face a public street or designated pedestrian way and be visible from the street whenever feasible and shall avoid out-of-direction travel. Upper story units may share entries.~~

4. Secondary entries may face parking lots or loading areas.

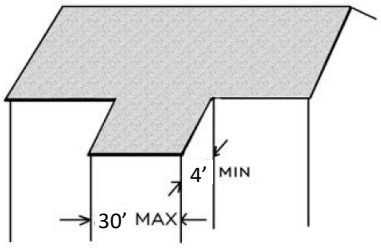
C. Building facades shall be articulated with windows, entries, balconies and/or bays. Towers or other special vertical elements may be used (no more than one per building) ~~in a limited fashion~~ to focus views to the area from surrounding streets.

D. Along the vertical face of a structure, when facing a public street, pedestrian way or an abutting residential use, offsets shall occur at a minimum of every ~~20~~ 30 feet by providing any two of the following:

1. Recesses (decks, patios, entrances, floor area, etc.) of a minimum depth of ~~eight~~ four feet.



2. Extensions (decks, patios, entrances, floor area, etc.) at a minimum depth of ~~eight~~ four feet, with maximum length of an overhang not to exceed ~~25~~ 30 feet.



3. If a ~~partially enclosed~~ covered porch is proposed, this can meet one of the offset requirements provided the porch is ~~eight~~ four feet deep and at least 125 square feet in area.

E. *Private Outdoor Areas.*

1. A separate outdoor area of not less than 48 square feet shall be attached to each ground level dwelling unit. These areas shall be separated from common outdoor areas in a manner, which enables the resident to control access from separate to common areas with elements such as walls, fences or shrubs.

2. A separate outdoor area of not less than 48 square feet in the form of balconies, terraces or porches shall be provided for each dwelling unit located above the ground level.

F. *Parking Lots.* Parking lots in multi-family developments shall not occupy more than 50 percent of the frontage of any public street abutting the lot or building.

G. *Individual Storage Areas.* Enclosed storage areas shall be required and may be attached to the exterior of each dwelling unit to accommodate garden equipment, patio furniture, barbecues, bicycles, and other items for outdoor use ~~etc~~. Storage areas may be provided within garages if the required storage area is in addition to the required parking area ~~required~~for a standard parking space, per subsection 17.98.60.B.1.

Size of Dwelling	Minimum Square Feet	Minimum Height
Studio	24	6
1 Bedroom	24	6
2 Bedroom	36	6
3+ Bedroom	48	6

H. *Carports and Garages.* If carport and garages are provided, the form, materials, color and construction shall be the same as ~~compatible with~~ the complex they serve.

I. *Shared Outdoor Recreation Areas.* Multi-family residential development shall provide usable recreation areas for developments containing more than five dwelling units at the rate of 200 square feet per dwelling unit. Such areas shall be counted as part of the required landscaping. Examples include, but are not limited to, playgrounds, exercise trails, swimming pools, play fields, tennis courts, community gardens, plazas, picnic areas, and passive seating areas. ~~etc~~. Usable recreation area may also include slopes, wetlands, FSH setback areas, and tree groves~~other natural site features~~;~~,~~ however, at least 50 percent of the recreation area must be located outside the boundaries of such areas and slopes may not exceed 15 percent in the 50 percent usable recreation area. Gazebos and other outdoor covered spaces are encouraged and qualify as 1.25 square feet for every one square foot of required shared recreation area. The shared outdoor recreation area(s) shall be located and designed ~~in a manner which~~to meet the following standards:

1. At least 80 percent of dwelling units shall be located within 200 feet walking distance of a recreation area.~~Provides approximately the same accessibility to the maximum number of dwelling units possible.~~

2. Windows shall be located ~~to encourage watching over~~such that all entry areas, shared recreational areas, laundry areas, walkways and parking areas are visible from windows in at least two adjacent dwelling units. These windows must be located in kitchen, living room, dining room or other ~~activity~~ rooms besides ~~(~~bedrooms or bathrooms~~ are not included)~~.

3. ~~Provides a s~~Separation from parking and driveway areas shall be provided with a landscaped transition area measuring a minimum of ten feet wide.

4. ~~Controls a~~Access to shared outdoor areas from off-site as well as from on-site parking and entrance areas shall be controlled with ~~features such as~~ fencing, walls, ~~and~~ landscaping, or a building.

5. ~~Provides a usable surface material such as~~All ground surfaces shall be improved with lawn, decks, wood chips, sand, ~~and~~ hard surface materials (concrete/asphalt), or other surface appropriate to the use (e.g., rubber surface in playground area).

J. *Safety and Security.*

1. ~~Provide an outdoor lighting system which facilitates police observation and resident observation through strategic location, orientation and brightness without being obtrusive by shining into residential units or adjacent residential developments.~~ Shared or common use areas, including building entries, vehicle parking areas, bicycle parking, shared outdoor areas, and pedestrian paths, shall be lighted to the following minimum levels of foot-candles to enhance safety and allow use at night, and shall conform to the requirements of Chapter 15.30, Dark Sky Ordinance:

   a. Building entries: minimum 2 foot-candles.

   b. Pedestrian paths: minimum 1.5 foot-candles.

c. Required bicycle parking: minimum 2 foot-candles.

d. Vehicle parking: minimum 1.5 foot-candles.

2. Establish a directory for apartment complexes of four or more units, which ~~clearly~~ orients visitors and emergency service providers as to the location of residential units. ~~Where possible, t~~This system ~~should~~ shall be evident from the primary vehicle entryway or within 100 feet from the vehicle entryway.

K. *Service, Delivery and Screening.*

1. Locate postal delivery areas in a ~~convenient~~ location ~~efficiently designed for~~that is accessible to all residents and mail delivery personnel and in accordance with U.S. Postal Service requirements.

2. Provide pedestrian access from unit entries to postal delivery areas, garbage and recycling collection areas, shared activity areas and parking areas. Walkways providing access to these areas shall meet standards for an ADA accessible route. Crosswalks through parking lots and drive aisles shall be painted or constructed of a material contrasting with the road surface (e.g., colored concrete inlay in asphalt). ~~Elements such as, but not limited to, concrete paths, striped walkways or raised walkways through vehicular areas or gravel trails will meet this requirement.~~

3. Provide garbage collection and recycling areas in ~~convenient~~ locations ~~for~~that are accessible by the service provider and residents.

4. Garbage collection areas shall have a concrete floor surface and shall have a gate on the truck-loading side and a separate pedestrian access.

5. Outdoor storage areas, garbage containers and recycling bins shall be screened from view in one of the following manners:

a. A solid sight obscuring wall or fence not less than six feet in height and constructed of durable materials ~~compatible with the primary structure(s)~~ shall surround these areas.

b. Evergreen plant materials which will retain their screening ability and will reach the height of six feet within three years from time of planting. An overlap of three inches is required of the evergreen plant screening. The material shall completely screen the area from ~~the public~~ view from the public right-of-way and on-site walkways.

L. *Electrical and Mechanical Equipment.* On-grade and above-grade electrical and mechanical equipment such as transformers, heat pumps, and central air conditioner units shall be screened with sight obscuring fences, walls, or landscaping.

Sec. 17.90.170. Maintenance.

A. All approved on-site improvements shall be the on-going responsibility of the property owner or occupant. The owner, occupant, or agent shall be jointly and severally responsible for the maintenance of all landscaping which shall be maintained in good condition so as to present a healthy, neat, and orderly appearance and shall be kept free of refuse and debris. All on-site improvements shall be controlled by maintaining, pruning, trimming or otherwise, so that:

1. It will not interfere with the maintenance or repair of any public facility;

2. It will not restrict pedestrian or vehicular access; and

3. It will not constitute a traffic hazard because of reduced visibility.

Sec. 17.90.180. Compliance.

A. The development site shall be checked by staff to ensure compliance with final approved plans prior to issuance of a Certificate of Occupancy.

B. The development ~~must~~ shall be completed as per the approved final plans including landscaping and recreation areas before the certificate of occupancy is issued.

~~C. It shall be the duty of the Director to enforce these regulations and to assure that conditions of final development approval are carried out.~~

CHAPTER 17.92 LANDSCAPING AND SCREENING GENERAL STANDARDS—ALL ZONES

Sec. 17.92.00. Intent.

The City of Sandy recognizes the aesthetic and economic value of landscaping and encourages its use to establish a pleasant community character, unify developments, and buffer or screen unsightly features; to soften and buffer large scale structures and parking lots; and to aid in energy conservation by providing shade from the sun and shelter from the wind. The community desires and intends all properties to be landscaped and maintained.

This chapter prescribes standards for landscaping, buffering, and screening. While this chapter provides standards for frequently encountered development situations, detailed planting plans and irrigation system designs, when required, shall be reviewed by the City with this ~~purposes~~ intent clause as the guiding principle.

Sec. 17.92.10. General provisions.

A. Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications~~.~~ and shall ~~No development may commence until the Director or Planning Commission has determined the plans~~ comply with the ~~purposes clause and specific~~ standards in this chapter. All required landscaping and related improvements shall be completed or financially guaranteed prior to the issuance of a Certificate of Occupancy.

B. Appropriate care and maintenance of landscaping on-site and landscaping in the adjacent public right-of-way is the right and responsibility of the property owner, unless City ordinances specify otherwise for general public and safety reasons. If street trees or other plant materials do not survive or are removed, materials shall be replaced in kind within six months.

C. Significant ~~plant and~~ tree specimens ~~should~~ shall be preserved ~~to the greatest extent practicable~~ and integrated into the design of a development. Trees of 11-inches DBH ~~25-inches~~ or greater (6-inches or greater in the FSH Overlay District)~~circumference measured at a height of four and one-half feet above grade~~ are considered significant. Plants to be saved and methods of protection shall be indicated on the detailed planting plan submitted for approval. Existing trees ~~may~~shall be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area five feet outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located five feet outside the dripline.

D. Planter and boundary areas used for required plantings shall have a minimum diameter of five feet (two and one-half foot radius, inside dimensions). Where the curb or the edge of these areas are used as a tire stop for parking, the planter or boundary plantings shall be a minimum width of seven and one-half feet.

E. In no case shall shrubs, conifer trees, or other screening be permitted within vision clearance areas of street, alley, or driveway intersections~~, or where the City Engineer otherwise deems such plantings would endanger pedestrians and vehicles.~~

F. ~~Landscaped planters and other landscaping features shall be used to define, soften or screen the appearance of off-street parking areas and other activity from the public street.~~ Up to 35 percent of ~~the~~ a site's total required landscaped area may be developed into pedestrian amenities, including~~, but not limited to~~ sidewalk cafes, seating, water features, and plazas~~, as approved by the Director or Planning Commission~~. Other pedestrian amenities may be approved as part of a discretionary review.

G. An applicant may choose to count one or more pre-existing vegetated areas toward a site's total required landscaped area, provided that the pre-existing vegetated area is located within the dripline of an existing tree and does not include any nuisance plants.

H~~G~~. For nonresidential development, or for residential development processed through discretionary review, r~~R~~equired landscaping~~/open space~~ shall be designed and arranged to offer the maximum benefits to the occupants of the development as well as provide visual appeal and building separation.

~~H. Balconies required for entrances and exits shall not be considered as open space except where such exits and entrances are for the sole use of the unit.~~

~~I. Roofed structures shall not be included as open space except for open unenclosed public patios, balconies, gazebos, or other similar structures or spaces.~~

~~J. Driveways and parking areas shall not be included as open space.~~

I~~K~~. All areas not occupied by paved roadways, walkways, patios, or buildings shall be landscaped.

J~~L~~. All landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.

Sec. 17.92.20. Minimum improvements—Landscaping and screening.

The minimum landscaping area of a site to be retained in landscaping shall be as follows:

Zoning District or Use	Percentage
R-3	25%
Manufactured Home Park	20%
C-1 Central Business District	10%
C-2 General Commercial	20%
C-3 Village Commercial	10%
I-1 Industrial Park	20%
I-2 Light Industrial	15%
I-3 Heavy Industrial	10%

Sec. 17.92.30. Required tree plantings.

Planting of trees is required for all parking lots with four or more parking spaces, public street frontages, and along private drives more than 150 feet long. ~~Trees shall be planted outside the street right-of-way except where there is a designated planting strip or City adopted street tree plan.~~

The City maintains a list of appropriate trees for street tree ~~and parking lot~~ planting ~~situations~~. Selection of species for street trees and trees within parking areas shall~~should~~ be made from the ~~c~~City-approved list. Alternate selections may be approved by the Director following written request as part of a discretionary review. The type of tree used shall determine frequency of trees in planting areas; tree spacing along streets and within parking areas shall meet the spacing standards in the table below. Trees in parking areas shall be dispersed throughout the lot to provide a canopy for shade and visual relief. "Medium" canopy trees are those whose canopy reaches 30 to 50 feet in width at maturity. "Large" canopy trees are those whose canopy reaches over 50 feet in width at maturity.

Area/Type of Planting	Canopy	Spacing
Street Tree	Medium	Maximum 30 ft. on center
Street Tree	Large	Maximum 50 ft. on center

Parking Lot Tree	Medium	Minimum 1 per 8 cars
Parking Lot Tree	Large	Minimum 1 per 12 cars

Trees may not be planted:

• Within five feet of permanent hard surface paving or walkways, unless specific species, special planting techniques and specifications approved by the Director as part of a discretionary review are used.

• Unless approved otherwise by the City Engineer as part of a discretionary review:

  • Within ten feet of fire hydrants and utility poles

  • Within 20 feet of street light standards

  • Within five feet from an existing curb face

  • Within ten feet of a public sanitary sewer, storm drainage or water line

• Where the Director determines as part of a discretionary review that the trees may be a hazard to the public interest or general welfare.

• Trees shall be pruned to provide a minimum clearance of eight feet above sidewalks and 12 feet above street and roadway surfaces.

Sec. 17.92.40. Irrigation.

Landscaping shall be irrigated, either with a manual or automatic system, to ensure long-term maintenance of the plantings ~~sustain viable plant life.~~

Sec. 17.92.50. Types and sizes of plant materials.

A. At least 75 percent of the required landscaping area shall be planted with a ~~suitable~~ combination of trees, shrubs, ~~or~~ and evergreen ground cover except as otherwise authorized by ~~Chapter~~ Subsection 17.92.10.F.

B. Plant Materials. Use of native plant materials or ~~plants acclimatized to the Pacific Northwest~~water-efficient plants for the Willamette Valley is ~~encouraged where possible~~required in compliance with the 2016 Water Management and Conservation Plan. Use of nuisance species listed in the City of Portland Plant List is not permitted.

C. Trees shall be species having an average mature spread of crown greater than 15 feet and having trunks which can be maintained in a clear condition with over five feet of clear wood (without branches). Trees having a mature spread of crown less than 15 feet may be substituted by grouping the same so as to create the equivalent of a 15-foot crown spread.

D. Deciduous trees shall be balled and burlapped, be a minimum of seven feet in overall height or one and one-half inches in caliper measured six inches above the ground at the time of ~~, immediately after~~ planting. Bare root trees will be acceptable to plant during their dormant season.

E. Coniferous trees shall be a minimum five feet in height above ground at time of planting.

F. Shrubs shall be a minimum of one gallon in size or two feet in height when measured at the time of ~~immediately after~~ planting.

G. Hedges, where required to screen and buffer off-street parking from adjoining properties shall be planted with an evergreen species maintained so as to form a continuous, solid visual screen within two years after planting.

H. Vines for screening purposes shall be a minimum of one gallon in size or 30 inches in height at the time of ~~immediate after~~ planting and may be used in conjunction with fences, screens, or walls to meet physical barrier requirements as specified.

I. Groundcovers shall be fully rooted ~~and shall be well branched or leafed~~. If used in lieu of turf in whole or in part, ground covers shall be planted in such a manner as to provide complete coverage in one year after planting.

J. Turf areas shall be planted in species normally grown as permanent lawns in western Oregon. Either sod or seed are acceptable. Acceptable varieties include improved perennial ryes and fescues. ~~used within the local landscape industry.~~

K. Landscaped areas may include architectural features or artificial ground covers such as sculptures, benches, masonry or stone walls, fences, rock groupings, ~~bark dust~~wood chips, decorative hard paving, and gravel areas, interspersed with planted areas. The exposed area developed with such features shall not exceed 25 percent of the required landscaped area. Artificial plants are prohibited in any required landscape area.

Sec. 17.92.60. Revegetation in ~~un~~non-landscaped or natural landscaped areas.

A. Areas where ~~natural~~ pre-existing vegetation has been removed or damaged through grading or construction activity in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements shall be replanted.

B. Plant material shall be watered at intervals sufficient to assure survival and growth.

C. The use of native plant materials or water-efficient plants ~~acclimatized to the Pacific Northwest~~for the Willamette Valley is ~~encouraged~~ required to reduce ~~irrigation~~ water use in compliance with the 2016 Water Management and Conservation Plan. ~~and maintenance demands.~~

Sec. 17.92.70. Landscaping ~~between~~ in the public right-of-way. ~~and property lines.~~

The planter strip in the public right-of-way shall include street trees spaced in accordance with Section 17.92.30, in accordance with the adopted street tree list, and at sizes in accordance with Section 17.92.50. In addition to street trees, the planter strip shall also include other landscaping, such as groundcover, turf, or wood chips to fully cover all exposed soils. ~~Except for portions allowed for parking, loading, or traffic maneuvering, a required setback area abutting a public street and open area between the property line and the roadway in the public street shall be landscaped. That portion of the landscaping~~ Landscaping within the street right-of-way shall not count as part of the site ~~lot~~ area percentage to be landscaped in accordance with Section 17.92.20.

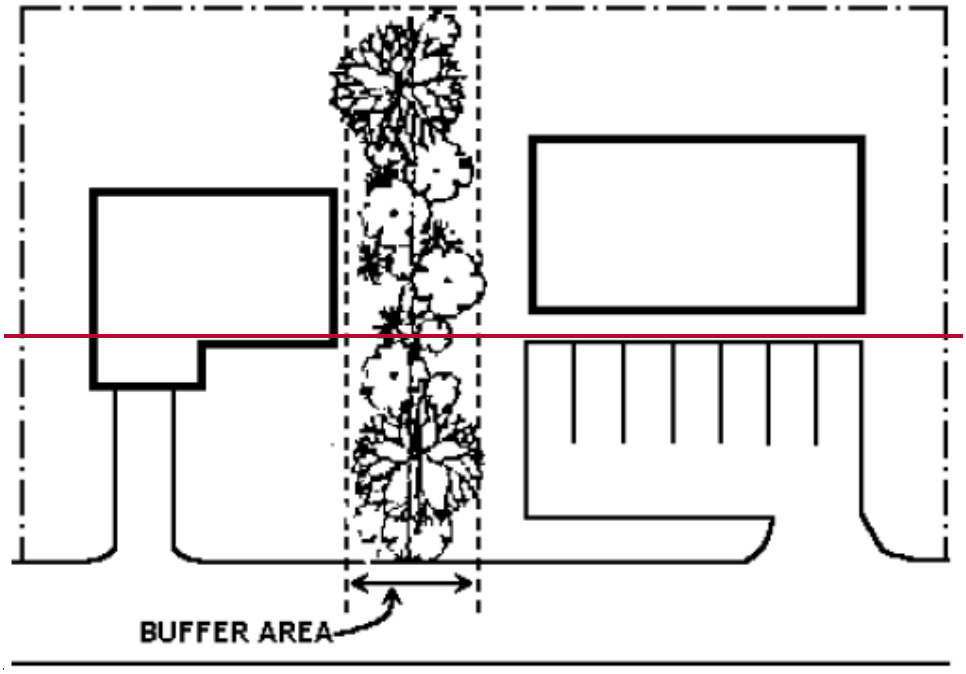
Sec. 17.92.80. Buffer planting—Parking, loading and maneuvering areas.

Intent: Buffer plantings are used to reduce building scale, provide transition between contrasting architectural styles, and generally mitigate incompatible or undesirable views. They are used to soften rather than block viewing.

A. Where required, a mix of plant materials shall be used to achieve the desired buffering effect.

B. Buffering is required in conjunction with issuance of construction permits for parking areas containing four or more spaces, loading areas, and vehicle maneuvering areas serving parking areas with four or more spaces. Boundary plantings shall be used to buffer these uses from adjacent properties and the public right-of-way. On-site plantings shall be used between parking bays, as well as between parking bays and vehicle maneuvering areas. Buffers shall have a minimum width of five feet, in accordance with Subsection 17.82.10.D. A balance of low-lying ground cover and shrubs, and vertical shrubs and trees shall be used to buffer the view of these facilities. At a minimum, one tree shall be planted for every 30 linear feet of buffer

area. ~~Decorative w~~Masonry walls (except plain concrete block) and fences may be used in conjunction with plantings~~,~~ but may not be used by themselves to comply with buffering requirements. Exception: ~~truck~~ parking lots reserved for large trucks in industrial and commercial zones are exempt from parking bay buffer planting requirements.



Sec. 17.92.90. Screening (hedges, fences, walls, berms).

Intent: Screening is used~~s~~ where unsightly views or visual conflicts must be obscured or blocked and where privacy and security are desired.

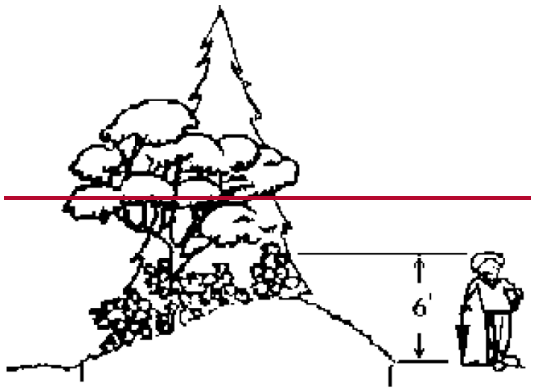
A. *Materials.* Fences and walls used for screening may be constructed of wood, concrete, stone, brick, and wrought iron.~~, or o~~ Other commonly used fencing/wall materials may be used if approved as part of a discretionary review. ~~Acoustically designed fences and walls are also used where noise pollution requires mitigation.~~

B~~A~~. *Height and Opacity.* Where landscaping is used for required screening, it shall be at least six feet in height and at least 80 percent opaque, as seen from a perpendicular line of sight, within two years after planting~~following establishment of the primary use of the site~~.

C~~B~~. *Chain Link Fencing.* A painted chain link fence (not galvanized finish) with slats shall qualify for screening only if a landscape buffer is also provided in compliance with Section 17.92.~~0~~80 above.

D~~C~~. *Height Measurement.* The height of hedges, fences, walls, and berm shall be measured from the lowest adjoining finished grade, except where used to comply with screening requirements for parking, loading, storage, and similar areas. In these cases, height shall be measured from the finished grade of such improvements. Screening is not permitted within vision clearance areas.

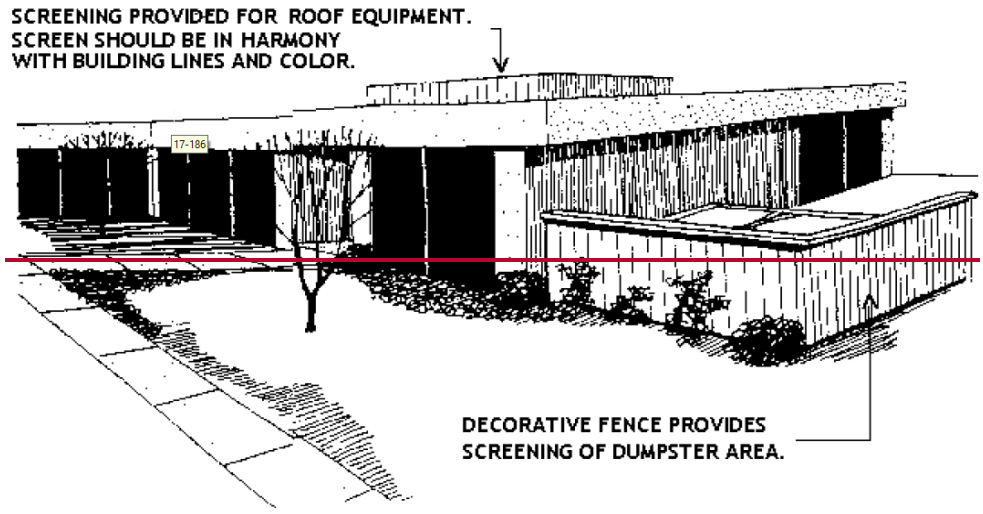
E~~D~~. *Berms.* Earthen berms up to six feet in height may be used to comply with screening requirements. Slope of berms may not exceed 2:1 and both faces of the slope shall be planted with ground cover, shrubs, and trees.



~~Long e~~Expanses of fences and walls that are longer than 50 feet shall ~~be designed to prevent visual monotony through use of~~ include offsets, changes of materials and textures, or landscaping in order to prevent visual monotony.

Sec. 17.92.100. Screening of service facilities.

Sight~~e~~-obscuring shrubbery or a berm, wall or fence shall be placed along a property line between residential and commercial and industrial zones and around ~~unsightly areas such as~~ trash and recycling areas, gas meters, ground level air conditioning units, disc antennas exceeding 36 inches in diameter, and equipment storage or an industrial or commercial use with outside storage of equipment or materials. Such "sight-obscuring" screening shall be at least 80 percent opaque when viewed horizontally from between two and eight feet above the average ground level.



Sec. 17.92.110. Outdoor storage.

All outdoor storage areas for commercial, industrial, public and semi-public uses are to be entirely screened by ~~a~~ sight obscuring shrubbery or a berm, wall or fence~~, vegetative materials, or other alternative deemed appropriate by the Director.~~ Such "sight-obscuring" screening shall be at least 80 percent opaque when viewed horizontally from between two and eight feet above the average ground level. Exceptions to the preceding requirements include: new or used cars, motorcycles and trucks (but not including car parts or damaged vehicles); new or used boat sales; recreational vehicle sales; new or used large equipment sales or rentals; manufactured home sales; florists and plants nurseries.

Sec. 17.92.130. Performance bond.

If weather conditions or other circumstances beyond the control of the developer or owner make completion of the landscaping impossible prior to desired occupancy, an extension of up to six months may be applied for by posting "security" equal to 120 percent of the cost of the landscaping, assuring installation within six months. "Security" may consist of a performance bond payable to the city, cash, certified check, time certificates of deposit, assignment of a saving account, letter of credit, or other such assurance of access to funds necessary for completion as shall meet the approval of the City Attorney. Upon acceptance of the security, the developer or owner ~~may~~ will be allowed occupancy ~~for a period of up to 180 days~~. If the installation of the landscaping improvement is not completed within 180 days, the City shall have access to the security to complete the installation ~~and/or revoke occupancy~~. Upon completion of the installation by the city, any portion of the remaining security minus administrative charges of 30 percent shall be returned to the owner. Costs in excess of the posted security shall be assessed against the property and the City shall thereupon have a valid lien against the property, which will come due, and payable.

Sec. 17.92.140. Guarantee.

All landscape materials and workmanship shall be guaranteed by the installer and/or developer for a ~~period of time not to exceed~~minimum of two years. This guarantee shall ensure that all plant materials survive in good condition and shall guarantee replacement of dead or dying plant materials.

***

CHAPTER 17.96 MANUFACTURED DWELLING PARK STANDARDS

Sec. 17.96.00. Intent.

These provisions are established to ensure a safe and healthful living environment for residents of manufactured dwelling parks and to ensure that a manufactured dwelling park can provide affordable quality housing compatible with adjacent land uses. In addition, these provisions are intended to ensure compliance with State regulations governing review of manufactured dwelling park development.

Sec. 17.96.10. Area requirements.

A. Minimum Size for Manufactured Dwelling Park = one acre.

B. Minimum Size for Manufactured Home Space = 2,000 square feet.

Note: ORS 446.100(x) requires that the space be at least 30 feet wide and 40 feet long.

Sec. 17.96.20. Permitted structures.

A. *Manufactured Homes and Mobile Homes (as defined in Chapter 17.10—Definitions).*

B. *Prefabricated Structures (as defined in ORS 197.286).*

C~~B~~. *Accessory Structures.* Structures customarily incidental to the primary use in accordance with Chapter 17.74.

Sec. 17.96.30. Setback and separation for the park perimeter.

A. *Setback Between Park Structures and Abutting Properties.* Between abutting property and any dwelling or accessory park structure or a park road there shall be a minimum setback equal to the rear yard setback specified by the district of the abutting property but in no case shall the setback be less than five feet.

B. *Setback Between Park Structures and a Public Street Right-of-Way. Between the public right-of-way and any dwelling or accessory structure there shall be an average setback along the public street of 20 feet with a minimum setback equal to the front yard setback of the district. "Average setback" shall be calculated by averaging the smallest and largest setbacks along the street.*

Sec. 17.96.40. Park perimeter treatment.

A. *Perimeter Treatment.* An applicant can choose one of two options for perimeter treatment.

1. *Option I—Abutting Public Streets.* On lands adjacent to public streets a six-foot high site-obscuring screen shall be provided through the use of fencing and vegetation and/or earth sculpting and vegetation.

a. *Fencing.* Any fence shall have an average 15-foot setback (average of the smallest and largest setbacks) from the public right-of-way and shall meet vision clearance requirements. Fencing closer than 15 feet to the public right-of-way shall be subject to the district's restrictions on front yard fencing. ~~Long e~~Expanses of fence or wall along public streets that are longer than 50 feet

shall be designed to prevent visual monotony through the use of offsets, landscaping, and change in materials.

b. *Earth Sculpting.* Any earth sculpting shall be used in conjunction with plant materials and when combined the screen will be a height of six feet in two years. This combination is subject to the following standards:

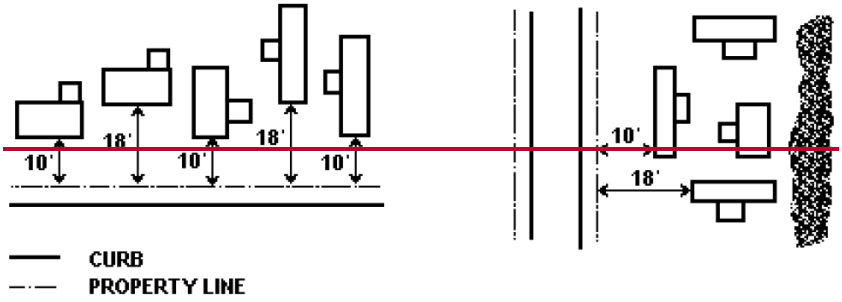
i. The earth sculpting, as a minimum, shall include a berm whose form does not have a slope over 40 percent (1:2.5) on the side away from the area screened from view. The slope for the other side (screened area) may vary.

ii. At least one row of deciduous and/or evergreen shrubs spaced not more than five feet apart shall be placed on this berm.

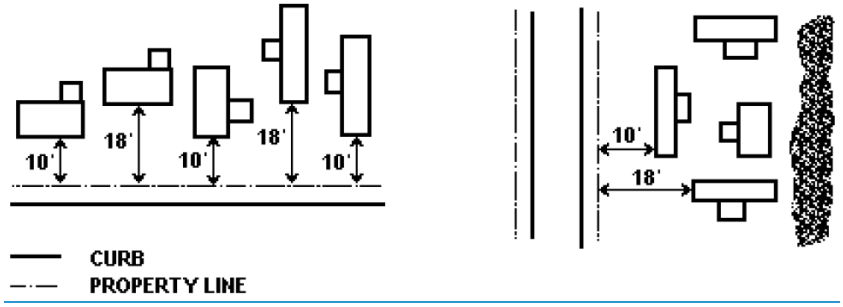
iii. Lawn, low growing evergreen shrubs, and evergreen ground cover shall cover the balance of the setback area.

2. *Option II—Perimeters Abutting other Zoning Districts:*

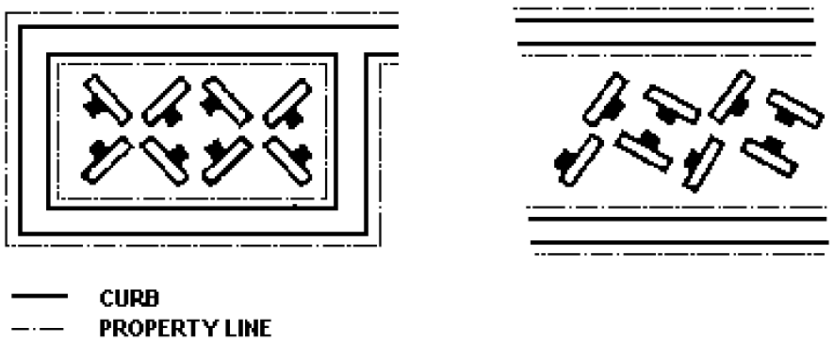
a. A manufactured home space that abuts the perimeter setback shall be a minimum of 4,000 square feet.



b. Manufactured homes abutting a public street shall have staggered setbacks and a variety of living unit orientations such as ~~indicated~~ illustrated below. ~~The required~~ An offset~~s~~ is required between each adjacent dwelling~~s~~ and shall be at least eight feet as measured perpendicular from the street. At least 25 percent of units shall be oriented perpendicular to the other units, or



c. An alternative to the above is to utilize a uniform setback but provide a substantial (greater than 30 degrees) acute or obtuse angle from the street, such as ~~indicated~~ illustrated below, or



d. A third alternative is to establish an eight-foot minimum building offset between each adjacent dwelling by utilizing attached garages or triple wide expansions.

B. Driveway access on local public streets may occur at the maximum frequency of one access for every two dwellings. Access from individual dwellings shall not be permitted on arterial streets. Access to collector streets is not permitted, unless approved by ~~shall be subject to review and approval of~~ the City Engineer with a Variance application.

Sec. 17.96.50. Setback and separation for structures within the park.

Setbacks and separation for structures within a manufactured ~~home~~ dwelling park shall comply with applicable ORS statutes.

Sec. 17.96.60. Site development standards.

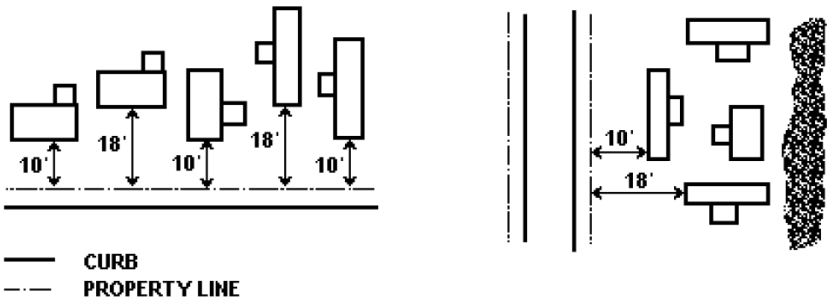
A. *Parking and Accessways.*

1. *Parking.* Off-street parking facilities shall be provided on-site in accordance with Chapter 17.98.
2. *Street Widths.* The minimum width for manufactured ~~home~~ dwelling park streets shall be 20 feet. Streets serving more than 12 dwelling spaces shall be a minimum of 24 feet in width. Streets serving more than 30 dwelling spaces shall be a minimum of 28 feet in width. If on-street parking is permitted, ORS 446.095(1) requires a minimum width of 30 feet.
3. *Private Street Standards.* Streets shall be paved to standards adopted by the City Engineer.
4. *Dead End Streets.* Cul-de-sacs over 400 feet in length shall have a standard cul-de-sac bulb with a 38-foot curbside radius. Shorter dead end streets shall have a turn-around approved by the City Engineer.
5. *Walks.* Paved walks, at least five feet wide and accessible to wheelchairs, shall be provided to connect park buildings to a park street or public street. In addition, a street sidewalk (or an equivalent pedestrian walking system) shall be provided to connect areas having more than 25 living units with the public sidewalk system.
6. *Lighting.* Private park roadways shall be lighted at intersections and pedestrian crossings. ~~Fixtures shall not produce direct glare on adjacent properties~~Lighting shall comply with Chapter 15.30, Dark Sky Ordinance.
7. *Street Signs.* Street identification signs shall be provided according to applicable City requirements.

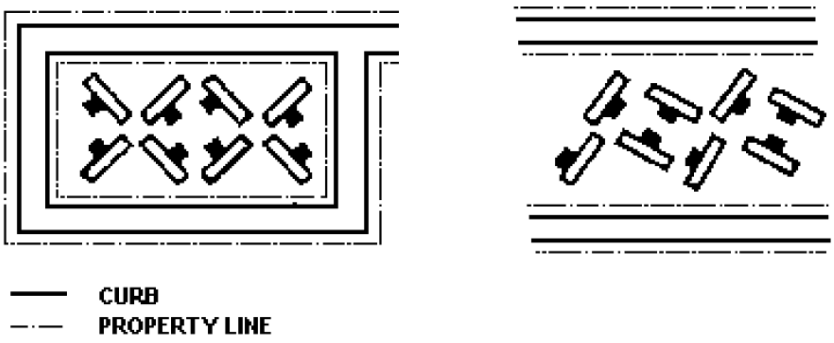
8. *Fire Access.* Access for fire protection services shall permit fire apparatus to approach within 100 feet of each dwelling. In addition, each manufactured dwelling space shall have direct access to a street to permit emergency escape. This access shall be an unobstructed area not less than 14 feet wide.

B. *Siting of Dwellings Within the Park.*

1. Dwellings shall have staggered setbacks from internal streets and a variety of living unit orientations such as ~~indicated~~ illustrated below.~~.~~ ~~The required~~ An offset~~s~~ is required between each adjacent dwelling~~s~~ and shall be at least eight feet as measured perpendicular from the street. At least 25 percent of units shall be oriented perpendicular to the other units.



2. An alternative to the above is to utilize a uniform setback from internal streets but provide a substantial (greater than 30 degrees) acute or obtuse angle from the park street.



3. Each dwelling ~~should~~ shall include, at a minimum, two of the following design features:

a. Dormers.

b. Gables.

c. Recessed entries.

d. Covered porch entries.

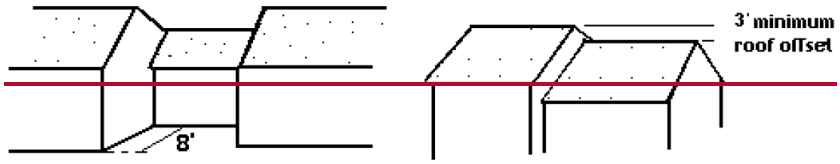
e. Pillars or posts.

f. Bay or bow windows.

g. Eaves of 12 inches or greater.

h. Off-set of 16 inches or greater on building face or roof.

4. No more than three identical units may be placed side by side.



C. *Public and Private Facilities.*

1. Each manufactured dwelling park space shall be provided with water, sanitary sewer, storm drainage and street facilities, natural gas services and underground electrical power, telecommunication, and cable television in accordance with the requirements of Chapter 15.20.

2. Applications for manufactured dwelling parks that would adjoin an open, natural drainageway or would be located in a floodplain shall be reviewed in accordance with Chapter 17.60, Flood, Slope and Hazard provisions.

D. *Play Areas.* Separate play areas shall be provided in all manufactured dwelling parks that accommodate children under 14 years of age unless each manufactured dwelling space has a minimum size of 4,000 square feet. Any required play area shall not be less than 2,500 square feet in area with no dimension less than 30 feet. There shall be at least 100 square feet of play area provided for each manufactured dwelling space ~~occupied by children~~. In the case of a large development, two or more play areas may be developed, provided that no individual play area is less than 2,500 square feet.

E. *Space Coverage.* A dwelling and any other attached or detached structures shall not occupy more than 60 percent of a manufactured dwelling space used in conjunction with such dwelling.

F. *Decks.* Each manufactured dwelling stand shall be provided with one or more, at least semi-private or private, outdoor living area adjacent to the dwelling, constructed of concrete, asphalt, flagstone, wood, or other ~~equivalent~~ hard surface material totaling at least 120 square feet of area and not less than eight feet wide in any dimension.

G. *Skirting.* Each mobile home or manufactured home located in a manufactured dwelling park shall have continuous skirting that, in design, color and texture, appears to be an integral part of the exterior walls or the foundation of the dwelling.

Sec. 17.96.70. Landscape plan.

A landscape plan is required prior to issuance of the building permit for the manufactured ~~home~~ dwelling park. This plan shall be drawn to scale showing the location of existing trees and vegetation proposed for removal or retention on the site, the location and design of landscaped areas, the varieties, quantities, and sizes of trees and plant materials to be planted on the site, contour lines indicating any earth sculpting to be used, and other pertinent landscape information.

A. *Plant Coverage and Maintenance.* Required landscape areas shall be covered by living plant material capable of attaining 90 percent ground coverage within five~~feet~~ years and shall be continuously maintained and irrigated with permanent facilities sufficient to maintain the plant material.

B. *Plantings in Perimeter Area.* In addition to the requirements specified in perimeter treatments above and in Chapter 17.92, Landscaping and Screening, landscaping shall be used to provide screening of decks and storage areas from the public roadway. Plant masses shall also be established between perimeter dwellings in order to reduce negative visual effects of roads and vehicle storage areas located within the park.

C. *Plantings Along Park Street.*

1. *Street Trees.* Street trees shall be provided in accordance with Chapter 17.92, Landscaping, Buffering, and Screening.

2. *Planting Continuity.* ~~Similar s~~Street trees similar in appearance shall be repeated to provide continuity for street plantings. Repetition of landscape elements such as lighting fixtures, consistent fencing styles, or similar carports ~~can~~ shall complement this street tree pattern.

3. *Street Focal Points.* The real or apparent end of a street (where a street makes a right turn) provides a focused view, which shall be heavily vegetated with trees and shrubs spaced no more than 15 feet on center, either with foreground plants or (as below) with background plants.

~~4. *Planting for Energy Efficiency.* Appropriate plant materials shall be utilized to cool dwellings in the summer and help insulate them in the winter.~~

CHAPTER 17.98 PARKING, LOADING, AND ACCESS REQUIREMENTS[25]

Sec. 17.98.00. Intent.

The intent of these regulations is to provide adequate capacity and appropriate location and design of parking and loading areas as well as adequate access to such areas. The parking requirements are intended to provide sufficient parking in close proximity for residents, guests/visitors, customers, and/or employees of various land uses. These regulations apply to both motorized vehicles (hereinafter referred to as vehicles) and bicycles.

Sec. 17.98.10. General provisions.

A. *Provision and Maintenance.* The provision of required off-street parking for vehicles and bicycles and loading facilities for vehicles is a continuous obligation. Building permits or other permits will only be issued after review and approval of site plans showing location of permanent access, parking and loading facilities.

B. *Unspecified Requirements.* Vehicle and bicycle parking requirements for non-residential uses not specified in this chapter shall be determined by the Director based upon the requirements of similar specified uses.

C. *New Structure or Use.* When a structure is constructed or a new use of land is commenced, on-site vehicle and bicycle parking and loading spaces shall be provided in accordance with Section 17.98.20 below or as otherwise modified through or specific area plan.

D. *Alteration of Existing Structures.* When an existing structure is altered to the extent that the existing use is intensified, on-site vehicle and bicycle parking shall be provided in the amount required for such intensification. Alteration of existing structures, increased intensity, and change in use per Sections 17.98.10.D., E. and F. does not apply to commercial uses in the Central Business District (C-1).

E. *Increased Intensity.* When increased intensity (e.g., adding floor area or dwelling units or changing to a use with a higher parking ratio) requires no more than four vehicle spaces, no additional parking facilities shall be required. However, the effects of changes, additions, or enlargements shall be cumulative. When the net effect of one or more changes generates a need for more than four spaces, the additional required spaces shall be provided. Additional spaces shall be required for the intensification but not for the original use.

F. *Change in Use.* When an existing structure or use of land is changed in use from one use to another use as listed in Section 17.98.20 below and the vehicle and bicycle parking requirements for each use type are the same; no additional parking shall be required. However, where a change in use results in an intensification of use in terms of number of vehicle and bicycle parking spaces required, additional parking space shall be provided in an amount equal to the difference between the number of spaces required for the existing use and number of spaces required for the more intensive use.

G. *Time of Completion.* Required parking spaces and loading areas shall be improved and available for use prior to issuance of a temporary certificate of occupancy and/or final building inspection or final certificate of occupancy.

H. *Inoperative Motor Vehicles.* In all residential zoning districts, all motor vehicles incapable of movement under their own power or lacking legal registration shall be completely screened from public view.

[25]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2020-06, effective May 6, 2020. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

I. *Truck Parking.* In all residential zoning districts, no overnight parking of trucks or other equipment on wheels or tracks exceeding a one-ton capacity used in the conduct of a business activity shall be permitted except vehicles and equipment necessary for farming on the premises where such use is conducted.

J. *Mixed Uses.* In the case of mixed uses, the total required vehicle and bicycle parking shall be the sum of requirements of individual uses computed separately.

K. *Conflicting Parking Requirements.* When a building or use is planned or constructed in such a manner that more than one standard is applicable, the use that requires the greater number of parking spaces shall govern.

L. *Availability of Parking Spaces.* Required vehicle and bicycle parking spaces shall be unobstructed, available for parking of vehicles and bicycles of residents, customers, patrons, and employees only, and shall not be used for storage of vehicles or materials or for parking of vehicles and bicycles used in conducting the business or use and shall not be used for sale, repair, or servicing of any vehicle or bicycle.

M. *Residential Parking Analysis Plan.* A Residential Parking Analysis Plan shall be required for all new residential subdivisions, and partitions to include a site plan depicting all of the following:

1. Location and dimension of required parking spaces as specified in Section 17.98.200.
2. Location of areas where parking is not permitted as specified in Sections 17.98.200.A.3. and A.5.
3. Location and design of parking courts (if applicable).

N. *Location of Required Parking.*

1. Off-street vehicle parking required for single family dwellings (both attached and detached) and duplexes shall be provided on the development site of the primary structure. At least two off-street vehicle parking spaces for detached single family homes and duplexes shall be located side-by-side. Tandem parking is only permitted for parking spaces that are not required to meet the minimum off-street parking requirements. Except where permitted by Section 17.98.40 below, required parking for all other uses in other districts shall be provided on the same site as the use or upon abutting property.
2. Bicycle parking required for all uses in all districts shall be provided on the development site in accordance with Section 17.98.160 below.

O. *Unassigned Parking in Residential Districts.*

1. Multi-family dwelling units with more than ten required vehicle parking spaces shall provide unassigned parking. The unassigned parking shall consist of at least 15 percent of the total required parking spaces and be located to be available for use by all occupants and guests of the development. Tandem spaces and spaces in a garage shall not qualify as unassigned parking spaces.
2. Multi-family dwelling units with more than ten required bicycle parking spaces may provide shared outdoor bicycle parking. The shared bicycle parking shall consist of at least 15 percent of the total required parking spaces and be located such that they are available for shared use by all occupants and guests of the development (i.e., shall not be restricted to access by only certain buildings or occupants).

P. *Fractions.* When the sum of the required vehicle and bicycle parking spaces is a fraction of a space (0.5 or more of a space) a full space shall be required.

Q. *Maximum Parking Allowed.* Commercial or Industrial zoned properties shall not be permitted to exceed the minimum off-street vehicle parking required by Section 17.98.20 by more than 30 percent.

(Ord. No. 2021-03 , § 9(Exh. I), 5-17-2021; Ord. No. 2021-16 , § 14(Exh. M), 8-16-2021)

Sec. 17.98.20. Off-street parking requirements.

A. *Off-Street Parking Requirements.* Off street parking shall conform to the following standards:

1. Commercial uses in the Central Business District (C-1) are exempt from off street parking requirements. Residential uses in the Central Business District (C-1) have to provide off street parking per this section but may get a reduction per Section 17.98.30.B.
2. All square footage measurements are gross square feet of total floor area.
3. 24 lineal inches of bench shall be considered one seat.
4. Except as otherwise specified, parking for employees shall be provided based on one space per two employees for the largest shift in addition to required parking specified in subsections 8.—11. below.
5. Where less than five parking spaces are required, then only one bicycle space shall be required except as otherwise modified in subsections 8.—11. below.
6. In addition to requirements for residential off-street parking, new dwellings shall meet the on-street parking requirements in Section 17.98.200.
7. Non-residential u~~U~~ses that rely on square footage for determining parking requirements may reduce the overall square footage of the use by deducting bathrooms, mechanical rooms, and other auxiliary rooms as approved by the Director.
8.

Residential Uses	Number of Parking Spaces	Number of Bicycle Spaces
Single Family Detached/Attached	2 per dwelling unit	Exempt
Duplexes	1 per dwelling unit	Exempt
Manufactured Home Park	2 per dwelling, plus 1 visitor space for each 10 vehicle spaces	Exempt
Multi-Family Dwellings	1.5 per studio unit or 1-bedroom unit 2.0 per 2-bedroom unit or greater	1 per dwelling unit
Congregate Housing, Retirement Homes, Intermediate Care Facilities, Group Care Facilities, and Halfway Houses	1 per each 3 residents, plus 1 per 2 employees	5% or 2 whichever is greater

9.

Community Service, Institutional and Semi-Public Uses	Number of Parking Spaces	Number of Bicycle Spaces
Administrative Services	1 per 400 sq. ft., plus 1 per 2 employees	5% or 2 whichever is greater
Community Recreation Buildings, Library, or Museum	1 per 250 sq. ft., plus 1 per 2 employees	5% or 2 whichever is greater
Church, Chapel, Auditorium, or Fraternal Lodge without eating and drinking facilities	1 per 4 fixed seats or 1 per each 50 sq. ft. of public assembly area where there are no fixed seats, plus 1 per 2 employees	5% or 2 whichever is greater

Hospitals	1 per examine room or bed, and 1 per 4 seats in waiting room or chapel, plus 1 per 2 employees	5% or 2 whichever is greater
Commercial Daycare	2 for the facility, plus 1 per employee on the largest shift	2
School—Preschool/Kindergarten	2 per classroom, plus 1 per 2 employees	2
School—Elementary or Middle School/Junior High	2 per classroom, plus 1 per 2 employees	5% or 2 whichever is greater
School—Senior High, Vocational or College	6 per classroom, plus 1 per employee on the largest shift	5% or 2 whichever is greater
Transit transfer stations and park-and-ride lots	0	4

10.

Commercial Uses	Number of Parking Spaces	Number of Bicycle Spaces
Retail Sales, General or Personal Services, Professional Offices, Shopping Centers, Grocery Stores, Convenience Stores	1 per 400 sq. ft., plus 1 per 2 employees	5% or 2 whichever is greater
Retail Sales of Bulky Merchandise (examples: furniture or motor vehicles)	1 per 1,000 sq. ft., plus 1 per 2 employees	2
Eating or Drinking Establishments	1 per 250 sq. ft. of gross floor area or 1 per 4 fixed seats or stools, plus 1 per 2 employees	5% or 2 whichever is greater
Funerals and Interment Services: Crematory and Undertaking Interring and Cemeteries are exempt	1 per 4 fixed seats or 1 space for each 50 sq. ft. of public assembly area where there are no fixed seats, plus 1 per 2 employees	2
Fuel Sales (without store)	1 per employee on the largest shift	2
Medical or Dental Office or Clinic	1 per examine room or bed, and 1 per 4 seats in waiting room, plus 1 per 2 employees	5% or 2 whichever is greater
Participant Sports or Recreation: Indoor or Outdoor; Spectator Sports; Theater or similar use	1 per 4 fixed seats or 1 space per 4 participants based on projected participant capacity, plus 1 per 2 employees	5% or 2 whichever is greater
Campground or RV Park	1 per designated space, plus 1 visitor space for each 8 designated spaces, plus 1 per 2 employees	Exempt
Hotel or Motel	1 per guest room or suite, plus 1 per 2 employees	2

11.

Industrial Uses	Number of Parking Spaces	Number of Bicycle Spaces

Sales, Storage, Rental, Services and Repairs of: Agricultural and Animals Automotive/Equipment Fleet Storage Light Equipment Non-operating vehicles, boats and recreational vehicles Building Equipment	1 per 1,000 sq. ft., plus 1 per 2 employees	2
Sales, Storage, Rental, and Repairs of: Heavy Equipment, or Farm Equipment	1 per 1,000 sq. ft., plus 1 per 2 employees	2
Storage, Distribution, Warehousing, or Manufacturing establishment; trucking freight terminal	1 per employee on the largest shift	2

(Ord. No. 2021-03 , § 9(Exh. I), 5-17-2021)

Sec. 17.98.30. Reduction of parking requirements.

A. *Transit Amenity Reduction.*

1. Any existing or proposed use in the C-2, C-3, or I-1 Zoning Districts subject to minimum parking requirements and located within 400 feet of an existing transit route may reduce the number of required parking spaces by up to ten percent by providing a transit stop and related amenities including a public plaza, pedestrian sitting areas, or additional landscaping provided such landscaping does not exceed 25 percent of the total area dedicated for transit oriented purposes.

2. Uses qualifying for a reduction under ~~s~~Subsection A.1., may reduce the number of r~~R~~equired parking spaces ~~may be reduced~~ at a ratio of one parking space for each 100 square feet of transit amenity space provided above and beyond the minimum requirements.

3. Uses that~~, which~~ are not eligible for these reductions~~,~~ include truck stops, building materials and lumber sales, nurseries and similar uses not likely to be visited by pedestrians or transit customers.

B. *Residential Uses in the Central Business District and Village Commercial District Reduction.* Required off-street parking for residential uses in the C-1 and C-3 Zoning District may be reduced by 25 percent.

Sec. 17.98.40. Shared use of parking facilities.

A. Except for single family dwellings (both attached and detached) and duplexes, required parking facilities may be located on an adjacent parcel of land or separated only by an alley or local street, provided the adjacent parcel is maintained in the same ownership as the use it is required to serve or a shared parking agreement that can only be released by the Director is recorded in the deed records of Clackamas County.

B. In the event that several parcels occupy a single structure or parcel of land, the total requirements for off-street parking shall be the sum of the requirements for the uses computed separately.

C. Required parking facilities for two or more uses, structures, or parcels of land may be satisfied by the same parking facility used jointly, to the extent that it can be shown by the owners or operators that the needs of

the facilities do not materially overlap (e.g., uses primarily of day time versus night time uses) and provided that such right of joint use is evidenced by a deed, lease, contract or similar written instrument recorded in the deed records of Clackamas County establishing such joint use.

Sec. 17.98.50. Setbacks.

A. Parking areas, which abut a residential zoning district, shall meet the setback of the most restrictive adjoining residential zoning district.

B. Required parking shall not be located in a required front or side yard setback area abutting a public street except in industrial districts. For single family and duplexes, required off-street parking may be located in a driveway.

C. Parking areas shall be setback from a lot line adjoining a street the same distance as the required building setbacks. Regardless of other provisions, a minimum setback of five feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this Code.

Sec. 17.98.60. Design, size and access.

All off-street parking facilities, vehicular maneuvering areas, driveways, loading facilities, accessways, and private streets shall conform to the standards set forth in this section.

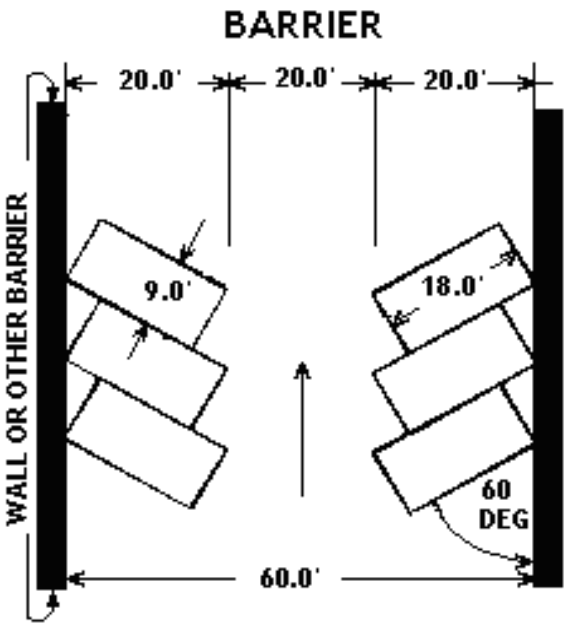
A. *Parking Lot Design.* All areas for required parking and maneuvering of vehicles shall have a ~~durable hard~~ surface ~~such as~~made of concrete or asphalt.

B. *Size of Space.*

1. A standard parking space shall be a minimum of nine feet wide by 18 feet in length.
2. A compact parking space shall be a minimum of eight feet wide by 16 feet in length.
3. Accessible parking spaces shall be nine feet by 18 feet and include an adjacent access aisle meeting ORS 447.233. Access aisles may be shared by adjacent spaces. Accessible parking shall be provided for all uses in compliance with the requirements of the State of Oregon (ORS 447.233) and the Americans with Disabilities Act.
4. Parallel parking spaces shall be a length of 22 feet.
5. No more than 40 percent of the parking stalls shall be compact spaces.
6. Parking spaces that do not conform to the dimensional standards in Subsections 1-5 shall be reviewed through the procedures in Chapter 17.66 of the Sandy Development Code.

C. *Aisle Width.*

Parking Aisle	Single Sided One-Way	Single Sided Two-Way	Double Sided One-Way	Double Sided Two-Way
90 degree	20 feet	22 feet	25 feet	25 feet
60 degree	20 feet	20 feet	20 feet	20 feet
45 degree	20 feet	20 feet	20 feet	20 feet
Parallel	12 feet	12 feet	16 feet	16 feet



D. *Pedestrian Circulation.*

1. Pedestrian circulation shall be provided in the form of pathways in all new off-street parking lots. Pathways shall connect sidewalks adjacent to parking lots to the entrances of new buildings.

2. Crosswalks. Where a pathway crosses a parking area or driveway ("crosswalk"), it shall be clearly identified with pavement markings or contrasting paving materials (e.g., pavers, light-color concrete inlay between asphalt, or similar contrast). The crosswalk may be part of a speed table to improve driver-visibility of pedestrians.

3. Pathway Width and Surface. Pedestrian pathways shall be constructed in accordance with the sidewalk construction standards in the Utility Standard Details adopted by the City in 2004. Multi-use pathways (i.e., designed for shared use by bicyclists and pedestrians) shall be concrete or asphalt and shall conform to the Utility Standard Details.

Sec. 17.98.70. On-site circulation.

A. Groups of more than three parking spaces shall be permanently striped. Accessible parking spaces and accompanying access aisles shall be striped regardless of the number of parking spaces.

B. *Backing and Maneuvering.* Except for a single family dwelling, duplex, or accessory dwelling unit, groups of more than three parking spaces shall be provided with ~~adequate~~ aisles or turnaround areas so that all vehicles enter the right-of-way (except for alleys) in a forward manner. Parking spaces shall not have backing or maneuvering movements for any of the parking spaces occurring across public sidewalks or within any public street, except as approved by the City Engineer. Evaluations of requests for exceptions shall consider constraints due to lot patterns and impacts to the safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

Sec. 17.98.80. Access management~~to arterial and collector streets~~.

A. *Access Spacing*. All proposed development shall have access to a public right-of-way. Spacing requirements for access points and intersections are shown in the City of Sandy 2023 Transportation System Plan Tables 5 and 6 and in the following tables:

Table 17.98.80.A.1: Minimum Access Spacing Standards for City Street Facilities

Cross-Section	Major Arterial	Minor Arterial	Collector	Local Street
Distance between public streets	5,280 feet	5,280 feet	2,640 feet	400-600 feet
Minimum driveway spacing (public street to driveway and driveway to driveway)	See Table 17.98.80.A.2	400 feet or 200 with restricted right-in/right-out access	300 feet or 150 with restricted right-in/right-out access	20 feet
Note: All distances measured from center to center of adjacent approaches.				

Table 17.98.80.A.2: Minimum Access Spacing Standards for Highway 26

Speed limit	Urban Expressway	Urban	STA[1]
> 55	2,640 feet	1,320 feet	n/a
50	2,640 feet	1,100 feet	n/a
40 & 45	2,640 feet	800 feet	n/a
30 & 35	n/a	500	See footnote
< 25	n/a	350 feet	See footnote

[1] Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 175 feet (55 meters) or mid-block if the current city block is less than 350 feet (110 meters).

Note: All distances measured from center to center of adjacent approaches.

B~~A~~. Location and design of all accesses to and/or from arterials and collectors (as designated in the 2023 City of Sandy Transportation System Plan) are subject to review and approval by the City Transportation Engineer or Public Works Director. Where ~~practical,~~access spacing requirements on a collector or arterial cannot be met, access from a lower functional order street may be required. ~~Accesses to arterials or collectors shall be located a minimum of 150 feet from any other access or street intersection.~~ Exceptions may only be granted as part of a discretionary review, when approved by the City Engineer. Evaluations of exceptions shall consider posted speed of the street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

C~~B~~. No development site shall be allowed more than one access point to any arterial or collector street (as designated in the 2023 City of Sandy Transportation System Plan) except as approved by the City Transportation Engineer or Public Works Director as part of a discretionary review. Evaluations of exceptions shall be based on a traffic impact analysis and parking and circulation plan and consider posted speed of street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

D~~C~~. When developed property is to be expanded or altered in a manner that significantly affects on-site parking or circulation (i.e., removes or changes the location of driveways, parking spaces, or drive aisles), both existing and proposed accesses shall be reviewed under the standards in ~~A~~B and ~~B~~C above. As a part of an expansion or alteration approval, the City may require relocation and/or reconstruction of existing accesses not meeting those standards.

E. The City or other agency with access permit jurisdiction has the authority to require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), developing a frontage street, installing traffic control devices, and/or other mitigation as a condition of granting an access permit to ensure the safe and efficient operation of the street and highway system.

Sec. 17.98.90. Access to unimproved streets.

A. *Access to Unimproved Streets.* ~~At the Director's discretion d~~Development ~~may occur~~ without access to a City standard street may only occur when that development constitutes infill on an existing substandard public street, and when an exception is requested by the applicant and approved by the Director as part of a discretionary review. A condition of development shall be that the property owner signs an irrevocable petition for street improvements and/or a declaration of deed restrictions agreeing to future completion of street improvements. The form shall be provided by the City and recorded with the property through the Clackamas County Recorder's Office. This shall be required with approval of any of the following applications:

1. Land partitions.
2. Conditional uses.
3. Building permits for new non-residential construction or structural additions to non-residential structures (except accessory development).
4. Building permits for new residential units.

Sec. 17.98.100. Driveways.

A. A driveway to an off-street parking area shall be improved from the public right-of-way to the parking area a minimum width of 20 feet for a two-way drive or 12 feet for a one-way drive, but in either case not less than the full width of the standard approach for the first 20 feet of the driveway.

B. A driveway for a single-family dwelling or duplex shall have a minimum width of ten feet. The total width for one or more driveway approaches within the public right-of-way shall not exceed 24 feet in width measured at the bottom of the curb transition. A driveway approach shall be constructed in accordance with applicable city standards and the entire driveway shall be paved with asphalt or concrete. ~~Shared d~~Driveway approaches may be ~~required for~~shared by adjacent lots in cul-de-sacs in order to ~~maximize room~~ meet requirements for street tree~~s~~ planting and ~~minimize conflicts with~~ utility facilities (power and telecom pedestals, fire hydrants, streetlights, meter boxes, etc.).

C. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of 12 feet for their entire length and width~~, but s~~ Such clearance may be reduced in parking structures ~~as~~if approved by the Director as part of a discretionary review.

D. No driveway shall exceed a grade of 15 percent at any point along the driveway length, measured from the right-of-way line to the face of garage or furthest extent of the driveway. For any driveway that exceeds a grade of 8.3 percent, a staircase or ramp made of concrete or exterior grade wood shall be installed that connects the primary entrance of a building to the sidewalk.

E. The nearest edge of a driveway approach shall be located a minimum of 15 feet from the point of curvature or tangency of the curb return on any street.

F. The sum of the width of all driveway approaches within the bulb of a cul-de-sac as measured in section B., above shall not exceed 50 percent of the circumference of the cul-de-sac bulb. The cul-de-sac bulb circumference shall be measured at the curb line and shall not include the width of the stem street. The nearest edge of driveway approaches in cul-de-sacs shall not be located within 15 feet of the point of curvature, point of tangency or point of reverse curvature of the curb return on the stem street.

Acronyms on the next page:

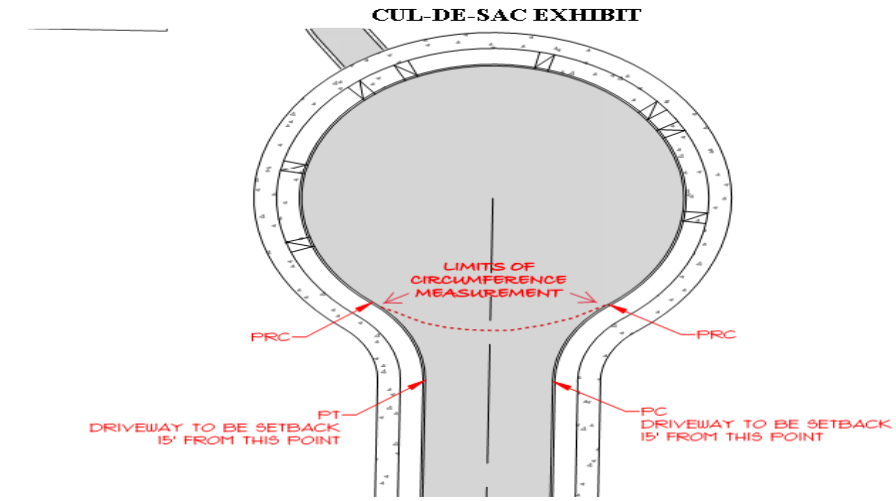
PT = point of tangency

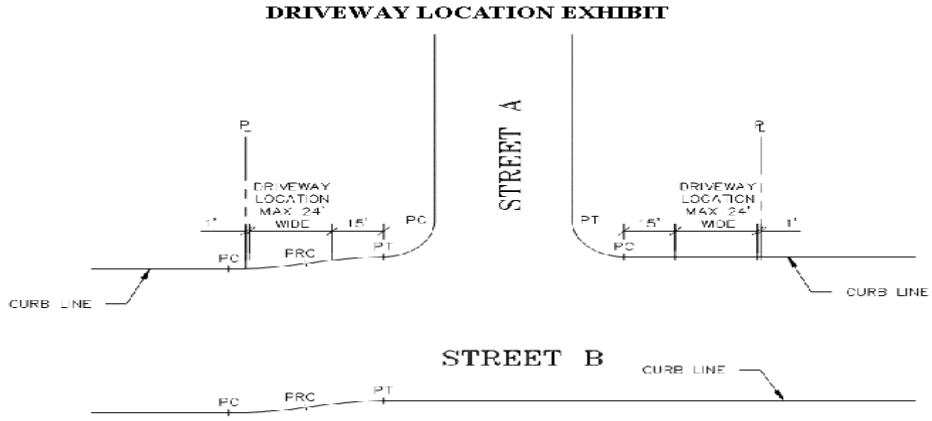
PC = point of curvature

PRC = point of reverse curvature

G. The location and design of any driveway approach shall provide for unobstructed sight per the vision clearance requirements in Section 17.74.30. Requests for exceptions to these requirements may be made as part of a discretionary review and will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.

H. Driveways shall taper to match the driveway approach width to prevent stormwater sheet flow from traversing sidewalks.





(Ord. No. 2021-03 , § 9(Exh. I), 5-17-2021)

Sec. 17.98.110. Vision clearance.

A. Except within the Central Business District, vision clearance areas shall be provided at intersections of all streets and at intersections of driveways and alleys with streets to promote pedestrian, bicycle, and vehicular safety. The extent of vision clearance to be provided shall be determined from standards in Chapter 17.74. For non-residential applications, and for residential applications processed through discretionary review, the determination of required vision clearance area shall ~~and taking~~ take into account functional classification of the streets involved, type of traffic control present at the intersection, and designated speed for the streets.

B. Traffic control devices, streetlights, and utility installations meeting approval by the City Engineer are permitted within vision clearance areas.

Sec. 17.98.120. Landscaping and screening.

A. Screening of all parking areas containing four or more spaces and all parking areas in conjunction with an off-street loading facility shall be required in accordance with zoning district requirements and Chapter 17.98. Where not otherwise specified by district requirement, screening along a public right-of-way shall include a minimum five feet depth of buffer plantings adjacent to the right-of-way.

B. When parking in a commercial or industrial district adjoins a residential zoning district, a sight-obscuring screen that is at least 80 percent opaque when viewed horizontally from between two and eight feet above the average ground level shall be required. The screening shall be composed of materials that ~~are an adequate size so as to~~ will achieve the required degree of screening within three years after installation.

C. Except for a residential development which has landscaped yards, parking facilities shall include landscaping to cover not less than ten percent of the area devoted to parking facilities. The landscaping shall be uniformly distributed throughout the parking area and may consist of trees, shrubs, and ground covers.

D. Parking areas shall be divided into bays of not more than 20 spaces in parking areas with 20 or more spaces. Between, and at the end of each parking bay, there shall be planters that have a minimum width of five feet and a minimum length of 17 feet for a single depth bay and 34 feet for a double bay. Each planter shall contain one ~~major structural~~ tree with a canopy when mature that is at least 20 feet wide and ground cover. Truck parking and loading areas are exempt from this requirement.

E. Parking area setbacks shall be landscaped with ~~major~~ trees, shrubs, and ground cover as specified in Chapter 17.92.

F. Wheel stops, bumper guards, or other methods to protect landscaped areas and pedestrian walkways shall be provided. No vehicle may project over a property line or into a public right-of-way. Parking may project over an internal sidewalk, but a minimum clearance of five feet for pedestrian circulation is required.

Sec. 17.98.130. Paving.

A. Parking areas, driveways, aisles, and turnarounds shall be paved with concrete, asphalt, or comparable surfacing, constructed to City standards for off-street vehicle areas.

B. Where remodeling, alteration or addition is proposed on a site with existing gravel-surfaced parking areas, driveways, aisles, or turnarounds, the following standard shall be met:

No building permit shall be issued for remodeling, alteration or addition to any building or structure when the estimated cost thresholds in Subsections B.1. or B.2., below, are exceeded on any site with vehicle areas that do not meet the standards in Subsection A., unless the applicant agrees to pave such vehicle areas to the standards in Subsection A. in conjunction with the construction activity related to the building permit.

1. Single-family and duplex dwellings: The estimated cost of the remodeling, alteration or addition exceeds 50 percent of the value of the building or structure before such remodeling, alteration or addition is commenced.

2. Multi-family, commercial, and industrial development: The estimated cost of the remodeling, alteration or addition exceeds 20 percent of the value of the building or structure before such remodeling, alteration or addition is commenced.

C~~B~~. Gravel surfacing shall be permitted only for areas designated for non-motorized trailer or equipment storage, propane or electrically powered vehicles, or storage of tracked vehicles.

Sec. 17.98.140. Drainage.

Parking areas, aisles and turnarounds shall ~~have adequate provisions made~~provide for the on-site collection of drainage waters to eliminate sheet flow of such waters onto sidewalks, public rights-of-way and abutting private property, in compliance with Title 13 of the Sandy Municipal Code and the 2020 City of Portland Stormwater Management Manual, as adopted by the City of Sandy.

Sec. 17.98.150. Lighting.

The Dark Sky Ordinance in Chapter 15 of the municipal code applies to all exterior lighting. Artificial lighting shall be provided in all required off-street parking areas and bicycle parking areas in compliance with SMC Chapter 15.30. ~~Lighting shall be directed into the site and shall be arranged to not produce direct glare on adjacent properties. Light elements shall be shielded and shall not be visible from abutting residential properties. Lighting shall be provided in all bicycle parking areas so that all facilities are thoroughly illuminated and visible from adjacent sidewalks or vehicle parking lots during all hours of use.~~

Sec. 17.98.160. Bicycle parking facilities.

Multi-family developments, industrial, commercial and community service uses, transit transfer stations, and park and ride lots shall meet the following standards for bicycle parking facilities. The intent of this section is to provide secure bicycle parking that is visible from a building's primary entrance and convenient to bicyclists.

A. *Location.*

1. Bicycle parking shall be located on-site, ~~convenient to primary building entrances,~~ and have direct access to both the public right-of-way and to the ~~main~~ primary entrance of the primary structure. The nearest bicycle parking space shall be located within 50 feet of at least one primary building entrance, as measured along the most direct pedestrian access route.
2. Bicycle parking areas shall be visible from building interiors ~~where possible~~through at least one window.
3. For facilities with multiple buildings or parking lots, bicycle parking shall be located either: ~~in areas of greatest use and convenience to bicyclists~~.
    a. Within 50 feet of a primary entrance as measured along the most direct pedestrian access route, and distributed to serve all primary buildings; or
    b. If the bicycle parking area is more than 50 feet from a main entrance, it must be in a shared bicycle parking location along a pedestrian path or access way.
4. If the bicycle parking area is located within the vehicle parking area, the bicycle facilities shall be separated from vehicular maneuvering areas by curbing, bollards, or landscaping ~~or other barrier~~ to prevent damage to parked bicycles.
5. Curb cuts shall be installed to provide ~~safe, convenient~~ access to bicycle parking areas.

B. *Bicycle Parking Space Dimensions.*

1. Each required bicycle parking space shall be at least two and one-half feet by six feet. If bicycle parking is covered, vertical clearance of seven feet shall be provided.
2. An access aisle of at least five feet wide shall be provided and maintained beside or between each row of bicycle parking. Vertical or upright bicycle storage structures are exempted from the parking space length.

C. *Security.*

1. Bicycle parking facilities shall offer security in the form of either a lockable enclosure in which the bicycle can be stored or a stationary object (i.e., a "rack") upon which the bicycle can be located.

2. "Bicycle rack" means a device to which bicycles can be securely attached and locked for parking purposes.

32. Bicycle r~~R~~acks requiring user-supplied locks shall ~~accommodate~~ be designed so that the bicycle frame and one wheel can be locked to a rigid portion of the rack with both cable and U-shaped locks.

43. Bicycle racks shall be securely anchored to the ground or a structure with tamper-resistant hardware and shall be designed to support the bicycle at two points, including the frame~~hold bicycles securely~~.

54. Shelter from precipitation is encouraged for a~~A~~ll outdoor bicycle parking facilities. ~~shall provide adequate shelter from precipitation where possible.~~ If more than 20 bicycle parking spaces are required, at least 25 percent of the spaces shall be covered or enclosed. If covered, the overhead clearance shall be at least 7 feet. Coverage can be provided through roof extensions, overhangs, awnings, arcades, carports, or enclosures.

D. *Signing.* Where bicycle facilities are not directly visible from the public right-of-way, primary structure entry, or civic space then directional signs shall be provided to direct bicyclists to the bicycle parking facility.

E. *Exemptions.* Temporary uses and other uses identified in Section 17.98.20 as not requiring bicycle parking are exempt from Section 17.98.160.

Sec. 17.98.170. Carpool and vanpool parking.

New industrial, commercial, and community service uses with more than 100 employees shall meet the following minimum requirements for carpool and vanpool parking.

A. *Number and Marking.* At least ten percent of the employee parking spaces shall be marked and signed for use as a carpool/vanpool space. The carpool/vanpool spaces shall be clearly marked "Reserved—Carpool/Vanpool Only."

B. *Location.* Designated carpool/vanpool parking spaces shall be the closest employee parking spaces to the building entrance normally used by employees except for any handicapped spaces provided.

Sec. 17.98.180. School design requirements.

A driveway designed for continuous forward flow of passenger vehicles for the purpose of loading and unloading children shall be located on the site of a school having a capacity greater than 50 students.

Sec. 17.98.190. Off-street loading facilities.

A. All commercial and industrial uses that anticipate loading and unloading of products/materials shall provide an off-street area for loading/unloading of products/materials.

B. The required loading berth shall be not less than ten feet in width by 35 feet in length and shall have an unobstructed height clearance of 14 feet.

C. Loading areas shall be screened from public view from public streets. The loading areas shall be screened from adjacent properties except in industrial districts and shall require the same screening as parking lots.

D. Sufficient space for turning and maneuvering of vehicles shall be provided on the site in accordance with the standard specifications established by the City Engineer.

Sec. 17.98.200. Residential on-street parking requirements.

A. *Residential On-Street Parking Requirements.* Residential on-street parking shall conform to the following standards:

1. In addition to required off-street parking, all new residential subdivisions and partitions shall provide one on-street parking space within 300 feet of each single family residence or duplex except as provided in Section 17.98.200.A.6. below. The 300 feet shall be measured in terms of walking distance from the primary entrance of the dwelling. Accessory dwelling units, multi-family developments, and conversions of single-family homes to duplexes are exempt from this standard.
2. The location of residential on-street parking shall be reviewed for compliance with this section through submittal of a Residential Parking Analysis Plan as required in Section 17.98.10.M.
3. Residential on-street parking shall not obstruct required clear vision areas and shall not violate any local or state laws.
4. Parallel residential on-street parking spaces shall be a minimum of 22 feet in length.
5. Residential on-street parking shall be measured along the curb from the outside edge of a driveway wing or curb cut. Parking spaces shall be set back a minimum of 15 feet from the point of tangency or curvature at an intersection and may not be located within ten feet of a fire hydrant.
6. Portions of residential on-street parking required by this section may be provided in parking courts that are interspersed throughout a development when the following standards are met:
   a. No more than ten parking spaces shall be provided in a parking court, except parking courts that utilize backing movements into the right-of-way in which case the parking court shall be limited to two parking spaces;
   b. Parking spaces within a parking court shall be nine feet wide and 18 feet in depth. In no instance shall a vehicle or any appurtenances parked in a parking court protrude into the public right-of-way;
   c. Notwithstanding Section 17.98.70, vehicles parked in a parking court on a local street as defined in the 2023 City of Sandy Transportation System Plan are permitted to back onto the public right-of-way from the parking court so long as the parking court is limited to two parking spaces;
   d. A parking court shall be located within 300 feet of the dwellings requiring parking in accordance with the requirements of Section 17.98.10.M.;
   e. No more than two parking courts shall be provided within a block, with only one parking court provided along a block face;
   f. A parking court shall be paved in compliance with the standards of this chapter and constructed to the grading and drainage standards in 17.98.140;
   g. A parking court adjacent to a public right-of-way~~, shall be privately owned and maintained;~~
   ~~h. If a parking court is adjacent to a~~ or private drive~~, it~~ shall be privately owned and maintained. For any parking court there shall be a legal recorded document which includes:
      - A legal description of the parking court;
      - Ownership of the parking court;
      - Use rights; and

- A maintenance agreement and the allocation and/or method of determining liability for maintenance of the parking court;

hi. A parking court shall be used solely for the parking of operable passenger vehicles.

(Ord. No. 2021-03 , § 9(Exh. I), 5-17-2021; Ord. No. 2021-16 , § 14(Exh. M), 8-16-2021)

CHAPTER 17.100 LAND DIVISION[26]

Sec. 17.100.00. Intent.

The intent of this chapter is to provide procedures, regulations, and design standards for subdivisions, partitions, replats, middle housing land divisions, and property line adjustments. The City of Sandy requires orderly and efficient land division patterns supported by a connected system of streets, sidewalks, park facilities, trails, fiber (broadband), water supply, sanitary sewer, and stormwater drainage facilities.

The division of land is the initial step in establishing Sandy's ultimate development pattern. The framework of streets, blocks, and individual lots is implemented through the land division process. Density, dimensional standards of lots, setbacks, and building height are established in applicable zoning district regulations.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.10. General provisions.

A. No land shall be divided prior to approval of a minor partition, major partition, replat, middle housing land division, or subdivision in accordance with Title 17 of the Sandy Municipal Code.

B. No sale or conveyance of any portion of a lot, other than for a public purpose, shall leave a structure on the remainder of a lot with less than the minimum lot size, density, or setback requirements of the zoning district, with the exception of lots created through the middle housing land division process.

C. Land division is processed by approval of a tentative plan prior to approval and recording of the final land division plat. Where a Type II or Type III procedure is required for land division approval, that procedure shall apply to the tentative plan approval. The Director has the authority to review a final plat for a land division through a Type I procedure to determine whether the plat complies with the approved tentative plat and conditions.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.20. Land division classification—Type I, II or III procedures.

A. *Type I Land Division (Property Line Adjustment).* Property line adjustments shall be a Type I procedure if the resulting parcels comply with standards of the zoning district and this chapter.

B. *Type I Land Division (Minor Partition).* A partition shall be a Type I procedure if the land division does not create a street and the resulting parcels comply with the standards of the zoning district and this chapter.

C. *Type II Land Division (Major Partition or Subdivision).* A partition or subdivision shall be a Type II procedure when a street is extended, satisfactory street conditions exist, the resulting parcels/lots comply with the standards of the zoning district, and the criteria for partitions and subdivisions in this chapter. Satisfactory street conditions exist when the Director determines all of the following are met:

[26]Editor's note(s)—Pre-republication, this chapter was last revised by Ord. No. 2020-24, effective September 21, 2020. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

1. Existing streets that are stubbed to the property boundaries are connected and extended through to the property boundaries of the subject property.

2. The land division does not create traffic volumes that exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.

3. The proposed street layout provides collector and arterial streets substantially as depicted in the 20231~~1~~ City of Sandy Transportation System Plan, Figure 11. "Substantially as depicted" means that the streets' proposed location is within 100 feet of the depicted location in any direction.

4. The proposed partition or subdivision provides, as applicable, a street pattern that meets the dimensional standards for blocks as required in Chapter 17.100 and~~/or~~ provides street cross-sections that meet the width requirements as detailed in Chapter 17.10, Definitions.

D. *Type II Land Division (Minor Replat).* A minor replat of an existing platted subdivision shall be a Type II procedure when the street(s) are existing and no extension or reconstruction/realignment is necessary, the replat does not increase the allowable density, the resulting parcels comply with the standards of the zoning district and this chapter, and the replat involves no more than six lots. Regardless of the number of lots, any replat involving the creation, extension, or modification of a street shall be processed as a major replat.

E. *Middle Housing Land Division.* A middle housing land division is a land division for a duplex built in accordance with ORS 197.758. A middle housing land division results in the creation of separate units of land for each dwelling unit of the duplex, or to create a separate unit of land for an Accessory Dwelling Unit. Following the land division, the units of land resulting from a Middle Housing Land Division shall collectively be considered a single lot along with the parent lot for all planning and zoning purposes except platting and property transfer.

F. *Type III Land Division (Major Partition or Subdivision).* A partition or subdivision shall be a Type III procedure if unsatisfactory street conditions exist, the resulting parcels/lots do not comply with the standards of the zoning district, the partition or subdivision does not meet the criteria in this chapter, or the applicant is requesting one or more variances. The Director shall determine that unsatisfactory street conditions exist if one or more of the following are proposed:

1. Existing streets that are stubbed to the property boundaries are not connected and extended through to the property boundaries of the subject property.

2. The land division creates traffic volumes that exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.

3. The proposed street layout does not provide collector and arterial streets substantially as depicted in the 20231~~1~~ City of Sandy Transportation System Plan, Figure 11. "Substantially as depicted" means that the streets' proposed location is within 100 feet of the depicted location in any direction.

4. The proposed partition or subdivision does not provide a street pattern that meets the dimensional standards for blocks as required in Chapter 17.100 and/or does not provide street cross-sections that meet the width requirements as detailed in Chapter 17.10, Definitions.

G. *Type III Land Division (Major Replat).* A major replat involves the realignment of property lines involving more than six lots, even if the major replat does not increase the allowable density. All parcels resulting from the replat must comply with the standards of the zoning district and this chapter. Any replat involving the creation, extension, or modification of a street shall be processed as a major replat.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.30. Property line adjustment.

Approval of a property line adjustment is required to move or eliminate a common boundary line between two parcels or lots. A Type I property line adjustment is not considered a development action for purposes of determining whether parkland dedication or right-of-way dedication is required.

A. *Preapplication Conference.* The applicant for a property line adjustment shall participate in a preapplication conference with City staff to discuss procedures for approval, applicable state and local requirements, objectives and policies of the Sandy Comprehensive Plan, and the availability of services. A preapplication conference is required.

B. *Application Requirements.* Property line adjustment applications shall be made on forms provided by the City and shall be accompanied by:

1. Two copies of the property line adjustment map at least 11 inches by 17 inches in size;
2. The required fees;
3. Narrative explaining the application; and,
4. Electronic copy of all materials.

C. *Map Information.* The property line adjustment map and narrative shall include the following:

1. The names, addresses, email addresses, and phone numbers of the owner(s) of the subject parcels and authorized representative;
2. Scale of drawing, north arrow, and date;
3. Legal description of the property;
4. Dimensions and size of the parcels or lots involved in the property line adjustment, existing and proposed;
5. Approximate locations of structures, utilities, rights-of-way, and easements;
6. Points of driveway access, existing and proposed;
7. Natural features, including waterways, drainage areas, significant vegetation, and rock outcroppings, and including features detailed in DSL's Statewide Wetlands Inventory and ODFW's Conservation Opportunity Areas maps; and,
8. Topography, including identification of land exceeding a 25 percent slope.

D. *Approval Criteria.* The Director shall approve a request for a property line adjustment if the following criteria are satisfied:

1. No additional parcels are created.
2. All parcels meet the density requirements and dimensional standards of the base zoning district.
3. Access, utilities, easements, and future collector and arterial streets as identified in the ~~2011~~ 2023 Transportation System Plan are not adversely affected by the property line adjustment.
4. Existing streets that are stubbed to the property boundaries can be connected and extended in the future.

E. *Final Approval.* Three paper copies of the final map shall be submitted within two years of approval of the property line adjustment. The final map shall include a boundary survey, which complies with ORS Chapters 92 and 209. The approved final map, along with required deeds, must be recorded with Clackamas County.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.40. Minor and major partitions and replats.

Approval of a partition or replat is required for a land division of three or fewer parcels in a calendar year. Partitions or replats that do not require creation or extension of a street for access are classified as a Type I, minor partition or replat. Partitions or replats that require creation or extension of a street for access are classified as Type II, major partitions or replats.

A. *Preapplication Conference.* The applicant for a minor or major partition or replat shall participate in a preapplication conference with City staff to discuss procedures for approval, applicable state and local requirements, objectives and policies of the Sandy Comprehensive Plan, and the availability of services. A preapplication conference is required.

B. *Application Requirements.* Partition or replat applications shall be made on forms provided by the City and shall be accompanied by:

1. Two copies of the tentative plan for the minor or major partition or replat;
2. The required fees;
3. Any data or narrative necessary to explain the application;
4. List of and two sets of mailing labels for affected property owners (if Type II, III, or IV), pursuant to Sections 17.22.10 and 17.22.20; and,
5. Electronic copy of all materials.

C. *Tentative Partition Plan or Replat.* The tentative partition plan or replat shall be a minimum of 11 inches by 17 inches in size and shall include the following information:

1. Scale of drawing, north arrow, and date;
2. Name and address of the owner of record and of the person who prepared the partition plan or replat;
3. Zoning, size, and dimensions of the property to be partitioned or replatted;
4. Size, dimensions, and identification of proposed parcels (i.e., Parcel 1, Parcel 2, Parcel 3);
5. Approximate location of any structures on the property to be partitioned or replatted, including setbacks to proposed parcel boundaries;
6. Location, names, and widths of streets, sidewalks, and bikeways within the property to be partitioned or replatted and extending 1,000 feet beyond the property boundaries;
7. Location, width, and purpose of existing and proposed easements on the property to be partitioned or replatted;
8. Location and size of sanitary sewer, water, and stormwater drainage facilities proposed to serve the property to be partitioned or replatted;
9. Natural features, including waterways, drainage areas, significant vegetation, and rock outcroppings, and including features detailed in DSL's Statewide Wetlands Inventory and ODFW's Conservation Opportunity Areas maps;
10. Topography, including identification of land exceeding a 25 percent slope;
11. Tree preservation plan detailing building footprints and critical root zones of trees proposed for retention;

121. A plan for future parcel redivision, if the proposed parcels are large enough to be redivided under the comprehensive plan or zoning designation.

D. *Approval Criteria.* The Director or Planning Commission shall review the tentative plan for a minor partition, major partition, or replat based on the classification procedure (Type I, II or III) and the following approval criteria:

1. The proposed partition or replat meets the density requirements, setbacks, and dimensional standards for all lots in the base zoning district or zoning districts if multiple zoning districts exist in the proposed partition or replat.
2. The proposed partition or replat meets the requirements of the Bornstedt Village Overlay (BVO), if the proposed partition or replat is located in the BVO, or other specific area plan, if the proposed partition or replat is located in another specific plan area, as required in Chapter 17.54.
3. The proposed partition or replat meets the requirements of hillside development as required in Chapter 17.56.
4. The proposed partition or replat meets the requirements of the flood and slope hazard overlay district as required in Chapter 17.60.
5. The proposed partition or replat meets the additional setback standards on collector and arterial streets as required in Chapter 17.80.
6. The proposed partition or replat meets the building orientation standards on transit streets as required in Chapter 17.82.
7. The proposed partition or replat meets all improvement standards for sidewalks, pedestrian connections including tracts and easements, bicycle facilities, water facilities, sanitary sewer facilities, stormwater facilities, and all other standards as required in Chapter 17.84.
8. The proposed partition or replat includes the dedication of land, or a fee in-lieu of land as required in Chapter 17.86 and the 2022 Parks and Trails Master Plan.
9. The proposed partition or replat will meet the requirements of Chapter 17.90 at the time of building~~house~~ construction.
10. The proposed partition or replat meets the landscaping requirements of Chapter 17.92.
11. The proposed partition or replat provides on-street parking, off-street parking, driveway spacing, and driveway widths as required in Chapter 17.98.
12. The proposed partition or replat provides tree retention as required in Chapter 17.102.
13. The proposed partition or replat provides a street pattern that meets the dimensional standards for blocks as required in Chapter 17.100 and street cross-sections that meet the width requirements as detailed in Chapter 17.10, Definitions.
14. The proposed street layout includes the siting of all collector and arterial streets substantially as depicted in the ~~2011~~ 2023 Transportation System Master Plan, Figure 11. "Substantially as depicted" means that the streets' proposed location is within 100 feet of the depicted location in any direction.
15. The proposed street improvements, including sidewalks, planter strips or swales, street trees, street lighting, curbs, asphalt, and vehicular and bicycle lanes and striping, are consistent with Figures ~~6~~18 through ~~13~~24 of the ~~2011~~ 2023 Transportation System Master Plan. The improvements shall be constructed to the standards described in the Oregon Standard

Specifications for Construction (OSSC) 2021 (or most recent revision) and the AASHTO Policy on Geometric Design of Highways and Streets (Green Book)—2018 (or most recent revision).

16. The proposed partition or replat is consistent with the design standards set forth in this chapter.

~~17. The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy.~~

17~~18~~. The proposed partition or replat creates traffic volumes that do not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.

18~~19~~. The proposed subdivision includes utilities that meet the requirements of the 2022 City of Sandy Water System Master Plan and the City of Sandy Wastewater System Facilities Plan.

19~~20~~. The proposed partition or replat includes the installation of all utilities underground, including electric, natural gas, fiber, telecommunication lines, water, and sanitary sewer, and the required easements for such utilities.

E. *Conditions.* The Director or Planning Commission may require dedication of land and easements and may specify such conditions or modifications of the tentative partition plan or replat as ~~deemed~~ necessary to ensure compliance with the applicable standards and criteria.

F. *Approval of Tentative Partition Plan or Replat.* When a tentative partition plan or replat has been approved, all copies shall be marked with the date and conditions of approval. One copy shall be returned to the applicant, one copy shall be sent to the county, and one copy shall be retained by the City.

G. *Tentative Plat Expiration Date.* The final plat shall be delivered to the Director for approval within two years following approval of the tentative plat, and shall incorporate any modification or condition required by approval of the tentative plat. The Director may, upon written request, grant an extension of the tentative plat approval for up to one additional year. The one-year extension by the Director is the maximum extension that may be granted for a partition or replat.

H. *Submission of Final Plat.* The applicant shall survey the partition or replat and prepare a final plat in conformance with the tentative plat approval and the requirements of ORS Chapter 92.

I. *Information on Plat.* In addition to information required for the tentative plat or otherwise specified by state law, the following information shall be shown on the final plat for the partition or replat:

1. Tract boundary lines, right-of-way lines of streets, and property lines with dimensions, bearings, or deflection angles and radii, arcs, points of curvature, and tangent bearings. All bearings and angles shall be shown to the nearest one-second and all dimensions to the nearest 0.01 foot. If circular curves are proposed in the plat, the following data must be shown in table form: curve radius, central angles, arc length, and bearing of long chord.

2. Easements denoted by fine dotted lines, clearly identified and, if already of record, their recorded references. If an easement is not definitely located of record, a statement of the easement shall be given. The width of the easement, its length and bearing, and sufficient ties to locate the easement with respect to the subdivision shall be shown. If the easement is being dedicated by the plat, it shall be properly referenced in the owner~~'~~'s certificates of dedication.

3. Any building setback lines if more restrictive than the City zoning ordinance.

4. Location and purpose for which sites, other than residential lots, are dedicated or reserved.

5. Easements and any other areas for public use dedicated without any reservation or restriction.

6. A copy of any deed restrictions and restrictive covenants written on the face of the plat or prepared to record with the plat with reference on the face of the plat.

7. The following certificates that may be combined where appropriate:

   a. A certificate signed and acknowledged by all parties having any recorded title interest in the land, consenting to the preparation and recording of the plat.

   b. A certificate signed and acknowledged as above, dedicating all land intended for public use except land that is intended for the exclusive use of the lot owners in the plat, their licensees, visitors, and tenants.

   c. A certificate with the seal of and signed by the engineer or the surveyor responsible for the survey and final plat.

   d. Other certificates now or hereafter required by law.

8. *Supplemental Information with Plat.* The following data shall accompany the final plat:

   a. A preliminary title report issued by a title insurance company in the name of the owner of the land, showing all parties whose consent is necessary and their interest in the land.

   b. Sheets and drawings showing the following:

      i. Traverse data including the coordinates of the boundary of the plat and ties to section corners and donation land claim corners, and showing the error of closure, if any.

      ii. The computation of distances, angles, and courses shown on the plat.

      iii. Ties to existing monuments, proposed monuments, adjacent subdivisions, street corners, and state highway stationing.

   c. A copy of any deed restrictions or recorded covenants applicable to the partition or replat.

   d. A copy of any dedication requiring separate documents.

   e. A list of all taxes and assessments on the land which have become a lien on the land.

   f. A certificate by the applicant's engineer that the applicant has complied with the improvement requirements.

9. Certification by the Public Works Director or by the owner of a privately owned domestic water supply system that water will be available to the property line of each and every lot depicted in the final plat.

J~~G~~. *Approval Signatures for Final Partition Plan or Replat.* Following review and approval of a final partition plan or replat, the Director shall:

1. Review Plat for Accuracy. The Director may require field investigations to verify that the plat survey is accurate. The applicant shall be notified and afforded an opportunity to make corrections if needed.

2. Sign the plat to certify that the map is approved.

3. Notify the applicant that the partition map or replat and accompanying documents have been approved and are ready for recording with the Clackamas County Recorder.

4. Deliver the signed original to the applicant who shall deliver the original for recording at the County Recorder's office.

K~~H~~. *Effective Date for Final Partition Map Approval.* The partition or replat shall become final upon recording of the approved partition map or replat together with any required documents from the land use decision with the County Recorder. Work specifically authorized following tentative approval may

take place prior to processing of the final partition map or replat. The documents effectuating a partition or replat shall become null and void if not recorded with the County Recorder within one year following approval.

L1. *Improvements.* The same improvements shall be installed to serve each parcel of a partition or replat as required of a subdivision. Improvement standards are set forth in Chapter 17.84.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.50. Middle housing land divisions.

A. *Applicability.* When land which has been, or is proposed to be, developed for middle housing is proposed to be partitioned or subdivided so that each dwelling unit will be located on its own separate lot, the partition or subdivision shall be processed as a middle housing land division pursuant to this section, in-lieu of the standards and procedures otherwise applicable to partitions and subdivisions included under this chapter.

B. *Procedure Type.* Unless an applicant requests that the application be reviewed as a Type II administrative review, a middle housing land division shall be processed as an expedited land division as provided under ORS 197.360 through ORS 197.380.

C. *Submittal Requirements.* An application for a middle housing land division shall include the following:

1. The information required under Section 17.18.30;
2. List and two sets of mailing labels for property owners within 100 feet of the subject property;
3. Two copies of a site plan for the middle housing development as it relates to the existing lot. The site plan shall be a minimum of 11 inches by 17 inches in size and shall contain the following information:
    a. Scale and north arrow;
    b. The boundaries, dimensions, and area of the parent lot and resulting middle housing lots;
    c. The location, width, and names of all existing streets, flag lot accessways, and public accessways abutting the perimeter of the lot;
    d. The location, width, curve radius, grade, and names of all proposed streets, flag lot accessways, and public accessways;
    e. The location and use of all existing and proposed buildings and accessory structures on the lot, indicating the setbacks to all property lines and adjacent on-site structures and identification of any structures that will be removed;
    f. The location of all existing and proposed off-street parking and vehicle use areas;
    g. Identification of vehicle, pedestrian, and bicycle parking and circulation areas, including handicapped parking spaces, and accessible routes of travel;
    h. Driveway locations, bike paths, transit stops, sidewalks, and other bike and pedestrian pathways, curbs, and easements;
    i. The location, height, and material of fences, berms, walls, and other existing and proposed screening;
    j. The location of all existing trees and vegetation required to be protected under Section 17.60.40, Subsection 17.92.10.C., and Section 17.102.50; and
    k. The location of all existing and proposed street trees required under Section 17.92.30;

4. Two copies of a tentative plan map for the middle housing development as it relates to the proposed lots. The tentative plan map shall be a minimum of 11 inches by 17 inches in size and shall contain the following information:

    a. A title block on each sheet indicating the names and addresses of the landowner; the names and addresses of the professional engineers or surveyors responsible for preparing the plan; the date; and the township, range, and section of the subject property;

    b. Scale and north arrow;

    c. The location of all property lines within 50 feet of the perimeter of the subject property;

    d. The boundaries, dimensions, and area of each proposed lot;

    e. The location, width, and names of all existing streets, flag lot accessways, and public accessways abutting the perimeter of the subject property;

    f. The location, width, curve radius, grade, and names of all proposed streets, flag lot accessways, and public accessways;

    g. The location and use of all buildings and accessory structures that will be located on each proposed lot, indicating the distance of such buildings and accessory structures to proposed lot lines and to adjacent structures on abutting lots.

    h. The location of all existing and proposed easements necessary to serve the development;

    i. The location, dimensions, and use of all existing and proposed public areas, including, but not limited to, stormwater management facilities and detention facilities;

    j. The location of any ditches, waterways, detention facilities, sewage disposal systems, and wells on the subject property, indicating which facilities will remain and which will be removed or decommissioned; and

    k. The location of any natural topographic features on the subject property, including, but not limited to, creeks, drainage ways as shown on the most recent USGS maps, wetlands as shown on the Local Wetland Inventory, and floodplains.

4. A current title report for the property;

5. A completed tree inventory detailing tree location, species, size (DBH), and condition as well as which, if any, trees are proposed for removal;

6. A tree protection plan for trees required to be retained;

7. A geological assessment or geo-technical report, if required by Chapter 17.56, or a certification from an engineering geologist or a geotechnical engineer that landslide risk on the site is low, and that there is no need for further landslide risk assessment;

8. A preliminary grading plan depicting proposed site conditions following completion of the proposed development, when grading of the subject property is necessary to accommodate the proposed development.

9. A utility plan showing the location of existing and proposed waterlines, sanitary sewer lines, and stormwater lines; and

10. A description of the proposed stormwater management system, including pre and post construction conditions, prepared in accordance with the 2020 City of Portland Stormwater Management Manual.

D. *Approval Criteria.* The Director shall review middle housing land division applications based on the procedure set forth in Chapter 17.18 and the following approval criteria:

1. A proposal for development of middle housing shall be in compliance with the Oregon Residential Specialty Code and land use regulations applicable to the original lot or parcel allowed under ORS 197.758(5);
2. Separate utilities are provided for each dwelling unit;
3. The following easements are shown for each dwelling unit on the tentative plan:
    a. Easements necessary for locating, accessing, replacing and servicing all utilities;
    b. Easements for pedestrian access from each dwelling unit to a public road;
    c. Easements necessary for any common use areas or shared building elements; and
    d. Easements necessary for any dedicated driveways or parking.
4. The middle housing land division results in exactly one dwelling unit on each resulting lot or parcel, except for lots, parcels, or tracts used as common areas;
5. The application demonstrates that buildings or structures on the middle housing lots created by the middle housing land division will comply with applicable building code provisions relating to new property lines, and, notwithstanding the creation of new lots or parcels, that structures or buildings located on the middle housing lots will comply with the Oregon Residential Specialty Code;
6. The final plat shall include a notation indicating that the land division was approved through a middle housing land division and that the lots shall not be further divided;
7. The final plat shall include a note indicating that neither a Homeowners Association nor Covenants, Conditions, and Restrictions can prohibit middle housing land division;
8. The deed shall contain a reference to the final plat, which includes a notation that the land division was approved though a middle housing land division and that the lots shall not be further divided; and
9. The proposal shall include street frontage improvements where a resulting lot or parcel abuts the street consistent with the ~~2011~~ 2023 Transportation System Plan.

E. *Conditions of Approval.* Conditions may not be placed on the approval of a middle housing land division except to:
1. Prohibit further division of the resulting lots;
2. Prohibit the construction of an accessory dwelling unit on any of the resulting lots;
3. Require dedication of right-of-way when an existing street abutting the property does not conform to the requirements of Section 17.10.30;
4. Require boundary street improvements when an existing street abutting the property does not conform to the requirements of the adopted street section consistent with the ~~2011~~ 2023 Transportation System Plan; and
5. Require a notation on the final plat indicating that the approval of the land division was given under ORS 92.031.

F. *Submission of Final Plat.* The applicant shall survey the middle housing land division and prepare a final plat in conformance with the tentative plat approval and the requirements of ORS Chapter 92.

G. *Information on Plat.* In addition to information required for the tentative plat or otherwise specified by state law, the following information shall be shown on the final plat for the middle housing land division:
1. Tract boundary lines, right-of-way lines of streets, and property lines with dimensions, bearings, or deflection angles and radii, arcs, points of curvature, and tangent bearings. All bearings and angles shall

be shown to the nearest one-second and all dimensions to the nearest 0.01 foot. If circular curves are proposed in the plat, the following data must be shown in table form: curve radius, central angles, arc length, and bearing of long chord.

2. Easements denoted by fine dotted lines, clearly identified and, if already of record, their recorded references. If an easement is not definitely located of record, a statement of the easement shall be given. The width of the easement, its length and bearing, and sufficient ties to locate the easement with respect to the subdivision shall be shown. If the easement is being dedicated by the plat, it shall be properly referenced in the owner-'s certificates of dedication.

3. Any building setback lines if more restrictive than the City zoning ordinance.

4. Location and purpose for which sites, other than residential lots, are dedicated or reserved.

5. Easements and any other areas for public use dedicated without any reservation or restriction.

6. A copy of any deed restrictions and restrictive covenants written on the face of the plat or prepared to record with the plat with reference on the face of the plat.

7. The following certificates that may be combined where appropriate:

   a. A certificate signed and acknowledged by all parties having any recorded title interest in the land, consenting to the preparation and recording of the plat.

   b. A certificate signed and acknowledged as above, dedicating all land intended for public use except land that is intended for the exclusive use of the lot owners in the plat, their licensees, visitors, and tenants.

   c. A certificate with the seal of and signed by the engineer or the surveyor responsible for the survey and final plat.

   d. Other certificates now or hereafter required by law.

8. *Supplemental Information with Plat.* The following data shall accompany the final plat:

   a. A preliminary title report issued by a title insurance company in the name of the owner of the land, showing all parties whose consent is necessary and their interest in the land.

   b. Sheets and drawings showing the following:

      i. Traverse data including the coordinates of the boundary of the plat and ties to section corners and donation land claim corners, and showing the error of closure, if any.

      ii. The computation of distances, angles, and courses shown on the plat.

      iii. Ties to existing monuments, proposed monuments, adjacent subdivisions, street corners, and state highway stationing.

   c. A copy of any deed restrictions or recorded covenants applicable to the partition or replat.

   d. A copy of any dedication requiring separate documents.

   e. A list of all taxes and assessments on the land which have become a lien on the land.

   f. A certificate by the applicant-'s engineer that the applicant has complied with the improvement requirements.

9. Certification by the Public Works Director or by the owner of a privately owned domestic water supply system that water will be available to the property line of each and every lot depicted in the final plat.

H~~F~~. *Expiration.* Tentative plan approval for a middle housing land division shall expire in three years, unless a final plat is approved within that timeframe.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022)

Sec. 17.100.60. Subdivisions.

Subdivision approval is required for a land division that creates four or more lots or parcels in a calendar year. A two-step procedure is required for subdivision approval: (1) tentative plat review and approval; and (2) final plat review and approval.

A. *Preapplication Conference.* The applicant for a subdivision shall participate in a preapplication conference with City staff to discuss subdivision criteria, applicable state and local requirements, objectives and policies of the Sandy Comprehensive Plan, and the availability of utility services. The preapplication conference provides the opportunity to discuss the conceptual development of the property in advance of a formal submission of the tentative plan. A preapplication conference is required.

B. *Application Requirements for a Subdivision.* Subdivision applications shall be made on forms provided by the Planning Division and shall be accompanied by:

1. Two copies of the tentative plat;
2. Required fees, including third-party review fees;
3. Preliminary title search;
4. Any data or narrative necessary to explain the application;
5. Existing zoning and proposed land use;
6. One mailing list and two sets of mailing labels of affected property owners, pursuant to Sections 17.22.10 and 17.22.20;
7. Electronic copy of all materials;
8. Two copies of the following supplementary materials, unless waived by the Director:
    a. A vicinity map, showing adjacent property boundaries and how proposed streets may be extended to connect to existing streets;
    b. Plan Set including the following sheets:
        i. Existing conditions plan detailing the following:
            1. Ground elevations shown by contour lines at two-foot vertical intervals for ground slopes of less than ten percent and at ten-foot vertical intervals for ground slopes exceeding ten percent.
            2. Natural features such as marshes, rock outcroppings, watercourses on and abutting the property, and location of wooded areas, and including features detailed in DSL's Statewide Wetlands Inventory and ODFW's Conservation Opportunity Areas maps.
            3. Existing uses of the property, including location and present use of all existing structures to remain on the property after platting.
        ii. Grading plan depicting proposed site conditions following completion of the proposed development and erosion control plan;

iii. Utility plan detailing location of stormwater drainage, sanitary sewers, and water lines (existing and proposed) on and abutting the property. If utilities are not on or abutting the property, indicate the direction and distance to the nearest locations;

iv. A description of the proposed stormwater management system, including pre and post construction conditions, prepared in accordance with the 2020 City of Portland Stormwater Management Manual;

~~i~~v. Tree preservation plan detailing building footprints and critical root zones of trees proposed for retention;

vi. Street tree plan;

vii. Driveway approach plan;

viii. On-street parking plan;

ix~~viii~~. Stream, wetlands, and flood and slope hazard (FSH) overlay map detailing the following:

1. Location, width, and direction of flow of all water courses.
2. Approximate location of areas subject to periodic inundation or storm sewer overflow, and location of any floodplain or flood hazard district.
3. Top of bank.
4. FSH analysis area, FSH restricted development area, and required setbacks.

~~i~~x. Slope analysis map identifying land exceeding a 25 percent slope.

xi. Future street plan in accordance with Subsection 17.100.100.C.

c. Arborist report and tree inventory detailing tree location, species, size (DBH), and condition as well as which, if any, trees are proposed for removal;

d. Traffic analysis in accordance with Section 17.84.50;

e. Wetland delineation, if applicable;

f. Geological assessment or Geotechnical Report, if required by Chapter 17.56, or a certification from an engineering geologist or a geotechnical engineer that landslide risk on the site is low, and that there is no need for further landslide risk assessment; and,

g. Proposed development phases, if applicable.

C. *Format.* The Tentative Plat and Plan Set shall be drawn on a sheet 24 inches by 36 inches in size and at a scale of one inch equals 50 feet, one inch equals 40 feet, one inch equals 30 feet, or one inch equals 20 feet, unless an alternative format is approved by the Director at the preapplication conference. The application shall include one copy of a scaled drawing of the proposed subdivision, on a sheet eight and one-half inches by 11 inches, suitable for reproduction.

D. *Data Requirements for Tentative Plat.*

1. Scale of drawing, north arrow, and date.
2. Location of the subdivision by section, township and range, and a legal description sufficient to define the location and boundaries of the proposed tract.

3. Names, addresses, and telephone numbers of the owner(s) of the property, the engineer or surveyor, and the date of the survey.

4. Streets: location, names, paved widths, alleys, and right-of-way (existing and proposed) on and within 400 feet of the boundaries of the property.

5. Easements: location, widths, purpose of all easements (existing and proposed) on or serving the property.

6. Location of at least one temporary bench mark within the tract boundaries.

7. Lots and Blocks: approximate dimensions of all lots, minimum lot sizes, block length, and proposed lot numbers, and block numbers if applicable.

8. Designation of land intended to be dedicated or reserved for public use, with the purpose, conditions, or limitations of such reservations clearly indicated.

E. *Approval Criteria.* The Director or Planning Commission shall review the subdivision based on the classification procedure (Type II or III) set forth in Chapter 17.12 and the following approval criteria:

1. The proposed subdivision meets the density requirements, setbacks, and dimensional standards for all lots in the base zoning district or zoning districts if multiple zoning districts exist in the proposed subdivision.

2. The proposed subdivision meets the requirements of the Bornstedt Village Overlay (BVO), if the proposed subdivision is located in the BVO, or other specific area plan, if the proposed subdivision is located in another specific plan area, as required in Chapter 17.54.

3. The proposed subdivision meets the requirements of the hillside development as required in Chapter 17.56.

4. The proposed subdivision meets the requirements of the flood and slope hazard overlay district as required in Chapter 17.60.

5. The proposed subdivision meets the additional setback standards on collector and arterial streets as required in Chapter 17.80.

6. The proposed subdivision meets the building orientation standards on transit streets as required in Chapter 17.82.

7. The proposed subdivision meets all improvement standards for sidewalks, pedestrian connections including tracts and easements, bicycle facilities, water facilities, sanitary sewer facilities, stormwater facilities, and all other standards as required in Chapter 17.84.

8. The proposed subdivision includes the dedication of land or a fee in-lieu of land as required in Chapter 17.86 and the 2022 Parks and Trails Master Plan.

9. The proposed subdivision will meet the requirements of Chapter 17.90 at the time of ~~house~~ building construction.

10. The proposed subdivision meets the landscaping requirements of Chapter 17.92.

11. The proposed subdivision provides on-street parking, off-street parking, driveway spacing, and driveway widths as required in Chapter 17.98.

12. The proposed subdivision provides tree retention as required in Chapter 17.102.

13. The proposed subdivision provides a street pattern that meets the dimensional standards for blocks as required in Chapter 17.100 and street cross-sections that meet the width requirements as detailed in Chapter 17.10, Definitions.

14. The proposed street layout includes the siting of all collector and arterial streets ~~substantially~~ as depicted in the ~~2011~~ 2023 Transportation System Master Plan, Figure 11. "Substantially as depicted" means that the streets' proposed location is within 100 feet of the depicted location in any direction.

15. The proposed street improvements include sidewalks, planter strips or swales, street trees, street lighting, curbs, asphalt, and vehicular and bicycle lanes and striping that meets the construction standards as required in the ~~2011~~ 2023 Transportation System Master Plan, Figures 18-24~~6-13~~.

16. The proposed subdivision creates traffic volumes that do not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.

17. The proposed subdivision includes utilities that meet the requirements of the 2022 City of Sandy Water System Master Plan and the City of Sandy Wastewater System Facilities Plan.

18. The proposed subdivision includes the installation of all utilities underground, including electric, natural gas, fiber, telecommunication lines, water, and sanitary sewer, and the required easements for such utilities.

19. The proposed subdivision, if phasing is proposed, meets the following standards:

    a. A proposed phasing plan shall be submitted with the subdivision land use application.

    b. The proposed phasing plan shall include a time schedule for developing a site in phases, with all phases to be recorded by plat within five years from the date of tentative plat approval.

    c. Public facilities shall be deemed substantially complete prior to construction of additional phases or as otherwise determined through a development agreement with a performance guarantee per Section 17.100.340.

    d. The phased development shall not result in requiring the City or other property owners to construct public facilities that are required to accomplish additional phases in the subdivision.

F. *Conditions.* A decision to approve a tentative plat may require dedication of land and easements, and may include such other conditions or modifications as necessary to ensure compliance with the applicable standards and criteria.

G. *Improvements.* A detailed list of required improvements for the subdivision shall be set forth in the final order for the tentative plat.

H. *Tentative Plat Expiration Date.* The final plat shall be delivered to the Director for approval within two years following approval of the tentative plat, and shall incorporate any modification or condition required by approval of the tentative plat. The Director may, upon written request, grant an extension of the tentative plat approval for up to one additional year. The one-year extension by the Director is the maximum extension that may be granted for a subdivision.

I. *Submission of Final Plat.* The applicant shall survey the subdivision and prepare a final plat in conformance with the tentative plat approval and the requirements of ORS Chapter 92.

J. *Information on Plat.* In addition to information required for the tentative plat or otherwise specified by state law, the following information shall be shown on the final plat for the subdivision:

    1. Tract boundary lines, right-of-way lines of streets, and property lines with dimensions, bearings, or deflection angles and radii, arcs, points of curvature, and tangent bearings. All bearings and angles shall be shown to the nearest one-second and all dimensions to the nearest 0.01 foot. If

circular curves are proposed in the plat, the following data must be shown in table form: curve radius, central angles, arc length, and bearing of long chord.

2. Easements denoted by fine dotted lines, clearly identified and, if already of record, their recorded references. If an easement is not definitely located of record, a statement of the easement shall be given. The width of the easement, its length and bearing, and sufficient ties to locate the easement with respect to the subdivision shall be shown. If the easement is being dedicated by the plat, it shall be properly referenced in the owner's certificates of dedication.
3. Any building setback lines if more restrictive than the City zoning ordinance.
4. Location and purpose for which sites, other than residential lots, are dedicated or reserved.
5. Easements and any other areas for public use dedicated without any reservation or restriction.
6. A copy of any deed restrictions and restrictive covenants written on the face of the plat or prepared to record with the plat with reference on the face of the plat.
7. The following certificates that may be combined where appropriate:
    a. A certificate signed and acknowledged by all parties having any recorded title interest in the land, consenting to the preparation and recording of the plat.
    b. A certificate signed and acknowledged as above, dedicating all land intended for public use except land that is intended for the exclusive use of the lot owners in the subdivision, their licensees, visitors, and tenants.
    c. A certificate with the seal of and signed by the engineer or the surveyor responsible for the survey and final plat.
    d. Other certificates now or hereafter required by law.
8. *Supplemental Information with Plat.* The following data shall accompany the final plat:
    a. A preliminary title report issued by a title insurance company in the name of the owner of the land, showing all parties whose consent is necessary and their interest in the land.
    b. Sheets and drawings showing the following:
        i. Traverse data including the coordinates of the boundary of the subdivision and ties to section corners and donation land claim corners, and showing the error of closure, if any.
        ii. The computation of distances, angles, and courses shown on the plat.
        iii. Ties to existing monuments, proposed monuments, adjacent subdivisions, street corners, and state highway stationing.
    c. A copy of any deed restrictions or recorded covenants applicable to the subdivision.
    d. A copy of any dedication requiring separate documents.
    e. A list of all taxes and assessments on the land which have become a lien on the land.
    f. A certificate by the applicant's engineer that the applicant has complied with the improvement requirements.
9. Certification by the Public Works Director or by the owner of a privately owned domestic water supply system that water will be available to the property line of each and every lot depicted in the final plat.

K. *Technical Plat Review.* Upon receipt by the City, the plat and supplemental information shall be reviewed by the City Engineer and Director through a Type I procedure. The review shall focus on conformance of the final plat with the approved tentative plat, conditions of approval, and provisions of city, county, or state law applicable to subdivisions.

1. The City Engineer may make field checks as needed to verify that the final plat is sufficiently correct on the ground, and City representatives may enter the subdivision property for this purpose.

2. If the City Engineer or Director determines that full conformance has not been made, they shall advise the applicant of the changes or additions that must be made and shall afford the applicant an opportunity to make the changes or additions.

3. All costs associated with the technical plat review and recording shall be the responsibility of the applicant.

L. *Approval of Final Plat.* The signatures of the Director and the City Engineer shall indicate approval of the final plat. After the plat has been approved by all City and Clackamas County officials, a digital copy of the plat and a digital copy of any recorded documents shall be delivered to the Director within 20 working days of recording.

M. *Recording of Final Plat.* Approval of the plat by the City shall be conditioned on its prompt recording. The applicant shall, without delay, submit the plat to the county assessor and the county governing body for signatures as required by ORS 92.100. The plat shall be prepared as provided by ORS 92.080. Approval of the final plat shall be null and void if the plat is not submitted for recording within 30 days after the date the last required approving signature has been obtained.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2021-16 , § 15(Exh. N), 8-16-2021; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.70. Land division design standards.

All land divisions shall be in conformance with the requirements of the applicable base zoning district, Chapter 17.100, and other applicable provisions of Title 17 of the Sandy Municipal Code. The design standards in this section shall be used in conjunction with street design standards included in the ~~2011~~ 2023 City of Sandy Transportation System Plan (Figures 18~~6~~ through 24~~13~~) and standards and construction specifications for public improvements as set forth in adopted Public Facilities Plans, including the 2022 City of Sandy Water System Master Plan and the City of Sandy Wastewater System Facilities Plan, and the Sandy Municipal Code, including Title 12 and Title 13.

(Ord. No. 2021-16 , § 15(Exh. N), 8-16-2021; Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.80. Reserved.

Editor's note(s)—Ord. No. 2022-07 , § 9(Exh. I), adopted May 2, 2022 and Ord. No. 2022-08 , § 1(Exh. A), adopted May 2, 2022, repealed § 17.100.80, which pertained to character of the land and derived from original Code material.

Sec. 17.100.90. Access control guidelines and coordination.

A. Notice and coordination with ODOT is required. The City will coordinate and notify ODOT regarding all proposals for new or modified public and private accesses to Highway 26. A notice to ODOT is also required if the proposal is within 1,000 feet of Highway 26, Proctor Blvd., or Pioneer Blvd.

B. It is the city policy to, over time, reduce noncompliance with the Oregon Highway Plan Access Management Policy guidelines. Reduction of noncompliance with the cited State standards means that all reasonable alternatives to reduce the number of accesses and avoid new non-complying accesses will be explored during the development review. The methods to be explored include, but are not limited to: closure, relocation, and consolidation of access; right-in/right-out driveways; crossover easements; and use of local streets, alleys, and frontage roads.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.100. Streets generally.

No subdivision or partition shall be approved unless the subdivision lots or partition lots have frontage or approved access to an existing public street. In addition, all streets shall be graded and improved in conformance with ~~the City's adopted~~ the construction standards and approved construction plans in Title 12 of the Sandy Municipal Code and the Utility Standard Details for Streets & Roads.

A. *Street Connectivity.* The pattern of streets established through a land division must be a ~~rectangular~~ grid pattern connected to the existing city or county road system. The streets shall provide for multimodal transportation facilities including vehicles, bicycles, and pedestrians. For Type III Land Division, t~~T~~he traffic impact study required under Subsection 17.100.100.B. shall demonstrate that the proposed roadways create a logical, recognizable circulation pattern, and spread traffic over many streets so that key transportation facilities (particularly ~~U.S.~~Highway 26) are not overburdened.

B. *Transportation Impact Studies.* An applicant is required to prepare and submit a transportation impact study in accordance with the standards of Chapter 17.84 unless those standards exempt the application from the requirement.

C. *Future Street Plan.* Future street plans are conceptual plans, street extensions, and street connections on land abutting proposed subdivisions and partitions. All applications for subdivision and partition shall provide a future street plan that shows the pattern of proposed streets within the boundaries of the proposed subdivision or partition, proposed connections to abutting land, and extension of streets to abutting land within a 1,000 foot radius of the subdivision, partition, or replat. The future street plan shall demonstrate that maximum block length standards in Section 17.100.120 will not be exceeded when streets are extended onto abutting land in the future.

D. *Connections.* Except as permitted under Exemptions, all streets, alleys, and sidewalks shall connect to other streets, alleys, and sidewalks within the subdivision or partition and to existing and planned streets, alleys, and sidewalks outside the subdivision or partition, and to undeveloped properties that have no future street plan. Streets shall terminate at other streets, parks, and schools. Local streets shall align and connect with other streets when crossing collectors and arterials.

Proposed streets or street extensions shall be located to provide direct access to existing or planned transit stops, and existing or planned schools and parks.

E. *Exemptions.*

1. A future street plan is not required for partitions of residentially zoned land when none of the parcels may be redivided under existing minimum density standards.

2. When street connection standards are inconsistent with an adopted street spacing standard for arterials or collectors, a right turn-in/right turn-out only design including median control ~~may be approved~~shall be an acceptable alternative to a full intersection. Where compliance with the standards would result in ~~unacceptable~~ sight distances that fall short of the current AASHTO Policy on Geometric Design of Highways and Streets, an accessway ~~may be approved in place of~~shall be an acceptable alternative to a street connection.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.110. Street standards and classification.

Functional definitions of each street type are described in the ~~2011~~ 2023 Transportation System Plan as summarized below. The descriptions below are intended to incorporate and implement the functional classifications in the ~~2011~~ 2023 Transportation System Plan, Chapter 5~~3~~ and Figures 18-24~~6-13~~.

A. ~~Major~~ Principal arterials are designed to carry high volumes of through traffic, mixed with some unavoidable local traffic, through or around the city.

B. Minor arterials are designed to collect and distribute traffic from major and minor arterials to neighborhood collectors and local streets, or directly to traffic destinations.

~~C. Residential minor arterials are a hybrid between minor arterial and collector type streets that allow for moderate to high traffic volumes on streets where over 90 percent of the fronting lots are residential.~~

C~~D~~. Collector streets are designed to collect and distribute traffic from higher type arterial streets to local streets or directly to traffic destinations. Right-of-way width shall not be less than 44 feet nor more than 78 feet (or 82 feet if it's a green street with swales on both sides).

D~~E~~. Local streets provide direct access to abutting property and connect to collector streets. Local streets shall be spaced no less than eight and no more than twelve streets per mile (i.e., spaced no less than 520 feet and no more 660 feet apart). Right-of-way width shall be 54 feet (or up to 60 feet if it's a green street with swales on both sides). Local streets shall not exceed the ADT standards set forth in Chapter 17.10, except that the ADT standard for local streets shall not apply to outright permitted development within the C-1 zone.

E. Development within the Bornstedt Village Overlay is subject to the roadway standards in Section 17.54.120.

F. The City may approve deviations from the street spacing standards in Section 17.100.110.A. to D. through an adjustment or variance pursuant to Chapter 17.66.

G~~F~~. Cul-de-sacs and dead-end streets ~~are prohibited.~~ shall only be used where the Director determines that street continuation is precluded by the following:

1. Existing development.

2. Areas in the Flood and Slope Hazard (FSH) Overlay District pursuant to SDC Chapter 17.60.

3. The street continuation would connect a Local Street with an Arterial Street, as defined in the 2023 City of Sandy Transportation System Plan, Table 4.

H. Where the Director determines that a cul-de-sac or dead-end street is allowed pursuant to Section 17.100.110.G, all of the following standards shall be met:

1. The cul-de-sac shall be a minimum length of 200 feet and shall not exceed 400 feet, except where the Director through a Type II procedure determines that factors identified in Section 17.100.110(H) require a longer block length. The length of the block shall be measured along the

centerline of the street from the near side of the intersecting street to the farthest point of the cul-de-sac.

2. The cul-de-sac or dead-end street shall provide pedestrian and bicycle access to adjacent streets with installation of a pathway in accordance with the 2004 Utility Standard Details and SDC Section 17.84.30 – Pedestrian and Bicycle Requirements.

3. The cul-de-sac shall terminate with a circular or hammer-head turnaround meeting the 2022 Oregon Fire Code.

4. The cul-de-sac shall not provide access to more than 25 dwelling units.

~~F~~G. Alleys are designed to provide access to multiple dwellings in areas where lot frontages are narrow, driveway spacing requirements cannot be met, and lots abut transit streets.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.120. Blocks and accessways.

A. *Blocks.* Blocks shall provide for two tiers of lots ~~at appropriate depths~~ , and shall provide minimum intersection spacing of 150 feet. ~~However, exceptions to the block width shall be allowed for blocks that are adjacent to natural features.~~

B. Blocks in the Single Family Residential zone, Low Density Residential zone, Medium Density Residential zone, High Density Residential zone, Central Business District zone, General Commercial zone, Village Commercial zone, and Industrial Park zone fronting local streets shall not exceed 400 feet in length. In situations where slopes in excess of 12 percent, perennial streams, or wetlands preclude a block length 400 feet or less, applicants may propose a longer block length as part of a discretionary land use review, provided that the proposed block length is no greater than needed to accommodate the slope or natural resource barrier.

C. *Pedestrian and Bicycle Access Way Requirements.* In any block in a residential or commercial district over 600 feet in length, a pedestrian and bicycle accessway with a minimum improved surface of ten feet within a 15-foot right-of-way, tract, or easement shall be provided through the middle of the block. ~~To enhance public convenience and mobility, such accessways are required to connect to cul-de-sacs, or between streets and other public or semipublic lands.~~

(Ord. No. 2021-16 , § 15(Exh. N), 8-16-2021; Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.130. Easements.

A minimum eight-foot wide public utility easement shall be recorded along property lines abutting a right-of-way for all lots created by partition, replat, or subdivision. Where a partition, replat, or subdivision is traversed by an open channel watercourse, open channel drainage way, or open channel ~~or~~ stream, the land division shall provide a stormwater easement or drainage right-of-way in ~~substantial~~ alignment with the topography and channel of the watercourse at a width equivalent to the width of flow for a 25-year return interval rainfall event, plus 10 feet on each side~~necessary for water quality and quantity protection~~.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.140. Public alleys.

A. Public alleys shall have a minimum width of 20 feet. Structural section and surfacing shall conform to standards adopted by the City Council.

B. For unimproved alleys, when division of land occurs or the thresholds in Chapter 15.20 are met, the abutting lot owner shall be responsible for completion of improvements to that portion of the alley abutting the property.

C. Parking within the alley right-of-way is prohibited, except an alley with a minimum width of 28 feet is allowed to have parallel parking on one side of the alley if driveway access is limited to one side of the alley.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.150. Reserved.

Editor's note(s)—Ord. No. 2022-07 , § 9(Exh. I), adopted May 2, 2022 and Ord. No. 2022-08 , § 1(Exh. A), adopted May 2, 2022, repealed § 17.100.150, which pertained to residential shared private drives and derived from Ord. No. 2021-03 , adopted May 17, 2021.

Sec. 17.100.160. Reserved.

Editor's note(s)—Ord. No. 2022-07 , § 9(Exh. I), adopted May 2, 2022 and Ord. No. 2022-08 , § 1(Exh. A), adopted May 2, 2022, repealed § 17.100.160, which pertained to public access lanes and derived from original Code material.

Sec. 17.100.170. Flag lots.

Flag lots ~~may be created~~are permitted only where it can be shown that there is adequate lot area to divide a property into two or more lots but there is not enough street frontage to meet the minimum frontage requirement for standard lots and where creation of a street is not necessary to meet connectivity standards~~no other street access is possible to achieve the requested land division~~. The flag lot shall have a minimum street frontage of 20 feet for its accessway. The following requirements shall apply to flag lots:

A. Setbacks applicable to the underlying zoning district shall apply to the flag lot.

B. The access strip (pole) shall not be included when calculating the minimum lot size.

C. The accessway shall have a minimum paved width of ten feet.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.180. Intersections.

A. *Intersections.* Streets shall intersect at ~~right~~ angles of 75 to 105 degrees. In no circumstances shall a proposed intersection of two new streets be approved at an angle of less than 75 degrees. No more than two streets shall intersect at any one point. Intersections shall be spaced to maintain a minimum of 150 feet between the nearest edges of the two rights-of-way. Driveways located on a collector or arterial street shall maintain a minimum distance of 150 feet between the nearest edges of the driveway and a right-of-way that intersects with the collector or arterial street.

B. *Curve Radius.* All ~~local and neighborhood collector~~ streets shall have a minimum curve radius (at intersections of rights-of-way) of ~~20~~28 feet, per Oregon Fire Code standards for fire apparatus access roads.

~~When a local or neighborhood collector enters on to a collector or arterial street, the curve radius shall be a minimum of 30 feet.~~

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.190. Street and traffic control signs.

The type and location of traffic control signs, street signs, and/or traffic safety devices shall follow the Oregon Standard Details and traffic control signage size, materials, and placement shall conform to the requirements of the FHWA Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 Edition with Revision Numbers 1, 2, and 3, dated July 2022~~2019 edition or most recent revision~~.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.200. Street surfacing.

Public streets, including alleys, within a partition, replat, or subdivision shall be improved in accordance with the requirements of the Oregon Standard Specifications AASHTO Green Book or OSSC standards. All streets shall be paved with asphaltic concrete or Portland cement concrete surfacing.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.210. Street lighting.

Installation of a complete lighting system (including conduits, wiring, bases, poles, arms, and fixtures) shall be the financial responsibility of the property owner completing the partition, replat, or subdivision on all cul-de-sacs, local streets, collector streets, and arterial streets. Standards and specifications for street lighting shall conform to IESNA roadway illumination standards and the 2020 City of Sandy Streetlighting Guidelines.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.220. Lot design.

A. The lot dimensions shall comply with the minimum standards of the Development Code as specified in the underlying zoning district, with the exception of a lot created through the middle housing land division process.

B. The lot or parcel width ~~at the front building line~~ shall meet the requirements of the Development Code and shall abut a public street other than an alley for a width of at least 20 feet, with the exception of a lot created through the middle housing land division process.

C. The creation of a lot with street frontage on two parallel sides of the lot is not allowed.

D. Lots shall not take access from major arterials, minor arterials, or collector streets if access to a local street exists. When driveway access from major or minor arterials ~~may be~~is necessary for several adjoining lots, ~~the Director or the Planning Commission may require that~~ and individual driveway accesses would not meet the minimum access spacing standards in Section 17.98.80, such lots shall be served by a common access drive in order to limit traffic conflicts on such streets.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.230. Water facilities.

All water facility improvements shall comply with the 2022 City of Sandy Water System Master Plan and the 2016 Water Management and Conservation Plan. Water lines and fire hydrants serving the partition, replat, or subdivision shall connect to City mainlines and be installed to provide adequate water pressure for domestic water, sanitation, and fire safety purposes. The facilities shall be designed by a professional engineer and must be approved by the City Engineer. The materials, sizes, and locations of water mains, valves, service laterals, meter boxes, and other required appurtenances shall be in accordance with American Water Works Association and the Oregon Standard Specifications for Construction and the Oregon Health Authority Drinking Water Services section. Fire flow requirements shall be based on the Clackamas County Interagency Fire Cde Application Guide.

If the City requires the applicant to install water lines in excess of eight inches, the City may participate in the oversizing costs. Any oversizing agreements shall be approved by the City Manager based upon City Council policy and dependent on budget constraints. If required water mains will directly serve property outside the subdivision, the City may enter into an agreement with the applicant setting forth methods for reimbursement by nonparticipating landowners for the proportionate share of the cost of construction per Chapter 12.14 of the Sandy Municipal Code.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.240. Sanitary sewers.

Sanitary sewers shall be installed to serve the partition, replat, or subdivision and to connect the partition, replat, or subdivision to existing mains. Design of sanitary sewers shall take into account the capacity and grade to allow for ~~desirable~~ extension beyond the ~~subdivision~~development, in compliance with Title 13 of the Sandy Municipal Code. The facilities shall be designed by a professional engineer and must be approved by the City Engineer.

If required sewer facilities will directly serve property outside the subdivision, the City may enter into an agreement with the subdivider setting forth methods for reimbursement by nonparticipating landowners for the proportionate share of the cost of construction per Chapter 12.14 of the Sandy Municipal Code.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.250. Surface drainage and storm sewer system.

A. Drainage facilities shall be provided within the partition or subdivision that connect to off-site drainage ways or storm sewers. Design of the facilities shall meet the requirements of Title 13 of the Sandy Municipal Code and the 2020 City of Portland Stormwater Management Manual, as adopted by the City of Sandy, and shall take into account the location, capacity and grade necessary to maintain unrestricted flow from areas draining through the subdivision, and to allow extension of the system to serve such areas. The facilities shall be designed by a professional engineer and must be approved by the City Engineer.

B. In addition to normal drainage design and construction, provisions shall be taken to handle any drainage from preexisting subsurface drain tile. The applicant's engineer shall investigate the location of drain tile and its relation to public improvements and building construction.

C. The roof and site drainage from each lot shall be discharged to either curb face outlets (if minor quantity), to a public storm drain, or to a natural ~~acceptable~~ drainage way if adjacent to the lot.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.260. Underground utilities.

All subdivisions or major partitions shall include the installation of underground utilities (including electric, gas, fiber, telecommunication cable, water, and sanitary sewer). The utilities shall be installed pursuant to the requirements of the utility company.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.270. Sidewalks.

Sidewalks shall be installed on both sides of a public street. Sidewalks shall be a minimum width of five feet on local streets and a minimum width of six feet on collector and arterial streets. Sidewalks on Pioneer and Proctor Boulevards shall be installed in accordance with the dimensions and design detailed in Appendix F. Sidewalks on Pleasant Street shall be installed in compliance with the Pleasant Street Master Plan.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.280. Bicycle routes.

If ~~appropriate to~~necessary for the extension of a system of bicycle routes, existing or planned in the ~~2011~~ 2023 City of Sandy Transportation System Plan, Figure 13~~4~~, the ~~Director or the Planning Commission shall require the~~ installation of bicycle lanes within streets shall be required.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.290. Street trees.

The street tree plan shall provide street trees every 30 feet on center for all lots. In cases where driveways, streetlights, mailboxes, or other obstructions conflict with spacing street trees 30 feet on center, street trees shall be installed at a reduced spacing interval but in no case less than 15 feet on center. The street tree planting area shall meet the minimum standards specified in Section 17.92.10.D.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.300. Erosion control.

Grass seed planting shall be completed prior to September 30 of the calendar year on all lots upon which a dwelling has not been started but the ground cover has been disturbed. The seeds shall be of an annual rye grass variety and shall be sown at not less than four pounds to each 1,000 square feet of land area.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.310. Required improvements.

The following improvements shall be installed at no expense to the City, consistent with the standards of Chapter 17.84, Chapter 17.100, ~~2011~~ 2023 Transportation System Master Plan, City of Sandy Street Tree Standard Planting Detail, 2020 Sandy Transit Master Plan, 2022 Water ~~Facilities~~ System Master Plan, Sanitary Sewer Master Plan, and Oregon Standard Details.

A. Lot, street, and perimeter monumentation.

B. Mailboxes and concrete slabs for mounting the mailboxes.

C. Sanitary sewer lines, required pump stations, water distribution lines, and fire hydrants.

D. Stormwater drainage facilities, including required plantings.

E. Sidewalks, planter strips or swales or tree wells with decorative grates, ADA ramps, and truncated domes.

F. Streetlight fixtures and electrical lines for the streetlights.

G. Street name signs, traffic control devices, and traffic control signs.

H. Street trees, including required stakes, ties, and mulch.

I. Streets, including curbs and asphalt.

J. Transit benches and concrete slabs for mounting benches.

K. Underground communication lines, including broadband (fiber) for SandyNet and telecommunication lines. Franchise agreements will dictate whether telephone and cable lines are required.

L. Underground electric and natural gas.

M. Erosion control measures for all areas without improvements or landscaping.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.320. Improvement procedures.

Improvements installed by an applicant dividing land either as a requirement of these regulations or at their own option shall conform to the standards of Chapter 17.84 and improvement standards and specifications adopted by the City. Improvements shall be installed in accordance with the following general procedure:

~~A. Improvement work shall not start until plans have been checked for adequacy and approved by the City Engineer. To the extent necessary for evaluation of the proposal, improvement plans may be required before approval of the tentative plan of a partition or subdivision.~~

A~~B~~. Improvement work shall not start until after the City is notified. If work is discontinued for any reason it shall not resume until the City is notified.

B~~C~~. Improvements shall be constructed under the inspection and to the satisfaction of the City Engineer.

C~~D~~. All improvements installed by the applicant shall be guaranteed for a period of two years following acceptance by the City Engineer. Such guarantee shall be secured by cash deposit in the amount of ten percent of the value of the improvements as approved by the City Engineer.

D~~E~~. As-constructed plans in both digital and hard copy formats shall be filed with the City Engineer upon completion of the improvements.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.330. Options for improvements.

Before the signature of the City Engineer is obtained on the final partition or subdivision plat, the applicant shall install the required improvements, agree to install required improvements, or have gained approval to form an improvement district for installation of the improvements required with the tentative plat approval. These procedures are more fully described as follows:

A. *Install Improvements.* The applicant may install the required improvements for the partition or subdivision prior to recording the final partition or subdivision plat. If this procedure is to be used, the partition or subdivision plat shall contain all the required certifications except the County Surveyor. The City shall keep the partition or subdivision plat until the improvements have been completed and approved by the City Engineer. Upon City Engineer's approval, the City shall forward the final partition or subdivision plat for certification by the County Surveyor and then to the County Clerk for recording; or

B. *Agree to Install Improvement.* The applicant may execute and file with the City an agreement specifying the period within which required improvements shall be completed. The agreement shall state that if the work is not completed within the period specified, the City may complete the work and recover the full cost and expense from the applicant. A performance bond equal to 110 percent of the value of the guaranteed improvements shall be required. Performance bonds shall be issued by a surety registered to do business in Oregon. The value of the guaranteed improvements may include engineering, construction management, legal, and other related expenses necessary to complete the work. The agreement may provide for the construction of the improvements in increments and for an extension of time under specified conditions; or

C. *Form Improvement District.* The applicant may have all or part of the public improvements constructed under an improvement district procedure. Under this procedure the applicant shall enter into an agreement with the City proposing establishment of the district for improvements to be constructed, setting forth a schedule for installing improvements, and specifying the extent of the plat to be improved. The City reserves the right under the improvement district procedure to limit the extent of improvements in a partition or subdivision during a construction year and may limit the area of the final partition or subdivision plat to the area to be improved. The performance bond described in Subsection B. above shall be required under the improvement district procedure. The formation of a Local Improvement District (LID) is entirely at the discretion of the City Council.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

Sec. 17.100.340. Performance guarantee.

If the applicant chooses to utilize the options for improvements provided under Subsection 17.100.330.B. or C. above, the applicant shall provide a performance guarantee equal to 110 percent of the cost of the improvements to assure full and faithful performance thereof, in one of the following forms:

A. A surety bond executed by a surety company authorized to transact business in the state of Oregon in a form approved by the City Attorney.

B. In lieu of the surety bond, the applicant may:

1. Deposit with the City cash money to be released only upon authorization of the City Engineer and Director;

2. Supply certification by a bank or other reputable lending institution that an irrevocable letter of credit in compliance with the International Chamber of Commerce Uniform Customs and Practice for Documentary Credits, UCP 600 or most current revision has been established to cover the cost of required improvements, to be released only upon authorization of the City Engineer and Director. The amount of the letter of credit shall equal 110 percent of the value of the improvements to be guaranteed; or

C. Such assurance of full and faithful performance shall be for a sum determined by the City Engineer as sufficient to cover the cost of required improvements, including related engineering and incidental expenses.

D. If the applicant fails to construct one or more of the guaranteed public improvements and the City has expenses resulting from such failure, the City shall call on the performance guarantee for reimbursement. If the amount of the performance guarantee exceeds the expense incurred, the remainder shall be released. If the amount of the performance guarantee is less than the amounts of expense incurred by the City, the applicant shall be liable to the City for the excess costs. If the applicant fails to reimburse the City for expenses incurred to complete the public improvements, the City shall place a lien on the property in an amount equal to the City's costs.

(Ord. No. 2022-07 , § 9(Exh. I), 5-2-2022; Ord. No. 2022-08 , § 1(Exh. A), 5-2-2022)

CHAPTER 17.102 URBAN FORESTRY[27]

Sec. 17.102.00. Intent.

A. This chapter is intended to conserve and replenish the ecological, aesthetic and economic benefits of urban forests, by regulating tree removal on properties greater than one acre within the Sandy Urban Growth Boundary.

B. This chapter is intended to facilitate planned urban development as prescribed by the Sandy Comprehensive Plan, through the appropriate location of harvest areas, landing and yarding areas, roads and drainage facilities.

C. This chapter shall be construed in a manner consistent with Chapter 17.60 Flood and Slope Hazard Overlay District. In cases of conflict, Chapter 17.60 shall prevail.

Sec. 17.102.10. Definitions.

Technical terms used in this chapter are defined below. See also Chapter 17.10, Definitions.

Urban Forestry Related Definitions:

• *Diameter at breast height (DBH):* The diameter of a tree inclusive of the bark measured four and one-half feet above the ground on the uphill side of a tree.

• *Hazard tree:* A tree located within required setback areas or a tree required to be retained as defined in 17.102.50 that is cracked, split, leaning, or physically damaged to the degree that it is likely to fall and injure persons or property. Hazard trees include diseased trees, meaning those trees with a disease of a nature that, without reasonable treatment or pruning, is likely to spread to adjacent trees and cause such adjacent trees to become diseased or hazard trees.

• *Protected setback areas:* Setback areas regulated by the Flood and Slope Hazard Ordinance (FSH), Chapter 17.60 and 8~~7~~0 feet from top of bank of Tickle Creek and 50 feet from top of bank of other perennial streams outside the city limits, within the urban growth boundary.

• *Tree:* For the purposes of this chapter, tree means any living, standing, woody plant having a trunk 11 inches DBH or greater.

• *Tree protection area:* The area reserved around a tree or group of trees in which no grading, access, stockpiling or other construction activity shall occur.

• *Tree removal:* Tree removal means to cut down a tree, 11 inches DBH or greater, or remove 50 percent or more of the crown, trunk, or root system of a tree; or to damage a tree so as to cause the tree to decline and/or die. Tree removal includes topping but does not include normal trimming or pruning of trees in compliance with ANSI A300 pruning standards.

[27]Editor's note(s)—Pre-republication, this chapter was adopted by Ord. No. 2002-10 on November 18, 2002. Any amendments occurring post-republication have a history note in parenthesis at the bottom of the amended section.

Sec. 17.102.20. Applicability.

This chapter applies only to properties within the Sandy Urban Growth Boundary that are greater than one acre including contiguous parcels under the same ownership.

A. *General:* No person shall cut, harvest, or remove trees 11 inches DBH or greater without first obtaining a permit and demonstrating compliance with this chapter.

1. As a condition of permit issuance, the applicant shall agree to implement required provisions of this chapter and to allow all inspections to be conducted.

2. Tree removal is subject to the provisions of Chapter 15.44, Erosion Control, Chapter 17.56, Hillside Development, and Chapter 17.60 Flood and Slope Hazard.

B. *Exceptions:* The following tree removals are exempt from the requirements of this chapter.

1. Tree removal as required by the ~~c~~City or public utility for the installation or maintenance or repair of public roads, public utilities, public structures, or other public infrastructure~~s~~, or tree removal from City-owned parks and natural areas as required by the City for the installation or maintenance of trails identified in the 2022 Parks and Trails Master Plan or for maintenance or improved safety of public parks. In these circumstances, the replanting requirements of Section 17.102.60 shall still apply.

2. ~~Tree r~~Removal of hazard trees, as defined in Section 17.102.10, necessary to prevent an imminent threat to public health or safety, or prevent imminent threat to public or private property, or prevent an imminent threat of serious environmental degradation. In these circumstances, a Type I tree removal permit shall be applied for within seven days following the date of tree removal.

Sec. 17.102.30. Procedures and application requirements.

A person who desires to remove trees shall first apply for and receive one of the following tree cutting permits before tree removal occurs:

A. *Type I Permit.* The following applications shall be reviewed under a Type I procedure:

1. Tree removal on sites within the city limits under contiguous ownership where 50 or fewer trees are requested to be removed and the subject site is in compliance with the tree retention requirements of Section 17.102.50.A.

2. Removal of a hazard tree or trees that presents an immediate danger of collapse and represents a clear and present danger to persons or property as defined by an ISA certified arborist or professional forester with the tree risk assessment qualification (TRAQ).

3. Removal of up to two trees per year, six inches DBH or greater within the FSH Overlay District as shown on the City Zoning Map and described in Chapter 17.60.

4. Tree removal on sites outside the city limits and within the urban growth boundary and outside protected setback areas.

5. Removal of up to two trees per year outside the city limits within the UGB and within protected setback areas.

B. An application for a Type I Tree Removal permit shall be made upon forms prescribed by the City to contain the following information:

1. Two copies of a scaled site plan to contain the following information:

a. Dimensions of the property and parcel boundaries.

b. Location, size (DBH), condition/health, and species of trees 11 inches DBH or greater (6-inches DBH or greater in FSH Overlay District) to be retained.

c. Location and type of tree protection measures to be installed.

2. A brief narrative describing the ~~project~~work to be performed.

3. Estimated starting and ending dates for tree removal.

4. A scaled re-planting plan indicating ground cover type, species of trees to be planted, and general location of re-planting.

5. An application for removal of a hazard tree within a protected setback area or a tree required to be retained as defined in ~~Chapter~~ Section 17.102.50 shall also contain a report from an ISA certified arborist or professional forester with the tree risk assessment qualification (TRAQ) indicating that the condition or location of the tree presents a hazard or danger to persons or property and that such hazard or danger cannot reasonably be alleviated by treatment or pruning.

C. *Type II Permit.* The following applications shall be reviewed under a Type II procedure:

1. Tree removal on sites under contiguous ownership where greater than 50 trees are requested to be removed as further described below:

a. Within City Limits: outside of FSH Restricted Development Areas as defined in Chapter 17.60.

D. An application for a Type II Permit shall contain the same information as required for a Type I permit above in addition to the following:

a. A list of property owners on mailing labels ~~within 200 feet of the subject property~~), as required for Type II applications in Chapter 17.22.

b. An arborist report prepared by an ISA-certified arborist with TRAQ. ~~A written narrative addressing permit review criteria in 17.102.40.~~

E. *Type III Permit.* The following applications shall be reviewed under a Type III procedure:

1. Request for a variance to tree retention requirements as specified in Section 17.102.50 may be permitted subject to the provisions of Section 17.102.70.

F. An application for a Type III Permit shall contain the same information as required for a Type I permit in addition to the following:

1. A list of property owners on mailing labels ~~within 300 feet of the subject property~~, as required for Type III applications in Chapter 17.22.

2. A written narrative addressing applicable code S~~s~~ections 17.102.50, 17.102.60, and 17.102.70, and an arborist report prepared by an ISA-certified arborist with TRAQ.

Sec. 17.102.40. Permit review.

An application for a Type II or III tree removal permit shall demonstrate that the provisions of ~~Chapter~~ Section 17.102.50 are satisfied. The Planning Director may require a report from a certified arborist or professional forester to substantiate the criteria for a permit.

A. The Director shall be responsible for interpreting the provisions of this chapter. The Director may consult with the Oregon Department of Forestry in interpreting applicable provisions of the Oregon

Forest Practices Act (OAR Chapter 629). Copies of all forestry operation permit applications will be sent to the Oregon Department of Forestry and Department of Revenue. The City may request comments from the Oregon Department of Forestry, the Oregon Department of Fish and Wildlife or other affected state agencies.

B. *Expiration of Tree Removal Permits.* Tree removal permits shall remain valid for a period of one year from the date of issuance or date of final decision by a hearing body, if applicable. A 30-day extension shall be automatically granted by the Planning Director if requested in writing before the expiration of the permit. Permits that have lapsed are void.

Sec. 17.102.50. Tree retention and protection requirements.

A. *Tree Retention.* The landowner is responsible for retention and protection of trees required to be retained as specified below:

1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership, except in the Bornstedt Village Overlay (BVO) in accordance with Section 17.54.140.
2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.
3. Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest, as determined by an arborist certified by the International Society of Arboriculture with Tree Risk Assessment Qualification (ISA TRAQ). Retention trees shall not be nuisance species as listed in the Portland Plant List.
4. ~~If possible,~~Provided they meet the other requirements in this section, at least two of the required trees per acre must be of conifer species.
5. Trees within the required protected setback areas, as defined in Section 17.102.10, may be counted towards the tree retention standard if they meet these requirements.

B. *Tree Protection Area.* ~~Except as otherwise determined by the Planning Director, a~~All tree protection measures set forth in this section shall be instituted prior to any development activities and removed only after completion of all construction activity, unless these requirements are waived by the Director. Tree protection measures are required for land disturbing activities including but not limited to tree removal, clearing, grading, excavation, or demolition work.

1. Trees identified for retention shall be marked with yellow flagging tape and protected by protective barrier fencing placed no less than ten horizontal feet from the outside edge of the trunk.
2. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade.
3. No construction activity shall occur within the tree protection zone, including, but not limited to dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles.

C. *Inspection.* The applicant shall not proceed with any tree removal or construction activity, except erosion control measures, until the City has inspected and approved the installation of tree protection measures. ~~Within 15 days of the date of accepting an application for a Type I permit, the city shall complete an onsite inspection of proposed activities and issue or deny the permit. Within 15 days of is suing a Type II or Type III permit, the city shall complete an onsite inspection of proposed activities.~~

For ongoing forest operations, the permit holder shall notify the city by phone or in writing 24 hours prior to subsequent tree removal. The city may conduct an onsite re-inspection of permit conditions at this time.

Sec. 17.102.60. Tree replanting requirements.

A. All areas with exposed soils resulting from tree removal shall be replanted with a ground cover of native species listed in the City of Portland Plant List within 30 days of harvest during the active growing season, or by June 1 of the following spring.

B. All areas with exposed soils resulting from tree removal occurring between October 1 and March 31 shall also be covered with straw to minimize erosion.

C. Removal of hazard trees as defined shall be replanted with two native trees listed in the City of Portland Plant List and meeting the standards in Section 17.92.50.~~of quality nursery stock~~ for every tree removed.

D. Tree Removal allowed within the FSH Overlay District shall be replanted with two native trees listed in the City of Portland Plant List and meeting the standards in Section 17.92.50. ~~of quality nursery stock~~ for every tree removed.

E. Tree Removal not associated with a development plan must be replanted following the provisions of OAR Chapter 629, Division 610, Section 020-060

Sec. 17.102.70. Variances.

Under a Type III review process, the Planning Commission may allow newly-planted trees to substitute for retained trees if:

A. The substitution is at a ratio of at least two-to-one (i.e., at least two native quality nursery grown trees will be planted for every protected tree that is removed); and

B. The substitution more nearly meets the intent of this chapter due to:

1. The location of the existing and proposed new trees, or

2. The physical condition of the existing trees or their compatibility with the existing soil and climate conditions; or

3. An undue hardship of creating a development below the minimum density requirement is caused by the requirement for retention of existing trees.

4. Tree removal is necessary to protect a designated public scenic view corridor.

Sec. 17.102.80. Enforcement.

The provisions of Chapter 17.06, Enforcement, shall apply to tree removal that is not in conformance with this chapter. Each unauthorized tree removal shall be considered a separate offense for purposes of assigning penalties under Section 17.06.80. At least 50 percent of f~~F~~unds generated as a result of enforcement of this chapter shall be dedicated to the Urban Forestry Fund established under Section 17.102.100, below, with the remaining 50 percent dedicated to the administrative costs associated with overseeing the fine.

~~Sec. 17.102.90. Applicability of the Oregon Forest Practices Act.~~

~~The following provisions of the Oregon Forest Practices Act (OAR Chapter 629) are adopted by reference for consideration by the City in the review of Forest Operations Plans. Although the Director may seek advice from the Department of Forestry, the Director shall be responsible for interpreting the following provisions:~~

~~*Division 610—Reforestation Stocking Standards.* Where reforestation is required, the provisions of OAR Chapter 629, Division 610, Section 020-060 shall be considered by the Director, in addition to the requirements of Section 17.102.60.~~

~~*Division 615—Treatment of Slash.* Slash shall not be placed within the protected setback areas. Otherwise, the Director shall consider the provisions of OAR Chapter 629, Division 615 in determining how to dispose of slash.~~

~~*Division 620—Chemical and Other Petroleum Products Rules.* The storage, transferring, cleaning of tanks and mixing of chemicals and petroleum products shall occur outside the protected setback areas. Aerial spraying shall not be permitted within the Urban Growth Boundary. Otherwise, the provisions of Chapter 629, Division 620 shall apply.~~

~~*Division 625—Road Construction and Maintenance.* Forest roads, bridges and culverts shall not be constructed within the protected setback areas, except where permitted within the FSH overlay area as part of an approved urban development. Otherwise, the Director shall consider the provisions of OAR Chapter 629, Division 625 in the review of road, bridge and culvert construction.~~

~~*Division 630—Harvesting.* Forest harvesting operations, including but not limited to skidding and yarding practices, construction of landings, construction of drainage systems, treatment of waste materials, storage and removal of slash, yarding and stream crossings, shall not be permitted within protected setback areas. Otherwise, the provisions of Chapter 629, Division 630 shall apply.~~

CHAPTER 15.30 DARK SKY ORDINANCE

Sec. 15.30.000. Purpose.

The purpose of the Sandy Dark Sky Ordinance is to regulate outdoor lighting in order to reduce or prevent light pollution. This means to the extent reasonably possible the reduction or prevention of glare and light trespass, the conservation of energy, and promotion of safety and security.

(Ord. No. 02, 2011)

Sec. 15.30.010. Definitions.

The "IES" (Illuminating Engineering Society of North America) Lighting Handbook, most recent edition, the City of Sandy Development Code, and Building Code, shall be used for the definition of terms used in this chapter but not defined herein. In the case where a definition of a term of this chapter is found to be in conflict with a definition of a term of any other ordinance, "IES" handbook or regulation, the more restrictive definition will apply.

Area light: Light that produces over 2050 lumens (See Table 2 for Light Output of Various Lamps). Area lights include, but are not limited to, street lights, parking lot lights and yard lights.

Automatic timing device: A device that automatically controls the operation of a light fixture or fixtures, circuit or circuits. Photocells and light and or motion sensors shall be considered automatic-timing devices

Average foot-candle: The level of light measured at an average point of illumination between the brightest and darkest areas. The measurement can be made at the ground surface or at four to five feet above the ground.

Bulb: The source of electric light. To be distinguished from the whole assembly (See Luminaire).

Candela (cd): Unit of luminous intensity.

Canopy light: A light fixture integrated into a projecting structure providing weather protection along a building façade (canopy).

Director: The Development Services Director for the City of Sandy.

~~*Eighty-five degree full cut-off type fixtures:* Fixtures that do not allow light to escape above an 85-degree angle measured from a vertical line from the center of the lamp extended to the ground.~~

Exterior lighting: Temporary or permanent lighting that is installed, located or used in such a manner to cause light rays to shine outside. Fixtures that are installed indoors that are intended to light something outside are considered exterior lighting for the intent of this chapter.

Fixture: The assembly that holds the lamp in a lighting system. It includes the elements designed to give light output control, such as a reflector (mirror) or refractor (lens), the ballast, housing, and the attachment parts.

Flood light: Light that produces up to 1800 lumens (See Table 2~~Addendum 1~~ for Light Output of Various Lamps) and is designed to "flood" a well-defined area with light. Generally, floodlights produce from 1000 to 1800 lumens.

Foot-candle: Illuminance produced on a surface one foot from a uniform point source of one candela. Measured by a light meter.

Full cutoff fixture: A fixture which, as installed, gives no emission of light above a horizontal plane.

Glare: Intense light that results in discomfort and/or a reduction of visual performance and visibility.

Holiday lighting: Festoon type lights, limited to small individual bulbs on a string, where the output per bulb is no greater than 15 lumens~~.~~; and laser light displays directed at a building or landscaping.

IESNA Illuminating Engineering Society of North America (IES or IESNA): The professional society of lighting engineers, including those from manufacturing companies, and others professionally involved in lighting.

Illuminance: Density of luminous flux incident on a surface. Unit is foot-candle or lux. Illuminating devices:

A. *Light fixture types.*

1. *Full cutoff fixture types.* A fixture which, as installed, gives no emission of light above a horizontal plane.

2. *Floodlights and Spotlights.* Fixtures ~~defined as having~~ that incorporate a reflector or a refractor to concentrate the light output into a directed beam in a particular direction and that have a full beam width or beam spread of less than 110 degrees (see definition for "flood light").

B. *Lamp types.*

1. *Incandescent lamps.* Lamps which produce light via an electrically heated metallic filament.

2. *Fluorescent lamps.* Lamps that use fluorescence of a phosphor to produce visible light.

3. *High Intensity Discharge Lamps.* Lamps, which produce visible light directly by the electrical heating or excitation of a gas. Examples of such lighting include, but are not limited to, Metal Halide, High Pressure Sodium, Low Pressure Sodium and Mercury Vapor. For purposes of this chapter, fluorescent lights are not considered HID lighting.

4. *Light-emitting diode (LED) lamps*. Lamps that produce light by applying electrical current to semiconductor diodes.

Lamp or *bulb:* The light-producing source installed in the socket portion of a luminaire.

Light pollution: Any adverse effect of manmade light including, but not limited to, light trespass, up lighting, the uncomfortable distraction to the eye, or any manmade light that diminishes the ability to view the night sky. Often used to denote urban sky glow.

Light trespass: Light emitted by a luminaire that falls where it is not wanted or needed or shines beyond the property on which the luminaire is installed.

Lighting: Any or all parts of a luminaire that function to produce light.

Lumen: Unit of luminous flux; the flux emitted within a unit solid angle by a point source with a uniform luminous intensity of one candela. One foot-candle is one lumen per square foot. One lux is one lumen per square meter.

Luminaire: The complete lighting unit, including the lamp, the fixture, and other parts.

Luminance: At a point and in a given direction, the luminous intensity in the given direction produced by an element of the surface surrounding the point divided by the area of the projection of the element on a plane perpendicular to the given direction. Units: candelas per unit area. The luminance is the perceived brightness that we see, the visual effect of the illuminance, reflected, emitted or transmitted from a surface.

Measurement:

A. *Lamp output.*

1. *Total output.* Measurement of total output is in lumens. This ~~should~~ shall be understood to be the initial lumen value for the lamp.

2. *Illuminance.* Measurements of illuminance are expressed in initial lumens per square foot. (A desktop illuminance of 20 initial lumens per square foot is adequate for most purposes.)

In measuring illuminance, the light detector ~~should~~ shall be pointed directly at the light source or sources. The intervening light path ~~should~~ shall be free of obstruction.

Outdoor light fixture: An outdoor illuminating device, outdoor lighting or reflective surface, luminous tube, lamp or similar device, permanently installed or portable, used for illumination, decoration, or advertisement. Such devices shall include, but are not limited to lights used for:

A. Parking lot lighting;

B. Roadway lighting;

C. Buildings and structures;

D. Recreational areas;

E. Landscape lighting;

F. Billboards and other signs (advertising or other);

G. Product display area lighting;

H. Building or structure decoration;

I. Building overhangs and open canopies.

Recessed: When a light fixture is built into a structure or portion of a structure such that the light emitted from the fixture is fully cut-off and no part of the ~~light~~ bulb extends or protrudes beyond the underside of a structure or portion of a structure.

Partially shielded: The bulb of the fixture is shielded by a translucent siding and the bulb is not visible at all. Light may be emitted at the horizontal level of the bulb.

Shielded: When the light emitted from the fixture is projected below a horizontal plane running through the lowest point of the fixture where light is emitted. The bulb is not visible with a shielded light fixture, and no light is emitted from the sides of the fixture. Also considered a full cut-off fixture.

~~*Spotlight* or *floodlight:* Any lamp that incorporates a reflector or a refractor to concentrate the light output into a directed beam in a particular direction (see definition for floodlight).~~

Temporary lighting: Lighting that is intended to be used for a special event for seven days or less.

Up lighting: Lighting that is directed in such a manner as to shine light rays above the horizontal plane.

(Ord. No. 02, 2011)

Sec. 15.30.020. Scope and applicability.

A. *New Lighting.* All exterior outdoor lighting installed after the effective date of this Chapter in any and all zones in the City shall conform with the requirements established by this Chapter and Title 17 of the Sandy Municipal Code ~~and other applicable ordinances~~ unless otherwise exempted. This chapter does not apply to indoor lighting.

B. *Existing Lighting.* All existing lighting located on a subject property that is part of a land use application or building permit, dependent on the value of the project, shall be brought into conformance with this chapter.

The value of the project will be determined in accordance with ~~Chapter~~ Sections 15.20.040 and 15.20.050 of the Sandy Municipal Code. If the value exceeds the threshold in ~~Chapter~~ Sections 15.20.020 and 15.20.030, all lighting on the property must be brought into full compliance before reoccupation or reuse.

C. *Nonconforming Uses or Structures.*

1. If a nonconforming use or structure has been abandoned for more than 12 months all lighting on the property must be brought into full compliance before reoccupation or reuse.

2. Conformity shall occur prior to issuance of Certificate of Occupancy, Final Inspection, or Final Plat Recordation, when applicable. For other permits, the applicant shall have a maximum of 30 days from date of permit issuance to bring the lighting into conformance.

D. Preferred Source Low-pressure Sodium (LPS) lamps and LED lamps in the 3000K color range are the preferred illumination source throughout the city and their use is encouraged.

E. When an existing fixture is replaced, the replacement fixture shall meet the requirements of this chapter.

F. Architectural design, site planning, landscaping and lighting may be further restricted elsewhere in the Sandy Municipal Code.

~~All governmental agencies, federal, state or county, which operate within the city limits of Sandy should experience no difficulty meeting the requirements of this chapter and are encouraged by the city to comply with its provisions.~~

G. In the event of a conflict with any other chapter of the Sandy Municipal Code, the more stringent requirement shall apply.

(Ord. No. 02, 2011)

Sec. 15.30.030. Exemptions and exceptions.

The following are exempt from the requirements of this chapter:

A. Residential fixtures consisting of lamp types of 2050 lumens and below (the acceptability of a particular light is decided by its lumen output, not wattage. Check manufacturer's specifications). Examples include:

100 Watt Standard Incandescent and less.

100 Watt Midbreak Tungsten-Halogen (quartz) and less.

25 Watt T-12 Cool White Fluorescent and less.

18 Watt Low Pressure Sodium and less.

B. Federally funded and state funded roadway construction projects~~,~~ are exempted from the requirements of this ~~division~~ chapter only to the extent it is necessary to comply with federal and state requirements.

~~C. *Fossil Fuel Light.* Fossil fuel light produced directly or indirectly by the combustion of natural gas or other utility-type fossil fuels is exempt from the provisions of this article.~~

C~~D~~. Full cutoff street lighting, which is part of a federal, state, or municipal installation.

D~~E~~. Holiday lighting, except for laser light displays prohibited under Section 15.30.070.

E~~F~~. Lighting of sports facilities or stadiums prior to 11:00 p.m. Illumination after 11:00 p.m. is also permitted if it is necessary in order to conclude a recreational, sporting or other scheduled activity, which is in progress prior to that time.

F~~G~~. Specialized lighting necessary for safety, such as navigated or runway lighting of airports, or temporary lighting associated with emergency operations, road hazard warnings, etc.

G~~H~~. Traffic control signals and devices.

(Ord. No. 02, 2011)

Sec. 15.30.040. Approved materials and methods of installation.

The provisions of this chapter are not intended to prevent the use of any design, material or method of installation or operation not specifically prohibited by this chapter, provided such alternative design, material or method conforms with the intent of this division and has been approved by the ~~building official~~Director.

The ~~Building Official administrator~~Director may approve an alternative design provided ~~he~~ they find~~s~~ that:

A. It complies with the applicable specific requirements of this division; or

B. It has been designed or approved by a registered professional engineer and complies with the purpose of this ~~division~~chapter.

(Ord. No. 02, 2011)

Sec. 15.30.050. Submittals.

All applications for building permits or land use planning review which include installation of outdoor lighting fixtures shall include lighting plans conforming to the provisions of this chapter. The ~~Planning~~ Director and/or Building Official shall have the authority to request additional information in order to achieve the purposes of this chapter, provided such requests are communicated at the pre-application conference or prior to the application being deemed complete.

A. The submittal shall contain the following information and submitted as part of the site plan to the Planning and Building ~~departments~~ Divisions for approval.

1. Plans indicating the location, type, intensity, and height of luminair~~i~~es including both building and ground-mounted fixtures;

2. A description of the luminair~~i~~es, including lamps, poles or other supports and shielding devices, which may be provided as catalogue illustrations from the manufacturer;

3. Photometric data, such as that furnished by the manufacturer, showing the angle of light emission and the foot-candles on the ground; and

4. Additional information as may be required by the ~~c~~City in order to determine compliance with this chapter.

B. Applications for single/multi-family residential or other projects where any single outdoor light fixture exceeds (2050 lumens output) shall be required to comply with ~~paragraph~~ Section 15.30.050 A. above.

(Ord. No. 02, 2011)

Sec. 15.30.060. General standards.

The following general standards shall apply to all outdoor lighting installed after the effective date of this chapter, unless exempt pursuant to Section 15.30.030~~which is not exempted above~~:

A. *Area Lights:* All area lights, including streetlights and parking area lighting, shall be downward-facing, full cut-off fixtures ~~and are encouraged to be 85 degree full cut-off type fixtures~~. Streetlights shall be LED, high-pressure sodium, low-pressure sodium, or metal halide, unless the applicant requests another lamp type and the Director ~~otherwise~~ determines~~d by the city that another type~~ it is more efficient. Streetlights along residential streets shall be limited to a 70-watt high-pressure sodium (hps) light. Streetlights along nonresidential streets or at intersections shall be limited to 100 watts hps, except that lights at major intersections on state highways shall be limited to 200 watts hps. If the city permits a light type other than high-pressure sodium, then the equivalent output shall be the limit for the other light type.

B. *Canopy Lights:* All lighting shall be recessed sufficiently so as to ensure that no light source is visible from ~~or causes glare on~~ public rights-of-way or adjacent property and that the limits in Subsection D, below, are not exceeded.

C. *Illumination Levels:* Illumination levels and uniformity shall be in accordance with current recommended practices of the Illuminating Engineering Society, as provided in the IES Lighting Applications Standards Collection. Recommended standards of the illuminating engineering society shall not be exceeded.

D. All outdoor lighting systems shall be designed and operated so that the area ten feet beyond the property line of the premises receives no more than one-quarter of a foot-candle of light from the premises lighting system.

E. *Temporary Lighting:* Temporary lighting that conforms to the requirements of this chapter shall be allowed. Nonconforming temporary exterior lighting may be permitted by the Building Official only after considering 1) the public and/or private benefits which will result from the temporary lighting; 2) any annoyance or safety problems that may result from the use of the temporary lighting; and 3) the duration of the temporary nonconforming lighting. The applicant shall submit a detailed description of the proposed temporary nonconforming lighting to the Building Official.

F. *Towers:* All radio, communication, and navigation towers that require lights shall have dual lighting capabilities. For daytime, the white strobe light may be used, and for nighttime, only red lights shall be used.

(Ord. No. 02, 2011)

Sec. 15.30.070. Non-permitted lighting.

A. Newly installed fixtures, which are not downward-facing, full-cutoff fixtures.

B. Lighting for non-residential uses which presents a clear hazard to motorists, cyclists, or pedestrians; or lighting for residential uses which does not meet all the applicable standards of this chapter.

C. Lighting with a color temperature that exceeds 4,125 Kelvins (4125K).

D~~C~~. *Laser Source Light.* The use of laser source light or any similar high intensity light for outdoor advertising or entertainment is prohibited.

E. Holiday laser light displays that pose safety risks to people, vehicles, or aircraft, or create a nuisance to neighboring properties are prohibited.

(Ord. No. 02, 2011)

Sec. 15.30.080. Appeals.

If an application is denied, an individual shall have the right of appeal to the City Council. The fee for an appeal shall be the same as a Type III City Council Appeal fee, based on the City of Sandy Master Fee Schedule~~review (Section 2—Master Fee Resolution)~~.

(Ord. No. 02, 2011)

Sec. 15.30.090. Violations.

This section may be enforced on the basis of a formal complaint filed in writing with the ~~c~~City.

(Ord. No. 02, 2011)

Sec. 15.30.100. Penalties.

See Section 1.16.010 of the Sandy Municipal Code.

(Ord. No. 02, 2011)

Sec. 15.30.110. Severability.

The provisions of this chapter are severable and if any paragraph, section, subsection, or part of this chapter is held to be invalid, unenforceable, unconstitutional, or inapplicable to any person or circumstance, such illegality, invalidity, unconstitutionality, or inapplicability shall not affect or impair the remainder of this chapter.

Sec. 15.30.120. Shielding.

All outdoor light fixtures shall have shielding as set forth in Table 1.

Table 1: Code Requirements Tables for Shielding

	Wattage								
Lamp Type	25	30	35	40	50	60	75	100	110 or More
LED	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield
Low Pressure Sodium	Unshielded	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed
High Pressure Sodium	Unshielded	Unshielded	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield
Metal Halide	Unshielded	Unshielded	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield
Fluorescent	Unshielded	Unshielded	Unshielded	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield	Directed Shield
Quartz	Unshielded	Unshielded	Unshielded	Unshielded	Unshielded	Directed Shield	Directed Shield	Directed Shield	Directed Shield
Tungsten Halogen	Unshielded	Unshielded	Unshielded	Unshielded	Unshielded	Directed Shield	Directed Shield	Directed Shield	Directed Shield
Mercury Vapor	Unshielded	Unshielded	Unshielded	Unshielded	Unshielded	Directed Shield	Directed Shield	Directed Shield	Directed Shield
Incandescent	Unshielded	Unshielded	Unshielded	Unshielded	Unshielded	Unshielded	Unshielded	Unshielded	~~Unshielded~~ Directed Shield

A. For the purpose of this section wattage ratings for lamp types will be for either a single lamp source or multiple lamp sources when installed in a cluster.

B. Lamp types not listed in the table may be approved for use by the ~~building official~~Director provided~~ing~~ installation of these lamps conforms to the lumen limits established in this section.

C. Glass tubes filled with argon, neon or krypton do not require shielding.

Table 2: Typical Lumen Values for Various Lamp Wattage

Wattage	Low Pressure Sodium	High Pressure Sodium	Metal Halide	Fluorescent	Quartz	Mercury Vapor	Incandescent	LED
9				600				800
18	1,800							1,600

35	4,725	2,250						3,200
40		4,000		2,250			480	3,600
50	7,925							4,500
60							870	5,400
70		5,800	5,500					6,300
75						2,800	1,190	6,750
90	14,400							8,100
100		9,500	8,000			4,300	1,750	9,000
110				6,600				9,900
150		16,000					2,850	13,500
175			14,000			8,600		15,750
200		22,000					4,010	18,000
250		27,500	20,500			12,100		22,500
300							6,360	27,000
400		50,000	36,000			22,500		36,000
500							10,850	45,000

Taken from data supplied by Portland General Electric—Energy Resource Center

(Ord. No. 02, 2011)

Sandy Clear and Objective Code Audit

City Council Worksession

June 20, 2023

Purpose of the Council Worksession

- Project background / purpose
- Status update on the project – what's been accomplished
- High level overview of the Public Review Draft and key issues/decision points
- Next steps

Project Background / Purpose

Sandy Clear and Objective Code Audit

Project Purpose

- Ensure that the City of Sandy's Development Code is consistent with Oregon state laws and legislation, primarily Oregon State statute (ORS 197.307).
- ORS 197.307 requires that local governments adopt and apply **only clear and objective standards, conditions and procedures** for the development of housing.
- Some exceptions for historic districts.
- Regulations also must not discourage needed housing through **unreasonable cost or delay**.

ORS 197.307(4)
Except as provided in subsection (6) of this section, a local government may adopt and apply only clear and objective standards, conditions and procedures regulating the development of housing, including needed housing. The standards, conditions and procedures:
(a) May include, but are not limited to, one or more provisions regulating the density or height of a development.
(b) May not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay.

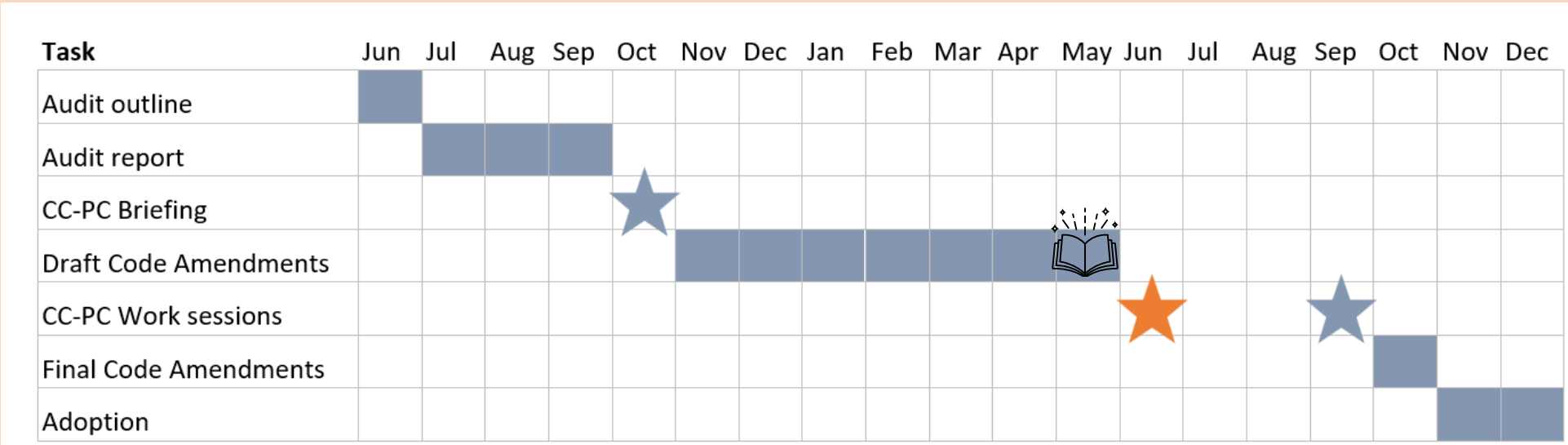
Other Proposed Amendments

- Changes to comply with new State laws:
  - Oregon House Bill 2583 (2021)
  - Senate Bill 8 (2021)
  - House Bill 2008 (2021)
  - House Bill 4064 (2022)
- Dark Sky Ordinance updates
- Exception to tree removal permits for parks maintenance
- Transportation System Plan (TSP) implementation
- Food and beverage cart updates

Project Status

Sandy Clear and Objective Code Audit

Project Schedule



Overview and Key Issues

Sandy Clear and Objective Code Audit

Overview

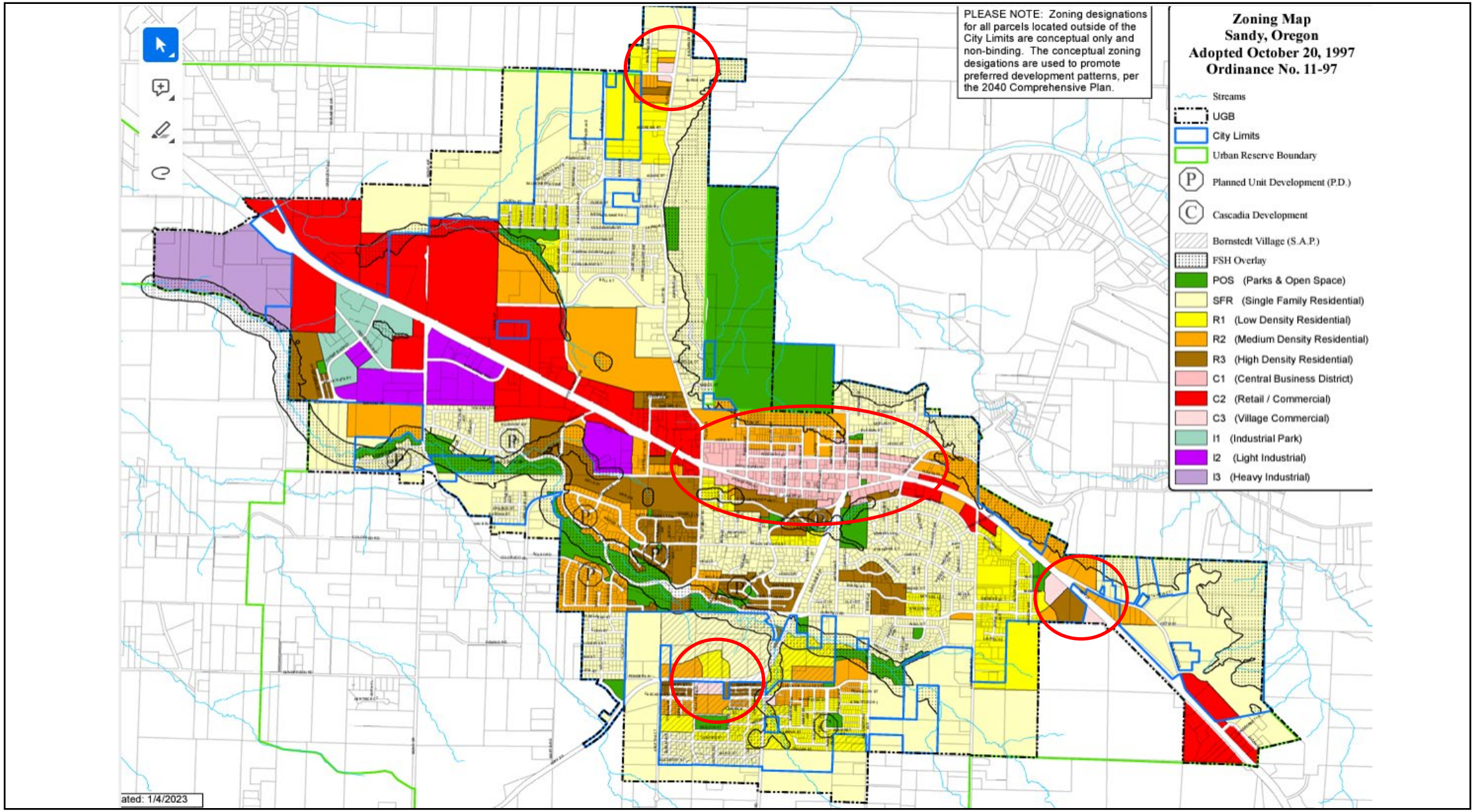
- Public review draft of the proposed Sandy Development Code amendments is 294 pages.
- The amendments are intended to make the code clear and objective as it applies to housing with a few exceptions.
- Most of the proposed amendments are **"policy neutral"** but there are some policy choices as highlighted in the memo.

"Policy Neutral" changes are intended to result in outcomes that are consistent with outcomes resulting from the current Development Code

Question 1

Standalone Multi-Family Housing in the C-1 and C-3 Zones

- Multi-family housing that is “not contained within a commercial building”
  - Conditional Use in the C-1 zone
  - Minor Conditional Use in the C-3 zone
- If a housing type is allowed in a zone, there must be a clear and objective path to approval.
- The City can no longer require Conditional Use review as the only option for approving standalone multi-family housing in the C-1 and C-3 zones.


PLEASE NOTE: Zoning designations for all parcels located outside of the City Limits are conceptual only and non-binding. The conceptual zoning desigations are used to promote preferred development patterns, per the 2040 Comprehensive Plan.
Zoning Map
Sandy, Oregon
Adopted October 20, 1997
Ordinance No. 11-97
Streams
UGB
City Limits
Urban Reserve Boundary
Planned Unit Development (P.D.)
Cascadia Development
Bornstedt Village (S.A.P.)
FSH Overlay
POS (Parks & Open Space)
SFR (Single Family Residential)
R1 (Low Density Residential)
R2 (Medium Density Residential)
R3 (High Density Residential)
C1 (Central Business District)
C2 (Retail / Commercial)
C3 (Village Commercial)
I1 (Industrial Park)
I2 (Light Industrial)
I3 (Heavy Industrial)
ated: 1/4/2023

Question 1: Options

A. **Recommended Option:** Remove the option for standalone multi-family in the C-1 and C-3 zones. Require all residential development in these zones to be part of a mixed-use development (horizontal or vertical mixed use).

B. Allow multi-family housing as a permitted use in the C-1 and C-3 zones and establish a new clear and objective review path.

Question 2

Mixed-Use Residential in the C-1 and C-3 Zones

- Residential dwellings are allowed in the Central Business District and Village Commercial zones only as part of a mixed-use development:
  - C-1 – Dwellings must be “attached” to a commercial business
  - C-3 – Dwellings must be “above, beside or behind” a commercial business
- The Downtown and Village Commercial Design Standards must be updated to be clear and objective when applied to housing development.

Question 2: Options

A. **Recommended Option:** Further limit residential development in the C-1 and C-3 zones, so it is only permitted above a commercial business

B. Keep the current allowances for residential uses, but apply the multi-family design standards to the residential portion of a development

C. Hybrid of A and B: Prohibit ground floor residential uses only in buildings with frontage on major streets (e.g., Pioneer and Proctor Blvd)

Question 3

Zero Lot Line Dwellings in the SFR Zone

- Single-Family Residential zone currently requires Minor Conditional Use review for “single detached or attached zero lot line dwellings”
- Requiring Conditional Use review for this type of housing conflicts with the state’s clear and objective requirements

***Attached** zero lot line dwellings are also known as townhouses*

***Detached** zero lot line housing involves dwellings being built with no setback from one side lot line*

Question 3

Single detached zero lot line dwellings

Single attached zero lot line dwellings

Question 3: Options

A. **Recommended Option:** Remove the option for zero lot line dwellings (attached and detached) in the SFR zone

B. Allow attached and detached zero lot line dwellings as permitted uses in the SFR zone and establish a clear and objective review path

C. Hybrid of A and B: Allow detached zero lot line dwellings in the SFR zone, but remove the option for attached zero lot line dwellings

Question 4

Transit Street Building Orientation

- The Special Setbacks on Transit Streets standards establish a set of requirements for orienting residential buildings toward the street when on a transit street
- Current requirements are somewhat discretionary and need to be revised to be clear and objective

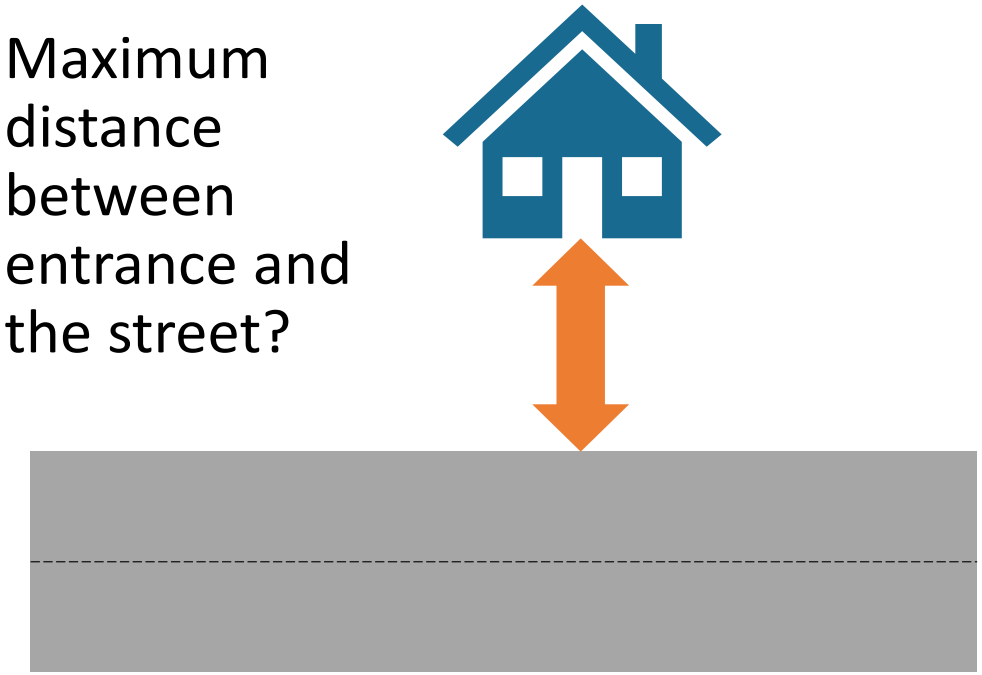
"Transit street" *is defined as a collector, arterial, or other transit street designated in the Transportation System Plan.*

Question 4: Options

A. Recommended Option: Establish a maximum distance between the building entrance and the transit street (i.e., maximum setback)

B. No maximum distance requirement

Maximum distance between entrance and the street?



Question 5

Changes to Comply with House Bill 2583

- Prohibits jurisdictions from establishing or enforcing occupancy limits for dwelling units that are based on the familial or nonfamilial relationships among any occupants

	~~Family = no more than 5 unrelated occupants~~	~~Dwelling unit = 1 family~~	~~Congregate housing = more than 5 unrelated occupants~~
New	Family = Any number of individuals, related or unrelated, living together in a dwelling unit	Dwelling unit = ?	Congregate housing = ?

Question 5: Options

A. **Recommended Option:**

Dwelling unit: An independent living unit containing eight or fewer bedrooms within a dwelling structure designed and intended for residential occupancy by not more than one family and having independent living facilities including permanent provisions for cooking, eating, sanitation and sleeping.

B. Keep the definition of dwelling unit as-is

Question 6

Type I Adjustments

- State statute requires local governments to provide public notice and the opportunity to appeal when decisions related to land use require interpretation (discretionary)
- City's review criteria for Adjustments are discretionary

Type I Adjustment	vary up to 10%	Potentially inadequate notice
Type II Adjustments	vary up to 20%	Adequate notice

Question 6: Recommended Solution

Recommended Solutions

- Remove the Type I Adjustment process and retain Type II Adjustments

~~Type I Adjustment~~	~~vary up to 10%~~	~~potentially inadequate notice~~
Type II Adjustments	vary up to 20%	Provides adequate notice

Keep

Question 7

Affordable Housing Under Senate Bill 8

- Requires local governments to allow affordable housing that meets definition and criteria
  - Affordable housing owned by a public body or religious nonprofit must be allowed in any zone
  - Affordable housing owned by other types of organizations must be allowed on property zoned for commercial uses, religious institutions, public lands, or industrial lands except those specifically for "heavy industrial."
- SB 8 provides height and density bonuses in areas zoned for residential uses
- **Unclear which densities apply in zones that do not allow housing**

Question 7: Recommendation

Recommendation: Add a new SDC chapter – Chapter 17.88 Affordable Housing

- Easier for staff to interpret and apply
- Gives the City the ability to fill in the gaps left by SB 8
- Establish density limits in nonresidential zones

Alternative: Apply the statutory requirements directly to an application

Question 8

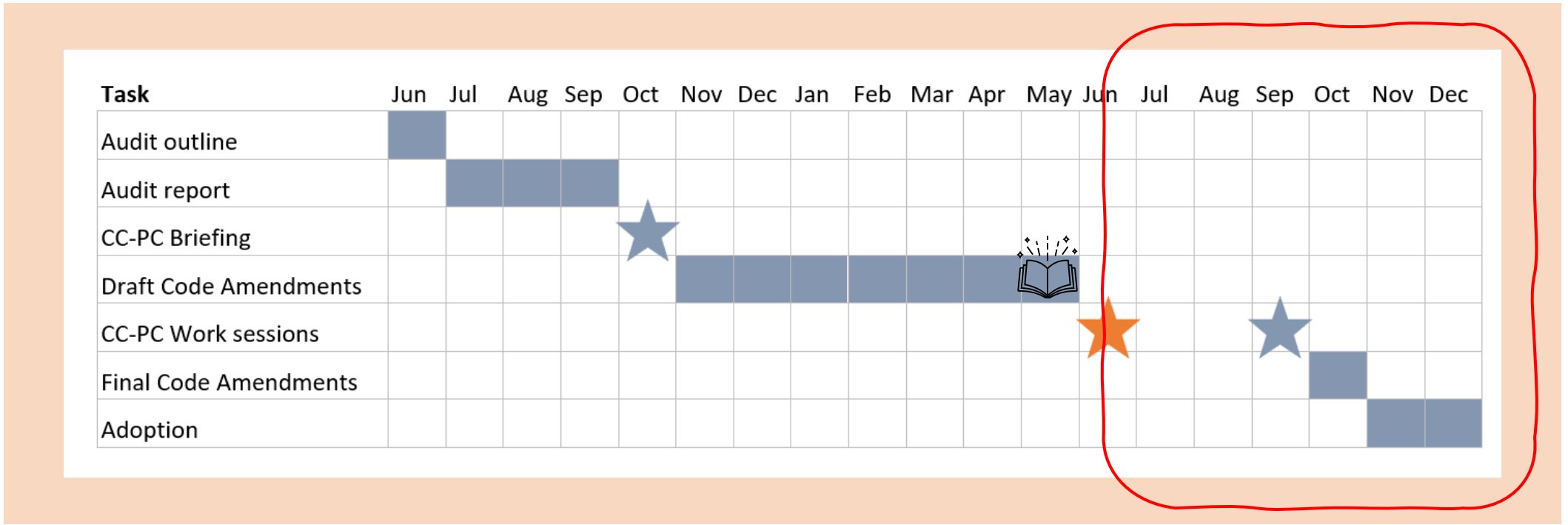
Tree Removal for Parks Maintenance

- Urban Forestry standards require properties larger than one acre to obtain a tree removal permit before removing trees 11 inches DBH or greater
- Current exceptions for:
  - Tree removal as required by the city or public utility for the installation or maintenance or repair of roads, utilities, or other structures
  - Hazard trees that pose an imminent threat
- **Recommendation:** Add a new exception for tree removal from City-owned parks and natural areas for trail installation/maintenance, safety improvements, and general park maintenance

Next Steps

Sandy Clear and Objective Code Audit

Project Schedule



MINUTES
City Council Meeting
Monday, June 5, 2023 6:30 PM

COUNCIL PRESENT:	Chris Mayton, Councilor; Laurie Smallwood, Council President; Richard Sheldon, Councilor; Kathleen Walker, Councilor; Don Hokanson, Councilor; and Stan Pulliam, Mayor
COUNCIL ABSENT:	Carl Exner, Councilor
STAFF PRESENT:	Jeff Aprati, Interim Deputy City Manager; Tyler Deems, Interim City Manager; Sean Lundry, Police Lieutenant; Josh Soper, City Attorney; Ernie Roberts, Police Chief; Rochelle Anderholm-Parsch, Parks and Recreation Director; and AJ Thorne, Assistant Public Works Director
MEDIA PRESENT:	(none)

Draft

1. CITY COUNCIL WORK SESSION - 6:30 PM

1.1. Parks and Recreation Financial Sustainability Plan

Staff Report - 0712

The Parks and Recreation Director and Community/Senior Center Manager summarized the staff report, which was included in the agenda packet along with presentation slides.

Council discussion ensued on the following matters:

- Differences between 'special events' and 'community events'
- Events conducted by outside organizations that the City collaborates with; Mountain Festival for example
- Flexible approaches to providing financial assistance for those who need it; opportunities for some to contribute toward scholarships
- Response rates on feedback/satisfaction surveys
- Considerations regarding charging youth sports organizations for using fields; impacts to local families paying for programs; opportunities for partnerships in which organizations can perform work to offset impacts and maintenance costs

- Considerations regarding partnering with organizations to sponsor events in Centennial Plaza, such as the Veterans Day ceremony
- Discussion on Thompson Farms' use of the plaza for produce sales; discussion of the need for a policy/process for others who may have similar interests
- Suggestions to charge more for the first hour of rental time and less for subsequent hours
- Parameters for applying resident discounts
- Assessment of costs for usage of the Community Garden
- Development of initial shelter reservation time windows; opportunities to reassess the time windows after the first year

2. CITY COUNCIL REGULAR MEETING - 7:00 PM

3. Pledge of Allegiance

4. Roll Call

5. Changes to the Agenda
(none)

6. Public Comment

6.1. 8

Bill Leslie: concerned about the City's new business license online portal. Though staff framed the new system as an opportunity to streamline processes, online payment is now the only option, and business owners have to print their own licenses. He feels people should be able to come into City Hall and make this transaction in person. Additionally, fees for rentals have increased from $10 to $85, which is unreasonable. Other area cities do not charge for rental businesses. There has been discussion at the federal level of requiring in person payment options. Mr. Leslie also delivered written comments, which are attached to these minutes.

Bill Leslie Written Comments

7. Response to Previous Public Comments
(none)

8. Consent Agenda

8.1. **City Council Minutes**
May 15, 2023

8.2. **City of Sandy Personnel Policy Update**

Draft

Resolution 2023-18

Staff Report - 0710

8.3. **Adoption of Economic Development Strategic Plan 2023**

Staff Report - 0711

8.4. **IGA with City of Lake Oswego (LOCOM) for After Hours Record Entry Services**

Staff Report - 0720

Moved by Richard Sheldon, seconded by Don Hokanson

Adopt the consent agenda

CARRIED. 6-0

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

9. Resolutions

9.1. **PUBLIC HEARING: City of Sandy Supplemental Budget 2021-23**

Resolution 2023-25

Staff Report - 0708

Staff Report

The **Interim City Manager** summarized the staff report, which was included in the agenda packet. Clarification was provided on the timing of collection of new utility fees.

Public Testimony

(none)

Moved by Richard Sheldon, seconded by Don Hokanson

Close the public hearing

CARRIED. 6-0

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

Draft

Moved by Kathleen Walker, seconded by Laurie Smallwood

Adopt Resolution 2023-25

CARRIED. 6-0

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

9.2. **PUBLIC HEARING: City of Sandy Budget Adoption 2023-25**

Resolution 2023-21
Resolution 2023-22

Staff Report - 0715

The **Interim City Manager** summarized the staff report, which was included in the agenda packet. It was noted that adoption of revised fees and charges would be considered at the June 20th meeting.

Moved by Chris Mayton, seconded by Richard Sheldon

Close the public hearing

CARRIED. 6-0

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

Moved by Chris Mayton, seconded by Laurie Smallwood

Adopt Resolution 2023-21

CARRIED. 6-0

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

Moved by Chris Mayton, seconded by Richard Sheldon

Adopt Resolution 2023-22

Draft

CARRIED. 6-0

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

10. New Business

10.1. **PUBLIC HEARING: EPA/DEQ Consent Decree Settlement Approval**

Staff Report - 0719

The **City Attorney** summarized the staff report, which was included in the agenda packet. In response to a question about costs for the rehabilitation of the collection system, it was noted that these costs have been accounted for in the rate model.

Other issues addressed included:

- The remaining collection system basins are not anticipated to need as much repair as those already addressed
- The City has recently closed on a low interest loan to help fund the project.
- The terms of the consent decree are relatively favorable, and are the best the City could have reasonably hoped for
- The fines in question were incurred in the past, and are inherited issues for current leadership

Moved by Richard Sheldon, seconded by Don Hokanson

Close the public hearing

CARRIED. 6-0

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

Moved by Laurie Smallwood, seconded by Don Hokanson

Approve the negotiated consent decree with the United States Environmental Protection Agency and the Oregon Department of Environmental Quality, as provided in the agenda packet

CARRIED. 6-0

Draft

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

10.2. **Gunderson / Hwy 211 Intersection Improvements Design Contract** 9 - 17

Staff Report - 0718

The **Assistant Public Works Director** summarized the staff report, which was included in the agenda packet. Presentation slides are attached to these minutes. Discussion included clarification that the project will include studying all intersection options, not only a traffic circle. It was also noted that Gunderson marks the beginning of the City's jurisdiction over Hwy 211.

Moved by Laurie Smallwood, seconded by Kathleen Walker

Authorize the City Manager to sign the agreement with Harper, Houf, Peterson, and Righellis for design of intersection improvements at Highway 211 and Gunderson Road, as included in the agenda packet

CARRIED. 6-0

Ayes: Chris Mayton, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Don Hokanson, and Stan Pulliam

Absent: Carl Exner

Gunderson Highway 211 Intersection Improvements JEC

11. Report from the City Manager

- Note that Planning Commissioner Hook submitted his resignation; the **Mayor** along with **Councilors Walker** and **Mayton** will serve on an interview panel for his replacement; advertisement will begin soon
- The recent speed enforcement effort was a success
- Thanks and appreciation for everyone's participation in the budget process, and for the opportunity to serve as Interim City Manager
- Updates on the City Manager recruitment process, delivered by the **Interim Deputy City Manager**

12. Committee /Council Reports

Councilor Hokanson

- Interviews are upcoming to fill vacancies on the SandyNet Advisory Board
- Thanks and appreciation for the speed enforcement effort

Councilor Walker

Draft

- Updates on library fines for food, arts programming, and kids programming
- Discussion on potholes on Pleasant street, which will receive an overlay later in the summer

Councilor Sheldon
(none)

Council President Smallwood

- Thanks and appreciation for the cost recovery project work

Councilor Mayton

- The Planning Commission recommends approval of the updated TSP

Mayor Pulliam

- Discussion on the upcoming season of music and movies in the park
- The recent C4 retreat covered housing and transportation issues
- Mountain Festival will not have a carnival this year, despite best efforts
- Addressed the recent Mayors Summit on the 362nd / Bell project, Winterfest, and the Community Campus Park
- Longest Day Parkway is coming on June 22nd
- Recognition of the City's proactive work on camping regulations

13. Staff updates

13.1. Monthly Reports

14. Adjourn

Draft

_____
Mayor, Stan Pulliam

_____
City Recorder, Jeff Aprati

William Leslie
37625 SE Kelso Rd.
Sandy, OR 97055
(503) 515-8854
bilboleslie@gmail.com

June 5, 2023

To: Sandy City Council:

On December 19, the Council approved some changes to fees for business licenses, and the use of an online payment portal for payment for such licenses. I don't think you were given the complete information necessary to make the best decisions.

I listened to the meeting three times, and I will quote from the video. You were told that the City wanted to add an "...online payment portal option that would streamline the process, help reduce some of the staff time that it takes to manage that as well as provide an online payment capability that we don't offer so there is some end user benefit as well as that."

What you weren't told was that the City intended to completely stop accepting payments by mail or over the counter. Effective with this change, the City no longer accepts payments bymail or over the counter. The City now will ONLY accept payments through the online portal. Obviously, that's a challenge to people who don't have credit cards or internet access. I don't think this qualifies as much of an "end user benefit."

Business licensees can't pay by check,can't pay at all if they don't have internet or a credit card, and they can't receive a paper copy of their business license if they don't have a printer.

You were told that "...the existing fee is $41..." Councilor Pletzold asked whether this change included a license for a rental house. He was told yes. That's either incorrect, or at best, incomplete. You weren't advised that the fee to have a rental house was not $41, but rather just $10. Under the new guidelines, this fee increased from $10 per year to $85 per year, or an increase of 750%, which is obviously a huge increase.

For comparison purposes, i note the following fees for a license to operate a rental house in nearby communities in Clackamas County:

Estacada: None
Happy Valley: None
Mollala: None
Oregon City: None
Tualatin: $10.

Sincerely,

Bill

William Leslie

SANDY

WHERE INNOVATION MEETS ELEVATION

Gunderson Highway 211 Intersection Improvements

Sandy City Council

AJ Thorne

June 5, 2023

Project Location

- Near UGB
- Sandy's jurisdiction Hwy 211
- New Gunderson Rd
- Main access for Shaylee Meadows

SANDY
WHERE INNOVATION MEETS ELEVATION

On The Ground

Looking North

Looking South

Project Drivers - Safety

- Reducing accidents and fatalities on 211
- Improving traffic flow through the City
- Providing safe mobility for bikes and pedestrians

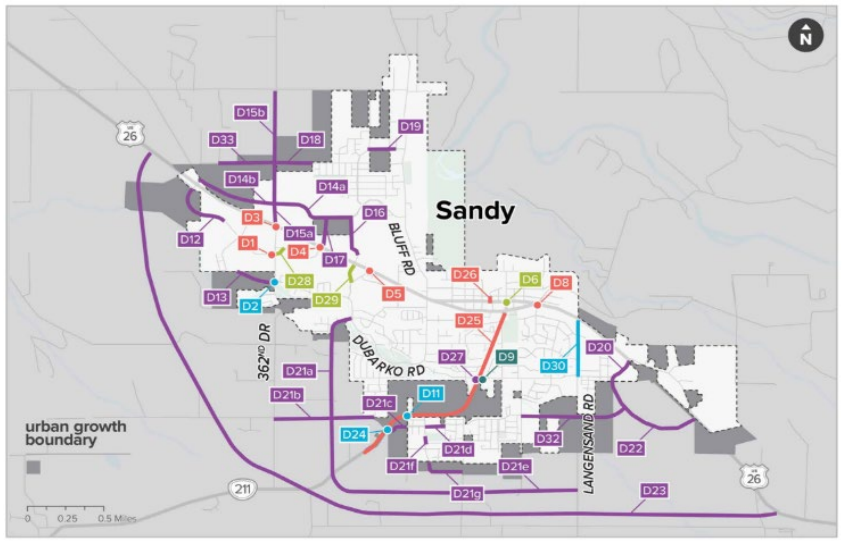
SANDY
WHERE INNOVATION MEETS ELEVATION

Development Agreement

- $500K developer contribution
- Tentative June 2024 construction date
- Part of subdivision agreement

SANDY
WHERE INNOVATION MEETS ELEVATION

Transportation System Plan



motor vehicle projects

figure 8

Motor Vehicle Projects

- Project D24 in TSP
- Solutions:
  - ✓Turn Lanes
  - ✓Signal
  - ✓Roundabout

SANDY
WHERE INNOVATION MEETS ELEVATION

Scope

- Review Reasonable Alternatives for the following:
  - ✓Traffic Rating
  - ✓Safety
  - ✓Cost of Construction
  - ✓Construction Schedule
  - ✓Construction Impact
- Select alternative that best meets City's needs

HHPR Harper Houf Peterson Righellis Inc.

SANDY
WHERE INNOVATION MEETS ELEVATION

Project Funding

- FY24_25 Budget has $1M total for project (including design)
- Using shovel ready design to identify and acquire additional grant funding
- Seek funding concurrently with design work
- Design work increases chances of funding

Questions?
Thank you!

MINUTES
City Council Meeting
Monday, June 12, 2023 6:00 PM

COUNCIL PRESENT:	Chris Mayton, Councilor; Richard Sheldon, Councilor; Kathleen Walker, Councilor; Carl Exner, Councilor; Don Hokanson, Councilor; and Stan Pulliam, Mayor
COUNCIL ABSENT:	Laurie Smallwood, Council President
STAFF PRESENT:	Jeff Aprati, Interim Deputy City Manager; Ernie Roberts, Police Chief; and Angie Welty, Human Resources Director
MEDIA PRESENT:	(none)

Draft

1. CITY COUNCIL WORK SESSION

1.1. **City Manager Recruitment: Position Profile and Hiring Procedures** 4

Staff Report - 0725

The **Interim Deputy City Manager** provided an introduction and project update. Erik Jensen with Jensen Strategies, LLC introduced himself and summarized the intent of the work session, which was to review and provide feedback on the draft position profile and hiring procedures.

Mr. Jensen summarized the content in the draft documents, and the Council engaged in discussion on the following matters:

Education and Experience

- ICMA Credentialed Manager should be included as a preferred attribute
- Discussion on the importance of previous city manager experience; whether to require a specific public administration degree; emphasis on the importance of having a diverse pool of candidates to consider
- Required government experience should be at the local level

Desired Skills / Attributes

- Consolidate the public works attributes into the same section; language from the Council Goals regarding public works may be incorporated
- Include language on policy implementation
- Skills should be focused on executive level management, rather than project management. Oversight, leadership, prioritization, and coordination of resources are critical, rather than day-to-day management of tasks
- Add emergency management in the intergovernmental relations section
- The city manager should be active in the community

Policy Directives

- The dollar figure in the new park project section should be fixed
- Police have been operating 24/7 for a long time
- "Recruitment and selection process" should be inserted in the police chief section
- Discussion on remote work
- Discussion on the importance of considering alternate experience and alternative pathways, in the interest of attracting a diverse range of applicants
    - Jensen Strategies will advertise the opening within diverse forums and has DEI experts on staff
- Note that while Sandy needs city management experience, alternate pathways exist for gaining necessary or equivalent experience
    - The preferred versus required experience sections provide the ability to address both these imperatives

Clarification was provided to the Council on the finalist interview process and on scheduling and decision points.

Mr. Jensen asked the Council what they would like to advertise as a salary range for the position. He provided a handout with comparable ranges from other cities (attached to these minutes). The Council discussed the possibility of raising the upper limit of the salary range so as to not discourage applicants. it was noted that the city manager's compensation is subject to COLAs but not step increases (pay increases are typically the result of performance reviews). The Council discussed the potential parameters and process of compensation negotiations with the preferred candidate.

Ultimately it was the consensus of the Council to advertise a salary range of $140,000 to $180,000.

Draft

Salary Comp Information

2. Adjourn

_____
Mayor, Stan Pulliam

_____
City Recorder, Jeff Aprati

Draft

June 12, 2023

CITY OF SANDY

CITY MANAGER SALARY COMPARISONS & RECOMMENDATION

Comparison cities (population size range 8k – 18k)

City	Population	Salary
1. Stayton	8,326	$142,250
2. Molalla	10,298	$149,352
3. Silverton	10,643	$135,150
4. Cottage Grove	10,792	$152,000
5. Monmouth	11,142	$148,225
6. Gladstone	12,170	$185,119
7. Cornelius	14,389	$150,336
8. The Dalles	16,202	$146,000
9. Troutdale	16,819	$175,386
10. Dallas	17,836	$160,695
		AVERAGE - $154,451.33

Recent Recruitment Salary Ranges

Sisters (2023)	3,475	$120,000 - $160,000
Stayton (2022)	8,265	$122,000 - $152,000
Fairview (2022)	10,451	$135,000 - $160,000
Cornelius (2022)	14,389	$140,000 - $175,000

Salary Range Recommendation: $140,000 - $170,000

Staff Report

Meeting Date:	June 20, 2023
From	Rochelle Anderholm-Parsch, Parks and Recreation Director
SUBJECT:	Policy Adoption for a Financial Sustainability Plan for Parks and Recreation

DECISION TO BE MADE:
Whether to adopt the Financial Sustainability Plan for the Parks and Recreation Department

BACKGROUND / CONTEXT:
On June 5, 2023 the Council reviewed the Parks and Recreation's Financial Sustainability Plan. Council supported the policy as written and requested staff present the policy for adoption during the June 20, 2023 Council meeting.

KEY CONSIDERATIONS / ANALYSIS:
As the Parks and Recreation Department continues to expand services and programs, it is important to have a policy that intentionally guides the Department's expenses and provides revenue generating goals.

Along with clear financial metrics, the Department's Financial Sustainability Plan will help guide the Department's prices, fees, partnerships, needs based assistance and capital investment opportunities. The Financial Sustainability Plan will provide Parks and Recreation with metrics to measure the success of the policy and an outline of what to do when the metrics are not being met.

SUGGESTED MOTION LANGUAGE:
"I move to adopt Resolution 2023-26"

LIST OF ATTACHMENTS/EXHIBITS:
- Attachment A: Resolution 2023-26
  - Financial Sustainability Plan for the Parks and Recreation Department

NO. 2023-26

A RESOLUTION ADOPTING A POLICY FOR A FINANCIAL SUSTAINABILITY PLAN FOR PARKS AND RECREATION

Whereas, The City of Sandy Parks and Recreation Department's Financial Sustainability Policy intends to create organizational resilience by way of logical, intentional, and thoughtful guidelines for investment and spending decisions; and

Whereas, The strategy encourages tax investment and revenue generation strategies and practices that are fair, equitable, and responsible. This policy is necessary to ensure the Department's financial stability in both the near and long term; and

Whereas, The Financial Sustainability Policy will guide investment and spending choices as the City responds to economic realities, growth competing priorities, demographic shifts and evolving community needs, and climate threats;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Sandy

1. Adoption. The City Council hereby adopts the Policy for a Financial Sustainability Plan for Parks and Recreation, attached to this resolution in Exhibit A. The policy shall be effective on June 21, 2023.

This resolution is adopted by the Common Council of the City of Sandy and approved by the Mayor this 20 day of June 2023

_____
Stan Pulliam, Mayor

ATTEST:

_____
Jeff Aprati, City Recorder

#2023-26

EXHIBIT A

SANDY PARKS AND RECREATION

FINANCIAL SUSTAINABILITY DEPARTMENT POLICY

Purpose

The City of Sandy Parks and Recreation Department's Financial Sustainability Policy intends to create organizational resilience by way of logical, intentional, and thoughtful guidelines for investment and spending decisions. The strategy encourages tax investment and revenue generation strategies and practices that are fair, equitable, and responsible. This policy is necessary to ensure the Department's financial stability in both the near and long term.

The Financial Sustainability Policy will guide investment and spending choices as the City responds to economic realities, growth competing priorities, demographic shifts and evolving community needs, and climate threats.

Policy Statement

In alignment with the City Council's 2021-2023 Goals *[Goal 5: To Maintain financial strength and sustainability; Action a: Diversify revenue sources, analyze new revenue streams, and look at cost recovery where possible]* the Department's Financial Sustainability Policy grounds cost recovery expectations and the spending of taxpayer dollars in a philosophical underpinning that affirms a commitment to equitable investment, financial discipline, and long-term fiscal health.

The bi-annual City of Sandy budget ultimately determines the amount of taxpayer support that can be made available for park and recreation services which results in understanding the degree to which subsidy investment can be made and to which services, and the degree to which user fees will be assessed and to which services.

Cost Recovery/Subsidy

Cost recovery refers to offsetting the costs (expenses) of delivering services by way of revenues generated from fees and charges, sponsorships, donations, grants, and other alternative revenue streams. Alternatively, subsidy represents a tax source. It is granted by a governmental entity; typically to remove some type of burden, and often considered to be in the overall interest of the public. It is also given to promote a social good or an economic policy.

For example, a cost recovery level of 75% simply means that for each dollar spent on a service, 75-cents are generated from a revenue source (i.e., fees) with the remaining 25-cents covered by subsidies (i.e., taxes).

Department Funding/Revenue Sources

The City of Sandy Parks and Recreation Department is supported by a number of revenue sources which all contribute varying levels of funding to support the breadth of park and recreation services provided to the community. The degree to which each of these sources is relied upon can shift based upon the economy, market behaviors, and City-wide policy; however, property taxes are the primary source of funding for the Parks and Recreation Department.

Tax Sources
-General Fund (property taxes paid by City of Sandy Residents)
Alternative Sources
-Parks System Development Charges (SDCs)
-Fee in Lieu of Park Land Dedication
-Trustee Account
-Fees and Charges for Service
-Grants

Service Categories

The development of categories which include *like* services are important when it comes to justifiable and equitable allocation of subsidy, cost recovery levels, and assignment of budget and general ledger lines to account for a category's fiscal performance (e.g., a service category such as *Beginner/ Intermediate Programs* would include "like purpose" activities such as youth basketball, kinder dance classes, or beginner guitar regardless of age or special interest).

The benefits of this type of approach are two-fold. First, it is inefficient for the Department to determine cost recovery expectations by each individual service including facility, activity, or event. Secondly, categorizing by "type of service" or "likeness of service" discourages attempts to determine fees and charges (and therefore cost recovery decisions) based upon special interests, age-based services, or individual values.

The City of Sandy Parks and Recreation Department provides many services annually to the community. The following Service Categories represent the Department's service menu and include Service Category definitions as well as example services.

-Advanced/Competitive Level Classes & Activities: Classes and activities designed to advance or master a skill. In the case of team or league play, scoring is kept with winning as a primary goal. *Examples: Power Yoga, Parkour, Softball Leagues*

-Beginner/Intermediate Level Classes & Activities: Classes and activities designed to teach or engage at an introductory or novice level. In the case of team or league play, there is no-scoring with a focus on building foundational skills. *Examples: Kinderdance, Yoga & Stretch, Music and Movement, Skyhawks, 3/4th Grade Youth Basketball, Intermediate Parkour, Intermediate Guitar Lessons, 5/6th grade Youth Basketball*

-Community Events: Annual events designed to be inclusive of the entire community regardless of age, ability, family composition, or special interest. *Examples: Christmas Tree Lighting, Music & Movies in the Park, Holiday Lights at Meinig, Longest Day Parkway*

-Drop-in Activities: Self-directed activities which include staff oversight and supervision and do not require registration. *Examples: Community/Senior Center Lounge Drop-in, Games & Puzzles, Cooling Shelter, Open Gym, Silvertones*

-Education & Enrichment Activities: Classes and activities designed to educate and teach personal, social-emotional, and life skills. *Examples: Mental Health Classes, Medicare Classes, Babysitting Classes*

-Human Services: Resources provided for the prevention and remediation of life challenges and to support those who need assistance ensuring independence and community connection. *Examples: Meals on Wheels, Transportation Services, Case Management, Referrals, Energy Assistance, Congregate Meals*

-Open Access: Access to parks, trails, and facilities where activity is self-directed. No staff oversight is provided. *Examples: Parks, Trails, Dog Park, Playgrounds, Skate Park, Sports Courts*

-Rentals: Reservations which provide exclusive use of public spaces and places by a group or individuals. *Examples: Sports Field Rentals, Auditorium Rental, Art Room Rental, Dining Room Rental, Gazebo Rental, Plaza Rental, Community Garden Bed Rentals*

-Social Equity Services: Services that remove barriers and constraints to accessing park and recreation opportunities. *Examples: Inclusive Egg Hunt, Shower Cart, Todos Juntos*

-Special Events: Events designed and targeted towards a specific market or market niche'. *Examples: Noah's Quest, Corn Cross, Teen Egg Hunt, Senior Egg Hunt, Senior Outings/Trips, Mountain Festival Kids' Events*

Note: Service Categories listed above are in alphabetical order.

Common Good Services or cause and purpose driven services intend to impact social, economic, and environmental issues and needs; aligns with the fundamental purpose and mission of the Department. Typically, there are no like services provided by the non-profit/Non-Governmental Organizations (NGO) or private sectors.

Exclusive Benefit Services or specialized services intend to serve personal interests with competition from the non-profit/ Non-Governmental Organizations (NGO) and private sectors which offer like services being common practice.

Common Good (justification for greater subsidy investment)

- Community building

- Provides accessibility to marginalized/under-represented populations
- Broad appeal to a wide audience
- Equity services

Exclusive Benefit (justification for greater cost recovery expectation)

- Individualized, special interest
- Requires higher competency/ability level to participate
- Private sector competition exists
- Specialized activities

Financial Sustainability Strategy

The City of Sandy Parks and Recreation Department's Financial Sustainability Strategy Continuum presents the degree to which financial resources will be spent and expenses will be recovered and managed. It is grounded in the differentiation of parks, recreation, and senior services on the basis of who benefits should pay. Economists have differentiated goods and services in the economy in this manner for decades and have designated three types of goods and services: community benefit, dual benefit, and individual benefit.

The Financial Sustainability Strategy Continuum acknowledges varying levels of service. This strategy shifts from one which suggests that all services should be provided at no or low cost for everyone to an equitable and just philosophy where subsidy allocation decisions are based upon "beneficiary of service". In this conceptualization, each type of service has a set of specific characteristics that provide a rationale for who should pay (e.g., taxpayers, the individual, or both) and to what degree. Ultimately, this aligns subsidy allocation, cost recovery goals and expectations with beneficiary of service. Essentially, those who benefit from a service should pay for that service.

The four-year Financial Sustainability Strategy Continuum includes the Department's Service Categories and short-term cost recovery/subsidy goals and expectations. The continuum is a graphic representation of the Department's tax use and revenue enhancement strategy.

The City of Sandy Parks and Recreation Department Financial Sustainability Strategy Continuum 2023-2026 are included in Appendix A of this policy.

Updating Investment Expectations

Service category cost recovery performance should be reviewed annually, and subsidy (tax dollar) investment goals should be analyzed and updated at least every four years or more frequently as necessary.

Pricing – Fees & Charges

Several pricing methods are utilized by the Department in order to establish fees and charges. The principal method for establishing services fees will be cost recovery pricing which is defined as determining a fee based on established cost recovery goals.

Other pricing methods may be utilized by the Department, however, any strategy or method used will ultimately require that cost recovery goals or subsidy allocation expectations be met. Common alternative pricing methods include the following options which can be used based upon market behaviors, the competition, and other relevant considerations.

- *Market (demand-based) pricing* results in pricing based on demand for a service or what the target market is willing to pay for a service. The private and commercial sectors commonly utilize this strategy. One consideration for establishing a market rate fee is determined by identifying all providers of an identical service (i.e., private sector providers, other municipalities, etc.), and setting the highest fee. Another consideration is setting the fee at the highest level the market will bear.

- *Competitive pricing* establishes prices based on what similar service providers or close proximity competitors are charging for services. One consideration for establishing a competitive fee is determined by identifying all providers of an identical or similar service (i.e., private sector providers, other municipalities, etc.), and setting the mid-point or lowest fee.

- *Value-based pricing* is a pricing strategy in which the price of a product or a service is decided on the basis of perceived value or benefit it can provide to a customer. Value based pricing is more evident in places or markets where exclusive products are offered which offer more value than the generic or standard products.

- *Penetration pricing* has the aim of attracting customers by offering lower prices on services. While many may use this technique to draw attention away from the competition, penetration pricing often results in lost revenue and higher subsidy requirements. Over time, however, an increased awareness of the service may drive revenues and help organizations differentiate themselves from others. After sufficiently penetrating a market, organizations should consider raising prices to better reflect the state of their position within the market.

- *Premium pricing* establishes prices higher than that of the competition. Premium pricing is often most effective in the early days of a service's life cycle, and ideal for organizations that offer unique services. Because customers need to perceive products and services as being worth a higher price tag, an organization must work hard to create a value perception.

- *Bundle pricing* allows for the sale of multiple services for a lower rate than customers would pay if they purchased each service individually. Bundling can be an effective way of selling services that are

poor performers and can also increase the value perception in the eyes of customers - essentially giving them something for a reduced rate.

- *Differential/Dynamic pricing* follows the "law of demand" by supporting a key pricing principle: some customers are willing to pay more than others. Differential pricing is the strategy of selling the *same* service to *different* customers at *different* prices (ex. Residential Discount vs Fee). Differential pricing enables organizations to "profit" from their customers' unique valuations (ex. Prime time or surge pricing).

In the event a Service Category's subsidy/cost recovery goal is higher than current cost recovery performance and fee increases are required, prices may need to be raised incrementally in accord with market acceptance to optimize revenue generation. However, if the market does not respond favorably to the increase, the service may require divestment if the subsidy investment required cannot be justified based upon beneficiary of service.

In the event a tax dollar investment/cost recovery goal is less than the current level of recovery the established fee will remain the same to ensure that there is no loss of revenue or negative impact on the Department's financial condition.

Partnerships

Partnerships are advantageous collaborations that position both the Department as well as participating partner organization(s) to efficiently utilize resources leading to cost effective and efficient service delivery, bridging of markets, reductions in duplication of services and fragmentation of resources, and cooperative capital development and/or improvements.

A condition that must be met in order for the Department to enter into a partnership agreement includes that of reciprocal benefit. To prevent the Department from simply becoming a granting body to any organization, the Department and its partner identify the value of the mutual contributions brought forth to the agreement and arrangement. There will be equal value and benefit to each organization resulting from any partnership ensuring that the Department is receiving fair and just value on behalf of taxpayers in return for any resource investment and commitment.

Reinvestment

The Financial Sustainability Policy guides re-investment into the park and recreation system such as in those services which require extensive and essential investment. Methods for reinvestment may include a retained earnings fund, an enterprise fund, or similar that will allow for the re-distribution of excess revenues generated from Department services such as Specialized Business Services that are individualized, highly specialized and/or exclusive, and expected to generate a minimum of 100% cost recovery to a retained earnings, enterprise, or similar fund. This fund may be used to support service interests such as social equity and capital investments in park and recreation infrastructure that require short, preventative, and long-term maintenance alleviating pressure and reducing reliance on the City's

General Fund.

Needs Based Assistance

The Department ensures that services are accessible to residents who may be considered economically-disadvantaged, underserved, under-represented, or marginalized, and who may require assistance and support in accessing parks and recreation services. This will require that funds are appropriated and fairly and equitably distributed throughout sub-communities in need. Applications will be made available allowing for the neediest individuals and families in order to have access to reduced rates that can both satisfy need for assistance as well as provide equitable subsidies across the system.

Appropriations will be determined as follows.

1. Projected financial aid needs.
2. Award thresholds.
3. Anticipated total population needing to be served.

Awards will be issued to City of Sandy residents, defined as those who live within the City limits. Financial assistance will be based upon a “pay what you can” model and the process will be evaluated annually. Additional funds will be sought by fundraising and using a “round up” or “pay it forward” option and will be made available within the registration/point of sale system.

The Department intends to reduce barriers to entry by not requiring financial records or disclosures, rather, relying on an “honor system” for the application process requesting information from applicants specific to their needs and ability to pay only. Applications will be kept on file for one year from application.

Capital Investment

The City of Sandy follows a biennium budget process and the budget philosophy is focused on expenditure control. If the Parks and Recreation Department under-expends and brings in more revenue than projected/allocated, these funds will be held over as a beginning balance for the subsequent budget. Beginning balance funds are transferred from year to year and can be used for Capital Investment Projects.

Success Metrics

Success metrics will be used as a means to evaluate whether or not each service is in compliance with established cost recovery goals (as indicated on the Financial Sustainability Strategy Continuum) as well as other efficiencies and intended outcomes. In the event success metrics are not being met, items 1-6 below the Success Metrics list outline actions to address gaps between current performance and success metrics.

Success Metric 1: Financial Viability: a service must meet its minimum tax dollar investment/ cost recovery goal as noted on the Financial Sustainability Strategy Continuum.

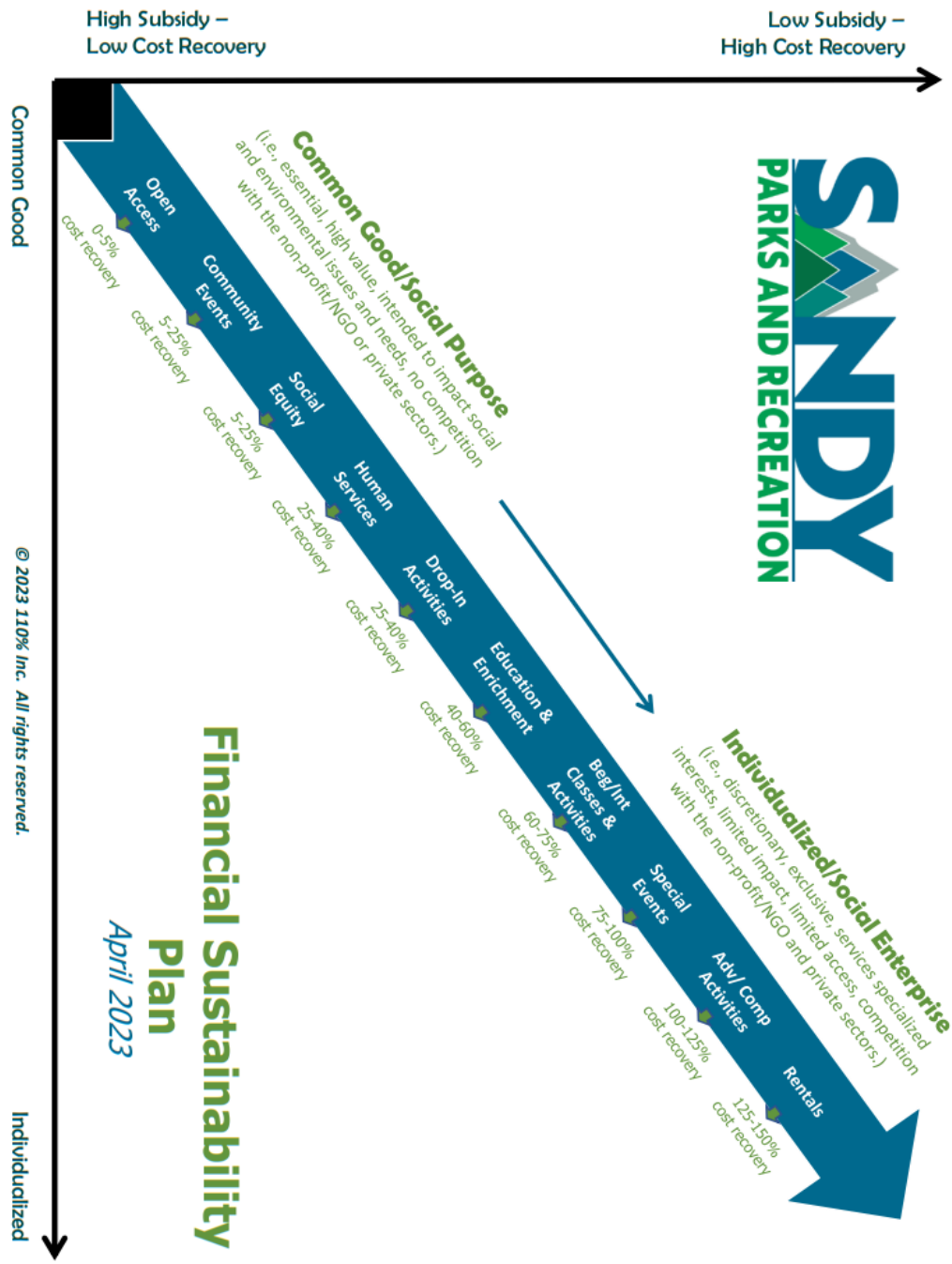
Success Metric 2: Operational Efficiency: services should meet 75% or more of capacity (maximum) or realize a minimum increase of 10% usage during each service cycle to ensure efficiency of resource investment *(excl: events where capacity is difficult to establish).*

Success Metric 3: Participant/Customer Satisfaction: overall participant (customer) satisfaction must meet a minimum of 85% satisfaction or higher *(per user surveys and evaluations).*

Success Metric 4: Participant/Customer Impact: alignment with service goals – impact on social connections, increases in activity levels, impacts on quality of life, school performance, etc. *(per user surveys and evaluations).*

Addressing gaps between existing cost recovery performance and target (goals)

1. Analyze success metrics for services not meeting their cost recovery goal.
2. Analyze direct and indirect costs of providing service.
    a. Measure ratio of direct and indirect cost.
    b. Identify cost reduction opportunities and implement.
3. Suggest market increase commensurate with cost recovery goal.
    a. Conduct market analysis of service.
    b. Identify opportunities for capturing larger markets.
4. Identify potential sponsorship, donation, or pay-it-forward opportunities.
5. Identify potential partnership opportunities to continue to provide a service, however, in collaboration with another provider, reducing impacts on and dilution of Department resources, avoiding unnecessary duplication of service, and responsibly utilizing finite taxpayer resources.
6. If services do not satisfy success metrics, consider divestment of service at the end of a four-year strategy term or sooner.


High Subsidy –
Low Cost Recovery
Low Subsidy –
High Cost Recovery
Common Good
Individualized
Common Good/Social Purpose
(i.e., essential, high value, intended to impact social and environmental issues and needs, no competition with the non-profit/NGO or private sectors.)
Individualized/Social Enterprise
(i.e., discretionary, exclusive, services specialized interests, limited impact, limited access, competition with the non-profit/NGO and private sectors.)
Open Access
0-5% cost recovery
Community Events
5-25% cost recovery
Social Equity
5-25% cost recovery
Human Services
25-40% cost recovery
Drop-In Activities
25-40% cost recovery
Education & Enrichment
40-60% cost recovery
Beg/Int Classes & Activities
60-75% cost recovery
Special Events
75-100% cost recovery
Adv/ Comp Activities
100-125% cost recovery
Rentals
125-150% cost recovery
SANDY
PARKS AND RECREATION
Financial Sustainability Plan
April 2023
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FINANCIAL SUSTAINABILITY PLAN – Appendix B

Finance-centric Definitions

Ability to Pay: Derived from the economics principle suggesting that those who have more financial resources (wealth) or earn higher incomes should pay more taxes. Relative to municipal park and recreation services, this can be translated to the ability to pay for direct service based on an individual's financial circumstances.

Alternative Funding: Other ways to improve cost recovery in addition to fees and charges. May include grants, sponsorships, donations, volunteer programs, etc.

Benefit: The degree to which programs and services positively impact the public (individual and community), or in other words, the impact of services.

Budget: An estimation of revenue and expenses over a specified future period of time; usually compiled and re-evaluated on a periodic basis.

Capacity: The number of available spaces or the occupancy rate of a service. Also referred to as service maximum.

Collaborate: The process of two or more people or organizations working together to complete a task or achieve a goal.

Contact Hours: The total number of hours an individual participates in an activity, class, course, or event.

Cost Recovery: The degree to which the cost (direct and indirect) of facilities, services and programs is supported or paid for by user fees and/or other designated funding mechanism such as grants, partnerships, etc. versus the use of tax subsidies.

Depreciation: The periodic cost assigned for the reduction in usefulness and value of a long-term tangible asset.

Direct Cost: Cost incurred that can be traced directly to provision of a service. This cost would not be incurred if the service ceased. This includes fixed and variable costs.

Donation: A gift, grant, or contribution with no expected exchange or reciprocity. Typically done as "good will".

Enterprise/Quasi-enterprise: A governmental accounting method established to record transactions like those utilized in the private sector, allowing for tracking of services through a separate fund that records all transactions. All revenues and expenses, as well as assets and current liabilities are included. This type of fund is generally required to break even or generate excess revenues over expenditures. Any revenues earned in excess of expenses are carried over, used for capital improvements or transferred to the General Fund. Collected gross revenues are not deposited in the General Fund, but rather are intended to be used to expand or improve services.

Exclusive Use: Scheduled, planned, or programmed use of a facility or space that is limited or restricted to a reserved or rented party. They have the right to the space for the specified period while others are excluded from using the facility or space.

Fee/Price: The amount charged to the customer for an activity or service.

Financial Management: The planning, directing, monitoring, organizing, and controlling of monetary resources.

Full Cost: The total cost associated with an activity or service.

Grant: A bounty, contribution, gift, or subsidy bestowed by a government or other organization (grantor) for specified purposes to an eligible recipient (grantee) and conditional upon certain qualifications as to use, maintenance of standards, or proportional contribution by the grantee.

Indirect Cost: Cost incurred with or without provision of a service. These costs are not traceable to a specific service and can benefit the system as a whole (do not directly benefit a single service).

Needs Quantification: Numerically expressing need through the application of a scoring system that quantifies whether an individual or family qualifies for financial assistance (e.g., applying a scoring system to HUD Poverty Guidelines, location of residence, school free lunch program qualification and other relevant variables).

Non-resident: A person or household whose primary residence is outside of the organization's (jurisdiction's) service area and does not pay property taxes to the organization (jurisdiction).

Participant/Guest/User/Visitor: The individual who participates in an activity, class, course, event, etc.

Participants/Guests/Users/Visitors: The total number of individuals who participate in an activity, class, course, event, etc.

Participations: The total number of participants multiplied times the total number of hours an activity, class, course, event, etc. meets.

Partnership: An advantageous collaboration that positions two or more participating organizations with common missions to efficiently utilize resources leading shared profits/losses and reciprocal benefit.

Price/Fee: The amount charged to the customer for an activity or service.

Profit/Excess Revenues: The additional revenue generated by a service when revenues exceed costs or expenditures.

Program: A common label in the field of parks and recreation for recreation services such as activities, courses, classes, and events.

Resident: A person or household whose primary residence is within an organization's (jurisdiction's) service area and who does pay property taxes to the organization (jurisdiction).

Scholarship: A waiver provided as a way to create access to services for those in need of financial assistance.

Sponsorship: The act of supporting a person, organization, or activity by giving money in either in-kind or cash form. Typically done with an expectation for some type of “exchange”.

Subsidy: Funding through taxes or other mechanisms that are used to financially support programs or services provided to users and participants. Subsidy dollars provide for the program or service costs (direct and/or indirect) that are not covered by user or participant fees, or other forms of alternative funding. This is the community’s financial investment (i.e., taxes).

Success Metrics: Performance measures are quantifiable evaluations of the organization's performance on a pre-determined set of criteria measured over time. The agreement upon standard performance measures allows the organization to judge its progress over time (internal benchmarking) and identify areas of strength, weakness and potential for improvement.

Total Cost of Service: The cost to provide a service including both direct and indirect costs.

Willingness to Pay (WTP): The maximum amount an individual is willing to give to procure a product or service. The price of the transaction will thus be at a point somewhere between an individual’s willingness to pay and the seller's willingness to accept. Macro environmental factors such as the overall state of the economy can influence willingness to pay.

Staff Report

Meeting Date:	June 20, 2023
From	Jeff Aprati, Interim Deputy City Manager
SUBJECT:	SandyNet Advisory Board Appointments

DECISION TO BE MADE:
Whether to accept the interview panel's recommendation for appointments to the SandyNet Advisory Board

BACKGROUND / CONTEXT:
The SandyNet Advisory Board currently has four vacant seats (Seats 1, 4, 6, and 7).

An application opportunity was advertised via multiple media over several weeks. Three applications were received, all of which met the eligibility requirements. The interview panel (including Councilors Hokanson and Sheldon) reviewed the materials and interviewed the applicants on June 7, 2023.

The interview panel recommends appointment of all three applicants (Greg Moore, Jed Rabe, and Jeremy Pietzold). Application forms are attached to this staff report for the Council's information.

KEY CONSIDERATIONS / ANALYSIS:
Because only six months remain in the terms for two of the four openings, the interview panel recommends appointing Jeremy Pietzold to the remaining term for Seat #4 plus an additional full term (for a total of four years and six months) to avoid having to re-advertise the opening at the end of this year.

RECOMMENDATION:
The interview panel recommends that the Council appoint:

- Greg Moore to Seat #1 (term expires 12/31/2024)
- Jeremy Pietzold to Seat #4 (term expires 12/31/2027)
- Jed Rabe to Seat #7 (term expires 12/31/2024)

SUGGESTED MOTION LANGUAGE:
"I move to appoint Greg Moore, Jed Rabe, and Jeremy Pietzold to the SandyNet Advisory Board as recommended in the staff report"

LIST OF ATTACHMENTS/EXHIBITS:

- Application forms

Greg Brewster <gbrewster@ci.sandy.or.us>

Form submission from: SandyNet Advisory Board Application

1 me age

Sandy Oregon <sandy-or@municodeweb.com> Fri, Jun 2, 2023 at 1:25 PM
Reply-To: Sandy Oregon <sandy-or@municodeweb.com>
To gbrew ter@ci andy or u

Submitted on Friday, June 2, 2023 1 25pm

Submitted by anonymou u er [redacted]

Submitted value are

Fir t Name Jedediah
Last Name Rabe
Email [redacted]
Phone Number [redacted]
Addre 15263 Salmonberry Ave
City Sandy
State OR
Zip Code 97055
Mailing Addre (if different)
Please explain your interest in serving on the SandyNet Advisory Board
I am a wireless network engineer at Structured Communication Systems Inc, based out of Clackamas OR. I recently moved to Sandy and have been very impressed with the service we receive from SandyNet. I know many people involved with the initial rollout of SandyNet and many people who currently work for SandyNet I have a pa ion for technology and have a strong desire to see SandyNet continue to grow in their service area and lead the way for other municipalities wanting to offer Internet Services to their citizens. I would like to offer my professional experience and knowledge in an advisory role to help with long term planning and growth of this service.
What knowledge, education, or kill would you bring to the Board?
I am a senior wireless network engineer at Structured Communication Systems, inc. I have my bachelors degree from ITT Technical Institute in Data Communication Systems. I have many industry and vendor certifications including the following:
CWNP Certified Wirele Network E pert
- Juniper Network JNCDA, JCIA, JNCIP-Mist
- Aruba Network ADCX and ACMP

You can find a li t of all my e perience and certification on LinkedIn http //www linkedin com/in/jed rabe/
Upload Current Resume resume-jed-rabe.pdf
Interview Availability I understand that applicants will be asked to participate in a 15 minute interview via Zoom (or by phone) during the afternoon of June 7th, 2023
By checking thi bo , I agree to the following I certify that the information contained in thi application i correct to the best of my knowledge. I understand that to falsify information is grounds for refusing to appoint me, or for removal should I be appointed. I also affirm that I have read and understand the Sandy Code of Conduct for members of Boards and Commissions (available as a Supporting Document on this webpage), and I understand its application to my role and re pon ibilitie while erving on a City Board I pledge to conduct my elf by the Sandy Board and Commi ion Code of Conduct, and I understand that the City Council may remove me from my position if my conduct falls below these standards.

The results of this submission may be viewed at:

https://www.ci.sandy.or.us/node/15801/submission/20037

resume-jed-rabe.pdf
204K

Greg Brewster <gbrewster@ci.sandy.or.us>

Form submission from: SandyNet Advisory Board Application

1 me age

Sandy Oregon <sandy-or@municodeweb.com> Fri, Jun 2, 2023 at 1:38 PM
Reply-To: Sandy Oregon <sandy-or@municodeweb.com>
To gbrew ter@ci andy or u

Submitted on Friday, June 2, 2023 1 38pm

Submitted by u er [redacted]

Submitted value are

Fir t Name Jeremy
Last Name Pietzold
Email [redacted]
Phone Number [redacted]
Addre 39997 Dubarko Rd
City Sandy
State OR
Zip Code 97055
Mailing Addre (if different)
Please explain your interest in serving on the SandyNet Advisory Board
I think my past experience would be a benefit to the City of Sandy and I would like to volunteer to be on this committee.
What knowledge, education, or skills would you bring to the Board?
I can contribute my knowledge and e perience in Sandy, Oregon, to help better my community
Upload Current Resume jeremy_pietzold_resume_city_of_sandy_sandynet_committee_jan_2023.pdf
Interview Availability I understand that applicants will be asked to participate in a 15 minute interview via Zoom (or by phone) during the afternoon of June 7th, 2023
By checking thi bo , I agree to the following I certify that the information contained in thi application i correct to the best of my knowledge. I understand that to falsify information is grounds for refusing to appoint me, or for removal should I be appointed. I also affirm that I have read and understand the Sandy Code of Conduct for members of Boards and Commissions (available as a Supporting Document on this webpage), and I understand its application to my role and re pon ibilitie while erving on a City Board I pledge to conduct my elf by the Sandy Board and Commi ion Code of Conduct, and I understand that the City Council may remove me from my position if my conduct falls below these standards.

The results of this submission may be viewed at:

https://www.ci.sandy.or.us/node/15801/submission/20038

jeremy_pietzold_resume_city_of_sandy_sandynet_committee_jan_2023.pdf
60K

Greg Brewster <gbrewster@ci.sandy.or.us>

Form submission from: SandyNet Advisory Board Application

1 me age

Sandy Oregon <sandy-or@municodeweb.com> Fri, May 19, 2023 at 10:48 AM
Reply-To: Sandy Oregon <sandy-or@municodeweb.com>
To gbrew ter@ci andy or u

Submitted on Friday, May 19, 2023 10 48am

Submitted by anonymou u er [redacted]

Submitted value are

Fir t Name Greg
Last Name Moore
Email [redacted]
Phone Number [redacted]
Addre 39842 Syblon Lane
City Sandy
State OR
Zip Code 97055
Mailing Addre (if different)
Please explain your interest in serving on the SandyNet Advisory Board
My main interests in being a part of the advisory board for Sandy.net is to ensure long term financial stability of the business, maintaining a competitive market position, and advancing sustainable expansion of services to additional communitie in the area
What knowledge, education, or skills would you bring to the Board?
25 years in Information Technology, 10 years in Enterprise Software Implementations, former small business owner, and former node host + member of the Portland Telco Project (Free Wifi spread out over the Portland Metro Area).
Upload Current Re ume greg moore r implementation project manager pdf
Interview Availability I understand that applicants will be asked to participate in a 15 minute interview via Zoom (or by phone) during the afternoon of June 7th, 2023
By checking this box, I agree to the following: I certify that the information contained in this application is correct to the be t of my knowledge I under tand that to fal ify information i ground for refu ing to appoint me, or for removal hould I be appointed. I also affirm that I have read and understand the Sandy Code of Conduct for members of Boards and Commissions (available as a Supporting Document on this webpage), and I understand its application to my role and responsibilities while serving on a City Board. I pledge to conduct myself by the Sandy Boards and Commissions Code of Conduct, and I under tand that the City Council may remove me from my po ition if my conduct fall below the e standards.

The results of this submission may be viewed at:

https://www.ci.sandy.or.us/node/15801/submission/19925

greg moore r implementation project manager pdf
138K

Staff Report

Meeting Date:	June 20, 2023
From	Tyler Deems, Interim City Manager
SUBJECT:	2023 Mountain Festival Requests for Street Closures and Exclusive Use of Meinig Park

DECISION TO BE MADE:
Whether to grant the requests from the Mountain Festival

BACKGROUND / CONTEXT:
These closure requests are routinely brought to the Council for approval each year.

KEY CONSIDERATIONS / ANALYSIS:
The Sandy Mountain Festival requests exclusive use of Meinig Park during the 2023 Mountain Festival event; July 7th through July 9th, 2023.

The organization also requests the following street closures to facilitate various events:

- July 6th: 3:30 - 9:00 p.m. (parade line up)
  - Sunset St. between Towle Dr. and Bluff Rd.
  - Strawbridge Pkwy. between Tupper Rd. and Bluff Rd.
  - University Ave. between Hwy 26 and Sunset Ave.
  - The parade committee will maintain a one-way open lane for resident and emergency traffic. Around 6:00 p.m. they anticipate needing to close Bluff Rd. between Sandy Heights and Hwy 26 and Wolf Dr. between McCormick Dr. and Hwy 26

- July 8th - July 9th (performer parking and ADA parking)
  - Request to control street parking on McCormick Ave. between Wolf Dr. and the entrance to Meinig Park, and some spaces on Kimberly Ct.

- July 9th (festival close down)
  - Meinig Ave. between Barker Ct. and Hwy 211

The Sandy Area Chamber of Commerce requests the use of Centennial Plaza during the 2023 Music Fair & Fest event; July 6th through July 8th, 2023. In addition, the request seeks approval for the sale of alcohol on City property, as well as the use of amplified sound equipment.

The organization also request the following street closure to facilitate the event:

- July 5th - July 9th
    - Hoffman Ave. between Pioneer Blvd. and Proctor Blvd.

RECOMMENDATION:
Grant the request of the Sandy Mountain Festival organization for street closures as detailed above, and for exclusive use of Meinig Park, during the 2023 Mountain Festival event. Grant the request of the Sandy Area Chamber of Commerce for use of Centennial Plaza, and for street closure as detailed above, during the 2023 Music Fair and Feast event.

SUGGESTED MOTION LANGUAGE:
"I move to grant the requests submitted by the Sandy Mountain Festival and Sandy Area Chamber of Commerce for street closures as detailed in the staff report, for exclusive use of Meinig Park during the 2023 Mountain Festival event, and for use of Centennial Plaza during the 2023 Music Fair and Feast event."

LIST OF ATTACHMENTS/EXHIBITS:
- Letter from Sandy Mountain Festival Vice President, June 5, 2023
- Letter from Sandy Area Chamber of Commerce Executive Director, May 23, 2023

MEMORANDUM

TO: CITY COUNCIL, CITY OF SANDY

FROM: KAREN BISSELL, VICE PRESIDENT – SANDY MOUNTAIN FESTIVAL

SUBJECT: USE OF MEINIG PARK AN ROAD CLOSURE REQUEST

DATE: 6/5/2023

The Sandy Mountain Festival is requesting official authorization for exclusive use of Meinig Memorial Park for this year's festival. The request would begin at 9am, Friday July 7th and run through the close on July 9th.

The committee is also requesting the following streets closure for festival 2023.

- July 6th: 3:30 pm to 9 pm for the parade line up the following closures are requested:
    - Sunset Ave. closed between Towel Dr. and Bluff Rd.,
      Strawbridge Parkway between Tupper Rd. and Bluff Rd. ,
      University Ave. between Hwy 26 and Sunset Ave.
    - The parade committee will maintain a one-way open lane for resident and emergency traffic. At or around 6 pm we will need to close Bluff Rd. between Sandy Heights and Hwy 26 and as well as Wolf Dr. between McCormick Dr. and Hwy 26.
- July 8th and 9th: the Sandy Mountain Festival committee requests to control the street parking on McCormick Ave. between Wolf Dr. and the entrance to Meinig Park as well as some spaces on Kimberly Ct. In the past we've use this for handicap parking and parking for the performers on the front and back stages.
- July 9th: 5 pm to 9 pm close Meinig Ave. between Barker Ct. and Hwy 211.

Thank you for your assistance in this request. If you have any questions, please do not hesitate to call me at 503-333-8844.

SANDY
AREA CHAMBER OF COMMERCE
SUPPORTING BUSINESS. GROWING COMMUNITY.

May 23, 2023

City of Sandy
Kelly O'Neil
39250 Pioneer Blvd.
Sandy, OR 97055

To Whom It May Concern:

On behalf of the Sandy Area Chamber of Commerce, please consider this letter the formal request for use of the Sandy Centennial Plaza and street closure from Hoffman to Pioneer, for the duration of the Annual Sandy Music Fair and Feast.

This event will take place from Thursday, July 6 through Saturday, July 8, 2022. We are planning set-up days for Wednesday, July 5th and will finish tear-down of the event on Monday, July 10, 2023.

We are requesting public works to please place street closure barriers at the end of workday on Friday, June 30th, 2023. Due to the Fourth of July Holiday, set up is more complicated. If the barriers are dropped Friday, I can come and put the barriers up in the evening of July 4th. We will be bringing in the stage on Monday, July 3rd. If the barriers are there Friday, I will move them to the parking spaces Sunday evening for the stage arrival on Monday morning, to prevent people from using the parking spots where the stage is placed. The Transit Department will still have access to the street and transit center through Tuesday, July 4th and we will open the road back up Monday, July 10th after all the equipment is removed and we have cleaned the street, the plaza, and surrounding areas.

SACC is also asking for approval of the sale of alcohol on City property and the use of amplified sound equipment at Centennial Plaza for the Music Fair & Feast as well. We have completed and submitted the appropriate forms for this request. OLCC license is in the works. We will also forward certificate of insurance upon receiving it from our agent.

If you have any questions, please don't hesitate to call me at (503)-668-4006.

Sincerely,

Khrys Jones
Executive Director
Sandy Area Chamber of Commerce

cc: Sandy Police Department
Sandy Transit
Public Works
City Manager
Planning Department

Staff Report

Meeting Date:	June 20, 2023
From	Jenny Coker, Public Works Director
SUBJECT:	Business Oregon Funding For Design of Portland-Sandy Filtration Plant Transmission System

DECISION TO BE MADE:
Whether to authorize Interim City Manager to execute Loan Agreement A23007 with Business Oregon to fund program management, planning and design of the Portland-Sandy Filtration Plant Transmission System

PURPOSE / OBJECTIVE:
Resolution 2023-23 authorizes staff to enter into Loan Agreement No. A23007 with the State of Oregon, acting through its Oregon Infrastructure Finance Authority of the Oregon Business Development Department.

BACKGROUND / CONTEXT:
The City of Sandy Water Master Plan was adopted by Council into the City Comprehensive Plan on April 3, 2023. Key next steps for the City to deliver the Drinking Water Reinvestment Program include meeting the Bilateral Compliance Agreement for treatment of cryptosporidium by September 30, 2027, securing debt financing, and hiring a program manager.

The City applied for $88 Million in loans from the Drinking Water State Revolving Fund (DWSRF) in September 2022 in anticipation of the Drinking Water Reinvestment Program design beginning in Spring of 2023. However, DWSRF has a small pool of revolving funds to loan, and is currently working with the City to finance only a $6M project. Upon learning of the DWSRF fund shortage, City staff applied for three loans totaling $10 Million from the Special Public Works Fund (SPWF) (the maximum allowed) from Business Oregon in order to provide needed debt financing. Between the SPWF loans from Business Oregon and the DWSRF loan in process, the City has enough funding to begin the program. It is anticipated that the larger funding needed for the construction of the Portland to Sandy Filtration Plant Transmission System Project will include either a Water Infrastructure Finance and Innovation Act (WIFIA) loan or a water bond. The construction financing package as well as grant applications will of the program management scope that is currently underway and will be completed in the next two years. City Staff are currently working to reorganize the capital improvement program (CIP) based on highest priority given challenges of less available financing for drinking water projects compared to wastewater projects.

Table 1 below summarizes the Drinking Water Reinvestment Program Financing Package to date:

Table 1: Sandy Drinking Water Reinvestment Program Financing Package

Lender	Project	Status	Loan Amount	Project Phase
SPWF (Business Oregon)	Sandercock Reservoir	Complete	$1,000,080	Design & Construction
SPWF (Business Oregon)	Portland to Sandy Filtration Transmission System	Closing	$7,000,000	Design Pre-Award Ongoing
SPWF (Business Oregon)	Alder Creek Water Treatment Plant Immediate Needs Project	Application in Process	$2,000,000	Design &Construction
DW State Revolving Fund	Alder Creek Near Term Improvements	Application in Process	$6,000,000	Design & Construction
TBD (WIFIA or Bonds)	Portland to Sandy FiltrationTransmission System Construction	Not Started	$33,000,000	Construction
TBD (WIFIA, Bonds, Grants)	Additional CIP	Not Started	TBD	TBD
	Total Financing Package	**In progress**	**TBD**	**TBD**

The City hired Stantec as the Program Manager for the Drinking Water Reinvestment Program and the Second Phase of the Sandy Clean Waters Program. The Contract was awarded at the February 6, 2023 Council Meeting.

The City was awarded a $7 million SPWF loan for design, planning, and program management of the Portland to Sandy Filtration Plant Transmission System by Business Oregon on April 14, 2023. The City is currently using water reserves to pay for Drinking Water Program Management services, and had anticipated closing on this SPWF loan in June 2023. Completion of this loan agreement will allow past program management services, and future management and design services, to be reimbursed to the City as design begins on the Portland to Sandy Filtration Plant Transmission System.

KEY CONSIDERATIONS / ANALYSIS:
The City is behind schedule with the interim milestone dates established by the Oregon Health Authority for the Bilateral Compliance Agreement for treatment of cryptosporidium and has to make rapid progress to meet the completion deadline of September 30, 2027. This low interest loan allows for program management, design, and financing to progress such that the project may begin construction in 2025 to meet the September 2027 completion date.

The Business Oregon Loan has a below market interest rate of 1.54% which makes this funding source preferable over regular market-rate loans.

RECOMMENDATION:
Authorize the Interim City Manager to execute Loan Agreement A23007 in the amount of $7 Million.

BUDGETARY IMPACT:
Business Oregon is offering a loan totaling $7 Million at an interest rate of 1.54%. The repayment period is 7 years after contract completion. Repayment will be made from water rate revenues and is included in the rate model.

SUGGESTED MOTION LANGUAGE:
"I move to approve Resolution 2023-23."

LIST OF ATTACHMENTS/EXHIBITS:
- Resolution 2023-23
    - Business Oregon Loan Packet
    - Opinion of Counsel

NO. 2023-23

A RESOLUTION AUTHORIZING A LOAN FROM THE SPECIAL PUBLIC WORKS FUND BY ENTERING INTO A FINANCING CONTRACT WITH THE OREGON INFRASTRUCTURE FINANCE AUTHORITY

Whereas, The City of Sandy (the Recipient) is a "municipality" within the meaning of Oregon Revised Statutes 285B.410(9); and

Whereas, Oregon Revised Statutes 285B.410 through 285B.482 (the "Act") authorize any municipality to file an application with the Oregon Infrastructure Finance Authority of the Business Development Department ("OBDD") to obtain financial assistance from the Special Public Works Fund; and

Whereas, The Recipient has filed an application with the OBDD to obtain financial assistance for a "development project" within the meaning of the Act; and

Whereas, The OBDD has approved the Recipient's application for financial assistance from the Special Public Works Fund pursuant to the Act; and

Whereas, The Recipient is required, as a prerequisite to the receipt of financial assistance from the OBDD, to enter into a Financing Contract with the OBDD, number A23007, substantially in the form attached hereto as Exhibit A. The project is described in Exhibit C to that Financing Contract (the "Project"); and

Whereas, Notice relating to the Recipient's consideration of the adoption of this Resolution was published in full accordance with the Recipient's charter and laws for public notification; and

Whereas, The City Attorney has reviewed the Loan Agreement and furnished an Opinion of Counsel attached hereto as Exhibit B regarding the City's fitness to enter into the Agreement;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Sandy

Section 1. Financing Loan Authorized The Interim City Manager (the "Authorized Officer") is hereby authorized to execute on behalf of the City the Financing Contract and such other documents as may be required to obtain financial assistance (the "Financing Documents"), including a loan from the Oregon Infrastructure Finance Authority of the Business Development Department ("OBDD"), on such terms as may be agreed upon between the Authorized Officer and OBDD, on the condition that the principal amount of the loan from the OBDD to the Recipient is not in excess of $7,000,000 and an annual interest rate of 1.54% per annum. The proceeds of

the loan from the OBDD will be applied solely to the "Costs of the Project" as such term is defined in the Financing Contract.

Section 2. Sources of Repayment Amounts payable by the Recipient are payable from the sources described in section 4 of the Financing Contract and the Oregon Revised Statutes Section 285B.437(3) which include:

a) The revenues of the project, including special assessment revenues;
b) Amounts withheld under ORS 285B.449 (1);
c) The general fund of the Recipient; or
d) Any other source.

Section 3. Tax-Exempt Status The Recipient covenants not to take any action or omit to take any action if the taking or omission would cause interest paid by the Recipient pursuant to the Financing Documents not to qualify for the exclusion from gross income provided by Section 103(a) of the Internal Revenue Code of 1986, as amended. The Recipient may enter into covenants to protect the tax-exempt status of the interest paid by the Recipient pursuant to the Financing Documents and may execute any Tax Certificate, Internal Revenue Service forms or other documents as may be required by the OBDD or its bond counsel to protect the tax-exempt status of such interest.

Section 4. Reimbursement Bonds The Recipient may make certain expenditures on the Project prior to the date the Financing Contract is executed with OBDD or the date the State of Oregon issues any bonds to fund the loan. The Recipeint hereby declares its intent to seek reimbursment of such expenditures with amounts received from the OBDD pursuant to the Financing Contract, but only as permitted by OBDD policy, the Financing Contract, and federal tax regualtions. Additionally, the Recipient understands that the OBDD may fund or reimburse itself for the funding of amounts paid to the Recipient prusuant to the Financing Documents with the proceeds of bonds issued by the State of Oregon pursuant to the Act. This Resolution constitutes "official intent" within the meaning of the 26 C.F.R. §1.150-2 of the income tax regulations promulgated by the United States Department of the Treasury.

This resolution is adopted by the Common Council of the City of Sandy and approved by the Mayor this 20 day of June 2023

_____
Stan Pulliam, Mayor

#2023-23

ATTEST:

_____
Jeff Aprati, City Recorder

#2023-23

EXHIBIT A

SPECIAL PUBLIC WORKS FUND PLANNING PROJECT
FINANCING CONTRACT

Project Name: Portland to Sandy Water Filtration Plant Transmission System

Project Number: A23007

This financing contract ("Contract"), dated as of the date the Contract is fully executed, is made by the State of Oregon, acting by and through its Oregon Infrastructure Finance Authority of the Oregon Business Development Department ("OBDD"), and City of Sandy ("Recipient") for financing of the project referred to above and described in Exhibit C ("Project"). This Contract becomes effective only when fully signed and approved as required by applicable law. Capitalized terms not defined in section 1 and elsewhere in the body of the Contract have the meanings assigned to them by Exhibit A.

This Contract includes the following exhibits, listed in descending order of precedence for purposes of resolving any conflict between two or more of the parts:

Exhibit A	General Definitions
Exhibit B	Security
Exhibit C	Project Description
Exhibit D	Project Budget

SECTION 1 - KEY TERMS

The following capitalized terms have the meanings assigned below.

"Estimated Project Cost" means $7,000,000.

"Interest Rate" means 1.54% per annum.

"Loan Amount" means $7,000,000.

"Maturity Date" means the 6th anniversary of the Repayment Commencement Date.

"Payment Date" means December 1**.**

"Project Closeout Deadline" means 90 days after the earlier of the Project Completion Date or the Project Completion Deadline.

"Project Completion Deadline" means 24 months after the date of this Contract.

"Repayment Commencement Date" means the first Payment Date to occur after the Project Closeout Deadline.

SECTION 2 - FINANCIAL ASSISTANCE

Commitment. OBDD shall provide Recipient, and Recipient shall accept from OBDD, financing for the Project specified below:

(1) A non-revolving loan in an aggregate principal amount not to exceed the Loan Amount, (the "Loan").

SECTION 3 - DISBURSEMENTS

A. Reimbursement Basis. The Financing Proceeds will be disbursed to Recipient on an expense reimbursement or costs-incurred basis. Recipient must submit each disbursement request for the

Financing Proceeds on an OBDD-provided or OBDD-approved disbursement request form ("Disbursement Request").

B. Financing Availability. OBDD's obligation to make and Recipient's right to request disbursements under this Contract terminates on the Project Closeout Deadline.

SECTION 4 - LOAN PAYMENT; PREPAYMENT

A. Promise to Pay. Recipient shall repay the Loan and all amounts due under this Contract in accordance with its terms. Payments required under this Contract are, without limitation, payable from the sources of repayment described in the Act and this Contract, including but not limited to Exhibit B, and the obligation of Recipient to make all payments is absolute and unconditional. Payments will not be abated, rebated, set-off, reduced, abrogated, terminated, waived, postponed, or otherwise modified in any manner whatsoever. Payments cannot remain unpaid, regardless of any contingency, act of God, event or cause whatsoever, including (without limitation) any acts or circumstances that may constitute failure of consideration, eviction or constructive eviction, the taking by eminent domain or destruction of or damage to the Project, commercial frustration of purpose, any change in the laws, rules or regulations of the United States of America or of the State of Oregon or any political subdivision or governmental authority, nor any failure of OBDD to perform any agreement, whether express or implied, or any duty, liability, or obligation arising out of or connected with the Project or this Contract, or any rights of set off, recoupment, abatement or counterclaim that Recipient might otherwise have against OBDD or any other party or parties; provided further, that payments hereunder will not constitute a waiver of any such rights.

B. Interest. Interest accrues at the Interest Rate on each disbursement from the date of disbursement until the Loan is fully paid. All unpaid interest accrued to the Repayment Commencement Date is (in addition to the first regular installment payment due) payable on the Repayment Commencement Date. Interest is computed by counting the actual days occurring in a 360-day year.

Recipient authorizes OBDD to calculate accrued interest for purposes including, but not limited to, loan amortization schedule, loan prepayment, and loan payoff. Absent manifest error, such calculations will be conclusive.

C. Loan Payments. Starting on the Repayment Commencement Date and then on each succeeding Payment Date, Recipient shall make level installment payments of principal and interest, each payment sufficient to pay the interest accrued to the date of payment and so much of the principal as will fully amortize the Loan by the Maturity Date, on which date the entire outstanding balance of the Loan is due and payable in full.

D. Loan Prepayments. Recipient may prepay all or part of the outstanding balance of the Loan on any day except a Saturday, Sunday, legal holiday or day that banking institutions in Salem, Oregon are closed.

E. Application of Payments. Regardless of any designation by Recipient, payments and prepayments by Recipient under this Contract or any of the Financing Documents will be applied first to any expenses of OBDD, including but not limited to attorneys' fees, then to unpaid accrued interest (in the case of prepayment, on the amount prepaid), then to the principal of the Loan. In the case of a Loan prepayment that does not prepay all the principal of the Loan, OBDD will determine, in its sole discretion, the method for how the Loan prepayment will be applied to the outstanding principal payments. A scheduled payment received before the scheduled repayment date will be applied to interest and principal on the scheduled repayment date, rather than on the day such payment is received.

SECTION 5 - CONDITIONS PRECEDENT

A. Conditions Precedent to OBDD's Obligations. OBDD's obligations are subject to the receipt of the following items, in form and substance satisfactory to OBDD and its Counsel:

(1) This Contract duly signed by an authorized officer of Recipient.

(2) A copy of the ordinance, order or resolution of the governing body of Recipient authorizing the borrowing and the contemplated transactions and the execution and delivery of this Contract and the other Financing Documents.

(3) Such other certificates, documents, opinions and information as OBDD may reasonably require.

B. Conditions to Disbursements. As to any disbursement, OBDD has no obligation to disburse funds unless all following conditions are met:

(1) There is no Event of Default.

(2) The representations and warranties made in this Contract are true and correct on the date of disbursement as if made on such date.

(3) OBDD, in the reasonable exercise of its administrative discretion, has sufficient moneys in the Fund for use in the Project and has sufficient funding, appropriations, limitations, allotments and other expenditure authority to make the disbursement.

(4) Recipient delivers to OBDD an estimated schedule for Disbursement Requests covering anticipated number, submission dates, and amounts.

(5) OBDD (a) has received a completed Disbursement Request, (b) has received any written evidence of materials and labor furnished to or work performed upon the Project, itemized receipts or invoices for payment, and releases, satisfactions or other signed statements or forms as OBDD may require, (c) is satisfied that all items listed in the Disbursement Request are reasonable and that the costs for labor and materials were incurred and are properly included in the Costs of the Project, and (d) has determined that the disbursement is only for costs defined as eligible costs under the Act and any implementing administrative rules and policies.

(6) Recipient has delivered documentation satisfactory to OBDD that, in addition to the Financing Proceeds, Recipient has available or has obtained binding commitments for all funds necessary to complete the Project.

(7) Any conditions to disbursement elsewhere in this Contract or in the other Financing Documents are met.

SECTION 6 - USE OF FINANCIAL ASSISTANCE

A. Use of Proceeds. Recipient shall use the Financing Proceeds only for the activities described in Exhibit C and according to the budget in Exhibit D. Recipient may not transfer Financing Proceeds among line items in the budget without the prior written consent of OBDD.

B. Costs of the Project. Recipient shall apply the Financing Proceeds to the Costs of the Project in accordance with the Act, and Oregon law as applicable. Financing Proceeds cannot be used for costs in excess of one hundred percent (100%) of the total Costs of the Project and cannot be used for pre-Award Costs of the Project, unless permitted by Exhibit C.

C. Costs Paid for by Others. Recipient may not use any of the Financing Proceeds to cover costs to be paid for by other financing for the Project from another State of Oregon agency or any third party.

SECTION 7 - REPRESENTATIONS AND WARRANTIES OF RECIPIENT

Recipient represents and warrants to OBDD:

A. Estimated Project Cost, Funds for Repayment. A reasonable estimate of the Costs of the Project is shown in section 1, and the Project is fully funded. Recipient will have adequate funds available to repay the Loan, and the Maturity Date does not exceed the usable life of the Project.

B. Organization and Authority.

(1) Recipient is a Municipality under the Act, and validly organized and existing under the laws of the State of Oregon.

(2) Recipient has all necessary right, power and authority under its organizational documents and under Oregon law to (a) execute and deliver this Contract and the other Financing Documents, (b) incur and perform its obligations under this Contract and the other Financing Documents, and (c) borrow and receive financing for the Project.

(3) This Contract and the other Financing Documents have been duly executed by Recipient, and when executed by OBDD, are legal, valid and binding, and enforceable in accordance with their terms.

(4) This Contract and the other Financing Documents executed and delivered by Recipient have been authorized by an ordinance, order or resolution of Recipient's governing body, and voter approval, if necessary, that was adopted in accordance with applicable law and requirements for filing public notices and holding public meetings.

C. Full Disclosure. Recipient has disclosed in writing to OBDD all facts that materially adversely affect the Project, or the ability of Recipient to make all payments and perform all obligations required by this Contract and the other Financing Documents. Recipient has made no false statements of fact, nor has it omitted information necessary to prevent any statements from being misleading. The information contained in this Contract and the other Financing Documents is true and accurate in all respects.

D. Pending Litigation. Recipient has disclosed in writing to OBDD all proceedings pending (or to the knowledge of Recipient, threatened) against or affecting Recipient, in any court or before any governmental authority or arbitration board or tribunal, that, if adversely determined, would materially adversely affect the Project or the ability of Recipient to make all payments and perform all obligations required by this Contract and the other Financing Documents.

E. No Events of Default.

(1) No Events of Default exist or occur upon authorization, execution or delivery of this Contract or any of the Financing Documents.

(2) Recipient has not violated, and has not received notice of any claimed violation of, any agreement or instrument to which it is a party or by which the Project or its property may be bound, that would materially adversely affect the Project or the ability of Recipient to make all payments and perform all obligations required by this Contract and the other Financing Documents.

F. Compliance with Existing Agreements and Applicable Law. The authorization and execution of, and the performance of all obligations required by, this Contract and the other Financing Documents will

not: (i) cause a breach of any agreement to which Recipient is a party or by which the Project or any of its property or assets may be bound; (ii) cause the creation or imposition of any third party lien, charge or encumbrance upon any property or asset of Recipient; (iii) violate any provision of the charter or other document pursuant to which Recipient was organized or established; or (iv) violate any laws, regulations, ordinances, resolutions, or court orders related to Recipient, the Project or its properties or operations.

SECTION 8 - COVENANTS OF RECIPIENT

Recipient covenants as follows:

A. Notice of Adverse Change. Recipient shall promptly notify OBDD of any adverse change in the activities, prospects or condition (financial or otherwise) of Recipient or the Project related to the ability of Recipient to make all payments and perform all obligations required by this Contract or the other Financing Documents.

B. Compliance with Laws. Recipient shall comply with all applicable laws, rules, regulations and orders of any court or governmental authority that relate to this Contract or the other Financing Documents, the Project and the operation of the drinking water system to which the Project is associated. In particular, but without limitation, Recipient shall comply with the following, as applicable:

(1) State procurement regulations found in the Oregon Public Contracting Code, ORS chapters 279A, 279B and 279C.

(2) OAR 123-042-0165(5) requirements for signs and notifications.

These laws, rules, regulations and orders are incorporated by reference in this Contract to the extent required by law.

C. Project Completion Obligations. Recipient shall:

(1) When procuring professional consulting services, provide OBDD with copies of all solicitations at least 10 days before advertising, and all contracts at least 10 days before signing.

(2) Complete the Project using its own fiscal resources or money from other sources to pay for any Costs of the Project in excess of the total amount of financial assistance provided pursuant to this Contract.

(3) Complete the Project no later than the Project Completion Deadline, unless otherwise permitted by OBDD in writing.

(4) No later than the Project Closeout Deadline, Recipient must deliver to OBDD an electronic copy of the final report.

D. NOT APPLICABLE

E. Inspections; Information. Recipient shall permit OBDD and any party designated by OBDD: (i) to inspect, at any reasonable time, the property, if any, constituting the Project; and (ii) at any reasonable time, to inspect and make copies of any accounts, books and records, including, without limitation, its records regarding receipts, disbursements, contracts, investments and any other related matters, and financial statements or other documents related to its financial standing. Recipient shall supply any related reports and information as OBDD may reasonably require.

F. Records Maintenance. Recipient shall retain and keep accessible all books, documents, papers, and records that are directly related to this Contract, the Project or the Financing Proceeds until the date

that is three years following the later of the final maturity of the Lottery Bonds, or the final maturity or redemption date of any obligation, or series of obligations, that refinanced the Lottery Bonds, or such longer period as may be required by other provisions of this Contract or applicable law.

G. Economic Benefit Data. OBDD may require Recipient to submit specific data on the economic development benefits of the Project and other information to evaluate the success and economic impact of the Project, from the date of this Contract until six years after the Project Completion Date. Recipient shall, at its own expense, prepare and submit the data within the time specified by OBDD.

H. Disadvantaged Business Enterprises. ORS 200.090 requires all public agencies to "aggressively pursue a policy of providing opportunities for disadvantaged business enterprises, minority-owned businesses, woman-owned businesses, businesses that service-disabled veterans owned and emerging small businesses..." OBDD encourages Recipient in any contracting activity to follow good faith efforts as described in ORS 200.045, available at https://www.oregonlegislature.gov/bills_laws/ors/ors200.html. Additional resources are provided by the Governor's Policy Advisor for Economic and Business Equity. Also, the Certification Office for Business Inclusion and Diversity at the Oregon Business Development Department maintains a list of certified firms and can answer questions. Search for certified MWESB firms on the web at: https://oregon4biz.diversitysoftware.com/FrontEnd/SearchCertifiedDirectory.asp?XID=2315&TN=oregon4biz.

I. Professional Responsibility. A professional engineer or architect, as applicable, registered and in good standing in Oregon, will be responsible for any construction design for the Project. All service providers retained for their professional expertise must be certified, licensed, or registered, as appropriate, in the State of Oregon for their specialty.

J. Notice of Events of Default. Recipient shall give OBDD prompt written notice of any Event of Default, or any circumstance that with notice or the lapse of time, or both, may become an Event of Default, as soon as Recipient becomes aware of its existence or reasonably believes an Event of Default is likely.

K. Contributory Liability and Contractor Indemnification.

(1) If any third party makes any claim or brings any action, suit or proceeding alleging a tort as now or hereafter defined in ORS 30.260 ("Third Party Claim") against a party (the "Notified Party") with respect to which the other party may have liability, the Notified Party must promptly notify the other party in writing and deliver a copy of the claim, process, and all legal pleadings related to the Third Party Claim. Either party is entitled to participate in the defense of a Third Party Claim, and to defend a Third Party Claim with counsel of its own choosing. The foregoing provisions are conditions precedent for either party's liability to the other in regards to the Third Party Claim.

If the parties are jointly liable (or would be if joined in the Third Party Claim), the parties shall contribute to the amount of expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred and paid or payable in such proportion as is appropriate to reflect their respective relative fault. The relative fault of the parties shall be determined by reference to, among other things, the parties' relative intent, knowledge, access to information and opportunity to correct or prevent the circumstances resulting in such expenses, judgments, fines or settlement amounts. Each party's contribution amount in any instance is capped to the same extent it would have been capped under Oregon law if that party had sole liability in the proceeding. This Section shall survive termination of this Contract.

(2) Recipient shall take all reasonable steps to require its contractor(s) that are not units of local

government as defined in ORS 190.003, if any, to indemnify, defend, save and hold harmless the State of Oregon and its officers, employees and agents ("Indemnitee") from and against any and all claims, actions, liabilities, damages, losses, or expenses (including attorneys' fees) arising from a tort (as now or hereafter defined in ORS 30.260) caused, or alleged to be caused, in whole or in part, by the negligent or willful acts or omissions of Recipient's contractor or any of the officers, agents, employees or subcontractors of the contractor ("Claims"). It is the specific intention of the parties that the Indemnitee shall, in all instances, except for Claims arising solely from the negligent or willful acts or omissions of the Indemnitee, be indemnified by the contractor from and against any and all Claims. This Section shall survive termination of this Contract.

L. Reserved.

M. Exclusion of Interest from Federal Gross Income and Compliance with Code.

(1) Recipient shall not take any action or omit to take any action that would result in the loss of the exclusion of the interest on any Lottery Bonds from gross income for purposes of federal income taxation, as governed by Section 103(a) of the Code. OBDD may decline to disburse the Financing Proceeds if it finds that the federal tax exemption of the Lottery Bonds cannot be assured.

(2) Recipient shall not take any action (including but not limited to the execution of a management agreement for the operation of the Project) or omit to take any action that would cause any Lottery Bonds to be "private activity bonds" within the meaning of Section 141(a) of the Code. Accordingly, unless Recipient receives the prior written approval of OBDD, Recipient shall not permit in excess of ten percent (10%) of either (a) the Financing Proceeds or (b) the Project financed or refinanced with the Financing Proceeds to be directly or indirectly used in any manner that would constitute "private business use" within the meaning of Section 141(b)(6) of the Code, including not permitting more than one half of any permitted private business use to be "disproportionate related business use" or private business use unrelated to the government use of the Financing Proceeds. Unless Recipient receives the prior written approval of OBDD, Recipient shall not directly or indirectly use any of the Financing Proceeds to make or finance loans to persons other than governmental units, as that term is used in Section 141(c) of the Code.

(3) Recipient shall not directly or indirectly use or permit the use of any of the Financing Proceeds or any other funds or take any action or omit to take any action, which would cause any Lottery Bonds to be "arbitrage bonds" within the meaning of Section 148(a) of the Code.

(4) Recipient shall not cause any Lottery Bonds to be treated as "federally guaranteed" for purposes of Section 149(b) of the Code, as may be modified in any applicable rules, rulings, policies, procedures, regulations, or other official statements promulgated or proposed by the Department of the Treasury or the Internal Revenue Service with respect to "federally guaranteed" obligations described in Section 149(b) of the Code. For purposes of this paragraph, any Lottery Bonds will be treated as "federally guaranteed" if: (a) all or any portion of the principal or interest is or will be guaranteed directly or indirectly by the United States of America or any agency or instrumentality thereof, or (b) five percent (5%) or more of the proceeds of the Lottery Bonds will be (i) used in making loans if the payment of principal or interest is guaranteed in whole or in part by the United States of America or any agency or instrumentality thereof, or (ii) invested directly or indirectly in federally insured deposits or accounts, and (c) none of the exceptions described in Section 149(b)(3) of the Code apply.

(5) Recipient shall assist OBDD to ensure that all required amounts are rebated to the United States of America pursuant to Section 148(f) of the Code. Recipient shall pay to OBDD such amounts as may be directed by OBDD to satisfy the requirements of Section 148(f) applicable to the portion of the proceeds of any tax-exempt bonds, including any Financing Proceeds or other amounts held in a reserve fund. Recipient further shall reimburse OBDD for the portion of any expenses it incurs related to the Project that is necessary to satisfy the requirements of Section 148(f) of the Code.

(6) Upon OBDD's request, Recipient shall furnish written information regarding its investments and use of Financing Proceeds, and of any facilities financed or refinanced therewith, including providing OBDD with any information and documentation that OBDD reasonably determines is necessary to comply with the arbitrage and private use restrictions that apply to the Lottery Bonds.

(7) Notwithstanding anything to the contrary, so long as is necessary to maintain the exclusion from gross income for purposes of federal income taxation of interest on any Lottery Bonds, the covenants contained in this subsection will survive the payment of the Loan and the Lottery Bonds, and the interest thereon, Project, including the application of any unexpended Financing Proceeds. Recipient acknowledges that the Project may be funded with proceeds of the Lottery Bonds and that failure to comply with the requirements of this subsection could adversely affect any exclusion of the interest on the Lottery Bonds from gross income for federal income tax purposes.

(8) Neither Recipient nor any related party to Recipient, within the meaning of 26 C.F.R. §1.150-1(b), shall purchase any Lottery Bonds, from which proceeds were used to finance the Project, in an amount related to the amount of the Loan.

(9) Recipient may use the Financing Proceeds to reimburse itself for Project expenditures made prior to the funding of the Project only if permitted by Exhibit D and only if such reimbursement is allowed under one of the following four categories pursuant to 26 C.F.R. §1.150-2:

(a) Preliminary expenditures such as architectural, engineering, surveying, soil testing, bond issuance and similar costs that, in the aggregate, are not in excess of 20% of the Financing Proceeds. Costs of land acquisition, site preparation and similar costs incident to commencement of construction are not preliminary expenditures.

(b) Expenditures for issuance costs.

(c) Expenditures that are described in a reimbursement resolution or other declaration of official intent that satisfies the requirements of 26 C.F.R. §1.150-2 and paid no earlier than 60 days prior to the adoption of such resolution or official intent.

(d) Expenditures paid within 60 days prior to the date the Loan is funded.

SECTION 9 - DEFAULTS

Any of the following constitutes an "Event of Default":

A. Recipient fails to make any Loan payment when due.

B. Recipient fails to make, or cause to be made, any required payments of principal, redemption premium, or interest on any bonds, notes, or other material obligations, for any other loan made by the State of Oregon.

C. Any false or misleading representation is made by or on behalf of Recipient in this Contract, in any other Financing Document or in any document provided by Recipient related to this Loan or the Project or in regard to compliance with the requirements of Section 103 and Sections 141 through 150 of the Code.

D. (1) A petition, proceeding or case is filed by or against Recipient under any federal or state bankruptcy or insolvency law, and in the case of a petition filed against Recipient, Recipient acquiesces to such petition or such petition is not dismissed within 20 calendar days after such filing, or such dismissal is not final or is subject to appeal;

(2) Recipient files a petition seeking to take advantage of any other law relating to bankruptcy, insolvency, reorganization, liquidation, dissolution, winding-up or composition or adjustment of debts;

(3) Recipient becomes insolvent or bankrupt or admits its inability to pay its debts as they become due, or makes an assignment for the benefit of its creditors;

(4) Recipient applies for or consents to the appointment of, or taking of possession by, a custodian (including, without limitation, a receiver, liquidator or trustee) of Recipient or any substantial portion of its property; or

(5) Recipient takes any action for the purpose of effecting any of the above.

E. Recipient defaults under any other Financing Document and fails to cure such default within the applicable grace period.

F. Recipient fails to perform any obligation required under this Contract, other than those referred to in subsections A through E of this section 9, and that failure continues for a period of 30 calendar days after written notice specifying such failure is given to Recipient by OBDD. OBDD may agree in writing to an extension of time if it determines Recipient instituted and has diligently pursued corrective action.

SECTION 10 - REMEDIES

A. Remedies. Upon any Event of Default, OBDD may pursue any or all remedies in this Contract or any other Financing Document, and any other remedies available at law or in equity to collect amounts due or to become due or to enforce the performance of any obligation of Recipient. Remedies may include, but are not limited to:

(1) Terminating OBDD's commitment and obligation to make the Loan or disbursements under the Contract.

(2) Barring Recipient from applying for future awards.

(3) Withholding amounts otherwise due to Recipient for application to the payment of amounts due under this Contract, including as provided in ORS 285B.449.

(4) Declaring all payments under the Contract and all other amounts due under any of the Financing Documents immediately due and payable, and upon notice to Recipient the same become due and payable without further notice or demand.

(5) Foreclosing liens or security interests pursuant to this Contract or any other Financing Document.

B. Application of Moneys. Any moneys collected by OBDD pursuant to section 10.A will be applied first, to pay any attorneys' fees and other fees and expenses incurred by OBDD; then, to pay interest

due on the Loan; then, to pay principal due on the Loan; and last, to pay any other amounts due and payable under this Contract or any of the Financing Documents.

C. No Remedy Exclusive; Waiver; Notice. No remedy available to OBDD is intended to be exclusive, and every remedy will be in addition to every other remedy. No delay or omission to exercise any right or remedy will impair or is to be construed as a waiver of such right or remedy. No single or partial exercise of any right power or privilege under this Contract or any of the Financing Documents will preclude any other or further exercise thereof or the exercise of any other such right, power or privilege. OBDD is not required to provide any notice in order to exercise any right or remedy, other than notice required in section 9 of this Contract.

D. Default by OBDD. In the event OBDD defaults on any obligation in this Contract, Recipient's remedy will be limited to injunction, special action, action for specific performance, or other available equitable remedy for performance of OBDD's obligations.

SECTION 11 - MISCELLANEOUS

A. Time is of the Essence. Recipient agrees that time is of the essence under this Contract and the other Financing Documents.

B. Relationship of Parties; Successors and Assigns; No Third Party Beneficiaries.

(1) The parties agree that their relationship is that of independent contracting parties and that Recipient is not an officer, employee, or agent of the State of Oregon as those terms are used in ORS 30.265.

(2) Nothing in this Contract gives, or is to be construed to give, directly or indirectly, to any third persons any rights and benefits greater than those enjoyed by the general public.

(3) This Contract will be binding upon and inure to the benefit of OBDD, Recipient, and their respective successors and permitted assigns.

(4) Recipient may not assign or transfer any of its rights or obligations or any interest in this Contract or any other Financing Document without the prior written consent of OBDD. OBDD may grant, withhold or impose conditions on such consent in its sole discretion. In the event of an assignment, Recipient shall pay, or cause to be paid to OBDD, any fees or costs incurred because of such assignment, including but not limited to attorneys' fees of OBDD's Counsel and Bond Counsel. Any approved assignment is not to be construed as creating any obligation of OBDD beyond those in this Contract or other Financing Documents, nor does assignment relieve Recipient of any of its duties or obligations under this Contract or any other Financing Documents.

(5) Recipient hereby approves and consents to any assignment, sale or transfer of this Contract and the Financing Documents that OBDD deems to be necessary.

C. Disclaimer of Warranties; Limitation of Liability. Recipient agrees that:

(1) OBDD makes no warranty or representation, either express or implied, as to the value, design, condition, merchantability or fitness for particular purpose or fitness for any use of the Project or any portion of the Project, or any other warranty or representation.

(2) In no event are OBDD or its agents liable or responsible for any direct, indirect, incidental, special, consequential or punitive damages in connection with or arising out of this Contract or the existence, furnishing, functioning or use of the Project.

D. Notices and Communication. Except as otherwise expressly provided in this Contract, any communication between the parties or notices required or permitted must be given in writing by personal delivery, email, or by mailing the same, postage prepaid, to Recipient or OBDD at the addresses set forth below, or to such other persons or addresses that either party may subsequently indicate pursuant to this Section.

Any communication or notice by personal delivery will be deemed effective when actually delivered to the addressee. Any communication or notice so addressed and mailed will be deemed to be received and effective five (5) days after mailing. Any communication or notice given by email becomes effective 1) upon the sender's receipt of confirmation generated by the recipient's email system that the notice has been received by the recipient's email system or 2) the recipient's confirmation of receipt, whichever is earlier. Notwithstanding this provision, the following notices may not be given by email: notice of default or notice of termination.

If to OBDD:
Deputy Director
Oregon Business Development Department
775 Summer Street NE Suite 200
Salem, OR 97301-1280

If to Recipient:
Public Works Director
City of Sandy
9250 Pioneer Blvd.
Sandy, OR 97055

E. No Construction against Drafter. This Contract is to be construed as if the parties drafted it jointly.

F. Severability. If any term or condition of this Contract is declared by a court of competent jurisdiction as illegal, invalid or unenforceable, that holding will not invalidate or otherwise affect any other provision.

G. Amendments, Waivers. This Contract may not be amended without the prior written consent of OBDD (and when required, the Department of Justice) and Recipient. This Contract may not be amended in a manner that is not in compliance with the Act. No waiver or consent is effective unless in writing and executed by the party against whom such waiver or consent is sought to be enforced. Such waiver or consent will be effective only in the specific instance and for the specific purpose given.

H. Attorneys' Fees and Other Expenses. To the extent permitted by the Oregon Constitution and the Oregon Tort Claims Act, the prevailing party in any dispute arising from this Contract is entitled to recover its reasonable attorneys' fees and costs at trial and on appeal. Reasonable attorneys' fees cannot exceed the rate charged to OBDD by its attorneys. Recipient shall, on demand, pay to OBDD reasonable expenses incurred by OBDD in the collection of Loan payments.

I. Choice of Law; Designation of Forum; Federal Forum. The laws of the State of Oregon (without giving effect to its conflicts of law principles) govern all matters arising out of or relating to this Contract, including, without limitation, its validity, interpretation, construction, performance, and enforcement.

Any party bringing a legal action or proceeding against any other party arising out of or relating to this Contract shall bring the legal action or proceeding in the Circuit Court of the State of Oregon for Marion County (unless Oregon law requires that it be brought and conducted in another county). Each party hereby consents to the exclusive jurisdiction of such court, waives any objection to venue, and waives any claim that such forum is an inconvenient forum.

Notwithstanding the prior paragraph, if a claim must be brought in a federal forum, then it must be brought and adjudicated solely and exclusively within the United States District Court for the District of Oregon. This paragraph applies to a claim brought against the State of Oregon only to the extent Congress has appropriately abrogated the State of Oregon's sovereign immunity and is not consent by the State of Oregon to be sued in federal court. This paragraph is also not a waiver by the State of Oregon of any form of defense or immunity, including but not limited to sovereign immunity and immunity based on the Eleventh Amendment to the Constitution of the United States.

J. Integration. This Contract (including all exhibits, schedules, or attachments) and the other Financing Documents constitute the entire agreement between the parties on the subject matter. There are no unspecified understandings, agreements, or representations, oral or written, regarding this Contract.

K. Execution in Counterparts. This Contract may be signed in several counterparts, each of which is an original and all of which constitute one and the same instrument.

Recipient, by its signature below, acknowledges that it has read this Contract, understands it, and agrees to be bound by its terms and conditions.

STATE OF OREGON
acting by and through its
Oregon Business Development Department

By: _____
Chris Cummings, Deputy Director

Date: _____

CITY OF SANDY

By: _____
The Honorable Stan Pulliam
Mayor

Date: _____

APPROVED AS TO LEGAL SUFFICIENCY IN ACCORDANCE WITH ORS 291.047:

/s/ David Berryman as per email dated 28 May 2023
David Berryman, Assistant Attorney General

EXHIBIT A - GENERAL DEFINITIONS

As used in this Contract, the following terms have the meanings below.

"Act" means ORS 285B.410 through 285B.482, as amended.

"Award" means the award of financial assistance to Recipient by OBDD dated 07 April 2023.

"C.F.R." means the Code of Federal Regulations.

"Code" means the Internal Revenue Code of 1986, as amended, including any implementing regulations and any administrative or judicial interpretations.

"Costs of the Project" means Recipient's actual costs (including any financing costs properly allocable to the Project) that are (a) reasonable, necessary, and directly related to the Project, (b) permitted by generally accepted accounting principles to be Costs of the Project, and (c) are eligible or permitted uses of the Financing Proceeds under applicable state or federal statute and rule.

"Counsel" means an attorney at law or firm of attorneys at law duly admitted to practice law before the highest court of any state, who may be of counsel to, or an employee of, OBDD or Recipient.

"Financing Documents" means this Contract and all agreements, instruments, documents, and certificates executed pursuant to or in connection with OBDD's financing of the Project.

"Financing Proceeds" means the proceeds of the Loan.

"Lottery Bonds" means any bonds issued by the State of Oregon that are special obligations of the State of Oregon payable from unobligated net lottery proceeds, the interest on which is exempt from federal income taxation, together with any refunding bonds, used to finance or refinance the Project through the initial funding or refinancing of all or a portion of the Loan.

"Municipality" means any entity described in ORS 285B.410(9).

"ORS" means the Oregon Revised Statutes.

"Project Completion Date" means the date on which Recipient completes the Project.

EXHIBIT B - SECURITY

A. Full Faith and Credit Pledge. Recipient will be required to pledge its full faith and credit and taxing power within the limitations of Article XI, Sections 11 and 11 b, of the Oregon Constitution to pay the amounts due under the Financing Contract. The Financing Contract shall be payable from all legally available funds of Recipient.

B. Pledge of Net Revenues as Source of Repayment. Recipient will be required to grant to the State a security interest in and irrevocably pledge its Net Revenues of the Recipient's Water System revenue to pay all of the obligations owed by Recipient to the State under the Financing Contract.

C. Financial Covenants. Recipient shall charge rates and fees in connection with the operation of the Water System which, when combined with other gross revenues, are adequate to generate Net Revenues each fiscal year at least equal to one hundred twenty (120%) percent of the annual debt service due in the fiscal year on the Loan, any outstanding senior lien obligations, and any outstanding Parity Obligations.

D. Senior & Parity. No Parity or Senior Debt without Agency Approval shall apply to future obligations secured by Net Revenue from Recipient's Water System.

EXHIBIT C - PROJECT DESCRIPTION

Recipient will, with the assistance of a professional engineer licensed in Oregon, complete planning and pre-construction engineering and design for the Portland to Sandy Water Filtration Plant Transmission System. The system includes a 24-inch 11,500-foot pipeline and pump station that will begin at the intersection of Hudson/Bluff Road and run along Bluff Road to the Portland Water Bureau's filtration plant. Eligible pre-award expenses for design and planning activities include, but are not limited to, preparation of a funding and financing package, permitting (land-use, right-of-way, and environmental), and the development of Intergovernmental Agreements with the Portland Water Bureau and Pleasant Home Water District

EXHIBIT D - PROJECT BUDGET

Line Item Activity	OBDD Funds	Other / Matching Funds
Design/Engineering	$6,100,000	$0
Design/Engineering (pre-award)	$500,000	$0
Planning	$150,000	$0
Planning (pre-award)	$50,000	$0
Environmental Review	$200,000	$0
Total	$7,000,000	$0

EXHIBIT B

Beery Elsner & Hammond LLP

_____, 2023

Oregon Infrastructure Finance Authority
775 Summer Street NE Suite 200
Salem OR 97301-1280

Re: City of Sandy – Portland to Sandy Water Filtration Plant Transmission System

To Whom It May Concern:

Our firm represents the City of Sandy, Oregon (the "Recipient" or "City") and it is in that capacity I write to you. The City of Sandy has entered into a Financing Contract (as hereinafter defined) with the Oregon Infrastructure Finance Authority of the Oregon Business Development Department ("OBDD") pursuant to Sections 285B.560 through 285B.599 of the Oregon Revised Statutes (the "Act"), and our firm has acted as counsel to the Recipient in connection with the authorization, execution and delivery by the Recipient of the Contract (as hereinafter defined). Capitalized terms not otherwise defined in this letter shall have the meanings assigned to them by the Contract.

In so acting, I have examined the Constitution and laws of the State of Oregon and the Recipient's Charter. I have also examined originals, or copies, certified or otherwise, identified to my satisfaction, of the following:

A. The Financing Contract by and between the OBDD and the Recipient, number A23007, signed by Recipient on _____, in the principal loan amount of $7,000,000, executed by the Recipient (collectively, the "Contract");
B. Proceedings of the governing body of the Recipient relating to the approval of the Contract and the execution, issuance and delivery thereof on behalf of the Recipient, and the authorization of the undertaking and completion of the Project as defined in the Contract;
C. All outstanding instruments relating to bonds, notes or other indebtedness of or relating to the Recipient.

I have also examined and relied upon originals or copies, certified or otherwise, authenticated to my satisfaction, of such other records, documents, certificates and other instruments, and made such investigation of law as in my judgment I have deemed necessary or appropriate to enable me to render the opinions expressed below.

Based upon the foregoing, I am of the opinion that:

1. The Recipient is a duly formed and operating municipality described in ORS 285B.560(3), with the legal right to own and operate the Project.

t 503.226.7191
f 503.226.2348
e info@gov-law.com
1804 NE 45th Ave
Portland, OR 97213-1416
www.gov-law.com

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2. The Recipient has full legal right and authority to execute and deliver the Contract and to observe and perform its duties, covenants, obligations and agreements thereunder, and to undertake and complete the Project.

3. Amounts due to the OBDD pursuant to the Contract are payable from the sources described in Section 4 of the Contract.

4. The Resolution (the "Resolution") of the Recipient approving the Contract and authorizing their execution, issuance and delivery on behalf of the Recipient, and authorizing the Recipient to undertake and complete the Project has been duly and lawfully adopted and authorized in accordance with the Recipient's Charter, if any, the Act and other applicable Oregon law, and the Resolution was adopted at a meeting or meetings which were duly called with public notice and held in accordance with the Recipient's Charter, if any, and applicable Oregon law, and at which quorums were present and acting throughout.

5. The Contract has been duly authorized, executed and delivered by the authorized officers of the Recipient and constitutes the legal, valid and binding obligation of the Recipient enforceable in accordance with its terms; subject, however, to bankruptcy, insolvency, fraudulent conveyance, reorganization, moratorium and other similar laws affecting creditors' rights or remedies generally ("Creditor's Rights Limitations") heretofore or hereafter enacted and the application of equitable principles.

6. To the best of my knowledge, after such investigation as I have deemed appropriate, the authorization, execution and delivery of the Contract by the Recipient, the observation and performance by the Recipient of its duties, covenants, obligations and agreements thereunder and the consummation of the transactions contemplated therein and the undertaking and completion of Project, do not and will not contravene any existing law or any existing order, injunction, judgment, decree, rule or regulation of any court or governmental or administrative agency, authority or person having jurisdiction over the Recipient or its property or assets or result in a breach or violation of any of the terms and provisions of, or constitute a default under, any existing bond ordinance, resolution, trust agreement, indenture, mortgage, deed of trust or other agreement to which the Recipient is a party or by which it, the Project, or its property or assets is bound.

7. To the best of my knowledge, after such investigation as I have deemed appropriate, all approvals, consents or authorizations of, or registrations of or filings with, any governmental or public agency, authority or person required to date on the part of the Recipient in connection with the authorization, execution, delivery and performance of the Contract and the undertaking and completion of the Project, have been obtained or made.

8. To the best of my knowledge, after such investigation as I have deemed appropriate, there is no litigation or other proceeding pending or threatened in any court or other tribunal of competent jurisdiction (either State or Federal) questioning the creation, organization or existence of the Recipient or of the validity, legality or enforceability of the Contract or the undertaking or completion of the Project.

This opinion is rendered on the basis of the laws of the State of Oregon, including the Act, as enacted and construed on the date hereof. I express no opinion as to any matter not set forth in the numbered paragraphs herein.

Sincerely,

Unsigned Draft
Ashleigh K. Dougill
City Attorney for the City of Sandy

AKD/kkb

NO. 2023-23

A RESOLUTION AUTHORIZING A LOAN FROM THE SPECIAL PUBLIC WORKS FUND BY ENTERING INTO A FINANCING CONTRACT WITH THE OREGON INFRASTRUCTURE FINANCE AUTHORITY

Whereas, The City of Sandy (the Recipient) is a "municipality" within the meaning of Oregon Revised Statutes 285B.410(9); and

Whereas, Oregon Revised Statutes 285B.410 through 285B.482 (the "Act") authorize any municipality to file an application with the Oregon Infrastructure Finance Authority of the Business Development Department ("OBDD") to obtain financial assistance from the Special Public Works Fund; and

Whereas, The Recipient has filed an application with the OBDD to obtain financial assistance for a "development project" within the meaning of the Act; and

Whereas, The OBDD has approved the Recipient's application for financial assistance from the Special Public Works Fund pursuant to the Act; and

Whereas, The Recipient is required, as a prerequisite to the receipt of financial assistance from the OBDD, to enter into a Financing Contract with the OBDD, number A23007, substantially in the form attached hereto as Exhibit A. The project is described in Exhibit C to that Financing Contract (the "Project"); and

Whereas, Notice relating to the Recipient's consideration of the adoption of this Resolution was published in full accordance with the Recipient's charter and laws for public notification; and

Whereas, The City Attorney has reviewed the Loan Agreement and furnished an Opinion of Counsel attached hereto as Exhibit B regarding the City's fitness to enter into the Agreement;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Sandy

Section 1. Financing Loan Authorized The Interim City Manager (the "Authorized Officer") is hereby authorized to execute on behalf of the City the Financing Contract and such other documents as may be required to obtain financial assistance (the "Financing Documents"), including a loan from the Oregon Infrastructure Finance Authority of the Business Development Department ("OBDD"), on such terms as may be agreed upon between the Authorized Officer and OBDD, on the condition that the principal amount of the loan from the OBDD to the

Recipient is not in excess of $7,000,000 and an annual interest rate of 1.54% per annum. The proceeds of the loan from the OBDD will be applied solely to the "Costs of the Project" as such term is defined in the Financing Contract.

Section 2. Sources of Repayment Amounts payable by the Recipient are payable from the sources described in section 4 of the Financing Contract and the Oregon Revised Statutes Section 285B.437(3) which include:

a) The revenues of the project, including special assessment revenues;
b) Amounts withheld under ORS 285B.449 (1);
c) The general fund of the Recipient; or
d) Any other source.

Section 3. Tax-Exempt Status The Recipient covenants not to take any action or omit to take any action if the taking or omission would cause interest paid by the Recipient pursuant to the Financing Documents not to qualify for the exclusion from gross income provided by Section 103(a) of the Internal Revenue Code of 1986, as amended. The Recipient may enter into covenants to protect the tax-exempt status of the interest paid by the Recipient pursuant to the Financing Documents and may execute any Tax Certificate, Internal Revenue Service forms or other documents as may be required by the OBDD or its bond counsel to protect the tax-exempt status of such interest.

Section 4. Reimbursement Bonds The Recipient may make certain expenditures on the Project prior to the date the Financing Contract is executed with OBDD or the date the State of Oregon issues any bonds to fund the loan. The Recipeint hereby declares its intent to seek reimbursment of such expenditures with amounts received from the OBDD pursuant to the Financing Contract, but only as permitted by OBDD policy, the Financing Contract, and federal tax regualtions. Additionally, the Recipient understands that the OBDD may fund or reimburse itself for the funding of amounts paid to the Recipient prusuant to the Financing Documents with the proceeds of bonds issued by the State of Oregon pursuant to the Act. This Resolution constitutes "official intent" within the meaning of the 26 C.F.R. §1.150-2 of the income tax regulations promulgated by the United States Department of the Treasury.

This resolution is adopted by the Common Council of the City of Sandy and approved by the Mayor this 20 day of June 2023

_____
Stan Pulliam, Mayor

#2023-23

ATTEST:

_____
Jeff Aprati, City Recorder

#2023-23

Staff Report

Meeting Date:	June 20, 2023
From	Jenny Coker, Public Works Director
SUBJECT:	Amendment #6, Leeway Engineering Solutions Phase 1A Owners Representative Services

BACKGROUND / CONTEXT:
At their March 15, 2021 meeting, City Council authorized the City Manager to sign an agreement with Leeway Engineering Solutions for Owner's Representation services on Phase 1A of the Clean Waters Program. The negotiated fee for the required services totaled $242,735. This contract was then amended per the following:

- Amendment #1 dated January 2022 – Extended the contract by 10 months through the completion of Phase 1A (assumed to be October 2022) for $369,873.
- Amendment #2 dated April 2022 – Added the sub-consultant Water Dude and effort for Leeway to oversee the sub-consultant contract for $152,681.
- Amendment #3 dated 17 October 2022 - Added $883,779 in fees, extended the services by eight months to June 2023, and added additional contract scope including oversight of the Facility Plan Amendment, stress testing, and continued support and negotiations with the US Department of Justice for the Consent decree.
- Amendment #4 - Added clauses to the contract required by the ARPA Grant, but had no cost or schedule changes.
- Amendment #5 - Divides up the contract as required by the ARPA Grant for accounting purposes, but had no cost or schedule changes.

As the Council is aware, the timeline for completing the initial phase of improvements to the wastewater system has been delayed a number of times due to factors outside of staff's control. As such, it's imperative to the continued progress of the project to extend the existing contract with Leeway Engineering Services for owner's representation services.

KEY CONSIDERATIONS / ANALYSIS:
Amendment #6 will provide continuing Owner's Representative Services and covers the following additional services:

Extended Project Schedule
This amendment will extend services from July 2023 to January 2024. The construction of the WWTP Condition Assessment Improvements Project has been extended longer than expected due to delays from conducting the stress testing. In addition, the Leeway team will also be needed for management and oversight of the stress testing and

comprehensive capacity analysis due as part of the consent decree, as well as to support the city in final negotiations with the Environmental Protection Agency (EPA) on the additional capacity in the system, including the number of ERUs. We now anticipate these activities to extend into Fall of 2023, and with the finalization of the Facility Plan projected to occur in January 2024.

Extended Services

This amendment will provide extended services for the Clean Waters Program including but not limited to managing deliverables and continued negotiations with the United States Department of Justice (DOJ) and the EPA, construction management of the WWTP Improvement Project, overseeing completing of stress testing and comprehensive capacity evaluation, and completion of immediate deliverables from the consent decree such as the Capacity, Management, Operations and Maintenance Program (CMOM), planning and initiation of future phases of the collection system program, and overseeing ARPA, SRF, and EPA community grant funding requirements and reimbursements of applicable expenditures.

The requested amendment for Owner Representative support totals $491,263. The updated proposal and a detailed description of the additional services are attached. This increases the total fee to $2,140,925 for Owner's Representative Services including all amendments.

The City is forecasting spending $29 Million on the Sandy Clean Waters program by June 30, 2023. Leeway, as the Owner's Representative, provides staff augmentation, oversight, financing support, management, communications, change management and delivery of the program, including design services of the collection system rehabilitation basins 2, and 8, and 6 and 7. The total of all these services are 7.4% of the program thus far, and well within industry standards which are typically 15-20% for design services, and 7% for owners representative services.

Furthermore, when the last large amendment was completed in October of 2022, the team anticipated the stress testing process would be faster and simpler, and assumed that all the analysis would be completed by June 2023. Complications with meeting the schedule, conducting construction and stress testing, required additional resources to get through the Spring and meet schedule, and this was drawn from the Leeway scope including additional construction management provided by Stantec as a subconsultant and additional operations management support from Water Dude and Sampling support from Leeway, which were all necessary to successfully complete the stress testing. As a result, additional fees are required to replenish dollars put towards extra efforts required to deliver the stress test that were taken from consent decree required scope such as completion of the CMOM program (due in December 2023).

Lastly, Owner's Rep and Program Management services must be specific to the loan funding source as well as the project. With Phase 1A and the stress testing/comprehensive capacity analysis and Facility Plan Reports extending through the end of 2023, the contract providing these services needs to be extended as it

cannot be placed on a new funding source specific to a new project (such as the $46Million SRF loan specific to the next phase of expansion at the WWTP).

RECOMMENDATION:
Authorize the Interim City Manager to sign Amendment #6 to the Owners Representative agreement with Leeway Engineering Solutions.

BUDGETARY IMPACT:
The proposed Amendment, which totals $491,263, is funded by the American Rescue Plan Act (ARPA) Grant and is included in the program budget.

SUGGESTED MOTION LANGUAGE:
"I move to authorize the Interim City Manager to sign Amendment #6 to the Owners Representative agreement with Leeway Engineering Solutions in the amount of $491,263."

LIST OF ATTACHMENTS/EXHIBITS:
Draft contract amendment #6, including a scope and fee for additional services.

AMENDMENT NO. 6
to the
PROFESSIONAL SERVICES AGREEMENT
Between
CITY OF SANDY and LEEWAY ENGINEERING SOLUTIONS, LLC.

THIS AMENDMENT is made and entered into this ___ day of _____ 2023, by and between the City of Sandy, OR (hereinafter "CITY"), whose address for any formal notice is 39250 Pioneer Blvd. Sandy OR, 97055 and Leeway Engineering Solutions, LLC. (hereinafter "CONTRACTOR") with offices at 12597 NW Majestic Sequoia Way Portland, Oregon 97229. This is Amendment No. 6 to the Agreement dated March 22, 2021, between CITY and CONTRACTOR for Owner's Representative Services to the Phase 1A Clean Waters Program.

Now, therefore, CITY and CONTRACTOR agree that this amendment authorizes an additional budget of $491,263 and to amend the Agreement as follows:

1. Section 2 is amended to read as follows:

   DURATION OF CONTRACT. Unless earlier terminated or extended, this contract shall remain in force and effect date in the preamble above through January 31, 2024.

2. The Scope of Services in Exhibit A is amended to include services necessary to assist the City with the Sandy Clean Waters Program through the completion of Phase 1A and additional services as shown in Exhibit A to this Amendment. All other terms and provisions of the Agreement remain in full force and effect.

3. The Fee total in the budget in Exhibit B is changed to $2,140,925.

Both parties indicate their approval of this Amendment by their signatures below.

LEEWAY ENGINEERING SOLUTIONS, LLC.	CITY OF SANDY, OREGON
Authorized signature:	Authorized signature:
Digitally signed by Robert Lee, PE, PMP Reason: I am approving this document Date: 2023.06.01 20:42:18-07'00'	
Name: Robert Lee, Principal	Name: Tyler Deems, City Manager
Date: June 1, 2023	Date:

Attachment A

Scope of Services

City of Sandy, Oregon

Phase 1A Owner's Representation Services, Clean Waters Program Amendment No. 6

The City of Sandy (City) is in the midst of a large program to address needed improvements in their wastewater collection, conveyance, and treatment system. The City has retained Leeway Engineering Solutions (Leeway) to provide Owner's Representative (ORep) services to assist with Phase 1 (formerly Phase 1A) of the Sandy Clean Waters Program (SCWP).

This Scope of Services encompasses the sixth Amendment to the Contract. Below summarizes the previous Contract Amendments:

- Amendment No. 1 – Extended the contract by 10 months through the completion of Phase 1A (assumed to be October 2022)
- Amendment No.2 – Added the sub-consultant Waterdude and effort for Leeway to oversee the sub-consultant contract.
- Amendment No.3 – Extended the Contract through June 30, 2023 and added additional scope for increased assistance with EPA negotiations, stress testing, increased construction management over the WWTP improvements, and programmatic support for additional coordination with outside agencies such as Business Oregon (American Rescue Plan Act, ARPA) and Department of Environmental Quality for an additional State Revolving Fund loan.
- Amendment No 4 – Added clauses to the Contract as required by ARPA.
- Amendment No 5 – Divides up the Contract into Task Orders as required by ARPA

Phase 1 will extend past June 30, 2023, mainly due to supply chain issues impacting construction and regulatory requirements that have also created schedule delays (e.g., stress testing). This Amendment covers the following:

- Extend the Contract by 7 months through January 2024
- Amends the Contract to account for extended services for the Clean Waters Program including, but not limited to, managing the information requests and supporting continuing negotiations with the United States Department of Justice (DOJ) and the United States Environmental Protection Agency (EPA), construction management of the WWTP Improvements Project, overseeing the coordination of WWTP stress testing, and execution of additional regulatory requirements such as development of a Capacity, Management, Operations, and Maintenance (CMOM) program, planning and initiation of future phases of the Collection System program elements, and overseeing ARPA, SRF, and EPA Community Grant funding requirements.

In order to provide continuing Owner's Representative Services through January 2024, the following scope of services will be performed:

Phase 1. Program Management and Consultant Management

Objective: Provide and perform program administration and management activities and provide consultant management on the City's behalf through January 2024.

Activities: This phase includes technical and financial management, including the following:

- Extension of services in Amendment No.1 from July 1, 2023 to January 31, 2024
- Phase 1 program budget forecasts and estimates
- Oversee consultant and construction contracts, review invoices on behalf of the program, and submit invoices to the City
- Supporting financial analyses and updates to the City's rate model
- Participation in monthly Council Advisory Committee meetings
- Development of Contract, Contract Amendments, and staff reports of Clean Water Program consultants.

Deliverables: Deliverables developed under this phase shall include:

- Progress updates
- Project status reports
- Variance reports
- Monthly invoices
- Staff reports
- Contracts and Contract Amendments
- Program dashboard
- Action item and comment review logs

Assumptions: This phase assumes the following assumptions:

- Project duration extension of 7 months
- Weekly check-in calls, 0.75 hours per call and 0.5 hours for preparation
- Monthly WW Advisory Board meetings, 1 hour per meeting and 2 hours for preparation
- Monthly program update with City Manager, Assistant City Manager, Public Works Director, and Assistant Public Works Director
- Management of 4 Consultant or Construction Contracts (WWTP Improvements Design, WWTP Improvements CM/GC, NPDES Support, Collection System Basin 6 and 7 CM/GC)

Phase 2. EPA and DEQ Negotiations, CWSRF, and DEQ support

Objective: Provide regulatory assistance including negotiations and reporting with DEQ and DOJ/EPA.

Activities: This phase includes the following:

- Extension of services from July 1, 2023 to January 31, 2024
- Provide support, planning, and coordination for developing responses to EPA/DOJ requests or requirements, including:
  - Comprehensive Capacity Evaluation (CCE) report
- Lead the development of the following reports:
  - Semi-Annual Report of the SCWP (due by January 2024)
  - Quarterly reports summarizing new service connections and approved ERUs (Q1 and Q2 of FY 23/24).

Deliverables: Deliverables developed under this phase shall include:

- Reporting, as described above in Phase Activities.

Assumptions: This phase assumes the following assumptions:

- Access to other City-consultants
- Monthly DEQ or EPA meetings, 1 hour per meeting
- EPA will request 2 additional TMs related to the WWTP and Collection System

Phase 3. Funding Support

Objective: Provide required technical support for funding the SCWP.

Activities: This phase includes the following:

- Extension of services from July 1, 2023 to January 31, 2024
- Preparing engineering documents in support of the City's loan applications
- Providing review of reports and documents needed for loan grant applications
- Prepare disbursement requests with required supporting documentation

Deliverables: Deliverables developed under this phase shall include:

- Other funding support documents
- Technical documents as required by funding agencies

Assumptions: This phase assumes the following assumptions:

- Any additional Environmental Permitting support that is required by loan applications is assumed to be after the conclusion of Amendment 5, and the new Program Manager contract can be utilized to provide this support.
- 2 new loan applications will take place during the period of this Amendment.

Phase 4. WWTP Improvements Oversight

Objective: Phase is complete.

Activities: None.

Deliverables: None.

Phase 5. WWTP Services During Construction

Objective: Provide services during construction of the Existing WWTP Condition Assessment Improvements Project.

Activities: Tasks include:

- Extension of services from July 1, 2023 to September 30, 2023
- Provide construction management for existing WWTP Condition Assessment Improvements
- Project, including preparing agendas, reviewing and approving pay requests, reviewing and approving change orders and fieldwork directives, conducting a general preconstruction meeting and regular progress meetings, review of construction contractor's payroll to ensure compliance with prevailing wage rates, coordinating public engagement efforts, and coordinating with the construction contractor the development of Record Drawings.
- Monitor construction schedule and construction milestones.
- Coordinate as-needed inspection and documentation of the construction, including enforcing City-requirements for the construction contractor to maintain daily logs.
- Coordination with the City's design consultant(s), including performing City-related project management services such as invoice review and schedule management.
- Coordinate with the City's design consultant(s) for review and approval of shop drawings, product data, and other submittals.
- In conjunction with the City's design consultant(s), monitor and observe the testing and start-up of all systems and equipment and review test reports.
- Complete the final close-out of each construction project, including gathering all required approvals; obtaining all warranties, guarantees, bonds, manuals, and insurance certificates; obtaining all affidavits, waivers, and releases; analyzing all claims; representing the City at all meetings and inspections; and providing certificates of Substantial and Final Completion
- Oversee the reporting of the stress testing and the subsequent analysis of the WWTP capacity being performed by other City consultants

Deliverables: Deliverables developed under this phase shall include:

- All other construction-related documents referenced in the above Phase Activities
- Progress updates, project status reports, variance reports, monthly invoice reviews, meeting outlines, and minutes.

Assumptions: This phase assumes the following assumptions:

- Construction substantial completion in June 2023
- Leeway will not be performing daily inspections. City staff and/or Veolia staff will provide as-needed observations of ongoing work.
- Special inspections and testing will be either added to the CM/GC contract or the City will contract directly.

- Bi-weekly virtual progress meetings, 1 hour per meeting
- Bi-weekly on-stie progress meetings
- Weekly internal coordination meetings

Phase 6. NPDES Permit Support

Objective: After June 30, 2023, work will be transitioned to the City's Program Management contract.

Activities: None.

Deliverables: None.

Phase 7. Wastewater Operations Support

Objective: After June 30, 2023, Waterdude Wastewater Operations Support will be transitioned to the City's Program Management contract.

Activities: None.

Deliverables: None.

Phase 8. Tupper Road Storm Sewer Rehabilitation

Objective: Phase is complete.

Activities: None.

Deliverables: None.

Phase 9. 2022-2023 Collection System Program Elements

Objective: Progress the required collection system program elements, such as the flow and rainfall monitoring program, development and implementation of the MH grouting program, recalibration and remodeling of the collection system, and development of the CMOM plan.

Activities: This phase includes the following:

- Extension of services from July 1, 2023 to January 31, 2024
- Recalibration of the Collection System Model after the completion of Basin 6/7 rehabilitation and the initial MH grouting program, per industry-accepted practices and EPA requirements.
- Closeout of of Basin 6/7 Construction, including engineering services, construction management and approval of invoices.
- Development of the CMOM plan and program, in accordance with EPA guidelines
- Support for City-led CCTV and Manhole Grouting contracts
- Identification of immediate collection system improvements to be conducted in 2024

Deliverables: Deliverables developed under this phase shall include:

- Model recalibration and updated peak flow TM

- Basin 6/7 Construction Management documents
- CMOM Draft and Final Plan

Assumptions: This phase assumes the following assumptions:

- Model will be developed per EPA requirements
- Basin 6/7 and MH grouting projects will both be completed by July 2023

Phase 10. Rehabilitation, Repair, and Modifications (RRM) Projects

Objective: After June 30, 2023, work will be transitioned to the City's Program Management contract.

Activities: None.

Deliverables: None.

Level of Effort Estimate

Leeway proposes to complete this work as detailed above on a time and expenses basis summarized on the attached Level of Effort estimate. This "not-to-exceed" amount is based on this scope of work and will not be exceeded without approval and written authorization by the City of Sandy.

Staff Report

Meeting Date:	June 20, 2023
From	Jeff Aprati, Interim Deputy City Manager; Angie Welty, HR Director
SUBJECT:	Adoption of City Manager Position Profile and Hiring Procedures

DECISION TO BE MADE:
Whether to adopt the city manager position profile and hiring procedures

BACKGROUND / CONTEXT:
Official adoption of certain documents is required under Oregon law for a City Council to hold an executive session for the purpose of considering the employment of a new City Manager (per ORS 192.660(2)(a) and ORS 192.660(7)(d)). These documents include:

- Position Profile (containing Hiring Standards, Criteria, and Policy Directives)
- Hiring Procedures

The City of Sandy recruitment consultant, Jensen Strategies, LLC, gathered input through one-on-one interviews, online staff and community surveys, and an offered public input session, which was used to prepare a draft position profile and hiring procedures for the City's 2023 City Manager Recruitment. These documents are attached hereto as Appendices A and B, respectively.

The City Council provided feedback on the documents at its work session on June 12, 2023, which has been incorporated into these final versions.

RECOMMENDATION:
Adopt the city manager position profile and hiring procedures

SUGGESTED MOTION LANGUAGE:
"I move to adopt the city manager position profile and hiring procedures as presented in the agenda packet."

LIST OF ATTACHMENTS/EXHIBITS:
- Adoption of Official Position Documents cover page
- Appendix A: Position Profile (containing Hiring Standards, Criteria, and Policy Directives) (6/20/23 version)
- Appendix B: Hiring Procedures (6/20/23 version)

SANDY CITY MANAGER RECRUITMENT 2023

Adoption of Official Position Documents

Official adoption of certain documents is required under Oregon law for a City Council to hold an executive session for the purpose of considering the employment of a new City Manager (per ORS 192.660(2)(a) and ORS 192.660(7)(d)). These documents include:

- Position Profile (containing Hiring Standards, Criteria, and Policy Directives)
- Hiring Procedures

The City of Sandy recruitment consultant, Jensen Strategies, LLC, gathered input through one-on-one interviews, online staff and community surveys, and an offered public input session, which was used to prepare a draft position profile and hiring procedures for the City's 2023 City Manager Recruitment. These documents are attached hereto as Appendices A and B, respectively. The documents will be reviewed, considered, and if deemed appropriate, approved at a meeting of the Sandy City Council that affords an opportunity for public comment.

APPENDIX A
SANDY CITY MANAGER RECRUITMENT
CITY MANAGER PROFILE

Required Minimum Education / Experience

The City Manager position requires a bachelor's degree in public administration, planning, political science, or related field, and at least three years of upper-level local government management experience. Equivalent combination of education and experience may be considered.

Preferred Education / Experience

The City prefers a candidate with an advanced degree in public administration or related field (e.g., Master of Public Administration), active ICMA Credentialed Manager (ICMA-CM) status, and five or more years of increasingly responsible public sector experience. Previous service as a City Manager as well as experience and/or training in economic development and growth management is highly desired. Experience working in Oregon is beneficial.

Desired Skills / Attributes

Leadership and Management

The City Manager should be a personable, visible, well-rounded, leader and manager for a dynamic and growing city. The City Manager should possess the ability to provide clear direction, effectively support and oversee multiple departments, balance priority initiatives, and foster a shared organizational vision. An ability to communicate and carry out policy directives while ensuring consistency of core service delivery is important. Management experience to effectively coordinate limited staff capacity, be accessible, support professional development, maintain accountability, and retain staff is important. A leadership style that values and practices consistent communication, organization, collaboration, team building, humility, professionalism, and integrity is essential. A personal demeanor which is approachable, patient, inclusive, respectful, and empathetic is desired. Experience in leading strategic workforce planning to meet current and future staff capacity needs to effectively serve a growing community with limited resources is attractive.

Council Relations

The City Council expects the City Manager to proactively facilitate a professional, responsive, fair, and inclusive relationship to support their work as the City's policy making body. Ability to effectuate Council policy decisions by directing and working with City staff to ensure implementation is important. A commitment to maintaining awareness of the City's operations and legal obligations to ensure regulatory compliance and informed decision-making processes is important. Skills to foster and maintain a working relationship that promotes and enhances Council's ability to address challenging policy issues and decisions by providing a framework for goal setting, provision of background information, collaboration, and consensus building.

Communication

It is imperative the City Manager have strong communication skills to provide excellent internal and external organizational coordination. An ability to effectively engage and/or collaborate with diverse City audiences and stakeholders including, but not limited to, City Council, staff, local government officials, community members and groups, nonprofits, and businesses are essential. The City Manager should demonstrate emotional competency, transparency, humility, inclusion, ethics, and accessibility when communicating with all individuals or groups. Further, the City Manager is expected to have experience and skills to facilitate and encourage respectful two-way dialogues on complex policy issues. Communication, both verbally and written, should be offered with clarity, substance, and conciseness.

Wastewater and Water Infrastructure

The City Manager should understand the components and processes for implementing large, complex capital projects for municipal infrastructure such as wastewater, stormwater, and water. Executive skills to manage, guide, prioritize, and provide leadership for multi-disciplinary and technical teams in support of tangible project outcomes is important. Experience leading multi-faceted efforts to facilitate system expansion to meet growth needs while ensuring compliance with federal and state regulatory requirements. A capability to coordinate and collaborate with intergovernmental and community partners to expedite effective planning and completion of capital infrastructure projects. An ability to seek creative and effective financing approaches to fund needed infrastructure with sensitivity to impacts on taxpayers is important.

Facilities

The City Manager should have experience in facility planning and management. An understanding of effectively integrating workforce space needs with current and future City facilities. Prudent facility planning to ensure efficiencies of operations within available resources. An ability to strategically plan for community needs in City facilities including, but not limited to, recreational resources, meeting spaces, and public facing administrative areas.

Transportation and Transit

The City Manager should be able to effectively manage planning, maintenance, and construction of streets as well as a City transit system. Beneficial experience includes street asset maintenance and enhancement, traffic and parking management, coordination of intergovernmental projects, management of right of way issues, and efforts to enhance walkability. Experience developing traffic management approaches to support livability while facilitating a high volume of visitors and through traffic is beneficial. In addition, a familiarity with operating a regional transit system, as currently provided by the City, would be helpful.

Community and Economic Development

The City Manager should have knowledge and experience to plan and implement community and economic development initiatives to meet City goals and the needs of a growing community. An understanding and ability to anticipate the many facets of community needs related to livability and healthy local economies is important. A proficiency in strategic approaches in managing policy and operations to position the City to recruit and/or take advantage of economic opportunities is important. Professional experience and facilitation skills to lead meaningful community dialogues, develop placemaking initiatives, and foster a shared vision of growth is desirable. Knowledge of Oregon land use law and urban renewal management is beneficial.

Public Finance

The City Manager should have excellent public finance skills to effectively support City needs by ensuring long-term organizational sustainability and an ability to provide high quality City services. Municipal finance proficiency to support responsible and strategic fiscal management, integrated with City goals, utilizing a diversity of revenue approaches, including urban renewal funds, to support priorities are important. Application of fiscally prudent approaches to manage taxpayer dollars and provide effective communication around decisions and/or potential outcomes is imperative. Experience developing and maintaining sustainable financial approaches to meet current and future service needs. Experience with Oregon budget law and requirements as well as growing communities is helpful.

Community Engagement

The City Manager is expected to maintain and enhance City efforts to inform and engage the Sandy community in City activities and decisions that may impact them. The City Manager should be a visible leader that promotes civic engagement and practices accessibility, professionalism, and employs an even-handed approach to differing views and interests. Skills and experience to facilitate meaningful community dialogue and consensus building around important and complex civic matters is essential. It will be important to demonstrate values of transparency, inclusion, collaboration, and two-way communication when conducting community engagement.

Intergovernmental Relations
It is important the City Manager work effectively with other local or regional jurisdictions to identify and pursue mutually beneficial cooperative opportunities and advocate for City needs and interests. An ability to enhance and expand strong working relationships with other local governments, the school district, fire district, County, State, regulatory agencies, and other key organizations will be imperative. Emergency management coordination and collaboration with such government partners will be important.

Housing Policy & Homelessness
The City Manager should have knowledge of current housing legislation and policy approaches related to housing supply and affordable housing options. Effective planning and management of housing projects with consideration of City infrastructure capacity is important. In addition, knowledge and experience to support collaborative efforts to facilitate policies, codes, and resources to address homelessness issues is important.

Broadband
The City of Sandy operates a fiber optic broadband network, SandyNet, for the community. The City Manager's familiarity with municipal broadband system operations, issues, and challenges is attractive.

Appreciation for Sandy
The City Manager role is a high-profile local leader who should appreciate Sandy as a historic and growing community with a warm, small-town feel. The City Manager should embrace and promote Sandy's pioneering spirit and participate as an active member of the community.

Understanding of City Government Roles
The City Manager should have a thorough understanding of the Council-Manager form of government and the proper roles of bodies and individuals within such governments. The City Manager will be expected to help ensure the City Council, staff, and advisory bodies are all operating effectively with each other and within their legally defined roles.

Policy Directives

Wastewater Infrastructure Expansion
Experiencing rapid growth over the last decade, the City of Sandy has been working diligently the last several years to upgrade its wastewater collection and treatment system through a program known as Sandy Clean Waters. The over $100 million overhaul includes upgrades to its aging collection system and existing treatment plant, along with the construction of a new facility to better handle current and future wastewater treatment capacity. The City is working to address the fact that in the past, prior to the recent significant achievements of Sandy Clean Waters, Sandy's rapid growth outpaced the ability of our wastewater infrastructure to consistently handle increased demand. To manage the increasing demand on the system and avoid further state and federal permit violations the City adopted a moratorium in 2022 which

placed a cap on new wastewater connections. Recently, the City negotiated a Consent Decree with the Oregon Department of Environmental Quality (DEQ) and U.S. Environmental Protection Agency (EPA) to resolve past violations and outline the City's planned wastewater system expansion and modernization plans. Community concerns over recent utility rate increases juxtaposed against funding needs for this infrastructure system update create a challenge for the City. The next City Manager will need to ensure the City can move forward with wastewater improvements, working closely with the Public Works Department to address unfunded mandates, meet the terms of the Consent Decree, and accommodate growth in a manner that is financially sustainable for the City and ratepayers.

Drinking Water Reinvestment

Sandy's drinking water is provided through three sources: two local watershed sources (Alder Creek and Brownell Springs), and Portland Water Bureau's Bull Run source (through a purchase agreement). The Drinking Water System Reinvestment Project will improve the system by addressing two critical needs: (1) upgrading the Alder Creek treatment plant; repairing reservoirs and replacing the pump station, filters, chemical feed systems, and utility systems; making it the primary water source for Sandy, and (2) building a transmission line to Portland's new Bull Run Treatment Plant facility, allowing Sandy to access water treated for cryptosporidium in compliance with Federal regulations. The City Manager will need to work closely with Public Works to ensure this vital project continues to move forward efficiently, and in a manner that is financially sustainable for the City and ratepayers.

Community Campus Park Project

The City of Sandy is working to develop a new park in the heart of downtown that will serve the community while also drawing tourists and spurring economic development in the area. The Sandy Community Campus Park will be a focal point and gathering place for Sandy residents and is intended to include a wide range of amenities, such as an action sports facility with a pump track/skate park (the only one of its kind in the Pacific Northwest), trails, a playground, picnic shelters, natural and open spaces, and restrooms. The City, with community input, is preparing a development plan for the site that will provide a framework to guide its construction and cost. The City and Urban Renewal Agency have allocated funding to construct Phases 1 and 2 of the park plan in the 2023-25 biennial budget. The next City Manager will be expected to help champion this project through funding, community engagement, and partnerships.

Police Chief Recruitment

With the upcoming retirement in the next several months of the long-time Police Chief, the City will soon be launching a recruitment process for his successor. The Police Department operates at a 24/7 service level and enjoys a high level of community support. The next City Manager is expected to lead a transparent and fair recruitment and selection process to select the next Police Chief.

Workforce Capacity and Space Needs Assessment

As the community grows, the City's workforce is experiencing increasing workloads as well as finite workspace. The staff's capacity to keep up with expanding demands has been stretched as the community continues to grow, service demands rise, major capital projects are initiated, and while resources remain limited. In addition, current City workspaces are physically divided across in six administrative buildings and have become constrained without room for new employees. The next City Manager will be expected to evaluate current roles and responsibilities of the City's workforce, develop operational effectiveness strategies, and address the overall staffing needs within available resources. Relatedly, employee workspace will need to be assessed and addressed if necessary.

APPENDIX B
SANDY CITY MANAGER RECRUITMENT
HIRING PROCEDURES

Phase 1: Position Advertisement

1.1 Recruitment Brochure Development: The consultant will develop a professional, comprehensive recruitment brochure designed to attract the highest quality applicants. Organization-specific information will be incorporated into the brochure, including an overview of department functions/services, staff size, budgetary information, and current challenges and policy priorities. Community information will be added, including a description of the community with quality-of-life details. The brochure will conclude with position compensation information, including salary and benefits package, as well as information on how to apply for the position and the recruitment timeline.

1.2 Position Advertisement: The consultant will execute a comprehensive position advertisement process designed to attract a diverse pool of qualified and well-suited candidates. The approach will be multi-faceted and will include advertising the position on high-profile managerial and specialization-specific websites, within professional publications and periodicals, and in other forums as appropriate. The consultant will also leverage an extensive professional network to directly contact qualified managers and inform them of the opening.

Phase 2: Screening of Candidates

2.1 Initial Application Screening: Candidates will provide a resume, a cover letter, and a Jensen Strategies recruitment questionnaire. The consultant will review the application (resume, cover letter, and supplemental question submission) against the City Manager Profile, remove all non-responsive applications, and determine which candidates best fit the City's needs.

2.2 Preliminary Interviews: The consultant will conduct preliminary interviews via Zoom with the candidates who best fit the candidate profile, as well as with any veterans who meet the position's minimum qualifications (as required by Oregon law).

2.3 Recommendation of Finalists: The consultant, in a City Council executive session, will present the results of the initial review process and provide recommendations of up to four finalists. For transparency purposes, the consultant will provide information on other candidates interviewed but not recommended as finalists. The consultant will facilitate a discussion to assist the Council in reaching consensus on the finalists they want to be interviewed. Subsequently, the Council will announce the finalists in a regular business meeting after candidates are notified and permission is received for public disclosure of their candidacy.

2.4 Formal Council Designation of Finalists: In accordance with Oregon public meetings law, the City Council will formally designate the finalists at a regular business meeting open to the public.

2.5 Background Checks on Finalists: The consultant will engage a background check firm to perform comprehensive background checks on all finalists. Background checks will include:

- County criminal searches
- State criminal searches
- Federal criminal searches
- National criminal database searches
- Sex offender searches
- Motor vehicle searches
- Education/degree verification
- Employment verification
- Credit checks
- Civil litigation

2.6 Reference Checks on Finalists: Upon selection as a finalist, candidates are asked to provide a minimum of four professional references. The consultant will take the necessary time to thoroughly discuss the candidates with references they provide, as well as other knowledgeable contacts, asking incisive questions to gain a comprehensive understanding of their abilities as managers and potential fit for the city.

2.7 Finalist Receptions: Prior to the final interviews, two receptions will be held to provide opportunities to interact with the finalists, ask them questions, and form general impressions of the candidates. The first reception will be open to the City staff, and the second reception will be open to members of the public. At both receptions, attendees will have an opportunity to provide online feedback concerning their impressions of the finalists to help inform the final selection process.

2.8 **Finalist Interviews**: Finalists will be interviewed in-person by four panels consisting of (1) the City Council, (2) local government managers from other jurisdictions, (3) a panel of community members and (4) panel of department heads. Interviewers will receive an informational packet containing interview questions and comprehensive information on each finalist. After panel interviews have been completed, the Council, in an executive session, will be presented with feedback from the other three panels, the staff and community receptions, and results of background and reference checks. The consultant will facilitate the Council in reaching consensus on its preferred candidate.

2.9 **Formal Council Designation of Preferred Candidate:** In accordance with Oregon public meetings law, the City Council will formally designate its preferred candidate at a regular business meeting open to the public.

City Manager Recruitment Schedule

Week of	**Actions**
Week of June 19th	Council official adoption - June 20th
Weeks of June 26th & July 3rd	Recruitment brochure finalization
Week of July 10th	Position advertisement- Position open (7/10 – 8/6)
Week of August 7th	Initial application screening
Week of August 14th	Preliminary Zoom interviews
Week of August 21st	Recommendation and selection of finalists Executive Session- Monday, August 21st
Weeks of August 28th & September 4th	Background/reference checks on finalists
Week of September 11th	Tuesday- September 12th - Staff and Community Receptions Wednesday, September 13th - Panel Interviews Thursday, September 14th - Executive Session: Council Interviews Friday, September 15th - Executive Session: Deliberation Regular Session: Announcement of Selection

Staff Report

Meeting Date:	June 20, 2023
From	Tyler Deems, Interim City Manager
SUBJECT:	2023-24 Master Fees and Charges

DECISION TO BE MADE:
Whether to adjust city rates and fees for fiscal year 2023-24.

PURPOSE / OBJECTIVE:
Review, hold a public hearing, and approve increases to city fees and charges for the 2023-24 fiscal year.

BACKGROUND / CONTEXT:
The City annually reviews and updates fees and charges to adjust for inflation for materials, operational expenses, and capital project funding. The Council's direction over the last few years, with exception of the pause during COVID, is to adjust the fees on a more regular basis to avoid less frequent but larger rate increases. The current Master Fee Schedule can be found here.

Sandy is in a historic period of public infrastructure reinvestment. The City's water, wastewater, and stormwater systems require improvements and expansion to ensure adequate supply of water and the capacity to effectively treat wastewater, and handle and manage stormwater runoff. Years of under-investment and holding down rate increases coupled with rapid growth has put the city in a difficult position of needing rate increases to complete the essential and mandated improvements to our water and wastewater facilities. At the same time, we are still in a period of high inflation and extreme construction cost escalation which results in higher costs for goods, services, contracts, equipment, and materials. The consumer price index, a common indicator of inflation, continues to sit at above 5% year over year for most indices.

Beyond utilities, the City charges fees to developers, builders, and homeowners for land use applications, new construction, and improvements. These fees pay for staff's time to review the proposals and plans to ensure they compliant state building standards and reflects the community's goals and policies implemented through the city's development code. While the Planning Department receives general revenue to both subsidize these activities and to fund non-current planning related development such as long range plans, the Building Department is operated and accounted for as an enterprise. Building plan review, permits, and inspection fees should cover the costs of those services. In both those cases, despite steady growth and development, our existing fees are not keeping pace with covering the costs of providing the service.

KEY CONSIDERATIONS / ANALYSIS:

Miscellaneous Fees

A slight update is needed with the copies and document fees to ensure that the costs of printing and coping are covered. These printing and copy charges have not been updated since November 2004, and the proposed increase will now match the current costs associated with the services provided.

The above changes would become effective July 1, 2023.

Planning and Building

In an effort to continue making incremental increases based on current CPI, the proposed fee increase for Planning and Building is 6% for all fees. The City has historically been low compared to other cities in many categories and the fees should be updated to cover the city's costs to process and review applications rather than relying on an increasing share of general revenue. The proposed 6% matches the CPI as of January of this year, which was used to develop the budget for the upcoming biennium. The average increase to a building permit for a new single family home would be approximately $350.

The State of Oregon requires that the City provide notice of at least 45 days prior to adopting changes in these specific fees. Notice was provided to the State on June 14, meaning the Council cannot adopt these fees until the August 7th meeting, at which point the fees would immediately become effective. This slight delay also allows the new Permit Technician in Development Services time to work with our software provider and gain a better understanding of the fee update process prior to the effective date of the increase. Staff recommends holding the public hearing now with all other fees, receive any public comments, and adopt the fees at a later date to comply with state law.

Water

As the Council is well aware, there are several vital capital projects related to the City's drinking water system. Repairs to Sandercock Reservoir have recently been completed, and millions of dollars need to be invested in the Alder Creek Treatment Plant to increase production of our own water supply source and reduce the amount of water the City needs to purchase from Portland. In addition, these investments will improve resiliency. A new pipeline also needs to be constructed to Portland's new Bull Run Filtration Plant.

Staff continues to work with our consultants to update the rate model, incorporating updated project costs, inflationary factors, and interest rates on future debt issuance. The modeling indicates a needed increase for FY23-24 of 36% which equates to an increase for the average residential customer in the range of $10-$20 per month depending on the amount of water used ($15.31 for the average residential customer

using 7 ccf). The proposed rate increase would go into effect with the July 2023 utility bills.

The proposed changes also include the addition of a reduced water rate for single family homes with 3/4" water meters at 50% of the regular rate. This would be an extension of the current wastewater utility assistance program, which currently has 43 participants. All current accounts receiving wastewater assistance would automatically be enrolled in the water assistance program.

Wastewater

The City's largest construction project requires rate increases to provide revenue to pay for the debt financing from the State Revolving Fund Loans and the Water Infrastructure Finance and Innovation Act (WIFIA) loans, which we plan to finalize later this summer to lock in interest rates. The ongoing investments address permit compliance, increasing treatment plant and collection system capacity, and constructing new facilities to accommodate the recent and future growth of the community.

The proposed rate increase of 16% is based on the City's most recent financial models, which includes grant funding, WIFIA loan, and low interest SRF loans through the State of Oregon. The average residential customer would see an increase in their monthly bill between $8-$15 ($11.67 for the average residential customer using 7 ccf). The proposed rate increase would go into effect with the July 2023 utility bills.

Stormwater

The City's stormwater utility is underfunded and does not have adequate revenue to plan, budget, and construct repairs and new investments in our stormwater system. This was recently demonstrated by the emergency pipeline repair under Tupper Park where the Stormwater Fund was not able to pay for the costs. As such, an interfund loan from the Wastewater Fund in the amount of $400,000 was needed to balance the budget. The Stormwater Fee is currently $5.00 per equivalent residential unit (ERU) which is extremely low when compared to other cities in Clackamas County. The City will need to complete a stormwater master plan at sometime in the future, but staff recommends incrementally increasing the utility's fee to build cash reserves for capital, as well as pay the annual debt service payments on the newly issued loan.

The proposed rate increase for Stormwater is $3.00 per ERU, brining the total fee to $8.00 per ERU. The proposed rate increase would go into effect with the July 2023 utility bills.

SandyNet

In June 2022, the Council adopted two new rates for multigig service for SandyNet. At the time, the proposed rates were competitive with other fiber providers. Since that time, competitor rates have dropped and our pricing for the 2 and 5 gig service is not attractive. Staff is recommending a rate reduction from $110 to $80 for the 2 gbps service and $180 to $110 for the 5 gbps service. In addition, adding a new rate for 10

gbps service at a rate of $280 per month is being proposed. Along with the 10 gbps service, additional installation efforts from the SandyNet team would be required. Due to this, the installation cost passed onto the customer is proposed to be $300 instead of the standard $100 currently charged.

Library

Continuing the efforts for accessibility and equity for all users of our public library system, the proposed changes in the fee schedule would reduce library fines. A core mission of the library network is to provide equitable service to all residents within the community. As discussed during the Budget Committee meetings, overdue fines go against this mission by disproportionately affecting residents in low-income households. This proposed fine reduction is the first step in an attempt to discontinue overdue fines altogether in all LINCC libraries.

The proposed change would decrease the daily fine amount from $0.25 to $0.10 per day, and the maximum overdue fine from $5.00 to $1.00. Additionally, and as noted above, the proposed fee changes would also slightly increase printing and copy fees to account for the actual cost to provide the service. These changes would become effective July 1, 2023.

Parks & Recreation

The Council was provided an update related to the Parks & Recreation Department's financial sustainability plan and fee changes at the June 5 work session. In conjunction with the financial sustainability plan, staff is proposing a restructured rate schedule that would incorporate the results of their recent cost recovery work and begin standardizing resident versus non-resident rates. Also included with these proposed changes is new rental opportunities for the small shelters in Meinig Park, the large shelter at Bornstedt Park, and the two shelters at Cascadia and Bluff Parks. City residents would see either no increase or a very slight increase in the current rental/use rates. The revenue generated from this change in fee structure would support the Council's goal of "maintaining financial sustainability of city programs, events, and services through adequate cost recovery policies and practices." If approved, these changes would become effective July 1, 2023.

RECOMMENDATION:

Staff recommends the City Council hold a public hearing and adopt Resolution 2023-28.

BUDGETARY IMPACT:

None. The proposed rate increases are built into the BN 2023-25 budget.

SUGGESTED MOTION LANGUAGE:

"I move to adopt Resolution 2023-28, a resolution amending the City's Master Fees and Charges schedule."

LIST OF ATTACHMENTS/EXHIBITS:

- Resolution 2023-28

NO. 2023-28

A RESOLUTION ADOPTING CHANGES TO THE MASTER FEE SCHEDULE

Whereas, the City Council imposes municipal fees and charges via Resolution; and

Whereas, adjustments to fees and charges are necessary to reflect the current costs of service delivery; and

Whereas, the City Council has reviewed the proposed changes;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Sandy:

Section 1. The Master Fee Schedule is amended as shown in Exhibit A.

Section 2. These changes shall become effective as identified in Exhibit B.

This resolution is adopted by the Common Council of the City of Sandy and approved by the Mayor this 20 day of June 2023

_____
Stan Pulliam, Mayor

ATTEST:

_____
Jeff Aprati, City Recorder

#2023-28

EXHIBIT A

CITY OF SANDY MASTER FEE SCHEDULE

July 1, 2023

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Fee Name	Amount	Description
1. MISCELLANEOUS CHARGES		
A. Business License		
a. Home-Based Business	$55.00	
b. Business License - businesses within City limits	$85.00	
c. Business License - businesses outside City limits	$115.00	
d. Residential Rental Business	$85.00	plus $6 per unit
e. Business License Renewal Late Fee	$39.00	If renewal is submitted after March 1st
B. Copies, Maps, and Documents		
a. Copy: 8.5 x 11	$0.25	
b. Copy: 8.5 x 14	$0.25	
c. Copy: 11 x 17	$0.50	
d. Blueline Maps	$10.00	
e. Comprehensive Plan Map	$5.00	
f. Zoning Map	$5.00	
g. Comprehensive Plan	$30.00	
h. Development Code	$50.00	
C. Events		
a. Highway Banner	$50.00	per week
b. Major Community		Actual cost + 20%
D. Liquor License		
a. Initial	$100.00	
b. Change	$75.00	
b. Renewal	$25.00	
E. Miscellaneous		
a. Finding Fee	$20.00	
b. Interest Past Due		Annual interest rate set by Finance Director at the time the past due balance is accrued. Rate shall be fixed and based on current yields for long-term investments, plus 1%
c. Lien Search	$30.00	
d. Returned Item Fee	$25.00	
F. Records Request		
a. Administrative Fee	$50.00	per hour
b. Executive Fee	$80.00	per hour
c. Legal Fee		actual cost
2. PLANNING CHARGES		
A. Addressing		
a. Addressing	$48.00	plus $6 per lot
b. Readdressing - Residential	$233.00	per lot (not exceeding two units)
c. Readdressing - Multi-family, commercial/industrial	$233.00	plus $6 per lot or unit
B. Administrative		
a. Administrative Fee		10% of total planning and public works fees assessed, excluding building, plumbing, and mechanical structural specialty code permit fees.
b. Land Use Compatibility Statement	$132.00	
c. Review of Non-Conforming Use	$850.00	
d. Public Hearing - Type III	$1,590.00	review not specifically listed elsewhere
e. Public Hearing - Type IV	$2,120.00	review not specifically listed elsewhere
f. Public Hearing - Reschedule (applicant's request)	$530.00	
g. Third-Party Review	$2,120.00	Deposit for each anticipated third-party review shall be collected in conjunction with the initial application fee. Additional charges, if any, shall be assessed and shall be a lien against the property until paid in full.
h. Third Party Review Scope Consultation	$530.00	
i. Zoning Verification Letter	$116.00	Bank/Loan Letter
C. Accessory Dwelling Unit		
a. Accessory Dwelling Units	$318.00	
D. Adjustments and Variances		
a. Type I Adjustment	$425.00	less than 10% a quantifiable provision
b. Type II Adjustment	$530.00	less than 20% a quantifiable provision
c. Type II Variance	$955.00	
d. Type III Special Variance	$1,590.00	
e. Type III Variance - Land Division	$1,590.00	
f. Type III Design Deviation	$530.00	
g. Sign Variance	$530.00	

E. Amendments		
a. Comprehensive Plan Map Amendment	$5,300.00	
b. Comprehensive Plan Text Amendment	$5,360.00	
c. Zoning Map Amendment	$4,240.00	
F. Annexation Type IV		
a. Type A	$3,180.00	assign conceptual zoning
b. Type B	$5,300.00	Type A, plus Zoning Map Change
c. Type C	$7,420.00	Type A and B, plus Plan Map
d. De-Annexation	$3,180.00	
G. Appeal		
a. Type I to Type II	$265.00	Notice
b. Type II to Type III	$425.00	Planning Commission appeal
c. Type III to Type IV	$1,060.00	City Council appeal
H. Conditional Uses		
a. Modification, Major	$1,060.00	
b. Modification, Minor	$530.00	
c. Outdoor Display & Storage	$530.00	
d. Type II	$1,272.00	
e. Type III	$3,180.00	
I. Design Review		
a. Type I: $0.00 - $10,000.00	$265.00	staff review only; no notice
b. Type I: $10,000.01 - $25,000.00	$477.00	staff review only; no notice
c. Type I: $25,000.01 - $100,000.00	$800.00	staff review only; no notice
d. Type I: $100,000.00 and above	$955.00	staff review only; no notice
e. Type II: $0.00 - $10,000.00	$425.00	
f. Type II: $10,000.01 - $25,000.00	$636.00	
g. Type II: $25,000.01 - $100,000.00	$2,120.00	
h. Type II: $100,000.00 - $1,000,000.00	$5,300.00	
i. Type II: $1,000,000.00 and above	$9,540.00	
j. Type III: $0.00 - $10,000.00	$636.00	
k. Type III: $10,000.01 - $25,000.00	$1,060.00	
l. Type III: $25,000.01 - $100,000.00	$2,650.00	
m. Type III: $100,000.00 - $1,000,000.00	$6,360.00	
n. Type III: $1,000,000.00 and above	$10,600.00	
o. Design Review Minor Modification	$530.00	
p. Design Review Major Modification: $0.00 - $25,000.00	$636.00	
q. Design Review Major Modification: $25,000.01 - $100,000.00	$1,060.00	
r. Design Review Major Modification: $100,000.01 and above	$2,120.00	
J. Erosion Control		
a. Single Family/Duplex Addition - Permit Fee	$138.00	
b. Single Family Dwelling/Duplex - Permit Fee	$160.00	
c. Multi-Family - Permit Fee	$212.00	per structure
d. Commercial/Industrial, Subdivisions - Permit Fee	$318.00	per acre
a. Single Family/Duplex Addition - Plan Review	$53.00	
b. Single Family Dwelling/Duplex - Plan Review	$90.00	
c. Multi-Family - Plan Review	$138.00	per structure
d. Commercial/Industrial, Subdivisions - Plan Review	$138.00	per acre
K. Final Plat Review		
a. Property Line Adjustment Final Review	$425.00	
b. Middle Housing Land Division Plat Review	$636.00	
c. Partition Final Plat Review	$636.00	
d. Subdivision Final Plat Review	$1,060.00	
L. Food Cart Permit		
a. Initial Permit Review	$1,590.00	per new pad lot; design review fees separate
b. Renewal	$212.00	single carts in existing pod
M. FSH Overlay		
a. Type I FSH Review	$265.00	in addition to fees listed, required deposit toward cost of any third-party reviews
b. Type II FSH Review	$530.00	in addition to fees listed, required deposit toward cost of any third-party reviews
c. Type III or Type IV FSH Review	$1,060.00	in addition to fees listed, required deposit toward cost of any third-party reviews
N. Hardship Trailer		
a. Type III Initial Review	$318.00	
b. Type II Renewal	$212.00	
O. Historic or Cultural Resource		
a. Type IV Designation of Resource	$1,060.00	
b. Type I Minor Alteration	$138.00	

c. Type II Major Alteration	$530.00	
P. Interpretation of Code		
a. Type II, Director	$530.00	
b. Type III, Quasi-Judicial	$1,060.00	
c. Type IV, Legislative	$1,590.00	
Q. Land Division		
a. Type I Property Line Adjustment	$636.00	
b. Type I Land Division (Minor Partition)	$1,272.00	
c. Middle Housing Land Division	$2,650.00	
d. Type II Land Division (Major Partition)	$1,590.00	plus $53 per lot
e. Type II Land Division (Minor Revised Plat)	$1,590.00	plus $53 per lot
f. Type III Land Division (Major Partition)	$3,180.00	plus $53 per lot
g. Type III Major Replat (revised plat)	$3,180.00	plus $53 per lot
h. Type II Subdivision 4 to 10 lots	$4,240.00	plus $106 per lot
i. Type II Subdivision 11 or more lots	$4,240.00	plus $106 per lot
j. Type III Subdivision 4 to 10 lots	$5,830.00	plus $127 per lot
k. Type III Subdivision 11 or more lots	$5,830.00	plus $127 per lot
l. Re-naming of Tentative Subdivision	$370.00	
m. Model Home Agreement	$530.00	
n. Phasing Plan Review	$1,590.00	in addition to subdivision fees
R. Pre-Application Conference		
a. Type I	$160.00	
b. Type II	$425.00	
c. Type III/IV	$850.00	
d. Subdivision	$1,272.00	
S. Request for Time Extension		
a. Type I	$127.00	
b. Type II	$265.00	
c. Type III/IV	$530.00	
T. Specific Area Plan		
a. Development Process: Type IV	$5,300.00	plus $64 per acre, plus subdivision fees
b. Administrative Amendment: Type I	$425.00	
c. Minor Amendment: Type II	$530.00	
d. Major Amendment: Type III	$1,272.00	
U. Street Vacation		
a. Street Vacation		Cost plus 20% ($2,650 deposit required)
V. Temporary Permits		
a. Structure: Type I - Initial	$138.00	
b. Structure: Type II - Renewal	$265.00	
c. Use Permit	$138.00	
W. Tree Removal		
a. Type I	$116.00	
b. Type II	$233.00	
c. Type III	$636.00	
X. Zoning Administration Fee		
a. Single Family Dwelling Addition	$116.00	
b. Single Family Dwelling	$185.00	
c. Duplex	$318.00	
d. Multi-Family	$318.00	plus $46 per unit
e. Commercial/Industrial	$116.00	minimum; up to 25% of design review fee
3. BUILDING CHARGES		
A. Building Permit (valuation)		
a. $0.01 - $500.00	$90.00	
b. $500.01 - $2,000.00	$90.00	First $500.00, plus $4.00 for each additional $100 or fraction thereof to and including $2,000
c. $2,000.01 - $25,000.00	$150.00	First $2,000.00, plus $11.00 for each additional $1,000 or fraction thereof to and including $25,000
d. $25,000.01 - $50,000.00	$403.00	First $25,000.00, plus $9.00 for each additional $1,000 or fraction thereof to and including $50,000
e. $50,000.01 - $100,000.00	$628.00	First $50,000.00, plus $6.00 for each additional $1,000 or fraction thereof to and including $100,000
f. $100,000.01 and above	$925.00	First $100,000.00, plus $5.00 for each additional $1,000 or fraction thereof
g. Permit Fee Valuation		The determination of the valuation for permit fees shall be based on the most current ICC Building Valuation Data Table as specified in OAR 918-050-0100 and 918-050-0110.

B. Demolition Permits		
a. Demolition Permits, general - State of Oregon		Commercial demolition fees are calculated on the total value of the demolition and are assessed using the building permit fees schedule. Residential demolition fees are based on a flat charge to include building and mechanical elements.
b. Commercial: Building	$106.00	minimum
c. Commercial: Public Works	$75.00	minimum
d. Residential: Building	$106.00	
e. Residential: Public Works	$75.00	
C. Derelict Buildings and Structures		
a. Appeal Fee	$318.00	
b. Application Fee for Rehabilitation Plan	$160.00	per application
D. Fire Sprinkler Plan Review and Inspection Fee		
a. Home Size: 0 - 2,000 square feet	$170.00	
b. Home Size: 2,001 - 3,600 square feet	$233.00	
c. Home Size: 3,601 - 7,200 square feet	$297.00	
d. Home Size: 7,201 square feet and greater	$340.00	
E. Foundation Permit		
a. Single Family Dwelling or Addition	$53.00	
b. Duplex/Multi-Family	$53.00	per dwelling unit
c. Commercial/Industrial	$106.00	Minimum. Fees will be calculated by the Building Official based on the size and scope of the project and overall project value.
F. Grading Permit		
a. 50 cubit yard or less	$43.00	
b. 51 - 100 cubic yards	$69.00	
c. 101 - 1,000 cubic yards	$73.00	First 100 cubic yards, plus $25 each additional 100 cubic yards up to 1,000
d. 1,001 - 10,000 cubic yards	$298.00	First 1,000 cubic yards, plus $26 each additional 1,000 cubic yards up to 10,000
e. 10,001 - 100,000 cubic yards	$532.00	First 10,000 cubic yards, plus $99 each additional 10,000 cubic yards up to 100,000
f. 100,001 cubic yards and above	$1,432.00	First 100,000 cubic yards, plus $50 each additional 10,000 cubic yards
G. Grading Plan Review		
a. 50 cubit yard or less	$27.00	
b. 51 - 100 cubic yards	$53.00	
c. 101 - 1,000 cubic yards	$85.00	
d. 1,001 - 10,000 cubic yards	$106.00	
e. 10,001 - 100,000 cubic yards	$106.00	First 10,000 cubic yards, plus $30 each additional 10,000 cubic yards up to 100,000
f. 100,001 - 200,000 cubic yards	$376.00	First 100,000 cubic yards, plus $16 each additional 10,000 cubic yards up to 200,000
g. 200,001 cubic yards and above	$520.00	First 200,000 cubic yards, plus $8.50 each additional 10,000 cubic yards
H. Manufactured Dwellings		
a. Manufactured Dwelling Installation Fee	$425.00	
b. Manufactured Dwelling Park Fees		Per OAR 918-600-0030.
c. Manufactured Dwelling State Fees	$32.00	
d. Recreational Park and Camps		Per OAR 918-650-0030.
e. Related Fees: Electrical Feeder	$106.00	
I. Mechanical Permit		
a. Mechanical Permit Review Fee		30% of permit issuance fees.
J. Mechanical Permit - Commercial (value)		
a. $1 - $1,000	$90.00	
b. $1,000.1 - $10,000.00	$90.00	First $1,000 plus $1.50 for each additional $100 or fraction thereof to and including $10,000
c. 10,000.01 - $25,000.00	$225.00	First $10,000 plus $16.00 for each additional $1,000 or fraction thereof and including $25,000
d. $25,000.01 - $50,000.00	$465.00	First $25,000.00, plus $14.00 for each additional $1,000 or fraction thereof to and including $50,000
e. $50,000.01 - $100,000.00	$815.00	First $50,000.00, plus $14.00 for each additional $1,000 or fraction thereof to and including $100,000
f. $100,000.01 and above	$1,515.00	First $100,000.00, plus $7.00 for each additional $1,000 or fraction thereof
K. Mechanical Permit - Residential		

a. Minimum Permit Fee	$90.00	
b. HVAC	$23.00	
c. Air conditioning	$23.00	
d. Alteration of existing HVAC	$22.00	
e. Boiler, compressor	$43.00	
f. Fire/smoke damper/duct smoke detectors	$16.00	
g. Heat pump	$23.00	
h. Install/replace furnace burner	$23.00	
i. Install/replace/relocate heater/suspend wall/floor	$23.00	
j. Vent for appliance other than furnace	$16.00	
k. Refrigeration (absorption unit)	$33.00	
l. Refrigeration (chillers)	$18.00	
m. Refrigeration (compressors)	$18.00	
n. Environmental exhaust and ventilation (appliance vent)	$16.00	
o. Dryer exhaust	$16.00	
p. Hoods Type I/II residential kitchen/hazmat hood fire suppression	$16.00	
q. Exhaust fan with single duct (bath fan)	$16.00	
r. Exhaust system apart from heating/AC	$16.00	
s. Fuel piping and distribution (up to four outlets)	$16.00	
t. Fuel piping each additional outlet over four	$2.35	
u. Process piping (up to four outlets)	$16.00	
v. Process piping each additional outlet over four	$2.35	
w. Decorative fireplace	$30.00	
x. Fireplace insert	$30.00	
y. Wood/pellet stove	$30.00	
L. Movement of Buildings		
a. Movement of Buildings Fee	$88.00	
M. Other Inspections and Fees		
a. Inspections outside of normal business hours	$127.00	per hour, two hour minimum
b. Reinspection fees	$90.00	
c. Inspection for which no fee is specifically indicated	$90.00	
d. Additional plan review required by changes/additions	$106.00	per hour
e. Permit reinstatement fee	$90.00	For renewal of a permit that has been expired for six months or less provided no changes have been made in the original plans and specifications for such work
f. Temporary certificate of occupancy	$265.00	per month
g. Penalty for work commencing before permit issuance	$106.00	
N. Plan Review		
a. Building		70% of permit issuance fees (residential and commercial)
b. Fire & Life Safety Plan Review Fee		50% of permit issuance fees
c. Seismic Plan Review		1% of permit issuance fees
d. Plumbing		30% of plumbing permit issuance fees
e. Mechanical		30% of mechanical permit issuance fees
f. Phased permit plan review fee	$265.00	plus 10% of the total project permit fee
g. Deferred submittals	$265.00	plus 10% of the total project permit fee
h. Simple one and two family dwelling plans	$138.00	
i. Solar Photovoltaic Installation Prescriptive Path Fee	$170.00	
O. Plumbing Permit		
a. Minimum Permit Fee	$90.00	
b. Each fixture	$27.00	
c. Catch basin	$37.00	each
d. Drywall	$37.00	each
e. Fire hydrant	$37.00	each
f. Footing drain	$0.30	per foot
g. Manhole/OWS	$37.00	each
h. Manufactured home set-up plumbing fee	$85.00	
i. Rain drains connector	$27.00	per 100 feet
j. Residential fire sprinkler	$11.00	per head
k. Sanitary swer	$90.00	per 100 feet
l. Single family one bath	$477.00	New 1 and 2 family dwellings includes 100 feet for each utility
m. Single family two bath	$583.00	New 1 and 2 family dwellings includes 100 feet for each utility
n. Single family three bath	$690.00	New 1 and 2 family dwellings includes 100 feet for each utility
o. Single family additional bath or kitchen	$116.00	
p. Storm sewer	$90.00	per 100 feet

q. Water service	$90.00	per 100 feet
P. State Surcharge		
a. State Surcharge Fee		All building, plumbing, and mechanical permits are subject to a State of Oregon surcharge of 12% payable with the payment of the permit. This surcharge is subject to change at the State's discretion
4. SIGN CHARGES		
A. Penalty		
a. Signs installed without permit		All sign permit fees doubled if the sign is installed or displayed prior to obtaining a permit.
B. Permanent Sign		
a. Sign Permits - Permanent	$80.00	Plus, fees based on the valuation of the sign, using the building permit fee schedule.
C. Temporary Signs		
a. Temporary sign penalty	$53.00	Fee is waived if the permit is obtained before the sign is installed
b. Copy change or change in panel	$25.00	
c. A-Frame Signs	$25.00	
d. Garage Sale Sign	$4.00	per sign
D. Zoning Review Fee		
a. Zoning Review Fee - Permanent Sign	$25.00	Does not include banners, A-Frames, or change in panel
5. PUBLIC WORKS CHARGES		
A. Right-of-Way Fees		
a. Electric Utilities		5% of gross revenues
b. Natural Gas Utilities		5% of gross revenues
c. Garbage Utilities		3% of gross revenues
d. Telephone Utilities		7% of gross revenues
e. Cable Utilities		5% of gross revenues
f. Utilities that do not provide retail service within City	$2.00	per lineal foot of facility
g. Small Wireless Facilities		
i. Sites	$500.00	for up to five sites, $100 for each additional site
ii. Application Fee	$1,000.00	per site (new, replacement, or modification) or actual cost, whichever is higher
iii. Annual Usage Fee	$270.00	per facility
B. Plan Review		
a. Plan Check Fee	$72.00	per hour
C. Street Approach/Sidewalks		
a. Single Family	$50.00	
b. Duplex	$50.00	
c. Multi-Family/Commercial/Industrial	$300.00	deposit. The deposit shall be collected in conjunction with the permit fee. Additional charges, if any, shall be assessed and paid prior to issuance of any certificates of occupancy.
D. Street Sweeping		
a. Street Sweeping Fee		Actual cost + 20%
E. Water/Wastewater		
a. Dye Test & Letter	$25.00	
b. Water Meter Test Fee		Actual cost + 20%
c. Penalty Fee	$5.00	per month
d. Shut-Off Fee	$50.00	each occurrence
e. Meter Tampering Fee	$50.00	each occurrence
f. Damaged Padlock Fee	$65.00	each occurrence
F. Public Improvement Plan Review and Inspection Fees (valuation)		
a. Initial Fee	$150.00	
b. $0.01 - $10,000.00	12%	plus $150
c. $10,000.01 - $50,000.00	8%	plus $150
d. $50,000.01 - $100,000.00	6%	plus $150
e. $100,000.01 - $500,000.00	5%	plus $150
f. $500,000.01 - $1,000,000.00	3%	plus $150
g. $1,000,000.01 and above	2%	plus $150
6. SYSTEM DEVELOPMENT CHARGES		
A. Water		
a. Equivalent Dwelling Unit (EDU)	$4,294.25	

b. 5/8" x 3/4" Meter	$4,294.25	
c. 3/4" Meter	$6,441.22	
d. 1" Meter	$10,735.62	
e. 1 1/2" Meter	$21,471.26	
f. 2" Meter	$34,353.26	
g. 3" Meter	$63,780.02	
h. 4" Meter	$107,353.48	
i. 6" Meter	$214,706.97	
j. Meters greater than 6"		calculated based on EDU
k. Meter Cost: 3/4 inch or 1 inch meter and meter box	$475.00	Larger meters are assessed based on time and material costs.
l. Water Tapping Fees		Costs + 20%

B. Wastewater

a. City wide	$6,126.36	per equivalent residential unit
b. Wastewater Tapping Fees		Costs + 20%

C. Park

a. Single Family	$8,897.09	
b. Multi-Family	$6,596.61	
c. Mobile Home	$7,166.22	

D. Payment in Lieu of Park Land Dedication

a. Payment in Lieu of Park Land Dedication, Not Deferred	$869,242.00	per acre
b. Payment in Lieu of Park Land Dedication, Deferred	$869,242.00	per acre, plus 10% administration fee on the amount of the remaining portion owed

E. Street

a. Residential	$4,826.00	per single family dwelling unit
b. AADPT (Trip) Cost	$304.10	per adjusted average daily person trip

7. WATER RATES

A. Base by Customer Class

a. Single Family	$14.97	per month
b. Single Family - Reduced	$7.49	per month
c. Multi-Family	$14.97	per month
d. Commercial/Industrial	$14.97	per month
e. Wholesale	$17.91	per month
f. Single Family - outside City limits	$22.51	per month

B. Charge by Meter Size - inside city limits

a. 5/8" Meter	$0.54	per month
b. 3/4" Meter	$0.81	per month
c. 3/4" Meter - Reduced	$0.40	per month
d. 1" Meter	$1.39	per month
e. 1 1/2" Meter	$2.65	per month
f. 2" Meter	$4.25	per month
g. 3" Meter	$8.06	per month
h. 4" Meter	$13.36	per month
i. 6" Meter	$26.78	per month
j. 8" Meter	$42.83	per month
k. 10" Meter	$61.61	per month

C. Charge by Meter Size - outside city limits

a. 5/8" Meter	$0.79	per month
b. 3/4" Meter	$1.24	per month
c. 1" Meter	$2.03	per month
d. 1 1/2" Meter	$4.02	per month
e. 2" Meter	$6.34	per month
f. 3" Meter	$11.95	per month
g. 4" Meter	$19.90	per month
h. 6" Meter	$39.76	per month
i. 8" Meter	$66.33	per month
j. 10" Meter	$91.52	per month

D. Volume Charge by Customer Class

a. Single Family	$6.01	per 100 cubic feet
b. Single Family - Reduced	$3.00	per 100 cubic feet
c. Multi-Family	$5.65	per 100 cubic feet
d. Commercial/Industrial	$5.18	per 100 cubic feet
e. Wholesale	$6.34	per 100 cubic feet
f. Single Family - outside City limits	$9.01	per 100 cubic feet
g. Commercial/Industrial - outside City limits	$8.06	per 100 cubic feet
h. Skyview Acres	$1.55	per 100 cubic feet, plus COP pass through

E. Metered Use From Fire Hydrant

a. Deposit	$300.00	
b. Set-up/take-down/billing fee	$60.00	
c. Meter Rental (day 1 to day 30)	$2.00	per day
d. Meter Rental (day 31 and beyond)	$5.00	per day
e. Water Rate		Inside or Outside Comm/Ind depending on location
F. Fire Hydrant Flow Test		
a. Set-up and observe (without neutralization)	$75.00	per test
b. Set-up and observe (with neutralization)	$200.00	per test
8. WASTEWATER RATES		
A. Base by Customer Class		
a. Single Family	$30.24	per month
b. Single Family - Reduced	$15.13	per month
c. Multi-Family	$30.24	per month
d. Commercial/Industrial	$14.41	per month
B. Volume Charges by Customer Class		
a. Single Family	$7.76	per 100 cubic feet
b. Single Family - Reduced	$3.89	per 100 cubic feet
c. Multi-Family	$7.76	per 100 cubic feet
d. Commercial/Industrial	$10.54	per 100 cubic feet
e. Residential - No water service	$109.09	per month
9. STORMWATER RATES		
A. Utility Fee		
a. Equivalent Residential Unit (ERU)	$8.00	per month, per ERU (ERU = 2,750 sq. ft. of impervious surface)
10. SANDYNET CHARGES		
A. Miscellaneous		
a. Installation Fee	$100.00	$300.00 for 10 gbps installation
b. Shut-Off Fee	$50.00	
B. Wireless		
a. Residential - 5 mbps	$24.95	per month
b. Residential - 10 mbps	$34.95	per month
c. Rural - 5 mbps	$29.95	per month
d. Rural BIP - 5 mbps	$39.95	per month
e. Rural Enhanced - 10 mbps	$49.95	per month
C. Fiber		
a. Residential - 500 mbps	$44.95	per month
b. Residential - 1 gbps	$59.95	per month
c. Residential - 2 gbps	$80.00	per month
d. Residential - 5 gbps	$110.00	per month
e. Residential - 10 gbps	$280.00	per month
f. Business - 500 mbps	$44.95	per month
g. Business - 1 gbps	$59.95	per month
h. Business - other		per contractual agreement, authorized by department director and/or City Manager
i. Rural - 500 mbpd	$64.95	per month
j. Rural - 1 gbps	$84.95	per month
D. Digital Voice		
a. Residential	$20.00	per month
b. Business	$28.95	per month
E. Other		
a. Static IP address	$10.00	per month
b. Fax line	$11.95	per month
c. Mesh unit	$5.00	per month
11. MUNICIPAL COURT		
A. Administrative		
a. File Review Fee	$25.00	
b. Payment Arrangement Fee	$50.00	
c. Suspension Fee	$15.00	
12. PARKING		
A. Citations		
a. Parking in area not allowed	$50.00	
b. Parking in excess of posted time	$30.00	
13. POLICE		
A. Impound		
a. Vehicle Impound Fee	$100.00	

B. Reports		
a. Copy of accident report	$10.00	
b. Copy of other police report	$15.00	
C. Alarm Registration		
a. Residential	$20.00	no charge for 65 or older with primary resident
b. Business	$50.00	
c. Government		no charge
d. Penalty Fee	$75.00	failure to obtain registration within 30 days of alarm installation
e. False Alarm - first	$0.00	
f. False Alarm - second	$50.00	
g. False Alarm - third	$100.00	
h. False Alarm - fourth	$150.00	after the four false alarm the registration is suspended for one year
D. Miscellaneous		
a. Fingerprinting Fee	$20.00	for first card, $10 for each additional card
b. Local background check letter	$5.00	additional $5 for notarized letter
c. DVD	$20.00	each
d. Photo CD	$15.00	each
14. TRANSIT		
A. Fares		
a. SAM Gresham, Estacada, and Shopper Shuttle (in town)		no charge in city limits
b. SAM Commuter Route to Gresham or Estacada	$1.00	per trip (one-way origin-to-destination including transfers)
c. STAR Dial-A-Ride	$1.00	per trip (one-way origin-to-destination including transfers)
d. STAR - Seniors or disabled	$1.00	round trip (in town)
e. STAR Dial-A-Ride Complementary Paratransit	$1.00	per trip (one-way origin-to-destination including transfers)
f. ED Dial-A-Rode (out of town)	$2.00	per trip (one-way origin-to-destination)
B. Fare Media		
a. Multi-Trip Pass (24 trips)	$20.00	per pass
b. Monthly Pass	$30.00	per month
c. All Day Pass	$5.00	Redeemable on SAM and Mt. Hood Express
15. LIBRARY		
A. Damaged Items		
a. Damaged book, audio/visual material, or Library of Things item		Full replacement cost
B. Library Fines		
a. Overdue Fines	$0.10	per day
b. Maximum Overdue Fine	$1.00	
c. Library of Things item	$1.00	per day
d. All lost Items		Full replacement cost
C. Meeting Space		
a. Community Room	$25.00	Individual
b. Community Room	$25.00	per hour - for-profit organizations or groups
c. Community Room		no charge for non-profits
D. Non-Resident Fees		
a. Out of District Fee	$95.00	per year
E. Prints and Copies		
a. Grey scale	$0.25	per side
b. Color	$0.50	per side
16. PARKS & RECREATION		
A. Community/Senior Center		
a. Auditorium		
i. Resident	$40.00	per hour
ii. Non-Resident	$60.00	per hour
b. Dining Room		
i. Resident	$40.00	per hour
ii. Non-Resident	$60.00	per hour
c. Art Room		
i. Resident	$15.00	per hour
ii. Non-Resident	$30.00	per hour
d. Lounge		
i. Resident	$15.00	per hour
ii. Non-Resident	$30.00	per hour
e. Kitchen		
i. Resident	$15.00	per hour

ii. Non-Resident	$30.00	per hour
f. Building		
i. Resident	$125.00	per hour
ii. Non-Resident	$145.00	per hour
g. Custodial Fee	$20.00	
B. Parks		
a. Meinig Park - Gazebo/Ampetheater		
i. Resident	$200.00	
ii. Non-Resident	$300.00	
b. Meinig Park - Small Shelters		
i. Resident	$10.00	per hour
ii. Non-Resident	$15.00	per hour
c. Centennial Plaza		
i. Resident	$200.00	
ii. Non-Resident	$300.00	
d. Bornstedt Park - Large Shelter		
i. Resident	$100.00	11:00 am - 2:00 pm
ii. Non-Resident	$130.00	11:00 am - 2:00 pm
e. Cascadia Park and Bluff Park - Shelters		
i. Resident	$50.00	11:00 am - 2:00 pm
ii. Non-Resident	$70.00	11:00 am - 2:00 pm
f. Community Garden		
i. Resident	$20.00	first bed, each additional bed $25
ii. Non-Resident	$25.00	first bed, each additional bed $25
C. Fields/Green Spaces		
a. Community Campus - Upper Field		
i. Resident	$20.00	per hour
ii. Non-Resident	$30.00	per hour
b. Community Campus - Lower Field		
i. Resident	$20.00	per hour
ii. Non-Resident	$30.00	per hour
c. Green Space		
i. Resident	$20.00	per hour
ii. Non-Resident	$30.00	per hour

EXHIBIT B

Fee Name	Current	Proposed	Description
1. MISCELLANEOUS CHARGES Effective July 1, 2023			
B. Copies, Maps, and Documents			
a. Copy: 8.5 x 11	$0.25		
b. Copy: 8.5 x 14	$0.25		
c. Copy: 11 x 17	$0.35	$0.50	
d. Blueline Maps	$5.00	$10.00	
e. Comprehensive Plan Map	$3.00	$5.00	
f. Zoning Map	$3.00	$5.00	
g. Comprehensive Plan	$10.00	$30.00	
h. Development Code	$25.00	$50.00	
~~i. Transportation System Plan (grey scale)~~	~~$18.00~~		
~~j. Transportation System Plan (color)~~	~~$38.00~~		
2. PLANNING CHARGES Effective at a future date (TBD)			
A. Addressing			
a. Addressing	$45.00	$48.00	plus $6 per lot
b. Readdressing - Residential	$220.00	$233.00	per lot (not exceeding two units)
c. Readdressing - Multi-family, commercial/industrial	$220.00	$233.00	plus $6 per lot or unit
B. Administrative			
a. Administrative Fee			10% of total planning and public works fees assessed, excluding building, plumbing, and mechanical structural specialty code permit fees.
b. Land Use Compatibility Statement	$125.00	$132.00	
c. Review of Non-Conforming Use	$800.00	$850.00	
d. Public Hearing - Type III	$1,500.00	$1,590.00	review not specifically listed elsewhere
e. Public Hearing - Type IV	$2,000.00	$2,120.00	review not specifically listed elsewhere
f. Public Hearing - Reschedule (applicant's request)	$500.00	$530.00	
g. Third-Party Review	$2,000.00	$2,120.00	Deposit for each anticipated third-party review shall be collected in conjunction with the initial application fee. Additional charges, if any, shall be assessed and shall be a lien against the property until paid in full.
h. Third Party Review Scope Consultation	$500.00	$530.00	
i. Zoning Verification Letter	$110.00	$116.00	Bank/Loan Letter
C. Accessory Dwelling Unit			
a. Accessory Dwelling Units	$300.00	$318.00	
D. Adjustments and Variances			
a. Type I Adjustment	$400.00	$425.00	less than 10% a quantifiable provision
b. Type II Adjustment	$500.00	$530.00	less than 20% a quantifiable provision
c. Type II Variance	$900.00	$955.00	
d. Type III Special Variance	$1,500.00	$1,590.00	
e. Type III Variance - Land Division	$1,500.00	$1,590.00	
f. Type III Design Deviation	$500.00	$530.00	
g. Sign Variance	$500.00	$530.00	
E. Amendments			
a. Comprehensive Plan Map Amendment	$5,000.00	$5,300.00	
b. Comprehensive Plan Text Amendment	$6,000.00	$5,360.00	
c. Zoning Map Amendment	$4,000.00	$4,240.00	
F. Annexation Type IV			
a. Type A	$3,000.00	$3,180.00	assign conceptual zoning
b. Type B	$5,000.00	$5,300.00	Type A, plus Zoning Map Change
c. Type C	$7,000.00	$7,420.00	Type A and B, plus Plan Map
d. De-Annexation	$3,000.00	$3,180.00	
G. Appeal			
a. Type I to Type II	$250.00	$265.00	Notice
b. Type II to Type III	$400.00	$425.00	Planning Commission appeal
c. Type III to Type IV	$1,000.00	$1,060.00	City Council appeal
H. Conditional Uses			
a. Modification, Major	$1,000.00	$1,060.00	
b. Modification, Minor	$500.00	$530.00	
c. Outdoor Display & Storage	$500.00	$530.00	
d. Type II	$1,200.00	$1,272.00	
e. Type III	$3,000.00	$3,180.00	
I. Design Review			
a. Type I: $0.00 - $10,000.00	$250.00	$265.00	staff review only; no notice
b. Type I: $10,000.01 - $25,000.00	$450.00	$477.00	staff review only; no notice
c. Type I: $25,000.01 - $100,000.00	$750.00	$800.00	staff review only; no notice
d. Type I: $100,000.00 and above	$900.00	$955.00	staff review only; no notice
e. Type II: $0.00 - $10,000.00	$400.00	$425.00	
f. Type II: $10,000.01 - $25,000.00	$600.00	$636.00	
g. Type II: $25,000.01 - $100,000.00	$2,000.00	$2,120.00	
h. Type II: $100,000.00 - $1,000,000.00	$5,000.00	$5,300.00	
i. Type II: $1,000,000.00 and above	$9,000.00	$9,540.00	
j. Type III: $0.00 - $10,000.00	$600.00	$636.00	

k. Type III: $10,000.01 - $25,000.00	$1,000.00	$1,060.00	
l. Type III: $25,000.01 - $100,000.00	$2,500.00	$2,650.00	
m. Type III: $100,000.00 - $1,000,000.00	$6,000.00	$6,360.00	
n. Type III: $1,000,000.00 and above	$10,000.00	$10,600.00	
o. Design Review Minor Modification	$500.00	$530.00	
p. Design Review Major Modification: $0.00 - $25,000.00	$600.00	$636.00	
q. Design Review Major Modification: $25,000.01 - $100,000.00	$1,000.00	$1,060.00	
r. Design Review Major Modification: $100,000.01 and above	$2,000.00	$2,120.00	
J. Erosion Control			
a. Single Family/Duplex Addition - Permit Fee	$130.00	$138.00	
b. Single Family Dwelling/Duplex - Permit Fee	$150.00	$160.00	
c. Multi-Family - Permit Fee	$200.00	$212.00	per structure
d. Commercial/Industrial, Subdivisions - Permit Fee	$300.00	$318.00	per acre
a. Single Family/Duplex Addition - Plan Review	$50.00	$53.00	
b. Single Family Dwelling/Duplex - Plan Review	$85.00	$90.00	
c. Multi-Family - Plan Review	$130.00	$138.00	per structure
d. Commercial/Industrial, Subdivisions - Plan Review	$130.00	$138.00	per acre
K. Final Plat Review			
a. Property Line Adjustment Final Review	$400.00	$425.00	
b. Middle Housing Land Division Plat Review	$600.00	$636.00	
c. Partition Final Plat Review	$600.00	$636.00	
d. Subdivision Final Plat Review	$1,000.00	$1,060.00	
L. Food Cart Permit			
a. Initial Permit Review	$1,500.00	$1,590.00	per new pad lot; design review fees separate
b. Renewal	$200.00	$212.00	single carts in existing pod
M. FSH Overlay			
a. Type I FSH Review	$250.00	$265.00	in addition to fees listed, required deposit toward cost of any third-party reviews
b. Type II FSH Review	$500.00	$530.00	in addition to fees listed, required deposit toward cost of any third-party reviews
c. Type III or Type IV FSH Review	$1,000.00	$1,060.00	in addition to fees listed, required deposit toward cost of any third-party reviews
N. Hardship Trailer			
a. Type III Initial Review	$300.00	$318.00	
b. Type II Renewal	$200.00	$212.00	
O. Historic or Cultural Resource			
a. Type IV Designation of Resource	$1,000.00	$1,060.00	
b. Type I Minor Alteration	$130.00	$138.00	
c. Type II Major Alteration	$500.00	$530.00	
P. Interpretation of Code			
a. Type II, Director	$500.00	$530.00	
b. Type III, Quasi-Judicial	$1,000.00	$1,060.00	
c. Type IV, Legislative	$1,500.00	$1,590.00	
Q. Land Division			
a. Type I Property Line Adjustment	$600.00	$636.00	
b. Type I Land Division (Minor Partition)	$1,200.00	$1,272.00	
c. Middle Housing Land Division	$2,500.00	$2,650.00	
d. Type II Land Division (Major Partition)	$1,500.00	$1,590.00	plus ~~$50~~ $53 per lot
e. Type II Land Division (Minor Revised Plat)	$1,500.00	$1,590.00	plus ~~$50~~ $53 per lot
f. Type III Land Division (Major Partition)	$3,000.00	$3,180.00	plus ~~$50~~ $53 per lot
g. Type III Major Replat (revised plat)	$3,000.00	$3,180.00	plus ~~$50~~ $53 per lot
h. Type II Subdivision 4 to 10 lots	$4,000.00	$4,240.00	plus ~~$100~~ $106 per lot
i. Type II Subdivision 11 or more lots	$4,000.00	$4,240.00	plus ~~$100~~ $106 per lot
j. Type III Subdivision 4 to 10 lots	$5,500.00	$5,830.00	plus ~~$120~~ $127 per lot
k. Type III Subdivision 11 or more lots	$5,500.00	$5,830.00	plus ~~$120~~ $127 per lot
l. Re-naming of Tentative Subdivision	$350.00	$370.00	
m. Model Home Agreement	$500.00	$530.00	
n. Phasing Plan Review	$1,500.00	$1,590.00	in addition to subdivision fees
R. Pre-Application Conference			
a. Type I	$150.00	$160.00	
b. Type II	$400.00	$425.00	
c. Type III/IV	$800.00	$850.00	
d. Subdivision	$1,200.00	$1,272.00	
S. Request for Time Extension			
a. Type I	$120.00	$127.00	
b. Type II	$250.00	$265.00	
c. Type III/IV	$500.00	$530.00	
T. Specific Area Plan			
a. Development Process: Type IV	$5,000.00	$5,300.00	plus ~~$60~~ $64 per acre, plus subdivision fees
b. Administrative Amendment: Type I	$400.00	$425.00	
c. Minor Amendment: Type II	$500.00	$530.00	
d. Major Amendment: Type III	$1,200.00	$1,272.00	
U. Street Vacation			
a. Street Vacation			Cost plus 20% (~~$2,500~~ $2,650 deposit required)

V. Temporary Permits			
a. Structure: Type I - Initial	$130.00	$138.00	
b. Structure: Type II - Renewal	$250.00	$265.00	
c. Use Permit	$130.00	$138.00	
W. Tree Removal			
a. Type I	$110.00	$116.00	
b. Type II	$220.00	$233.00	
c. Type III	$600.00	$636.00	
X. Zoning Administration Fee			
a. Single Family Dwelling Addition	$110.00	$116.00	
b. Single Family Dwelling	$175.00	$185.00	
c. Duplex	$300.00	$318.00	
d. Multi-Family	$300.00	$318.00	plus ~~$44~~ $46 per unit
e. Commercial/Industrial	$110.00	$116.00	minimum; up to 25% of design review fee
3. BUILDING CHARGES Effective at a future date (TBD)			
A. Building Permit (valuation)			
a. $0.01 - $500.00	$85.00	$90.00	
b. $500.01 - $2,000.00	$85.00	$90.00	First $500.00, plus $4.00 for each additional $100 or fraction thereof to and including $2,000
c. $2,000.01 - $25,000.00	$145.00	$150.00	First $2,000.00, plus $11.00 for each additional $1,000 or fraction thereof to and including $25,000
d. $25,000.01 - $50,000.00	$398.00	$403.00	First $25,000.00, plus $9.00 for each additional $1,000 or fraction thereof to and including $50,000
e. $50,000.01 - $100,000.00	$623.00	$628.00	First $50,000.00, plus $6.00 for each additional $1,000 or fraction thereof to and including $100,000
f. $100,000.01 and above	$923.00	$925.00	First $100,000.00, plus $5.00 for each additional $1,000 or fraction thereof
g. Permit Fee Valuation			The determination of the valuation for permit fees shall be based on the most current ICC Building Valuation Data Table as specified in OAR 918-050-0100 and 918-050-0110.
B. Demolition Permits			
a. Demolition Permits, general - State of Oregon			Commercial demolition fees are calculated on the total value of the demolition and are assessed using the building permit fees schedule. Residential demolition fees are based on a flat charge to include building and mechanical elements.
b. Commercial: Building	$100.00	$106.00	minimum
c. Commercial: Public Works	$70.00	$75.00	minimum
d. Residential: Building	$100.00	$106.00	
e. Residential: Public Works	$70.00	$75.00	
C. Derelict Buildings and Structures			
a. Appeal Fee	$300.00	$318.00	
b. Application Fee for Rehabilitation Plan	$150.00	$160.00	per application
D. Fire Sprinkler Plan Review and Inspection Fee			
a. Home Size: 0 - 2,000 square feet	$160.00	$170.00	
b. Home Size: 2,001 - 3,600 square feet	$220.00	$233.00	
c. Home Size: 3,601 - 7,200 square feet	$280.00	$297.00	
d. Home Size: 7,201 square feet and greater	$320.00	$340.00	
E. Foundation Permit			
a. Single Family Dwelling or Addition	$50.00	$53.00	
b. Duplex/Multi-Family	$50.00	$53.00	per dwelling unit
c. Commercial/Industrial	$100.00	$106.00	Minimum. Fees will be calculated by the Building Official based on the size and scope of the project and overall project value.
F. Grading Permit			
a. 50 cubit yard or less	$40.00	$43.00	
b. 51 - 100 cubic yards	$65.00	$69.00	
c. 101 - 1,000 cubic yards	$69.00	$73.00	First 100 cubic yards, plus $25 each additional 100 cubic yards up to 1,000
d. 1,001 - 10,000 cubic yards	$270.00	$298.00	First 1,000 cubic yards, plus $26 each additional 1,000 cubic yards up to 10,000
e. 10,001 - 100,000 cubic yards	$500.00	$532.00	First 10,000 cubic yards, plus $99 each additional 10,000 cubic yards up to 100,000
f. 100,001 cubic yards and above	$1,400.00	$1,432.00	First 100,000 cubic yards, plus $50 each additional 10,000 cubic yards
G. Grading Plan Review			
a. 50 cubit yard or less	$25.00	$27.00	
b. 51 - 100 cubic yards	$50.00	$53.00	
c. 101 - 1,000 cubic yards	$80.00	$85.00	
d. 1,001 - 10,000 cubic yards	$100.00	$106.00	
e. 10,001 - 100,000 cubic yards	$100.00	$106.00	First 10,000 cubic yards, plus $30 each additional 10,000 cubic yards up to 100,000

f. 100,001 - 200,000 cubic yards	$300.00	$376.00	First 100,000 cubic yards, plus $16 each additional 10,000 cubic yards up to 200,000
g. 200,001 cubic yards and above	$450.00	$520.00	First 200,000 cubic yards, plus $8.50 each additional 10,000 cubic yards
H. Manufactured Dwellings			
a. Manufactured Dwelling Installation Fee	$400.00	$425.00	
b. Manufactured Dwelling Park Fees			Per OAR 918-600-0030.
c. Manufactured Dwelling State Fees	$30.00	$32.00	
d. Recreational Park and Camps			Per OAR 918-650-0030.
e. Related Fees: Electrical Feeder	$100.00	$106.00	
I. Mechanical Permit			
a. Mechanical Permit Review Fee			30% of permit issuance fees.
J. Mechanical Permit - Commercial (value)			
a. $1 - $1,000	$85.00	$90.00	
b. $1,000.1 - $10,000.00	$85.00	$90.00	First $1,000 plus $1.50 for each additional $100 or fraction thereof to and including $10,000
c. 10,000.01 - $25,000.00	$220.00	$225.00	First $10,000 plus $16.00 for each additional $1,000 or fraction thereof and including $25,000
d. $25,000.01 - $50,000.00	$460.00	$465.00	First $25,000.00, plus $14.00 for each additional $1,000 or fraction thereof to and including $50,000
e. $50,000.01 - $100,000.00	$810.00	$815.00	First $50,000.00, plus $14.00 for each additional $1,000 or fraction thereof to and including $100,000
f. $100,000.01 and above	$1,510.00	$1,515.00	First $100,000.00, plus $7.00 for each additional $1,000 or fraction thereof
K. Mechanical Permit - Residential			
a. Minimum Permit Fee	$85.00	$90.00	
b. HVAC	$22.00	$23.00	
c. Air conditioning	$22.00	$23.00	
d. Alteration of existing HVAC	$20.00	$22.00	
e. Boiler, compressor	$40.00	$43.00	
f. Fire/smoke damper/duct smoke detectors	$15.00	$16.00	
g. Heat pump	$22.00	$23.00	
h. Install/replace furnace burner	$22.00	$23.00	
i. Install/replace/relocate heater/suspend wall/floor	$22.00	$23.00	
j. Vent for appliance other than furnace	$15.00	$16.00	
k. Refrigeration (absorption unit)	$31.50	$33.00	
l. Refrigeration (chillers)	$17.00	$18.00	
m. Refrigeration (compressors)	$17.00	$18.00	
n. Environmental exhaust and ventilation (appliance vent)	$15.00	$16.00	
o. Dryer exhaust	$15.00	$16.00	
p. Hoods Type I/II residential kitchen/hazmat hood fire suppression	$15.00	$16.00	
q. Exhaust fan with single duct (bath fan)	$15.00	$16.00	
r. Exhaust system apart from heating/AC	$15.00	$16.00	
s. Fuel piping and distribution (up to four outlets)	$15.00	$16.00	
t. Fuel piping each additional outlet over four	$2.20	$2.35	
u. Process piping (up to four outlets)	$15.00	$16.00	
v. Process piping each additional outlet over four	$2.20	$2.35	
w. Decorative fireplace	$28.00	$30.00	
x. Fireplace insert	$28.00	$30.00	
y. Wood/pellet stove	$28.00	$30.00	
L. Movement of Buildings			
a. Movement of Buildings Fee	$83.00	$88.00	
M. Other Inspections and Fees			
a. Inspections outside of normal business hours	$120.00	$127.00	per hour, two hour minimum
b. Reinspection fees	$85.00	$90.00	
c. Inspection for which no fee is specifically indicated	$85.00	$90.00	
d. Additional plan review required by changes/additions	$100.00	$106.00	per hour
e. Permit reinstatement fee	$85.00	$90.00	For renewal of a permit that has been expired for six months or less provided no changes have been made in the original plans and specifications for such work
f. Temporary certificate of occupancy	$250.00	$265.00	per month
g. Penalty for work commencing before permit issuance	$100.00	$106.00	
N. Plan Review			
a. Building			70% of permit issuance fees (residential and commercial)
b. Fire & Life Safety Plan Review Fee			50% of permit issuance fees
c. Seismic Plan Review			1% of permit issuance fees
d. Plumbing			30% of plumbing permit issuance fees
e. Mechanical			30% of mechanical permit issuance fees
f. Phased permit plan review fee	$250.00	$265.00	plus 10% of the total project permit fee
g. Deferred submittals	$250.00	$265.00	plus 10% of the total project permit fee
h. Simple one and two family dwelling plans	$130.00	$138.00	
i. Solar Photovoltaic Installation Prescriptive Path Fee	$160.00	$170.00	

O. Plumbing Permit

a. Minimum Permit Fee	$85.00	$90.00	
b. Each fixture	$25.00	$27.00	
c. Catch basin	$35.00	$37.00	each
d. Drywall	$35.00	$37.00	each
e. Fire hydrant	$35.00	$37.00	each
f. Footing drain	$0.25	$0.30	per foot
g. Manhole/OWS	$35.00	$37.00	each
h. Manufactured home set-up plumbing fee	$80.00	$85.00	
i. Rain drains connector	$25.00	$27.00	per 100 feet
j. Residential fire sprinkler	$10.00	$11.00	per head
k. Sanitary swer	$85.00	$90.00	per 100 feet
l. Single family one bath	$450.00	$477.00	New 1 and 2 family dwellings includes 100 feet for each utility
m. Single family two bath	$550.00	$583.00	New 1 and 2 family dwellings includes 100 feet for each utility
n. Single family three bath	$650.00	$690.00	New 1 and 2 family dwellings includes 100 feet for each utility
o. Single family additional bath or kitchen	$110.00	$116.00	
p. Storm sewer	$85.00	$90.00	per 100 feet
q. Water service	$85.00	$90.00	per 100 feet

P. State Surcharge

a. State Surcharge Fee			All building, plumbing, and mechanical permits are subject to a State of Oregon surcharge of 12% payable with the payment of the permit. This surcharge is subject to change at the State's discretion

4. SIGN CHARGES Effective at a future date (TBD)

A. Penalty

a. Signs installed without permit			All sign permit fees doubled if the sign is installed or displayed prior to obtaining a permit.

B. Permanent Sign

a. Sign Permits - Permanent	$75.00	$80.00	Plus, fees based on the valuation of the sign, using the building permit fee schedule.

C. Temporary Signs

a. Temporary sign penalty	$50.00	$53.00	Fee is waived if the permit is obtained before the sign is installed
b. Copy change or change in panel	$20.00	$25.00	
c. A-Frame Signs	$10.00	$25.00	
d. Garage Sale Sign	$3.00	$4.00	per sign

D. Zoning Review Fee

a. Zoning Review Fee - Permanent Sign	$22.00	$25.00	Does not include banners, A-Frames, or change in panel

7. WATER RATES Effective with July 2023 billing

A. Base by Customer Class

a. Single Family	$11.01	$14.97	per month
b. Single Family - Reduced		$7.49	per month
c. Multi-Family	$11.01	$14.97	per month
d. Commercial/Industrial	$11.01	$14.97	per month
e. Wholesale	$13.17	$17.91	per month
f. Single Family - outside City limits	$16.55	$22.51	per month

B. Charge by Meter Size - inside city limits

a. 5/8" Meter	$0.40	$0.54	per month
b. 3/4" Meter	$0.59	$0.81	per month
c. 3/4" Meter - Reduced		$0.40	per month
d. 1" Meter	$1.02	$1.39	per month
e. 1 1/2" Meter	$1.95	$2.65	per month
f. 2" Meter	$3.12	$4.25	per month
g. 3" Meter	$5.92	$8.06	per month
h. 4" Meter	$9.82	$13.36	per month
i. 6" Meter	$19.69	$26.78	per month
j. 8" Meter	$31.49	$42.83	per month
k. 10" Meter	$45.30	$61.61	per month

C. Charge by Meter Size - outside city limits

a. 5/8" Meter	$0.58	$0.79	per month
b. 3/4" Meter	$0.91	$1.24	per month
c. 1" Meter	$1.49	$2.03	per month
d. 1 1/2" Meter	$2.95	$4.02	per month
e. 2" Meter	$4.66	$6.34	per month
f. 3" Meter	$8.79	$11.95	per month
g. 4" Meter	$14.63	$19.90	per month
h. 6" Meter	$29.24	$39.76	per month
i. 8" Meter	$48.78	$66.33	per month

j. 10" Meter	$67.29	$91.52	per month
D. Volume Charge by Customer Class			
a. Single Family	$4.42	$6.01	per 100 cubic feet
b. Single Family - Reduced		$3.00	per 100 cubic feet
c. Multi-Family	$4.16	$5.65	per 100 cubic feet
d. Commercial/Industrial	$3.81	$5.18	per 100 cubic feet
e. Wholesale	$4.66	$6.34	per 100 cubic feet
f. Single Family - outside City limits	$6.62	$9.01	per 100 cubic feet
g. Commercial/Industrial - outside City limits	$5.92	$8.06	per 100 cubic feet
h. Skyview Acres	$1.14	$1.55	per 100 cubic feet, plus COP pass through
8. WASTEWATER RATES Effective with July 2023 billing			
A. Base by Customer Class			
a. Single Family	$26.07	$30.24	per month
b. Single Family - Reduced	$13.04	$15.13	per month
c. Multi-Family	$26.07	$30.24	per month
d. Commercial/Industrial	$12.42	$14.41	per month
B. Volume Charges by Customer Class			
a. Single Family	$6.69	$7.76	per 100 cubic feet
b. Single Family - Reduced	$3.35	$3.89	per 100 cubic feet
c. Multi-Family	$6.69	$7.76	per 100 cubic feet
d. Commercial/Industrial	$9.08	$10.54	per 100 cubic feet
e. Residential - No water service	$94.04	$109.09	per month
9. STORMWATER RATES Effective with July 2023 billing			
A. Utility Fee			
a. Equivalent Residential Unit (ERU)	$5.00	$8.00	per month, per ERU (ERU = 2,750 sq. ft. of impervious surface)
10. SANDYNET CHARGES Effective with July 2023 billing			
A. Miscellaneous			
a. Installation Fee	$100.00		$300.00 for 10 gbps installation
b. Shut-Off Fee	$50.00		
B. Wireless			
a. Residential - 5 mbps	$24.95		per month
b. Residential - 10 mbps	$34.95		per month
c. Rural - 5 mbps	$29.95		per month
d. Rural BIP - 5 mbps	$39.95		per month
e. Rural Enhanced - 10 mbps	$49.95		per month
C. Fiber			
a. Residential - 500 mbps	$44.95		per month
b. Residential - 1 gbps	$59.95		per month
c. Residential - 2 gbps	~~$110.00~~	$80.00	per month
d. Residential - 5 gbps	~~$180.00~~	$110.00	per month
e. Residential - 10 gbps		$280.00	per month
f. Business - 500 mbps	$44.95		per month
g. Business - 1 gbps	$59.95		per month
h. Business - other			per contractual agreement, authorized by department director and/or City Manager
i. Rural - 500 mbpd	$64.95		per month
j. Rural - 1 gbps	$84.95		per month
D. Digital Voice			
a. Residential	$20.00		per month
b. Business	$28.95		per month
E. Other			
a. Static IP address	$10.00		per month
b. Fax line	$11.95		per month
c. Mesh unit	$5.00		per month
15. LIBRARY Effective July 1, 2023			
A. Damaged Items			
a. Damaged book, audio/visual material, or Library of Things item			Full replacement cost
B. Library Fines			
a. Overdue Fines	~~$0.25~~	$0.10	per day
b. Maximum Overdue Fine	~~$5.00~~	$1.00	
c. Library of Things item			$1.00 ~~or $5.00 per day, depending on item~~
d. All lost Items			Full replacement cost
~~e. Cultural Pass - overdue~~	~~$5.00~~		~~per day~~
C. Meeting Space			
a. Community Room	$25.00		Individual
b. Community Room	$25.00		per hour - for-profit organizations or groups
c. Community Room			no charge for non-profits
D. Non-Resident Fees			
a. Out of District Fee	$95.00		per year
~~b. Three month temporary card~~	~~$25.00~~		~~per quarter~~
E. Prints and Copies			
a. Grey scale	~~$0.10~~	$0.25	per side

b. Color	~~$0.25~~	$0.50	per side

~~16. COMMUNITY SERVICES~~

~~A. Rental Fees - Community Center~~

~~a. Auditorium~~	~~$35.00~~	
~~b. Dining Room~~	~~$35.00~~	
~~c. Kitchen~~	~~$15.00~~	
~~d. Art Room~~	~~$10.00~~	
~~e. Conference Room~~	~~$10.00~~	
~~f. Lounge~~	~~$10.00~~	
~~g. Total Floor~~	~~$55.00~~	~~per floor, plus $100 deposit~~
~~h. Non-profit~~		~~no charge~~

~~B. Rental Fees - Community Campus~~

~~a. Upper Field~~	~~$20.00~~	~~per hour, $200 daily~~
~~b. Lower Field/Track~~	~~$20.00~~	~~per hour, $200 daily~~
~~c. Gym~~	~~$40.00~~	~~per hour, $400 daily~~
~~d. 25 Yard Pool~~	~~$60.00~~	~~per hour, $600 daily~~
~~e. Shallow Pool~~	~~$15.00~~	~~per hour, $150 daily~~
~~f. Deep Pool~~	~~$15.00~~	~~per hour, $150 daily~~
~~g. Kiddie Pool~~	~~$15.00~~	~~per hour, $150 daily~~
~~h. Pool (all aspects)~~	~~$75.00~~	~~per hour, $750 daily~~
~~i. Long Term or Specialty Rentals~~		~~per contractual agreement, authorized by department director and/or City Manager~~

16. PARKS & RECREATION Effective July 1, 2023

A. Community/Senior Center

a. Auditorium			
i. Resident	$35.00	$40.00	per hour
ii. Non-Resident	$35.00	$60.00	per hour
b. Dining Room			
i. Resident	$35.00	$40.00	per hour
ii. Non-Resident	$35.00	$60.00	per hour
c. Art Room			
i. Resident	$10.00	$15.00	per hour
ii. Non-Resident	$10.00	$30.00	per hour
d. Lounge			
i. Resident	$10.00	$15.00	per hour
ii. Non-Resident	$10.00	$30.00	per hour
e. Kitchen			
i. Resident	$15.00	$15.00	per hour
ii. Non-Resident	$15.00	$30.00	per hour
f. Building			
i. Resident		$125.00	per hour
ii. Non-Resident		$145.00	per hour
g. Custodial Fee		$20.00	

B. Parks

a. Meinig Park - Gazebo/Ampetheater			
i. Resident	$200.00		
ii. Non-Resident	$300.00		
b. Meinig Park - Small Shelters			
i. Resident		$10.00	per hour
ii. Non-Resident		$15.00	per hour
c. Centennial Plaza			
i. Resident	$200.00		
ii. Non-Resident	$300.00		
d. Bornstedt Park - Large Shelter			
i. Resident		$100.00	11:00 am - 2:00 pm
ii. Non-Resident		$130.00	11:00 am - 2:00 pm
e. Cascadia Park and Bluff Park - Shelters			
i. Resident		$50.00	11:00 am - 2:00 pm
ii. Non-Resident		$70.00	11:00 am - 2:00 pm
f. Community Garden			
i. Resident	$20.00	$20.00	first bed, each additional bed $25
ii. Non-Resident	$20.00	$25.00	first bed, each additional bed $25

C. Fields/Green Spaces

a. Community Campus - Upper Field			
i. Resident	$20.00	$20.00	per hour
ii. Non-Resident	$20.00	$30.00	per hour
b. Community Campus - Lower Field			
i. Resident	$20.00	$20.00	per hour
ii. Non-Resident	$20.00	$30.00	per hour
c. Green Space			
i. Resident		$20.00	per hour
ii. Non-Resident		$30.00	per hour

Staff Report

Meeting Date:	June 20, 2023
From	Josh Soper, City Attorney
SUBJECT:	Revised Moratorium Raising Limit on New Wastewater Connections

DECISION TO BE MADE:
Whether to adopt a revised moratorium, lifting the limit on equivalent residential units (ERUs) from 120 to 300 in alignment with the Consent Decree approved on June 5, 2023, and making other administrative changes and clarifications.

BACKGROUND / CONTEXT:
On October 3, 2022, City Council approved Resolution 2022-24, adopting a six-month development moratorium as a result of the capacity issues the City is experiencing with its wastewater treatment system, for the purpose of limiting development that could increase sewer flows. The duration of that moratorium was extended for an additional six months by Resolution 2023-07 on March 20, 2023, and it is currently set to expire on October 3, 2023, unless the City Council takes additional action prior to that date.

Subsequently, on June 5, 2023, City Council approved a consent decree to settle the enforcement proceedings from the Oregon Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA) relating to past permit violations incurred by the City's wastewater treatment system. The consent decree includes terms that differ from the existing development moratorium, the most significant of which is that it allows up to 300 equivalent residential units (ERUs, a measure of sewer flow equal to that typically generated by a single family detached dwelling) of new connections and additional flows through existing connections, rather than the 120 ERUs allowed under the current moratorium. **This higher ERU allowance reflects the anticipated capacity improvements resulting from the work the City has performed on the wastewater treatment system over the past year.**

As noted in the staff report presented in connection with approval of the consent decree, staff is now bringing forward a resolution to establish a development moratorium that is in alignment with the terms of the consent decree, among other changes. **Approval of this resolution will loosen the terms of the moratorium and allow additional new construction to move forward in the city.**

KEY CONSIDERATIONS / ANALYSIS:

Consent Decree with EPA / DEQ

Background

Through the consent decree, the City agreed to take certain steps intended to prevent additional permit violations now and into the future. This includes the City's obligation to complete a "stress test" and comprehensive capacity analysis, which will definitively determine the current capacity of the City's wastewater treatment system based on the work the City has already completed to address capacity issues, including reduction of infiltration and inflow (I/I) and improvements at the wastewater treatment plant. The stress test is currently underway, and staff is working diligently to conclude the stress testing analysis and comprehensive capacity evaluation in order to develop a report for EPA/DEQ review and approval by Fall 2023.

Capacity Assurance Program

Another major component of the consent decree requirements is the Capacity Assurance Program (CAP). The CAP is divided into two time periods:

- Period 1 - before the approved results of the stress test establish the system capacity
- Period 2 - after the results of the stress test are approved, and continuing until the City has completed improvements providing capacity for 10 years of anticipated population growth

Under the CAP, the City must:

- Limit new connections to the wastewater system and changes to existing connections that increase flows.
    - Period 1 - City limited to 300 ERUs as an estimate of the current capacity of the system based on the improvement work the City has already done.
    - Period 2 - City limited to the number of ERUs the stress test results support. Note that the City can increase the ERU cap during Period 2 by demonstrating to EPA/DEQ that additional capacity has been made available in the interim through additional improvements.
- Take any actions necessary to accomplish the above, specifically including enacting a development moratorium.

Negotiation of Higher ERU Allowance

The ERU limit during Period 1 was a subject of extensive negotiations with EPA/DEQ, where staff worked to ensure the number of ERUs allowed was consistent with two goals. First, it needed to reflect the anticipated capacity improvements resulting from the significant work the City has done in the last year. Second, it needed to be sufficient to avoid unnecessary negative impacts on developments for which land use applications were submitted prior to the original moratorium effective date of October 3, 2022. A table is attached with additional details on these projects.

In addition, EPA/DEQ proposed that the CAP would be in place for the entire duration of the consent decree, which could last for over two decades. Staff negotiated to have the CAP instead end when the City can demonstrate system capacity for ten years of anticipated population growth, allowing the CAP to end sooner. Staff also focused negotiation efforts on ensuring that the consent decree requirements for calculating capacity as a result of the stress test will fairly represent the actual capacity of the wastewater system.

This resolution is primarily intended to meet the City's obligations under the consent decree and to establish a moratorium that is in alignment with the terms of the consent decree, thereby reducing the limitations on developments submitted for land use approval prior to the original moratorium to move forward.

Revision of the Moratorium

In addition to the above, this resolution would make other clarifications and modifications from the original moratorium based on staff's experience administering the moratorium to date. This resolution would also have the effect of adopting a new moratorium and repealing the existing moratorium, rather than being an extension of the existing moratorium, because state law requires a new moratorium be adopted in order to make any modifications to the moratorium terms.

Highlights of key changes from the prior moratorium include:

1. An increase from a limit of 120 ERUs to 300 ERUs based on the terms of the consent decree and improvements the City has made to its wastewater treatment system. Note that, as described in the consent decree, this count will start over—the ERUs approved since October 3, 2022, under the original moratorium, will not be subtracted from the 300 ERUs.
2. Clarification that the moratorium applies to modifications that result in additional flows through existing connections, not just to new connections, based on the consent decree.
3. Clarification that a duplex does not have to already be built in order to qualify for the exception for a middle housing land division under SB 458 (middle housing land divisions).
4. Allowing annexations and medical hardship permits.
5. An exemption to allow land use applications for projects described in the City's facility plans and master plans, and reserving 2 ERUs for these projects.
6. Reserving 12 ERUs for economic development projects (non-residential projects), which is the number needed to accommodate 100 percent of the economic development projects which submitted for land use approval prior to the original moratorium.
7. A statement that City Council will re-evaluate the moratorium upon approval of the results of the stress test and comprehensive capacity analysis, or within 6 months, whichever is sooner.

Next Steps

As indicated above, staff expects the results of the stress test and comprehensive capacity analysis to be completed and approved by EPA/DEQ in Fall 2023. Depending on what those results show in terms of the capacity of the City's wastewater treatment system, staff anticipates either bringing forward a new moratorium with additional modifications which will hopefully include making additional ERUs available for new construction, or alternatively, if and when sufficient additional capacity is shown to be available, bringing forward a resolution to repeal the moratorium entirely.

RECOMMENDATION:

Staff recommends Council approval of Resolution 2023-27

SUGGESTED MOTION LANGUAGE:

"I move to adopt Resolution 2023-27."

LIST OF ATTACHMENTS/EXHIBITS:

1. Resolution 2023-27 with attached findings
2. Consent Decree
3. Table of projects which submitted for land use approval prior to the original moratorium

NO. 2023-27

A RESOLUTION APPROVING A MORATORIUM ON DEVELOPMENT PURSUANT TO ORS 197.505 TO 197.540 BASED ON LIMITED SANITARY SEWER CAPACITY

THE CITY OF SANDY, CLACKAMAS COUNTY, OREGON, FINDS AS FOLLOWS:

WHEREAS, pursuant to the federal Clean Water Act of 1972, the City of Sandy sanitary sewer collection and treatment system is subject to a National Pollutant Discharge Elimination System (NPDES) permit (the Permit) issued to the City by Oregon Department of Environmental Quality (DEQ) under authority granted by the U.S. Environmental Protection Agency (EPA); and

WHEREAS, the Permit limits the types and amounts of discharges from the City treatment plant into Tickle Creek; and

WHEREAS, population growth and development in the City has increased the demand on the available capacity at the treatment plant; and

WHEREAS, inflow and infiltration (I&I) into the City collection system (i.e. sewer pipes) from surface water has also increased the demand on available treatment plant capacity; and

WHEREAS, the combination of I&I and increased base flows has caused discharges from the treatment plant to violate permitted NPDES levels during certain weather events; and

WHEREAS, the City has engaged in a significant program of investigation, remediation and repair of the collection system to reduce the amount of I&I and the corresponding demand on the treatment facilities; and

WHEREAS, the City is also amending the Facilities Master Plan to provide for the design, financing, and construction of additional treatment facilities to improve the capacity of the City's wastewater system in the long term; and

WHEREAS, the aforementioned permit violations have resulted in enforcement proceedings from DEQ and EPA which are anticipated to be resolved via the consent decree approved by the City Council on June 5, 2023 (the "Consent Decree"); and

WHEREAS, the terms of the Consent Decree require the City to perform a "stress test" and comprehensive capacity analysis that will determine the capacity of the City's existing sanitary sewer system based on work the City has already performed to improve capacity; and

WHEREAS, the results of the comprehensive capacity analysis are not anticipated to be available and approved by EPA and DEQ until Fall 2023; and

WHEREAS, the Consent Decree requires the City to limit new connections to the City's sanitary sewer system, and modifications to existing connections to the City's sanitary sewer system that increase flows, to no more than 300 equivalent residential units (ERUs) until the comprehensive capacity analysis results are approved by EPA and DEQ, at which point the 300 ERU cap will be replaced with a cap determined by the results of the comprehensive capacity analysis; and

WHEREAS, upon completion of the comprehensive capacity analysis and approval of the results by EPA and DEQ, the City anticipates that additional capacity will become available and additional development projects will be allowed to connect to the sanitary sewer system and add increased flows through existing connections; and

WHEREAS, the Consent Decree requires the City to take such actions as are necessary to meet the above obligations, including enactment of a development moratorium; and

WHEREAS, the Consent Decree also sets out a process the City is required to follow in order to address the lack of capacity in its wastewater system moving forward, including specific steps the City is required to take and deadlines for completion; and

WHEREAS, the moratorium imposed by this Resolution is intended to meet the City's obligations under the Consent Decree and to prevent the approval of additional development that will require new connections to the City's sanitary sewer system or modifications to existing connections to the City's sanitary sewer system that increase flows, until such time as sufficient additional capacity in the City's wastewater system is achieved; and

WHEREAS, while negotiations with EPA and DEQ were ongoing, the City enacted a development moratorium via Resolution 2022-24 on October 3, 2022, and extended that moratorium via Resolution 2023-07 on March 20, 2023; and

WHEREAS, the new moratorium enacted by this Resolution is intended to replace said prior moratorium; and

WHEREAS, this Resolution is authorized by ORS 197.505 to 197.540;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Sandy

Section 1. The moratorium previously enacted via Resolution 2022-24 on October 3, 2022, and extended via Resolution 2023-07 on March 20, 2023, is hereby repealed.

#2023-27

Section 2. The City of Sandy Development Services Department (Department) staff shall not accept or process a land use application or other application for approval of development that is submitted on or after the effective date of this Resolution if the development will require a new connection to the City sanitary sewer system or will result in increased flow through an existing connection to the City's sanitary sewer system.

Section 3. Section 2 of this Resolution applies to the following types of land use applications or other similar application as determined by the Department Director:

a.) Comprehensive plan or zoning map amendment.

b.) Subdivision.

c.) Partition, except as provided in Section 4.l below.

d.) Specific area plan.

e.) Replat that results in a new lot.

f.) Design review that will require a new connection or increased flows through an existing connection if approved, including conversion of a single-family dwelling into a duplex.

g.) Accessory dwelling unit.

h.) Food cart permit outside of an existing pod.

i.) Conditional use permit that requires a new connection or will result in increased flows through an existing connection.

Section 4. Section 2 of this Resolution does not apply to the following types of land use applications or other similar application as determined by the Department Director:

a.) Property line adjustment.

b.) Conditional use permit without a new connection and which will not result in increased flows through an existing connection.

c.) Food cart permit inside an existing pod.

d.) Adjustment, variance, or design deviation.

e.) Tree permit.

f.) Flood slope hazard permit.

g.) Hillside development permit.

h.) Replat that does not create a new lot.

i.) Street vacation.

j.) Request for code interpretation.

k.) Development that relies on on-site septic treatment or another alternative that does not connect to the City sanitary sewer, as allowed under City code and other applicable law.

l.) Middle Housing Land Division per Section 17.100.50 of the Sandy Municipal Code and SB 458 (2021).

m.) City projects described in a facility plan or master plan.

n.) Annexations.

o.) Hardship permits.

Section 5. During the time this Resolution is in effect, the Department will limit any new connections to the City's sanitary sewer system, and any increased flows through existing connections, to 300 ERUs. The Department shall not issue building permits or other permits that in total would allow more than 300 ERUs through new connections or increased flows through existing connections to the City sanitary sewer system. This Section 5 is subject to the following:

a.) ERUs shall be calculated as set forth in the Consent Decree.

b.) Twelve (12) of the 300 ERUs shall be exclusively for use for economic development projects, which shall be defined as any private development or portion thereof that is not residential.

c.) Two (2) of the 300 ERUs shall be exclusively for use for City projects under Section 4.m above.

d.) A second connection to an existing duplex currently served by a single connection in order to allow a Middle Housing Land Division under Section 4.l above, per Section 17.100.50 of the Sandy Municipal Code and SB 458 (2021), shall not be considered a new connection for purposes of this Section 5.

Section 6. The City Council shall review this Resolution and determine whether there is a need to extend or repeal the moratorium it establishes based on the results of the comprehensive capacity analysis after such results are approved by EPA and DEQ, or in any event not more than six months after the effective date of this Resolution.

Section 7. The City hereby adopts the requirements of the Consent Decree as its program to correct the problems leading to this moratorium, as required by ORS 197.530.

Section 8. This Resolution is based on the recitals above and the findings of fact set forth in the attached Exhibit A.

Section 9. This Resolution is effective on the date it is adopted by the City Council and shall remain in effect for a period of six months, unless earlier extended or repealed.

This resolution is adopted by the Common Council of the City of Sandy and approved by the Mayor this 20 day of June 2023

_____

Stan Pulliam, Mayor

ATTEST:

#2023-27

_____
Jeff Aprati, City Recorder

#2023-27

EXHIBIT A

FINDINGS OF FACT

1. These findings are intended to supplement the findings stated in the recitals to Resolution 2023-27.

2. ORS 197.520 provides:

(1) No city, county or special district may adopt a moratorium on construction or land development unless it first:

(a) Provides written notice to the Department of Land Conservation and Development at least 45 days prior to the final public hearing to be held to consider the adoption of the moratorium;

Finding: The City e-mailed notice to DLCD on May 5, 2023. This criterion is satisfied.

(b) Makes written findings justifying the need for the moratorium in the manner provided for in this section; and

Finding: The findings stated in the recitals to Resolution 2023-27 and this Exhibit A are written findings justifying the need for the moratorium. This criterion is satisfied.

(c) Holds a public hearing on the adoption of the moratorium and the findings which support the moratorium.

Finding: The City Council held a hearing on the adoption of the moratorium and the findings during a duly noticed public meeting on June 20, 2023. This criterion is satisfied.

(2) For urban or urbanizable land, a moratorium may be justified by demonstration of a need to prevent a shortage of public facilities which would otherwise occur during the effective period of the moratorium. Such a demonstration shall be based upon reasonably available information, and shall include, but need not be limited to, findings:

Finding: The land affected by this moratorium is the entire city limits of the City of Sandy, which is urban or urbanizable land. The basis for the moratorium is a need to prevent a shortages of public facilities which would otherwise occur during the effective period of the moratorium. This criterion is satisfied.

(a) Showing the extent of need beyond the estimated capacity of existing public facilities expected to result from new land development, including identification of any public facilities currently operating beyond capacity, and the portion of such capacity already committed to development;

Finding: The Consent Decree constitutes a legally binding agreement and court order establishing that the capacity of the City's wastewater system is an additional 300 ERUs as of the effective date of the Consent Decree. City staff has estimated that applications for land use approval submitted prior to the effective date (October 3, 2022) of the prior moratorium created by Resolution 2022-24, and not yet developed, will require 592.9 ERUs of wastewater system capacity. Therefore, even before taking into consideration any need which may exist beyond the development represented by applications for land use approval that were submitted prior to October 3, 2022, the wastewater system capacity already committed to development, for purposes of ORS 197.520(2)(a), exceeds the capacity of existing public facilities. This criterion is satisfied.

(b) That the moratorium is reasonably limited to those areas of the city, county or special district where a shortage of key public facilities would otherwise occur; and

Finding: The City sanitary sewer system serves the entire City. Therefore, the moratorium must apply to the entire City. This criterion is satisfied.

(c) That the housing and economic development needs of the area affected have been accommodated as much as possible in any program for allocating any remaining public facility capacity.

Finding: The City negotiated with DEQ and EPA to maximize the number of ERUs of capacity that would be available prior to the approval of the results of the comprehensive capacity analysis in order to accommodate as much development addressing housing and economic development needs as possible. The City anticipates more capacity becoming available based on the results of the comprehensive capacity analysis, and the moratorium will be revisited as needed to ensure any such capacity will be made available to address additional housing and economic development needs. Moreover, as further capacity becomes available as a result of improvements and repairs to the collection and treatment systems, the City also intends that this capacity will be made available to address additional housing and economic development needs.

The vast majority of the land use applications submitted prior to October 3, 2022 relate to housing. In order to ensure a degree of balancing of accommodation of housing needs with economic development needs in the area, the moratorium allocates twelve ERUs of capacity to economic development projects, based on the ERUs estimated to be required by the economic development projects that were submitted for land use approval prior to October 3, 2022. Two ERUs are allocated for public projects necessary to serve the community, as described in facility plans and master plans. The remaining 286 ERUs (95.3% of the total capacity) are available for housing projects.

This criterion is satisfied.

3. ORS 197.530 provides:

(1) A city, county or special district that adopts a moratorium on construction or land development in conformity with ORS 197.520(1) and (2) shall within 60 days after the effective date of the moratorium adopt a program to correct the problem creating the moratorium. The program shall be presented at a public hearing. The city, county or special district shall give at least 14 days' advance notice to the Department of Land Conservation and Development of the time and date of the public hearing.

Finding: Resolution 2023-27 adopts the requirements of the Consent Decree as the City's program to correct the problem creating the moratorium. It is adopted simultaneously with adoption of the moratorium. This program was presented at a public hearing under consideration of Resolution 2023-27 on June 20, 2023. Notice of this public hearing was provided to DLCD via e-mail on May 5, 2023. This criterion is satisfied.

(2) No moratorium adopted under ORS 197.520(2) shall be effective for a period longer than six months from the date on which the corrective program is adopted…

Finding: The effective period for this moratorium is six months. This criterion is satisfied.

4. This Resolution is based on and directly implements state law. There are no applicable goals and policies in the Sandy Comprehensive Plan.

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF OREGON

PORTLAND DIVISION

UNITED STATES OF AMERICA, STATE OF OREGON
BY AND THROUGH DEPARTMENT OF
ENVIRONMENTAL QUALITY,

Plaintiffs, Case No.

v.

CITY OF SANDY, OREGON

Defendant.

CONSENT DECREE

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I. BACKGROUND

Plaintiff United States of America, on behalf of the United States Environmental Protection Agency ("EPA"), and the State of Oregon by and through the Oregon Department of Environmental Quality (the "State") (collectively "Plaintiffs"), have filed a complaint in this action concurrently with this Consent Decree pursuant to Section 309 of the Clean Water Act ("CWA" or "Act"), 33 U.S.C. § 1319, and Oregon Revised Statute ("ORS") 468.140, alleging that Defendant, City of Sandy, Oregon ("Sandy" or "City"), violated and continues to violate Sections 301 and 402 of the CWA, 33 U.S.C. §§ 1311 and 1342, and ORS 468B.025(2) by failing to comply with the requirements of its National Pollution Discharge Elimination System Permit ("NPDES Permit") for the City's Wastewater Treatment Plant located at 33400 Southeast Jarl Road in Boring, Oregon and its 1200-Z Stormwater Discharge General NPDES Permit ("Industrial Stormwater Permit").

On February 18, 2018, ODEQ and the City entered into a Mutual Agreement and Order ("MAO") resolving civil penalties assessed for violations of the City's NPDES Permit. Pursuant to the MAO, the City was to provide an Updated Facility Plan by January 1, 2019, and plant improvements were to be completed by November 1, 2021, that would bring the City into compliance with the terms and conditions of its NPDES Permit.

In April 2019, the City requested a revised schedule for the MAO, as the improvements were not on schedule to meet the November 1, 2021 deadline.

The City submitted a Facility Plan to ODEQ in October 2019 that was approved on January 17, 2020. A "Preliminary Design Report: Sandy WWTP Immediate Needs Upgrades Project," was submitted in July of 2020 and approved on August 28, 2020. A Preliminary

Design Evaluation Report was submitted to ODEQ in March of 2021 and approved on April 16, 2021 (attached as Appendix A). Preliminary Need Improvements identified in these plans are not scheduled to be completed until August, 2023 due to supply and construction delays and complications with conducting sampling and stress testing in tandem with construction.

The City now estimates that the preferred alternative in the City's 2019 Wastewater System Facilities Plan is cost prohibitive, and seeks to further evaluate alternatives to bring the system into compliance with its NPDES Permit.

Since October 23, 2017, the City has experienced a significant number of violations of its NPDES Permit, including a high volume of waste discharge limitation violations and six bypass events where waste streams were intentionally diverted from a portion of the treatment facility. Due to system improvements in 2021 and 2022, the City has not had any bypass events since June 11, 2022. ODEQ and EPA have determined, based on the extensive history of violations and the lack of information supporting a conclusion that the City has adequate capacity at the Wastewater Treatment Plant for additional peak system flows and that new or modified connections that increase flow may result in increases in the number and extent of violations of the City's NPDES Permit.

Defendant does not admit any liability to the United States or the State arising out of the transactions or occurrences alleged in the Complaint.

The Parties recognize, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith and will avoid litigation among the Parties and that this Consent Decree is fair, reasonable, and in the public interest.

NOW, THEREFORE, before the taking of any testimony, without the adjudication or admission of any issue of fact or law except as provided in Section I, and with the consent of the

Parties, IT IS HEREBY ADJUDGED, ORDERED, AND DECREED as follows:

II. JURISDICTION AND VENUE

1. This Court has jurisdiction over the subject matter of this action, pursuant to 28 U.S.C. §§ 1331, 1345, and 1355, and Section 309(b) of the CWA, 33 U.S.C. § 1319(b), and over the Parties. This Court has supplemental jurisdiction over the State law claims asserted by the State of Oregon pursuant to 28 U.S.C. § 1367. Venue lies in this District pursuant to Section 309(b) of the CWA, 33 U.S.C. § 1319(b), and 28 U.S.C. §§ 1391(b) and 1395(a), because the violations alleged in the Complaint are alleged to have occurred in, and Defendant is located in, this judicial district. For purposes of this Decree, or any action to enforce this Decree, Defendant consents to the Court's jurisdiction over this Decree and any such action and over Defendant and consents to venue in this judicial district.

2. For purposes of this Consent Decree, Defendant agrees that the Complaint states claims upon which relief may be granted pursuant to Section 309(b) of the CWA, 33 U.S.C. § 1319(b), ORS 468.035(1)(k) and ORS 468.100.

III. APPLICABILITY

3. The obligations of this Consent Decree apply to and are binding upon the United States and the State, and upon Defendant and any successors, assigns, or other entities or persons otherwise bound by law.

4. No transfer of ownership or operation of the City of Sandy Treatment Works, whether in compliance with the procedures of this Paragraph or otherwise, shall relieve Defendant of its obligation to ensure that the terms of the Decree are implemented. At least 30 Days prior to such transfer, Defendant shall provide a copy of this Consent Decree to the proposed transferee and shall simultaneously provide written notice of the prospective transfer,

together with a copy of the proposed written agreement, to EPA, the State, and DOJ, in accordance with Section XV (Notices). Any attempt to transfer ownership or operation of the City of Sandy Treatment Works without complying with this Paragraph constitutes a violation of this Decree.

5. Defendant shall provide a copy of this Consent Decree to all officers, employees, and agents whose duties might reasonably include compliance with any provision of this Decree, as well as to any contractor retained to perform work required under this Consent Decree. Defendant shall condition any such contract upon performance of the work in conformity with the terms of this Consent Decree.

6. In any action to enforce this Consent Decree, Defendant shall not raise as a defense the failure by any of its officers, directors, employees, agents, or contractors to take any actions necessary to comply with the provisions of this Consent Decree.

IV. OBJECTIVE

7. The Objective of this Consent Decree is for the City to achieve and maintain compliance with the CWA, ORS Chapter 468B, applicable federal and state regulations, its NPDES Permit and its Industrial Stormwater Permit, with the goal of eliminating all untreated discharges and discharges that fail to meet the effluent limitations established in its NPDES Permit.

V. DEFINITIONS

8. Terms used in this Consent Decree that are defined in the CWA, 33 U.S.C. §§ 1251-1387, and ORS Chapter 468B or in regulations promulgated thereunder have the meanings assigned to them in the Act, statutes or such regulations, unless otherwise provided in this

Consent Decree. Whenever the terms set forth below are used in this Consent Decree, the following definitions apply:

"2020-2023 Wastewater Improvements" shall mean the 2021-2023 WWTP Immediate Needs Upgrades Project, 2021 Basins 2 and 8 Rehabilitation Project, and 2022 Basins 6 and 7 Rehabilitation Project;

"Basin" shall mean a subdivision of a Wastewater Collection and Transmission System which consists of hydraulically linked sewers that are tributary to a common point in the sewer system. Sewer system evaluation techniques are undertaken on a basin basis. The basins for the City of Sandy are identified in Appendix B;

"City" or "Sandy" shall mean the Defendant City of Sandy, Oregon, including all of its departments, agencies, and instrumentalities and any successors thereto;

"City of Sandy Treatment Works" or "CSTW" shall mean the wastewater collection, treatment, control, and disposal system for the City of Sandy, including the Wastewater Treatment Plant and the Wastewater Collection and Transmission System;

"Complaint" means the complaint filed by the United States and the State in this action;

"Connection" means a physical connection to the WCTS measured at the time the connection is used or is permitted by the City to increase the flow to the CSTW;

"Consent Decree" or "Decree" means this Decree and all appendices attached hereto (listed in Section XXV);

"Day" means a calendar day unless expressly stated to be a business day. In computing any period of time for a deadline under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal holiday, the period runs until the close of business of the next business day;

"Defendant" means the City of Sandy, Oregon;

"DOJ" means the United States Department of Justice and any of its successor departments or agencies;

"EPA" means the United States Environmental Protection Agency and any of its successor departments or agencies;

"Effective Date" means the definition provided in Section XVI;

"Industrial Stormwater Permit" means the 1200-Z Stormwater Discharge General NPDES Permit 17517, ORR900001 authorizing stormwater discharges associated with an industrial activity;

"ODEQ" means the State of Oregon Department of Environmental Quality;

"ODOJ" means the State of Oregon Department of Justice;

"NPDES Permit" means permit number 102492, OR0026573 issued to the City by ODEQ pursuant to ODEQ's delegated permitting authority under CWA Section 402, 33 U.S.C. § 1342, and any future extended, modified, or reissued permits;

"Paragraph" means a portion of this Decree identified by an Arabic numeral;

"Parties" means the United States, the State, and Defendant;

"Section" means a portion of this Decree identified by a Roman numeral;

"State" means the State of Oregon, acting on behalf of the Oregon Department of Environmental Quality;

"United States" means the United States of America, acting on behalf of EPA;

"Wastewater Collection and Transmission System" or "WCTS" shall mean the municipal wastewater collection, retention and transmission system, including but not limited to, all pipes,

Force Mains, Gravity Sewer Lines, Pump Stations, pumps, manholes, and appurtenances thereto, which are owned or operated by the City and which flow to the City's WWTP;

"Wastewater Treatment Plant" or "WWTP" shall mean all facilities, devices, or systems which are owned, managed, operated, or maintained by the City for the storage, treatment, recycling, or reclamation of municipal wastewater, including the WWTP located at 33400 Southeast Jarl Road in Boring, Oregon, and all components of such wastewater treatment facility;

"Work" shall mean all activities the City is required to perform under this Consent Decree.

VI. CIVIL PENALTY

9. Within 30 Days after the Effective Date, Defendant shall pay the sum of $250,000 as a civil penalty to the United States, together with interest accruing from the date on which the Consent Decree is lodged with the Court, at the rate specified in 28 U.S.C. § 1961 as of the date of lodging.

10. Defendant shall pay the civil penalty due to the United States by FedWire Electronic Funds Transfer ("EFT") to the DOJ account, in accordance with instructions provided to Defendant by the Financial Litigation Program of the United States Department of Justice after the Effective Date. The payment instructions provided will include a Consolidated Debt Collection System ("CDCS") number, which Defendant shall use to identify all payments required to be made in accordance with this Consent Decree. Payment instructions will be provided to:

Jenny Coker, Public Works Director
City of Sandy
39250 Pioneer Boulevard
Sandy, Oregon 97055

(503) 668-6927
jcoker@ci.sandy.or.us

on behalf of Defendant. Defendant may change the individual to receive payment instructions on its behalf by providing written notice of such change to DOJ and EPA in accordance with Section XV (Notices).

11. At the time of payment, Defendant shall send notice that payment has been made: (i) to EPA via email at cinwd_acctsreceivable@epa.gov and steffen.craig@epa.gov or via regular mail at EPA Cincinnati Finance Office, 26 W. Martin Luther King Drive, Cincinnati, Ohio 45268; (ii) to DOJ in accordance with Section XV; and (iii) to EPA in accordance with Section XV. Such notice shall state that the payment is for the civil penalty owed pursuant to the Consent Decree in *United States, et. al v. City of Sandy, Oregon* and shall reference the civil action number, CDCS Number and DOJ case number 90-5-1-1-12501.

12. No later than 30 Days after the Effective Date, Defendant shall pay to the State the $24,300 penalty assessed in Notice of Civil Penalty Assessment and Order No. WQ/M-NWR-2018-141 ("Notice"), issued by ODEQ to Defendant on February 26, 2019, in resolution of that Notice in the same manner as identified in Paragraph 16.

13. In addition to the civil penalty referenced in the preceding paragraph, a total civil penalty of $250,000 is payable to the State. In accordance with ODEQ's Internal Management Directive on Supplemental Environmental Projects ("SEP"), the civil penalty is mitigated to $50,000 on the condition Defendant completes the approved SEP proposal at Appendix C by December 31, 2028. Defendant shall refrain from using the value of the SEP as a tax deduction or as part of a tax credit application; and, if and when Defendant publicizes the SEP or the results of the SEP, Defendant will state in a prominent manner that the project was undertaken as settlement of an ODEQ enforcement action.

Defendant will be deemed to have completed the SEP when ODEQ receives the following documentation: A written report from the Clackamas River Basin Council confirming that it received at least $200,000 from Defendant and expended the money in the manner described in the SEP proposal.

14. Defendant shall pay the $50,000 portion of the civil penalties, not subject to mitigation through the SEP, within 30 Days of the Effective Date.

15. Should Defendant fail to complete the approved SEP by December 31, 2028, Defendant shall pay the balance of the civil penalties, $200,000, plus 9% interest per annum beginning on the Effective Date, within 30 Days of the completion deadline.

16. Defendant shall pay the civil penalties owed to the State in Paragraphs 12-15 by check or money made out to "Oregon State Treasurer" and submitted to Oregon DEQ, Attn: Business Office, 700 NE Multnomah Street, Portland, OR 97232. At the time of payment, Defendant shall send notice that payment has been made to ODEQ via email to Kieran.ODONNELL@deq.oregon.gov.

VII. COMPLIANCE REQUIREMENTS

17. Defendant shall comply with the CWA, ORS Chapter 468B, implementing regulations, and its NPDES Permit with respect to the CSTW and its Industrial Stormwater Permit.

18. Capacity, Management, Operation, and Maintenance. Within 180 Days of the Effective Date, Sandy shall submit to EPA and ODEQ for review and approval a Capacity, Management, Operation, and Maintenance ("CMOM") Program for the City's Wastewater Collection and Transmission System. The CMOM Program shall be developed in accordance with EPA's 2005 Guidance titled "Guide for Evaluating Capacity, Management, Operation, and

Maintenance Programs at Sanitary Sewer Collection Systems." The CMOM Program shall be stamped and signed by a registered professional engineer licensed to practice in the State of Oregon, demonstrating that the Program has been developed in accordance with EPA's 2005 Guidance and sound engineering practices. Upon approval, Sandy shall implement the CMOM Program and shall annually review the Program, by December 31 of each year, and update the Program as necessary to ensure that it is consistent with accepted industry practices to properly manage, operate, and maintain sewer systems, identify and inventory areas within sewer systems with capacity constraints, and implement measures to ensure adequate capacity throughout its sewer systems. Any updates to the CMOM Program shall be completed by March 31 of the year following the annual review of the CMOM Program and the updated CMOM Program shall be provided to EPA and ODEQ no later than 30 Days following completion of the updated CMOM Program.

19. Sewer Assessment and Rehabilitation Program. By December 31, 2025, Sandy shall for all basins within its WCTS: (1) investigate sources of infiltration and inflow by means of smoke testing, CCTV inspection, and other identification methods; and (2) provide EPA and ODEQ for review and approval an annual report and rehabilitation plan, to be submitted by December 31 of each year, containing a schedule for completion of all basins, the results of the smoke testing and other infiltration and inflow identification efforts, and identifying planned corrective measures along with a schedule for implementation. Corrective measures must include removing heavy sediment and making repairs to category 4 and 5 defects from the National Association of Sewer Service Companies ("NASSCO") rating system. All identified corrective measures shall be completed within 10 years of the Effective Date of the Consent Decree.

20. Preliminary Design Improvements. By October 31, 2023, the City shall complete construction and begin operation of improvements detailed in the 2020-2023 Wastewater Improvements, in accordance with ODEQ approved design plans.

21. Stress Test. The City has previously submitted to EPA and ODEQ, and EPA and ODEQ have reviewed and approved, a plan for conducting a stress test at the Wastewater Treatment Plant as outlined in Paragraph 9.b. of Appendix D. By June 30, 2023, Sandy shall perform the Stress Test in accordance with the plan approved by EPA and ODEQ.

22. Amended Wastewater Facilities Plan. The City shall submit to EPA and ODEQ, for review and approval, an Amended Wastewater Facility Plan that complies with the requirements of Appendix E and proposes alternatives to bring the City into compliance with the terms and conditions of the NPDES Permit. The schedule for final completion of all work under the Amended Wastewater Facility Plan shall be as expeditious as possible, but in no event longer than fifteen (15) years from the date the Facilities Plan is approved by EPA and ODEQ.

23. Capacity Assurance Program. The City shall implement the Capacity Assurance Program outlined in Appendix D that limits new sewer connections until capacity for the additional flows associated with those new or modified connections has been demonstrated within City of Sandy Treatment Works during both dry and peak flows.

24. Approval of Deliverables. After review of any plan, report, or other item that is required to be submitted pursuant to this Consent Decree, EPA and the State will in writing: (a) approve the submission; (b) approve the submission upon specified conditions; (c) approve part of the submission and disapprove the remainder; or (d) disapprove the submission. If all or part of a submission is disapproved, the EPA and the State will explain in writing the reasons for the disapproval, including identifying any deficiencies subject to Paragraphs 25 or 26.

25. If the submission is approved pursuant to Paragraph 24(a), Defendant shall take all actions required by the plan, report, or other document, in accordance with the schedules and requirements of the plan, report, or other document, as approved. If the submission is conditionally approved or approved only in part pursuant to Paragraph 24(b) or (c), Defendant shall, upon written direction from EPA and the State, take all actions required by the approved plan, report, or other item that EPA and the State determines are technically severable from any disapproved portions, subject to Defendant's right to dispute only the specified conditions or the disapproved portions, under Section XI (Dispute Resolution).

26. If the submission is disapproved in whole or in part pursuant to Paragraph 24(c) or (d), Defendant shall, within 60 Days or such other time as the Parties agree to in writing, correct all deficiencies and resubmit the plan, report, or other item, or disapproved portion thereof, for approval, in accordance with the preceding Paragraphs. If the resubmission is approved in whole or in part, Defendant shall proceed in accordance with the preceding Paragraph.

27. If a resubmitted plan, report, or other item, or portion thereof, is disapproved in whole or in part, EPA and the State may again require Defendant to correct any deficiencies, in accordance with the preceding Paragraphs, subject to Defendant's right to invoke Dispute Resolution and the right of EPA and the State to seek stipulated penalties as provided in the preceding Paragraphs.

28. If Defendant elects to invoke Dispute Resolution as set forth in Paragraphs 25 or 27, Defendant shall do so by sending a Notice of Dispute in accordance with Paragraph 57 within 30 Days (or such other time as the Parties agree to in writing) after receipt of the applicable decision.

29. Any stipulated penalties applicable to the original submission, as provided in Section IX, accrue during the 60 Day period described in Paragraph 26 or other specified period, but shall not be payable unless the resubmission is untimely or is disapproved in whole or in part; provided that, if the original submission was so deficient as to constitute a material breach of Defendant's obligations under this Decree, the stipulated penalties applicable to the original submission shall be due and payable notwithstanding any subsequent resubmission.

30. Permits. Where any compliance obligation under this Section requires Defendant to obtain a federal, state, or local permit or approval, Defendant shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals. Defendant may seek relief under the provisions of Section X (Force Majeure) for any delay in the performance of any such obligation resulting from a failure to obtain, or a delay in obtaining, any permit or approval required to fulfill such obligation, if Defendant has submitted timely and complete applications and has taken all other actions necessary to obtain all such permits or approvals.

VIII. REPORTING REQUIREMENTS

31. Defendant shall submit the following reports to EPA and the State at the addresses set forth Section XV (Notices):

a. By July 31st and January 31st of each year after the lodging of this Consent Decree, until termination of this Decree pursuant to Section XIX, Defendant shall submit a semi-annual report for the preceding six months that includes: the status of any construction or compliance measures; completion of milestones; problems encountered or anticipated, together with implemented or proposed

solutions; status of permit applications; operation and maintenance; reporting on Capacity Assurance Program in compliance with Paragraph 13 of Appendix D; reports to state agencies; and a summary of costs incurred since the previous report.

b. The report shall also include a description of any noncompliance with the requirements of this Consent Decree and an explanation of the violation's likely cause and of the remedial steps taken, or to be taken, to prevent or minimize such violation. If Defendant violates, or has reason to believe that it may violate, any requirement of this Consent Decree, Defendant shall notify DOJ, EPA, and the State of such violation and its likely duration, in writing, within ten business days of the Day Defendant first becomes aware of the violation or potential violation, with an explanation of the violation's likely cause and of the remedial steps taken, or to be taken, to prevent or minimize such violation. If the cause of a violation cannot be fully explained at the time the report is due, Defendant shall so state in the report. Defendant shall investigate the cause of the violation and shall then submit an amendment to the report, including a full explanation of its cause, within 30 Days of the Day Defendant becomes aware of the cause of the violation. Nothing in this Paragraph or the following Paragraph relieves Defendant of its obligation to provide the notice required by Section X (Force Majeure).

32. Whenever any violation of this Consent Decree or of any applicable permits or any other event affecting Defendant's performance under this Decree may pose an immediate threat to the public health or welfare or the environment, Defendant shall notify EPA and the State by telephone at (206) 553-1816 and (503) 229-5019 and by email to levo.brian@epa.gov, R10enforcement@epa.gov, and bailey.randall@deq.state.or.us as soon as possible, but no later than 24 hours after Defendant first knew of the violation or event. This procedure is in addition to the requirements set forth in the preceding Paragraph.

33. Each report submitted by Defendant under this Section shall be signed by an official of the submitting party and include the following certification:

> I certify under penalty of perjury that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

34. This certification requirement does not apply to emergency or similar notifications where compliance would be impractical.

35. The reporting requirements of this Consent Decree do not relieve Defendant of any reporting obligations required by the CWA or implementing regulations, or by any other federal, state, or local law, regulation, permit, or other requirement.

36. Any information provided pursuant to this Consent Decree may be used by the United States and/or the State in any proceeding to enforce the provisions of this Consent Decree and as otherwise permitted by law.

IX. STIPULATED PENALTIES

37. Defendant shall be liable for stipulated penalties to the United States and the State for violations of this Consent Decree as specified below, unless excused under Section X (Force Majeure). A violation includes failing to perform any obligation required by the terms of this Decree, including any work plan or schedule approved under this Decree, according to all applicable requirements of this Decree and within the specified time schedules established by or approved under this Decree.

38. Late Payment of Civil Penalty. If Defendant fails to pay the civil penalty required to be paid under Section VI (Civil Penalty) when due, Defendant shall pay a stipulated penalty of $5,000 per Day for each Day that the payment is late.

39. Permit Violations. The following stipulated penalties shall accrue for each violation of any requirement of Defendant's Permits (NPDES Permit and Industrial Stormwater Permit) specified below:

a. Waste Discharge Limit Violations. For each violation of the requirement to comply with all daily, weekly, or monthly effluent limits on parameters set forth in the Permit or any final effluent limits under any successor permit, Defendant shall pay a stipulated penalty as follows:

Penalty Per Violation

$5,000 for each violation of each daily limit
$10,000 for each violation of each weekly or seven day limit
$20,000 for each violation of each monthly or 30-day limit

b. Bypasses. The following penalties apply to any bypasses made in violation of the requirements of Defendant's NPDES Permit:

Per Violation Per day	
First violation per year	$15,000 per violation per day
Second and Third violation	$30,000 per violation per day
Fourth violation or more	$50,000 per violation per day

c. Any other violations of the Permit shall be subject to the following penalties per violation per day.

Penalty Per Violation Per Day	Period of Noncompliance
$500	1st through 14th Day
$1,000.	15th through 30th Day
$2,500.	31st Day and beyond

40. Compliance Milestones.

a. The following stipulated penalties shall accrue per violation per Day for each violation of the requirements identified in Paragraphs 18-22 of this Consent Decree (CMOM, Sewer Assessment and Rehabilitation Program, Preliminary Design Improvements, Stress Test, Amended Facilities Plan), including failing to meet deadlines set by the Consent Decree or within any deliverables:

Penalty Per Violation Per Day	Period of Noncompliance
$700	1st through 14th Day
$1500	15th through 30th Day
$2500	31st Day and beyond

b. The following stipulated penalties shall accrue per violation per Day for each violation of the requirements of the Capacity Assurance Program:

(a) For any new sewer service connection or change to an existing connection that results in additional flow that is

approved by the City in violation of Capacity Assurance Program:

$10,000 per Equivalent Residential Unit calculated as outlined in Paragraphs 15-16 of Appendix D.

41. Reporting Requirements. The following stipulated penalties shall accrue per violation per Day for each violation of the reporting requirements of Section VIII:

Penalty Per Violation Per Day	Period of Noncompliance
$100	1st through 14th Day
$300	15th through 30th Day
$500	31st Day and beyond

42. Stipulated penalties under this Section shall begin to accrue on the Day after performance is due or on the Day a violation occurs, whichever is applicable, and shall continue to accrue until performance is satisfactorily completed or until the violation ceases. Stipulated penalties shall accrue simultaneously for separate violations of this Consent Decree.

43. Defendant shall pay stipulated penalties to the United States and the State within 30 Days of a written demand by either Plaintiff. Defendant shall pay 50 percent of the total stipulated penalty amount due to the United States and 50 percent to the State. The Plaintiff making a demand for payment of a stipulated penalty shall simultaneously send a copy of the demand to the other Plaintiff.

44. Either Plaintiff may in the unreviewable exercise of its discretion, reduce, or waive stipulated penalties otherwise due to it under this Consent Decree.

45. Stipulated penalties shall continue to accrue as provided in Paragraph 42, during any Dispute Resolution, but need not be paid until the following:

a. If the dispute is resolved by agreement of the Parties or by a decision of EPA or the State that is not appealed to the Court,

Defendant shall pay accrued penalties determined to be owing, together with interest, to the United States or the State within 30 Days of the effective date of the agreement or the receipt of EPA's or the State's decision or order.

b. If the dispute is appealed to the Court and the United States or the State prevails in whole or in part, Defendant shall pay all accrued penalties determined by the Court to be owing, together with interest, within 60 Days of receiving the Court's decision or order, except as provided in subparagraph c, below.

c. If any Party appeals the Court's decision, Defendant shall pay all accrued penalties determined to be owing, together with interest, within 15 Days of receiving the final appellate court decision.

46. Obligations Prior to the Effective Date. Upon the Effective Date, the stipulated penalty provisions of this Decree shall be retroactively enforceable with regard to any and all violations of Section VI (Compliance Requirements) that have occurred after signature but prior to the Effective Date, provided that stipulated penalties that may have accrued prior to the Effective Date may not be collected unless and until this Consent Decree is entered by the Court.

47. Defendant shall pay stipulated penalties owing to the United States in the manner set forth in Paragraph 10 and with the confirmation notices required by Paragraph 11, except that the transmittal letter shall state that the payment is for stipulated penalties and shall state for which violation(s) the penalties are being paid. Defendant shall pay stipulated penalties owing to the State in the manner set forth in Paragraph 16.

48. If Defendant fails to pay stipulated penalties according to the terms of this Consent Decree, Defendant shall be liable for interest on such penalties, as provided for in 28 U.S.C. § 1961, accruing as of the date payment became due. Nothing in this Paragraph shall be construed to limit the United States or the State from seeking any remedy otherwise provided by law for Defendant's failure to pay any stipulated penalties.

49. The payment of penalties and interest, if any, shall not alter in any way Defendant's obligation to complete the performance of the requirements of this Consent Decree.

50. Non-Exclusivity of Remedy. Stipulated penalties are not the United States' or State's exclusive remedy for violations of this Consent Decree. Subject to the provisions of Section XIII (Effect of Settlement/Reservation of Rights), the United States and the State expressly reserve the right to seek any other relief it deems appropriate for Defendant's violation of this Decree or applicable law, including but not limited to an action against Defendant for statutory penalties, additional injunctive relief, mitigation or offset measures, and/or contempt. However, the amount of any statutory penalty assessed for a violation of this Consent Decree shall be reduced by an amount equal to the amount of any stipulated penalty assessed and paid for the same violation pursuant to this Consent Decree.

X. FORCE MAJEURE

51. "Force majeure," for purposes of this Consent Decree, is defined as any event arising from causes beyond the control of Defendant, of any entity controlled by Defendant, or of Defendant's contractors, that delays or prevents the performance of any obligation under this Consent Decree despite Defendant's best efforts to fulfill the obligation. The requirement that Defendant exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any potential force

majeure event (a) as it is occurring and (b) following the potential force majeure, such that the delay and any adverse effects of the delay are minimized. "Force Majeure" does not include Defendant's financial inability to perform any obligation under this Consent Decree.

52. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Decree, whether or not caused by a force majeure event, Defendant shall provide notice by telephone to (206) 553-1816 and (503) 229-5019 and by email to levo.brian@epa.gov, R10enforcement@epa.gov, and bailey.randall@deq.state.or.us, within 72 hours of when Defendant first knew that the event might cause a delay. Within seven Days thereafter, Defendant shall provide in writing to EPA and the State an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Defendant's rationale for attributing such delay to a force majeure event if it intends to assert such a claim; and a statement as to whether, in the opinion of Defendant, such event may cause or contribute to an endangerment to public health, welfare or the environment. Defendant shall include with any such notice all available documentation supporting the claim that the delay was attributable to a force majeure. Failure to comply with the above requirements shall preclude Defendant from asserting any claim of force majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. Defendant shall be deemed to know of any circumstance of which Defendant, any entity controlled by Defendant, or Defendant's contractors knew or should have known.

53. If EPA, after a reasonable opportunity for review and comment by the State, agrees that the delay or anticipated delay is attributable to a force majeure event, the time for

performance of the obligations under this Consent Decree that are affected by the force majeure event will be extended by EPA, after a reasonable opportunity for review and comment by the State, for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation. EPA will notify Defendant in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure event.

54. If EPA, after a reasonable opportunity for review and comment by the State, does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, EPA will notify Defendant in writing of its decision.

55. If Defendant elects to invoke the dispute resolution procedures set forth in Section XI (Dispute Resolution), it shall do so no later than 15 Days after receipt of EPA's notice. In any such proceeding, Defendant shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Defendant complied with the requirements of Paragraphs 51 and 52. If Defendant carries this burden, the delay at issue shall be deemed not to be a violation by Defendant of the affected obligation of this Consent Decree identified to EPA and the Court.

XI. DISPUTE RESOLUTION

56. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Decree. Defendant's failure to seek resolution of a dispute

under this Section shall preclude Defendant from raising any such issue as a defense to an action by the United States to enforce any obligation of Defendant arising under this Decree.

57. Informal Dispute Resolution. Any dispute subject to Dispute Resolution under this Consent Decree shall first be the subject of informal negotiations. The dispute shall be considered to have arisen when Defendant sends DOJ, EPA, and the State a written Notice of Dispute. Such Notice of Dispute shall state clearly the matter in dispute. The period of informal negotiations shall not exceed 30 Days from the date the dispute arises, unless that period is modified by written agreement. If the Parties cannot resolve a dispute by informal negotiations, then the position advanced by the United States and the State shall be considered binding unless, within 20 Days after the conclusion of the informal negotiation period, Defendant invokes formal dispute resolution procedures as set forth below.

58. Formal Dispute Resolution. Defendant shall invoke formal dispute resolution procedures, within the time period provided in the preceding Paragraph 57, by sending DOJ, EPA, and the State a written Statement of Position regarding the matter in dispute. The Statement of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting Defendant's position and any supporting documentation relied upon by Defendant.

59. The United States and the State will send Plaintiffs' Statement of Position to Defendant within 45 Days of receipt of Defendant's Statement of Position. The Plaintiffs' Statement of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation relied upon by the United States and the State. The Plaintiffs' Statement of Position is binding on Defendant, unless

Defendant files a motion for judicial review of the dispute in accordance with the following Paragraph.

60. Judicial Dispute Resolution. Defendant may seek judicial review of the dispute by filing with the Court and serving on the United States and the State a motion requesting judicial resolution of the dispute. The motion (a) must be filed within 20 Days of receipt of the Plaintiffs' Statement of Position pursuant to the preceding Paragraph; (b) may not raise any issue not raised in informal dispute resolution pursuant to Paragraph 57, unless the Plaintiffs raise a new issue of law or fact in the Statement of Position; (c) shall contain a written statement of Defendant's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and (d) shall set forth the relief requested and any schedule within which the dispute must be resolved for orderly implementation of the Consent Decree.

61. The Plaintiffs shall respond to Defendant's motion within the time period allowed by the Local Rules of this Court. Defendant may file a reply memorandum, to the extent permitted by the Local Rules.

62. Standard of Review

a. Disputes Concerning Matters Accorded Record Review. Except as otherwise provided in this Consent Decree, in any dispute brought under Paragraph 60 pertaining to: the adequacy or appropriateness of plans, procedures to implement plans, schedules or any other items requiring approval by EPA and ODEQ under this Consent Decree; the adequacy of the performance of work undertaken pursuant to this Consent Decree; and all other disputes that are accorded review on the administrative record under applicable

principles of administrative law, Defendant shall have the burden of demonstrating, based on the administrative record, that the position taken by the United States is not consistent with the Consent Decree or applicable law.

b. Other Disputes. Except as otherwise provided in this Consent Decree, in any other dispute brought under Paragraph 58, Defendant shall bear the burden of demonstrating that its position complies with this Consent Decree and better furthers the Objectives of the Consent Decree.

63. The invocation of dispute resolution procedures under this Section shall not, by itself, extend, postpone, or affect in any way any obligation of Defendant under this Consent Decree, unless and until final resolution of the dispute so provides. Stipulated penalties with respect to the disputed matter shall continue to accrue from the first Day of noncompliance, but payment shall be stayed pending resolution of the dispute as provided in Paragraph 45. If Defendant does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section IX (Stipulated Penalties).

XII. INFORMATION COLLECTION AND RETENTION

64. The United States, the State, and their representatives, including attorneys, contractors, and consultants, shall have the right of entry into any facility covered by this Consent Decree, at all reasonable times, upon presentation of credentials, to:

a. monitor the progress of activities required under this Consent Decree;

b. verify any data or information submitted to the United States or the

State in accordance with the terms of this Consent Decree;

c. obtain samples and, upon request, splits of any samples taken by Defendant or its representatives, contractors, or consultants;

d. obtain documentary evidence, including photographs and similar data; and

e. assess Defendant's compliance with this Consent Decree.

65. Upon request, Defendant shall provide EPA and the State or their authorized representatives splits of any samples taken by Defendant. Upon request, EPA and the State shall provide Defendant splits of any samples taken by EPA or the State.

66. Until five years after the termination of this Consent Decree, Defendant shall retain, and shall instruct its contractors and agents to preserve, all non-identical copies of all documents, records, or other information (including documents, records, or other information in electronic form) in its or its contractors' or agents' possession or control, or that come into its or its contractors' or agents' possession or control, and that relate in any manner to Defendant's performance of its obligations under this Consent Decree. This information-retention requirement shall apply regardless of any contrary corporate or institutional policies or procedures. At any time during this information-retention period, upon request by the United States or the State, Defendant shall provide copies of any documents, records, or other information required to be maintained under this Paragraph.

67. At the conclusion of the information-retention period provided in the preceding Paragraph, Defendant shall notify the United States and the State at least 90 Days prior to the destruction of any documents, records, or other information subject to the requirements of the preceding Paragraph and, upon request by the United States or the State, Defendant shall deliver

any such documents, records, or other information to EPA or the State. Defendant may assert that certain documents, records, or other information is privileged under the attorney-client privilege or any other privilege recognized by federal law. If Defendant asserts such a privilege, it shall provide the following: (a) the title of the document, record, or information; (b) the date of the document, record, or information; (c) the name and title of each author of the document, record, or information; (d) the name and title of each addressee and recipient; (e) a description of the subject of the document, record, or information; and (f) the privilege asserted by Defendant. However, no documents, records, or other information created or generated pursuant to the requirements of this Consent Decree shall be withheld on grounds of privilege.

68. Defendant may also assert that information required to be provided under this Section is protected as Confidential Business Information ("CBI") under 40 C.F.R. Part 2. As to any information that Defendant seeks to protect as CBI, Defendant shall follow the procedures set forth in 40 C.F.R. Part 2.

69. This Consent Decree in no way limits or affects any right of entry and inspection, or any right to obtain information, held by the United States or the State pursuant to applicable federal or state laws, regulations, or permits, nor does it limit or affect any duty or obligation of Defendant to maintain documents, records, or other information imposed by applicable federal or state laws, regulations, or permits.

XIII. EFFECT OF SETTLEMENT/RESERVATION OF RIGHTS

70. This Consent Decree resolves the civil claims of the United States and the State for the violations alleged in the Complaint filed in this action through the date of lodging.

71. The United States and the State reserve all legal and equitable remedies available to enforce the provisions of this Consent Decree. Defendant retains all rights and defenses to

such claims except as provided in this Consent Decree. This Consent Decree shall not be construed to limit the rights of the United States or the State to obtain penalties or injunctive relief under the Act or implementing regulations, or under other federal or state laws, regulations, or permit conditions, except as expressly specified in Paragraph 70. The United States and the State further reserve all legal and equitable remedies to address any imminent and substantial endangerment to the public health or welfare or the environment arising at, or posed by, Defendant's CSTW, whether related to the violations addressed in this Consent Decree or otherwise.

72. In any subsequent administrative or judicial proceeding initiated by the United States or the State for injunctive relief, civil penalties, other appropriate relief relating to the CSTW or Defendant's violations, Defendant shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States or the State in the subsequent proceeding were or should have been brought in the instant case, except with respect to claims that have been specifically resolved pursuant to Paragraph 70.

73. This Consent Decree is not a permit, or a modification of any permit, under any federal, State, or local laws or regulations. Defendant is responsible for achieving and maintaining complete compliance with all applicable federal, State, and local laws, regulations, and permits; and Defendant's compliance with this Consent Decree shall be no defense to any action commenced pursuant to any such laws, regulations, or permits, except as set forth herein. The United States and the State do not, by their consent to entry of this Consent Decree, warrant or aver in any manner that Defendant's compliance with any aspect of this Consent Decree will

result in compliance with provisions of the CWA, 33 U.S.C. § 1251, et seq., or with any other provisions of federal, State, or local laws, regulations, or permits. Application for construction grants, State Revolving Loan Funds, or any other grants or loans, or other delays caused by inadequate facility planning or plans and specifications on the part of Defendant shall not be cause for extension of any required compliance date in this Consent Decree.

74. This Consent Decree does not limit or affect the rights of Defendant or of the United States or the State against any third parties, not party to this Consent Decree, nor does it limit the rights of third parties, not party to this Consent Decree, against Defendant, except as otherwise provided by law.

75. This Consent Decree shall not be construed to create rights in, or grant any cause of action to, any third party not party to this Consent Decree.

76. Nothing in this Consent Decree limits the rights or defenses available under Section 309(e) of the CWA, 33 U.S.C. § 1319(e), in the event that the laws of the State, as currently or hereafter enacted, may prevent Defendant from raising the revenues needed to comply with this Decree.

XIV. COSTS

77. The Parties shall bear their own costs of this action, including attorneys' fees, except that the United States and the State shall be entitled to collect the costs (including attorneys' fees) incurred in any action necessary to collect any portion of the civil penalty or any stipulated penalties due but not paid by Defendant.

XV. NOTICES

78. Unless otherwise specified in this Decree, whenever notifications, submissions, or communications are required by this Consent Decree, they shall be made in writing and sent by mail or email, (with a preference for email), addressed as follows:

As to DOJ by email (preferred):	eescdcopy.enrd@usdoj.gov Re: DJ # 90-5-1-1-12501
As to DOJ by mail:	EES Case Management Unit Environment and Natural Resources Division U.S. Department of Justice P.O. Box 7611 Washington, D.C. 20044-7611 Re: DJ # 90-5-1-1-12501
As to EPA by email (preferred):	levo.brian@epa.gov and johnson.patrick@epa.gov
As to EPA by mail:	Brian Levo, Compliance Officer U.S. Environmental Protection Agency, Region 10 1200 6th Avenue, Suite 155, MS 20-C04 Seattle, Washington 98101
As to the State by email:	Randall.bailey@deq.oregon.gov *and* Jeff.bachman@deq.oregon.gov *and* nina.englander@doj.state.or.us
As to the State by mail:	Randall Bailey Oregon Department of Environmental Quality 700 NE Multnomah Street, Suite 600 Portland, Oregon 97232 Jeff Bachman Oregon Department of Environmental Quality 700 NE Multnomah Street, Suite 600 Portland, Oregon 97232 Nina Englander Oregon Department of Justice 100 SW Market Street Portland, Oregon 97201

As to Defendant by email:	tdeems@ci.sandy.or.us *and* jcoker@ci.sandy.or.us
As to Defendant by mail:	Attn: City Manager City of Sandy 39250 Pioneer Boulevard Sandy, Oregon 97055

79. Any Party may, by written notice to the other Parties, change its designated notice recipient or notice address provided above.

80. Notices submitted pursuant to this Section shall be deemed submitted upon mailing or transmission by email, unless otherwise provided in this Consent Decree or by mutual agreement of the Parties in writing.

XVI. EFFECTIVE DATE

81. The Effective Date of this Consent Decree shall be the date upon which this Consent Decree is entered by the Court or a motion to enter the Consent Decree is granted, whichever occurs first, as recorded on the Court's docket; provided, however, that Defendant hereby agrees that it shall be bound to perform duties scheduled to occur prior to the Effective Date. In the event the United States withdraws or withholds consent to this Consent Decree before entry, or the Court declines to enter the Consent Decree, then the preceding requirements to perform duties scheduled to occur before the Effective Date shall terminate.

XVII. RETENTION OF JURISDICTION

82. The Court shall retain jurisdiction over this case until termination of this Consent Decree, for the purpose of resolving disputes arising under this Decree or entering orders modifying this Decree, pursuant to Sections XI and XVIII, or effectuating or enforcing compliance with the terms of this Decree.

XVIII. MODIFICATION

83. Except as otherwise set forth in Appendix D, the terms of this Consent Decree, including any attached appendices, may be modified only by a subsequent written agreement signed by all the Parties. Where the modification constitutes a material change to this Decree, it shall be effective only upon approval by the Court.

84. Any disputes concerning modification of this Decree shall be resolved pursuant to Section XI (Dispute Resolution), provided, however, that, instead of the burden of proof provided by Paragraph 62, the Party seeking the modification bears the burden of demonstrating that it is entitled to the requested modification in accordance with Federal Rule of Civil Procedure 60(b).

XIX. TERMINATION

85. After Defendant has completed the requirements of Section VII (Compliance Requirements), has thereafter maintained continuous satisfactory compliance with this Consent Decree and Defendant's NPDES Permit for a period of 3 years, has complied with all other requirements of this Consent Decree, and has paid the civil penalty and any accrued stipulated penalties as required by this Consent Decree, Defendant may serve upon the United States and the State a Request for Termination, stating that Defendant has satisfied those requirements, together with all necessary supporting documentation.

86. Following receipt by the United States and the State of Defendant's Request for Termination, the Parties shall confer informally concerning the Request and any disagreement that the Parties may have as to whether Defendant has satisfactorily complied with the requirements for termination of this Consent Decree. If the United States, after consultation with

the State, agrees that the Decree may be terminated, the Parties shall submit, for the Court's approval, a joint stipulation terminating the Decree.

87. If the United States after consultation with the State does not agree that the Decree may be terminated, Defendant may invoke Dispute Resolution under Section XI. However, Defendant shall not seek Dispute Resolution of any dispute regarding termination until 15 Days after service of its Request for Termination.

XX. PUBLIC PARTICIPATION

88. This Consent Decree shall be lodged with the Court for a period of not less than 30 Days for public notice and comment in accordance with 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations indicating that the Consent Decree is inappropriate, improper, or inadequate. Defendant consents to entry of this Consent Decree without further notice and agrees not to withdraw from or oppose entry of this Consent Decree by the Court or to challenge any provision of the Decree, unless the United States has notified Defendant in writing that it no longer supports entry of the Decree.

XXI. SIGNATORIES/SERVICE

89. Each undersigned representative of Defendant and other Parties to the Decree and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice identified on the DOJ signature page below, certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind the Party he or she represents to this document.

90. This Consent Decree may be signed in counterparts, and its validity shall not be challenged on that basis. Defendant agrees to accept service of process by mail with respect to

all matters arising under or relating to this Consent Decree and to waive the formal service requirements set forth in Rules 4 and 5 of the Federal Rules of Civil Procedure and any applicable Local Rules of this Court including, but not limited to, service of a summons. Defendant need not file an answer to the Complaint in this action unless or until the Court expressly declines to enter this Consent Decree.

XXII. INTEGRATION

91. This Consent Decree, including deliverables that are subsequently approved pursuant to this Decree, constitutes the entire agreement among the Parties regarding the subject matter of the Decree and supersedes all prior representations, agreements and understandings, whether oral or written, concerning the subject matter of the Decree herein.

XXIII. HEADINGS

92. Headings to the Sections and Subsections of this Consent Decree are provided for convenience and do not affect the meaning or interpretation of the provisions of this Consent Decree.

XXIV. FINAL JUDGMENT

93. Upon approval and entry of this Consent Decree by the Court, this Consent Decree shall constitute a final judgment of the Court as to the United States, the State, and Defendant.

XXV. APPENDICES

94. The following Appendices are attached to and part of this Consent Decree:

"Appendix A" is the Preliminary Design Evaluation Report.
"Appendix B" is the Collection System Basin Map
"Appendix C" is the State Supplemental Environmental Project
"Appendix D" is the Capacity Assurance Program Evaluations
"Appendix E" is the Amended Wastewater System Facility Plan Requirements

Dated and entered this __ day of _____, 20

_____
UNITED STATES DISTRICT JUDGE

FOR THE UNITED STATES OF AMERICA:

TODD KIM
ASSISTANT ATTORNEY GENERAL
Environment and Natural Resources Division
U.S. Department of Justice

_____
Date

_____
RACHEL A. HANKEY
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Washington, D.C. 20044-7611

NATALIE K. WIGHT
United States Attorney

_____
Date

_____
ALEXIS A. LIEN, OSB #110569
Assistant United States Attorney
Office of United States Attorney
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FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY:

_____ _____

Date

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FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY CONTINUED:

_____ _____

Date ROSEMARIE KELLEY
Director
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency

_____ _____

Date BENJAMIN BAHK
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FOR THE STATE OF OREGON:

_____
Date

_____
NINA R. ENGLANDER #106119
Assistant Attorney General
Oregon Department of Justice
100 S.W. Market Street
Portland, Oregon 97201

_____
Date

_____
KIERAN O'DONNELL
Oregon Department of Environmental Quality
Manager of Office of Compliance and Enforcement
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232

FOR DEFENDANT:

Date

TYLER DEEMS
Interim City Manager
City of Sandy
39250 Pioneer Boulevard
Sandy, Oregon 97055

APPENDIX A

Preliminary Design Evaluation Report | March 2021

Sandy Wastewater Treatment Plant
Condition Assessment Improvements Project

PREPARED FOR

City of Sandy, OR

PREPARED BY

Sandy Wastewater Treatment Plant
Condition Assessment Improvements Project
Preliminary Design Evaluation Report

Prepared for

City of Sandy

Project No. 964-50-20-01

Project Manager: Preston Van Meter — March 2021 (Date)

QA/QC Review: Timothy R. Banyai — March 2021 (Date)

WEST YOST
Water. Engineered.

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2019 Condition Assessment	Condition Assessment in July 2019
2019 Facilities Plan	Wastewater Facilities Plan in 2019
2019 Facilities Plan	Wastewater Facilities Plan in 2019
2020 PDR	Immediate Needs Improvements Project Preliminary Design Report
AACE	Association for the Advancement of Cost Engineering
AAF	Average Annual Flow
ACH	Air Changes per Hour
ADWF	Average Dry Weather Flow
aSRT	Aerobic Solids Retention Time
ASSB	Aerated Sludge Storage Basin
ASSB	Aerated Sludge Storage Basin
BOD	Biological Oxygen Demand
City	City of Sandy

CMU	Concrete Masonry Unit
DO	Dissolved Oxygen
EDI	Energy Dissipating Inlet
FRP	Fiberglass Reinforced Plastic
GPM	Gallons Per Mile
I&C	Instrumentation and Control
IMLR	Internal Mixed Liquor Recycle
IOT	Internet of Things
LEL	Lower Explosive Limit
MBR	Membrane Bioreactor
MCCs	Motor Control Centers
MGD	Millions of Gallons
MLSS	Mixed Liquor Suspended Solids
MMDWF	Maximum Month Dry Weather Flow
MMWWF	Maximum Month Wet Weather Flow
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
OPCC	Opinion of Probable Construction Cost
OSHA	Occupational Safety and Health Administration
PDF	Peak Day Flow
PDR	Preliminary Design Report
PIF	Peak Instantaneous Flow
PLC	Programmable Logic Controller
Project	City of Sandy WWTP Condition Assessment Improvements Project
PVC	Polyvinyl Chloride
RAS	Recycled Activated Sludge
RPS	Return Pump Station
SCADA	Supervisory Control and Data Acquisition
SCFM	Standard Cubic Feet Per Minute
SRT	Solids Retention Time
TAG	The Automation Group
TM	Technical Memorandum
UV	Ultraviolet
VFD	Variable Frequency Drives
WAS	Waste Activated Sludge
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

The City of Sandy (City) developed a Wastewater Facilities Plan in 2019 (2019 Facilities Plan), which identified wastewater collection, conveyance and treatment system improvements to be implemented in three phases through 2040. The 2019 Facilities Plan also identified several immediate needs projects required to improve the performance of the Wastewater Treatment Plant (WWTP).

After the 2019 Facilities Plan was completed, the City conducted a Condition Assessment in July 2019 (2019 Condition Assessment), which identified additional immediate needs projects beyond those identified in the 2019 Facilities Plan. The City then performed several operational and mechanical improvements to the WWTP after completion of the 2019 Condition Assessment.

In the summer of 2020, the City developed the Immediate Needs Improvements Project Preliminary Design Report (2020 PDR). The 2020 PDR presented a preliminary design for the improvements required at the WWTP based on the recommendations in the 2019 Facilities Plan, the findings of the 2019 Condition Assessment, and the improvements implemented in 2019.

This report evaluates the recommendations in the 2020 PDR and presents a modified set of recommended improvements, which will more efficiently utilize the City's budget while also effectively addressing the operational and maintenance deficiencies at the WWTP. These improvements will be implemented under the City of Sandy WWTP Condition Assessment Improvements Project (Project).

In addition to the recommended improvements identified in this report, a "Wish List" of improvements that can be implemented under this Project, if funding allows, or under future projects is provided in Appendix E. The items included on the Wish List are improvements identified by City and plant operations staff during site visits conducted for this Project. The Wish List is intended to be a living document that can be changed over time to keep track of small and large improvements that the City wishes to complete.

2.0 OVERVIEW OF EXISTING FACILITIES

The City of Sandy WWTP is located at 33400 SE Jarl Road in Boring, Oregon. A site plan showing the major processes, buildings, and other site features at the WWTP is shown in Figure 2-1. A summary of the design influent flows for the WWTP from the 2020 PDR are provided in Table 2-1. A summary of the major equipment sizing and design criteria from the 2020 PDR are provided in Table 2-2. The existing condition of the major processes, building and other site features are discussed in more detail in Section 3.0.

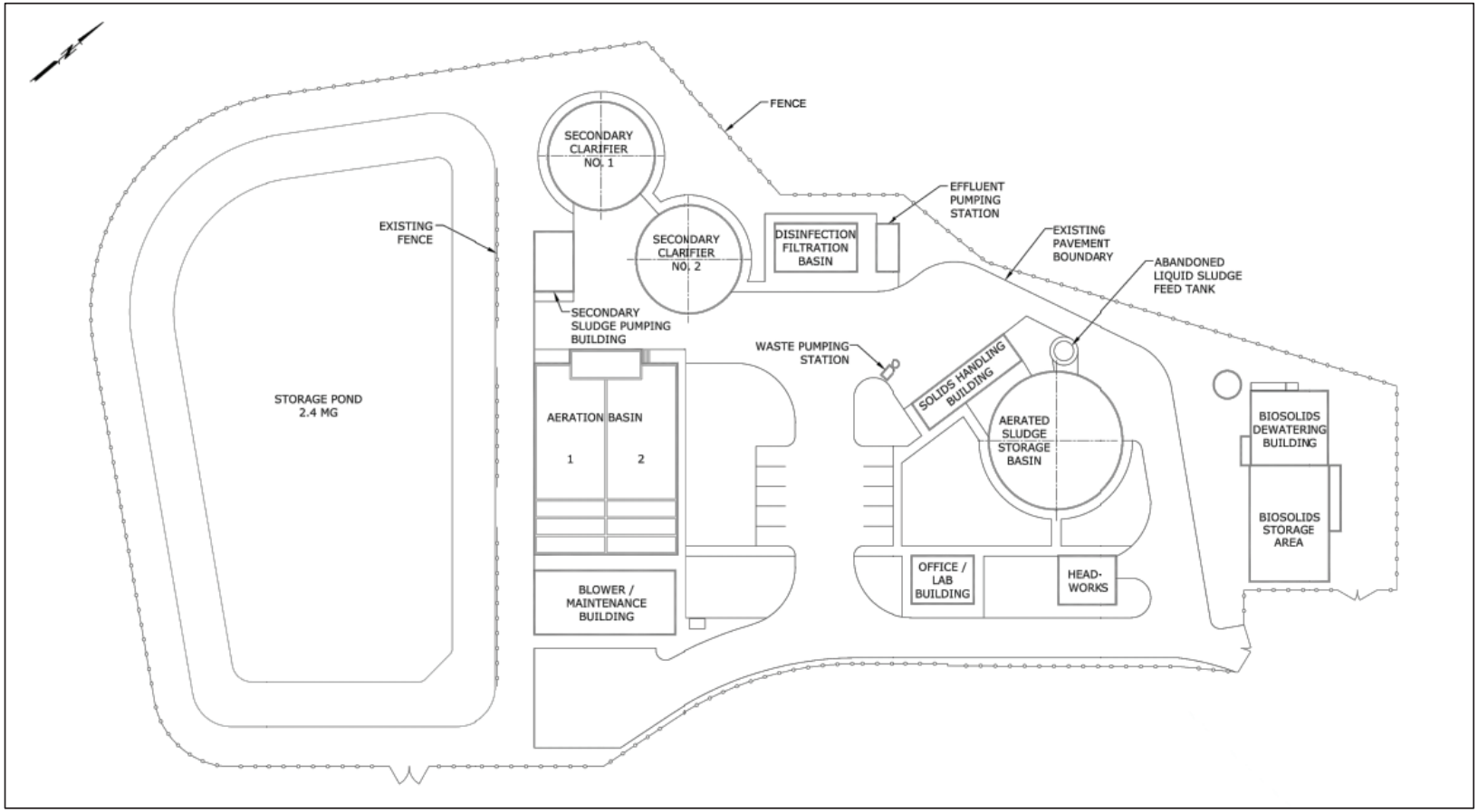


Figure 2-1. Sandy WWTP Site Plan

Table 2-1. Sandy WWTP Influent Design Flows

Flow Condition	Design Flow, million gallons per day (mgd)						
	Exist	2025	2026[1]	2030	2035	2036[2]	2040
Average Annual Flow (AAF)	1.4	1.5	0.9	1.1	1.4	0.8	1.2
Average Dry Weather Flow (ADWF)	1.1	1.2	0.7	0.9	1.1	0.6	0.9
Maximum Month Dry Weather Flow (MMDWF)	1.4	1.5	0.9	1.2	1.4	0.8	1.2
Maximum Month Wet Weather Flow (MMWWF)	2.7	2.9	1.8	2.2	2.6	1.4	2.3
Peak Day Flow (PDF)	5.9	5.5	3.9	4.8	5.7	3.2	5.0
Peak Instantaneous Flow (PIF)	9.1	9.9	6.4	7.7	9.1	5.6	7.0

Notes:
1. First phase of the Eastside Satellite Plant begins operation in 2026
2. Second phase of the Eastside Satellite Plant begins operation in 2036.

Table 2-2. Sandy WWTP Existing Design Criteria

Parameter	Value
Raw Screening	
Screen Type	Drum Screen
Screen Capacity	6.7 mgd
Screen Channel Width	4 ft
Screen Bar Spacing	1/4-in
Manual Screen	
Type	Bar Screen Rack
Quantity	1
Width	2 ft
Bar Spacing	3/4-inch
Grit Removal	
Type	Vortex
Max Flow	7.0 mgd
Grit Chamber Diameter	10 ft
Air Scour	75 standard cubic feet per minute (scfm)
Grit Chamber Mechanism Drive Motor	1 hp
Grit Pump	250 gpm @ 30 ft TDH, 5 hp
Grit Concentrator	250 gpm
Grit Classifier Screw Conveyor Drive	1 hp
Influent Flow Measurement	
Type	Parshall flume with level sensor
Throat width	12-inch
Capacity	9.2 mgd
Aeration Basins	
Number of Trains	2

Table 2-2. Sandy WWTP Existing Design Criteria

Parameter	Value
Total Basin Volume	740,000 gal
Selector Cells (3 per train)	75,000 gal, ea
Aerobic Cells (1 per train)	145,000 gal, ea
Average Sidewater Depth	17.79 ft
Diffuser Type	Fine Bubble Disc, 7 in dia.
Submersible Mixers (Total 4)	4 hp
Internal Mixed Liquor Recycle Pumps (Total 2)	750 gpm @ 12.0 ft TDH, 5 hp ea
Utility Pumps (Total 2)	2,800 gpm @ 12 ft TDH, ea
Blowers (No. 1-3)	
Type	Multi-stage Centrifugal
Capacity	1,350 scfm
Motor	100 hp
Blowers (No. 4)	
Type	Positive Displacement
Capacity	1,199 scfm
Motor	60 hp
Secondary Clarifiers	
Quantity	2
Capacity	3.5 mgd, ea.
Surface Overflow Rate at Capacity	1,500 gal/day per ft^2
Diameter	54 ft
Side-water Depth	15 ft
Mechanism Drive	3/4 hp
RAS Pumps	
Quantity	2
Capacity	600 gpm @ 23 ft TDH, ea
Motor	7.5 hp
WAS Pumps	
Quantity	2
Capacity	260 gpm @ 23 ft TDH, ea
Motor	5 hp
Filters	
Type	Disk Filters
Number of Units	2
Number of Disks per Unit	6
Capacity, total	6 mgd
Average Flow Rate	2 gpm/ft^2
Disk Drive	1/2 hp, ea

Table 2-2. Sandy WWTP Existing Design Criteria

Parameter	Value
Backwash Pump Quantity	2
Backwash Pump Drive	2 hp, ea
High Pressure Wash Pump Quantity	2
High Pressure Wash Pump Drive	40 hp, ea
Ultraviolet (UV) Disinfection	
Type	Medium Pressure
Number of Channels	1
Peak Flow Rates	7.0 mgd
Dosage	30,010 microwatt sec/cm^2
Headloss	17.7 in
Aerated Sludge Storage Basin	
Center Well	90,000 gallons
Cell No. 1:	90,000 gallons
Cell No. 2:	180,000 gallons
Decant Pumps	
Quantity	3
Capacity	50 gpm @ 22 ft TDH
Motor	1/2 hp
Sludge Transfer Pump	
Quantity	2
Motor	10 hp
Diffusers	
Center Well	270, 7-in dia fine bubble membrane disc
Cell No. 1 and No. 2	16, coarse bubble
Sodium Hypochlorite Storage & Metering Facility	
Number of Tanks	2
Tank Volume	1,000 gallons, ea
Number of Metering Pumps	2
Metering Pump Capacity	5 gph
Waste Pump Station	
Pump Station Type	Wet Pit with valve vault
Wet Pit Diameter	4 ft
Pumps	
Type	Submersible
Quantity	2
Capacity	350 gpm @ 22 ft TDH, ea
Motor	3 hp

3.0 PRELIMINARY DESIGN EVALUATION

This section summarizes the existing condition of each process area at the WWTP, the improvements recommended in the 2020 PDR, an evaluation of the 2020 PDR recommendations and a modified set of improvements recommended for implementation under this Project. Drawings of the proposed improvements are provided in Appendix A.

3.1 Headworks Facility

3.1.1 Existing Conditions

The existing headworks consists of a drum screen in a 4-foot wide channel with 1/4-inch openings; a manual screen in a 2-foot wide bypass channel; a 10-foot diameter vortex grit removal basin; and a Parshall flume for measuring influent flow. The grit basin is equipped with an airlift pump that pumps grit from the bottom of the basin and discharges it to a grit classifier. The grit classifier removes water and organic material from the grit and conveys the grit via a screw conveyor to a dumpster. The drum screen also discharges screenings to the same dumpster.

The headworks facility has the following deficiencies:

- The headworks equipment is over 20 years old and is reaching the end of its useful life.
- The drum screen does not have adequate capacity to treat future peak wet weather flows.
- Solids and rags leak through the side seals on the drum screen and influent flow periodically overflows the bypass channel isolation gate. This results in poor removal of solids and rags from the influent flow.
- There is no means of removing the screen from the channel to perform routine maintenance on the screen.
- The paddle mixer in the grit removal basin failed recently.
- The grit pump and grit pump discharge piping need replacement.
- There is no redundant mechanical screen or grit removal equipment at the headworks facility.
- The hydraulic grade line of the headworks facility is not compatible with future planned primary clarifiers, which are required to treat the additional solids load from the future Eastside Satellite MBR facility. The headworks facility will need to be relocated to a higher elevation to allow primary clarifiers to be installed at the WWTP.

3.1.2 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR recommended the following improvements for the headworks facility:

- Replace the drum screen in-kind.
- Replace the vortex grit removal equipment including paddle mixer, grit pump, grit concentrator, grit classifier, and screw conveyor in-kind.
- Install a motorized crane next to the screen to improve maintenance accessibility.

- Replace the headworks equipment control panel to improve control from the Supervisory Control and Data Acquisition (SCADA) system.
- Repair/replace the conduit and wiring between field equipment and motor control centers (MCCs) in the blower building.

After reviewing the existing conditions of the headworks facility and the 2020 PDR recommendations, West Yost recommends the City make limited investments in the existing headworks facility for the following reasons:

- The biggest issue impacting operation of the headworks facility is peak flows and system hydraulics. The current headworks is simply not designed for the nearly 10 millions of gallons of (MGD) peak flows that are believed to enter the facility during peak storm events.
- The main bearing on the existing drum screen has been replaced and the screen is functioning adequately.
- Ultimately, the headworks facility will need to be relocated to a higher elevation to support the future installation of primary clarifiers as part of the major planned expansion when the Eastside Membrane Bioreactor (MBR) facility is constructed.

As a result, West Yost recommends a modified approach for addressing the deficiencies at the headworks facility as summarized in the following section.

3.1.3 Modified Preliminary Design Recommendations

Based on the analysis summarized above, it recommended that the following improvements, which will improve permit compliance, treatment performance, and maintenance access be implemented at the headworks facility under this Project:

- Install a motorized gantry crane next to the existing drum screen to assist in removing the screen from the channel for routine maintenance.
- Replace the paddle mixer in the grit basin.
- Replace the grit pump and grit pump discharge piping.
- Implement structural improvements to prevent influent flow from overflowing the bypass channel isolation gate and bypass the screen.

These recommended upgrades are shown on Drawings S000 and M001 included in Appendix A.

3.2 Equalization Basin

3.2.1 Existing Conditions

The existing flow equalization facilities consist of a flow control structure, an equalization basin and utility pumps that drain the basin and discharge flow into the aeration basins. The flow control structure was installed in 2018 and is designed to split flow from the headworks facility to the aeration basin and the equalization basin using two fixed weirs. The weir elevations are set to allow flow to the equalization basin when influent flow exceeds 2.0 mgd. The existing flow equalization facilities have the following deficiencies:

- The existing flow control structure and equalization basin do not include any instrumentation to measure flow to the equalization basins or water surface level in the basins. As a result, the basin frequently overfills.
- Large plumes of algae have been observed to build up in the equalization basin.
- The existing utility pumps that drain the basin back into the aeration basin are constant speed pumps and are oversized. Therefore, when operation staff begin draining the equalization basin, large slugs of flow with high concentrations of algae are discharged into the aeration basins. The presence of algae in the equalization basins return flow can inhibit the biological treatment in the aeration basins and result in permit violations.

3.2.2 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR recommended the following improvements to the flow equalization facilities, which were focused on adding instrumentation to measure flow to the equalization basins and water level in the basins:

- Build a concrete flow control structure in the equalization basin and extend the existing 16-inch Polyvinyl Chloride (PVC) bypass pipe from the aeration basin to this flow control structure
- Install a walkway out to the concrete flow control structure.
- Install a 350 gallons per mile (gpm) submersible pump within the flow control structure to allow for drainage of the equalization basin back to the aeration basin as needed.
- Install a magnetic flow meter on the new bypass pipe and an ultrasonic level transmitter in the equalization basin.

After reviewing the existing conditions of the flow equalization facilities and the 2020 PDR recommendations, a slightly different approach is recommended for the equalization basin upgrades. Instead of building a new flow control structure, it is recommended that existing facilities be modified to better control and measure flow to the equalization basin. It is also recommended that floating aerators be added to the equalization basin to reduce the formation of algae in the basins.

3.2.3 Modified Preliminary Design Recommendations

To meet the deficiencies noted above, the following improvements are recommended for the equalization basin:

- Evaluate the design of the flow control structure using the existing Visual Hydraulics model and modify the elevation of the weirs to reduce the frequency at which raw sewage is discharged into the equalization basins. Proposed modifications include removing the existing baffles and static weir plates in the flow control structure and installing a motorized weir gate in the structure to control flow to the equalization basin.
- Install a level sensor in the existing flow control structure to measure the level over the proposed weir gate. This level measurement can be used to determine flow to the equalization basin and can also be used to send an alarm to operators and the SCADA system to inform them that flow is diverted to the equalization basin.
- Install a level sensor in the equalization basin to allow operators and the SCADA system to know the depth of the basin.

- Install floating aerators in the equalization basin to limit algae growth.
- Install motorized plug valves on the discharge piping of the existing utility pumps, which can be used to adjust the output from the pumps. This will allow operations staff to return water from the equalization basin back into the treatment plant at a rate that does not overwhelm the treatment process.

These recommended upgrades are showing on Drawings C001 and M003 included in Appendix A.

3.3 Aeration Basins

3.3.1 Existing Conditions

The existing aeration basins are split into two trains each consisting of two anoxic zones and two aerobic zones. The anoxic zones are equipped with submersible mixers and the aerobic zones are equipped with a floor-mounted grid of fine bubble diffusers. A common influent channel conveys raw sewage from the headworks facility into the first anoxic zone, first aerobic zone, or second aerobic zone of either train. Recycled activated sludge (RAS) is discharged into either the upstream or downstream end of the common influent channel where it is mixed with the raw/screened sewage before entering the aeration basins. Mixed liquor from both aeration basin trains is collected in a common effluent channel that directs flow to the secondary clarifiers. The common effluent channel also directs a portion of the flow to an internal mixed liquor recycle (IMLR) pump station that is configured to allow a portion of the mixed liquor to be returned to any of the four zones in each aeration basin train. Bypass piping allows flow from the first aerobic zone of each aeration basin train to bypass the second aerobic zone and be discharged into the common effluent channel. Air is delivered to the fine-bubble diffusers with three 1,350 scfm, 100 hp multi-stage centrifugal blowers and one 1,199 scfm, 60 hp positive displacement blower.

The aeration basins have the following deficiencies:

- Air leaks have been identified in the ductile iron air piping. Some of the air leaks have been repaired, but the air piping is in poor condition.
- The aeration basins do not have an effective aeration control system. There are two dissolved oxygen (DO) probes in the aeration basins. However, the blowers are constant speed and the air piping drop legs delivering air to the fine bubble diffusers in the aerobic zones are not equipped with flow meters and modulating valves. Therefore, airflow cannot be adequately adjusted to meet oxygen demand. This results in periods of low DO concentrations that impairs biological oxygen demand (BOD) and ammonia removal, resulting in permit violations.
- A significant amount of foam builds up in the aeration basins on a regular basis. The low DO in the aeration basins contributes to the foam build-up. Also, the mixed liquor must pass under several flow control slide gates as it flows through the aeration basins. This configuration does not allow foam to exit the aeration basins.
- The openings in the walls separating each zone of the aeration basins are located on the same side of the aeration basin. This configuration does not create a serpentine flow path through the various zones. Instead, the configuration allows flow to short circuit directly from the influent opening to the effluent opening in each zone. This results in inadequate mixing in each zone and inadequate treatment time in each zone.

- When the bypass piping connecting the first aerobic zone to the mixed liquor effluent channel is used, raw sewage entering the aeration basins will receive very little treatment, because of the short-circuiting issue noted above.
- The influent wastewater does not have adequate alkalinity and prevents the nitrification process from occurring in the aeration basins because the pH is lowered to below recommended levels. The low pH inhibits biological treatment, which results in permit violations.
- The configuration of the mixed liquor effluent channel results in more flow from the eastern train entering the IMLR pump station. Therefore, nitrified effluent from the western train is not adequately returned to the anoxic zones for dentification.
- There is not adequate means of balancing the flow from the mixed liquor effluent channel into the two secondary clarifiers.

3.3.2 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR recommended the following improvements for the aeration basins:

- Replace two multi-stage centrifugal blowers with two new variable speed blowers.
- Install new motor-operated butterfly valves on the air piping drop legs serving each train.

After review, West Yost recommends a slightly different approach for the aeration basin upgrades. We do not recommend replacing the existing blowers as recommended in the 2020 PDR, nor do we think the addition of actuated butterfly valves on the existing aeration header will provide adequate aeration control. As the "heart" of the treatment process, much work is needed in the aeration basin to address the biological process and operational issues. Our recommendations are summarized in the following section.

3.3.3 Modified Preliminary Design Recommendations

A Biowin© biological process model was developed to evaluate the performance of the aeration basins and determine the improvements needed to address the deficiencies discussed above. The process modeling is summarized in the technical memorandum (TM) included in in Appendix B. Summary of key findings from the process model include:

- Optimization of the secondary process treatment system through mechanical upgrades and operational changes to the aeration basins is necessary to meet the current effluent limitations at the anticipated 2025 wet weather flows and load conditions.
- The key capacity limitation is the solids loading on the secondary clarifiers during peak flow conditions and operating the aeration basins in a fully aerobic mode with an inlet step feed will maximize treatment capacity by lowering the solids loadings to the clarifiers.
- With the recommended changes, the steady-state BioWin© modeling predicts the WWTP will be able to meet the effluent limitations following filtration. However, the State Point model predicts clarifier failure at flows exceeding 7.0 mgd which is about 2.0 mgd lower than the defined peak instantaneous flow conditions.
- The steady-state modeling approach used for this analysis does provide a conservative assessment of the available capacity for handling peak flow conditions. However, the dynamic modeling needed to fully optimize the treatment process performance for short-

term peak flow conditions is complex and requires a significant amount of process data and wastewater characterization that is not available.

- The addition of a third clarifier would eliminate performance concerns with the secondary clarifier system and would allow the aeration basins to be operated at a higher mixed liquor suspended solids (MLSS) concentration, increasing overall performance of the secondary process. However, once the new satellite treatment system is constructed, the overall loadings to the plant will decrease. Therefore, it would not be prudent to construct a new secondary clarifier facility at this time.
- It may also be possible to further lower MLSS concentrations in peak flow conditions by using the Aerated Sludge Storage Basin (ASSB) for contact stabilization. Additional modeling analysis is needed to assess this possible strategy.

Based on the results of the process modeling, it is recommended that the aeration basins be operated as described below and as summarized in Table 3-1 to improve performance and address the deficiencies discussed above:

- Anoxic/Aerobic Zone Configuration:
  - Install a divider wall in the last cell of each train, dividing those cells into two smaller cells, creating five cells in each train (Cells A1 – A5 and B1 – B5)
  - Configure the first two cells in each train as swing zones
  - Operate the swing zones in anoxic mode during the dry season and aerobic mode during the wet season
  - Operate the last three cells in each train as aerobic zones year round
- Step-Feed Operations:
  - During the dry season, it is recommended that all flow be discharged into the first swing zone
  - During the wet season, it is recommended that half the raw/screened sewage be discharged into the first swing zone of each train and the other half be discharged to the second aerobic zone of each train.
- IMLR Flows
  - During the dry season, when the first two cells of each train are being operated in anoxic modes, the IMLR pumps should be operated to return nitrified mixed liquor to the anoxic zones for denitrification. The IMLR flows should be set to the maximum 1.08 mgd per train.
  - During the winter season, when all cells are being operated in aerobic mode, the IMLR should be off.
  - The IMLR piping should be modified so that IMLR flows are discharged to the first cell of each train only.
- RAS Flows
  - It is recommended that the RAS pump be modified so that they can achieve a return rate of 50 percent of influent flow during current max day conditions (1,800 gpm).
  - The RAS pumps should be operated at a return rate of 100 percent of influent flows for influent flows up to 2.6 mgd.

- When influent flows exceed 2.6 mgd, the RAS pump should be operated at their max pumping rate 1,800 gpm.

Table 3-1. Sandy WWTP Summary of Aeration Basin Operational Recommendations

Parameter	Wet Season Operation	Dry Season Operation
Cell A1 and B1	Aerobic	Anoxic
Cell A2 and B2	Aerobic	Anoxic
Cells A3 – A5 and B3 – B5	Aerobic	Aerobic
Raw/Screened Sewage Discharge Location	33 – 50 percent to Cell A1/B1 50 – 67 percent to Cell A4/B4	100% to Cell A1/B1
RAS Rate	50 – 100 percent of Influent, 1,800 gpm max	50 – 100 percent of Influent, 1,800 gpm max
IMLR Rate	0 gpm	1,500 gpm
Aerobic Solids Retention Time (aSRT)	6.5 days	4.0 days, min
MLSS Concentration, max	1,900 mg/L	2,900 mg/L

Recommended aeration basin mechanical improvements required to implement the proposed operational changes and to address the deficiencies discussed above, are summarized as follows:

- Install a concrete baffle wall to divide the two existing aerobic cells (largest cells in each aeration train) into two smaller aerated cells;
- Replace slide gates on the influent channel with downward opening weir gates to allow control of flow into each zone;
- Modify the RAS and IMLR piping so that RAS and IMLR flows are discharged to the first zone of each train under all conditions;
- Remove the aeration piping and diffusers and install the following aeration system components:
  - Two new stainless-steel air headers, one serving each train of the aeration basins.
  - Three grids of fine bubble diffusers in each aeration basin train: one grid in the anoxic zones. one grid in the first two aerobic zones, and one grid in the final aerobic zone.
  - New air piping drop legs for each fine bubble diffuser grid.
  - New flow meters and motorized butterfly valves on each air piping drop leg.
  - Three DO probes in each train of the aeration basins.
- Install VFDs on the three existing multi-stage centrifugal blowers and implement a control strategy tied to new air drops with air mass flow meters and actuated butterfly valves;
- Implement the following improvements to create a serpentine flow path through each aeration basin train and prevent scum accumulation in each cell:
  - Provide new openings in the wall between Cell A2 and A3 and the wall between Cell B2 and B3. The new opening will be near the center of the basins.

- Provide openings in the new wall between Cells A4 and A5 and the new wall between Cells B4 and B5. The openings shall be near the outer edge of the basins.

- Add fiberglass reinforced plastic (FRP) baffles at the opening to Cells A4 and B4 to direct flow toward the center of the basins and limit short-circuiting of flow through those cells. Replace the slide gates on the effluent channel and gate between the aeration basin zones with downward opening gates to prevent foam from accumulating in the aeration basins;
- Install a concrete divider wall in the middle of the effluent channel to dedicate a single secondary clarifier to each aeration basin train to improve the flow split between the secondary clarifiers;
- Install new piping below the effluent channel to direct mixed liquor into the IMLR pump station.
- Install a gate on the overflow cutout on the utility pump station.
- If project funding allows, it is recommended to investigate a way to measure flow going into each secondary clarifier. This is placed on a Wish List of improvement included in Appendix E.

These recommended upgrades are shown on Drawings S001, S002, S003, S004, M002, M004, and M007 included in Appendix A.

3.4 RAS/WAS Pump Station

3.4.1 Existing Conditions

The RAS/ WAS pumps station consists of two 600 gpm, 7.5 hp centrifugal RAS pumps and two 100 gpm WAS pump located in the basement of a concrete masonry unit (CMU) block building north of the aeration basins and west of the secondary clarifiers. The RAS/WAS Pump Station has the following deficiencies:

- The RAS/WAS pump station building ventilation system cannot provide the minimum of six air changes per hour (ACH) required by the National Fire Protection Association (NFPA) 820 Standard for a Class 1, Division 2 area.
- The RAS/WAS pump station building does not have a lower explosive limit (LEL) gas sensor, oxygen sensor, or audio/visual gas alarm required by NFPA 820
- The RAS pumps do not have adequate capacity based on the findings of the process modeling TM provided in Appendix B.

3.4.2 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR did not recommend any improvements for the RAS/WAS pump station. Based on West Yost's biological process modeling, it is recommended that the RAS pumping capacity be increased as summarized in the following section.

3.4.3 Modified Preliminary Design Recommendations

To meet the deficiencies noted above, the following improvements are recommended for the RAS/WAS pump station:

- Upgrade the HVAC system to ensure proper ventilation within the basement and building and to meet the requirements of NFPA 820.
- Install LEL gas detectors, oxygen sensors, and audio/visual gas alarms in the RAS/WAS Pump Station.
- Replace the RAS pump motors with new 20 hp, inverter duty rated motors to increase the capacity of each pump to 900 gpm.
- Install variable frequency drives (VFDs) for each RAS pump.
- Modify RAS pump discharge piping to accommodate increased pump capacity.

One opportunity that has been proposed by Veolia that was not able to be included in the current preliminary design evaluation is the potential for using ASSB Cells 1 and 2 as a contact zone during peak flows. West Yost believes this idea has merit and could potentially increase the peak WWTP capacity. Under this scenario, RAS would be pumped to ASSB Cell No.1, flow through Cell No.2 after which it would be pumped to the aeration basin. To implement this process change, the following would be required:

- A new valve vault would be constructed on the existing 8" RAS pipe;
- An 8" RAS pipeline extension would be constructed from the valve vault to ASSB Cell No.1;
- A new submersible RAS Return Pump Station (RPS) would be constructed next to the ASSB to return RAS from ASSB Cell No.2 to the aeration basin; and
- A new 8" return pipe would be installed from the RPS to the new valve vault.

If implemented, these upgrades would also allow pressate from the belt filter press to be diverted to the ASSB during peak storm events to reduce flow to the storm water pump station.

These recommended upgrades are showing on Drawings M006 included in Appendix A.

3.5 Secondary Clarifiers

3.5.1 Existing Conditions

There are two existing secondary clarifiers at the WWTP. Each clarifier is 54-feet in diameter with a 15-foot side water depth; and is equipped with a center feed column, energy dissipating inlet (EDI), flocculation well, cantilevered effluent launders with a scum baffle, a multiple uptake pipe/draft tube type sludge collection mechanism, a scum skimmer arm and a scum box. The secondary clarifiers have the following deficiencies:

- The clarifier mechanisms are over 20 years old, have reached the end of their useful life and need to be replaced.
- Scum/foam accumulates in the clarifiers.
- The sludge collection uptake pipes get clogged with rags.
- The effluent weirs are not level causing short circuiting of the flow through the units.

3.5.2 Previous Preliminary Design Recommendations and Discussion

Ovivo Eimco and Rebuild-It Services Group performed a site visit and inspection of the secondary clarifiers in June 2020. Based on the findings of that site visit and inspection, it was recommended in the 2020 PDR that the following components be replaced:

- Sludge/scum collector mechanism drive.
- Scum skimmer arm.
- Scum beach flush valves.
- Seals on sludge box.
- Sludge uptake pipe valves.
- Spray nozzles.
- Effluent weirs.
- Effluent baffles.

Rehabilitation of the secondary clarifiers and, especially, leveling the launder weirs is an important part of the project. There are a few items West Yost recommends adding to the project if funding allows as summarized in the following section.

3.5.3 Modified Preliminary Design Recommendations

The secondary clarifier improvements summarized in the 2020 PDR are recommended for implementation under this Project. It is also recommended that the following improvements be implemented:

- Replace the existing scum beach and box with a system consisting of two scum beaches and boxes, one on either side of the cantilevered launder. This will allow scum to be removed on each side of the launder.
- Replace the section of scum baffle near the new scum beaches with a deeper baffle to prevent scum from bypassing the baffle.
- If project funding allows and depending on improving gravity flow from the scum boxes, it is recommended the scum pump station be upgraded or replaced. This item is one of the items included on the Wish List of improvements in Appendix E.

These recommended upgrades are showing on Drawings M005 included in Appendix A.

3.6 Filters and UV Disinfection

3.6.1 Existing Conditions

The existing Filter and UV Disinfection Facility consists of two filter basins equipped with cloth disk filters and a UV disinfection channel equipped with 24 medium pressure UV lamps. The existing facility has the following deficiencies:

- The filter media was replaced in 2020 with new cloth media that was anticipated to allow the initial design capacity of 6 MGD to be achieved.
- However, the current filter operation appears to be limited to a capacity of approximately 3 MGD. This is at least partially due to the poor secondary effluent quality that typically flows to the filters during high flow conditions.
- It is anticipated that the recommended aeration basin and secondary clarifier upgrades will improve secondary effluent quality under higher flow conditions but it is unknown at this time how much additional filter capacity will be "recovered".
- The existing Trojan 4000 UV disinfection system is over 20 years old and has reached the end of its useful life but Veolia has indicated they are still able to get parts and that replacement of the UV system is not the highest priority in the treatment plant.
- The existing 14" outfall pipeline that connects the UV channel effluent wet well is designed with a horizontal flared inlet which allows the pipe to become airlocked.

3.6.2 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR recommended the following improvements for the Filter and UV Disinfection Facility:

- Replace the existing UV system with a new higher capacity UV disinfection system;
- Perform channel modifications required to accommodate the new UV disinfection system; and
- Install a new programmable logic controller (PLC) and operator interface for the new equipment.

3.6.3 Modified Preliminary Design Recommendations

West Yost recommends the following Filter/UV area upgrades:

- Replace the existing horizontal flared inlet on the existing 14-inch outfall pipeline with a 90-degree fluted end bend that points down to help prevent air locking of the pipeline;
- Provide baffles in the filter influent channel to better control the flow split between the filter trains.
- Consider installation of a new 3 MGD tertiary treatment train consisting of a skid-system with new secondary effluent diversion pumps, new cloth media disk filters, new medium-pressure UV system, flow meter and composite sampler; and
- Rehabilitate the metal building components on the Filter/UV area cover and replace the sacrificial anode on the cathodic protection system for the structure.

These recommended upgrades are showing on Drawings C001 included in Appendix A.

3.7 Aerated Sludge Storage Basin

3.7.1 Existing Conditions

The existing ASSB is a circular structure that is split into three cells. Cell No. 1 is a circular cell located at the center of the ASSB with a volume of 90,000 gallons. The two other cells form a "donut" around the center cell. Cell No. 2 has a volume of 180,000 gallons and Cell No. 3 has a volume of 90,000 gallons. WAS

and secondary clarifier scum are discharged into Cell No. 1 where it is thickened and then overflows into Cell No. 2. Sludge from Cell No. 2 is pumped to a belt filter press with a submersible pump. Filtrate from the belt filter press flows back to Cell No. 3. Decant pumps in Cells No. 2 and No. 3 convey supernatant from those cells back to the Headworks Facility. All three cells are equipped with floor-mounted diffusers that are used to provide mixing, remove ammonia, and prevent anaerobic degradation of stored sludge. Air is supplied to the ASSB with two positive displacement 800 scfm, 25 hp blowers.

A liquid sludge feed tank with recirculation pump is located next to the ASSB. The tank was previously used to mix sludge with lime and provide a sufficient hydraulic grade line for conveyance to the belt filter press. The tank and recirculation pump are currently not in use because the equipment needs to be repaired or replaced.

The ASSB has the following deficiencies:

- The submersible pump in Cell No. 2, which pumps sludge to the belt filter press, cannot meet the design flow and pressure requirements for the belt filter press.
- The ASSB structure and components are in poor condition.
- The walkway around the center cell (Cell No. 1) of the ASSB consists of a single plank of wood and handrailing that is not approved by the Occupational Safety and Health Administration (OSHA). This is a safety hazard for operators.
- The ASSB does not provide adequate sludge detention time to meet the requirements for Class B biosolids.
- There are four davit cranes at the ASSB that do not have adequate reach to remove equipment out of the ASSB and require too much force to crank.
- The existing walkway leading from the side of the ASSB to the center of the ASSB needs to be repaired and re-coated.
- The two existing blowers do not have adequate capacity.

3.7.2 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR recommended the following improvements for the ASSB:

- Replace the existing center chamber walkway with 3-foot wide platform with OSHA approved handrailing; and
- Replace the four davit cranes around the ASSB with new cranes that have adequate reach and require less force to crank.

West Yost recommends more extensive upgrades to the ASSB and abandoning the proposed walkways and handrails as summarized in the following section.

3.7.3 Modified Preliminary Design Recommendations

The improvements recommended in the 2020 PDR address some operational and health and safety issues at the ASSB, but do not address solids treatment process deficiencies that would go a long way toward improving solids dewatering performance and reducing polymer consumption. West Yost recommends the following ASSB upgrades be included in the project:

- Remove the walkway around the center cell (Cell No.1) of the ASSB and do not install a new walkway
- Repair, sandblast, and paint the existing walkway leading from the side of the ASSB to the center of the ASSB.
- Re-route the belt filter press filtrate so that it is conveyed to the aeration basins via the Waste Pump Station without passing through the ASSB (see Section 3.9.3 for further discussion on re-routing of these flows)
- Rehabilitate the ASSB aeration system as follows:
  - Replace the existing aeration piping and diffusers with new piping and diffusers
  - Design the new aeration system to provide adequate mixing and to maintain a DO of 1 to 2 mg/L in each cell of the ASSB.
  - Provide four separate zones of diffusers: one in Cell No. 1, two in Cell No. 2, and one in Cell No.3
  - Provide a separate air piping drop leg for each zone of diffusers, each with a flow meter and modulating butterfly valve. The valve and flow meter will be used to control the amount of air provided to each cell of the ASSB.
  - Install a DO probe in each cell of the ASSB.
  - Install one new 800 scfm, 25 hp positive displacement blower to provide air to the ASSB along with the two existing blowers.
- Convert ASSB Cell No. 3 into an aeration/decant zone for thickening and feeding solids to the belt filter press. One of the existing decant pumps will be relocated from ASSB Cell No. 2 to ASSB Cell No. 3 so there is a decant pump on each end of Cell No.3.

These recommended upgrades are showing on Drawings C002 and M008 included in Appendix A.

3.8 Chemical Storage and Metering Facilities

3.8.1 Existing Conditions

There are two chemical storage and metering facilities at the WWTP: a sodium hypochlorite facility and a sodium hydroxide facility. The sodium hypochlorite facility consists of two 1,000 gallons storage tanks, a diaphragm metering pump skid with two metering pumps and appurtenances, and an emergency eye wash/shower. The equipment is located on the top floor of the RAS/WAS Pump Station.

The sodium hydroxide feed system is located near the headworks and consists of chemical storage totes and a diaphragm metering pump skid. The system is used to increase the pH of the raw wastewater upstream of the aeration basin, to address the low alkalinity issues.

The existing chemical facilities have the following deficiencies:

- The sodium hypochlorite storage and metering facility is not capable of disinfecting the process water system year-round. This creates a health and safety issue for the operators using the water.

- The current sodium hydroxide storage and metering facility at the headworks uses totes and is a temporary system that is manually controlled and does not allow the chemical metering pump discharge rate to be adjusted based on influent flow or process needs.

3.8.2 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR recommended the following chemical storage and metering facility improvements:

- Install a new sodium hypochlorite metering pump system to pump sodium hypochlorite from the existing storage tank into the process water system to provide year-round disinfection of the process water.
- Replace the temporary sodium hydroxide feed system with a permanent system that allows the chemical feed rate to be adjusted based on influent flow and process needs.

West Yost agrees that a more permanent sodium hydroxide storage and feed system is needed, but recommends it be constructed at an alternate location that will also allow the sodium hypochlorite feed pumps for the utility water and RAS systems to be installed in a common building as summarized in the following section.

3.8.3 Modified Preliminary Design Recommendations

Several different configurations of the proposed chemical system improvements were considered. The most cost-effective approach recommended for implementation under this Project includes the following improvements:

- Install a new 16-foot by 24-foot concrete pad on the east side of the existing RAS/WAS Pump Station.
- Install an 8,000-gallon, insulated, double-walled, polypropylene tank with a mixer on the concrete pad for storage of 25 percent sodium hydroxide. It is assumed that 25 percent solution will be delivered to the site and that no on-site dilution will be needed.
- Install a fiberglass shed building on the concrete pad equipped with the following:
  - A sodium hydroxide metering pump skid with two pumps and required appurtenances.
  - A sodium hypochlorite metering pump skid with two pumps and required appurtenances.
  - A heater and ventilation fan.
  - Lighting.
  - Required LEL gas sensors, oxygen sensors, and audio/visual alarms.
- Install an emergency eye wash/shower with a 20 gpm, on-demand, tepid water heater on the new concrete pad.
- Install chemical piping required to allow sodium hydroxide to be injected into the RAS pump discharge header.
- Install chemical piping required to allow sodium hypochlorite to be injected into the process water piping and into the RAS pump discharge header.
- Chemical storage and metering facilities shall be designed to provide a minimum of 15-feet of clearance around the secondary clarifiers to allow adequate space for maintenance vehicles to drive around the clarifiers.

These recommended upgrades are showing on Drawings C001 and M005 included in Appendix A.

3.9 Waste Pump Station and Stormwater Control

3.9.1 Existing Conditions

The existing Waste Pump Station consists of a circular wet pit with two 350 gpm, 3 hp submersible pumps and an at-grade rectangular valve vault. The wet pit receives flow from the following sources and discharges it into the 24-inch pipeline that conveys raw sewage from the Headworks Facility to the Aeration Basins:

- Filter backwash water.
- Dewatering Building and Sludge Storage Facility floor drains, roof drains and foundation drains.
- Solids Handling Building roof drains and foundation drains.
- Sanitary sewer flow from the Maintenance Building.

Although the Waste Pump Station receives some stormwater runoff from the WWTP site, the majority of stormwater runoff from the site is discharged into Tickle Creek through Outfall 003. This configuration allows for the potential release of hazardous materials or chlorinated process water into Tickle Creek. To prevent accidental discharge, an inflatable plug has been inserted into the outfall. The plug is removed during storm events and re-installed during dry weather. If drainage accumulates in the outfall during dry weather conditions when the plug is installed, the flow is pumped back to the WWTP with a temporary pump.

3.9.2 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR recommended the following improvements to the Waste Pump Station and stormwater control system:

- Install a new manhole on the existing 15-inch storm drain that discharges into Outfall 003.
- Install new piping to connect the new manhole to the existing Waste Pump Station.
- Install an overflow weir in the manhole that will direct stormwater drainage from the 15-inch storm drain into the Waste Pump Station during normal rain events but allow stormwater drainage during peak events to flow into the Outfall 003.

West Yost believes the proposed storm water upgrades do not provide the assurance City and Veolia staff desire related to ongoing and consistent compliance with the City's National Pollutant Discharge Elimination System (NPDES) 1200z stormwater permit. Recommendations are summarized in the following section.

3.9.3 Modified Preliminary Design Recommendations

The following improvements are recommended for implementation under this Project because they will provide a more comprehensive solution for managing onsite stormwater by directing it entirely back to the headworks downstream of the influent flow meter and composite sampler. In addition, ASSB Cell No. 3 would be freed up for use as the solids decant zone by directing pressate from the belt filter press to

the storm water pump station to be recycled and treated in the aeration basin. Recommended Waste Pump Station and storm water control upgrades include the following:

- Re-route all storm drain piping to discharge into the Waste Pump Station, except for the 10-inch foundation drains from the secondary clarifiers and Filter/UV Facility and the 8-inch overflow piping from the Filter/UV Facility.
- Re-route the belt filter press pressate piping to discharge into the Waste Pump Station.
- Replace the existing submersible pumps with two new 650 gpm, 20 hp pumps with VFDs.
- Replace the pump discharge piping with larger piping to accommodate the larger pumps.
- Install a new valve vault with new valves to accommodate the larger pump discharge piping.
- Installed a new 6-inch diameter force main to convey flow from the Waste Pump Station to the 24-inch pipeline that conveys raw sewage from the Headworks Facility to the Aeration Basins.

These recommended upgrades are showing on Drawings C002 included in Appendix A.

3.10 Site Improvements

The following site improvements are recommended for implementation under this Project:

- Install a new LEL gas sensor, oxygen sensor and audio/visual alarms at the Dewatering Building
- Install new lighting throughout the site as described in Section 3.11

3.11 Electrical and Instrumentation and Control (I&C) Improvements

3.11.1 Previous Preliminary Design Recommendations and Discussion

The 2020 PDR recommended the following electrical and instrumentation and control (I&C) improvements throughout the plant:

- Inspect the MCCs and Switchgear inspected and have it serviced by a qualified electrician. After the inspection, apply labels to electrical equipment as determined by the assessment.
- It is noted that physical ingress to some electrical equipment is currently not possible because of field modifications to the equipment in the past. These situations will be identified and corrected to help ensure operations staff safety.
- Replace the PLC hardware.
- Replace the SCADA system computer.
- Upgrade the Cimplicity SCADA software to accommodate the Windows 10 operating system.
- Provide Alarming system in the upgraded SCADA.
- Update the screens to incorporate modern graphics that are easy to navigate.
- Modify the graphics for the new UV Disinfection System.
- Install high speed internet to improve remote monitoring.
- Install Ethernet Network between several buildings.

West Yost worked with The Automation Group, Inc. (TAG) and Landis to further evaluate the electrical and I&C upgrades recommended in the 2020 PDR and determine what improvements are recommended for meeting the objectives of this Project. The major control system components are discussed in Section 3.11.2 and other electrical and I&C improvements are discussed in Section 3.11.3.

3.11.2 Control System Components Evaluation

TAG considered alternatives for each component of the control system recommended for upgrade in the 2020 PDR, evaluated the alternatives, and identified a preferred alternative for each component. The components that were evaluated include:

1. PLC Architecture
2. HMI/SCADA
3. Ethernet Connections via copper CAT6 Shielded vs. Fiber
4. Alarm Dialer via software vs. direct connection (Hardware)
5. Reporting Software
6. Secure Remote Connection

A technical memorandum summarizing the evaluation performed on each of these components is included in Appendix D. The key recommendations from the evaluation are:

- Provide a new SCADA system at the WWTP that is separate from the drinking water and distribution/collections systems. This is to prevent a single failure from affecting the rest of the City.
- Retain as much of the existing PLC system as possible, but replace components needed to upgrade the system to a platform that is fully supported by the manufacturer.
- Re-write the PLC software logic to enhance the process control with the added/upgraded processes.
- Connect new devices to the upgraded PLC system and SCADA by extending the ProfiNet Network to smart communications modules on the new devices
- Use copper CAT6 shielded wire cables to connect PLCs to the new SCADA system. The CAT6 cables can be installed in existing conduits, which may have some tight bends, and can be installed in the same conduit as the camera system ethernet cables. This makes them preferable versus fiber optic cables which cannot be installed in conduits with tight bends or in the same conduits at the camera system cables.
- No new reporting software is needed at this time.
- Connect the alarm dialer system directly to the PLC. This is a more reliable method than using software as the software requires a PC to run continuously.
- Use a Tosi Box Solution to make a secure remote connection to the WWTP, when needed. This type of system uses a two-part authentication (Physical USB Key and Username/Password), which meets the latest Internet of Things (IOT) requirements for a secure connection.

3.11.3 Modified Preliminary Design Recommendations

Other electrical and I&C improvements required to support the recommended process mechanical and site improvements discussed above are as follows:

- Headworks Facility
  - Provide power from Office/Lab Building for the new jib crane.
  - Replace the four (4) existing column mounted lights with new 4-foot, vaportight, LED fixtures mounted to the steel joists.
  - Disconnect and reconnect the conductors for the grit motor.
  - Provide conduit and CAT6 cabling for camera.
- Equalization Basin
  - Provide conduit and conductors to level transmitter from the RAS Building
  - Provide conduit and conductors to aerators from the RAS Building
- Aeration Basins
  - Provide two (2) Instrumentation panels at the end of the basins. Provide CAT6 cabling back to the Blower Building Control Panel PN-1004.
  - Provide control cabling, conduit and power cabling for four (4) DO Sensors.
  - Provide control cabling, conduit and power cabling for six (7) flow meters.
  - Provide control cabling, conduit and power cabling for six (6) motorized valves.
  - Provide control cabling and conduit for two (2) level sensors.
  - Provide control cabling, conduit and power cabling for four (4) motorized actuators.
  - Provide control cabling and conduit for four (4) motorized slide gates.
- Blower Building
  - Replace existing MCC-A1 section with VFD drives for each of the four (4) blowers and an active harmonic filter.
  - Disconnect and reconnect existing conductors to each of the four (4) blower starters.
  - Provide conduit and CAT6 cabling for two (2) outdoor rated cameras.
  - Provide conduit and CAT6 cabling from new MCC-A1 to Control Panel PN-1004.
- RAW/WAS Pump Station
  - Provide new 400amp, 480/277volt panel at the RAS Building.
  - Provide 400amp conductors in spare conduits in existing conduit duct bank. Provide new conduit from the power vault to the new panel.
  - Provide new conductors and conduit for the two (2) RAS pumps from the new 400Amp panel. Remove existing conductors back to MCC-A.
  - Provide new conductors and conduit for the existing 45kVA transformer from the new 400Amp panel. Remove the existing conductors back to MCC-A.
  - Provide new 120volt branch circuits for the new chemical building from the existing panel CBP-2.
  - Replace existing conductors to the new exhaust fan.

- Secondary Clarifiers
  - Disconnect and reconnect existing conductors from secondary clarifier motors.
  - Replace existing light fixture (2 total) with new LED fixtures on a collapsible pole.
  - Replace eight (8) existing lights with new vapor tight LED fixtures.
- Filters and UV Disinfection Facility
  - Provide a new 100amp, 480/277volt panel from MCC-B for new UV train.
  - Provide new 100amp conductors and conduit from MCC-B to a new panel. Provide a 100amp circuit breaker in MCC-B.
  - Replace eight (8) existing lights with new vapor tight LED fixtures.
- ASSB
  - Remove all electrical connections.
  - Provide new VFD for new Blower No. 3. Provide new conductors and conduit from MCC-C. Provide new circuit breaker in MCC-C
- Waste Pump Station
  - Provide new VFDs (total 2) for the new stormwater pump controllers. Provide new conductors and conduit from MCC-C. Provide a new circuit breaker in MCC-C.
  - Provide a new instrumentation panel in the building. Provide one (1) CAT6 cable to Dewatering Building using the existing 1-inch conduit.
  - Provide conductors and conduit for controls to the VFDs from the control panel.
  - Provide conductors and conduit for three (3) pressure sensors to the control panel.
- Dewatering Building
  - Provide new CAT6 cable and conduit for the new camera to the control panel PN-1050.
  - Provide new conductors and conduit to the new exhaust fan in the electrical room.
- Site Improvements
  - Replace four (4) existing area pole fixtures with new LED fixtures. The poles will be reused.
  - Add five (5) new LED area lights with 20-foot poles.
  - Replace the existing building mounted flood light on the Solids Handling Building with a new LED spotlight.
  - Add (2) new LED spotlights on the roof of the Solids Handling Building.
  - Add (3) new LED spotlights on the roof structure of the Disinfection Filtration Basin.
  - Add three (3) CAT6 cables in the existing spare conduits between the Office Building and the Blower Building.
  - Add three (3) CAT6 cables in the existing spare conduits between the Blower Building and the RAS/WAS Building.
  - Add three (3) CAT6 cables in the existing spare conduits between the Office Building and the Solids Handling Building.
  - Add three (3) CAT6 cables in the existing spare conduits between the Office Building and the Effluent Pumping Building.

- Add three (3) CAT6 cables in the existing spare conduits between the Effluent Pumping Building and the Dewatering Building.

These recommended upgrades are showing on the Electrical Drawings included in Appendix A.

4.0 OPINION OF PROBABLE CONSTRUCTION COST

Table 4-1 summarizes the opinion of probable construction cost (OPCC) for the improvements recommended in this PDR. Table 4-1 also summarizes the costs for the improvements recommended in the 2020 PDR and the difference in cost between the 2020 PDR recommendations and the modified set of recommendations included in this PDR.

The OPCC summarized in Table 4-1 was developed using budgetary quotes from vendors and cost data from similar projects and includes the costs listed below:

- Direct Costs = Direct material, equipment, and labor costs
- Subcontractor Markup = 5 percent of material, equipment, and labor provided by subcontractors
- Mobilization and Demobilization = 5 percent of direct costs + subcontractor markup
- Insurance and Bonds = 3 percent of direct costs + subcontractors markup
- OH&P = 6.5 percent of direct costs + subcontractor markup
- Contingency = 15 percent of direct costs + all other markups

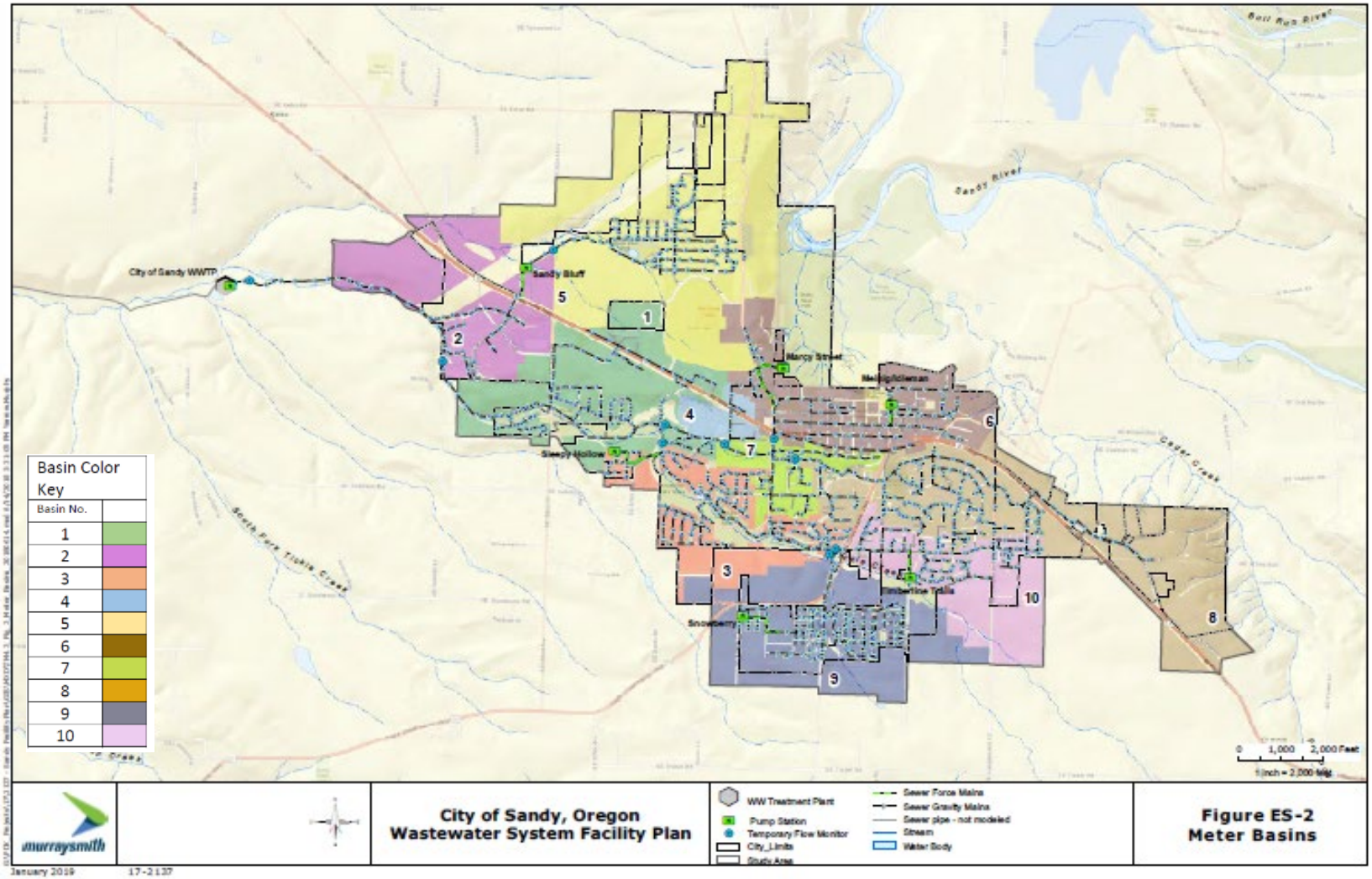
Other key information regarding the cost estimate is as follows:

- A detailed breakdown of the costs summarized in Table 4-1 is included in Appendix C
- The OPCC is a Class 4 estimate based on the Association for the Advancement of Cost Engineering (AACE) International guidelines. Typical accuracy ranges for Class 4 estimates are (-)15 to (-)30 percent on the low side and (+)20 to (+)50 percent on the high side.
- The costs for the RAS diversion to the ASSB discussed in Section 3.0 are not included in the OPCC.

Table 4-1. Opinion of Probable Construction Cost (OPCC) Summary

Item Description	Modified Recommendations	2020 PDR Recommendations	Difference
Headworks Facility	260,000	710,000	(450,000)
Equalization Basin	110,000	0	110,000
Aeration Basin and Blowers	1,400,000	610,000	790,000
Secondary Clarifiers	130,000	350,000	(220,000)
RAS/WAS Pump Station	80,000	0	80,000
Aerated Sludge Storage Basin	560,000	120,000	440,000
Chemical Storage and Metering Facilities	370,000	500,000	(130,000)
Waste Pump Station and Stormwater Control	270,000	70,000	200,000
Site Improvements	510,000	0	480,000
Total Construction Cost	**$3,690,000**	**$2,360,000**	**$1,330,000**
Filter and UV Disinfection Improvements	1,220,000	690,000	530,000
Total Construction Cost + Filter/UV	**$4,910,000**	**$3,050,000**	**$1,860,000**

APPENDIX B
COLLECTION BASIN MAP



APPENDIX C

Supplemental Environmental Project Application

Oregon Department of Environmental Quality
Office of Compliance and Enforcement
700 NE Multnomah St., Suite 600
Portland OR 97232

Case Name and No. *United States, et. al v. City of Sandy, Oregon*
90-5-1-1-12501

Project Contact: Jordan Wheeler, City of Sandy
39250 Pioneer Blvd. Sandy, OR 97055

Type of Project (choose one):

☐ **Pollution Prevention** – preventing waste or pollution at the source, by conserving energy or natural resources, or by making process changes (such as chemical substitutions) or by making a process more efficient so that less waste is created for a given amount of product.

☐ **Pollution Reduction –** reducing the amount and/or danger presented by some form of pollution, often by providing better treatment and disposal of the pollutant.

☐ **Public Health Protection**- an example is the medical examination of residents in a community to determine if anyone has experienced any health problems because of the violations at issue.

☐☒ **Environmental Restoration and Protection** –improving the condition of the land, air or water in the area damaged by the violation. For example, restoring a wetland or planting trees along a riparian zone to reduce erosion and provide shade for improved water quality.

☐ **Emergency Planning and Preparedness** – providing assistance to a responsible state or local emergency response or planning entity. Such assistance may include the purchase of computers and/or software, communication systems, chemical emission detection and inactivation equipment, HAZMAT equipment or training.

☐ **Assessments and Audits** to determine if the Respondent is causing any other pollution problems or can run its operation better to avoid future violations.

☐ **Environmental Compliance Promotion**- providing training or technical support to other members of the regulated community to achieve, or go beyond, compliance with applicable environmental requirements.

☐ **Other Projects** that have environmental merit but do not fit within the categories listed above.

Who is conducting the project? (i.e. Respondent or third party entity such as a watershed council or other nonprofit organization)
Clackamas River Basin Council

Location where project will take place: Tickle Creek Trail Corridor, Sandy, Oregon

Project description (Please attach an extra sheet of paper, if necessary):
This project is a restoration project to improve riparian health and water quality protection along a section of the Tickle Creek Stream Corridor between 362nd Ave to nearly Hwy 211 in Sandy. This section of Tickle Creek is about two miles upstream from Sandy's Wastewater Treatment Plant. The 1.8 mile Tickle Creek Trail travels along parts of this corridor and was built in 2010. The stream corridor is surrounded by residential development (see attachment 1).

This project will accomplish three objectives:

1. Reduce non-native plants in the riparian corridor.

Reduce invasive and noxious non-native plants in a 37-acre stream corridor with a focus on Himalayan blackberry, ivy, holly, and knotweed. Some invasive plant control and planting was conducted along portions of the corridor in 2015. However, there were insufficient funds for multiple years of treatments. Additionally, climate change and adjacent land use have accelerated tree mortality and canopy loss in the last five years.

In years one and two (2023 and 2024) of the project, CRBC and their contractors will conduct initial non-native plant control, including mechanical and chemical treatments, and closing off trampled areas. Planting of native trees and shrubs along the stream will occur in Winter 2025

(year 3). Spot treatments of persistent non-native plants will occur in years 3 and 4. (See detailed prescription, attached.)

Areas with unmarked private property within 100' of the creek will be surveyed to maximize the riparian area that can be enhanced for water quality protection.

2. Increase native plants, particularly shade-providing conifers, hardwoods and shrubs.

Plant site appropriate conifers, hardwoods and shrubs at sufficient densities to occupy the site and reduce re-establishment of non-native plants. Where appropriate, plant long-lived confers such as Western redcedar and Douglas-fir to provide shade and future large down wood. The number of plants per acre will vary by site conditions. For example, several acres of riparian and wetland forest have been significantly impacted by blowdown and the loss of tree canopy likely due to an adjacent clearcut. The loss of stream shade and the establishment of high levels of non-native blackberry have reduced the riparian corridor health. This area will be planted at approximately 500 plants per acre. The total plants to be installed across the entire 37 acre project area is estimated to be up to 18,500 (dependent on exact project needs; CRBC will truth the total number of acres and quantity of plants).

3. Mitigate erosion and soil compaction from off-trail disturbance.

Numerous unsanctioned trails and trampled areas have become established in the stream corridor. These areas of off-trail disturbance will be obliterated and restored where feasible, which could include soil rehabilitation, erosion mitigation, mulching, covering exposed ground with logs and debris, and/or replanting. Together, CRBC and City of Sandy will identify areas of off-trail disturbance for treatment.

Attached are aerial maps of the project area.

What environmental benefits are expected?
The primary benefit will be improved riparian corridor health including increasing native plants and reducing erosion along the creek, benefiting water quality and wildlife habitat. This project will remove invasive and noxious plants in the stream corridor that compete with native species and reduce native plant diversity. Native trees and shrubs will be installed after invasive and noxious plants have been reduced. This section of Tickle Creek is unusual for its large trees, understory of vine maple, and other shrubs, carpets of native ferns and oxalis, snags, down wood in the creek, and a variety of birds, and wildlife habitat. There are often sightings of coyotes, and occasional bear and cougars along the trail. The large trees and areas of dense native understory provide shade and future large down wood for Tickle Creek. The extreme summer temperatures and drought in recent years have likely contributed to the acceleration of tree mortality in the corridor, along with impacts from adjacent land use.

How will you measure/assess the benefits?

Treatment areas will be mapped for inspection and if necessary, re-treatment and/or replanting the following year. Photo points will be made in key infestation areas. Mortality of tree seedlings will be monitored and replanted the following late winter. While we will plant heavily for expected mortality, we will replant the following late winter, if mortality is excessive. The project corridor will be monitored and documented by City staff and partners over a three-year period.

Success can also be measured by area treated and percent survival after 2 years. The project goal is to treat at least 75% of the project site and achieve a 75% survival rate of native plants at age two. The area treated will be mapped during treatment. The planting success will be documented using photo points showing conditions before treatment and at Year Two after planting.

What is the total projected cost of the project? Explain. (Qualifying costs are all reasonable costs of executing the SEP and may include costs of preparing the SEP proposal, costs of materials and services, wages paid to employees (appropriate to the work), and wages and proportional overhead for employees of a third party executing the project. Qualifying costs do not include entertainment or refreshment costs related to the SEP.)

The total estimated cost of this project is $200,000 which includes Clackamas River Basin Council oversight costs, noxious weed treatment, shrub and tree planting, off-trail disturbance mitigation, and community outreach and engagement activities. The budget below is calculated based on an assumption of uniform restoration needs across the 37-acre green space; however, actual treatments will vary across the site and total acreages/costs for each implementation activity are expected to be lower, to be determined by detailed survey and site evaluation to be conducted prior to project implementation. Funds not required for restoration implementation can be utilized for community engagement activities, extended maintenance, and/or other relevant project costs. CRBC will manage site preparation, planting, and two years of maintenance treatments; City of Sandy will assume responsibility for maintaining restored areas after this is complete.

City of Sandy will lead communication directed to city residents and park users, focused on project implementation. CRBC will lead communication for volunteer stewardship and community engagement events focused on natural resource stewardship. Both will coordinate on communication activities for consistent messaging.

Task/Item	Date	Estimated cost
Project management	Duration of project	$8180 (200 hours for CRBC Riparian Specialist at $35/hr, 20 hours for CRBC Executive Director at $59/hr.)

Pre-planting weed treatments	Summer 2023 – Fall 2024	$80,000 (cutting and spraying in 2023, 3 spray treatments in 2024)
Close off-trail disturbance areas and install mitigation measures (e.g., fencing, erosion control, seeding)	Summer-Fall 2023	$11,500 (200 hours of general labor at $50/hour, plus materials)
Install 18,500 native plants	Winter 2025	$34,500 (includes cost of plants and planting)
Post-planting weed treatments	Spring 2025-Fall 2026	$41,000 (6 spot treatments over 2 years)
Supplemental planting if needed based on survival rate	Winter 2026	$4,000 (includes cost of plants and planting)
Community engagement, including volunteer and educational activities	Duration of project	$2,200 (CRBC outreach staff time and supplies)
Vehicle mileage	Duration of project	$210 (320 miles at $0.655/mi.)
Administrative overhead		$18,180 (10%)
Post-project monitoring and reporting	2027 and 2029	$300
		$200,000 Project Total

What is the timeframe for the project (most projects are completed within one year)?
Include milestones and final completion date.

Action	**Date**	**Notes**
Site inspection and surveys	Spring 2023	Covered by other funding
Finalize plan, contract work	August 2023	
Pre-planting vegetation treatments	August 2023 to October 2024	
Close off-trail disturbance areas and mitigate impacts	Fall 2023	Public Outreach
Native plant installation	Winter 2025	Establish photo points, pre and post planting photos
Post-planting vegetation treatments	Spring 2025 to Fall 2026	
Community engagement	Duration of project	
Planting photo points	Fall 2026	Year 1 after planting
Planting photo points	Fall 2028	Year 3 after planting

Attachments
Attachment 1 Tickle Creek Stream Restoration Project Area Map
Attachment 2 Tickle Creek Stream Restoration Planting Species List

Date : __4/7/2023_____ Signature _____

Goodwill Industries of the Columbia Willamette
Safeway
Sandy River Park
Park St
Meeker St
Jiffy Lube
Yocum Loop
Les Schwab Tire Center
Hood St
Paola's Pizza Barn
Dubarko Rd
Eldridge Dr
Ruben Ln
Double Creek Condominiums
Salmon Creek Park
Aubin St
Skogan Rd
Tollgate Inn Restaurant & Saloon
Boring Brewing Co
Sunset St
Next Adve
Knollwood Mobile Estates
Bluff Rd
Circle Dr
Strawbridge Pkwy
Ichabod St
Sandy Heights St
Katrina St
Knollwood Park
SE 370th Ave
SE 362nd Dr
Sandy Heights St
Tickle Creek
Solso Dr
Miller St
Weiser Ave
Grey Ave
Melissa Ave
Rachael Dr
Tickle Creek Tra
Steelhead St
Coho St
Deming Rd
SE Ponder Ln
Melissa Ave
Google Earth
C-Attachment 1
2000 ft
N

TICKLE CREEK DEQ SUPPLEMENTAL ENVIRONMENTAL PROJECT NOTES

Species for stream corridor restoration along Tickle Creek

Shrubs

Rose Spirea –Spiraea douglasii (Hook or hardhack) 2-6 feet tall.

Snowberry - Symphoricarpos albus: to 6 feet, but can be trimmed lower

Thimbleberry – Rubus parviflorus: 4-6 feet

Salmonberry - Rubus spectabilis: 3-12 feet, branches have prickles for access deterrence

Red huckleberry - Vaccinium parvifolium Sm

Red Elderberry - Sambucus racemosa

Willows (live fascines) – low growing variety that is shade tolerant.

Stink currant - Ribes bracteosum

Ferns

Western Sword Fern - Polystichum munitum

Western Maidenhair Fern - Adiantum aleuticum

Lady Fern -Athyrium filix-femina

Piggyback plant - Tolmiea menziesii

Trillium leaved sorrel - Oxalis trilliifolia

Trees

Western red cedar – Thuja placata

Douglas fir - Pseudotsuga menziesii

APPENDIX D

CAPACITY ASSURANCE PROGRAM (CAP) EVALUATIONS

1. In accordance with Paragraph 23 of the Consent Decree, the City shall implement the Capacity Assurance Program ("CAP"). The CAP will limit new sewer connections or changes to existing connections that result in additional flows to the City of Sandy Treatment Works ("CSTW") without a demonstration, and approval by EPA and ODEQ, that capacity to accommodate the additional flows within the Wastewater Collection and Transmission System ("WCTS") and at the Wastewater Treatment Plant ("WWTP") exists during both dry and peak flows. The CAP will be separated into two time periods, as explained below. Period One is the period between the Effective Date of this Consent Decree and the date the CAP limit is established for Period Two. Period Two establishes a limit on the number of new connections and/or changes to existing connections that result in additional flows (initially determined in accordance with Paragraphs 10, and adjusted over time in accordance with Paragraph 11, of this Appendix) based on established capacity at the WWTP ("CAP Limit") and then-current peak flow to the WWTP. The CAP will continue until the improvements for Continued Compliance identified in the approved Amended Wastewater System Facilities Plan, as required in Paragraph 8 of this Appendix, have been implemented, permitted, and are fully operational, and the City is in compliance with all Permit Waste Discharge Limitations.

RESTRICTIONS DURING PERIOD ONE

2. The time period between the Effective Date of this Consent Decree and establishment of the CAP Limit shall be considered Period One under the CAP.
3. During Period One of the CAP, the City shall limit new sewer connections or changes to existing connections that result in additional flows to the WCTS to 300 Equivalent Residential Units ("ERUs") in increased flow (whether from industrial or residential connections). For purposes of the CAP a new connection or changes to existing connections that result in additional flow will be counted for any physical connection to the CSTW at the time that it adds flow to the WWTP.
4. ERUs shall be calculated in accordance with Paragraphs 15-16 of this Appendix, and included in the quarterly reporting outlined in Paragraph 13 of this Appendix.

5. The City shall take all steps reasonably necessary to effectuate the limitations on new connections and changes to existing connections that result in additional flows, including but not limited to putting in place a moratorium consistent with Oregon and local law during Period One of the CAP, and as necessary during Period Two of the CAP.

RESTRICTIONS DURING PERIOD TWO

6. During Period Two of the CAP, prior to approving any new connections or changes to existing connections that will result in additional flows to the WCTS, the City shall ensure that the CSTW has adequate capacity to collect, carry, transmit, and treat said increased flow, combined with the flow predicted to occur from all other existing sources, including authorized sewer service connections during both peak and normal flow conditions. In performing this analysis, the City shall utilize: (i) the evaluations undertaken in accordance with the Stress Test Work Plan and/or Stress Test Report, ii) Comprehensive Capacity Evaluations ("CCEs"), and iii) perform Connection-Specific Capacity Evaluations ("CSCEs") where appropriate. Once a CAP Limit has been established by EPA and ODEQ in accordance with the process outlined in Paragraph 10 of this Appendix, the City may approve new connections or changes to existing connections resulting in additional flow without approval by EPA and ODEQ until either the CAP Limit has been reached or new Capacity Related Violations occur as set out in Paragraph 7 of this Appendix. All ERUs added and approved Building Permits during this period must be included in the quarterly reporting under Paragraph 13 of this Appendix.
7. If Waste Discharge Limitation exceedances, sewer overflows, or bypasses in violation of the Permit have occurred, the City must demonstrate that capacity in the CSTW exists, that the violations were not due to capacity limitations, and any maintenance required to prevent future violations has been completed or they will be deemed Capacity Related Violations. If the CAP Limit has been reached or Capacity Related Violations have occurred, new connections cannot be authorized and/or added without the City demonstrating capacity exists within the CSTW and receiving approval from EPA and ODEQ. Capacity must be demonstrated by submitting a request to EPA and ODEQ providing i) CCEs as outlined in Paragraph 6 of Appendix E and ii) CSCEs as outlined in

Paragraph 14 of this Appendix. EPA and ODEQ may withhold approval of the City's request to authorize and /or add new connections or make changes to existing connections that result in additional flows under this section if the City has not: i) demonstrated capacity for additional flow and that the new connections will not lead to new violations or ii) Capacity Related Violations have already occurred.

8. The City may seek to end the requirements for Period Two of the CAP by submitting a request for review and approval to EPA and ODEQ demonstrating that the Continued Compliance Improvements identified in the Amended Wastewater System Facilities Plan, as required in Paragraph 9 of Appendix E, have been implemented, permitted, and are fully operational, and the City is in compliance with all Permit Waste Discharge Limitations. EPA and ODEQ will review the report for compliance with the requirements of this Section in accordance with Paragraphs 24-29 of the Consent Decree. Upon approval of the report by EPA and ODEQ, Period Two of the CAP will be deemed ended.

TREATMENT CAPACITY EVALUATION FOR CAP LIMIT

9. **Treatment WWTP Capacity Evaluation** – The City shall carry out a comprehensive evaluation of treatment capacities of its WWTP following completion of the 2020-2023 Wastewater Improvements[1] (as required by Paragraph 20 of the Consent Decree). This evaluation shall include the following:
    a. Hydraulic and Loading Capacity Assessment – A desktop evaluation, stamped by a licensed Professional Engineer in Oregon, of the hydraulic capacity of the entire WWTP using as-built drawings, including the WWTP hydraulic profile, and field survey elevation information (as necessary). This assessment shall include a comparison of the design capacities, detention times and loading rates of each and every WWTP unit process (as modified by the immediate needs projects), to industry guidelines and benchmarks, including the Orange Book, WEF No. FD-08, and Metcalf & Eddy.
    b. Stress Test – A Stress Test of the WWTP in accordance with the following guidance: USEPA's Peak Stress Testing Protocol Framework; Peak Wet Weather

[1] Includes the 2021-2023 WWTP Immediate Needs Upgrades Project, 2021 Basins 2 and 8 Rehabilitation Project, and 2022 Basins 6 and 7 Rehabilitation Project.

Flow Stress Testing Contract No.: GS-10F-0227J; May 2015. The Stress Test shall consider the impacts of peak flows on each unit operation as well as on subsequent compliance with all permit parameters. The Stress Test shall include the following:

i. Baseline Monitoring – Enhanced monitoring shall include during a period of typical WWTP operation, monitoring of influent and effluent for the following: 5 day biochemical oxygen demand ("BOD5"), chemical oxygen demand ("COD"), total suspended solids ("TSS"), volatile suspended solids ("VSS"), dissolved Solids, Total Kjeldahl Nitrogen ("TKN"), ammonia, Total Phosphorus, alkalinity, and pH. Enhanced operational monitoring shall include during a period of typical WWTP operation, sampling multiple times per day for the following: Mixed Liquor Suspended Solids ("MLSS"), Mixed Liquor Volatile Suspended Solids ("MLVSS"), Return Sludge Suspended Solids ("RSSS"), Sludge Volume Index ("SVI"), Return Activated Sludge ("RAS") rate, aeration basin DO levels, and sludge blanket depths. This information shall be used to better quantify typical operating conditions as well as to refine the BioWIN and State Point modeling as described below.

ii. Treatment train-specific flow monitoring – Installation of flow monitoring equipment as necessary as to allow the continuous monitoring of treated flow, RAS, and all other recycles within the treatment train to be used for peak flow testing.

iii. Peak Flow/Solid Loading Rate Tests – A series of test events across a range of peak flow and solid loading rates equivalent to whole WWTP flow and load rates, including multiple tests that cover the range of hydraulic loading rates at which the WWTP has experienced bypasses during wet weather events. During each such test event, continuous monitoring of treated flow, RAS, and all other recycles within the treatment train shall be conducted, as will frequent aeration basin influent, mixed liquor, clarifier effluent and recycle monitoring. Such monitoring shall include influent and effluent BOD5, COD, TSS, VSS, Dissolved

Solids, TKN, ammonia, Total Phosphorus, alkalinity, and pH, as well as frequent operational monitoring of MLSS, MLVSS, SVI, RAS rate, aeration basin DO levels, and sludge blanket depths.

iv. Dye testing - During at least one of the solids loading rate tests specified above, carry out slug dye testing to characterize the hydraulic characteristics of the secondary clarifier. Such testing shall employ fluorescent dye and the use of appropriate instrumentation (such as a fluorimeter) and frequent grab sampling to characterize the effluent dye concentration curve.

c. BioWIN and Clarifier State Point modeling – Utilize the WWTP operational and performance data collected per above to validate and if necessary, calibrate the City's WWTP BioWIN and State Point models (WEF No. FD-08), and then use those models to update the information provided in the 2021 West Yost Technical Memorandum and to characterize plant performance at flows of Max Month Wet Weather, Peak Day and Peak hour. In particular, the City shall collect data necessary to validate the BioWIN model's default input parameters, including those for which no details were previously provided as noted in FT 3 of the 2021 West Yost Technical Memorandum, and shall monitor SVI to validate the assumption made in the State Point analysis.

d. Based upon the results of the above, apply sound engineering judgement to identify the following WWTP capacities, consistent with ODEQ Guidelines for Making Wet Weather and Peak Flow Projections for Sewage Treatment in Western Oregon, based upon the criteria of the WWTP's ability to remain in full compliance with its current NPDES permit:

   i. Peak Instantaneous
   ii. Peak Daily

   Capacities may include the use of equalization to manage brief flow peaks; however, consideration of such use must assume operational strategy(s) that can actually be implemented.

10. **Treatment WWTP Capacity Evaluation Report**– The City shall submit to EPA and ODEQ by September 30, 2023, for review and approval, a report that describes and fully documents its completion of the tasks described in Paragraph 9 of this Appendix, and seeks EPA and ODEQ approval of a CAP Limit. This report shall at a minimum include the following:

    a. A detailed description of the Hydraulic Capacity Assessment carried out and its results. All as-built drawings, the hydraulic profile, and all calculations carried out shall be provided as attachments.
    b. A tabular summary of City design criteria, selected industry guideline used.
    c. A detailed description of each baseline and peak testing event, and a summary of all the flow and monitoring data collected during each event. For each event in which there is dye testing, a discussion of the results of that testing including the effluent dye concentration curve, shall be provided. All raw data and event operational logs/notes shall be included as attachments.
    d. A detailed description of the BioWIN and Clarifier State Point models calibration, and a discussion of the impact of those calibrations on the model predictions of the WWTP's peak capacities. The detailed model inputs and outputs shall be provided as attachments.
    e. A detailed description of how the City utilized the results of the evaluations required by this section to determine the Sandy WWTP peak capacities. The report shall fully document the bases of the City's determinations.
    f. A description of any bypass events or compliance issues at the WTTP that occurred between Consent Decree signing and the Report, and any remedial actions taken.
    g. A CAP Limit which will be calculated as follows:
        i. Peak Daily capacity of the upgraded WWTP (as established by the Stress Test, in MGD) minus the peak flow rate in the 5-year/24 hour storm (as simulated by the Model, in MGD) = Available Capacity in MGD.
        ii. The CAP Limit in ERUs will be equal to Available Capacity in MGD multiplied by 1000. (CAP Limit = [Available Capacity in MGD x 1000])

EPA and ODEQ will respond to the request for approval and/or provide comments on the WWTP Treatment Capacity Evaluation Report within 45 Days of receipt in accordance with Paragraphs 24-29 of the Consent Decree. Upon approval of the report by EPA and ODEQ, the CAP Limit will be deemed established.

SEEKING TO AMEND THE CAP LIMIT

11. The City may seek to amend the CAP Limit at any time by submitting to EPA and ODEQ for review and approval a report providing evidence that capacity has been expanded in the CSTW, such as a CCE, and that there is information sufficient to determine and demonstrate a new CAP Limit can be set without future NPDES permit violations occurring, and setting forth the proposed new CAP Limit. EPA and ODEQ will make best efforts to respond in writing to approve and/or provide comments or request new information within 45 days of receipt in accordance Paragraphs 24-29 of the Consent Decree. Upon approval of the report by EPA and ODEQ, the CAP Limit will be deemed amended.

EXEMPTION FOR ESSENTIAL SERVICES

12. The City may authorize a new sewer service connection or authorize changes to existing connections that result in additional flows, even if it cannot certify that it has adequate treatment, transmission, or collection capacity, for the following:

    a. essential services such as health care facilities, public safety facilities, public schools, and, subject to EPA/ODEQ review and approval, government and other public facilities; and

    b. cases where a pollution or health or safety condition exists, including failed septic systems.

    Any new sewer service connections, or changes to existing connections that result in additional flows, for essential services will count toward the CAP Limit in Period Two, and shall be included in quarterly reporting.

QUARTERLY REPORTING

13. The City shall submit quarterly reports of new sewer connections or changes to existing connections that result in additional flows, including the number of ERUs and how they were calculated, to EPA and ODEQ.

CONNECTION-SPECIFIC CAPACITY EVALUATIONS (CSCEs)

14. For any developments, industrial or residential, which will result in connections above 50 ERUs, the City shall conduct a connection specific capacity evaluation to ensure capacity exists in the WCTS. Capacity to collect and convey at and below the point of connection shall be evaluated for the 5-year event using the Collection System Model.

EQUIVALENT RESIDENTIAL UNIT (ERU)

15. For the purposes of the Capacity Assurance Plan, an ERU shall be assumed to generate a peak flow of 1,000 gallons per day.[2] For the purposes of assigning ERUs to each connection to the WCTS, the following assumptions shall be used:

Type of Use/Facility	ERUs
Single-family (incl. manufactured homes, and townhomes with three or more bedrooms)	1
Duplex (incl. manufactured homes)	2
Triplex (incl. manufactured homes)	3
Multi-family (4 or more units)	0.7 per household unit

[2] Based in part on the Sandy Code of Ordinances, Section 13.16.020 for average flow ERU assignment. Peak flow for residential facilities is assumed to be 4.0 times average flow as per Figure 1, Recommended Standards for Wastewater Facilities; Policies for the Design, Review, and Approval of Plans and Specifications for Wastewater Collection and Treatment Facilities 2014 Edition; A Report of the Wastewater Committee of the Great Lakes - Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers Member States. Other peaking factors assigned based on expected flow variation patterns.

Accessory Dwelling Unit ("ADU")	0.7
Room & Board Facilities	1 per 3 tenant rooms
Hotel/motel	1 per 3 rental rooms
Restaurants	1 per 8 seats
Tavern/lounges	1 per 15 seats
Food cart(s)	0.1 per cart
Hospitals/similar care facilities	1 per 3 beds
Auto service stations	1 per 6 pumps
Car washes	1 per 330 gpd predicted daily flow
Theaters and meeting venues	1 per 330 seats
Churches	1 per 260 seats
Laundromats	1 per 4 washers
Bakeries	1 per 6 employees
Mortuaries (without residence)	1 per 12 employees
Schools without showers	1 per 80 students
Schools with Showers	1 per 40 students
Colleges without residential facilities	1 per 40 students
Dormitories	1 per 6 two-person rooms
Offices	1 per 2,0000 square feet
Retail	1 per 12,000 square feet

Other Commercial	1 per 333 gpd predicted flow

16. Industrial users and high-volume/high-strength dischargers (collectively, IUs) shall be assigned ERUs based upon predicted wastewater flow volume, patterns and strength as follows:

    Assigned Flow ERUs = Higher of average or peak flow ERU value, where:

    - Average flow ERUs = Predicted average facility discharge volume, gpd ÷ 250 gpd
    - Peak flow ERUs = Predicted daily peak flow rate, gpd ÷ 1,000 gpd

    If the IUs' waste is expected to have strength characteristics different than typical sanitary sewage, the impact of its wastewater on the WWTP shall also be evaluated based upon the expected average and maximum monthly loadings of BOD5 and maximum day loadings of TSS on the aeration basins and the final clarifiers following the addition of the proposed IU connection, as compared to the benchmarks identified in accordance with Paragraph 9.a**.** of this Appendix.

    This evaluation shall at a minimum consider: i) aeration basin organic loading (pounds BOD5 per day per 1000 cubic feet of aeration basin capacity), aeration basin F/M ratio (pounds BOD5 per day per pound MLVSS), both at Maximum Monthly conditions; and ii) secondary clarifier peak hourly surface overflow rate (in gallons per day per square foot of clarifier surface area).

17. References

    "Orange Book" refers to the Criteria for Sewage Works Design manual, publication number 98-37 (revised January 2022), Department of Ecology, State of Washington.

    "WEF No. FD-08" refers to Clarifier Design: WEF Manual of Practice No FD-08.

    "Metcalf & Eddy" refers to Wastewater Engineering: Treatment and Resource Recovery, Metcalf & Eddy, 5th Edition.

    "2021 West Yost Technical Memorandum" refer to the February 22, 2021 West Yost Technical Memorandum, Sandy WWTP Secondary Process Evaluation

APPENDIX E

AMENDED WASTEWATER SYSTEM FACILITIES PLAN REQUIREMENTS

1. In compliance with Paragraph 22 of the Consent Decree, an Amended Wastewater System Facilities Plan, consistent with the guidelines "Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities," and the requirements of the State Revolving Fund, shall be submitted for review and approval to EPA and ODEQ. The Amended Wastewater System Facilities Plan shall propose alternatives to bring the City into compliance, and ensure continued compliance, with the terms and conditions of the Permit. A schedule for completion of CSTW improvements shall be included in the Plan. The Amended Wastewater System Facilities Plan shall comply with the requirements of this Appendix.
2. The Amended Wastewater System Facilities Plan shall include an evaluation of the capacity increases that have been achieved in the CSTW thus far, either through plant improvements (based on performance during wet weather events that have occurred in 2022) or infiltration and inflow ("I&I") reductions, and how they compare to the results anticipated in the 2019 Facilities Plan and 2021 WWTP Preliminary Design Report. This evaluation shall include a review and evaluation of data collected from the completed I&I reduction work in the Basins, to determine if the type and extent of work carried out there achieved the anticipated/desired level of I&I reductions.
3. Wet season rainfall and flow monitoring program – The City shall carry out a wet season (November 1 to April 30) rainfall and flow monitoring program to collect the data necessary to support validation or as necessary recalibration of its Collection System Model in accordance with CIWEM 2017. Monitoring shall consist of the following:
    a. Rainfall monitoring – The City shall install and operate a minimum of 3 automatic recording/telemetered rainfall gauges. Such gauges shall be capable of measuring 0.01 inches of rainfall and shall be distributed to characterize local rainfall patterns. The rainfall gauges shall be installed in locations throughout the system to provide representative rainfall data, and operated, and maintained in accordance with the gauge manufacturers' recommendations.
    b. Flow Monitoring – The City shall install and operate a network of flow monitors and level sensors to facilitate its evaluation of the effectiveness of its Rainfall

Derived Infiltration and Inflow ("RDII") reduction efforts and to support the development, validation, and recalibration of its Collection System Model.

i. Flow monitors shall be telemetered Area/Velocity ("A/V") meters capable of the following: Consistently providing accurate and reliable monitoring data. At a minimum, velocity, depth, and flow shall be accurately measured and recorded, under both open channel and surcharged conditions, and shall be recorded in at most 5-minute intervals. The equipment must allow the collection of data remotely via cellular telemetry.

ii. Level sensors shall also be telemetered.

iii. Both A/V meters and level sensors shall be capable of measuring surcharge depths above the pipe invert to the manhole rim.

iv. Flow meters and level sensors shall be installed in locations throughout the system to provide representative flow data and to monitor each individual sewer basin's flow rates as well as to support successful model development, calibration, and validation.

v. Flow meters shall be operated, and maintained in accordance with manufacturer recommendations.

c. Data QA/QC – The City shall implement QA/QC practices, consistent with industry standards in Section 3 of CIWEM 2017 and the WRc Guide to Short Term Flow Surveys in Sewers (1987), including weekly data reviews, consistent data qualification procedures and consistent and complete QC documentation protocols.

d. Data collection will be considered sufficient for proceeding with Collection System Modeling if the following conditions are met:

i. Flow monitoring and rainfall collection must continue through at least February 28, 2023.

ii. Flow and rainfall observations are recorded, reviewed, deemed acceptable quality, and 95% complete during at least one or both of the following:

1. At least one storm with 72-hour rainfall in exceedance of the 1.17-year storm (2.75 inches in 72 hours), AND at least 2 other storms with 2.0 inches in 72 hours (1.08-year frequency); or
2. Plant flows exceed flows of 6 MGD at least once, and exceed 4 MGD at least two times.

4. Collection System Model Development/Validation/Recalibration – The City shall develop and maintain a calibrated hydrologic/hydraulic model of its WCTS ("the Collection System Model") to establish existing system wet weather response and hydraulic conditions and limitations and to support implementation of the CAP. The Collection System Model shall be configured, calibrated, and verified in accordance with current good industry practice, as per CIWEM 2017, and shall:
    a. Accurately predict the hydrologic response of each Basin to an appropriate range of wet weather events by each of the City's ten individual sewer basins. At a minimum, the following precipitation events shall be considered:
        1. OR 5-year 24 hour storm
        2. OR 5-year 6 hour storm with Atlas 14 first quartile distribution
    ii. Accurately predict flow rate and hydraulic grade line ("HGL") of wastewater in all portions of the collection system explicitly represented in the Collection System Model in storm events including those listed above in Paragraph 4.a.;
    iii. Accurately predict surcharge and releases (e.g., Sanitary Sewer Overflows) in all portions of the collection system explicitly represented in the Collection System Model;
    iv. Utilize dynamic wave routing, including representative simulation of downstream backwater impacts on upstream flows and HGLs; and
    v. Support accurate analysis of alternative measures for addressing capacity limitations.
    b. Collection System Model configuration/calibration/verification
        i. The Collection System Model shall be configured based upon accurate hydrologic and collection system attribute information, including that

taken from as-built drawings and as necessary, acquired through field survey activity.

ii. Dry weather and wet weather calibration shall be carried out using the validated data collected in the monitoring program described in Paragraph 3 above. Calibration shall be carried out in accordance with current good industry practice and the criteria presented in Table 5-1 from the CIWEM 2017. In particular, the following wet weather calibration criteria will be applied:

Table 5-1 Storm Verification Targets

Parameter	General	Critical Locations	Comments
Shape	Good match (NSEC if used >0.5)	Good match (NSEC if used >0.5)	An evaluation technique may be used to compare the shape such as the Nash-Sutcliffe Efficiency Co-efficient (NSEC) method together with a visual check. More information on this approach is included in **Appendix G**
Time of peaks and troughs	±0.5 hour	±0.5 hour	The timing of the peaks and troughs should be similar having regard to the duration of the event
Peak depth (un-surcharged)	±0.1m or ±10% whichever is greater	±0.1m	
Peak depth (surcharged)	+0.5m to – 0.1m	±0.1m	Relaxation may be appropriate in deep sewers. Where coupled 1D-2D models are used the 'critical locations' criteria should apply
Peak flow	+ 25% to -15%	±10%	
Flow volume	+20% to -10%	±10%	Excluding poor / missing data

iii. Collection System Model documentation: Fully document configuration, attribute data, initial and final calibration parameters, and calibration performance. Last to include 45-degree scatterplots of individual event peak flow rate and peak depth and total volume for each calibration point.

5. The City shall provide a report to EPA and ODEQ that describes in detail rainfall monitoring, flow monitoring, Collection System Model development and the calibration process, and that at a minimum includes:

a. Rainfall monitoring – The report shall describe the location and type of each rain gauge employed to collect rainfall data during the monitoring period. The

methodology used to review and qualify rainfall data shall be described, data excluded from use due to quality issues identified, and the results of the data review shall be summarized in a chart like the attached Example 1. Both raw and edited rainfall data shall be provided in a spreadsheet as attachments.

b. Flow monitoring - The report shall describe the location and type of each flow monitoring installation used to collect flow and HGL data during the monitoring period. The methodology used to review and qualify depth and velocity data shall be described, data issues at each meter location discussed, data excluded from use due to quality issues identified, and the results of the data review shall be summarized in a chart like the attached Example 1. Site installation sheets and scatterplots of all dry and wet weather data shall be provided as an attachment.

c. Collection System Model software – The report shall identify all software (including versions) utilized, and if not widely utilized within the industry for collection system modeling, shall provide information regarding the capabilities and limitations of that software.

d. Collection System Model configuration – The report shall describe how all hydrologic processes are represented in the model and shall provide as appendices all initial and final hydrologic parameters. The report shall also describe and illustrate with map(s) and/or schematics, all portions of the system explicitly included in the hydraulic model and shall include as appendices all attribute data input to the model.

e. Collection System Model calibration and verification – The report shall describe in detail the dry and wet weather calibration processes and rainfall/flow monitoring data utilized, the calibration criteria employed (as per the CIWEM 2017) and the calibration results achieved. The report shall provide:

    i. A discussion of the overall calibration achieved, limitations of the model and recommendations for future model refinement;

    ii. Specifically identify each dry weather and wet weather calibration or verification period and shall describe why each such period was selected;

    iii. Summary tables of calibration and verification peak flow, peak depth, and total event volume model-to-meter statistics;

iv. For each calibration location/meter -45-degree calibration/verification peak flow, peak depth, and total event volume scatterplots; and

v. For each calibration location/meter, calibration/verification meter-to-model comparative hydrographs.

6. Comprehensive Capacity Evaluation. As part of the Amended Wastewater System Facilities Plan, the City shall conduct a Comprehensive Capacity Evaluation ("CCE"). The CCE shall be carried out to evaluate and document the then-current peak wet weather capacity of the Sandy collection system and the peak wet weather and longer-term capacities of the Sandy wastewater treatment plant. This will be achieved by a combination of monitoring, modeling, and engineering analyses as described in detail below:

   a. The CCE shall, at a minimum, consist of the following activities:

      i. Wet season rainfall and flow monitoring program in Paragraph 3 of this Appendix;

      ii. Collection System Model Validation/Recalibration in Paragraph 4 of this Appendix;

      iii. Collection System Model Capacity Evaluation. The City shall carry out a series of simulations to identify any portions of the collection system with inadequate conveyance capacity. For this evaluation, inadequate capacity will be any sewer predicted to surcharge to within 3-feet of the ground surface or would be expected to result in a backup to private property based on expected lowest fixture elevations. This evaluation shall consist of two steps:

         a. First, the City shall use the model to simulate the performance of the existing system during the OR 5-year Storm and shall identify any portions of the collection system with inadequate conveyance capacity. If any such portions are identified, those portions shall be deemed to have no additional capacity for new connections until measures are completed to increase that capacity.

         b. The City shall then simulate increased base flow in the portions of the interceptors and main trunk sewers with adequate conveyance capacity

to identify how much additional flow is required to reach inadequate conveyance capacity conditions in that same OR 5-year storm event. The City shall identify the additional baseflow capacity in gallons per day rate for each interceptor and main trunk sewer and provide that information on a sewer map.

iv. Collection System Record Review and Evaluation. The City shall carry out a review of the last three years of its collection system complaints and maintenance records, to identify all instances of capacity-related overflow or private property backup. For each such instance identified, the City shall provide an evaluation of how the responsible precipitation event compared to the OR 5-year event.

v. Treatment Plant Capacity Evaluation in Paragraph 9 of Appendix D;

vi. Integrated WCTS and WWTP Evaluation and Identification of Currently Available Capacity

a. The City shall utilize the results of the evaluations and analyses described in subparagraphs i-v above, to identify the available additional baseflow capacity for the WWTP and for each portion of the specified interceptors and main trunk sewers.

7. Subsequent CCEs shall be carried out and Reports submitted following the completion of significant collection system or WWTP projects implemented by the City to address specific capacity limitations and to support the submission of requests by the City for increase in the CAP connection limitation(s).

8. Permit Compliance. The Amended Wastewater System Facilities Plan shall include an evaluation of the City's expected compliance with the Permit, including Capacity Related Violations, to be conducted for both current conditions and with anticipated growth over the next 10 years.

9. The Amended Wastewater System Facilities Plan shall include a set of improvements identified as "Continued Compliance Improvements." "Continued Compliance Improvements" shall mean improvements which when completed, and permitted, will allow for sufficient capacity to collect, treat, and discharge to meet permit requirements,

including discharge limitations during peak flow, for at least ten years, including expected population growth through the tenth year.

10. Alternatives. Utilizing all of the above information, as well as data on predicted population growth over the next 20 years, the City shall conduct an evaluation of all viable alternative measures to improve capacity in the WCTS and WWTP, including both short-term and long-term improvements to address increased flow, to ensure compliance with the terms and conditions of the Permit, and shall at a minimum include consideration of the following measures:

    (1) Expansion of current tertiary treatment configurations (additional aeration basin, clarifier), and tertiary filtration;

    (2) Converting the existing plant to a Membrane BioReactor System ("MBR");

    (3) Hybrid installation of an MBR train at the existing plant, and conversion of the existing aeration basin, secondary clarifier and tertiary filtration train to wet weather operation only;

    (4) Pumping wastewater to adjacent treatment facility;

    (5) Detention in a new pump station and equalization basin, or within the existing collection system by limited surcharging;

    (6) Satellite MBR concept.

    (7) Any other temporary or permanent measures the City wishes to consider.

11. References

"CIWEM 2017" refers to

CIWEM Chartered Institution of Water and Environmental Management
Urban Drainage Group

Code of Practice for the Hydraulic Modelling of Urban Drainage Systems 2017.

www.ciwem.org/groups/udg

ATTACHMENT 3. Developments for which land use applications were submitted prior to October 3, 2022

Project Name	Dwelling Count	ERUs	Land Use	Status
Barlow Trail Veterinary Clinic	N/A	1	veterinary clinic	land use review occuring
Cascade Creek (apartments)	78	54.6	apartments	land use review occuring
Cascade Creek (commercial)	N/A	4	commercial use	land use review occuring
Cedar Creek Heights	134	134	duplex units & single-family	subdivision construction occuring
Bull Run Terrace (duplexes)	8	8	duplex units	tentative plat approved
Bull Run Terrace (apartments)	192	134.4	apartments	tentative plat approved
Bull Run Terrace (commercial)	N/A	3	commercial use	tentative plat approved
Idleman Park Subdivision	6	6	duplex units	plat recorded
Jewelberry Meadows	15	15	single-family	plat recorded
Mairin's Viewpoint	2	2	single-family	plat recorded
Next Adventure Expansion	N/A	1	retail business	design review approved
Pioneer Meadows	10	10	duplex units	plat recorded
Sandy Plaza Apartments	18	12.6	apartments	site utilities being installed
Salmon Creek Estates	3	3	single-family	plat recorded
Sandy Woods Phase II	43	43	single-family	tentative plat approved
Snowberry Subdivision	5	5	single-family	plat recorded
State Streets Homes (apartments)	42	29.4	apartments	design review approved
State Streets Homes (commercial)	N/A	1	self storage	design review approved
Stefenee Court House	1	1	single-family	permit ready to issue
Ten Eyck Rim	16	16	duplex units	plat recorded
The Bornstedt Views	43	43	single-family	tentative plat approved
The Pad Townhomes	10	7	apartments	design review approved
The Riffles Food Cart Facility	N/A	2	food cart dining facility	design review approved
Tickle Creek Village	67	46.9	apartments	site utilities being installed
Trimble PD	10	10	duplex units	plat recorded
TOTALS	703	**592.9**		

Staff Report

Meeting Date:	June 20, 2023
From	Kelly O'Neill Jr., Development Services Director
SUBJECT:	23-011 CPA - Transportation System Plan (TSP) City Council Adoption

PURPOSE / OBJECTIVE:
This hearing is intended for the City Council to consider approving adoption of the Transportation System Plan (TSP). The hearing will include a review the draft TSP with the consultant team and opportunities for comments and questions from the City Council and the public.

BACKGROUND / CONTEXT:
The City of Sandy has been undergoing a planning process to comprehensively update the TSP. Project objectives included determining which projects, policies, and programs are important to protecting and enhancing the quality of life in Sandy and how to fund prioritized projects over the next 20 years. The current TSP was adopted in 2011. The proposed 2023 TSP will replace the 2011 TSP and once adopted will become the transportation element of the City's Comprehensive Plan. The TSP embodies the community's vision for an efficient, safe, and diverse transportation system. The TSP balances the needs of walking, bicycling, driving, transit, and freight by including strategies and projects that are important for protecting and enhancing the quality of life in Sandy through the next 20 years. The TSP is a collection of current inventory, future forecasts, past and current project ideas, decisions, and standards housed in a single document.

By setting priorities for available and anticipated funds in the 20- year planning period, the TSP provides a foundation for budgeting, grant writing, and requiring public improvements with private development. It also identifies and advocates for the projects and services that the City would like to implement but cannot reasonably expect to fund during the next 20 years.

This plan is intended to serve areas within the Sandy urban growth boundary. Areas outside of the urban growth boundary are served by the Clackamas County TSP.

The TSP was led by a project team that included City staff members and the consultant team. The project team worked closely with a Community Advisory Committee (CAC) comprised of local partners to develop and review interim work products and address major issues collaboratively. Two online and one in-person public open house events were conducted during the development of the TSP to solicit additional community feedback.

The draft TSP has been discussed with Planning Commission and City Council at three separate work sessions. A Planning Commission hearing was held to consider adoption of the TSP as well. Each work session and the Planning Commission hearing is summarized below.

The first City Council and Planning Commission work session was held in December 2021. This work session included information on the Sandy Bypass Feasibility Study and early TSP findings.
Staff Report: December 2021 staff report
Video: December 2021 meeting video

The second City Council and Planning Commission work session was held in November 2022. This work session presented the draft TSP project list and priorities for future funding.
Staff Report: November 2022 staff report
Video: November 2022 meeting video

The third City Council and Planning Commission work session was held in April 2023. This work session presented updates and additions to the financially constrained project list, updates to typical street cross sections, and proposed amendments to the Sandy Municipal Code.
Staff Report: April 2023 staff report
Video: April 2023 meeting video

The Planning Commission hearing was held in May 2023. The hearing included a review of the draft TSP and time for staff and the consultants to discuss any questions or comments from the Planning Commission and the public. The Planning Commission recommended that City Council approve adoption of the draft TSP with some edits, which are discussed in this staff report.
Staff Report: May 2023 Planning Commission hearing staff report
Video: May 2023 Planning Commission hearing video

KEY CONSIDERATIONS / ANALYSIS:

Package 1 TSP Projects

The TSP process identified over 133 projects, totaling an estimated $710 million. Most of the identified projects are unlikely to secure funding in the TSP planning horizon (before 2040). Therefore, the TSP organizes projects into two “packages” based on priority and available funding. Package 1 projects are financially constrained, meaning the estimated total of $10.8 million among these projects can likely be funded by the City by 2040. Package 2 projects are considered “aspirational” and are less likely to secure funding by 2040. There are a total of 29 Package 1 projects. Package 1 projects are defined in Table 3 of Exhibit A.

TSP Edits

Clackamas County and the Planning Commission each provided a brief list of edits to incorporate into the final adoption draft of the TSP. The edits have been added to the current draft of the TSP. The edits from the County and Planning Commission are summarized below.

Clackamas County edits:

- Add text on page 22 – Note that as the City of Sandy grows, it is anticipated that the City and County will coordinate regarding jurisdictional transfer of roadways as appropriate.
- Add text on page 22 – Acknowledge Figure 8 Motor Vehicle Projects includes future projects located outside the current city limits and UGB and clarify that these projects would only occur with a UGB expansion and city annexation.
- Add text on page 14 - Acknowledge the partnership with Mt Hood Express, providing an important connection to Timberline Lodge.
- Add text on page 65 to recreation congestion discussion - Mention the work of Vision Around the Mountain to coordinate transit investments in the corridor.

Planning Commission edits:

- Make sure Cedar Ridge Middle School (CRMS) and Sandy Grade School (SGS) are defined.
- Ensure other acronyms are defined.
- Add local street connectivity map.
- Update maps to have consistent legend for the UGB and city limits.

Next Steps

This is the second adoption hearing being held for the draft TSP. The TSP related Code amendments will be combined with the Clear and Objective Code Audit project that is already in process and presented as a package later in 2023. The adoption of these code amendments will be completed separately from the TSP adoption.

In coordination with the TSP update project, DKS Associates is also working with the FCS Group to update the Sandy Transportation System Development Charges (SDCs) in anticipation of needed fee increases. The updates to the SDCs are already ongoing and it is anticipated proposed changes will be brought forward for City Council review sometime in 2023.

RECOMMENDATION:

The Planning Commission and City staff recommend that City Council approve adoption of the 2023 Sandy Transportation System Plan.

BUDGETARY IMPACT:

None at this time.

LIST OF ATTACHMENTS/EXHIBITS:

- Ordinance No. 2023-24

    - Exhibit A. Transportation System Plan (TSP)
    - Exhibit B. Transportation System Plan Appendix
    - Exhibit C. Findings for Ordinance No. 2023-24
- ODOT Comment Letter

NO. 2023-24

AN ORDINANCE ADOPTING THE 2023 CITY OF SANDY TRANSPORTATION SYSTEM PLAN

Whereas, Oregon statutes and administrative rules require every municipality to enact a Comprehensive Plan and land use regulations in conformance with Statewide Planning Goals and Guidelines, and coordinated with other affected units of government;

Whereas, Statewide Planning Goal 12 requires cities, counties, metropolitan planning organizations, and the Oregon Department of Transportation (ODOT) to provide and encourage a "safe, convenient and economic transportation system." This is accomplished through development of transportation system plans based on inventories of local, regional and state transportation needs. Goal 12 is implemented through OAR 660, Division 12, also known as the Transportation Planning Rule (TPR). The TPR contains numerous requirements governing transportation planning and project development;

Whereas, the Oregon Transportation Plan (OTP) is the State's long-range, multimodal transportation plan and is the overarching policy document for a series of modal and topic plans with which a local TSP must be consistent;

Whereas, the City of Sandy last adopted a Transportation System Plan (TSP) in 2011 and that document is out of date and no longer provides good guidance;

Whereas, upon setting out to update the TSP, the City of Sandy formed a Community Advisory Committee (CAC) composed of representatives from the Sandy City Council and Planning Commission, ODOT, Clackamas County, Sandy Area Metro (SAM), Sandy Fire District, Sandy Chamber of Commerce and neighborhoods. The CAC met on three occasions to review and provide input on the technical memoranda, recommendations, and proposed TSP updates;

Whereas, during the course of developing the draft TSP there were three public open houses held to gather community input regarding transportation goals, concerns and needs related to multimodal transportation options, and community priorities for future investments;

Whereas, the notice of the first public hearing on the draft TSP was sent to the Oregon Department of Land Conservation and Development on April 12, 2023;

Whereas, the Sandy Planning Commission held a public hearing on May 22, 2023, and recommended adoption of the TSP to the City Council;

Whereas, the City Council held a public hearing to review the TSP on June 20, 2023, and adopted the TSP.

NOW, THEREFORE, THE CITY OF SANDY ORDAINS AS FOLLOWS:

Section 1. The 2023 Sandy TSP is the transportation element of the City of Sandy Comprehensive Plan. The 2023 TSP is attached to this ordinance as Exhibit A and incorporated by reference. The 2023 TSP replaces and supersedes any previously adopted TSP.

Section 2. Adoption of the 2023 TSP is supported by an appendix, attached as Exhibit B and incorporated by reference.

Section 3. Adoption of the 2023 TSP is supported by findings, attached as Exhibit C and incorporated by reference.

This ordinance is adopted by the Common Council of the City of Sandy and approved by the Mayor this 20 day of June 2023

_____
Stan Pulliam, Mayor

ATTEST:

_____
Jeff Aprati, City Recorder

#2023-24

EXHIBIT A

transportation system plan

may 2023

acknowledgments

project team

City of Sandy
Kelly O'Neill Jr., Development Services Director
Ryan Wood, Public Works Superintendent

Oregon Department of Transportation
Seth Brumley, Contract Manager
Avi Tayar, Traffic Engineer
Neelam Dorman, Planning Manager

DKS Associates
Reah Flisakowski, Project Manager
Dock Rosenthal, Transportation Engineer
Paddy Gilligan, Junior Designer

Angelo Planning Group
Darci Rudzinski, Land Use Planner
Brandon Crawford, Land Use Planner

community advisory committee

The Community Advisory Committee (CAC) guided the development and recommendations of the Transportation System Plan, and included the following members:

Andi Howell	Sandy Transit Director	City of Sandy
Jeff Aprati	Assistant to the City	City of Sandy
Seth Brumley	TGM Grant Manager	ODOT
Jennifer Donnelly	Planner	DLCD
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1 introduction

The City of Sandy is located between Mt. Hood and the Portland metro area. Since the last Transportation System Plan in 2011, the population has grown from 9,500 to 12,911 residents.[1] This equates to annual population growth of approximately 300 people or 3% per year. That growth outpaces Clackamas County, at 1.2 percent per year, and the State of Oregon, at 1.1 percent per year.[2]

This transportation system plan looks ahead to 2040 and will guide the City of Sandy in facilitating a safer and more vibrant transportation system and city. The challenge ahead for city leaders is to address existing system needs identified through this process and to make strategic investments with partner transportation agencies to prepare for additional growth in the decades to come.

[2] Portland State University Population Research Center, July 1, 2022

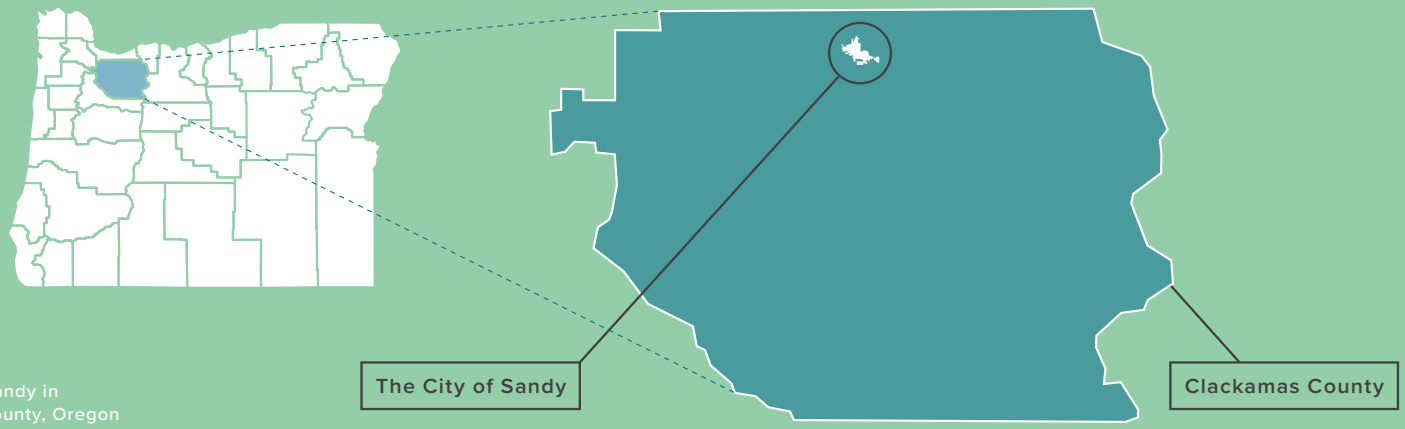


figure 1

Location of Sandy in Clackamas County, Oregon

the challenge

Sandy, similar to many other communities throughout Oregon, faces the challenge of addressing new transportation infrastructure needs without sufficient funding and with escalating maintenance costs. The transportation system serves a variety of users with different and sometimes competing objectives. For example, US 26 accommodates both highway through traffic and local residents, with significant seasonal recreation travel demand in the summer and winter. The future system should provide safe and efficient local connections to allow residents to meet their daily transportation needs. The City must balance its future investments to ensure it can develop and maintain the transportation system adequately to serve the city and everyone who travels in it. To address this challenge, the City has developed this Transportation System Plan (TSP).

the need for planning

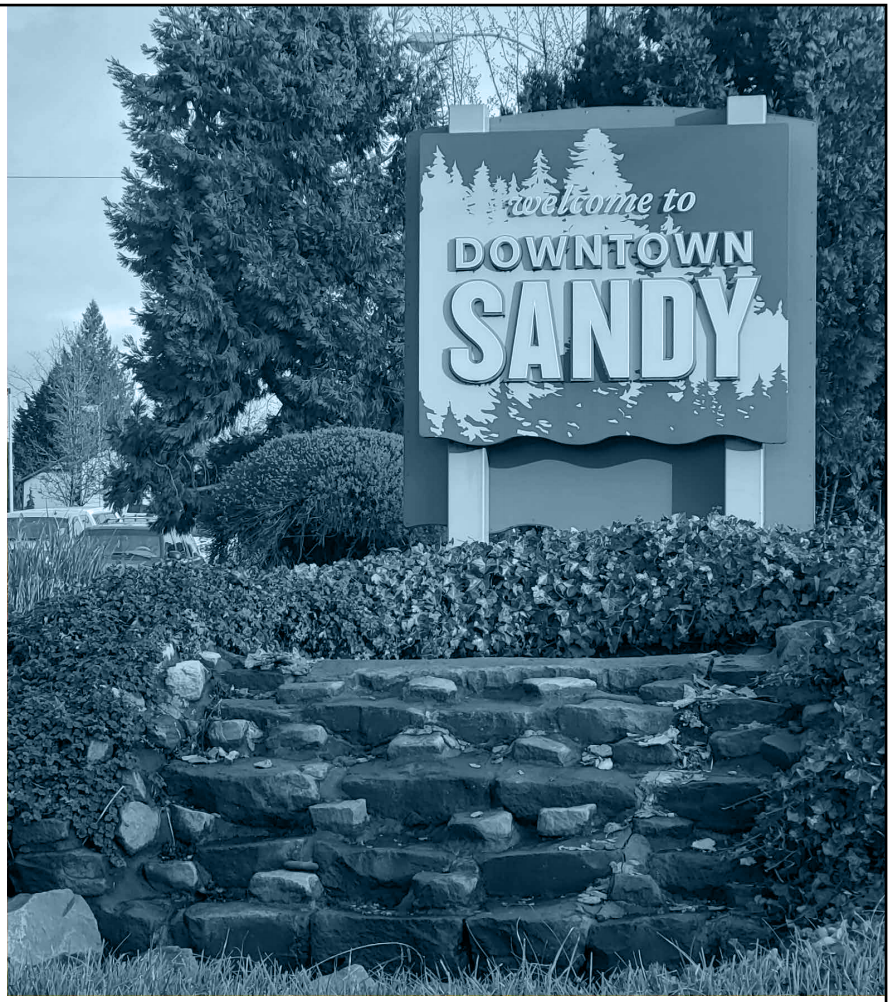
The TSP prepares Sandy for accommodating transportation needs within the planning area in the best manner possible through 2040. The TSP's all encompassing approach allows it to guide the City in developing and maintaining acceptable transportation network performance more holistically and incorporates other more focused plans.

As the transportation element of the city's Comprehensive Plan, the TSP embodies the community's vision for an efficient, safe, and diverse transportation system. The TSP attempts to balance the needs of walking, bicycling, driving, transit, and freight with strategies and projects that are important for protecting and enhancing the quality of life in Sandy through the next 20 years. The TSP is a collection of current inventory, future forecasts, past and current project ideas, decisions, and standards housed in a single document. The City, Clackamas County, private developers, and state (e.g., Oregon Department of Transportation) or federal agencies all have a role in implementing elements of the TSP.

By setting priorities for available and anticipated funds in the 20-year planning period, the TSP provides a foundation for budgeting, grant writing, and requiring public improvements of private development. It also identifies and advocates for the projects and services that the City would like to implement but cannot reasonably expect to fund during the next 20 years.

This plan is intended to serve areas within the Sandy urban growth boundary. Areas outside of the urban growth boundary are served by the Clackamas County TSP.

The State of Oregon requires a TSP to integrate the County's transportation investment plans (including projects along State highways) into the statewide transportation system. The Oregon Department of Transportation (ODOT) looks to local agencies to help identify needed investments along State highways within their planning area. This plan identifies needed investments along US 26 in the TSP planning area.



tsp outreach

The TSP project team, which included City staff members and the consultant team, worked closely with a Community Advisory Committee (CAC) comprised of local partners to develop and review interim work products and address major issues collaboratively. The CAC roster included representatives from Sandy City Council and Planning Commission, Oregon Department of Transportation (ODOT), Clackamas County, Sandy Area Metro, Sandy Fire District, Sandy Chamber of Commerce and neighborhoods. The CAC met three times to review how the system works today, expected changes with growth to 2040, and proposed transportation improvements recommended within Sandy. During each meeting, initial technical findings were presented and discussed with CAC members to collect feedback on draft concepts and to align long-range plans among the various partner agencies.

In addition, two online and one in-person public open house events were conducted during the development of the TSP.

- **Event #1** was an online survey conducted in September and October 2021 to obtain feedback on community concerns and needs related to walking, biking, riding transit, and driving in Sandy.
- **Event #2** was the Future Fest open house in September 2022 to solicit community input to support the Sandy Comprehensive Plan update and transportation goals.
- **Event #3** was an online survey that presented the draft TSP project list to obtain feedback on the community's priorities for future investments.

engaging a diverse community

Participation from community members and organizations in the TSP process was important for the success of the TSP update.
The Sandy TSP is the result of a collaboration among various public agencies, key stakeholders, the community, and the project team of City staff, ODOT, and consultants. Throughout this process, the project team took time to understand multiple points of view, obtain fresh ideas, and encourage broad participation, as it collected and analyzed data and possible solutions. The engagement efforts considered equity by reaching out to potentially affected and/or interested individuals, neighborhoods, businesses, and organizations. The project process is illustrated in **Figure 2**.

The planning process was implemented through a series of technical memoranda that discussed specific topics ranging from goals to existing conditions to funding assumptions to transportation solutions. Public hearings with the Planning Commission and City Council on the Draft TSP led to the adoption of the 2023 Sandy Transportation System Plan.

The project website (www.sandy-speaks.org) is linked to each memorandum, giving the community opportunity to provide feedback. The project website is also linked to all project news, documents, and meeting notices. It allowed residents to comment on the transportation system and identify locations with problems and opportunities for improvement.

The transportation goals developed for the City of Sandy TSP reflect the community-vision for a balanced transportation system. They were used to provide direction for the planning process and evaluation criteria for the selection and prioritization of recommended improvements.

performance based planning elements

The Sandy TSP applied a performance-based approach. As described below, that begins with the community's vision for its transportation system, which is distilled into goals and supporting policies. These goals and policies are then used to develop performance measures that are used to identify gaps and challenges in the system today, to evaluate potential projects, and to measure long-term alignment between Sandy's transportation system and the community's vision of this system. The plan process is illustrated in **Figure 2**, along with the key questions that are considered at each stage of the planning work. The advantage of a performance-based planning process is that it demonstrates how strategic investments directly benefit and address essential community goals regarding multimodal transportation services for all of the community's residents, workers, and visitors.

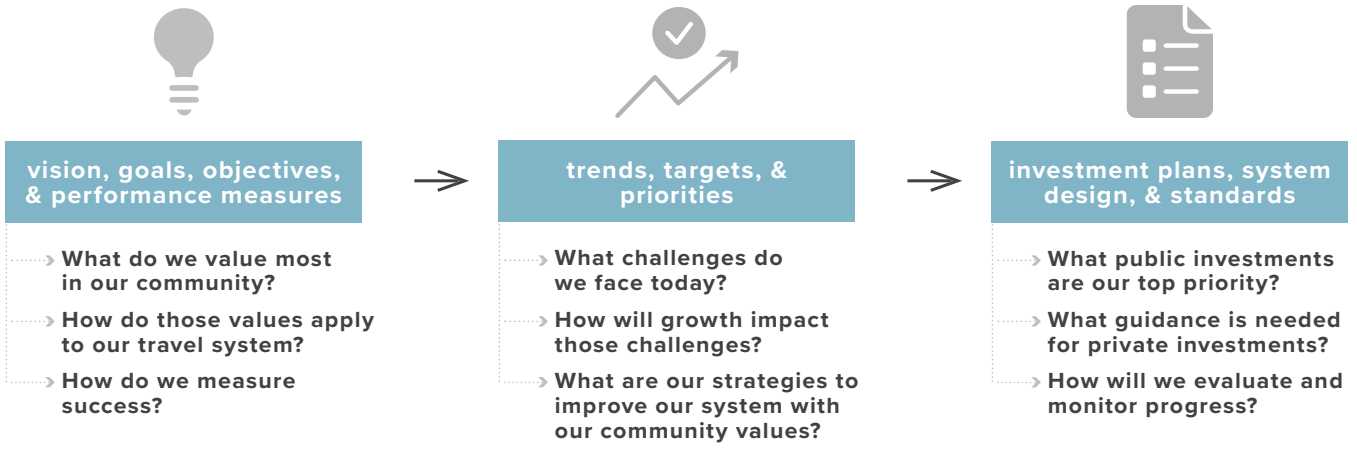


figure 2

Performance Based Planning Process

goals for the transportation system

The nine transportation goals set priorities for transportation solutions and plan implementation.

1. mobility & connectivity

2. capital investments & funding

3. community needs

4. system management

5. environmental

6. transit

7. safety

8. equity

9. health

goals for the transportation system

1. mobility & connectivity

Goal 1: *Provide a transportation system that prioritizes mobility & connectivity for all users.*

- 1.1 Maintain the livability of Sandy through well-connected transportation facilities
- 1.2 Improve the safety and accessibility of transit facilities
- 1.3 Improve vehicular/pedestrian interface along all arterial and collector streets
- 1.4 Ensure sufficient capacity to accommodate future travel demand (transit, bicycle, pedestrian, etc.) to, within, and through the City of Sandy
- 1.5 Emphasize local street connections, in an effort to reduce reliance on US 26 and Hwy 211 for local trips
- 1.6 Minimize access along the City's arterials and consolidate or relocate access points when possible

2. capital investments & funding

Goal 2: *Promote cost effective investments to the transportation system.*

- 2.1 Optimize the use, performance, and value of existing facilities while planning for future infrastructure
- 2.2 Seek opportunities to combine transportation, other infrastructure, and environmental mitigation projects
- 2.3 Maximize the use of state and federal funds for transportation capital, operating, service, and demand improvements
- 2.4 Maintain a capital improvement plan that identifies construction priorities and funding

3. community needs

Goal 3: *Provide a transportation system that supports specific community needs.*

- 3.1 Protect the scenic resources in Sandy
- 3.2 Preserve the historic character of Sandy
- 3.3 Identify gateway and beautification treatments for Hwy 211
- 3.4 Support Mt. Hood Scenic Byway Enhancements
- 3.5 Incorporate the street network and transportation improvements contained within the Bornstedt Village Plan
- 3.6 Identify walking and biking needs in the urban growth boundary expansion area

goals for the transportation system

4. system management

Goal 4: *Promote traffic management to achieve the efficient use of transportation infrastructure.*

- 4.1 Balance local access to US 26 with the need to serve regional and statewide traffic, while supporting adjacent land uses
- 4.2 Plan for a transportation system that supports projected population and employment growth and maximize travel options by providing efficient routes for all modes of transportation
- 4.3 Support Oregon Transportation Commission adoption of an alternate mobility target for US 26 that allows for increased congestion on the highway corridor, especially during peak seasonal and continued planned

5. environmental

Goal 5: *Minimize environmental impacts on natural resources and encourage carbon-neutral or efficient transportation alternatives.*

- 5.1 Avoid or mitigate transportation project impacts to environmental resources including creeks and wetlands, cultural resources, and wildlife corridors
- 5.2 Support energy conservation by supporting public transit, transportation demand management, transportation system management and a multi-modal transportation system
- 5.3 Encourage transportation facility construction methods that reduce environmental impacts
- 5.4 Minimize street cross-sections to protect and preserve open space and reduce impervious surface

6. transit

Goal 6: *Provide safe, efficient, high-quality transit service that gives Sandy residents, employees, employers, and visitors more freedom to meet their needs within the city, region and state. Create a transit system that offers an alternative to private automobile use, supports efficient use of roadways and reduces air pollution and energy use.*

- 6.1 Provide service that is safe, comfortable, and useful to many different kinds of people
- 6.2 Collaborate with other transportation agencies and support user-friendly connections between transit system
- 6.3 Improve accessibility to transit services for people arriving by foot, by bicycle or with a mobility device
- 6.4 Increase public awareness of Sandy Transit (SAM) and its connectivity to other transit systems and transportation modes

goals for the transportation system

7. safety

Goal 7: *Promote a safe transportation system for all users.*

- 7.1 Encourage traffic safety through education, enforcement, and engineering
- 7.2 Identify high accident locations and implement specific counter measures to reduce their occurrence
- 7.3 Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities
- 7.4 Provide transportation design standards that encourage appropriate traffic volumes, speeds, and pedestrian safety
- 7.5 Provide enhanced pedestrians and bicyclists crossings where needed
- 7.6 Improve emergency service response time and evacuation routes through connectivity
- 7.7 Develop street design standards that support emergency service vehicle needs

8. equity

Goal 8: *Support an equitable transportation system and provide transportation choices to all users.*

- 8.1 Ensure the transportation system provides equitable access to underserved, disadvantaged, and vulnerable populations and is easy to use and accommodating to travelers of all ages
- 8.2 Ensure the pedestrian and bike facilities are designed clear of obstacles and obstructions (e.g., utility poles, grates) and meet ADA requirements
- 8.3 Provide multi-faceted and inclusive public engagement process that provides all community members an opportunity to provide input on transportation system decisions

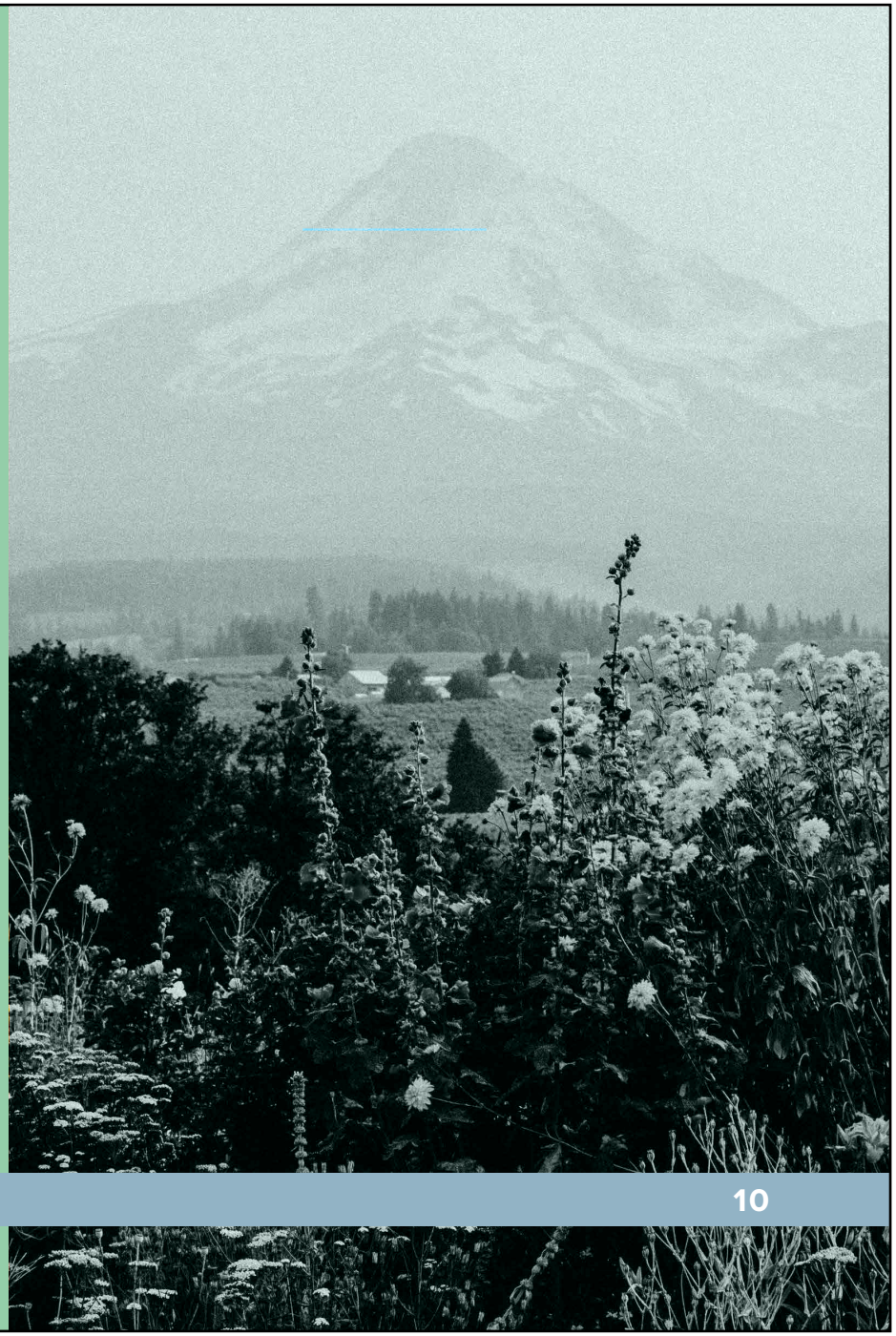
9. health

Goal 9: *Support options for exercise and healthy lifestyles to enhance the quality of life.*

- 9.1 Develop recreational walking and biking routes to access employment, schools, shopping, and transit routes
- 9.2 Provide walking facilities that are physically separated from auto traffic on all arterials and collectors
- 9.3 Apply traffic calming measures to support neighborhood livability

today & tomorrow

Most residents of Sandy today commute to jobs in the Portland metro region with only 12 percent of residents working in Sandy. This commuting trend, coupled with the heavy recreational traffic through Sandy to access the Mt. Hood recreation area, means that US 26 plays an important role in the transportation system that is expected to continue in the future. However, the proportion of residents working in Sandy is increasing, up 3 percent from 2011, and serving those local work trips, along with non-work trips such as shopping and school trips creates an opportunity to increase the walking and biking options within the city.



today & tomorrow

To determine needed investments for the City's transportation system, the project team reviewed current travel conditions and forecasted future growth and travel trends through 2040 (see Appendix Section E). Initial analysis of future travel conditions assumed future travel occurs on the transportation system that exists today. The analysis of current and future travel conditions identified deficiencies that might be addressed by investments in the transportation system.

sandy in 2040

Sandy is home to about 13,000 permanent residents. By 2040 the population of Sandy is expected to increase to 18,800[1] (based on adopted 2.1% AAGR) with additional employment growth as well. With more people and jobs in Sandy and more recreational travel demand to Mt. Hood and Central Oregon, the transportation network will face increasing pressure through 2040.

demographics

The population of Sandy is young with an average age of 34, less than the statewide average of 40. Most residents come from a European ancestry and speak English at home. Spanish is the second most widely spoken language but is only spoken in 5 percent of households.

The average household income in Sandy of $88,775 is higher than the state average of $71,562 and similarly the proportion of the population below the poverty line is lower than the statewide average with approximately 8 percent of households in Sandy below the poverty line compared to 12 percent statewide.

[1]https://www.pdx.edu/population-research/

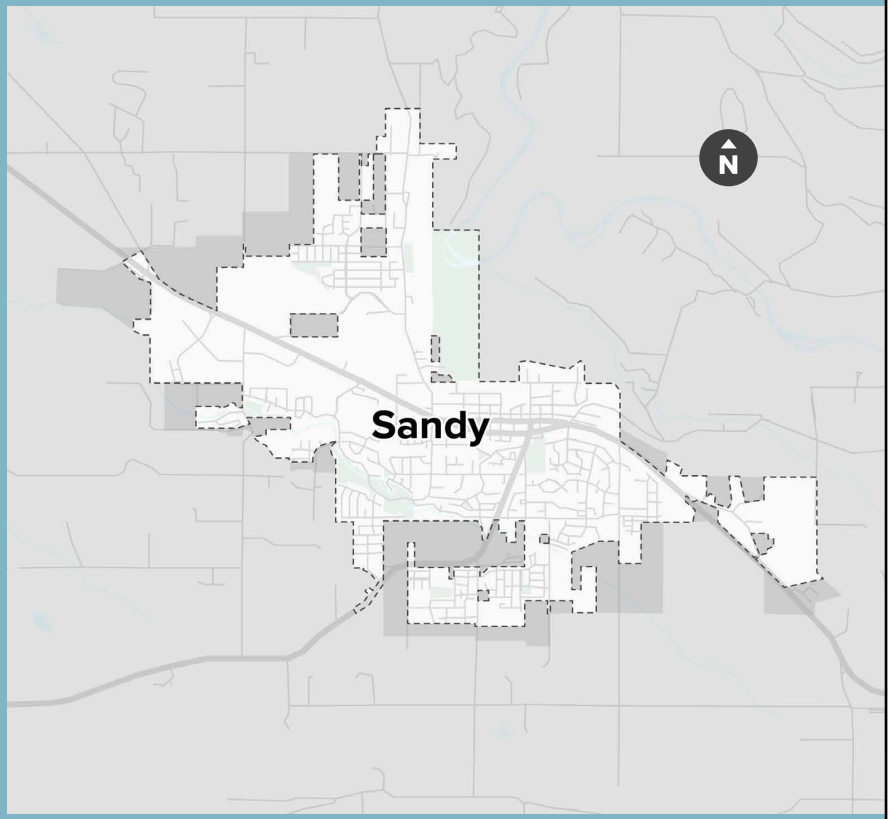


figure 3

Sandy City Limits

demographics

populations & people

Total Population: 12,991[1]

income & poverty

Medium Household Income: $88,775[4]

education

Bachelor's Degree or Higher: 22.8%[7]

employment

Employment Rate: 64.5%[2]

housing

Total Housing Units: 4,697[5]

health

Without Health Care Coverage: 5.7%[8]

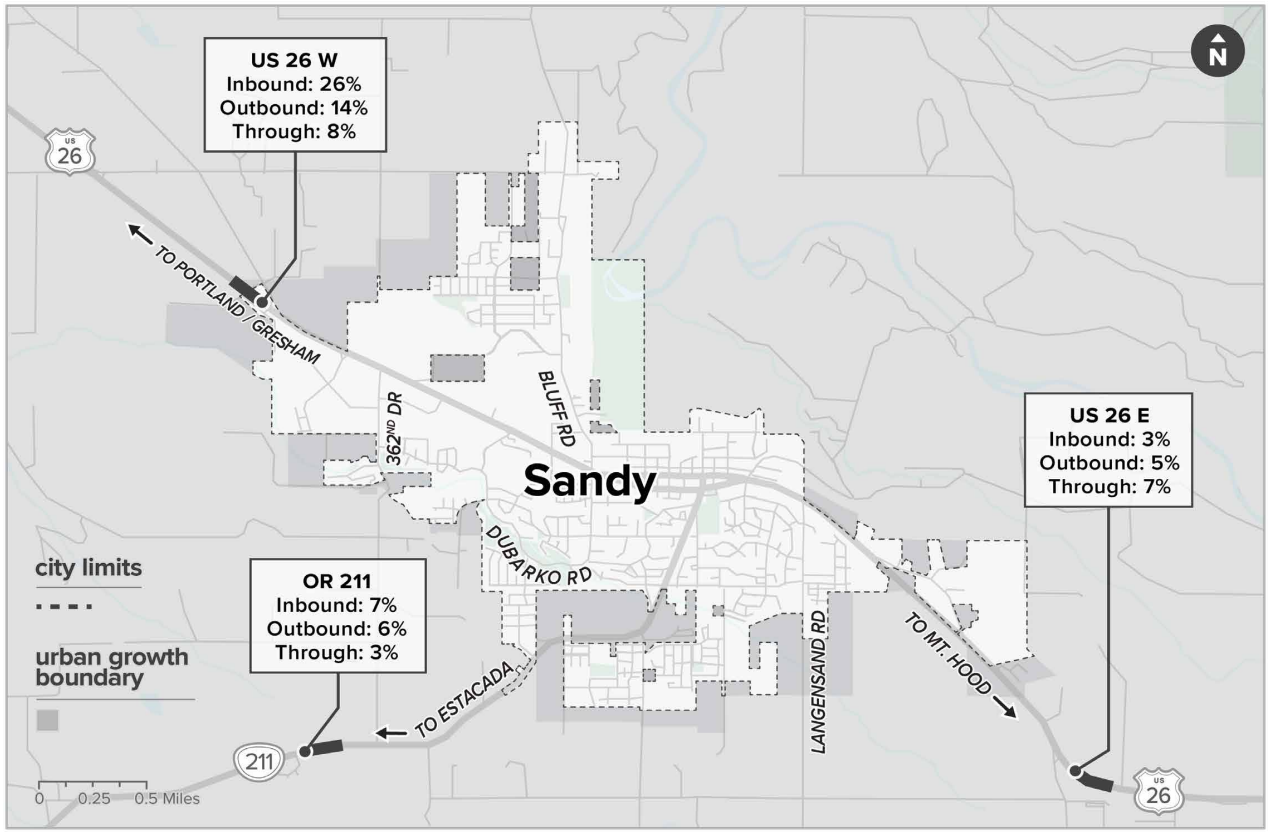
families & living arrangements

Total Households: 4,317[3]

race & ethnicity

Hispanic or Latino (of any race): 1,226[6]

[1] *PORTLAND STATE UNIVERSITY POPULATION RESEARCH CENTER, JULY 2022*
[2] DP03 *2021 AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES*
[3] DP02 *2021 AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES*
[4] S1901 *2021 AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES*
[5] H1 *2021 AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES*
[6] P2 *2020 DECENNIAL CENSUS*
[7] S1501 *2021 AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES*
[8] S2701 *2021 AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES*



Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

figure 4

Sandy Trip Distribution

travel patterns

Inbound trips start outside of Sandy and enter through the labeled gateway. Outbound trips start in Sandy and exit through the labeled gateway. Through trips do not start or stop within Sandy.

Trip Distribution

23%
internal trips

18%
external trips

59%
trips entering or exiting Sandy

local transit system

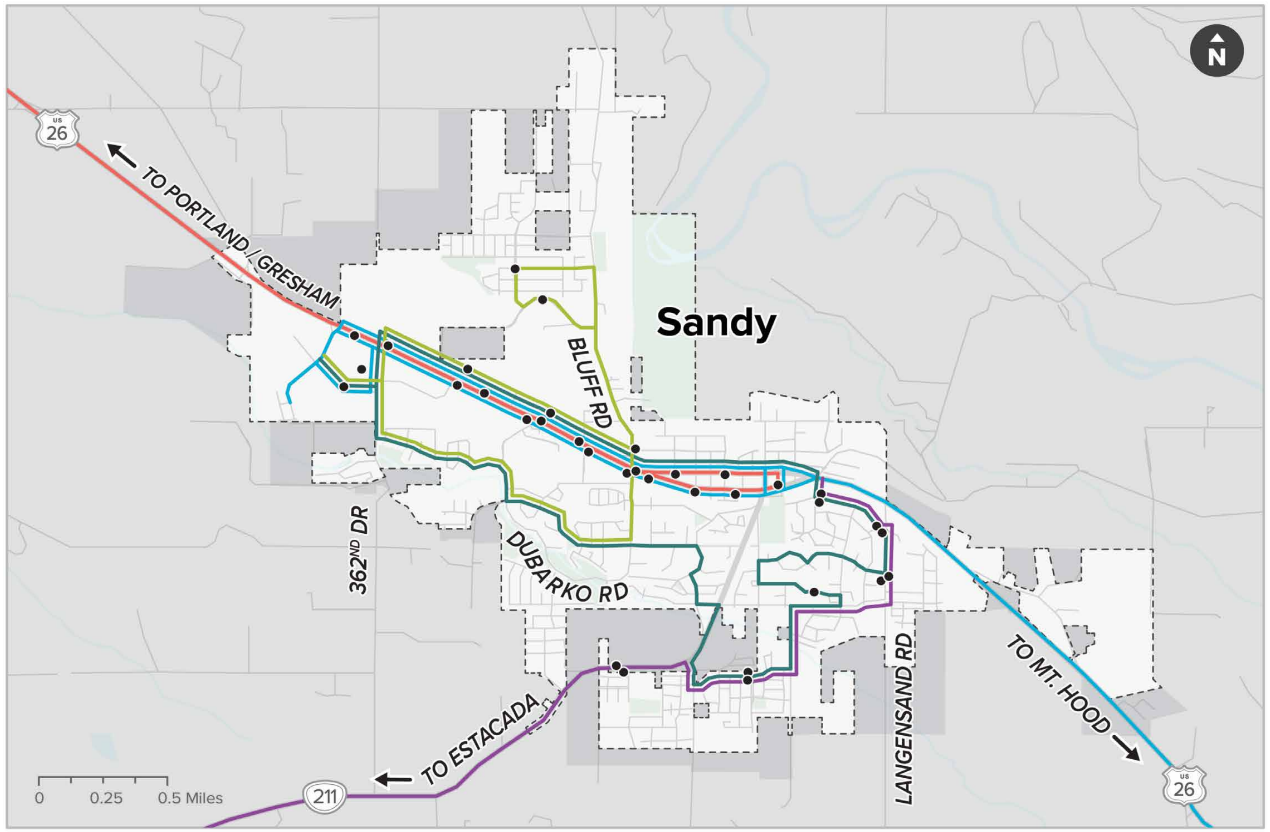
Sandy Area Metro (SAM) provides transit service in Sandy via four fixed bus routes including two local shopper routes and two regional routes connecting the City with downtown Gresham and Estacada. Clackamas County operates an additional fixed route service to Mount Hood.

system characteristics

- Transit riders can transfer to TriMet routes at the Gresham Transit Center for access to transit service in the Portland Metro area.
- Bus stops with more than 10 boardings per day should have a shelter and a bench per Sandy Transit's standard. The bus stops in Sandy are currently meeting that standard.
- The SAM stop at Gresham Transit Center is the highest ridership stop in Sandy Transit's system.
- There is poor connectivity between the regional fixed routes and the local shopper routes. Pedestrian improvements and a new shopper shuttle stop at Proctor Boulevard and Hoffman Avenue are proposed in the Transit Master Plan to remedy this issue.

dial-a-ride & paratransit service

Sandy Transit's dial-a-ride and paratransit service provides public transportation to persons with disabilities who are unable to use regular fixed route buses and members of the general public. While federal guidelines require that service be provided within 3/4 mile of fixed route service, service is provided for any trip that starts and ends within the City of Sandy. Current ridership of dial-a-ride/paratransit service is approaching capacity. The Transit Master Plan recommends reviewing the operating practices of the service rather than immediately adding another bus and driver to meet future increases in demand.



transit routes

sandy - estacada | sandy - gresham | shopper b | shopper a | mt. hood express | transit stops

Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

figure 5

Sandy Transit

transit service

sandy shoppers (a & b)

Every 60 minutes, afternoons and evenings, Monday through Friday

sandy / gresham express

Every 30 minutes, Monday through Friday; 60 minutes Saturday & Sunday

sandy / estacada express

Five trips daily, Monday through Saturday

mt. hood express

Mount Hood Express – Six trips daily (seven in winter), Monday through Sunday

transportation system challenges

more travel & recreation seasonal demand

More jobs, residents, and recreational through traffic on US 26 means that the street network in 2040 must accommodate additional motor vehicle trips during the seasonal weekend peak hour. Even today, two intersections along US 26 exceed an acceptable level of congestion during typical peak traffic conditions. By 2040, total traffic is expected to increase by over 30% resulting in further traffic operation deficiencies. The expected increase in seasonal, recreational traffic on US 26 will add to the strain on the transportation system.

more congestion

With the forecasted increase in motor vehicle trips through 2040, more study intersections are expected to exceed the mobility targets. The study intersections along US 26 from Orient Drive to Bluff Road, the two Industrial Way intersections with 362nd Drive, and the intersection of Highway 211 and Bornstedt Road will all **exceed mobility targets in 2040** without additional capacity improvements or regulatory changes (see alternative mobility targets). These intersections along US 26 are all signalized but with high peak hour traffic volumes are unable to adequately serve all the critical movements, typically including the eastbound through traffic. The remaining intersections off of US 26 are unsignalized but will serve high turning movement volumes with significant conflicting traffic. See **Appendix Section E** for details about the highway performance analysis.

safety concerns

The SPIS system is a methodology used by the Oregon Department of Transportation (ODOT) to evaluate safety issues statewide and identify locations to prioritize for improvements. Intersections along US 26 on the west side of Sandy have significant safety issues. The US 26 intersections with 362nd Drive, Ruben Lane, and Orient Drive are all top 15 percentile Safety Priority Index System (SPIS) locations. Most collisions at these locations are rear end collisions and turning collisions. The higher speed limit, relatively long distance between intersections, and high traffic related to the commercial district likely contribute to the safety issues at these intersections.

The intersection of Hwy 211 and Dubarko Road is also a location with safety concerns. Most of the collisions at this intersection are turning movements. This intersection is currently unsignalized and two-way stop controlled for movements from Dubarko Road. The City has identified a proportional share fee which is assessed for new development based on the number it's trips using this intersection. TSP project D9 will address the multimodal safety concerns. More information can be found in **Appendix Section L**.

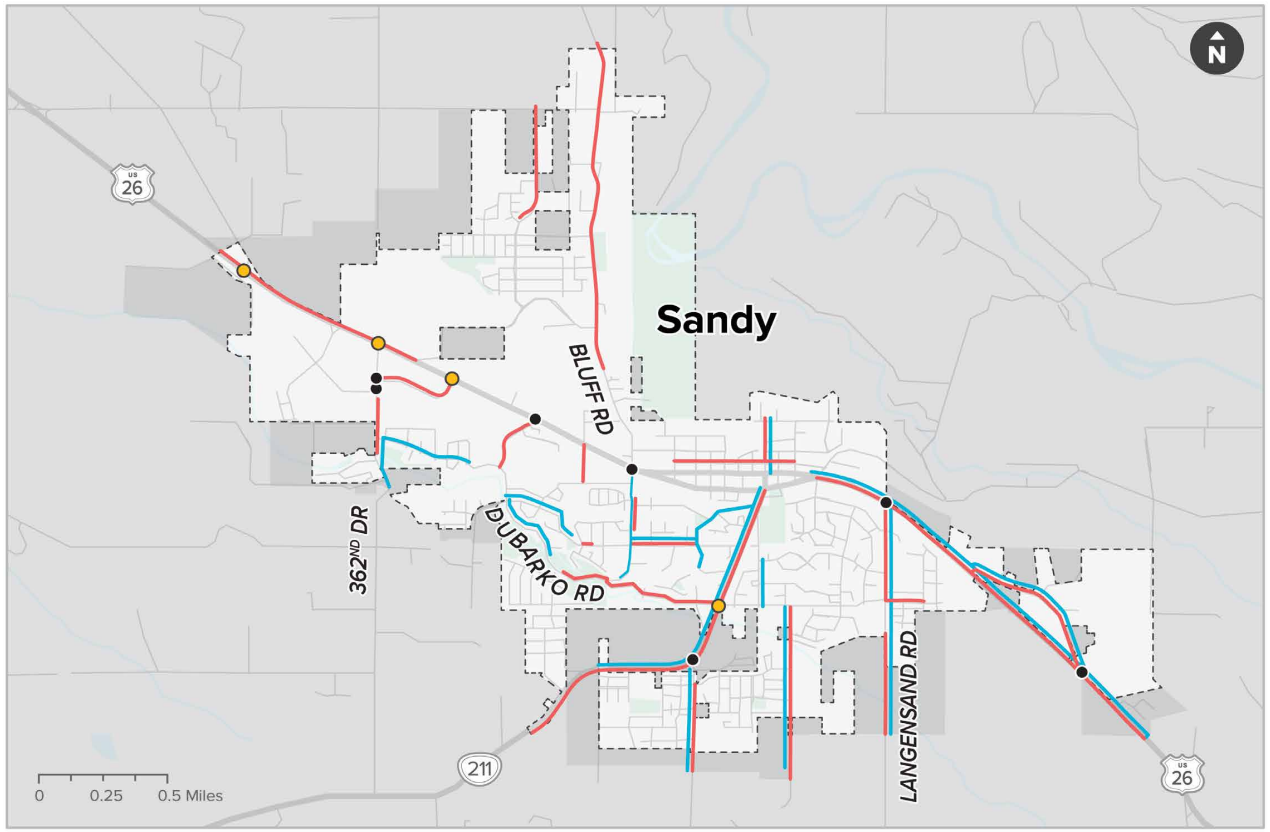
transportation system challenges

pedestrian network needs

The quality of the pedestrian network depends on the presence of a sidewalk or path, a buffer zone (such as a shoulder, landscape strip, or on-street parking), street lighting, traffic volumes, number of travel lanes and travel speeds along the adjacent roadway. **Figure 9** summarizes the pedestrian network needs in Sandy. Most neighborhoods have adequate pedestrian facilities along some or all the higher volume roadways. This is especially true in the newer neighborhoods to the northwest and south of downtown. However, many roads have significant gaps on one or both sides of the street. The longest segments are along US 26, Hwy 211, and Bluff Road. The Downtown Walkability Assessment (DWA) includes a focused reviewed of the pedestrian system in downtown Sandy. The recommendations included in the DWA informed the projects included in the TSP and is included in **Appendix J**.

bicycle network needs

The bicycle network is evaluated on the presence and width of bike facilities (such as a bike lane, shoulder, path, shared roadway), the number of travel lanes, motor vehicle volumes, and travel speeds along the adjacent roadway. **Figure 10** summarizes the bicycle network conditions in Sandy. This analysis shows that the arterial and collector streets in Sandy have relatively few needs on the west side of the City with significant needs on the central and east sides of the City. The longest need segments are along US 26, Hwy 211, and Langensand Road.



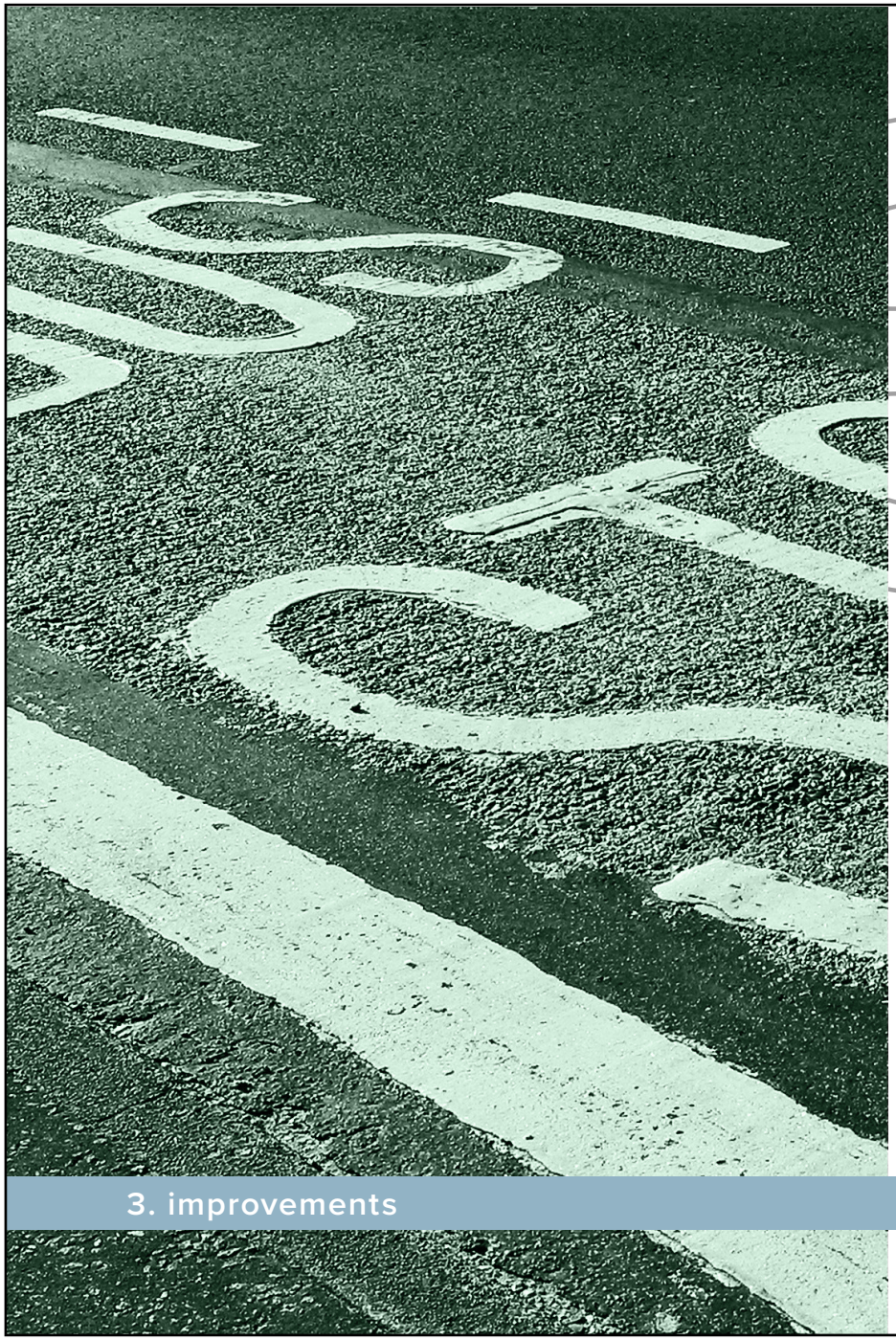
Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

figure 6

Sandy System Deficiencies

sandy system deficiencies

As shown in **Figure 6** there are deficiencies for various travel modes across the City of Sandy. Deficiencies were only evaluated along roads classified as collector and higher. Additional evaluation along local roads may be found in focused plans, like the Downtown Walkabilty Assessment. Motor vehicle related deficiencies are generally limited to US 26 and Hwy 211. Bicycle and pedestrian infrastructure gaps are present throughout the city with the exception of the northern neighborhood off of Bluff Road where there are no existing bicycle gaps.



3 improvements

Sandy must make investment decisions to implement a set of transportation improvements that meet identified needs through 2040. Transportation funding is limited, so a fiscally responsible approach to enhancing and maintaining the transportation system is imperative.

Sandy's approach to developing the TSP investments emphasized adding capacity to existing facilities, improving safety, upgrades to cross section standards, and filling important system gaps. This process allowed the city to maximize use of available funds, minimize impacts to the natural and built environments, and balance investments across all modes of travel. See **Appendix Section H** for more information about project priorities.

prioritization

high priority

Add vehicle capacity by widening, constructing major improvements to existing roadways, or extending existing roadways to create parallel routes to congested corridors. Improve existing facilities with minor enhancements, such as upgrading roads to cross section standards, filling in important system gaps, and safety improvements to intersections and to corridors.

medium priority

Add cost-effective improvements such as better traffic signal operations, encouraging walking, biking and transit, and applying new policies and standards.

low priority

Add capacity to the system by constructing new facilities.

figure 7

Transportation Solutions Identification Process

prioritizing investments

Unless the City expands its funding options, most of the desired transportation system projects are not likely to happen before 2040. For this reason, the TSP splits transportation solutions into improvement packages.

The Constrained Projects, or those projects that the City believes are reasonably likely to be funded during the 20-year planning horizon are included in Package 1 "is financially constrained", meaning it totals the $10.2 million is expected to be available through existing City funding and revenue from various state and/or federal sources.

Package 2 is comprised of the aspirational projects, those remaining projects that exceed the likely level of funding available in the next 20 years.

Sandy supports and would like to implement all of the projects identified in both of the packages. The full list includes over 100 projects, totaling an estimated $710 million worth of investments (in 2021 Dollars). See **Appendix Section H** for more information on the development of the TSP project list.

prioritization

The TSP compared all proposed projects using the TSP goals (detailed in the TSP Introduction). Based on a project's contribution to achieving the transportation goals of Sandy, the process assigned each transportation solution a priority. The process considered cost, particularly those projects with extremely high cost, in the prioritization process but did not necessarily rank a project lower due to high cost. Projects that would have more immediate impacts and spread investment benefits citywide were selected to form the financially constrained list.

The City has discretion to implement the projects in a different order than is reflected in Table 1. Future circumstances could allow or require the City to fund projects not on the financially constrained project list to address an unanticipated transportation need or take advantage of an unexpected opportunity. The projects listed in Table 1 are shown by category, such as driving or biking.

The project identification numbers in the first column indicate which travel mode they are primarily intended to benefit; however, some projects can benefit more than one mode of travel and most projects are expected to also improve safety. The Project IDs are coded as follows:

- **P** pedestrian project
- **C** crossing project
- **B** bicycle project
- **T** trail project
- **S** safety project
- **D** pedestrian project

The project design elements depicted are identified for the purpose of creating a reasonable cost estimate for planning purposes. The actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City and/or ODOT approval.

motor vehicle

Motor vehicle projects improve safety and mobility throughout the City for motorists. Sandy identified 39 projects to improve roadway segments and intersections that, as originally proposed, would cost an estimated $640 million to complete. Motor vehicle projects are shown in **Figure 8**.

Along US 26, the Sandy TSP calls for various intersection improvements to improve capacity at the signalized intersections. Other road extension projects off US 26 also contribute to improving the highway by creating more route options for local traffic. Ultimately, the proposed Sandy Bypass results least congestion along the current highway by rerouting US 26 to the west and south of the current UGB and providing an alternative route for through traffic that does not pass through the city center.

For most intersections to meet current Oregon Highway Plan (OHP) mobility targets, all of the included US 26 intersection improvements are necessary along with the construction of the Sandy Bypass. Even with all these projects completed the intersection of US 26 and Orient Drive would still fail to meet mobility targets. Additional highway widening beyond these projects would have significant community, environmental, and right-of-way impacts and would require further environmental and technical analysis. Widening US 26 is not recommended in this TSP.

In addition, highway widening projects are not financially feasible based on the current financial constraint threshold. The cost of the US 26 projects mentioned above is estimated to be $180 million with the bypass adding an additional $390 million. These costs are well above the $10 million expected for the financially constrained project list. No potential highway widening projects could be implemented in small enough segments to fit within the 20-year budget. The full analysis of US 26 improvement options considered during the TSP analysis process are described in the appendix.

Without the improvements to US 26 capacity included in this TSP, traffic demand for the 30th highest volume hour peak period at all signalized highway intersections along US 26 from Bluff Road to Orient Drive likely will exceed capacity by 2040 due to high volumes on multiple turning movements. Three other unsignalized intersections, along minor arterials, will exceed the City's level of service standard due to high delay for turning movements.

With the projected amount of funding available and the significant shortfall relative to the cost of the proposed improvements to improve operations along US 26, the City will need to work with ODOT to establish alternative mobility targets for US 26. The full analysis of US 26 alternative mobility targets is described in the **Appendix Section I**.

TABLE 1. FINANCIALLY CONSTRAINED & ASPIRATIONAL PROJECT LIST[A]

PROJECT ID	DRIVING PROJECTS	DESCRIPTION	$2021 DOLLARS	LEAD AGENCY[B]	FUNDING
D1	362nd Drive & Industrial Way (south) Intersection Improvement	Reduce eastbound congestion. Project may include restriping to include an exclusive eastbound left turn lane and exclusive right turn lane.	$140,000	City	2
D2	362nd Drive & Dubarko Road Intersection Improvement	Reduce intersection congestion. Project may construct a traffic signal or roundabout.	$1,425,000	City	2
D3	US 26 & 362nd Drive Intersection Improvement	Reduce congestion for the westbound left turn and accommodate the 362nd Drive Extension 1. Project may minor widening to accommodate a northbound through lane, construction of a three-lane southbound approach with a right turn lane, through lane, and left turn lane, and an eastbound left turn lane.	Funded	ODOT	1
D4	US 26 & Industrial Way Intersection Improvement	Improve egress from commercial area and reduce northbound congestion. Project may include minor widening to accommodate a northbound left turn lane and restriping on the southbound approach to dual left turn lanes and a shared through/right turn lane.	$950,000	ODOT	2
D5	US 26 & Ruben Lane Intersection Improvement	Improve egress from commercial area and reduce northbound congestion. Project may include restriping southbound approach to dual left turns and a shared through/right lane and restriping the northbound approach to a left turn lane and shared through/right lane.	$950,000	ODOT	2
D6	Highway 211 & Proctor Boulevard Intersection Improvement	Reduce northbound congestion. Project may include restriping northbound approach to include an exclusive left turn lane and through/right lane.	$15,000	ODOT	1
D8	US 26 & Ten Eyck Road/Wolf Drive Intersection Improvement	Improve northbound and southbound approaches. Project may include striping left turn lanes on both minor street approaches.	$1,500,000	ODOT	2
D9	Highway 211 & Dubarko Road Multimodal Improvement	Reduce intersection congestion and improve safety. Project includes multimodal improvements such as improved pedestrian crossings. Coordinate with C2, C23, D20, D27.	$500,000	City	1

PROJECT ID	DRIVING PROJECTS	DESCRIPTION	$2021 DOLLARS	LEAD AGENCY[B]	FUNDING
D11	Highway 211 & Arletha Court Intersection Improvement	Reduce northbound congestion and improve pedestrian crossing. Project may include signage and approach modifications to prohibit left turns from the minor street approach. Traffic calming such as curb extensions may be used to reduce crossing distance for pedestrians. Proctor Road may be gated for emergency vehicle only access.	$125,000	City	2
D12	Industrial Way Extension 1	Extend Industrial Way to Jarl Road/US 26 at Collector standards.	$13,175,000	City	2
D13	Dubarko Road Extension	Extend Dubarko Road to Champion Way at Collector standards.	$7,450,100	City	2
D14A	Bell Street Extension 1	Extend Bell Street to 362nd Drive Extension 1 at Minor Arterial standards.	Funded	City	1
D14B	Bell Street Extension 2	Extend Bell Street from 362nd Drive Extension 1 to Orient Drive at Minor Arterial standards.	$9,900,000	City	2
D15A	362nd Drive Extension 1	Extend 362nd Drive to Bell Street Extension 1 at Minor Arterial standards.	Funded	City	1
D15B	362nd Drive Extension 2	Extend 362nd Drive from Bell Street Extension 1 to Kelso Road at Minor Arterial standards.	$14,000,000	City	2
D16	Kate Schmidt Street Extension	Extend Kate Schmidt Street to Bell Street Extension 1 at Collector standards.	$9,000,000	City	2
D17	Industrial Way Extension 2	Extend Industrial Way to Bell Street Extension 1 at Collector standards.	$4,675,000	City	2
D18	Olson Street Extension	Extend Olson Street to 362nd Drive Extension 2 at Collector standards.	$5,250,000	City	2
D19	Agnes Street Extension	Extend Agnes Street to Bluff Road at Collector standards.	$5,950,000	City	2

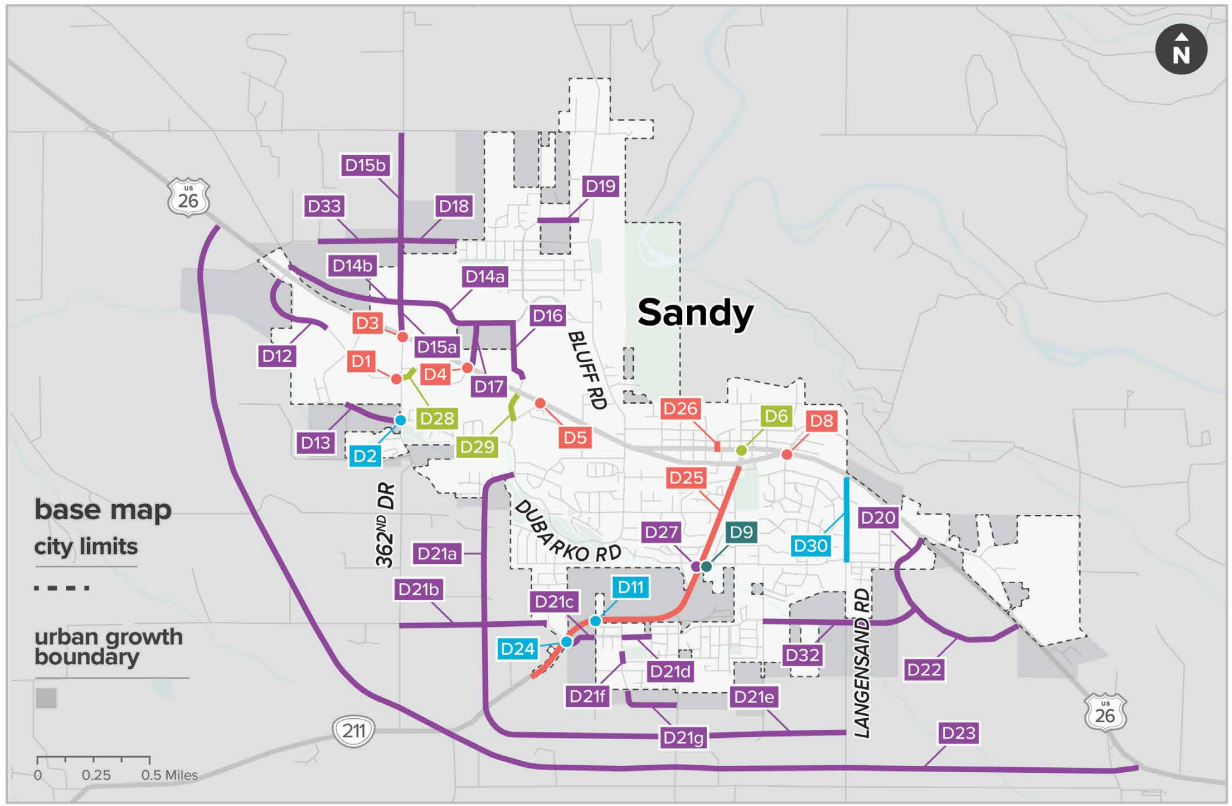
PROJECT ID	DRIVING PROJECTS	DESCRIPTION	$2021 DOLLARS	LEAD AGENCY[B]	FUNDING
D20	Dubarko Road Extension	Extend Dubarko Road to US 26/Vista Loop Road (west) at Minor Arterial standards, coordinate with D9, C2, C17, and D27.	$3,900,000	City	1
D21A	Sandy Heights Street/ 370th Avenue Extension	Extend Sandy Heights Street/370th Avenue to Highway 211 at Collector standards.	$24,350,000	City	2
D21B	Gunderson Road Extension	Extend Gunderson Road from existing terminus near Highway 211 to 362nd Drive at Collector standards.	$13,750,000	City	2
D21C	Cascadia Village Extension 1	Extend Cascadia Village from Highway 211 to Arletha Court at Collector standards.	$2,025,000	City	2
D21D	Cascadia Village Extension 2	Extend Cascadia Village Drive from Village Boulevard to Pine Street at Collector standards.	$2,175,000	City	2
D21E	New southern collector	Construct new a new road at Collector standards from Highway 211 at the intersection with the Sandy Heights Street/370th Avenue Extension to Langensand Road.	$33,550,000	City	2
D21F	Village Boulevard Extension 1	Connect Village Boulevard at Collector standards between Cascadia Village Drive and Juniper Street.	$875,000	City	1
D21G	Village Boulevard Extension 2	Extend Village Boulevard at Collector standards from existing terminus south of Juniper Street to Bornstedt Road.	$4,000,000	City	2
D22	New eastern collector	Construct new a new road at Collector standards from Dubarko Road at the intersection with the Dubarko Road Extension to US 26/ Vista Loop Road (east).	$20,000,000	City	2
D23	US 26 Bypass	Construct bypass from east of Orient Drive to Shorty's Corner (Firwood Road).	$390,000,000	City	2
D24	Highway 211 & Gunderson Road Intersection Improvement	Intersection improvement project may include turn lanes from Highway 211 to Gunderson Road, a traffic signal or roundabout.	$1,000,000	City	1

PROJECT ID	DRIVING PROJECTS	DESCRIPTION	$2021 DOLLARS	LEAD AGENCY[B]	FUNDING
D25	Highway 211	Upgrade Highway 211 to Minor Arterial standards from UGB to US 26, coordinate with P23.	$22,000,000	City	2
D26	Alt Avenue	Reconstruct Alt Avenue from Proctor Blvd to Pleasant St to improve walkability and access to the Sandy Library.	$11,000,000	City	2
D27	Highway 211 & Dubarko Road Intersection Control Evaluation	Study intersection control and other options to improve safety and capacity. Coordinate with D9, D20, and C2.	$50,000	City	1
D28	Industrial Way Realignment	Realign Industrial Way (east of 362nd Drive) to connect with the intersection of Industrial Way (west of 362nd).	$4,150,000	City	2
D29	Ruben Lane Realignment to Kate Schmitz	Realign Ruben Lane to the west to connect with Kate Schmitz Avenue and US 26.	$3,700,000	City	2
D30	Langensand Road Truck Traffic Calming	Traffic calming measures along Langensand Road, potential treatments include bollards at the intersection of Langensand Road and US 26 and curb extensions along Langesand Road.	$175,000	City	2
D31	Sandy Bypass Planning	Planning to support the proposed US 26 Sandy Bypass.	$1,000,000	City	1
D32	Cascadia Village Drive Extension 3	Extend Cascadia Village Drive from Bornstedt Road to New Eastern Collector (D22) at Collector standards.	$19,100,000	City	2
D33	Olson Street Extension 2	Extend Olson Street from 362nd Drive extension to SE Crescent Road.	$8,500,000	City	2
Estimated Cost for all Driving Projects			*$640,305,000*		

A Project descriptions and cost estimates are at a high level for planning purposes. Specific details of a particular project may be modified with additional analysis or when funding is identified with major changes requiring TSP amendment. Some projects initially included were later removed. As a result the project numbers are not consecutive.

B Expected, funding will likely come from multiple sources.

motor vehicle projects



Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

figure 8

Motor Vehicle Projects

pedestrian & bicycle

Pedestrian and bicycle projects include sidewalk, path and roadway crossing improvements, and an integrated network of bicycle lanes, marked on-street routes and shared-use paths to facilitate safe and convenient travel citywide. Sandy identified 90 pedestrian and bicycle projects that, as originally proposed, would cost an estimated $53 million to complete.

Most pedestrian and bicycle projects are standalone projects and not included with other driving capacity projects. However, all roadway extension projects are expected to be constructed at cross section standards which include bike lanes and sidewalks. There are some advantages of separating out bicycle and pedestrian improvements from driving capacity projects, including:

1. Walking and biking projects are generally less expensive and have less impact than roadway widening projects, and most can be accomplished within the existing right-of-way.
2. Construction of walking and biking projects can be done in smaller phases or combined with a related maintenance activity like a pavement rehabilitation job.
3. Walking and biking projects are generally non-controversial in nature and provide clear safety benefits to the more vulnerable users of the transportation system by providing dedicated infrastructure which separates them motor vehicle traffic.

Sandy identified **90 pedestrian and bicycle projects** that, as originally proposed, would cost an estimated **$53 million to complete**.

TABLE 2. FINANCIALLY CONSTRAINED & ASPIRATIONAL PROJECT LIST BICYCLE & PEDESTRIAN[A]

PROJECT ID	LOCATION	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY[B]	PACKAGE
PEDESTRIAN PROJECTS					
P1	362nd Drive – West sidewalk of Chinook Street to Industrial Way	Infill sidewalk gaps.	$1,000,000	City	1
P2	Bluff Rd. - East and west side of Green Mountain St. to Northern UGB	Infill sidewalk gaps.	$900,000	City	2
P3	Bluff Rd - West sidewalk gap infill from Bell Street to 15931 SE Bluff Road	Infill sidewalk gaps.	$875,000	City	1
P4	Bluff Rd - West sidewalk gap infill from Strawbridge Pkwy to Nettie Connett Dr.	Infill sidewalk gaps.	$650,000	City	2
P5	Bornstedt Rd. - East and west sidewalk gap infill from Cascadia Village Dr. to UGB	Infill sidewalk gaps.	$1,750,000	City	2
P6	Dubarko Rd. - South sidewalk gap infill 300 feet east of Melissa Ave. to 200 feet east Highway 211	Infill sidewalk gaps.	$3,950,000	City	2
P7	Dubarko Rd. - North sideswalk gap infill from Langensand Rd. to Antler Ave.	Infill sidewalk gaps.	$50,000	City	2
P8	Industrial Way - North and south sidewalk gap infill from 362nd Dr. to US 26	Infill sidewalk gaps.	$2,200,000	City	2
P9	Jewelberry Rd. - East and west sidewalk infill from Penny Ave. to Kelso Rd.	Infill sidewalk gaps.	$250,000	City	2
P10	Jacoby Rd. - East and west sidewalk gap infill from Dubarko Rd. to southern UGB	Infill sidewalk gaps.	Included in B14	City	2
P11	Langensand Rd - East and west sidewalk gap infill from Dubarko Rd. to US 26	Infill sidewalk gaps.	$100,000	City	2

PROJECT ID	LOCATION	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY[B]	PACKAGE
P12	Langensand Rd. - East and west sidewalk gap infill from Dubarko Rd. to UGB	Infill sidewalk gaps.	$1,150,000	City	2
P13	Meinig Avenue - East and west sidewalk gap infill from Scenic St. to US 26	Infill sidewalk gaps.	$150,000	City	2
P14	Pleasant St - East and west sidewalk infill from Beers Ave. to Revenue Ave.	Infill sidewalk gaps.	$250,000	City	2
P15	Ruben Ln. - West sidewalk gap infill from US 26 to Dubarko Rd.	Infill sidewalk gaps.	$75,000	City	2
P16	Sandy Heights St - North and south sidewalk infill from Bluff Rd. to Tupper Rd.	Infill sidewalk gaps.	$225,000	City	2
P17	Downtown Core Pedestrian Improvements - Sidewalk infill side streets perpendicular to US 26	Infill sidewalk gaps.	$350,000	City	2
P19	US 26 - North sidewalk infill from Royal Ln to 362nd Dr.	Infill sidewalk gaps.	$550,000	ODOT	2
P20	US 26 - North sidewalk infill from 362nd Dr. to West UGB	Infill sidewalk gaps.	$1,200,000	ODOT	2
P22	US 26 - South sidewalk infill from Ten Eyck Rd. to East UGB (a project filling this gap on the north side of the highway is under construction)	Infill sidewalk gaps.	Included in B12	ODOT	2
P23	Highway 211 - Construct sidewalk from south UGB to US 26 – coordinate with D25	Construct sidewalk.	Included in D25	City	2

A Project descriptions are at a high level for planning purposes. Specific details of a particular project may be modified with additional analysis or when funding is identified.

B Expected, funding will likely come from multiple sources.

PROJECT ID	LOCATION	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY[B]	PACKAGE
P24	Sandy Heights St. - North sidewalk infill from Nettie Connett Drive to Balken Ave	Construct sidewalk.	$125,000	City	2
P25	Vista Loop - Full extent	Construct sidewalk.	Included in B15	City	2
P26	362nd Drive	East sidewalk infill from Chinook Street to Industrial Way.	$625,000	City	2
P27	Bluff Road	East sidewalk infill from 200 feet north of Marcella Court to Green Mountain Street.	$2,225,000	City	2
Estimated Cost for all Pedestrian Projects			***$18,650,000***		
CROSSING PROJECTS					
C1	Sandy Shopper Crossing - Evans	Evans Street Senior Apartments, traffic calming, and other crossing improvements are needed. Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$25,000	City	2
C2	Highway 211 Dubarko Crossing	Project may include pedestrian crossing advisory signage, curb extensions, marked crosswalks, and installation of RRFB. Coordinate with D9, D20, and D27.	$125,000	City	2
C3	Sandy Transit Center - Pioneer	Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$125,000	ODOT	2
C4	Sandy Transit Center - Proctor	Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$125,000	ODOT	2
C5	CRMS - Bluff Road at Marcy	Install Rectangular Rapid Flashing Beacon (RRFB) with School Crossing Assembly (S1-1 and W16-7P), and high visibility crosswalks across the north and east sides of the intersection.	$125,000	City	1
C6	CRMS - Bluff Road at Hood	Install a curb extension including perpendicular curb ramps and tactile domes at northeast corner of Hood St. Install a curb extension to provide clearance from existing pole, including perpendicular curb ramps and tactile domes, at southeast corner. Mark crosswalk and stop bar across the east leg of intersection.	$125,000	City	1

PROJECT ID	LOCATION	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY[B]	PACKAGE
C7	CRMS - Bluff Road at US 26	Increase pedestrian signal crossing time. Reconfigure crossing to provide perpendicular curb ramps with tactile domes and reduce curb radius at all corners. Add pedestrian-scale lighting. Reallocate existing roadway space to provide buffered bike lanes along Highway 26 and consider the use of green pavement markings near Bluff Rd. Consider installing vertical delineators with buffered bike lanes contingent on city maintenance agreement or construct a fully grade-separated bicycle facility.	$125,000	ODOT	1
C8	CRMS - Hood Street at Beers	At Beers Ave, repaint stop bars on west and east sides of intersection. Consider installation of a 4 way stop at Beers Ave.	$25,000	City	1
C9	CRMS - Hood Street at Scales	Install perpendicular curb ramps with tactile domes at northwest and southwest corners of the intersection of Hood St and Scales Ave. Install tactile domes at the northeast and southeast corners. Repaint stop bars.	$25,000	City	1
C10	CRMS - Hood Street at Bruns	Install tactile dome at southwest corner of Bruns Ave and Hood St.	$25,000	City	1
C11	SGS - Hood/Strauss	Relocate southbound school advance crossing assembly (S1-1 & W16-9P) and school speed limit assembly (S4-3P & R2-1) along Strauss Ave to approximately 100 ft and 175 ft north of intersection, respectively. Repair approximately 150 LF of degraded sidewalk along the east side of Strauss Ave at the intersection with Hood St and widen sidewalk at encroaching utility pole. Install a curb ramp on the east side of the south leg of the intersection of Strauss Ave at Hood St. Add tactile domes and a stop bar associated with the crosswalk across the west leg of the intersection.	$350,000	City	1
C12	SGS - Pleasant/Strauss	Mark stop bars in advance of crosswalks. Consider revising the intersection of Pleasant St and Strauss Ave to be a four-way stop (currently STOP control north- and southbound only).	$25,000	City	1

PROJECT ID	LOCATION	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY[B]	PACKAGE
C13	SGS - Pleasant/Alt	Mark stop bars in advance of crosswalks. Replace existing diagonal curb ramps at all four corners with perpendicular curb ramps with tactile domes. Construct a raised intersection at Pleasant St at Alt Ave.	$350,000	City	1
C14	SGS - Smith/Pleasant	Mark stop bars in advance of crosswalks. Relocate southbound school advance crossing assembly (S1-1 & W16-9P) and school speed limit assembly (S4-3P & R2-1) along Smith Ave to approximately 100 ft and 175 ft north of intersection, respectively.	$25,000	City	1
C15	SGS - Alt/US 26	Increase pedestrian signal crossing time. Upgrade pedestrian pushbuttons to meet current standards with audible indications. Consolidate the two existing crosswalks across Highway 26 at Alt Ave with one high visibility continental crosswalk on the east side of the intersection including advance stop bar, bulb outs, curb ramps, and pedestrian scale lighting.	$125,000	ODOT	1
C16	Bluff/Sandy Heights	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	City	2
C17	Dubarko/US26	Install marked crosswalks on all four legs with tactile domes on the ramps, coordinate with D20, this project is not needed until the Dubarko Extension is complete.	$25,000	ODOT	2
C18	Scales/Proctor	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	ODOT	2
C19	Scales/Pioneer	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	ODOT	2
C20	Bruns/Proctor	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	ODOT	2
C21	Bruns/Pioneer	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	ODOT	2

PROJECT ID	LOCATION	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY[B]	PACKAGE
C22	Highway 211	Pedestrian Overcrossing for Sandy Heights Street.	$6,000,000	City	2
C23	Highway 211 Pedestrian Improvements	ADA Improvements along Highway 211.	Funded	City	1
C24	Green Mountain and Bluff Pedestrian Crossing	Construct curb extensions and mark crossing to Jonsrud Viewpoint.	$75,000	City	2
Estimated Cost for all Crossing Projects			**$8,450,000**		
BIKE PROJECTS					
B1	362nd Dr. - Dubarko Rd. to UGB	Widen shoulder to 6 feet minimum for bike access.	$1,500,000	City	2
B2	Bluff Rd. - US 26 to Miller Rd.	Re-stripe roadway to provide bike lanes, cost assumes that the roadway is not widened and parking is removed.	$50,000	City	2
B3	Bornstedt Rd - Highway 211 to UGB	Re-stripe roadway to provide bike lanes, cost assumes that the roadway is not widened and parking is removed.	$2,550,000	City	2
B4	Dubarko Rd. - 362nd Dr. to Eldridge Dr.	Re-stripe roadway to provide bike lanes, cost assumes that the roadway is not widened and parking is removed.	$50,000	City	2
B5	Dubarko Rd. - Sandy Heights St. to Melissa Ave.	Re-stripe roadway to provide bike lanes, cost assumes that the roadway is not widened and parking is removed.	$50,000	City	2
B6	Langensand Rd. - US 26 to UGB	Re-stripe roadway to provide bike lanes, cost assumes that the roadway is not widened and parking is removed.	$75,000	City	2
B7	Meinig Ave - Scenic St. to US 26	Re-stripe roadway to provide bike lanes, cost assumes that the roadway is not widened and parking is removed.	$75,000	City	2
B8	Meinig Ave - Barker Ct. to Dubarko Rd.	Re-stripe roadway to provide bike lanes, cost assumes that the roadway is not widened and parking is removed.	$25,000	City	2
B9	Sandy Heights St - Bluff Rd. to Tupper Rd.	Re-stripe roadway to provide bike lanes, cost assumes that the roadway is not widened and parking is removed.	$50,000	City	2
B10	Tupper Rd. - Long Circle to Highway 211	Widen roadway to provide bike lanes.	$3,000,000	City	2

PROJECT ID	LOCATION	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY[B]	PACKAGE
B12	US 26 - Ten Eyck Road to UGB	Widen to provide a six foot bike lane and sidewalk.	$7,725,000	ODOT	2
B13	Sandy Heights St - Dubarko Rd to Nettie Connett Dr	Re-stripe/widen Roadway to provide bike lanes.	$2,275,000	City	2
B14	Jacoby Rd - Dubarko Rd to southern UGB	Re-stripe/widen Roadway to provide bike lanes and construct sidewalk.	$3,925,000	City	2
B15	Vista Loop - Full extent	Re-stripe/widen Roadway to provide bike lanes and construct sidewalk.	$2,075,000	City	2
Estimated Cost for all Bike Projects			***$23,425,000***		
TRAIL PROJECTS		**These projects will be funded through the Parks System Development Charge for new development**			
T03	362nd	6' - 8' wide gravel trail	$125,000	City	2
T04	Kelso to Powerline	6' - 8' wide gravel trail	$200,000	City	2
T05	Powerline	5' concrete path	$50,000	City	2
T06	Olson to Powerline	5' concrete path	$100,000	City	2
T08	Sandy Bluff Park to 362nd 3	6' - 8' wide gravel trail	$150,000	City	2
T09	Sandy Bluff Park Pond Loop Trail 3	6' - 8' wide gravel trail	$50,000	City	2
T10	Bell Street to Sandy Bluff Park 3	6' - 8' wide gravel trail	$75,000	City	2
T11	Kate Schmidt to Bell Street 3	3' wide natural surface trail	$50,000	City	2
T12	SHS Trail Easement 1 3	3' wide natural surface trail	$100,000	City	2
T13	Meeker to MH Athletic Club	5' concrete path	$50,000	City	2
T17	Community Campus to Sandy River Trail	3' wide natural surface trail	$25,000	City	2

PROJECT ID	LOCATION	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY[B]	PACKAGE
T19	Park Street to Community Campus	3' wide natural surface trail	$5,000	City	2
T21	Vista Loop to Hood Street	6' - 8' wide gravel trail	$50,000	City	2
T28	Tickle Creek Reroutes 3	6' - 8' wide gravel trail	$75,000	City	2
T30	Sunset Street to Tickle Creek	3' wide natural surface trail	$15,000	City	2
T31	Sunset Street to Nettie Connett Drive	5' wide concrete path	100,000	City	2
T32	Bluff Road to Sandy Heights	3' wide natural surface trail	$15,000	City	2
T33	Tupper Park to Gerilyn Court	5' concrete path	$50,000	City	2
T35	Tickle Creek Extension East to Dubarko Underpass	6' - 8' wide gravel trail	$75,000	City	2
T38	Tickle Creek to Deer Point Park	5' concrete path	$450,000	City	2
T39	Dubarko Extension Road	8' wide asphalt trail	$125,000	City	2
T40	Tickle Creek Extension Dubarko East to Jacoby	3 6' - 8' wide gravel trail	$100,000	City	2
T41	Alleyway to Tickle Creek Trail Connector	5' concrete path	$50,000	City	2
T42	Jacoby Road to Tickle Creek Connector	5' concrete path	$50,000	City	2
T44	Bornstedt Park	5' concrete path	$75,000	City	2
T50	Highway 211 Parkway	-	$400,000	City	2
T54	Cascadia to Tickle Creek	6' - 8' wide gravel trail	$30,000	City	2
Estimated Cost for all Trail Projects			***$2,640,000***		

B Expected, funding will likely come from multiple sources.

pedestrian

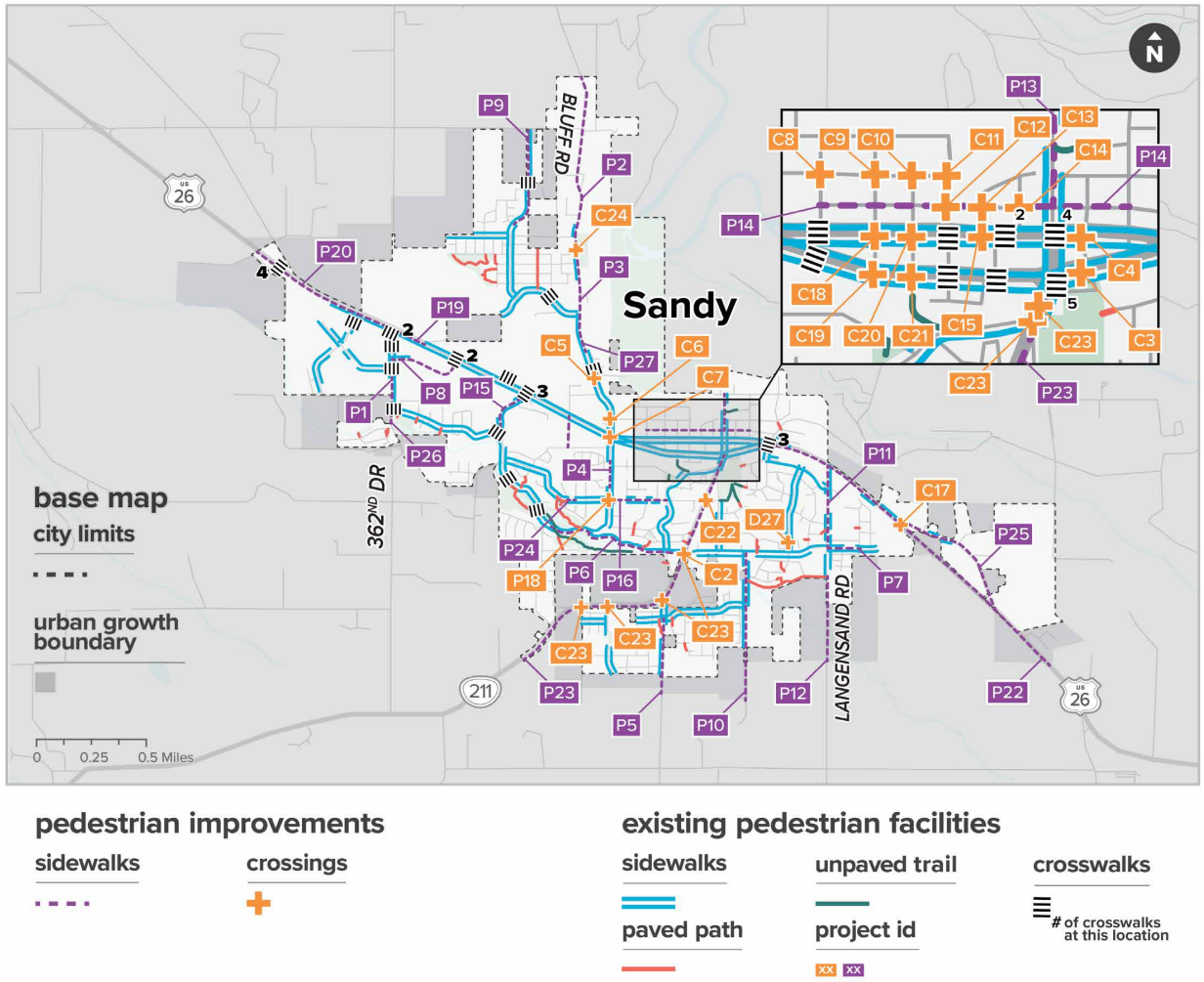
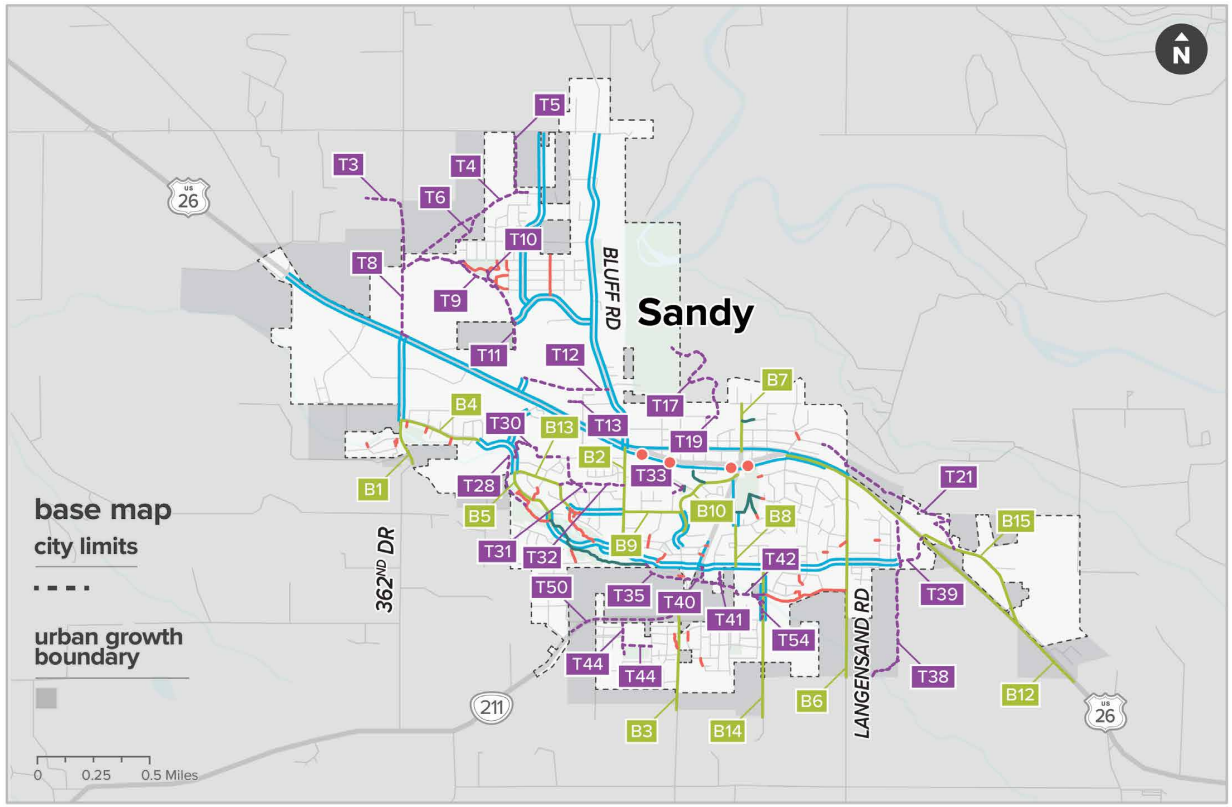


figure 9

Pedestrian Improvements & Facilities

Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

bicycle



bicycle improvement type

bicycle lanes

trails

existing bicycle facilities

bicycle lanes

unpaved trail

project ID

paved path

narrow parking

Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

figure 10

Bicycle Improvements & Facilities

transit projects

Transit projects would enhance the quality and convenience for passengers. Eight transit projects were identified. Most of these projects will be led by Sandy Area Metro and can be implemented with different funding sources than the driving, walking, biking, and safety projects and so were not considered for the financially constrained list. Some pedestrian crossing projects were included based on needs identified in the Sandy Transit Master Plan and will serve pedestrians in the downtown area as well as transit riders.

TRANSIT PROJECTS	
LOCAL SERVICE IMPROVEMENTS – FIXED ROUTES	Add Saturday service, lengthening the service hours, adding an additional shuttle route that reaches the Vista Apartments.
LOCAL SERVICE IMPROVEMENTS – FLEXIBLE SERVICES	Add a bus and driver.
LOCAL SERVICE IMPROVEMENTS – ELECTRIC BUSES	Purchase one or more electric buses, a charging station, and the required maintenance equipment.
ADDITIONS TO REGIONAL SERVICE – GRESHAM EXPRESS	Higher frequencies on Saturdays or Sundays, more night and morning service on Saturdays or Sundays, Occasional additional trips that go directly to important destinations.
ADDITIONS TO REGIONAL SERVICE – NEW CLACKAMAS EXPRESS	Coordinate with Clackamas County, the City of Boring and TriMet to plan and fund a route connecting these communities.
ADDITIONS TO REGIONAL SERVICE – IMPROVED BUS STOPS	Coordinate with the City of Gresham and TriMet to invest in better stop amenities at the Gresham Transit Center.
PEDESTRIAN IMPROVEMENTS – TRANSIT CENTER	Improve access to the transit center by providing crossing treatments from every direction specifically at Proctor and Pioneer Blvd at Hoffman Ave. TSP projects include C3 & C4 – Hoffman Ave at Proctor and at Pioneer Crossing Improvement, these projects require coordination with ODOT.
PEDESTRIAN IMPROVEMENTS – EVANS ST CROSSING	Construct a crosswalk or traffic calming treatment on Evans St. TSP projects include C1 – Van Fleet Ave/Evans St Crossing Improvement, this project would be lead by SAM.

safety

Safety projects primarily reduce the risk of collisions. Many bicycle, pedestrian, and driving projects also improve safety along with improving capacity for their respective travel modes. There are three safety projects at a cost of $325,000.

PROJECT ID	NAME	PROJECT ELEMENTS	ESTIMATED COST (2021 DOLLARS)	LEAD AGENCY	PACKAGE
S1	US 26 Adaptive Signal System	Install an adaptive signal control system on US 26 between Orient Drive and Bluff Road.	$200,000	ODOT	1
S2	US 26 at Ten Eyck Road Study	Study improvements to business access at Ten Eyck Road and US 26.	$50,000	ODOT	1
S3	US 26 Speed Zone Study	Study speeds east of Ten Eyck Road/Wolf Drive along US 26. Coordinate with C17 and D20 to consider the impact of the Dubarko extension (D20) and if an intersection control modification is necessary.	$75,000	ODOT	1

funding

The total cost of the transportation system projects is far greater than the City's ability to raise funds. Unless Sandy develops additional revenue streams, the City can expect to have no more than $10.8 million of local street funds to spend on locally-funded improvements over the next 20 years.

city funding gap:

Sandy has just $10.8 million to fund the total cost of the locally funded transportation system projects.

transportation system maintenance:

Nearly 76% of Sandy's current revenue streams for transportation fund maintenance of the existing system.

The City uses six general funding sources for transportation, including funds from:

Infrastructure Investment Jobs Act (IIJA). Federal transportation funds allocated from the IIJA flow to the states that use them primarily for safety, highway, and bridge projects. Sandy receives a portion of these funds based partially upon population.

The State Highway Trust Fund. The State Highway Trust Fund makes distributions from the state motor vehicle fuel tax, vehicle registration and title fees, driver license fees, and truck weight-mile taxes. Cities and counties receive a share of State Highway Trust Fund monies based on registered vehicles, and by statute may use the money for any road-related purpose, including walking, biking, bridge, street, signal, and safety improvements.

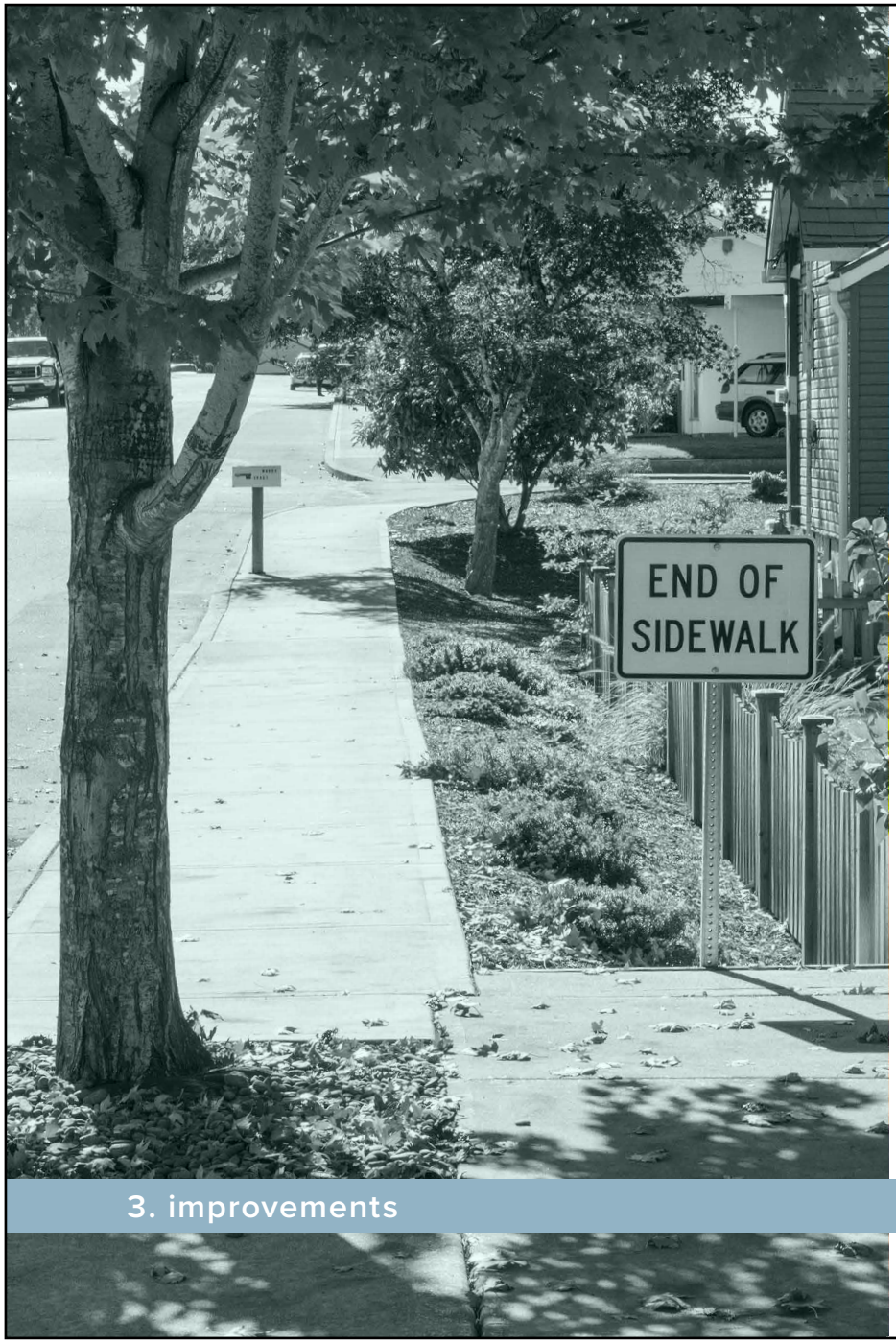
The state gas tax funds previously have failed to keep up with cost increases and inflation. With increased fuel efficiency of vehicles and the State's emphasis on reducing vehicle miles traveled, the real revenue collected gradually has eroded over time. To offset the relative decline in contribution to state funds these fees are periodically increased to generate higher revenue for the state. Vehicle registration fees in Oregon recently increased from $86 to $112 per vehicle per year for passenger cars, with similar increases for other vehicle types. The gas tax in Oregon is currently 36 cents per gallon.

Local Gas Tax. Sandy collects a local tax from fuel distributors within the city limits. These funds have historically been used for roadway maintenance of streets under City jurisdiction. The gas tax was approved in 2002 at one cent per gallon. The gas tax was increased to two cents per gallon in 2009.

revenues vs. expenditures:

$42 million in revenue is expected through 2040 compared with $32 million in expenditures for maintenance or other committed costs such as the Bell Street extension.

Clackamas County Vehicle Registration Fee. Clackamas County commissioners approved a $30 per year vehicle registration fee to fund road maintenance and construction projects. Sandy will receive an estimated $200,000 annually which will be used to construct various transportation projects.



System Development Charges. Street System Development Charges (SDC) are collected from new development applications within the City of Sandy based on the proposed land use. The SDC fees are determined based on each land use's potential to generate new vehicle trips. SDC's are a funding source for all capacity adding projects. The funds collected can pay for constructing or improving portions of roadways impacted by applicable development and include roadway improvements, bikeways, and pedestrian facilities. The City of Sandy currently applies an SDC of $4,826.00 per single family dwelling unit or $304.10 per adjusted average daily person trip for non-residential land uses.

Grants. Sandy was awarded a Transportation Growth and Management grant to fund the current update to the Transportation System Plan. Future funding of projects from grants are not guaranteed and are awarded through a competitive application and review process. Grants typically provide an opportunity for securing funding for important capital projects that do not have sufficient City funds to complete.

Based on the above sources, Sandy is expected to have $42 million in revenue for the transportation system through 2040. The current expenditures total approximately $32 million, or nearly 76 percent of Sandy's current revenue streams, allocated for transportation fund maintenance of the existing system. Rising maintenance costs through 2040 will diminish the share of funds available for improvements to the transportation system. The remaining balance of $10.2 million is expected to be available to fund other expenditures such as the projects in the TSP.

For more information on the funding assumptions utilized for the TSP, see **Appendix Section C**.

4 financially constrained

The TSP sets priorities for spending anticipated funds and identifies projects that would be possible with additional funding. The financially constrained plan identifies the transportation solutions that the city prioritizes for funding and implementation by 2040. These projects reflect the highest priority projects identified by the CAC and public that are likely to be funded in the next 20 years. The City currently receives funding from a variety of sources including the Highway Trust Fund, a 2 cent local gas tax, the Clackamas County Vehicle Registration Fee, System Development Charges, federal funding, and grants. The City has also instituted a proportional share fee for Highway 211 and Dubarko Road. The fee is charged for new development per trip that travels through the intersection. Due to uncertainty about future development that would be subjected the fee, funds from the proportionate share fee are not included in available funds for the financially constrained plan. The proportional share calculation can be found in **Appendix L**. ODOT has projected that the City could receive up to $1 million from various state and/or federal sources over the next 20 years. Based on current needs, **Table 3** and **Figure 11** show how the City could use the state funds. The projects listed are illustrative only and ODOT does not give them higher priority than any other US 26 project in the City's list. The City may modify and adapt the list to advance any supported project along US 26 in response to any opportunity or issue that may arise during the planning horizon.

financially constrained projects

The following pages include the financially constrained projects in chart form and on the accompanying map. Improvement Package 1, Financially Constrained Plan totals the $10.8 million likely to be available through existing City funding sources. It also suggests how the City would use a likely amount of revenue from state and/or federal sources.

TABLE 3. CONSTRAINED STREET DESIGN OPTIONS

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
PEDESTRIAN IMPROVEMENTS (2 PROJECTS)			
P1	362nd Drive	This project constructs sidewalk to fill in existing gaps along the west side of 362nd Drive from Chinook Street to Industrial Way. By filling in sidewalk gaps along 362nd Drive this project improves the low-stress pedestrian network and access to the shopping center at 362nd Drive and US 26.	The $1,000,000 cost is expected to be primarily funded by developers as undeveloped parcels adjacent to 362nd Drive are developed, any remaining funds would come from System Development Charges (SDC).
P3	Bluff Rd	This project constructs sidewalk to fill in existing gaps along the west side of Bluff Road from Bell Street to the parcel at 15931 SE Bluff Road. This project improves the low-stress pedestrian network in the vicinity of Sandy High School, Jonsrud Viewpoint, and the residential area to the west of Bluff Road.	The $875,000 cost is expected to be primarily funded through the road fund and System Development Charges (SDC).
CROSSING IMPROVEMENTS (12 PROJECTS)			
C5	CRMS - Bluff Road at Marcy	This project improves the intersection crossing by constructing a Rectangular Rapid Flashing Beacon (RRFB) with School Crossing Assembly, and high visibility crosswalks across the north and east sides of the intersection.	The $125,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C6	CRMS - Bluff Road at Hood	This project improves the intersection by modernizing the crossing, particularly with curb extensions.	The $125,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.

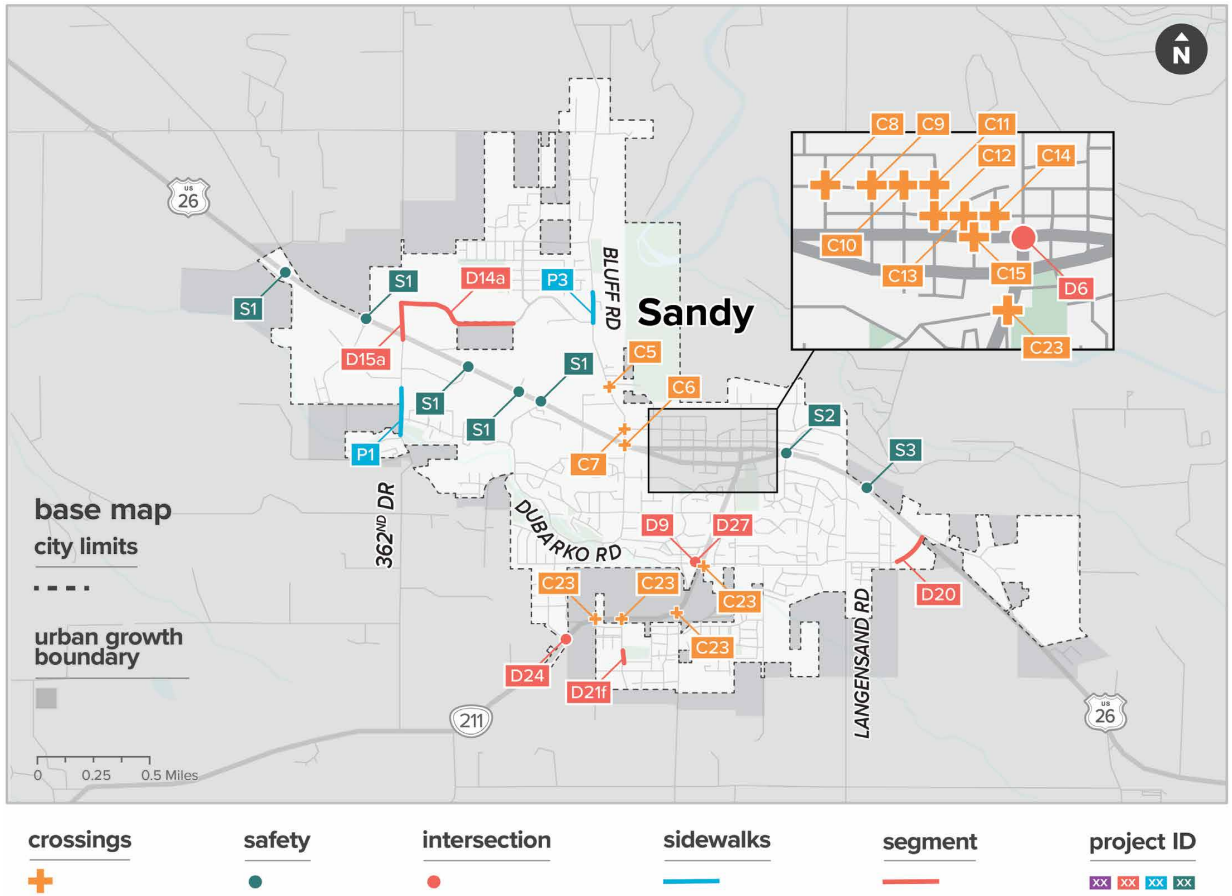
PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
C7	CRMS – Bluff Road at US 26	This project improves the intersection modernizing the crossing by reducing the curb radius at all corners, adding pedestrian-scale lighting and improvement of the bicycle network by providing buffered or separated bicycle facilities at the intersection crossing. Pending coordination with ODOT, the pedestrian signal crossing time may be increased, based on a slower walking speed.	The $125,000 cost, which does not assume a fully separated bike facility, is expected to be primarily funded by ODOT with additional funding expected from a Safe Routes to School grant and local funding from the road fund and urban renewal fund.
C8	CRMS – Hood Street at Beers	This project improves the intersection by repainting stop bars on Beers Avenue and improving the intersection control by installing stop signs for the Hood Street approaches, creating a 4-way stop intersection.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C9	CRMS – Hood Street at Scales	This project improves the intersection by installing perpendicular curb ramps with tactile domes at the intersection of Hood St and Scales Ave and repainting stop bars.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C10	CRMS – Hood Street at Bruns	This project improves the intersection by installing a tactile dome at the southwest corner of Bruns Ave and Hood St.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C11	SGS – Hood/Strauss	This project improves the intersection by: • Relocating the southbound school advance crossing sign and school speed limit sign north of intersection. • Repairing sidewalk along the east side of Strauss Avenue and mitigating the narrowing caused by a utility pole. • Installing a curb ramp at the southeast corner of the intersection and adding tactile domes and a stop bar on the west leg of the intersection.	The $350,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C12	SGS – Pleasant/Strauss	Pleasant Street at Strauss Avenue: This project improves the intersection by marking stop bars in advance of crosswalks and potentially revising the control of the intersection to be all-way stop control.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
C13	SGS – Pleasant/Alt	This project improves the intersection by marking stop bars in advance of crosswalks, replace existing diagonal curb ramps with perpendicular curb ramps and tactile domes, and constructing a raised intersection.	The $350,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C14	SGS – Smith/Pleasant	This project improves the intersection by marking stop bars in advance of crosswalks, relocating the southbound school advance crossing sign and school speed limit sign north of the intersection.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C15	SGS – Alt/US 26	This project improves the intersection by increasing the pedestrian crossing time based on a walking rate of 3.0 feet per second, upgrading the pedestrian pushbuttons to meet current standards with audible indications, and consolidating the two existing crosswalks with one high visibility continental crosswalk on the east side of the intersection including an advance stop bar, bulb outs, curb ramps, and pedestrian scale lighting.	The $125,000 cost is expected to be primarily funded through an ODOT grant. Additional funding is expected from the road fund, urban renewal fund, and potential grant funding.
C23	Hwy 211 Pedestrian Improvements	These American with Disabilities Act related ramp improvements along Highway 211 are currently funded by $500,000 received from ODOT as part of the jurisdictional transfer of Highway 211 from ODOT to the City of Sandy.	Funded
SAFETY IMPROVEMENTS (3 PROJECTS)			
S1	US 26 Adaptive Signal System	This project extends the adaptive signal system from Orient Drive to Ruben Lane. An adaptive signal system improves performance and monitoring of traffic signals by providing real-time adjustments and improved data collection.	The $200,000 cost is expected to be funded by ODOT.
S2	US 26 at Ten Eyck Road Study	This project studies improvements or mitigations related to traffic impacts from access for business adjacent to the Ten Eyck Road and US 26 intersection.	The $50,000 cost is expected to be funded by ODOT and the road fund.
S3	US 26 Speed Zone Study	This project studies speeds east of Ten Eyck Road/Wolf Drive along US 26 for consideration of a potential reduction. It should be coordinated with C17 (Dubarko pedestrian crossing improvements) and D20 (Dubarko Road extension) to consider if an intersection control modification is necessary.	The $75,000 cost is expected to be primarily funded by ODOT.

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
DRIVING IMPROVEMENTS (10 PROJECTS)			
D3	US 26 & 362nd Drive Intersection Improvement	This project is expected to reduce congestion for the westbound left turn and accommodate the 362nd Drive Extension 1 (D15a). The project includes minor widening on the south leg to accommodate a northbound through lane, construction of a three-lane southbound approach with a right turn lane, through lane, and left turn lane, and an eastbound left turn lane.	This project is currently funded with local funds without an additional westbound left turning movement. The additional westbound left turn lane is dependent on the 362nd Drive and Industrial Way improvements (D1) that would extend the second southbound lane from the Fred Meyer driveway to the Industrial Way intersection. The second westbound left turn lane should be coordinated with project D1.
D6	Highway 211 & Proctor Boulevard Northbound Approach Modification	This project restripes the northbound approach to clearly indicate the set back stop bar and associated keep clear distance.	The $15,000 cost is expected to be funded through the road fund.
D9	Highway 211 & Dubarko Road Multimodal Intersection Improvement	This project improves safety and multimodal connectivity and should be coordinated with the recommendations in project D27 Highway 211 & Dubarko Road Intersection Control Evaluation and C23 ADA improvements along Highway 211.	The $500,000 cost is expected to be funded through the road fund and system development charges.
D14A	Bell Street Extension to 362nd Drive Extension	This project extends Bell Street to 362nd Drive extension (D15a) at Minor Arterial cross section standards. It improves connectivity by providing a parallel route to US 26 from 362nd Drive to Bluff Road.	This project is currently funded with local funds.
D15A	362nd Drive Extension to Bell Street Extension	This project extends 362nd Drive to Bell Street extension (D14a) at Minor Arterial cross section standards. It improves connectivity by providing a parallel route to US 26 from 362nd Drive to Bluff Road.	This project is currently funded with local funds.
D20	Dubarko Road to US 26 Opposite Vista Loop Drive (West)	This project extends Dubarko Road to US 26/Vista Loop Road (west) at Minor Arterial cross section standards. It should be coordinated with D9 (US 26 Dubarko Road intersection improvement) and C17 (US 26 Dubarko Road pedestrian crossing improvement).	This project is expected to be constructed by development, with partial SDC credits, with an expected cost of $3,900,000.
D21F	Village Blvd Extension 1	This project connects Village Boulevard between Cascadia Village Drive and Juniper Street at Collector standards providing additional north-south connectivity for the neighborhood south of Highway 211.	The $875,000 cost is expected to be funded by the City through system development charges and partially by development.

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
D24	Highway 211 Roundabout at Gunderson	This project improves the intersection of Highway 211 at Gunderson Road by constructing a roundabout.	The $1,000,000 cost is partially funded by development with the remaining amount provided by the road fund and system development charges.
D27	Highway 211 & Dubarko Road Intersection Control Evaluation	This project studies the intersection control options for Highway 211 and Dubarko road given the strain of high traffic volumes and difficult topography. The resulting solutions should improve safety and capacity. While the specific intersection improvement is unknown, for financial planning purposes the improvement from the 2011 TSP is used. This includes construction of a traffic signal with widening for a northbound left and right turn lane and a southbound left turn lane. The inflated project cost (to 2021 dollars) is reflected in the proportional share fee calculation included in Appendix Section L. After completion of this intersection control evaluation the proportional share fee will be updated to reflected the cost of the expected improvement.	The $50,000 cost is expected to be funded through the road fund and system development charges.
D31	US 26 Sandy Bypass Planning	This project includes preparation of planning documents to evaluate alternatives and the environmental impact of a potential US 26 bypass. This project consists of planning work only, not directly resulting in any capital improvement, and is not included in the map.	The $1,000,000 is expected to be funded by the City.

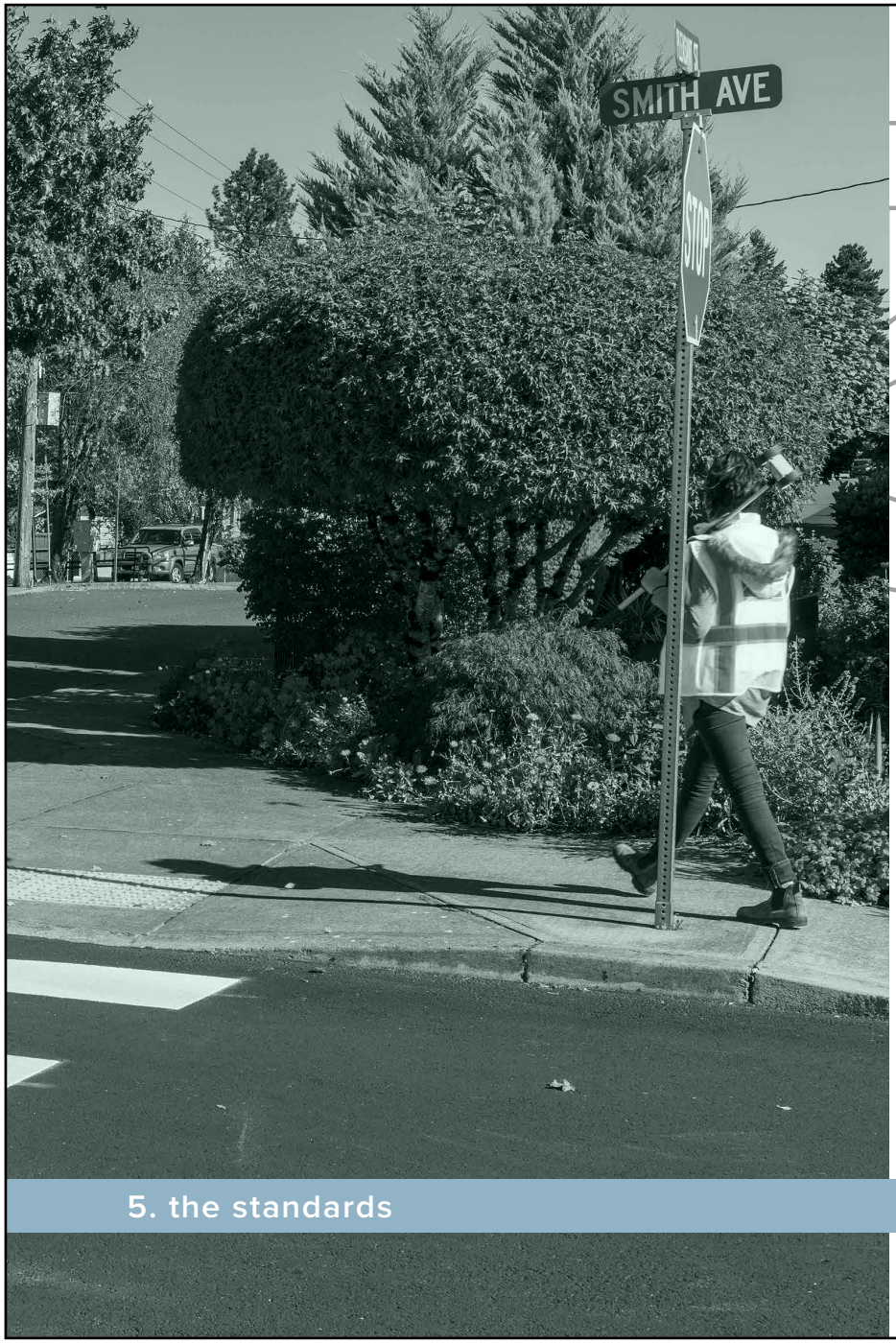
financially constrained plan



Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

figure 11

Financially Constrained system



5 the standards

The TSP sets standards and regulations to ensure future development or redevelopment of property is consistent with the City's transportation vision and goals (see Volume 2, Sections D and H for more information).

A road's functional classification (shown in **Figure 13**) determines the level of mobility for all travel modes for anticipated level of access and usage. The functional classification system recognizes that individual streets do not act independently of one another, but instead form a network that serves travel needs on a local and regional level. From highest to lowest intended traffic volume, the functional classifications are: principal arterial, minor arterial, collector, and local streets. Roadways with higher classification generally limit access to adjacent property in favor of more efficient motor vehicle traffic movement (i.e., mobility). Local roadways with lower classification have more driveway access and intersections, and generally accommodate shorter trips to nearby destinations.

functional classifications

principal arterials

Principal Arterials serve the highest volume of motor vehicle traffic and are primarily used for longer distance regional trips. The only roadway in the city classified as a principal arterial is US 26, which is under ODOT jurisdiction.

minor arterials

Minor Arterials are high-volume, intra-city streets providing connectivity and parallel features, and should generally be spaced approximately one mile apart. These roads have a typical capacity between 8,000 and 16,000 ADT. Minor arterials are generally the most important classification for circulation within Sandy and are intended to serve longer local trips. Private driveway access is discouraged where access to facilities of lower classification is available, and traffic calming measures and on-street parking should be avoided. The provision of bike lanes is required.

collectors

Collector streets provide both access and circulation within and between residential and commercial areas. These roads have a typical capacity between 2,000 and 6,000 ADT. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access (compared to arterials), and penetrate residential neighborhoods, distributing trips from the local street system to minor and major arterials. Collectors may provide on-street parking, may incorporate traffic calming measures, and should be spaced approximately one-half mile apart. The provision of bike lanes is required.

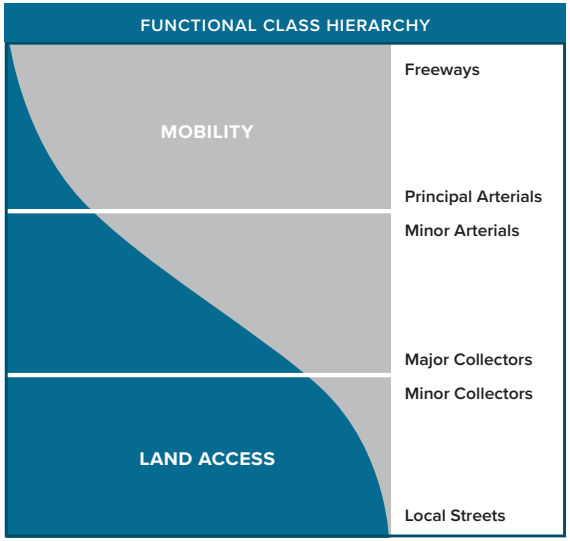
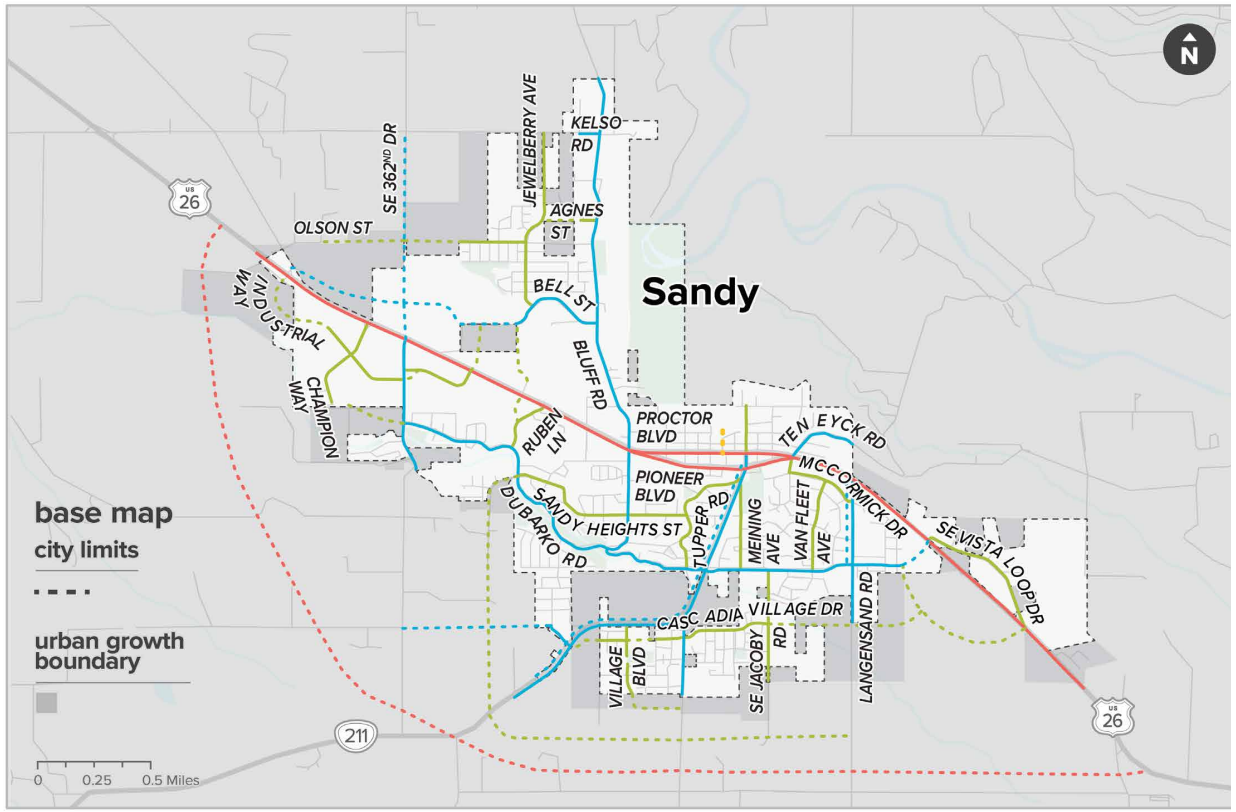


figure 12

Functional Class Hierarchy

local streets

Local Streets provide more direct access to residences without serving through travel. These roadways are often lined with homes and are designed to serve lower volumes of traffic. Streets in Sandy that are not classified as Major Arterials, Minor Arterials, or Collectors are classified as Local Streets.



Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

figure 13

Functional Classification

typical street cross section standards

Figures 15 to 18 and **Table 4** include standard cross-section types for city roadways, with guidelines for constrained areas where design elements may need to be reduced shown.

Figure 14 shows the cross-section options for local streets. Local streets should be designed so that moving cars must occasionally yield between parked cars before moving forward, as shown in the sidebar images, allowing for the development of narrow streets, encouraging vehicles to move slower, and allowing for periodic areas where a 20-foot-wide clear area is available for parking of fire apparatus. Local streets require placement of no-parking locations (i.e., driveways, fire hydrants, mailboxes) at appropriate intervals to provide the needed gaps for queuing opportunities. Also, parking near intersections on narrow streets should not be permitted because it can interfere with the turning movements of large vehicles. The Junker Street Circulation Plan (2021) identifies specific cross section standards for Junker Street. A separate cross section is included in **Figure 18**.

Design standards for Principal Arterials in Sandy (US 26) are controlled by the Blueprint for Urban Design in the Oregon Highway Design Manual and are not completely duplicated in the TSP.

figure 14

Local Street – Yielding Traffic Behavior

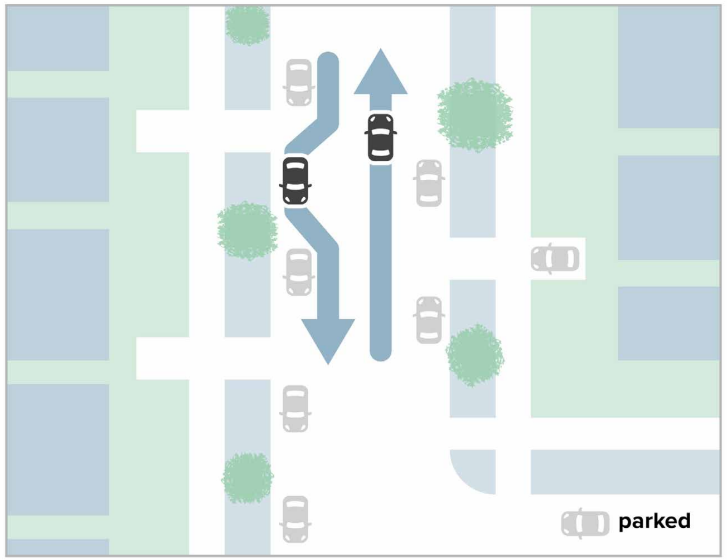


figure 15

Minor Arterial Cross Section

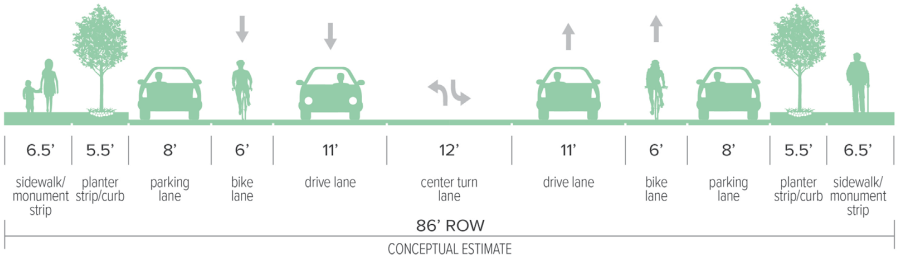


figure 16

Cross-section of Collector

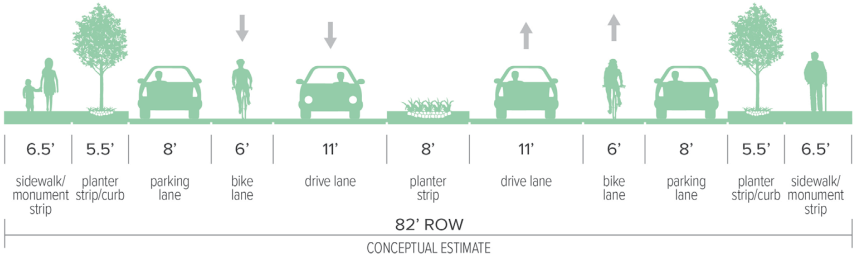


figure 17

Cross-section of Local Street

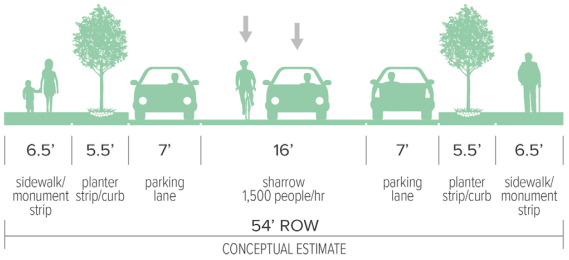
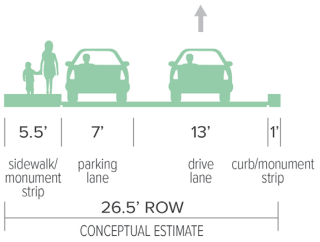


figure 18

Cross-section of Junker Street



city facility

TABLE 4. CROSS-SECTION STANDARDS

CROSS-SECTION	TOTAL ROW	SIDEWALK	PLANTER STRIP	PARKING	BIKE LANE	TRAVEL LANE	CENTER LANE
MINOR ARTERIAL – STANDARD	86	6.5[C]	5.5[D]	8[G]	6	11	12
MINOR ARTERIAL – MINIMUM[B]	66	6.5[C]	5.5[D]	-	6	11	8
COLLECTOR – STANDARD	82	6.5[C]	5.5[D]	8	6	11	8
COLLECTOR – MINIMUM[B]	58	6.5[C]	5.5[D]	-	6	11	-
LOCAL	54	6.5[C]	5.5[D]	7	-	16[A]	-
JUNKER STREET	26.5	5.5[AC]	1[ACD]	7[A]	-	13[A]	5

A Not directional, this element only appears once in the cross section

B Minimum cross section designs can be applied per Section 17.66.00 SMC

C Includes 0.5' monument strip

D Includes 0.5' curb

E All dimensions in feet

F As shared use path

G Parking is optional

shared-use paths

Shared-use paths provide off-roadway facilities for walking and biking travel. Depending on their location, they can serve both recreational and commuter needs. Shared-use path designs vary in surface types and widths. Hard surfaces are generally better for bicycle travel. Widths need to provide ample space for both walking and biking and should be able to accommodate maintenance vehicles.

Sandy requires that shared-use paths are paved and are 12 feet wide (see **Figure 19**). This design standard applies to newly constructed or improved facilities and does not apply to existing shared-use paths.

figure 19

Shared-Use Path Street

roadway & access spacing standards

Access management is a broad set of techniques that balance the need to provide for efficient, safe, and timely travel with the ability to allow access to individual destinations. Appropriate access management standards and techniques can reduce congestion and accident rates and may reduce the need for construction of additional roadway capacity.

Table 5 identifies minimum public roadway intersection and minimum private access spacing standards for streets in Sandy. New roadways or redeveloping properties must comply with these standards to the extent practical, as determined by the City. As the opportunity arises through redevelopment, streets not complying with these standards could improve with strategies such as shared access points, access restrictions (through the use of a median or channelization islands), or closure of unnecessary access points, as feasible.

Like street design and mobility targets, access spacing standards for US 26 are determined by ODOT. ODOT spacing standards are defined in the Oregon Highway Plan (OHP), OAR 734-051, and ODOT's Highway Design Manual.

city facility

TABLE 5. STREET AND ACCESS SPACING STANDARDS

CROSS-SECTION	MAJOR ARTERIAL	MINOR ARTERIAL	COLLECTOR	LOCAL STREET
DISTANCE BETWEEN PUBLIC STREETS	5,280 feet	5,280 feet	2,640 feet	400-600 feet
MINIMUM DRIVEWAY SPACING (PUBLIC STREET TO DRIVEWAY AND DRIVEWAY TO DRIVEWAY)	See **Table 6**	400 feet or 200 with restricted right-in/ right-out access	300 feet or 150 with restricted right-in/ right-out access	Covered by the Sandy Development Code

Note: All distances measured from center to center of adjacent approaches.

TABLE 6. OHP ACCESS MANAGEMENT SPACING STANDARDS FOR STATEWIDE HIGHWAYS

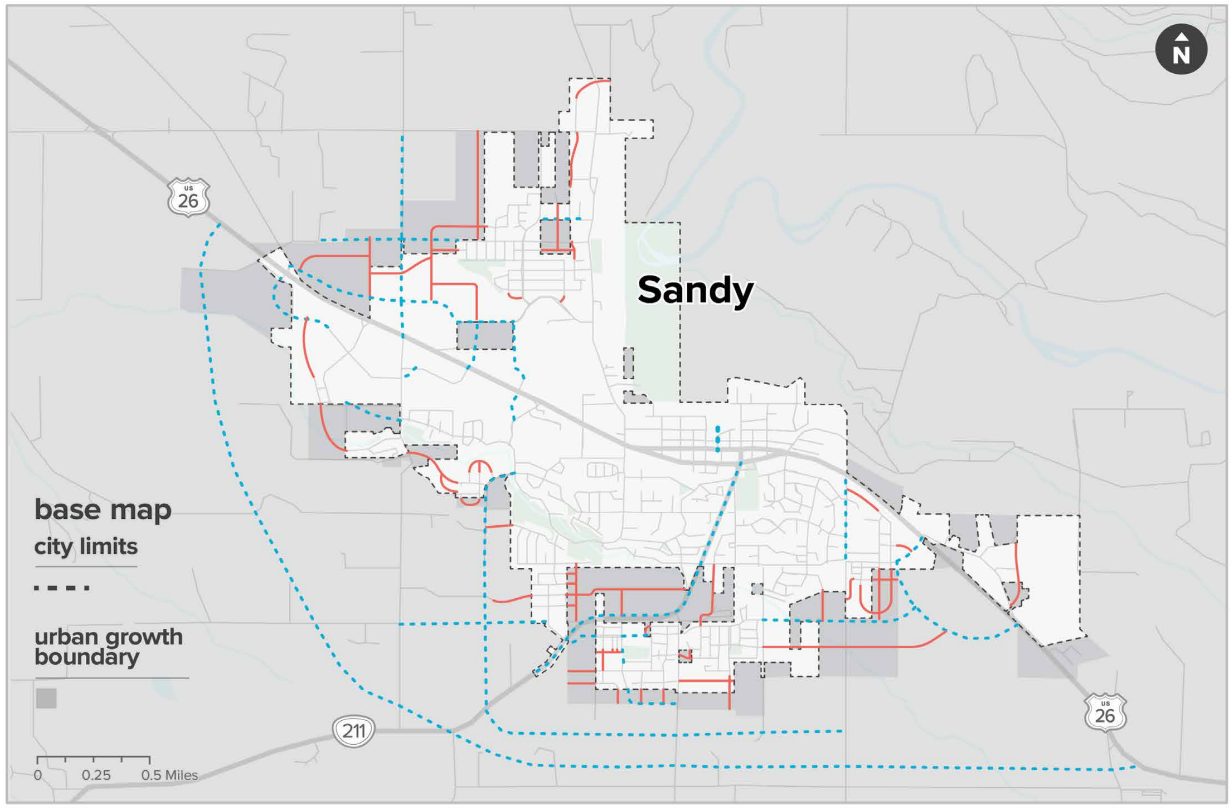
SPEED	RURAL EXPY[A]	RURAL	URBAN EXPY[AB]	URBAN[C]
≥ 55	5280 feet	1320 feet	2640 feet	1320 feet
50	5280 feet	1100 feet	2640 feet	1100 feet
40 & 45	5280 feet	990 feet	2640 feet	800 feet
30 & 35	n/a	770 feet	n/a	500 feet
≤ 25	n/a	550 feet	n/a	350 feet

A Spacing for Expressway at-grade intersections only. See OHP Table 12 for interchange spacing.

B These standards also apply to Commercial Centers.

C The Urban standard applies in UBAs unless a management plan agreed to by ODOT and the local government(s) establishes a different standard. Spacing standards on access controlled facilities are also guided by those controls.

Note: All distances measured from center to center of adjacent approaches.



Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy

local street connectivity

Figure 20 shows the Local Street Connectivity Plan aimed to provide adequate multimodal connectivity and reduce potential neighborhood traffic impacts by balancing traffic flows on local streets. The specific alignments and design will be determined upon development review.

figure 20

Local Street Connectivity

mobility targets

Mobility targets for streets and intersections in Sandy provide a metric for assessing the impacts of new development on the existing transportation system and for identifying where capacity improvements may be needed. They are the basis for requiring improvements needed to sustain the transportation system as growth and development occur. Two methods used to gauge operational conditions for motor vehicles include volume-to-capacity (v/c) ratios and level of service (LOS).

Volume-to-capacity (v/c) ratio: A v/c ratio is a decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. The ratio is the peak hour traffic volume divided by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. A ratio approaching 1.00 indicates increased congestion and reduced performance.

Level of service (LOS): LOS is a "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay is excessive and demand exceeds capacity, typically resulting in long queues and delays.

Assuming Sandy grows in accordance with its current adopted land use plan and travelers continue to rely heavily on private autos for their trips, US 26 through the city will not be able to meet ODOT's v/c ratio-based mobility targets. In this situation, adoption of alternative mobility targets is appropriate. Alternative mobility targets reflect realistic expectations for roadway performance at the end of the 20-year planning horizon, based on traffic projections. Adopting realistic alternative targets allows for planned development and does not put additional burdens on investments to comply with unachievable targets.

ODOT and Sandy are planning to adopt alternative mobility targets as part of a long-term strategy for this corridor that would reflect the growing local population and increased traffic on US 26. This approach recognizes that the existing mobility targets do not utilize the full capacity available at the intersections along US 26. The purpose of alternate mobility targets is not to allow more congestion along US 26 in the city but to acknowledge the growth that has occurred, and is expected to occur in the future, based on an adopted comprehensive plan land use, and to provide a helpful metric to track the impact of that growth on the transportation system.

mobility targets for sandy:

The City of Sandy operating standards require that a level of service "D" or better be maintained for any signalized intersection and unsignalized intersections with stop control on the minor approach.

This transportation system plan introduces an operating standard for roundabouts. This standard requires a volume-to-capacity ratio of less than or equal to 0.90 on each intersection approach.

State-owned roadways are intended to comply with the mobility targets included in the Oregon Highway Plan. Current ODOT mobility targets require 5 hours of congestion or less to be maintained at intersections along US 26 through Sandy.

Funding constraints for capital projects means it is likely that mobility targets will not be met in 2040. The City is working with ODOT to establish an alternative mobility target for US 26 that reflects the performance that is forecast based on no significant capacity improvements over the planning horizon.

transportation impact analysis (TIA) guidelines

Sandy Transportation Impact Analysis (TIA) requirements implement Sections 660-012-0045(2)(b) and -0045(2)(e) of the State Transportation Planning Rule (TPR). These sections require the City to adopt mobility targets and a process to apply conditions to land use proposals in order to minimize impacts on and protect transportation facilities.

Appendix Section F includes the City's required content for a Transportation Impact Analysis (TIA). In general terms, the TIA applies to developments that are presumed to have a transportation impact.

A professional engineer licensed in Oregon must prepare the TIA and must use appropriate data, methods, and standards as documented in the Sandy Guidelines for Transportation Impact Analysis.

the outcome

How will the constrained investment recommendations in the TSP improve the performance of the transportation network in Sandy? To answer this question, the TSP evaluated investment decisions and compared them to anticipated trends through 2040.

the improved transportation system

Sandy expects the following results from the TSP by 2040:

safer streets

Safer Streets: Sidewalk infill and crossing improvements in downtown will improve safety for people walking and especially children accessing Sandy Grade School, Cedar Ridge Middle School, and the Sandy Public Library. The proposed Adaptive Signal Control Technology extension along US 26 should improve signal operations and reduce congestion, likely reducing some of the collisions associated with congestion traffic conditions. Other projects in the TSP aim to reduce the frequency and severity of crashes.

increased congestion on US 26

Increased congestion on US 26: While the funded Bell Street and 362nd Drive Extension projects will increase road network density and improve local street connections (off US 26) traffic volumes will be higher, and congestion will be worse than it is now.

greater street connectivity

Greater street connectivity: As areas of the city develop, new streets will provide increased motor vehicle, pedestrian, and bicycle connectivity. Improved local street connectivity also reduces reliance on US 26 for local trips.

to the horizon & beyond

The 2023 Sandy TSP has not resolved all the of the city's transportation issues. The following require additional exploration.

potential additional funding sources

Based on the identified funding gap, Sandy may wish to consider expanding its funding options in order to fund more of the desired improvements in a timely manner. Other cities and counties use one or more of the following sources to fund the capital and maintenance aspects of their transportation programs. A variety of factors affect use of these sources, including the willingness of local leadership and the electorate to collect taxes and fees from residents and business, the availability of local funds the City can dedicate or divert to transportation issues from other competing City programs, and the availability of state and federal funds. The City should consider opportunities for providing or enhancing funding for the transportation improvements included in the TSP.

System Development Charges: System development charges (SDC) are fees collected from new development and used as a funding source for all capacity adding projects for the transportation system. The fee is based on the proposed land use and size and is proportional to each land use's potential PM peak hour vehicle trip generation. The City of Sandy is currently updating their SDCs which are expected to increase the available revenue available for the City.

Transportation Utility Fee: A transportation utility fee is a recurring monthly charge that could be paid by all residences and businesses within the City. The City can base the fee on the estimated number of trips a particular land use generates or as a flat fee per residence or business. This fee is typically collected through regular utility billing; however, it could be collected as a separate stand-alone bill.

Existing law places no express restrictions on the use of transportation utility fee funds, other than the restrictions that normally apply to the use of government funds. Some local agencies utilize the revenue for any transportation related project, including construction, improvements, and repairs; however, many choose self-imposed restrictions or parameters on the use of the funds.

Sandy Fuel Tax Increase: A local fuel tax increase to 4 cents per gallon could generate an additional $305,000 annually or $6.1 million through 2040. Sandy citizens voted down a measure to increase the gas tax to 3 cents per gallon in 2016.

Local Improvement District: Local improvement districts (LIDs) can fund capital transportation projects that benefit a specific group of property owners. LIDs require owner/voter approval and a specifically defined project. Benefiting properties pay for the improvements through assessments. LID projects that benefit more than the adjacent properties can serve as match for other funds. Property owners pay fees through property tax bills over a specified number of years.

Debt Financing: While not a direct funding source, debt financing is another funding method. Through debt financing, available funds can be leveraged, and the cost can be spread over the project's useful life. Though interest costs are incurred, the use of debt financing can serve not only as a practical means of funding major improvements, but it is also viewed as an equitable funding source for larger projects because it spreads the burden of repayment over existing and future customers who will benefit from the projects. One caution in relying on debt service is that a funding source must still be identified to fulfill annual repayment obligations.

to the horizon & beyond

ODOT Statewide Transportation Improvement Program (STIP) Enhance Funding: The Oregon Transportation Commission selects projects proposed by ODOT and local jurisdictions for STIP funding. Historically, only projects on the state highways were eligible for funding. ODOT has modified the selection process to allow funding for projects off the state system that enhance system connectivity and improve multi-modal travel options. The TSP prepares the City to apply for STIP funding.

ODOT Highway Safety Improvement Program (HSIP) Funding: With significantly more funding under the HSIP and direction from the Federal Highway Administration to address safety challenges on all public roads, ODOT will increase the amount of funding available for safety projects on local roads. ODOT will distribute safety funding to each ODOT region, which will collaborate with local governments through the All Roads Transportation Safety (ARTS) Program to select projects that can reduce fatalities and serious injuries, regardless of whether they lie on a local road or a state highway.

Multimodal Active Transportation Fund: In 2017, the Oregon Legislature passed Keep Oregon Moving (House Bill 2017), which includes changes to the existing Connect Oregon Grant Fund program that necessitates aligning the implementing rules with the new statutes. The legislation bifurcated the program into two new parts, with a separate allocation of 7% for multimodal active transportation projects.

In 2019, the Oregon Legislature passed House Bill 2592 to clarify and amend House Bill 2017. The legislation establishes the Multimodal Active Transportation (MAT) Fund for bicycle and pedestrian projects, consisting of 7% of the Connect Oregon Fund plus revenues from Oregon's bicycle excise tax. The MAT is a separate grant program from Connect Oregon and requires a new set of administrative rules. The legislation also clarifies roles and responsibilities between ODOT and the Oregon Department of Parks and Recreation to provide funding to bicycle and pedestrian projects with up to $4 million of lottery revenues annually.

Safe Routes to School Programs: Safe Routes to School refers to efforts that improve, educate, or encourage children safely walking (by foot or mobility device) or biking to school. ODOT has two main types of Safe Routes to School programs: infrastructure and non-infrastructure.

to the horizon & beyond

Infrastructure programs focus on making sure safe walking and biking routes exist through investments in crossings, sidewalks and bike lanes, flashing beacons, and the like. Non-infrastructure programs focus on education and outreach to assure awareness and safe use of walking and biking routes. ODOT manages funding competitions for both infrastructure and non-infrastructure programs at the annual levels of $15 million and $300,000 respectively.

technology advancements

The TSP is a plan for conditions 20 years into the future; however, it cannot anticipate all advancements in technology or their impact on the way people travel to and within Sandy. Advancements may include alternative fuel sources that lower the cost of driving and operating transit service, connected vehicle technology that improves the safety and efficiency of roadways, proliferation of electric-assisted bicycles that take the effort out of traveling across hilly topography and expand the number of travelers who can make that choice of mode. The TSP recommends that the City continue to monitor opportunities arising from innovations in transportation technology and anticipate their impact on investment priorities.

US 26 bypass

A US 26 bypass feasibility study was conducted in coordination with the TSP update. The study identified the available funding and timeline needed for planning, approving and constructing a bypass would by beyond the 20-year planning horizon. TSP project D31 allocates local funds towards preliminary planning efforts to advance the project. The 20-year cost estimate for the US 26 Bypass is approximately $1 billion.

detailed analysis of physical constraints

All proposed improvements in this plan are conceptual. The plan has not analyzed these improvements for hydrologic, topographic, or other geological constraints, which could require substantial modifications. Detailed surveys need to precede construction of these improvements.

future street extensions

As property develops or redevelops in the future, several new streets that are not included as financially constrained projects in this TSP are needed to enhance local connectivity and reduce the reliance on US 26 for local trips. Conceptual local street connectivity needs are partially shown in **Figure 13** and the appendix.

recreation congestion

Assuming Sandy grows in accordance with its existing adopted land use plan and travelers continue to rely primarily on private cars for transportation, US 26 in the city increasingly will become more heavily congested during the summer/winter peak tourist times. The construction of the US 26 Bypass project is expected to significantly reduce traffic volumes through Sandy, but the high cost of this project makes funding within the next 20 years unlikely. Alternatively, the state and Sandy can handle the congestion by managing travel demand, enhancing local street connectivity, maximizing the efficiency of the existing transportation system, increasing walking, biking, and transit ridership, and other techniques. A safe, convenient, and attractive transportation system is critical to a successful future for Sandy.

appendix

TM #1 Policy Framework and Code Review ..... Section A
TM #2 Goals Objectives and Evaluation Criteria ..... Section B
TM #3 TSP Financial Forecast ..... Section C
TM #4 Existing Conditions ..... Section D
TM #5 Needs Analysis ..... Section E
TM #6 Regulatory Solutions ..... Section F
TM #7 TSP Solutions ..... Section G
TM #8 Planned and Financially Constrained System ..... Section H
TM #9 Alternative Mobility Standards ..... Section I
Downtown Walkability Assessment ..... Section J
Junker Street Circulation Plan ..... Section K
Dubarko Road & Hwy 211 Proportional Share ..... Section L

The contents of the TSP Appendix represent an iterative process in the development of the TSP. Refinements to various plan elements occurred throughout the process as new information was obtained. The TSP supersedes any appendix materials.

EXHIBIT B

appendix

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appendix

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TECHNICAL MEMORANDUM #1

DATE: April 12, 2021

TO: Project Management Team

FROM: Darci Rudzinski and Emma Porricolo | Angelo Planning Group
Reah Flisakowski, Kevin Chewuk, and Dock Rosenthal | DKS Associates

SUBJECT: City of Sandy Transportation System Plan
Policy Framework and Code Review (Task 2.1) Project #20020-001

This memorandum summarizes planning documents, policies, and regulations that will apply to the City of Sandy Transportation System Plan (TSP) as it is developed through this process. State documents that guide TSP development include:

- Transportation Planning Rule
- Oregon Access Management Rule
- ODOT Highway Design Manual
- The Oregon Transportation Plan
- Oregon Highway Plan
- Oregon Bicycle and Pedestrian Plan
- Oregon Transportation Options Plan
- Oregon Transportation Safety Action Plan
- Statewide Transportation Improvements Programs
- ODOT Transportation System Plan Guidelines
- Oregon Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Emissions Reduction
- The Greenhouse Gas Emissions Reduction Toolkit

The TSP update will also need to consider locally adopted plans that have recommended improvements or implementation measures that would impact Sandy's transportation system. Local documents in this review include:

- Clackamas County Transportation System Plan
- City of Sandy Comprehensive Plan
- City of Sandy Transportation System Plan
- City of Sandy Development Code
- City of Sandy Transit Master Plan

- Oregon Trail School District Safe Routes to School (SRTS) Plan
- City of Sandy Parks and Trails Master Plan
- Special Transportation Area (STA) Management and Design Plan
- Downtown Parking Management Study
- Downtown Walkability Assessment (in draft form)
- Urban Growth Boundary Expansion Analysis Report
- US 26 Gateway Plan

This Policy Framework and Code review document concludes with the ***Managing and Monitoring the Transportation System*** section that summarizes the design, mobility, and spacing standards associated with the highway and local roadway system.

As solutions and strategies for addressing transportation needs in the City of Sandy are proposed in later work tasks, a cross-check will be required to ensure compliance and coordination with the state and regional plans, policies, and regulations.

STATE PLANNING DOCUMENTS

TRANSPORTATION PLANNING RULE

Transportation system planning in Oregon is required by Statewide Planning Goal 12 – Transportation[1]. The Transportation Planning Rule (TPR), OAR 660-012, describes how to implement Statewide Planning Goal 12 [2].

By implementing Statewide Planning Goal 12 (Transportation), the TPR promotes the development of safe, convenient, and economic transportation systems that are designed to reduce reliance on the automobile. Key elements include direction for preparing TSPs under OAR 660-012-0015 through 0040.

OAR 660-012-0020 specifies required plan elements for TSPs, including an inventory and assessment of existing conditions; forecasts of transportation needs; a road system plan; a public transportation plan; a bicycle and pedestrian plan; air, rail, water, and pipeline plans as applicable; transportation system and demand management plans; a financing program; and implementing policies and land use regulations.

OAR 660-012-0035 describes the evaluation and selection of transportation system alternatives in the TSP. 660-012-0035(2) allows jurisdictions to evaluate alternative land

[1] Statewide Planning Goals: https://www.oregon.gov/lcd/OP/Pages/Goals.aspx

[2] Transportation Planning Rule: https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=3062

use designations, densities, and design standards to meet local and regional transportation needs.

OAR 660-012-0045 describes implementation of the TSP. It includes the requirement for each local government to amend its land use regulations to implement the TSP. It also requires local government to adopt land use or subdivision ordinance regulations consistent with applicable federal and state requirements, to protect transportation facilities, corridors, and sites for their identified functions. This policy is achieved through a variety of measures, including access control measures, standards to protect future operations of roads, and expanded notice requirements and coordinated review procedures for land use applications. Measures also include a process to apply conditions of approval to development proposals, and regulations assuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities, and performance standards of facilities identified in the TSP.

OAR 660-012-0050, Transportation Project Development, requires that transportation projects be reviewed for compliance with local and regional plans and, when applicable, undergo a NEPA environmental review process.

OAR 660-012-0060, Plan and Land Use Regulation Amendments, specifies a category of facilities, improvements, and services that can be assumed to be "in-place" or committed and available to provide transportation capacity over a 20-year planning horizon. The TPR guides local jurisdictions in determining what transportation improvements are "reasonably likely to be provided by the end of the planning period" when considering amendments to local plans and land use regulations.

Amendments made to Section -0060 are among the most significant changes that have been made to the TPR since adoption of the City's 2011 TSP. The amendments require local jurisdictions to balance the need for development with the need for transportation improvements, establish the end of the planning period as the measure for determining "significant effect," define the transportation improvements that a local government can consider in determining significant effect, and identify methods to determine whether a needed transportation facility is reasonably likely to be provided within the planning horizon.

What this means for the City of Sandy TSP:

The TSP must address the policy and regulatory requirements included in the OTP, State Modal Plans, and TPR as described in the ODOT TSP Guidelines and the specific policy documents. Requirements in TPR Sections -0020 and -0035 will guide the development of the updated TSP, including the evaluation of alternatives and project prioritization. Requirements in Sections -0045 and -0060 will help reviewers identify and facilitate potential changes to the Sandy Development Code that help implement the TSP.

OREGON ACCESS MANAGEMENT RULE (OAR 734-051) (2014)

Oregon Administrative Rule (OAR) 734-051 defines the state's role in managing access to highway facilities in order to maintain functional use and safety and to preserve public investment. Oregon Highway Plan (OHP) Policy 3A and OAR 734-051 set access spacing standards for driveways and approaches to the state highway system.[3] The most recent amendments presume that existing driveways with access to state highways have written permission from the Oregon Department of Transportation (ODOT) as required by Oregon Revised Statutes (ORS) 734. The standards are based on state highway classification and differ depending on posted speed and average daily traffic volume.

The TPR does not regulate access management. ODOT adopted OAR 734-051 to address access management and it is expected that ODOT, as part of this TSP update, will coordinate with the City of Sandy in planning for access management on state roadways consistent with its Access Management Rule.

What this means for the City of Sandy TSP:

Analysis for the TSP update and final project recommendations will need to reflect State requirements for State facilities; the updated TSP will comply or move in the direction of meeting access management standards for State facilities. Project recommendations where access rights are needed will be identified. Implementation measures related to the updated TSP may entail amendments to the Development Code to ensure that they are consistent with state access management requirements, as well as local TSP

ODOT HIGHWAY DESIGN MANUAL (2012)

The 2012 Highway Design Manual (HDM) provides ODOT with uniform standards and processes for project development for the state's roadways. The HDM is to be used for all projects that are located on state highways. It is intended to provide guidance for the design of new construction; major reconstruction (4R); resurfacing, restoration, and rehabilitation (3R); or resurfacing (1R) projects.

National Highway System or Federal-aid projects on roadways that are under local jurisdiction will typically use AASHTO design standards (Policy on Geometric Design of Highways and Streets manual, the "Green Book) or ODOT 3R design standards. The flexibility contained in the HDM supports the use of Practical Design concepts and Context Sensitive Design practices. The Blueprint for Urban Design (BUD), published in 2020, furthers these concepts by recognizing how transportation needs and solutions are different in urban areas. The BUD is a "bridging document" that establishes revised criteria to be

[3] ODOT Access Management Standards – OHP Appendix C Revisions to Address Senate Bill 264 (2011): http://www.oregon.gov/ODOT/TD/TP/docs/ohp_am/apdxc.pdf

used when designing urban projects on the state system. The document provides guidance for urban design on Oregon state highways until such time that all ODOT manuals related to urban areas are updated to include the revised design criteria.

Table 1 shows which design standards are applicable for certain projects based on project type, and whether the project involves a state route. State and local planners will also use the manual in determining design requirements as they relate to the state highways in TSPs, Corridor Plans, Special Transportation Areas and Refinement Plans. Some projects under ODOT roadway jurisdiction traverse across local agency boundaries. Some local agencies have adopted design standards and guidelines that may differ from the various ODOT design standards. Although the appropriate ODOT design standards are to be applied on ODOT roadway jurisdiction facilities, local agency publications, and design practices can also provide additional guidance, concepts, and strategies related to roadway design.

TABLE 1: DESIGN STANDARDS SELECTIONS MATRIX, ODOT HIGHWAY DESIGN MANUAL[4]

Project Type	**Roadway Jurisdiction**				
	State Highways			Local Agency Roads	
	Interstate	Urban State Highways	Rural State Highways	Urban	Rural
Modernization[5]/ Bridge New/Replacement	ODOT 4R/New Freeway	ODOT 4R/New Urban	ODOT 4R/New Rural	AASHTO / Local Design Standards	
Preservation/ Bridge Rehabilitation	ODOT 3R Freeway	ODOT 3R Urban	ODOT 3R Rural	AASHTO / Local Agency Standards	ODOT 3R Rural
Preventive Maintenance	1R	1R	1R	NA	NA
Safety- Operations-Miscellaneous/ Special Programs	ODOT Freeway	ODOT Urban	ODOT Rural	AASHTO / Local Agency Standards	ODOT 3R Rural

[4] See HDM Chapter 1, pg. 23, https://www.oregon.gov/ODOT/Engineering/Documents_RoadwayEng/HDM_01-Design-Standard.pdf

[5] Note that modernization projects are defined as improvements that will accommodate existing traffic and/or projected traffic growth through adding capacity by either adding lanes or building new highways.

The HDM includes mobility standards related to project development and design that are applicable to all modernization projects, except for development review projects (see Table 2, "Outside UGB"). The v/c ratios in the HDM are different than those shown in the OHP. The v/c ratio values in the OHP are used to assist in the planning phase to identify future system deficiencies; the HDM v/c ratio values provide a mobility solution that corrects those previously identified deficiencies and provides the best investment for the state over a 20-year design life.

TABLE 2: 20-YEAR DESIGN MOBILITY STANDARDS (VOLUME/CAPACITY [V/C]) RATIO

Highway Category	Inside UGB				Outside UGB	
	Special Transportation Areas (STA)	MPO	Non-MPO/ STA, MPH <45	Non-MPO/ STA, MPH 45+	Uninc. Comm.	Rural Land
Interstate Hwy & Statewide (NHS) Expressways	N/A	0.75	0.70	0.65	0.60	0.60
Statewide (NHS, Freight Rte)	0.85	0.75	0.70	0.70	0.60	0.60
Statewide (NHS, Non-Freight Rte)	0.90	0.80	0.75	0.70	0.60	0.60
Regional/District Expressways	0.90	0.80	0.75	0.70	0.60	0.60
Regional Highway	0.95	0.85	0.75	0.75	0.70	0.65
District/Local Interest Roads	0.95	0.85	0.80	0.75	0.75	0.70

BLUEPRINT FOR URBAN DESIGN (2020)

The Blueprint for Urban Design (BUD) is a "bridging document" that establishes revised criteria to be used when designing urban projects on the state system. The document provides guidance for urban design on Oregon state highways until such time that all ODOT manuals related to urban areas are updated to include the revised design criteria. The key takeaways from the BUD are:

- Supplements and overrides existing HDM and other design manuals on any conflicting guidance,
- Describes planning and design by urban context in addition to existing roadway classification and designation,
- Highlights flexibility in design,

- Provides a performance based design approach,
- Focuses on the highest level of protection for vulnerable users, and
- Includes a new design documentation process.

The BUD provides new design principals for ODOT owned and operated facilities, however local governments that are leading their own projects make their own design decisions for local facilities. The City of Sandy will coordinate with ODOT on the application of the BUD along US 26, if necessary, through the TSP update process.

ODOT TRAFFIC MANUAL (2020)

The Traffic Manual provides guidance on state traffic engineering policies, establishes uniform methods and procedures, and includes information about traffic engineering and operations on state highways. The Traffic Manual complements the HDM - it does not contain roadway design policies but rather contains standards and guidelines, as well as lists needed approvals and processes.

What this means for the City of Sandy TSP:

The HDM and Blueprint for Urban Design (BUD) provide design standards for state roadways; the Traffic Manual governs engineering methods and procedures for highway improvements. The analysis for the TSP update and final project recommendations will need to be consistent with requirements for state facilities in Sandy. The HDM and BUD can be referenced for additional guidance, concepts, and strategies for design during this planning process.

OREGON TRANSPORTATION PLAN

As the guiding document for local TSPs, the OTP[6] establishes goals, policies, strategies, and initiatives that address the core challenges and opportunities facing transportation in Oregon. The goals and policies are further implemented by various modal plans, including the Highway Plan, Freight Plan, Bicycle and Pedestrian Plan, Transportation Options Plan, Transportation Safety Action Plan, Public Transportation Plan, and the Rail Plan. Each of the OTP's seven goals are defined by more specific policies and strategies.

OREGON HIGHWAY PLAN

The 1999 Oregon Highway Plan (OHP) defines policies and investment strategies for Oregon's state highway system for the next 20 years by further refining the goals and policies of the Oregon Transportation Plan (OTP). One of the key goals of the OHP is to

[6] Oregon Transportation Plan: https://www.oregon.gov/ODOT/Planning/Documents/OTP_Volume_I.pdf

maintain and improve safe and efficient movement of people and goods, while supporting statewide, regional, and local economic growth and community livability. The implementation of this goal occurs through a number of policies and actions that guide management and investment decisions by defining a classification system for state highways, setting standards for mobility, employing access management techniques, supporting intermodal connections, encouraging public and private partnerships, addressing the relationship between the highway and land development patterns, and recognizing the responsibility to maintain and enhance environmental and scenic resources.

OHP POLICY 1A - STATE HIGHWAY CLASSIFICATION SYSTEM

Among the policies established through the OHP, Policy 1A calls for the implementation of a classification system for state highways to identify management objectives. This policy classifies US 26 as a Statewide Highway. According to the OHP, Statewide Highways are typically intended to provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreational areas that are not directly served by Interstate Highways. Providing connections for intra-urban and intra-regional trips is a secondary function. For such highways, the management objective is to provide safe and efficient, high-speed, continuous-flow operation. In constrained urban areas, interruptions to flow should be minimal.

Beyond the classification as a Statewide Highway, Policy 1A further designates the segment of US 26 between Powell Valley Road in Gresham to Orient Drive in Sandy as an expressway. Expressways are intended to provide for safe and efficient high-speed and high-volume travel and are primarily focused on inter-urban and connections to ports and major recreational areas with minimal interruptions. A secondary function is to provide for long-distance intra-urban travel in metropolitan areas. Speeds are high in rural areas, ranging from moderate to high in urban areas. Usually, there are no pedestrian facilities and bikeways may be separated from the roadway.

Other characteristics of expressways include:

- Discouraging private access with the long-range plan to eliminate existing approaches as opportunities arise,
- Purchasing of access rights,
- Public road connections are highly controlled,
- Traffic signals are discouraged in rural areas,
- Non-traversable medians are encouraged, and
- Parking is prohibited.

In December 2020, ownership of OR 211, within the City of Sandy, was transferred to the City. It is currently classified as a Minor Arterial within the City's functional classification system and local design standards apply.

OHP POLICY 1B - LAND USE AND TRANSPORTATION

The purpose of this policy is to facilitate coordination of land use and transportation decision making to efficiently use public infrastructure investments to:

- Maintain the mobility and safety of the highway system;
- Foster compact development patterns in communities;
- Encourage the availability and use of transportation alternatives;
- Enhance livability and economic competitiveness; and
- Support acknowledged regional, city and county transportation system plans that are consistent with the Oregon Highway Plan.

US 26 serves as the main street for the City of Sandy. Note that US 26 Eastbound (Pioneer Blvd.) between MP 23.87 and 24.61 through the downtown couplet is a City street.[7] Policy 1B strives to maintain a balance between serving the function of a main street and a state highway. Key elements from this policy include:

- Encourage the availability and use of transportation alternatives.
- State and local government must work collaboratively in planning and decision-making relating to transportation system management.
- The OHP also provides specific guidance for STAs in Policy 1B. US 26 in downtown Sandy (Proctor Boulevard westbound and Pioneer Boulevard eastbound) between Bluff Road and Ten Eyck Road/Wolf Drive is designated as an STA. The primary objective of an STA is to provide access to community activities, businesses, and residences and to accommodate pedestrian movement along and across the highway in a downtown, business district and/or community center. In an STA, direct property access to highways is discouraged and direct street connections and shared on-street parking are encouraged. Local auto, pedestrian, bicycle, and transit movements are generally as important as the through movement of traffic. Traffic speeds are low, generally 25 miles per hour or less.

OHP POLICY 1C - FREIGHT ROUTE

US 26 has been designated as a Freight Route through the entire city of Sandy by ODOT. This emphasizes efficient operation to ensure the timely and dependable movement of goods. To support this function, special management objectives for freight routes were developed as outlined in Policy 1C of the OHP. Key objectives relating to this plan include:

- Application of higher highway mobility standards than other Statewide Highways.
- Examine options to treat designated freight routes as expressways where the routes are outside of urban growth boundaries and unincorporated communities and continue to treat freight routes as expressways within urban growth boundaries where existing

[7] ODOT uses Pioneer Boulevard for the eastbound lanes of US 26 per the terms of an intergovernmental agreement (#2811) dated February 10, 1965 between the City of Sandy and the (then) Oregon Highway Department.

facilities have limited access or where corridor or transportation system plans indicate limited access.

- Consider the importance of timeliness in freight movements in developing and implementing plans and projects.

Amendment 13-23 (added in August 2013) identifies US 26 as a Reduction Review Route. Identification as a Reduction Review Route means changes to the vehicle-carrying capacity of this route require review as identified in OAR 731-012-0010.

OHP POLICY 1D - SCENIC BYWAYS

Several highways throughout the state have been designated as Scenic Byways, which are defined as having exceptional scenic value. To protect the scenic assets of its Scenic Byways, ODOT has developed guidelines for aesthetic preservation and created design elements within the public right-of-way that are appropriate for Scenic Byways. US 26 is designated as a National Scenic Byway from Bluff Road to the junction with OR 35.

OHP POLICY 1F - HIGHWAY MOBILITY STANDARDS

ODOT has adopted standards for mobility for state facilities through the OHP and the *Highway Design Manual* as amended (HDM). The OHP mobility standards are intended to be used for identifying needs, while the amended HDM standards represent the level of operation for which state facilities are to be designed. For this study, the OHP standards will be applied on ODOT facilities.

If the mobility standards from the OHP cannot be met, alternate mobility standards will be determined. This process will involve ODOT and the City of Sandy. The resulting mobility targets will balance the objectives of the following categories:

- Land use
- Economic development
- Social equity
- Mobility for all modes
- Safety for all modes

Table 6 in Policy 1F of the OHP (Amended May 2015) displays the maximum allowable volume to capacity (v/c) ratios for the 30th highest annual hour of traffic in areas outside of the Portland Metropolitan Area. These mobility standards are tabulated in the Motor Vehicle Mobility Targets in the ***Managing and Monitoring the Transportation System*** section.

OHP POLICY 1G - MAJOR IMPROVEMENTS

Policy 1G in the OHP pertains to Major Improvements and states that ODOT places a priority on improving system efficiency and management before adding capacity where improvements are needed. Action 1G.1 outlines the following hierarchy:

- First priority – Protect the existing system

- Second priority – Improve efficiency and capacity of existing highway facilities
- Third priority – Add capacity to the existing system
- Fourth priority – Add new facilities to the system

According to this policy, the highest priority should be placed on protection of the existing system, followed by improvements in efficiency and capacity of existing facilities. Once these options have been reviewed and analyzed, the third and fourth priorities would be to add capacity to the existing system and then to add new facilities.

OHP POLICY 1H - BYPASS POLICY

The Bypass Policy of the OHP deals with increasing congestion on state highways and the need to potentially separate regional travel and local access. According to the policy, "bypasses are highways designed to maintain or increase statewide or regional mobility. Generally, they relocate a highway alignment around a downtown, an urban or metropolitan area or an existing highway. The goal of bypass facilities is to effectively serve state and regional traffic trips."

The policy states that the desire for a bypass often evolves from increases in congestion and safety problems on a state highway that is serving both as a regional highway and as a main street for a city. The highway is typically trying to serve both as an efficient freight and through travel route, while also providing access to local businesses and residential areas. As traffic increases, the highway does not typically serve either purpose well, resulting in inefficient travel for through traffic and congested and unsafe access for local businesses and residences.

The need for a highway bypass of US 26 in Sandy is being reviewed as part of the Sandy Bypass Feasibility Reevaluation; more detailed planning considerations are included in the Policy and Regulatory Considerations Memo, included as an attachment to this memorandum. These findings will be incorporated in the TSP update as appropriate. The process for this is outlined in Action 1H.1 as follows:

- ODOT and the affected local governments shall identify the need for a bypass in a transportation system plan and/or corridor plan in a manner consistent with Oregon Highway Plan Policy 1G.
- In establishing the purpose and need for the bypass facility to guide its planning, design, and development, ODOT and the affected local governments shall analyze the following:
  - Percentages of local and through trips projected at least over a 20-year period on the bypass.
  - Percentages, volumes and impacts of freight truck traffic.
  - Average trips on the proposed bypass facility based on build-out of the comprehensive land use plan.
  - Crash data history on the nearby or impacted facility.

The other provisions of *OHP Policy 1H* would need to be addressed in a refinement plan or NEPA process if a bypass is determined to be an appropriate solution and as the location and design of the bypass become more specific.

OHP POLICY 2B - OFF-SYSTEM IMPROVEMENTS

It is a State of Oregon policy to provide financial assistance to local jurisdictions to develop, enhance, and maintain improvements on local transportation systems when these projects are deemed cost-effective in improving the state highway system. For instance, construction of portions of Dubarko Road and improvements to Pleasant Ave. were partially funded through the ODOT Local Streets Network (LSN) program to provide alternative routes to US 26 for local traffic and improve mobility and relieve congestion along US 26. This policy includes a specific set of criteria to be met when considering financial support for off-system improvements, including:

- The off-system costs are less than or equal to on-system costs, and/or the benefits to the state system are equal to or greater than those achieved by investing in on-system improvements.
- Local jurisdictions adopt land use, access management and other policies and ordinances to assure the continued benefit of the off-system improvement to the state highway system.
- Local jurisdictions agree to provide advance notice to ODOT of any land use decisions that may impact the off-system improvement in such a way as to adversely impact the state highway system.
- Local jurisdictions agree to a minimum maintenance level for the off-system improvement that will assure the continued benefit of the off-system improvement to the state highway system.

Furthermore, as one of the actions listed to implement this policy, ODOT is directed to work with local governments to identify and evaluate off-system improvements that would be cost-effective in improving performance of the state highway when preparing corridor plans, transportation system plans and project plans.

OHP POLICY 2F - TRAFFIC SAFETY

This policy emphasizes the State's efforts to improve safety for all users of the highway system. Action 2F.4 addresses the development and implementation of the Safety Management System, which targets resources for sites with the most significant safety issues. The TSP update process will include citywide crash analysis to identify sites with a history of fatal and serious injury crashes and identify potential countermeasures to reduce crashes.

OHP GOAL 3

The management of access to state highways is addressed by Goal 3 of the OHP, along with several supporting policies. Policy 3A sets the foundation for much of ODOT's access management practices by pairing the classification system defined in Policy 1A with detailed

access management objectives and associated access spacing standards. As a Statewide Highway in an urban environment, US 26 through the City maintains the following access management objectives.

- Provision of high to moderate speed operations with limited interruptions in traffic flow.
- Direct access to the abutting property is a minor objective.
- The function of the highway is consistent with the purchasing of access rights. As the opportunity arises, access rights should be purchased with a preference to purchase access rights in full.
- The primary function of these highways is to provide connections to larger urban areas, ports, and major recreational areas of the state not served by freeways or expressways.

Furthermore, the segment of US 26 that has been designated as an expressway, from Orient Drive to Powell Valley Road, maintains unique access management objectives that put a higher priority on through travel. These objectives include:

- Provision of safe and efficient high-speed and high-volume travel.
- Private access is discouraged. There is a long-range plan to eliminate, as possible, existing approach roads as opportunities occur or alternate access becomes available. Access rights will be purchased and a local road network may be developed consistent with the function of the roadway.
- Public road connections are highly controlled and must be spaced appropriately. Future grade separations (interchanges) may be an option. Compatible land use actions may be necessary and shall be included in local comprehensive plans.
- Traffic signals are discouraged. Where signals are allowed, their impact on through traffic must be minimized by ensuring the efficient progression of traffic is achieved.
- Parking is prohibited.
- The primary function of expressways is to provide connections to larger urban areas, ports, and major recreational areas of the state with minimal interruptions.
- Median treatments are considered in accordance with criteria in Action 3B.3.

Spacing Standards for State Highways

To support these objectives, access management spacing standards have been adopted for each highway classification. Within the City, US 26 would have these spacing standards applied. Where approaches to the highway will be allowed that do not comply with adopted access spacing standards, a deviation to those standards must be documented, as described in Policy 3D. Spacing standards are tabulated in the Street and Driveway Spacing Standards in the ***Managing and Monitoring the Transportation System*** section of this technical memorandum.

Policy 3B in the OHP addresses the installation on non-traversable medians in state highways. According to this policy, the installation of non-traversable medians shall be considered for:

- Modernization of all urban, multi-lane Statewide Highways.
- Multi-lane highways undergoing 3-R or 4-R improvements.

- Highways not undergoing modernization where a median could improve safety.
- Highways where forecasted average daily traffic is anticipated to be 28,000 vehicles per day during the 20-year planning period.
- The annual accident rate is greater than the statewide average accident rate for similar roadways.
- Pedestrians are unable to safely cross the highway, as demonstrated by an accident rate that is greater than the statewide annual average accident rate for similar roadways.
- Topography and horizontal or vertical alignment result in inadequate left-turn intersection sight distance and it is impractical to relocate or reconstruct the connecting approach road or highway to improve the situation.

Reasons for not using non-traversable medians when any of these conditions are present must be documented and reviewed and approved by the ODOT Region Manager.

Full and directional median openings shall be restricted to locations that meet applicable access spacing standards and shall be designed with a left turn bay and deceleration lane. Full median openings will be given preference to public road connections that are part of a continuous and comprehensive public road network.

Furthermore, using raised median pedestrian refuge islands and mid-block crosswalks in urban areas that are pedestrian and/or transit oriented should be considered.

POLICY 4A - EFFICIENCY OF FREIGHT MOVEMENT

This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system. It seeks to balance the needs of long distance and through freight movements with local transportation needs on highway facilities in both urban and rural areas. US 26 is a designated Freight Route.

POLICY 4B- ALTERNATIVE PASSENGER MODES

Policy 4B encourages the development of alternative passenger services and systems as part of broader corridor strategies. The policy promotes the development of alternative passenger transportation services in commuter highway corridors, as well as those located off the highway system to help preserve the performance and function of the state highway system. Sandy Area Transit (SAM) provides public transportation service in the City.

POLICY 4D - TRANSPORTATION DEMAND MANAGEMENT (TDM)

This policy supports the efficient use of the state transportation system through investment in transportation demand management (TDM) strategies. Action 4D.1 calls for reducing peak period single-occupancy vehicle travel and moving traffic demand out of the peak period so as to improve the flow of traffic on state highways. The TSP update process will review TDM strategies that can be adopted as policy, development requirements, and/or incentive programs instituted by employers and other organizations in Sandy.

What this means for the City of Sandy TSP:

This Plan serves as the guiding policy for highway planning, including any improvements, modifications, or local policies that would affect state facilities within Sandy. The TSP will incorporate the goals and performance measures of the Plan when modifications are proposed to the highway system within Sandy.

OREGON BICYCLE AND PEDESTRIAN PLAN (2016)

The Oregon Bicycle and Pedestrian Plan provides a decision-making framework for walking and biking efforts in the State within the context of the overall transportation system. The Plan is an element of the Oregon Transportation Plan and provides local plans guidance in its implementation. The policies and strategies in the Plan impact transportation decisions of local jurisdictions through their transportation system plans and other planning efforts, which must be consistent with statewide policy plan direction. The nine goals of the plan, described below, reflect statewide values and desired accomplishments, and refine and expand upon the broad goals of the OTP.

- **Safety -** The safety goal is written to align with "Vision Zero" and other federal and local initiatives that target the elimination of the most serious safety issues. Policies and strategies call for a multimodal look at roadway cross-sections, updating design guidance to identify the most appropriate walking or biking facility depending on context (such as physical separation), more visible pedestrian crossings, and examination and consideration of lower speeds where appropriate. Within the walking and biking system goal areas include education and encouragement, comfort and security, and an assessment of the system to determine safety issues.
- **Accessibility and Connectivity -** This goal targets making walking and biking accessible in areas where it currently is not, filling in gaps, and connecting to other transportation modes. Policies and strategies call for such things as system inventories to identify gaps and prioritize walking and biking needs, retrofitting existing facilities to accommodate pedestrians and cyclists, wayfinding signage, bike share, and enhancing connections to other modes, especially public transportation.
- **Mobility and Efficiency -** This focuses on assuring that pedestrians and cyclists can move freely and easily on the existing system. Policies and strategies seek to reduce physical barriers that may impede movement, address maintenance practices, seek to assure movement through or around construction zones, and reference design elements such as signal timing and bicycle detection, among other issues.
- **Community and Economic Vitality -** Both land use and tourism are included under this goal area. Specifically, the land use policy framework identifies the need for model code assistance, siting schools and government buildings so they are accessible to walking and biking, considering land use attractors to assure safe connections, bicycle parking, and prioritizing employment centers and main streets as critical connection points that serve the community and economy. Tourism policies and strategies focus on partnerships, collaboration opportunities, and

disseminating information as ways to encourage pedestrian and bicycle recreational travel.

- **Equity -** This goal focuses on making walking and biking options equally available to all. Assuring access for underserved areas and transportation disadvantaged populations is identified. The policies and strategies under this goal are designed to address issues that may prevent certain portions of the population from walking and biking, such as looking at census data, conducting research, and doing network gap analysis that looks at demographics. This goal also focuses on integrating equity criteria and considerations into decision making, locating, and prioritizing transportation disadvantaged populations, and helping to close the gap between areas served and not served.
- **Health -** This goal highlights the link between personal and public health. Policies and strategies identify such things as integrating health criteria in transportation decision making, engaging health professionals, strengthening partnerships, and improving data collection and sharing.
- **Sustainability -** This goal highlights the impacts that zero emission modes can have on helping the state reduce Greenhouse Gas emissions, have cleaner air and water, and reduce impacts to the environment. Strategies promote innovations such as electric bikes or scooters, which may attract more people to use those modes.
- **Strategic Investment -** This goal highlights the contribution that walking and bicycling facilities make to the entire transportation system. A strategic approach is needed to spend existing resources on the highest need and greatest value investments, leverage what is available, and to identify additional funding sources. An investment prioritization framework lays out priorities as follows: protect the existing system (e.g., maintenance and preservation) and address significant safety issues; add critical connections; complete the system (e.g., separation, and bicycle parking); and increase connectivity in lower priority areas of the system.
- **Coordination, Cooperation, and Collaboration -** With an interest in creating an integrated and seamless system, this coordination, cooperation, and collaboration goal assures communication between entities in decision making. Policies and strategies call for a checklist of communication needs, and guidance for coordinating.

The Plan includes performance measures to track and monitor implementation progress.

- Number of pedestrian and bicycle fatalities (five-year average)
- Number of pedestrian and bicycle serious injuries (five-year average)
- Perceived safety of walking and biking
- Utilization of walking or biking for short trips
- Identifying data needs for pedestrian and bicycle performance measures
- Pedestrian access to transit

The performance measures indicate whether safety is improving, use of the system is increasing (assumed through overall improvements to the network), and that data needs are being understood and data collected for more robust performance measures in the future.

The OBPP also provides background information related to state and federal laws, funding opportunities, and implementation strategies proposed by ODOT to improve bicycle and pedestrian transportation. It outlines the role that local jurisdictions play in the implementation of the OBPP, including the development of local pedestrian and bicycle plans as stand-alone documents within TSPs.

What this means for the City of Sandy TSP:

This Plan serves as the guiding policy for bicycle and pedestrian planning and local street standards. The TSP should work to incorporate the goals and performance measures of the Plan. In addition, bicycle and pedestrian system improvements recommended in the updated Sandy TSP should reflect recommended implementation strategies from the OBPP.

OREGON TRANSPORTATION OPTIONS PLAN

The Oregon Transportation Options Plan is an element of the Oregon Transportation Plan and provides policy guidance for state and local partners to enhance and expand transportation access for all people while ensuring that transportation investments are efficient and support broader community goals. The Oregon Transportation Options Plan:

- Identifies opportunities to expand transportation choices.
- Looks to increase funding opportunities for transportation programs and investments.
- Provides information to better integrate transportation options into local, regional, and state transportation planning.

Policies, strategies, and programs described in the Oregon Transportation Options Plan promote efficient use of existing transportation system investments, thus reducing reliance on the single-occupancy vehicle and facilitating additional walking, biking, transit, and rideshare. While transportation infrastructure and operations are critical to the success of a balanced transportation system, this Plan focuses on the programs, strategies, and investments that support the efficient use of transportation infrastructure.

The Transportation Options Plan process identifies a critical need to establish responsive and reliable funding for transportation options programs. Opportunities exist to expand funding by integrating transportation options into existing transportation planning processes and identifying and leveraging new sources of funding.

Performance measures identified in this plan include:

- Number of transportation options staff per capita – This measure indicates the ability of transportation programs to conduct outreach, deliver information and manage programs.

- Motor vehicle miles traveled per capita – As vehicle miles travelled per capita declines more people tend to use the transportation system and system reliability is improved for freight.
- Percent of trips that use a mode other than driving along during the peak hour – Tracking mode share during the peak hour documents congestion and system efficiency benefits.

What this means for the City of Sandy TSP:

The policies, strategies, and programs of this plan provide guidance for the TSP to support the efficient use of existing and future transportation infrastructure.

OREGON TRANSPORTATION SAFETY ACTION PLAN

The Oregon Transportation Safety Action Plan (TSAP) is an element of the Oregon Transportation Plan and "provides long-term goals, policies and strategies and near-term actions to eliminate deaths and life-changing injuries on Oregon's transportation system by 2035." The goals, policies, and strategies in the Plan are focused on changing safety culture and proactively planning, designing, operating, and maintaining a transportation system that eliminates fatalities and serious injuries.

The Plan includes emphasis areas to provide a framework for the near-term component. Emphasis areas are focus areas directly related to the long-term goals, policies, and strategies. The emphasis areas include:

- **Risky Behaviors -** Reductions in fatalities and serious injuries can be accomplished by deterring unsafe or risky behaviors made by drivers and other transportation users. For this emphasis area, actions are identified to minimize impaired, unbelted, speeding, and distracted driving crashes.
- **Infrastructure -** Transportation facilities can be constructed or retrofitted to reduce fatal and serious injury crashes. Opportunities to do this include implementing safety treatments on a site-specific basis or implementing low-cost treatments system-wide. Actions are identified to minimize intersection and roadway departure crashes.
- **Vulnerable Users -** Vulnerable road users can be characterized by the amount of protection they have when using the transportation system – pedestrians, bicyclists and motorcyclists are more exposed than people in vehicles, making them more susceptible to injury in the event of an incident. Older drivers and pedestrians can also be more vulnerable to severe injuries in the event of a crash because of increasing fragility and potentially longer recovery times. Actions are identified to minimize pedestrian, bicycle, motorcycle, and older road user crashes.
- **Improved Systems-** Opportunities to address and improve transportation safety come in several forms. Actions have been identified to continually improve data, train and educate transportation and safety staff, support law enforcement and emergency responders, and minimize commercial vehicle crashes.

Performance measures can be grouped into two categories.

- Efficiency – tracks the effort and output of a program.

- Effectiveness – tracks the results of a program or activity.

The Plan identifies the following safety performance measures.

- FHWA performance measures
  - Number of fatalities
  - Number of serious injuries
  - Roadway fatalities per vehicle miles traveled
  - Roadway serious injuries per vehicle miles traveled
  - Combined nonmotorized fatalities and nonmotorized serious injuries
- Oregon Traffic Safety Performance Plan and NHTSA Performance Measures
  - Fatalities
  - Serious Traffic Injuries
  - Fatalities/100M VMT
  - Rural Road Fatalities/100M VMT
  - Urban Road Fatalities/100M VMT
  - Unrestrained Passenger Vehicle Occupant Fatalities, All Seat Positions
  - Alcohol Impaired Driving Fatalities Involving a Driver or Motorcycle Operator with a BAC of 0.08 and Above
  - Speed-related Fatalities
  - Motorist Fatalities
  - Unhelmeted Motorcyclist Fatalities
  - Drivers Age 20 or Younger in Fatal Crashes
  - Pedestrian Fatalities
  - Bicyclist Fatalities
  - Statewide Observed Seat Belt Use, Passenger Vehicles, Front Seat Outboard Occupants

What this means for the City of Sandy TSP:

The policies, strategies, and programs of this plan provide guidance for the TSP to evaluate safety performance. The TSP update process will consider safety in the selection and prioritization of transportation projects, consistent with the TSAP.

2021-2024 STATEWIDE TRANSPORTATION IMPROVEMENTS PROGRAM

The State Transportation Improvement Program (STIP) is the four-year programming and funding document for transportation projects and programs on the state and regional transportation systems, including federal land and Indian reservation road systems; interstate, state, and regional highways; bridges; and public transit. The STIP includes state-funded and federally-funded system improvements.

The projects and programs considered for the STIP undergo a selection process that is held every two years. The current STIP is the 2021-2024 Active STIP. The STIP is adopted by the OTC and is approved by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) as required by federal law.

2021-2024 Active STIP projects located in Sandy are:

- US 26: Ten Eyck Rd/Wolf Dr – Vista Loop (Project Key 18823): Construct sidewalk on the north side of US 26 in accordance with the Americans with Disabilities Act. Install illumination to allow safer travel for pedestrians. Estimated Project Cost - $3.685 million.
- Installation of Signals at Dubarko Rd. and OR 211 (Project Key: 20339): Two streetlights installed at the intersection of Dubarko Rd. and OR 211.
- US 26 Curb Ramps (Sandy) (Project Key 22112): Pilot project to construct curb ramps to meet compliance with the Americans with Disabilities ACT (ADA) standards. Estimated Project Cost - $3.086 million.

What this means for the City of Sandy TSP:

The TSP update process will take into account projects that are programmed in the STIP. An expected outcome of this planning process is the identification of projects and/or programs that are recommended for inclusion in the STIP. The policies, strategies, and programs of this plan provide guidance for the TSP to evaluate safety performance.

ODOT TRANSPORTATION SYSTEM PLAN GUIDELINES (2018)

The Transportation System Plan Guidelines are intended to assist local jurisdictions in the preparation and update of city and county TSPs. The guidelines help jurisdictions develop plans that meet local needs and comply with state regulation and policy direction, including applicable elements of the TPR, as well as the OTP and associated mode and topic plans. The TSP Guidelines answer the "What, Why and When" questions surrounding TSP projects and provide detailed direction on scoping, developing, and administering TSPs. The planning guidance is best accessed via a web-based platform[8] and includes helpful information and examples for both citizens and practitioners.

[8] https://www.oregon.gov/odot/Planning/TSP-Guidelines/Pages/default.aspx

What this means for the City of Sandy TSP:

The TSP Guidelines will be a reference for the Project Management Team to ensure that required plan elements and methodology are employed in the updated TSP. They may also be used to inform citizens and local decision makers on the required planning steps in the TSP update process and plan implementation.

OREGON STATEWIDE TRANSPORTATION STRATEGY

The Oregon Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas (GHG) Emissions Reduction Goal (STS) describes how the transportation sector can move towards the goal of a 75% reduction in GHG emissions from 1990 levels by 2050. The STS contains no specific policies or goals, rather it includes strategies for greenhouse gas reductions. The STS furthers and supports the OTP and its goals to provide a safe, efficient and sustainable transportation system that enhances Oregon's quality of life and economic vitality. In time, the strategies may be incorporated into the Oregon Transportation Plan and its related modal plans.

In total, the STS contains 18 strategies, which are categorized into the following six categories.

- **Vehicle and Engine Technology Advancements** – Strategies in this category increase the operating efficiency of multiple transportation modes through transition to more fuel-efficient vehicles, improvements in engine technologies, and other technological advances.
- **Fuel Technology Advancements** – Strategies in this category increase the operating efficiency of fuel-powered transportation modes through transitions to fuels that produce fewer GHG emissions or have a lower lifecycle carbon intensity.
- **Enhanced System and Operations Performance** – Strategies in this category improve the efficiency of the transportation system and operations through technology, infrastructure investment, and operations management.
- **Transportation Options** – Strategies in this category increase opportunities for travelers and shippers to use transportation modes that are more energy efficient and produce fewer emissions.
- **Efficient Land Use** – Strategies in this category promote more efficient movement throughout the transportation system by supporting compact growth and development. This development pattern reduces travel distances and increases opportunities for using lower energy and zero- energy transportation modes.
- **Pricing and Funding Mechanisms** – Strategies in this category support a transition to more sustainable funding sources to maintain and operate the transportation system, pay for environmental costs of climate change, and provide market incentives for developing and implementing efficient ways to reduce emissions.

Integrating the STS into regional and local planning processes is important to the successful implementation of the STS. Additionally, the STS will point to efforts that may be engaged in at the state or national level that help the metropolitan areas meet their targets.

What this means for the City of Sandy TSP:

In developing the TSP, the Project Management Team should consider including STS into the policies, programs, and projects.

GREENHOUSE GAS EMISSIONS REDUCTION TOOLKIT

The Greenhouse Gas, or GHG, Emissions Reduction Toolkit is a collection of strategy reports and case studies designed to help local jurisdictions identify and explore the kinds of actions and programs they can undertake to reduce vehicle emissions. Additionally, strategies are designed to meet other community goals, such as spur economic development, increase biking and walking, support downtowns, create healthy livable communities and more.

The reports relevant to transportation in Sandy are:

- Bicycle and Pedestrian Connectivity
- Bicycle and Pedestrian Marketing Campaigns
- Bicycle and Pedestrian Safety
- Bicycle Facilities
- Car Sharing
- Complete Streets
- Increased Connectivity and Shorter Block Lengths
- Parking Management
- Parking Pricing
- Pedestrian Crossings
- Pedestrian Environment
- Transit Services and Facilities
- Transportation Demand Management
- Transportation System Development Charges
- Vehicle Access Management to Public Roads
- Yield Signs and Roundabouts

What this means for the City of Sandy TSP:

The TSP update planning project will consider strategies identified in the Greenhouse Gas Emissions Reduction Toolkit in updating policy and developing local transportation solutions.

LOCAL PLANNING DOCUMENTS

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN (2013)

The Clackamas County TSP identifies six goals:

- **Sustainable**: Provide a transportation system that optimizes benefits to the environment, the economy, and the community.
- **Local Business and Jobs**: Plan the transportation system to create a prosperous and adaptable economy and further the economic well-being of businesses and residents of the county.
- **Livable and Local**: Tailor transportation solutions to suit the diversity of local communities.
- **Safety and Health**: Promote a transportation system that maintains or improves our safety, health, and security.
- **Equity**: Provide an equitable transportation system.
- **Fiscally Responsible**: Promote a fiscally responsible approach to protect and improve the existing transportation system and implement a cost-effective system to meet future needs.

Projects in the City of Sandy are listed in the Appendix. No projects within Sandy were included in the 20-year Capital projects (high priority) list. In 2015 an Active Transportation Plan was added to the TSP. The active transportation plan identifies two corridors through the City of Sandy. They include:

- Tickle Creek Trail/Cazadero Trail – This trail is proposed as a multi-use path, 23.5 miles in length, connecting the City of Sandy to the City of Estacada with a northern connection to the Springwater Corridor trail in the Portland Metro area.
- Sandy to Mount Hood – This trail is proposed as a shoulder bikeway or shared-street, 49.8 miles in length, connecting the City of Sandy with Government Camp and the City of Gresham.

What this means for the City of Sandy TSP:

The goals and projects identified in the 2013 TSP will be evaluated, updated, and carried over into the current TSP, as appropriate and with approval by the Project Management Team (PMT).

CITY OF SANDY COMPREHENSIVE PLAN (1997)

The City's Comprehensive Plan is designed to guide land development within the City Limits. The plan also establishes the goals, policies, and strategies to guide the City's future growth. Plan goals and policies are implemented through subsequent measures, such as zoning and development ordinances, that provide decision-making criteria and standards by which proposals can be evaluated.

The Comprehensive Plan addresses the 14 relevant statewide planning goals. Transportation policies are outlined in Goal 12 of the Plan and provide the policy direction in developing the TSP and transportation-related Development Code regulations. The overall Transportation Goal is to "establish policies to provide and encourage a safe, convenient, and economic transportation system."

The policies in Goal 12 are focused on six specific topic areas, Neighborhood Street System, Pedestrian Friendly Street and Streetscape Design, Bicycle Facilities, Transit, Major Roadway Circulation, and Parking. The policies for each of these topic areas are important to the TSP update and include:

Neighborhood Street System

1. Support a pattern of connected streets, sidewalks, and bicycle routes to: a) provide safe and convenient options for cars, bikes, and pedestrians; b) create a logical, recognizable pattern of circulation; and c) spread traffic over local streets so that collector and arterial streets are not overburdened.

2. Work with fire district, police, and other emergency service providers to ensure that adequate emergency access is possible on all streets.

3. Require connected streets that form pedestrian-scaled blocks, except where it is shown that topography, existing land ownership patterns, or other conditions preclude the creation of blocks.

4. Discourage the use of cul-de-sacs and dead-end streets, except where it is shown that topography or other existing conditions make them necessary. If cul-de-sacs or dead-end streets are found necessary, the City shall consider requiring pathways that connect these streets to adjacent through streets.

5. Encourage the use of parks and open space corridors as pedestrian and other non-auto-oriented linkages within the urban area. Where possible, connect these pathways to a regional system of trails linking public and private open space, parks, and recreational resources within and between jurisdictions.

6. Encourage the development of neighborhood parks or other public or private open spaces connecting short cul-de-sac streets or other local streets in order to provide neighborhood focal points.

7. Encourage joint use of major power line or utility corridors as pedestrian/bicycle linkages where feasible.

Pedestrian Friendly Street and Streetscape Design

8. Encourage the planting of street trees in tree-deficient areas of the city.

9. Require buildings, awnings, landscaping, and modifications to the street width and sidewalks in commercial areas to create a sheltered, interesting, and safe environment that works for pedestrians as well as for automobiles.

10. Encourage the development of sidewalks on both sides of all streets, especially in high pedestrian activity areas such as near schools and in the downtown area.

11. Develop street, bicycle, and pedestrian facilities that encourage pedestrian-friendly streetscapes.

Bicycle Facilities

12. Establish a system of designated bicycle routes and pathways that link neighborhoods, schools, parks, employment centers, and other points of interest.

13. Establish a logical and coherent transportation network within the city, and provide connections to larger, regional facilities. Bicycle facilities should be constructed in accordance with the design standards of the Oregon Bicycle and Pedestrian Plan or another approved plan.

14. Make provisions for bicycle facilities in accordance with the bicycle network map. Recognize that this map represents a conceptual plan. Actual bicycle routes will be determined when the proposed street network is more fully developed.

15. Identify and develop local or collector streets which can provide good parallel bicycle facilities with less vehicular traffic within a short distance of an arterial as the preferred bicycle route.

16. Encourage the provision of bicycle racks for existing commercial, industrial, civic, and school facilities.

Transit

17. Promote local transit service for Sandy.

18. Promote the creation of transit stops in neighborhood centers and other areas of the city. The City shall consider the possibility of locating park-and-ride lots immediately adjacent to, or within, the downtown and other neighborhood centers.

19. Identify bus pull-outs and spaces for bus stops and shelters. Some type of bus shelter or other protection from weather should be included at all bus stops in the downtown area. Such protection may consist of awnings or other overhangs from adjacent buildings, provided the sheltered area is adequate to meet the needs of waiting transit riders as well as pedestrians.

Major Roadway Circulation

20. Work with property owners and developers to limit the number of accesses onto major roadways. Encourage the use of shared driveways, off-street connections between properties, and access from lower order streets.

21. Work with ODOT to determine locations for necessary traffic control signals. Proposed locations for future traffic signals have been determined for the downtown area in the City of Sandy Transportation System Plan. Other locations need to be determined in order to improve the safety and convenience of pedestrians, bicycles, and automobiles. The location of traffic signals should be consistent with the street network indicated in the Comprehensive Plan Map and current traffic engineering standards.

22. Submit notice of development proposals impacting Highways 26 and 211 to ODOT for review and comment.

Parking

23. Wherever feasible, encourage the provision of on-street parking on both sides of streets. Cooperation with ODOT will be necessary along Highway 26 and Highway 211.

24. Reduce parking requirements for development proposals where existing on-street parking and excess parking from adjacent development is available to meet parking requirements. Consideration should also be given to allowing payment of fees in lieu of required on-site parking. The fees shall be dedicated to the development of public parking lots.

25. Public parking lots may be developed for commercial and other areas in order to help relieve obligations for off-street parking and to encourage commercial development with higher floor-to-area ratios.

26. Encourage shared parking arrangements when parking demands for the sharing uses can be satisfied.

27. Require convenient and safe bicycle parking as part of the parking requirement for all new development, except single-family houses.

28. Require that each downtown development project be connected to adjacent developments by a direct and continuous sidewalk.

What this means for the City of Sandy TSP:

The updated TSP will be adopted as the transportation element of the Comprehensive Plan; updated policy that results from this planning process will need to be reflected in the Comprehensive Plan document. It is expected that recommendations that result from this planning process will necessitate an update to Sandy Comprehensive Plan Goal 12 Section. This will entail referencing the updated TSP or modifying Goal 12 goals to be consistent with the updated TSP.

Note: The City of Sandy intends to update the entire Comprehensive Plan in the 2022 to 2024 biennial budget cycle.

CITY OF SANDY TRANSPORTATION SYSTEM PLAN (2011)

The current adopted TSP was completed in 2011 and planned a transportation system for forecasted growth in the City through 2029. The TSP identified the following goals to guide the planning process.

Mobility/Circulation/Safety Goals

- Develop a transportation system to encourage all travel modes (transit, bicycle, pedestrian)
- Improve the safety and accessibility of transit facilities
- Improve mobility for the transportation disadvantaged
- Improve vehicular/pedestrian interface along all arterial and collector streets
- Ensure sufficient capacity to accommodate future travel demand (transit, vehicular, bicycle, pedestrian, etc.) to, within, and through the City of Sandy
- Emphasize improvements to the City street system, in an effort to reduce reliance on US 26 and OR 211 for local trips

Capital Improvement Goals

- Maximize the useful life of existing facilities
- Maximize the cost effectiveness of transportation improvements
- Seek opportunities to combine transportation, other infrastructure, and environmental mitigation projects

Community Goals

- Protect the scenic resources of the City of Sandy
- Preserve the historic character of Sandy
- Identify gateway and beautification treatments for OR 211
- Support Mt Hood Scenic Byway Enhancements

- Incorporate street network and transportation improvements contained within the Bornstedt Village Plan
- Explore transfer of OR 211 from ODOT to City jurisdiction[9] **Economic Development Goals**
- Balance local access to US 26 and OR 211 with the need to serve regional and statewide traffic, while supporting adjacent land uses
- Develop a transportation system that supports balanced growth of population and employment and the internalization of trips
- Support ODOT adoption of an alternate mobility standard for US 26 that allows for efficient use of capacity in the highway corridor, especially during peak seasonal travel periods

Environmental Goals

- Avoid or mitigate transportation project impacts to environmental resources including creeks and wetlands, cultural resources, and wildlife corridors
- Support energy conservation through the provision of public transit, transportation demand management, a multi-modal transportation system, and improvements in City fleet operations and maintenance activities
- Encourage alternative (environmentally sensitive) transportation facility construction methods
- Minimize street cross-sections to protect and preserve open space and reduce impervious surface

The TSP also identified pedestrian, bicycle, and motor vehicle projects. These projects are identified and tabulated in its Appendix.

Future intersection operations along state highway corridors in Sandy were expected to exceed mobility targets, even with preferred improvements. The TSP recommends the adoption of alternate mobility targets, in coordination with ODOT, at these locations.

What this means for the City of Sandy TSP:

The goals and projects identified in the 2011 TSP will be reviewed and updated for inclusion in the updated TSP, where appropriate and approved by the PMT. Future traffic forecasts will be updated to a 2040 horizon and mobility will be reevaluated. The issue of alternate mobility targets will be considered at locations where other strategies, such as travel demand management, are insufficient.

CITY OF SANDY DEVELOPMENT CODE (AMENDED 2020)

[9] The jurisdictional transfer was completed in December 2020.

The Sandy Development Code regulates development within the Sandy urban growth boundary (UGB) and helps implement the long-range land use vision embodied in the Comprehensive Plan and TSP. The Development Code contains several sets of requirements that address the relationship between land use and transportation system development. Those requirements are summarized below and address access, transportation improvements, clear vision areas, traffic impact analysis, parking, and street design standards. TSP-related items covered in the code include sidewalk, parking, driveway, and access requirements, as well as building setback specifications for properties abutting arterials and collector streets. Specific sections of the Development Code that are of importance to the TSP are summarized below.

Chapter 17.80 requires additional setbacks, a minimum of 20 feet, on collector and arterial streets. Improvements required with developments are described in Chapter 17.84, which describes timing of improvements, and required improvements for bicycle and pedestrian, transit, and streets. The requirements include a Transportation Impact Study section that was revised in 2020 after consultation with the city transportation engineer.

Chapter 17.82 addresses special setbacks on transit streets. Transit streets are defined as collectors or arterial streets unless the Transit System Plan includes specifically designated streets. Development on transit streets is required to have primary entrances oriented toward the street and dwellings are required to have clearly marked, convenient, safe, and lighted pedestrian routes from the building entrance to the street.

Parking, loading, and access requirements are found in Chapter 17.98. Off-street vehicle and bicycle parking requirement are in Section 17.98.20. Options for parking reductions and shared parking are found in Sections 17.938.30 and 17.98.40, respectively. Amendments to Chapter 17.98 in 2020 eliminated the requirement for off-street parking in the C-1 zone. Standards for access onto arterial and collector streets are found in Section 17.98.80. Design and location of bicycle parking facilities are found in Section 17.98.160.

Improvements required with development, consistent with the standards of Chapter 17.84, are listed in Chapter 17.100, Land Division and include sidewalks, streets, traffic control devices, and signs (Section 17.100.310). Provisions also address US 26 access management, requiring notice to ODOT for proposed public and private access and that future development reduce noncompliance with the OHP Access Management Policies (Section 17.100.90). This chapter includes standards for streets design, connectivity, and spacing. Street design standards and classifications are found in Section 17.100.110. B.

Blocks and accessway standards are in Section 17.100.120 and specify that blocks for residential areas should generally not exceed 400 feet in length and blocks for commercial areas shall not exceed 400 feet in length. A minimum 10-foot-wide pedestrian and bicycle accessway must be provided in the middle of a block when its length exceeds 600 feet in a commercial or residential area.

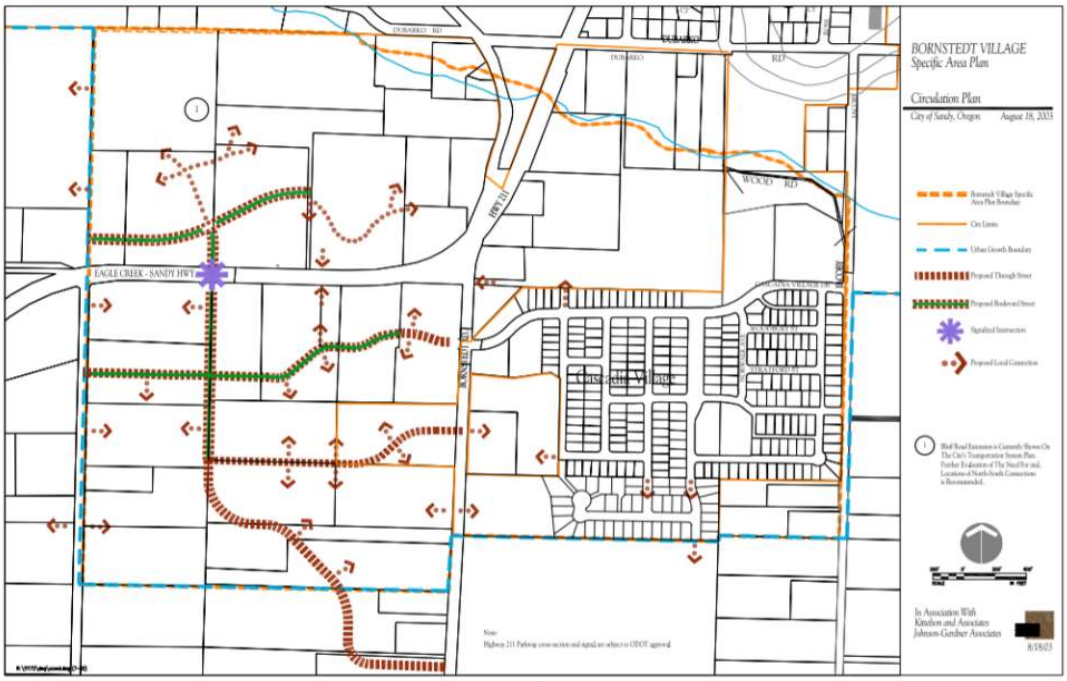
Section 17.100.180 specifies the requirements for the construction of City intersections and the curve radii of local streets, including the following provisions.

> *A. Intersections. Streets shall be laid out so as to intersect as nearly as possible at right angles. A proposed intersection of two new streets at an angle of less than 75 degrees shall not be acceptable. No more than two streets shall intersect at any one point unless specifically approved by the City Engineer. The city engineer may require left turn lanes, signals, special crosswalks, curb extensions and other intersection design elements justified by a traffic study or necessary to comply with the Development Code.*
>
> *B. Curve Radius. All local and neighborhood collector streets shall have a minimum curve radius (at intersections of rights-of-way) of 20 feet, unless otherwise approved by the City Engineer. When a local or neighborhood collector enters on to a collector or arterial street, the curve radius shall be a minimum of 30 feet, unless otherwise approved by the City Engineer.*

Sidewalks are required to be installed on both sides of a public street and in any special pedestrian way within a subdivision, pursuant to Section 17.100.270; the Development Services Director or Planning Commission can require installation of bicycle lanes within streets, per Chapter 17.100.280.

The Bornstedt Village Overlay district also includes street specifications for the district (Section 17.54.120). Development in the overlay must be consistent with the Bornstedt Village Circulation Plan shown in Figure 1 (Figure 7 of the Bornstedt Village Specific Area Plan). OR 211 cross sections must meet the design requirements of the Bornstedt Village Specific Area Plan but are subject to ODOT approval. Modifications can be approved by the City Engineer. Boulevard roads are required in certain areas of the overlay and have their own requirements, described in Section 17.54.120.C.

FIGURE 1. BORNSTEDT VILLAGE CIRCULATION PLAN



What this means for the City of Sandy TSP:

Amendments to the Sandy Development Code are necessary to ensure consistency between the updated TSP and development requirements. Code requirements related to connectivity, pedestrian and bicycle access and circulation, bicycle parking, development review coordination, zoning and plan amendments, and other transportation system-related provisions will be reviewed and updated as part of implementation of the updated TSP. Proposed amendments will address consistency with the TPR and will implement recommendations in the updated TSP. Ultimately, consistency will need to be ensured between standards in the Sandy Development Code, updated TSP, and Engineering Standards.

CITY OF SANDY TRANSIT MASTER PLAN (2020)

The Sandy Transit Master Plan includes an evaluation of existing transit service and provides a framework for service expansion. The Master Plan update was completed in 2020 and referenced the previous Transit Master Plan completed in 2009.

The plan identifies two goals and seven policies to implement the goals.

Goal 1: *To provide effective, safe, and equitable transit service that gives Sandy residents, workers, businesses, and visitors more freedom to meet their needs within the city, the region, and the state.*

Goal 2: *To create a transit system that offers an alternative to private automobile use, supports efficient use of roadways, and reduces air pollution and energy use.*

Policy 1: *Provide service that is safe, comfort-able, and useful to many different kinds of people.*

Policy 2: *Collaborate with other transportation agencies and support user-friendly connections between transit systems.*

Policy 3: *Increase service as the numbers of residents and jobs in Sandy grow.*

Policy 4: *Improve accessibility to transit and connections between transit services for people arriving by foot, by bicycle or with a mobility device.*

Policy 5: *Increase public awareness of Sandy Transit and its connectivity to other transit systems and transportation modes.*

Policy 6: *Operate with the highest degree of fiscal responsibility.*

Policy 7: *Reduce air pollution and energy use through strategies such as conservation, improved technology, and alternative fuels.*

The public outreach conducted for the Master Plan identified consensus around four aspects of transit service in Sandy:

- Regional service is a slightly higher priority than local service.
- Local routes should be designed with the expectation that many riders will walk to a main street.
- The current balance is about right between services that attract high ridership and services that attract low ridership but are important for other reasons.
- Getting places when it matters is more important than other amenities.

The plan identifies a variety of projects to improve service to meet future demand. These are included in the Master Plan's Appendix.

The Master Plan specifically addressed the overlap between its objectives and the TSP. These common objectives are:

- Better street connectivity
- Pedestrian improvements
- Redefinition of "transit street"

What this means for the City of Sandy TSP:

The PMT will review the projects identified in the Transit Master Plan and incorporate them as needed into the updated project list. The Master Plan goals and policies will inform the transit-related TSP policies.

OREGON TRAIL SCHOOL DISTRICT SAFE ROUTES TO SCHOOL (SRTS) PLAN (2020)

The Oregon Trail School District Safe Routes to School (SRTS) Plan lays the foundation for reducing barriers to students walking and biking to Cedar Ridge Middle School and Sandy Grade School. The plan is designed to create a collaborative approach and establish recommendations for the two schools, the community, the City of Sandy, Clackamas County, and ODOT, ultimately to achieve SRTS objectives.

Recommendations were developed through data analysis and a safety assessment for each school. The SRTS Plan includes both recommendations for short and long-term construction projects, as well as ideas for education and engagement events to promote healthy, active lifestyles.

The Plan includes a list of recommended projects that are organized by priority, including high priority improvements for the ODOT Infrastructure Grant Application.[10] These improvements include:

- Cedar Ridge Middle School
  - Widen sidewalk to fence along east side of Bluff Rd between Hood St and school vehicle entrance.
  - Replace "7AM - 5PM" 20 MPH school zone signs on Bluff Rd with "WHEN FLASHING" 20 MPH school zone signs and flashing beacons (S5-1).
  - Replace existing crossing signage on Bluff Rd at Marcy St with a Rectangular Rapid Flashing Beacon (RRFB) with School Crossing Assembly (S1-1 and W16-7P), and high visibility crosswalks across the north and east sides of the intersection.
  - Construct approximately 225 LF of sidewalk along west side of Bluff Rd from Meeker St north to existing sidewalk.
  - Install a curb extension including perpendicular curb ramps and tactile domes at northeast corner of Bluff Rd at Hood St.
  - Install a curb extension to provide clearance from existing pole, including perpendicular curb ramps and tactile domes, at southeast corner of Bluff Rd at Hood St.
  - Mark crosswalk and stop bar across the east leg of intersection of Bluff Rd at Hood St.

[10] https://www.oregon.gov/odot/Programs/Pages/SRTS-Competitive-Infrastructure-Grant.aspx

- At Beers Ave and Hood St, repaint stop bars on west and east sides of intersection. Consider installation of a 4 way stop at Beers Ave, which experiences higher traffic volume than other north-south streets in Sandy.
- Install 100 ft of new sidewalk on north side of street between 38661 Hood St and Scales Ave.
- Install perpendicular curb ramps with tactile domes at northwest and southwest corners of the intersection of Hood St and Scales Ave. Install tactile domes at the northeast and southeast corners. Repaint stop bars.
- Install tactile dome at southwest corner of Bruns Ave and Hood St.

- Sandy Grade School
  - Mark stop bars in advance of crosswalks at all STOP control approaches at the intersections of Pleasant St at Strauss Ave, Alt Ave, and Smith Ave.
  - Construct approximately 125 LF of sidewalk along the north side of Pleasant St between Bruns Ave and Strauss Ave.
  - Consider installation of advanced school warning signage with flashing beacons (S5-1) to raise awareness of school speed zone on both sides of Pleasant St approaching school.
  - Consider revising the intersection of Pleasant St and Strauss Ave to be a four-way stop (currently STOP control north- and southbound only).
  - Replace existing diagonal curb ramps at all four corners with perpendicular curb ramps with tactile domes at the intersection of Pleasant St and Alt Ave.
  - Install a curb ramp on the east side of the south leg of the intersection of Strauss Ave at Hood St. Add tactile domes and a stop bar associated with the crosswalk across the west leg of the intersection.

The SRTS Plan includes cost estimates for the infrastructure projects and describes potential funding sources.

The SRTS Plan notes that recommendations for US 26 were not included in the grant prioritization for this project because, at the time the plan was developed, traveling on the highway "is not critical for school travel, nor would the proposed facilities be used primarily by school students." The plan further notes that ODOT staff had acknowledged during a field visit that safety improvements for walking and biking on US 26 are an important community issue and indicated that they are being addressed in a planning process outside the scope of SRTS.

What this means for the City of Sandy TSP:

The SRTS Plan suggests that some projects could be integrated in the Sandy TSP for future consideration and that the City is a key partner in accessing ODOT Safe Route to School grant funds. This can assist the likelihood of successful grant applications for the projects. SRTS projects will be evaluated and prioritized along with other transportation projects for inclusion in the updated TSP.

SANDY PARKS AND TRAILS MASTER PLAN (IN PROGRESS)

The Parks and Trails Master Plan update is currently in progress.[11] The Master Plan is intended to identify the parks and trails needed to accommodate existing and future residents of the City and to ensure that these facilities are distributed and built in an equitable manner so that they serve everyone in the city. The City currently has a park and trail inventory that details amenities and includes a level of service analysis.

What this means for the City of Sandy TSP:

To the extent possible and depending on the timing of the two planning projects, the TSP update will consider the recommendations from the Parks and Trails Master Plan and will evaluate transportation and access needs to existing and planned facilities. The trails system will be reflected in the updated TSP maps for the non-motorized modes.

INTERGOVERNMENTAL SPECIAL TRANSPORTATION AREA MANAGEMENT AND DESIGN PLAN – CITY OF SANDY (LAST AMENDED 2003)

The City of Sandy's STA is located along the one-way couplet of US 26 between the intersections of Bluff Road and Ten Eyck Road (MP 23.87 to 24.61). An intergovernmental agreement (#21319) outlines specific responsibilities and authorities granted to the City by ODOT,[12] including:

- The City is an Agent of ODOT and therefore isn't required to seek ODOT permits for roadway projects within STA, with the exception of signals, which must be approved by the State Traffic Engineer.
- The City will maintain the projects it designs and constructs on the State Highway within the STA area.
- ODOT will maintain the projects it designs and constructs on the State Highway within the STA area, but may delegate these projects to the City.

The agreement also identifies needed improvements along US 26 within the STA area including:

- New signals on Pioneer and Proctor Boulevards at Scales and Strauss Avenues,
- Signal coordination, sidewalks, curb extensions and crosswalks at the signalized intersections as well as Proctor and Hoffman, Alt, Bruns, and Beers, and at Pioneer and Hoffman, Shelley, Bruns, Scales, and Beers

[11] https://www.ci.sandy.or.us/parksrec/page/parks-and-trails-master-plan-update

[12] This section is an excerpt Technical Memorandum #1, May 26, 2009, included in the 2011 Sandy TSP Appendix.

When new or modified improvements within the STA are identified through this TSP update process, design standards identified in the STA Agreement apply, including:

- Speed limit: 25
- Pedestrian Signals: Additional pedestrian signals in the STA area must be timed with the signals at Bluff and Meinig. Possible locations include Alt/Shelly, Bruns and Beers, or Strauss and Scales.
- Access Management: Where possible, the number of driveways accessing US 26 (i.e., Proctor and Pioneer) should be reduced.
- Through Traffic: Coordinate signal timing to provide for smooth traffic flow.
- Transportation System: Maintain the one-way couplet and consider the construction of a bypass to re-route truck traffic out of the downtown.
- Cross-section:
  - The City will follow AASHTO Guidelines for lane widths and striping. The minimum lanes widths are:
    - Travel lanes: 11 feet
    - Parking Lanes 8 feet
    - Bicycle Lanes 4 feet
  - Right-of-way Allocation:
    - Sidewalks: 8 feet max,
    - Lanes widths: 11 feet minimum, and
    - Bicycle lanes: since US 26 is a Statewide Bike Route, bicycle lanes may only be removed if an adequate alternative bike route is designated, and the TSP is amended.
  - Traffic Calming:
    - Allowed treatments include signing or striping, curb extensions, overhead flashers, Landscaped medians at either end of the couplet, narrowed travel lanes and widened sidewalks, street trees and other pedestrian-oriented amenities, speed enforcement and photo radar.
  - Disallowed treatments include speed humps or other intentional mutilation of the road surface.

What this means for the City of Sandy TSP:

In developing the policies, strategies, and recommended US 26 improvements needed to support the local system, the updated TSP will need to reflect the STA or include recommendations for modifications to this STA, an adopted element of the OHP.

SANDY DOWNTOWN PARKING MANAGEMENT STUDY (2012)

The objective of the Downtown Parking Management study was to identify key issues regarding parking in Sandy's downtown core and determine impacts on the continuing

economic vitality of the downtown. The result of the analyses were a number of recommendations and strategies proposed for adoption.

A review of parking data and observations in the field identified the following issues in the inventory area that informed the recommendations:

- Lack of oversight and review of downtown parking issues.
- No dedicated funding to cover future public parking lot improvements.
- No mechanism exists to allow developers of new projects in the downtown to reduce parking requirements and build at higher densities.
- Lack of enforcement of time limited parking areas.
- No incentive for downtown employees to park in private off-street parking lots.
- Inadequate signage directing individuals to parking opportunities.
- Limited on-street ADA parking spaces.
- A number of curbs are unnecessarily painted yellow.
- An excessive number of time variations and applicable time variations for restricted parking.
- Arrows on time restriction signs are non-descriptive and lead to confusion.
- The public parking lot located in Block 3B (behind Otto's Ski Shop) is underused.

The study recommended continued parking monitoring to allow for transitions in management, as the recommendations were implemented and parking needs and conditions in the downtown shifted. There are many recommendations in the plan that were proposed to be phased. Recommendations that could inform the TSP update include:

- Review pedestrian accessibility issues relating to parking, including street crossing placements.
- Establish a Downtown Parking Fund to direct funds derived from parking into a dedicated fund to cover future public parking improvements.
- Develop criteria for installing time limited signs and handicapped/ADA signs. Evaluate other areas within the downtown for time limitation potential and necessity.
- Develop a wayfinding plan that includes the location and design of signs for City owned public parking lots.
- Evaluate the need to provide additional on-street ADA parking and evaluate the practicality to modify the existing on-street ADA parking space to meet state standards.
- If applicable, install additional on-street ADA parking spaces at identified locations and modify the existing on-street ADA parking space.
- Coordinate with Sandy Transit regarding the designation of a portion of the public parking lot to the south of Pioneer Boulevard and between Bruns Avenue and Scales Avenue as a park-and-ride facility.
- Initiate a fee-in-lieu option for new parking development in downtown that would allow developers to build at higher densities while providing the City of Sandy with money to purchase land for future off-street parking.
- Lease/acquire strategically located land for use as future public off-street parking.

- Sponsor employer-based initiatives to encourage employee use of alternate modes of travel and/or car-pools.
- Further evaluate off-street parking capacity solutions for high demand blocks.
- Continue to monitor downtown parking use and function.

What this means for the City of Sandy TSP:

The update TSP should be consistent with, or should update, the recommendations of the parking study related to access to parking, wayfinding, ADA accessibility, access to transit, and park and ride facilities. Specific projects that have not been implemented and that are prioritized through this planning process should be considered for inclusion in the updated TSP projects list.

SANDY URBAN GROWTH BOUNDARY EXPANSION ANALYSIS REPORT (2017)

The report evaluated and determined the need for a UGB expansion. The report analyzed future land needs and developed a single preferred expansion alternative. Ultimately, the preferred alternative was used for the City's UGB expansion in 2017.

The report includes a Transportation Analysis of the Proposed Rezoning (in Appendix D) for parcels located in the City that were proposed for rezoning as a part of the UGB expansion. The Transportation Analysis Report focused on 10 parcels in the City, ranging from 10 acres to 0.1 acres. Key findings include:

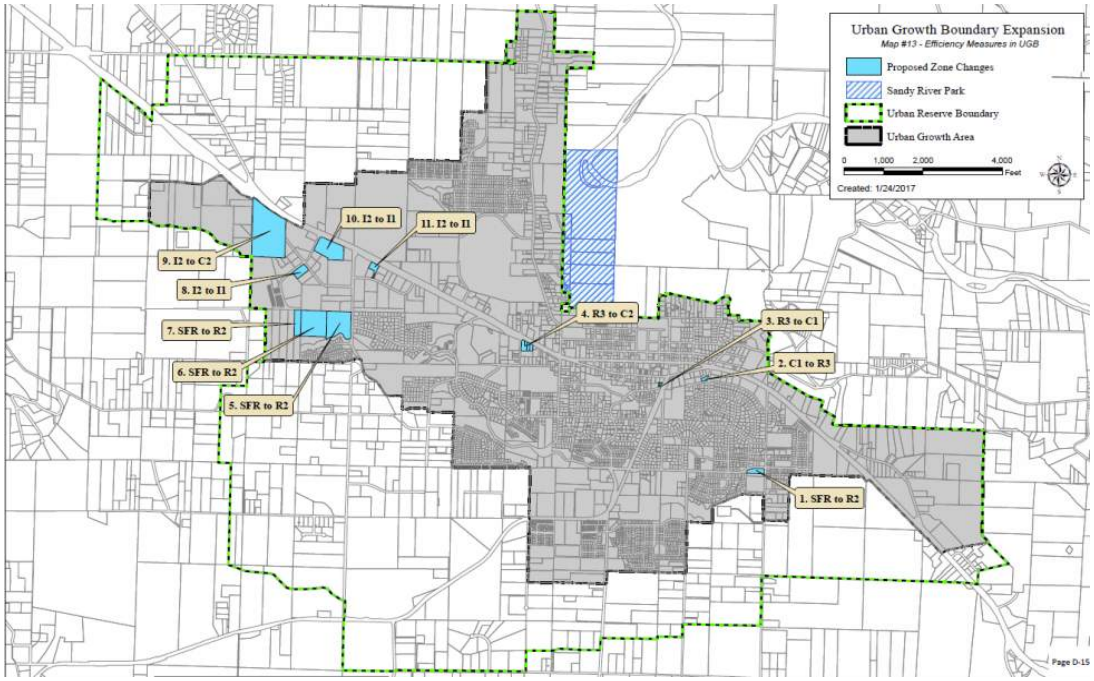
- The trip generation potential of each proposed rezoning was calculated using a reasonable worst case development scenario under existing and proposed zoning.
- Six of the parcels have predicted PM peak hour trip generation that differ so little between current and proposed zoning that the transportation impact can be considered insignificant.
- To support a finding of no significant impact for the other parcels, the use of a trip cap for the three remaining cases was applied. For all three, the recommended trip cap is based on the current zoning. The recommended trip cap based on the trip generation in the PM peak hour is presented in Table 3 in the Analysis Report.

TABLE 3: PROPOSED TRIP CAPS IN CONNECTION WITH REZONING

Map Number	Map & Tax Lot	Gross Acres	Net Acres	Existing Zoning	Proposed Zoning	Recommended PM Peak Hour Trip Cap
4	24E14AD03500	0.73	0.73	R-3	C-2	19 trips (combined for all tax lots)
	24E14AD03600	0.16	0.16			
	24E14AD03700	0.32	0.32			
	24E14AD03800	0.32	0.32			
8	24E15A 00205	1.69	1.69	I-2	I-1	90 trips
10	24E10 05700*	6.88	6.88	I-2	I-1	Current Forest Service PM peak trips plus 92 trips

- Based on the implementation of the recommended trip cap, the proposed rezoning of the parcels will also have an insignificant impact on the transportation system.

FIGURE 2. UGB EXPANSION REZONED PROPERTIES TRANSPORTATION ANALYSIS IDENTIFICATION



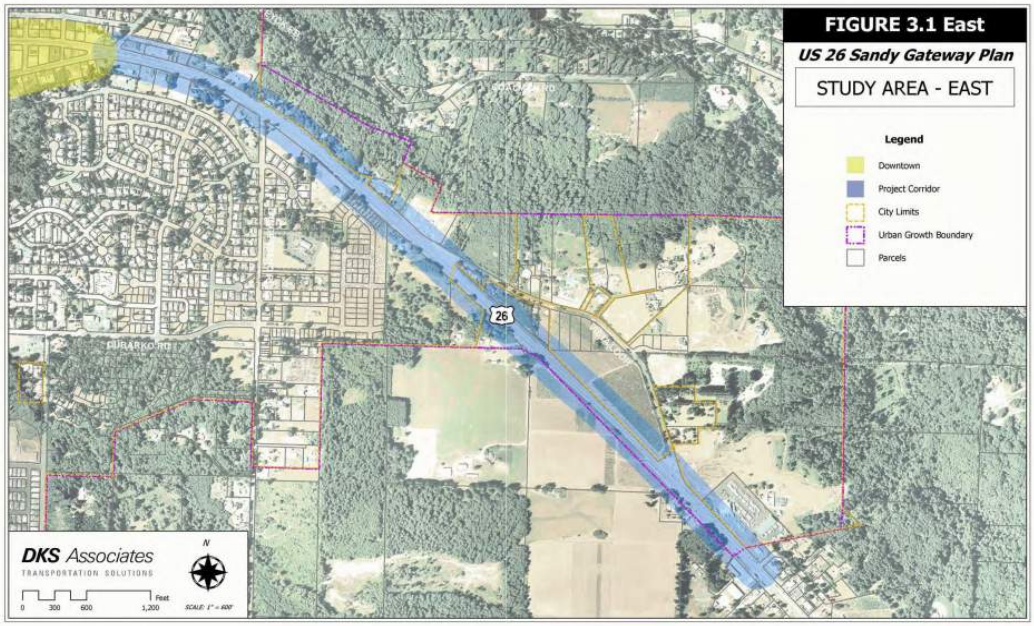
What this means for the City of Sandy TSP:

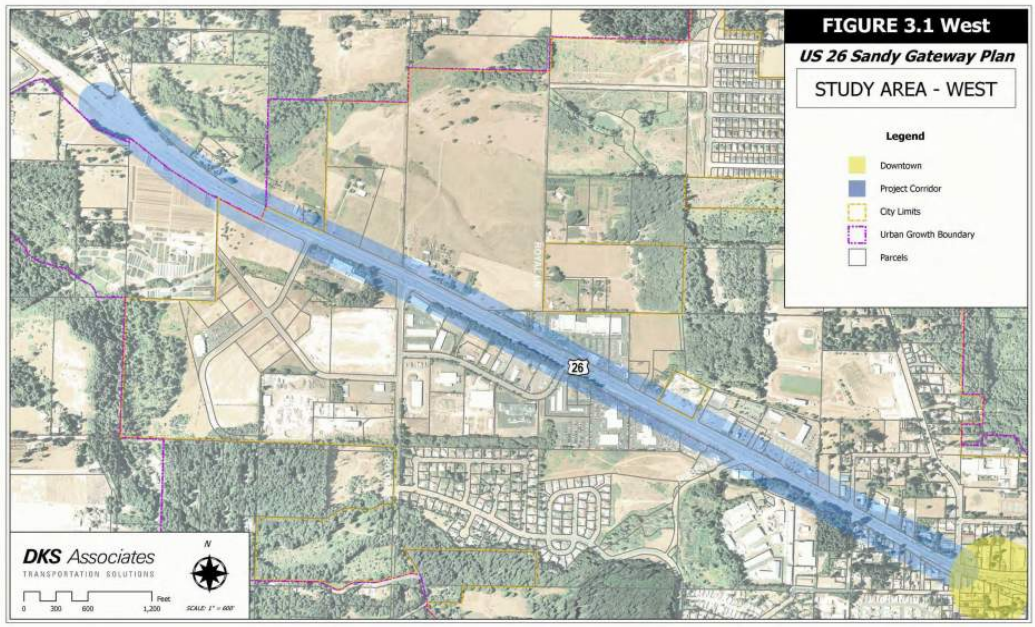
The trip caps identified in the Report "freeze" trip generation potential of identified parcels based on existing zoning at the time the UGB was amended in 2017. These assumptions should be reflected in existing conditions and future trip generation forecasting for the TSP update.

US 26 SANDY GATEWAY PLAN (2008)

The US 26 Sandy Gateway Plan provides a vision and implementation plan for safety, operational, and aesthetic enhancements in the US 26 corridors between the west and east UGB boundaries and the downtown couplet (the couplet was not included). Study area maps are shown in Figure 3.

FIGURE 3. US 26 SANDY GATEWAY PLAN STUDY AREA





Key elements of the plan include: a system inventory, a needs assessment, an access management vision, streetscape designs with typical cross-sections, recommendations for traffic control and geometric improvements, and implementation recommendations.

> *The vision for the US 26 Gateway Plan is a safe and efficient multi-modal highway with design elements that reflect the unique scenic values and historic character of the City of Sandy. Highway design elements enhance motorist awareness as they transition from rural to suburban to urban settings, support community livability as well as provide for statewide travel and freight movement.*

Chapter 7 addresses implementation of the concepts described in the plan, including the following actions and recommended improvements:

- Streetscape design for US 26 (includes typical cross sections for the study area)
- Pedestrian improvements - three key improvements prioritized:
  - Fill in the gaps in the existing sidewalk system consistent with HDM design standards.
  - Upgrade current sidewalks to meet the proposed design standards.
  - Pedestrian crossing improvements where feasible and safe.
- West and east gateways for the downtown couplet
- An access management plan - reviewed every access point in the study area and the intended future plans for each (e.g., close, or constructing alternative approaches, or limiting permitted turns) and the trigger for action (e.g., change of use, as opportunity arises, or construction of public and private roadways).

The plan includes cost estimates for the recommended streetscape elements, listed in 2007 dollars.

What this means for the City of Sandy TSP:

Plan recommendations include that it be adopted as an amendment to the Sandy TSP in order to facilitate implementation of suggested improvements and design treatments. However, only the typical roadway sections were included in the 2011 Sandy TSP – all other Gateway Plan elements were deferred. The Gateway Plan vision and policies should be considered in developing TSP guiding policies. Additionally, recommended improvements that were not previously included in the TSP and have yet to be adopted or implemented should be considered for incorporation into the TSP project list. Additionally, the TSP could include a recommendation to update the Gateway Plan.

DOWNTOWN WALKABILITY ASSESSMENT

This document evaluated the walkabilty of downtown Sandy, primarily the US 26 couplet consisting of Pioneer and Proctor Boulevard between Bluff Road and Ten Eyck Road but also including the area north of the couplet to Hood Street. The following goals were identified:

- Goal 1: Improve pedestrian safety and comfort in the downtown.
- Goal 2: Improve pedestrian accessibility in the downtown.
- Goal 3: Improve pedestrian connectivity to the downtown.

The existing conditions were evaluate using the Pedestrian Environmental Quality Index (PEQI). This measurement system includes a variety of "indicators" that contribute to the quality of the pedestrian experience. Some of these indicators are the number of lanes in a road, the sidewalk width, vacant buildings along the route and the presence of trees. Following this qualitative evaluation there was a public involvement process that documented the perceptions of the community towards the pedestrian environment.

The recommendations of this document are:

Goal 1 – Increase pedestrian safety and comfort in the downtown.

- Recommendation A: Partner with Oregon Department of Transportation (ODOT) to find techniques to accomplish improved pedestrian safety in the downtown via reduction of speed limits.
- Recommendation B: Partner with the Sandy Police Department to enforce speed limits in the downtown in order to increase pedestrian safety and reduce traffic crash outcomes.
- Recommendation C: Reduce speed on Hwy 26 east of downtown to provide for a better transition to reduced speeds in the downtown (reduction of 40mph current speed limit).
- Recommendation D: Create traffic calming measures such as rumble strips to deter erratic driving.
- Recommendation E: Increase landscaping and street trees on busy streets in order to increase separation of pedestrians and automobiles.
- Recommendation F: Improve sight lines for pedestrian visibility by ensuring parking and street trees are placed away from intersections through municipal code.
- Recommendation G: Increase number of marked crosswalks on Highway 26 in the downtown.
- Recommendation H: Transition all marked crosswalks on Pioneer Blvd. and Proctor Blvd. to high visibility crosswalk paint.
- Recommendation I: Increase signage and/or signalized flashing beacons at marked crosswalks.
- Recommendation J: Increase number of pedestrian bulb-outs for pedestrian safety in crossing the street.
- Recommendation K: Increase number of streetlights on street segments in the downtown to provide for increased pedestrian safety and comfort.

Goal 2 – Improve pedestrian accessibility in the downtown.

- Recommendation A: Construct missing sidewalks within project boundaries to improve walking and rolling in the downtown.
- Recommendation B: Create a sidewalk maintenance plan to provide continuation of pedestrian enhancements.
- Recommendation C: Increase pedestrian walk signal times at the intersections at the edges of downtown (Bluff Rd. and Ten Eyck Rd.) and at major intersections within the couplet. Increased pedestrian signal times will allow people with mobility impairments, older adults, or children cross in a safe amount of time.
- Recommendation D: Widen narrow sidewalks within project boundaries.
- Recommendation E: Upgrade sidewalks with major impediments and in poor condition.
- Recommendation F: Improve and prioritize ADA accessibility along sidewalks and pedestrian crossings in downtown. This includes, but is not limited to, increasing audible pedestrian crossing signals, lengthening time of pedestrian crossing signals, transitioning to automated pedestrian cross times to decrease the need to push buttons (which can be an impediment for people with mobility impairments), and implementing more truncated domes at curb cuts.

Goal 3 – Improve pedestrian connectivity to the downtown.

- Recommendation A: Create and post wayfinding for pedestrians detailing length of time from location to the downtown via walking/rolling.
- Recommendation B: Construct sidewalks on connecting streets with missing sidewalks.
- Recommendation C: Complete and widen sidewalks on Pleasant Street (for more information reference Pleasant Street Master Plan) to create a more pedestrian friendly environment on Pleasant St.
- Recommendation D: Improve the safety of the crosswalk at the intersection of Alt Ave. and Proctor Blvd. to connect Pleasant St and Proctor Blvd. This improvement will create a safer pedestrian environment for students traveling to and from the Sandy Public Library to Sandy Grade School.
- Recommendation E: Encourage more events downtown with instructions for pedestrian access from neighboring areas to attract more pedestrian activity in the downtown.

What this means for the City of Sandy TSP:

Plan recommendations will be considered when developing proposed improvements during the solutions portion of the TSP.

OREGON TRAIL SCHOOL DISTRICT SAFE ROUTES TO SCHOOL PLAN

The Oregon Trail School District Safe Routes to School (SRTS) Plan lays the foundation for schools, the community, the City of Sandy, Clackamas County, and the Oregon Department of Transportation (ODOT) to work together on reducing barriers for students walking and biking to school.

SRTS is a comprehensive program to make school communities safer by combining engineering tools and enforcement with education about safety and activities to enable and encourage students to walk and bicycle to school. SRTS programs typically involve partnerships among municipalities, school districts, community members, parent volunteers, and law enforcement.

The plan outlines goals, objectives, and actions related to Safety, Equity, and Heath.

- Safety - Increase safety for families traveling to school, including perceptions of safety, since perceived barriers can have a real impact on whether parents allow their students to walk or bike.
- Equity - Increase access and opportunity for all residents, including disadvantaged, minority, and low-income households.
- Health - Increase student access to physical activity and reduce emissions near schools, contributing to better air quality.

There are many construction needs and recommendations identified in the plan. The transportation system improvements are:

- Cedar Ridge Middle School
  - Bluff Road in Front of School
    - Widen sidewalk to fence along east side of Bluff Rd between Hood St and school vehicle entrance.
    - Widen sidewalk in the vicinity of telephone poles north of school entrance and move associated utility structures as needed.
    - Replace "7AM - 5PM" 20 MPH school zone signs on Bluff Rd with "WHEN FLASHING" 20 MPH school zone signs and flashing beacons (S5-1).
    - Replace existing crossing signage on Bluff Rd at Marcy St with a Rectangular Rapid Flashing Beacon (RRFB) with School Crossing Assembly (S1-1 and W16-7P), and high visibility crosswalks across the north and east sides of the intersection.
    - Construct approximately 225 LF of sidewalk along west side of Bluff Rd from Meeker St north to existing sidewalk.
    - If redistricting occurs, install marked crosswalk with curb ramps, tactile domes, HAWK beacon and median refuge island across north leg of the Meeker St at Bluff Rd intersection.
    - If redistricting occurs, construct sidewalk along the north side of Meeker between Bluff Rd and the existing sidewalk west of Bluff Rd.
  - Bluff Road at Hood Street
    - Intersection Improvement
      - Install a curb extension including perpendicular curb ramps and tactile domes at northeast corner of Hood St.

- Install a curb extension to provide clearance from existing pole, including perpendicular curb ramps and tactile domes, at southeast corner.
- Mark crosswalk and stop bar across the east leg of intersection.

- Bluff Road at US 26
  - Intersection Improvement
    - Increase pedestrian signal crossing time to be based on a walking rate of 3.0 feet per second.
    - Reconfigure crossing to provide perpendicular curb ramps with tactile domes and reduce curb radius at all corners. Add pedestrian-scale lighting.
    - Reallocate existing roadway space to provide buffered bike lanes along Highway 26 and consider the use of green pavement markings in the vicinity of Bluff Rd. Consider installing vertical delineators with buffered bike lanes contingent on city maintenance agreement, or construct a fully grade-separated bicycle facility.
- Hood Street
  - Beers Avenue Intersection Improvement
    - At Beers Ave, repaint stop bars on west and east sides of intersection. Consider installation of a 4 way stop at Beers Ave, which experiences higher traffic volume than other north-south streets in Sandy
  - Reconstruct and widen 60 ft of sidewalk in front of 38641 Hood St.
  - Install 100 ft of new sidewalk on north side of street between 38661 Hood St and Scales Ave.
  - Scales Avenue Intersection Improvement
    - Install perpendicular curb ramps with tactile domes at northwest and southwest corners of the intersection of Hood St and Scales Ave. Install tactile domes at the northeast and southeast corners. Repaint stop bars.
  - Bruns Avenue Intersection Improvement
    - Install tactile dome at southwest corner of Bruns Ave and Hood St.
  - Remove unutilized pipe causing sidewalk slope between 38795 and 38785 Hood St.
  - Require 6 ft-wide sidewalk infill as part of future development.

- Sandy Grade School
  - Pleasant Street in Front of School
    - Mark stop bars in advance of crosswalks at all STOP control approaches at the intersections of Pleasant St at Strauss Ave, Alt Ave, and Smith Ave.
    - Construct approximately 125 LF of sidewalk along the north side of Pleasant St between Bruns Ave and Strauss Ave.
    - Consider installation of advanced school warning signage with flashing beacons (S5-1) to raise awareness of school speed zone on both sides of Pleasant St approaching school.
  - Pleasant Street and Strass Avenue
    - Intersection Improvement
      - Mark stop bars in advance of crosswalks.

- Consider revising the intersection of Pleasant St and Strauss Ave to be a four-way stop (currently STOP control north- and southbound only).

- Pleasant Street at Alt Avenue
  - Intersection Improvement
    - Mark stop bars in advance of crosswalks.
    - Replace existing diagonal curb ramps at all four corners with perpendicular curb ramps with tactile domes.
    - Construct a raised intersection at Pleasant St at Alt Ave.
- Pleasant Street at Smith Avenue
  - Intersection Improvement
    - Mark stop bars in advance of crosswalks.
    - Relocate southbound school advance crossing assembly (S1-1 & W16-9P) and school speed limit assembly (S4-3P & R2-1) along Smith Ave to approximately 100 ft and 175 ft north of intersection, respectively.
- Strass Avenue and Hood Street
  - Relocate southbound school advance crossing assembly (S1-1 & W16-9P) and school speed limit assembly (S4-3P & R2-1) along Strauss Ave to approximately 100 ft and 175 ft north of intersection, respectively.
  - Repair approximately 150 LF of degraded sidewalk along the east side of Strauss Ave at the intersection with Hood St, and widen sidewalk at encroaching utility pole.
  - Install a curb ramp on the east side of the south leg of the intersection of Strauss Ave at Hood St. Add tactile domes and a stop bar associated with the crosswalk across the west leg of the intersection.
- Alt Avenue and US 26
  - Intersection Improvement
    - Increase pedestrian signal crossing time to be based on a walking rate of 3.0 feet per second. Upgrade pedestrian push-buttons to meet current standards with audible indications.
    - Consolidate the two existing crosswalks across Highway 26 at Alt Ave with one high visibility continental crosswalk on the east side of the intersection including advance stop bar, bulbouts, curb ramps, and pedestrian scale lighting.
  - Reallocate existing roadway space to provide buffered bike lanes along Highway 26 and consider the use of green pavement markings in the vicinity of Alt Ave. Consider installing vertical delineators with buffered bike lanes contingent on city maintenance agreement, or construct a fully grade-separated bicycle facility.

What this means for the City of Sandy TSP:

Plan recommendations will be considered when developing proposed improvements during the solutions portion of the TSP.

MANAGING AND MONITORING THE TRANSPORTATION SYSTEM

To ensure that the transportation system maintains acceptable quality, it is monitored with a variety of measures. These measures are typically defined by the agency with maintenance responsibilities, which includes City of Sandy, Clackamas County and ODOT. US 26 is under the jurisdiction of ODOT. Each responsible jurisdiction sets various standards for the streets to maintain its designated classifications.

MOTOR VEHICLE MOBILITY STANDARDS

The state and region have adopted vehicle mobility standards. These mobility standards ensure that the transportation system will have adequate capacity to support planned growth or that the average driver does not experience significant delay, depending on specific policy of the managing jurisdiction. Note that ODOT mobility standards and based on the volume to capacity ratio, a measure volume that can be served by an intersection or approach while the City of Sandy's mobility standards are based on Level of Service, a measure of the delay experienced by drivers.

If changes made in the TSP or City of Sandy Comprehensive plan would cause study intersections to exceed adopted performance measures, mitigation could be necessary before plans are approved. The intersection mobility targets vary by jurisdiction of the roadways. Table 4 below shows the applicable performance standards and road authority for study intersections in the TSP.

TABLE 4: MOBILITY STANDARDS FOR STUDY INTERSECTIONS

INTERSECTION	CONTROL TYPE	MOBILITY STANDARDS	AGENCY
ORIENT DR/US 26	Signal	0.70	ODOT
362ND DR/US 26	Signal	0.80	ODOT
INDUSTRIAL WAY/ US 26	Signal	0.80	ODOT
362ND DR/INDUSTRIAL WAY (NORTH)	Stop Controlled	D	City of Sandy
362ND DR/INDUSTRIAL WAY (SOUTH)	Stop Controlled	D	City of Sandy
RUBEN LN/US 26	Signal	0.80	ODOT
BLUFF RD/US 26	Signal	0.85	ODOT

INTERSECTION	CONTROL TYPE	MOBILITY STANDARDS	AGENCY
BLUFF RD/BELL ST	Stop Controlled	D	City of Sandy
MEINIG AVE (OR 211)/PIONEER BLVD (US 26)	Signal	0.90	ODOT
MEINIG AVE (OR 211)/PROCTOR BLVD (US 26)	Signal	0.90	ODOT
OR 211/ DUBARKO RD	Stop Controlled	D	City of Sandy
OR 211/BORNSTEDT RD	Stop Controlled	D	City of Sandy
TEN EYCK RD/US 26	Signal	0.85	ODOT
LANGENSAND RD/US 26	Stop Controlled	0.80	ODOT
VISTA LOOP DR/US 26	Stop Controlled	0.80	ODOT

OREGON HIGHWAY PLAN

At signalized intersections, these standards are to be applied to the intersection as a whole. At unsignalized intersections, these standards are applicable only to movements that are not required to stop. For other movements at unsignalized intersections the standards for District/Local Interest Roads shall be applied for areas within urban growth boundaries and a maximum volume to capacity ratio of 0.80 shall be applied for areas outside of urban growth boundaries.

CITY OF SANDY

City of Sandy requires a minimum Level of Service D operating condition for signalized and unsignalized intersections.

What this means for the City of Sandy TSP:

System performance will be measured, in part, using the adopted mobility standards. The previous City of Sandy TSP (2011) identified the need for alternative mobility standards at ODOT intersections due to high v/c ratios even with capacity improvements. This update will continue developing alternate mobility standards for those intersections, if needed.

MULTI-MODAL PERFORMANCE MEASURES

The Oregon Transportation Options Plan, The Oregon Transportation Safety Action Plan, and the Oregon Bicycle and Pedestrian Plan identify a variety of performance measures that are partially or wholly focused on non-motorized or non-single-occupant-vehicle trips. These performance measures are reflected in their respective sections. The City has adopted Transportation System Development Charge methodology that uses person-trips instead of motor vehicle trips in order to quantify impacts from all modes of travel and as a funding source for bike-ped improvements.

What this means for the City of Sandy TSP:

The traditional approach to mobility standards has changed in response to many evolving conditions such as transportation funding for projects, economic viability, livability, and funding priorities. The TSP could explore measures to evaluate multi-modal performance.

STREET AND DRIVEWAY SPACING STANDARDS

Access spacing along streets in the City of Sandy will be managed through access spacing standards. Access management is a broad set of techniques that balance the need to provide efficient, safe, and timely travel with the ability to allow access to individual destinations. Proper implementation of access management techniques will promote reduced congestion and accident rates and may lessen the need for additional street capacity.

CITY OF SANDY ROADWAY AND DRIVEWAY APPROACH SPACING STANDARDS

These standards are shown in Table 5 below and regulate access spacing on facilities managed by the City of Sandy. Access spacing on ODOT facilities is also regulated by the access spacing standards from the Oregon Highway Plan.

TABLE 5: CITY OF SANDY ACCESS SPACING

FUNCTIONAL CLASSIFICATION	PUBLIC ROADWAY SPACING (FEET)	DRIVEWAY APPROACH SPACING (FEET)
MAJOR ARTERIAL	See Table 6	See Table 6
MINOR ARTERIAL	5280	300
RESIDENTIAL MINOR ARTERIAL AND COLLECTOR	2640	150
LOCAL STREET	400-660	20

OREGON HIGHWAY PLAN SPACING STANDARDS

The Oregon Access Management Rule[13] (OAR 734-051) attempts to balance the safety and mobility needs of travelers along state highways with the access needs of property and business owners. ODOT's rules manage access to the state's highway facilities in order to maintain highway function, operations, safety, and the preservation of public investment consistent with the policies of the 1999 OHP. Access management rules allow ODOT to control the issuance of permits for access to state highways, state highway rights-of-way and other properties under the State's jurisdiction. In addition, it sets access spacing standards, identifies the ability to close existing approaches and establishes a formal appeal process in relation to access issues. These rules enable the State to direct location and spacing of intersections and approaches on state highways, ensuring the relevance of the functional classification system and preserving the efficient operation of state routes.

OHP Goal 3, Policy 3A and OAR 734-051 set access spacing standards for driveways and approaches to the state highway system.[14] The standards are based on state highway classification and differ based on posted speed. These segments are identified by milepost in the OHP Appendix D. The segments presented in Table 6 below, by intersection, are only approximate.

TABLE 6: OREGON HIGHWAY PLAN SPACING STANDARDS

[13] Access Management Rule: https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=3317

[14] ODOT Access Management Standards (Appendix C): https://www.oregon.gov/ODOT/Planning/Documents/OHP.pdf

SEGMENT	CLASSIFICATION	SPEED (MPH)	ACCESS SPACING (FEET)
US 26 – WEST OF ORIENT RD	Rural Expressway Statewide	50	5280
US 26 – BETWEEN 362ND DR & RUBEN LN	Urban Statewide	45	800
US 26 – BETWEEN RUBEN LN & BLUFF RD	Urban Statewide	40	800
US 26 – BETWEEN BLUFF RD & TEN EYCK RD	Special Transportation Area Statewide	25	350[a]
US 26 – BETWEEN TEN EYCK & ANTLER AVE	Urban Statewide	40	800
US 26 – EAST OF ANTLER AVE	Rural Statewide	55	1320

a. Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 150 feet (46 meters) or mid-block if the current city block is less than 300 feet (91 meters).

What this means for the City of Sandy TSP:

There are many proposed street connections and extensions that have been documented from existing plans. These spacing standards will be followed if additional connections are proposed in the TSP.

FACILITY DESIGN

This section covers applicable design guidance from statewide plans.

OREGON BICYCLE AND PEDESTRIAN DESIGN GUIDE (OBPDG)

The OBPDG provides context guidance to select appropriate design criteria. The seven criteria are shown in Table 7 below.

TABLE 7: OREGON BICYCLE PEDESTRIAN DESIGN GUIDE CONTEXT CRITERIA

CONTEXT	SUMMARY	APPLICABILITY
GENERAL LAND USE	Broad terms such as rural, urban, or suburban	Moderate
ADJACENT LAND USE	More specific terms such as residential, commercial, industrial etc.	Moderate/High
OREGON HIGHWAY PLAN	Defines highway segments including: Special Transportation Areas, Urban Business Areas, Commercial Centers, Non-designated Urban Highways, Urban fringe/Suburban, Developed, and Traditional Downtowns/Central Business Districts	Moderate/High
"MAIN STREET"	A standalone guide for communities working to enhance the vitality of their main street	High
THE TRANSECT	A specific land use classification system ranging from most natural to most urban	Very High
PORTLAND METRO'S DESIGN	A reflection of the various functions that streets often perform and the need to reduce the conflicts that arise due to those conflicts. This system includes three classifications: Throughways, Boulevards, and 2040 mixed-use corridors.	High
AASHTO STREET CLASSIFICATION	A system created for highway and street design including arterial, collector, and local classifications.	Low

The guide identifies the following issues that impact walkway and bikeway design.

- Land use and site design
- Interconnected streets
- Access Management
- Public Transit

Bikeways

OBPDG identifies five types of bikeways.

- Shared Roadway – Bicyclists and motorists share the same lane. The OBPDG does not provide cross-section dimensions. This type of bikeway is most appropriate at vehicle speeds less than or equal to 20 miles per hour.
- Bicycle Boulevards – A series of treatments that restrict through vehicle access along a corridor while providing through access for cyclists. This treatment is most appropriate at vehicle speeds less than or equal to 20 miles per hour.

- Shoulder Bikeway – A shoulder bikeway provides a paved shoulder for use by cyclists. This treatment is commonly found in rural areas. A width of six feet is recommended for this facility. A minimum allowance of four feet is permissible in constrained conditions.
- Bike Lane – A bike lane provides a portion of the paved roadway exclusively for cyclist use. This treatment reduces conflicts between motorists and cyclists and is appropriate for higher speed, higher volume roads. The standard width for a bike lane is six feet.
- Shared-use Path – A shared-use path is a separated facility usually shared with other active transportation modes. This treatment is appropriate when the road system provides inadequate connections.

Walkways

OBPDG identifies three types of walkways.

- Sidewalks – This facility is located parallel to a road and is separated by a curb and/or planting strip. -Sandy restricts the use of sidewalks for pedestrians only.
- Paths – These are typically shared-use facilities, as identified in the Bikeways section above. The OBPDG warns against designing paths for exclusive pedestrian use as other active transportation modes will be attracted to the facility.
- Shoulders – This facility is a paved section of the road for use by pedestrians. In rural areas this is the main pedestrian facility. Shoulders that may be used for pedestrians should be at least six feet in width.

What this means for the City of Sandy TSP:

There are many bicycle and pedestrian improvements that have been identified in other plans. If additional improvements are identified in the TSP process this guide will inform the decision on the appropriate treatment.

APPENDIX

CONTENTS

SECTION 1. PROJECTS FROM ADOPTED PLANS

DKS

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SECTION 1. PROJECTS FROM ADOPTED PLANS

Projects from Adopted Plans

Project Name/Location	Description	Extent	Plan	Year	Cost (if included)
Local service improvements - Fixed routes	Add Saturday service, lengthening the service hours, adding an additional shuttle route that reaches the Vista Apartments	-	Sandy Transit Master Plan	2020	-
Local service improvements - Flexible services	Add a bus and driver	-	Sandy Transit Master Plan	2020	-
Local service improvements - Electric buses	Purchase one or more electric buses, a charging station and the required maintenance equiptment	-	Sandy Transit Master Plan	2020	-
Additions to regional service - Gresham Express	Higher frequencies on Saturdays or Sundays, more night and morning service on Saturdays or Sundays, Occasional additional trips that go directly to important destinations	-	Sandy Transit Master Plan	2020	-
Additions to regional service - New Clackamas Express	Coordinate with Clackamas County, the City of Boring and TriMet to plan and fund a route connecting these communities	-	Sandy Transit Master Plan	2020	-
Additions to regional service - Improved bus stops	Coordinate with the City of Gresham and TriMet to invest in better stop amenities at the Gresham Transit Center	-	Sandy Transit Master Plan	2020	-
Pedestrian Improvements - Transit Center	Improve access to the transit center by providing crossing treatments from every direction specifically at Proctor and Pioneer Blvd at Hoffman Ave	-	Sandy Transit Master Plan	2020	-
Pedestrian Improvements - Evans St Crossing	Construct a crosswalk or traffic calming treatment on Evans St	-	Sandy Transit Master Plan	2020	-
362nd Dr.	Infill sidewalk gaps	Chinook Dr. to Industrial Way	Sandy TSP (2011)	2011	$ 1,230,000.00
Bluff Rd.	Infill sidewalk gaps	Hood St. to Green Mountain St.	Sandy TSP (2011)	2011	$ 520,000.00
Bluff Rd.	Infill sidewalk gaps	Strawbridge Parkway to Nettie Connett Dr.	Sandy TSP (2011)	2011	$ 505,000.00
Bluff Rd.	Infill sidewalk gaps	Green Mountain St. to Northern UGB	Sandy TSP (2011)	2011	$ 716,000.00
Bornstedt Rd.	Infill sidewalk gaps	Cascadia Village Dr to UGB	Sandy TSP (2011)	2011	$ 1,420,000.00
Dubarko Rd.	Infill sidewalk gaps	East of Melissa Ave. to East of OR 211	Sandy TSP (2011)	2011	$ 3,240,000.00
Dubarko Rd.	Infill sidewalk gaps	Langensand Rd. to Antler Ave.	Sandy TSP (2011)	2011	$ 39,000.00
Industrial Way	Infill sidewalk gaps	362nd Dr. to US 26	Sandy TSP (2011)	2011	$ 1,790,000.00
Jacoby Rd.	Infill sidewalk gaps	Dubarko Rd. to Cascadia Village Dr.	Sandy TSP (2011)	2011	$ 40,000.00
Jewelberry Rd.	Infill sidewalk gaps	Penny Ave. to Kelso Rd.	Sandy TSP (2011)	2011	$ 194,000.00
Langensand Rd.	Infill sidewalk gaps	Dubarko Rd. to US 26	Sandy TSP (2011)	2011	$ 82,000.00
Meinig Ave.	Infill sidewalk gaps	Scenic St. to US 26	Sandy TSP (2011)	2011	$ 95,000.00
Pleasant St.	Infill sidewalk gaps	Beers Ave. to Revenue Ave.	Sandy TSP (2011)	2011	$ 173,000.00
Ruben Rd.	Infill sidewalk gaps	US 26 to Dubarko Rd.	Sandy TSP (2011)	2011	$ 51,000.00
Sandy Heights St.	Infill sidewalk gaps	Bluff Rd. to End	Sandy TSP (2011)	2011	$ 176,000.00

Projects from Adopted Plans

Project Name/Location	Description	Extent	Plan	Year	Cost (if included)
Downtown Core Pedestrian	Infill sidewalk gaps	Side streets perpendicular to US 26	Sandy TSP (2011)	2011	$ 287,000.00
University Ave.	Construct sidewalk	Sunset St. to US 26	Sandy TSP (2011)	2011	$ 107,000.00
New Accessway / Trail	Accessway / Trail	Extension of Tickle Creek Trail to Dubarko Rd.	Sandy TSP (2011)	2011	$ 1,700,000.00
New Accessway / Trail	Accessway / Trail	Bell St. Fields to Kate Schmitz Ave.	Sandy TSP (2011)	2011	$ 230,000.00
New Accessway / Trail	Accessway / Trail	North of Kate Schmitz Ave. to Orient Dr	Sandy TSP (2011)	2011	$ 1,520,000.00
New Accessway / Trail	Accessway / Trail	Industrial Way to Eastern UGB	Sandy TSP (2011)	2011	$ 1,310,000.00
New Accessway / Trail	Accessway / Trail	Marcy to Middle School Fields	Sandy TSP (2011)	2011	$ 370,000.00
New Accessway / Trail	Accessway / Trail	Marcy to Sandy River	Sandy TSP (2011)	2011	$ 370,000.00
New Accessway / Trail	Accessway / Trail	OR 211 to Jacoby	Sandy TSP (2011)	2011	$ 320,000.00
New Accessway / Trail	Accessway / Trail	Meinig Memorial Park Demand Trails	Sandy TSP (2011)	2011	$ 230,000.00
New Accessway / Trail	Accessway / Trail	Meinig Memorial Park Demand Trail to SW Corner	Sandy TSP (2011)	2011	$ 430,000.00
OR 211	Construct sidewalk	South UGB to US 26	Sandy TSP (2011)	2011	Included in other project
OR 211	Pedestrian Overcrossing	Sandy Heights St. to Meinig Ave.	Sandy TSP (2011)	2011	$ 4,900,000.00
US 26	Infill sidewalk gaps	Royal Lane to 362nd Dr.	Sandy TSP (2011)	2011	$ 440,000.00
US 26	Infill sidewalk gaps	362nd Dr. to West UGB	Sandy TSP (2011)	2011	$ 990,000.00
US 26	Infill sidewalk gaps	Ruben Ln. to University Ave.	Sandy TSP (2011)	2011	$ 510,000.00
US 26	Infill sidewalk gaps	Ten Eyck Rd. to Vista Loop Dr. West	Sandy TSP (2011)	2011	$ 3,260,000.00
362nd Dr.	Widen shoulder to 6'	Dubarko Rd. to UGB	Sandy TSP (2011)	2011	$ 1,230,000.00
Bluff Rd.	Re-stripe/widen Rd.	US 26 to Miller Rd.	Sandy TSP (2011)	2011	$ 40,000.00
Bornstedt Rd.	Re-stripe/widen Rd.	OR 211 to UGB	Sandy TSP (2011)	2011	$ 32,000.00
Dubarko Rd.	Re-stripe/widen Rd.	362nd Dr. to Eldridge Dr.	Sandy TSP (2011)	2011	$ 36,000.00
Dubarko Rd.	Re-stripe/widen Rd.	Sandy Heights St. to Melissa Ave.	Sandy TSP (2011)	2011	$ 36,000.00
Langensand Rd.	Re-stripe/widen Rd.	US 26 to UGB	Sandy TSP (2011)	2011	$ 61,200.00
Meinig Ave.	Re-stripe/widen Rd.	Scenic St. to US 26	Sandy TSP (2011)	2011	$ 61,000.00
Meinig Ave.	Re-stripe/widen Rd.	Barker Ct. to Dubarko Rd.	Sandy TSP (2011)	2011	$ 17,000.00
Sandy Heights	Re-stripe/widen Rd.	Bluff To End	Sandy TSP (2011)	2011	$ 40,000.00

Projects from Adopted Plans

Project Name/Location	Description	Extent	Plan	Year	Cost (if included)
Tupper Rd.	Re-stripe/widen Rd.	Long Circle to OR 211	Sandy TSP (2011)	2011	$ 59,000.00
OR 211	Widen shoulder to 6'	UGB to US 26	Sandy TSP (2011)	2011	$ 28,200,000.00
US 26	Widen shoulder to 6'	Ten Eyck Rd. to UGB	Sandy TSP (2011)	2011	$ 3,260,000.00
362nd Dr./ Industrial Way (West)	Remove stop signs on northbound and southbound approaches,Construct an eastbound left turn lane with 50 feet of storage	-	Sandy TSP (2011)	2011	$ 115,000.00
362nd Dr./ Dubarko Rd.	Construct a single-lane roundabout	-	Sandy TSP (2011)	2011	$ 1,165,000.00
US 26/ 362nd Dr.	Construct a second westbound left turn lane, Construct an acceptance lane for second westbound left turn lane to drop at southern access to Fred Meyer property, Construct a northbound through lane, Construct southbound through, right turn and left turn lanes	-	Sandy TSP (2011)	2011	$ 5,350,000.00
US 26/ Industrial Way	Change southbound approach to dual left turn lanes and a shared through/right lane, Construct a northbound left turn lane	-	Sandy TSP (2011)	2011	$ 780,000.00
US 26/ Ruben Lane	Change southbound approach to dual left turn lanes and a shared through/right lane, Change northbound approach to left turn lane, and shared through/right lane	-	Sandy TSP (2011)	2011	$ 770,000.00
OR 211/Proctor Boulevard (US 26)	Construct a northbound left turn lane (restriping only)	-	Sandy TSP (2011)	2011	$ 5,000.00
US 26	US 26 Adaptive Signal Timing	-	Sandy TSP (2011)	2011	$ 400,000.00
US 26/ Ten Eyck Rd. - Wolf Drive	Construct a northbound left turn lane, Construct a southbound left turn lane	-	Sandy TSP (2011)	2011	$ 1,220,000.00
OR 211/ Dubarko Rd.	Construct a northbound right turn lane, Construct a southbound left turn lane, Construct a northbound left turn lane, Construct a traffic signal	-	Sandy TSP (2011)	2011	$ 10,150,000.00
OR 211/ Bornstedt Rd.	Prohibit left turns out of Bornstedt Rd.	-	Sandy TSP (2011)	2011	$ 16,000.00
OR 211/ Arletha Court	Realign Arletha Court approach from the south	-	Sandy TSP (2011)	2011	$ 2,570,000.00
Industrial Way extension to Jarl Rd./ US 26	-	-	Sandy TSP (2011)	2011	$ 10,800,000.00
Dubarko Rd. connection to Champion Way	-	-	Sandy TSP (2011)	2011	$ 6,105,000.00
Extend Bell St. to Orient Dr.	-	-	Sandy TSP (2011)	2011	$ 50,905,000.00
Extend 362nd Dr. to Kelso Rd.	-	-	Sandy TSP (2011)	2011	$ 26,620,000.00
Extend Kate Schmidt St. from US 26 to the proposed Bell St. extension	-	-	Sandy TSP (2011)	2011	$ 7,345,000.00
Extend Industrial Way north to Bell Street extension	-	-	Sandy TSP (2011)	2011	$ 3,820,000.00
Extend Olson Rd. from 362nd Dr. to Jewelberry Ave.	-	-	Sandy TSP (2011)	2011	$ 12,890,000.00
Extend Agnes St. to Jewelberry Ave.	-	-	Sandy TSP (2011)	2011	$ 4,870,000.00
Extend Dubarko Rd. to US 26 opposite Vista Loop Dr. (West)	-	-	Sandy TSP (2011)	2011	$ 3,200,000.00

Projects from Adopted Plans

Project Name/Location	Description	Extent	Plan	Year	Cost (if included)
Gunderson Rd., 370th Ave., Cascade Village Drive, Cascade Village Boulevard, New Collector	-	-	Sandy TSP (2011)	2011	$ 20,000,000.00
New Rd. extension to US 26 opposite Vista Loop Dr. (East)	-	-	Sandy TSP (2011)	2011	$ 16,390,000.00
7-lane US 26: Orient Dr. to Bluff Rd. and Ten Eyck Rd. to Vista Loop Dr. East	-	-	Sandy TSP (2011)	2011	$ 62,100,000.00
US 26 Bypass (west of Orient Dr. to Shorty's Corner - south of the City)	-	-	Sandy TSP (2011)	2011	$ 544,000,000.00
4053 - OR 211	intersection remove or decrease vertical curve and remove vegetation	362nd Dr/OR 211	Clackamas County TSP (2013)	2013	-
2017 - 362nd Ave	Add Paved shoulders	Skogan Rd to OR 211	Clackamas County TSP (2013)	2013	-
3033 - 362nd Drive	Remove or Decrease horizontal and vertical curves	Colorado Rd to Dubarko Rd	Clackamas County TSP (2013)	2013	-
3034 - 362nd Drive	Remove or Decrease vertical curve, relocate intersection	362nd Ave/Deming Rd intersection	Clackamas County TSP (2013)	2013	-
4057 - OR 211	Add shoulders and bikeways	Bornstedt Rd to City of Sandy	Clackamas County TSP (2013)	2013	-
4070 - US 26	Add eastbound right turn lane	US 26/Firwood Rd intersection	Clackamas County TSP (2013)	2013	-
3043 - Firwood Rd	Realign Trubel Rd to remove or decrease downgrade	Firwood Rd/Trubel Rd intersection	Clackamas County TSP (2013)	2013	-
4067 - US 26	Perform Road Safety Audit or transportation safety review to identify appropriate road safety improvements	Ducan Rd to Langesand Rd	Clackamas County TSP (2013)	2013	-
4066 - US 26	Perform Road Safety Audit or transportation safety review to identify appropriate road safety improvements	Kelso Rd to Duncan Rd	Clackamas County TSP (2013)	2013	-
3050 - Orient Dr	Add Paved shoulders	US 26 north to county line	Clackamas County TSP (2013)	2013	-
3055 - Tickle Creek Trail	Construct multi-use path in accordance with the Active Transportation Plan	Springwater Corridor to Sandy city limits	Clackamas County TSP (2013)	2013	-

appendix

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DRAFT TECHNICAL MEMORANDUM #2

DATE: September 20, 2021

TO: Project Management Team

FROM: Reah Flisakowski and Sarah Keenan | DKS Associates
Darci Rudzinski and Emma Porricolo | Angelo Planning Group

SUBJECT: City of Sandy Transportation System Plan
Project Goals, Objectives, and Evaluation Criteria (Task 2.2) Project #20020-001

The purpose of this memorandum is to initiate the process of developing the transportation-related goals, objectives, and evaluation criteria that will help guide the update of the Sandy Transportation System Plan (TSP) and future investment decisions. This effort will continue through the planning process, shaped by input received from the project management team, community advisory committee, and the general public.

SETTING DIRECTION FOR TRANSPORTATION PLANNING

Collectively, transportation-related goals and objectives state what the community wants to focus on in the TSP update and what they want the future Plan to address. Evaluation criteria can be developed for each objective to help judge how identified solutions or projects developed through the update process meet the community's goals. Ultimately, once the TSP update is complete, TSP objectives can be used to:

- guide future transportation and land use decisions as part of the adopted TSP
- reworked as policy statements
- inform updates to existing transportation policies in the Comprehensive Plan
- combination of the above.

Goals and objectives create manageable stepping stones through which the broad vision statement can be achieved. **Goals** are broad statements that should focus on outcomes, describing a desired end state. Goals should be challenging, but not unreasonable. Each goal must be supported by more finite **objectives**. In contrast to goals, objectives should be specific and identify key issues or concerns that are related to the attainment of the goal.

The solutions recommended through the TSP must be consistent with the goals and objectives. To accomplish this, measurable **evaluation criteria** that are based on the goals and objectives will be developed. For the Sandy TSP, they will be used to inform the selection and prioritization of projects and programs for the plan by describing how well the alternatives support each goal.

DEVELOPING UPDATED TSP GOALS AND POLICIES

The goals and objectives from Sandy's current TSP, adopted in 2011, provided a starting point for setting the direction for the new TSP. The current TSP goals cover a wide range of topics that are relevant and appropriate to carry forward in the TSP Update.

The Transit goals and objectives from the 2020 Sandy Transit Master Plan that are applicable to the TSP were added under the Transit goal. This memo also presents two new goals under the topic headings of Safety and Equity to be considered as part of the Sandy TSP update. The existing goals and objectives have been updated and expanded to provide more detail and reflect current community needs. The headings used for some of the current TSP goals were changed to better reflect the overall topic covered by the objectives. Many objectives support more than one goal. Some existing objectives have also been relocated to the goal that it supports the most.

The TSP goals and objectives provided below will be shared with the advisory committee, with further input sought to refine them. At this time, all goals and objectives are considered to be of equal importance when evaluating and prioritizing TSP projects and programs.

TSP GOALS AND POLICIES

MOBILITY & CONNECTIVITY

Goal 1: Provide a transportation system that prioritizes mobility and connectivity for all users.

- Objective 1.1: Maintain the livability of Sandy through well connected transportation facilities
- Objective 1.2: Improve the safety and accessibility of transit facilities
- Objective 1.3: Improve vehicular/pedestrian interface along all arterial and collector streets
- Objective 1.4: Ensure sufficient capacity to accommodate future travel demand (transit, bicycle, pedestrian, etc.) to, within, and through the City of Sandy
- Objective 1.5: Emphasize local street connections, in an effort to reduce reliance on US 26 and OR 211 for local trips
- Objective 1.6: Minimize access along the City's arterials and consolidate or relocate access points when possible

CAPITAL INVESTMENTS AND FUNDING

Goal 2: Promote cost effective investments to the transportation system.

- Objective 2.1: Maximize the useful life of existing facilities
- Objective 2.2: Seek opportunities to combine transportation, other infrastructure, and environmental mitigation projects
- Objective 2.3: Maximize the use of state and federal funds for transportation capital, operating, service, and demand improvements
- Objective 2.4: Maintain a capital improvement plan that identifies construction priorities and funding
- Objective 2.5: Minimize street cross-sections to reduce maintenance costs

COMMUNITY NEEDS

Goal 3: Provide a transportation system that supports specific community needs.

- Objective 3.1: Protect the scenic resources in Sandy
- Objective 3.2: Preserve the historic character of Sandy
- Objective 3.3: Identify gateway and beautification treatments for OR 211
- Objective 3.4: Support Mt. Hood Scenic Byway Enhancements
- Objective 3.5: Incorporate the street network and transportation improvements contained within the Bornstedt Village Plan
- Objective 3.6: Identify walking and biking needs in the urban growth boundary expansion area

SYSTEM MANAGEMENT

Goal 4: Promote traffic management to achieve the efficient use of transportation infrastructure.

- Objective 4.1: Balance local access to US 26 with the need to serve regional and statewide traffic, while supporting adjacent land uses
- Objective 4.2: Plan for a transportation system that supports projected population and employment growth and maximize travel options by providing efficient routes for all modes of transportation

- Objective 4.3: Support ODOT adoption of an alternate mobility target for US 26 that allows for increased congestion on the highway corridor, especially during peak seasonal travel periods

ENVIRONMENTAL

Goal 5: Minimize environmental impacts on natural resources and encourage carbon-neutral or efficient transportation alternatives.

- Objective 5.1: Avoid or mitigate transportation project impacts to environmental resources including creeks and wetlands, cultural resources, and wildlife corridors
- Objective 5.2: Support energy conservation by supporting public transit, transportation demand management, transportation system management and a multi-modal transportation system
- Objective 5.3: Encourage transportation facility construction methods that reduce environmental impacts
- Objective 5.4: Minimize street cross-sections to protect and preserve open space and reduce impervious surface

TRANSIT

Goal 6: Provide safe, efficient, high-quality transit service that gives Sandy residents, employees, employers, and visitors more freedom to meet their needs within the city, region and state. Create a transit system that offers an alternative to private automobile use, supports efficient use of roadways and reduces air pollution and energy use.

- Objective 6.1: Provide service that is safe, comfortable, and useful to many different kinds of people
- Objective 6.2: Collaborate with other transportation agencies and support user-friendly connections between transit system
- Objective 6.3: Improve accessibility to transit services for people arriving by foot, by bicycle or with a mobility device
- Objective 6.4: Increase public awareness of Sandy Transit (SAM) and its connectivity to other transit systems and transportation modes

SAFETY

Goal 7: Promote a safe transportation system for all users.

- Objective 7.1: Encourage traffic safety through education, enforcement, and engineering
- Objective 7.2: Identify high accident locations and implement specific counter measures to reduce their occurrence
- Objective 7.3: Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities
- Objective 7.4: Provide transportation design standards that encourage appropriate traffic volumes, speeds, and pedestrian safety
- Objective 7.5: Provide enhanced pedestrians and bicyclists crossings where needed
- Objective 7.6: Improve emergency service response time and evacuation routes through connectivity
- Objective 7.7: Develop street design standards that support emergency service vehicle needs

EQUITY

Goal 8: Support an equitable transportation system and provide transportation choices to all users.

- Objective 8.1: Ensure the transportation system provides equitable access to underserved, disadvantaged, and vulnerable populations and is easy to use and accommodating to travelers of all ages
- Objective 8.2: Ensure the pedestrian and bike facilities are designed clear of obstacles and obstructions (e.g., utility poles, grates) and meet ADA requirements
- Objective 8.3: Provide multi-faceted and inclusive public engagement process that provides all community members an opportunity to provide input on transportation system decisions

HEALTH

Goal 9: Support options for exercise and healthy lifestyles to enhance the quality of life.

- Objective 9.1: Develop recreational walking and biking routes to access employment, schools, shopping, and transit routes.
- Objective 9.2: Provide walking facilities that are physically separated from auto traffic on all arterials and collectors
- Objectives 9.3: Apply traffic calming measures to support neighborhood livability.

EVALUATION CRITERIA

After receiving input, the project team will create a revised set of goals and objectives and develop corresponding evaluation criteria. These will continue to evolve throughout the TSP update process. The evaluation criteria will guide the selection and prioritization of TSP projects and policies.

Sandy's proposed approach to developing transportation projects emphasizes improved system efficiency and management over adding driving capacity. This approach considers four tiers of priorities that included:

- **Highest Priority** – preserve the function of the system through cost-effective management practices such as improved traffic signal operations, encouraging alternative modes of travel, and implementation of new policies and standards.
- **High Priority** – improve existing facility efficiency through minor enhancement projects that upgrade roads to desired standards, fill important system connectivity gaps, or include safety improvements to intersections and corridors.
- **Moderate Priority** – add capacity to the system by widening, constructing major improvements to existing roadways, or extending existing roadways to create parallel routes to congested corridors.
- **Lowest Priority** – add capacity to the system by constructing new facilities.

This approach allows the City to maximize use of available funds, minimize impacts to the natural and built environments, and balance investments across all modes of travel.

appendix

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TECHNICAL MEMORANDUM #3

DATE: November 10, 2021

TO: Project Management Team

FROM: Reah Flisakowski, Dock Rosenthal | DKS Associates

SUBJECT: City of Sandy Transportation System Plan
Financial Forecast (Task 2.3) Project #20020-001

This memorandum presents the City's historic transportation funding and the forecast for available funding through 2040. The funding estimate will help prioritize the investments the City can make in the TSP and will be utilized to develop reasonable budgeting assumptions when selecting a set of transportation improvement needs identified over the next 20 years.

HISTORIC FUNDING SOURCES

Transportation funding is commonly viewed as a user fee system where the users of the system pay for infrastructure through motor vehicle fees (such as gas tax and registration fees) or transit fares. However, a great share of motor vehicle user fees goes to road maintenance, operations, and preservation of the system rather than construction of new system capacity. Much of what the public views as new construction is commonly funded (partially or fully) through system development charges and frontage or off-site improvements required as mitigation for land development.

The City of Sandy currently utilizes several sources to fund construction and maintenance of its transportation infrastructure as described below. Each source collects revenue each year that is used to repair street facilities or construct new streets, with some restrictions on the type and location of projects. Each funding source is described in the following sections.

STATE HIGHWAY TRUST FUND

The State of Oregon Highway Trust Fund makes distributions from the state motor vehicle fuel tax, vehicle registration and title fees, driver license fees and truck weight-mile taxes. A portion is paid to cities and counties annually on a per capita basis. By statue, the money can only be used for road-related purpose, including walking, biking, bridge, street, signal, and safety improvements. The City of Sandy uses these funds primarily for street operation needs, such as street

maintenance (including repaving and pothole repair), street lighting costs, street sign maintenance, winter ice mitigation, and for installing missing sidewalk segments.

Oregon gas taxes are collected as a fixed amount per gallon of gasoline bought. Gas tax in Oregon is currently 36 cents per gallon, and this tax does not vary with changes in gasoline prices. There is no adjustment for inflation tied to the gas tax, therefore the net revenue collected has gradually eroded over time as the cost to construct and repair transportation systems has increased significantly. Fuel efficiency in new vehicles and the prevalence of electric vehicles has further reduced the total dollars collected through gas taxes.

Oregon vehicle registration fees are collected as a fixed amount at the time a vehicle is registered with the Department of Motor Vehicles. Vehicle registration fees in Oregon have recently increased from $86 per vehicle per year to $112 per vehicle per year for passenger cars, with similar increases for other vehicle types. There is no adjustment for inflation tied to vehicle registration fees.

LOCAL GAS TAX

In addition to the State of Oregon gas tax, Sandy collects a local tax from fuel distributors within the city limits. These funds have historically been used for roadway maintenance of streets under City jurisdiction. The gas tax was approved in 2002 at one cent per gallon. The gas tax was increased to two cents per gallon in 2009.

CLACKAMAS COUNTY VEHICLE REGISTRATION FEE

Clackamas County commissioners approved a $30 per year vehicle registration fee to fund road maintenance and construction projects. Forty percent of the fees will go directly to cities in the county. Sandy will receive an estimated $200,000 annually which will be used to construct various transportation projects. The funds may be used as a portion of the Full Faith and Credit Obligation for the 362nd Avenue/Bell Street extension project that is currently in the design phase. This funding source does not have an expiration date.

SYSTEM DEVELOPMENT CHARGES

Street System Development Charges (SDC) are collected from new development applications within the City of Sandy based on the proposed land use. The SDC fees are determined based on each land use's potential to generate new vehicle trips. SDC's are a funding source for all capacity adding projects. The funds collected can pay for constructing or improving portions of roadways impacted by applicable development and include roadway improvements, bikeways and pedestrian facilities. The City of Sandy currently applies an SDC of $4,063.21 per single family dwelling unit or $256.03 per adjusted average daily person trip for non-residential land uses.

FEDERAL FUNDS

Sandy has received Federal funds that are disbursed to urban areas based on population. ODOT "holds" these funds for cities and counties in Oregon and when an agency wishes to use them. Sandy received $297,316 in federal funds to construction improvements along Dubarko Road.

GRANTS

Sandy was awarded a Transportation Growth and Management grant to fund the current update to the Transportation System Plan. Future funding of projects from grants are not guaranteed and are awarded through a competitive application and review process. Grants typically provide an opportunity for securing funding for important capital projects that do not have sufficient City funds to complete.

REVENUES AND EXPENDITURES

The City of Sandy revenues and expenditures for the transportation system over the past seven years (2013 to 2020) were reviewed to help estimate the reasonable funding for projects and programs over the next 20 years. The historic and forecasted funding dollars are presented in the following sections and in Table 1.

REVENUES

A review of historic and current funding revenue found the largest contributor was the State Highway Trust Fund with an average annual contribution of $720,000. ODOT estimates the City of Sandy will receive $18.3 million through 2040 from this source. Other primary funding sources were the collection of SDCs and the local gas tax with an average annual revenue of $445,000 and $307,000 respectively. Starting in 2021, the City is anticipating to receive $200,000 annually from Clackamas County vehicle registration fees.

The City has also received approximately $230,000 in other revenues on average annually. This included around $62,000 in interest and $96,000 in miscellaneous funds. Additionally, the City received $297,000 in federal funds in 2014.

Assuming the levels of funding are similar in the future, Sandy can expect to receive approximately $42 million in revenues through 2040 to be used towards transportation projects and programs. For estimating purposes, the City is anticipated to receive two more grants of $300,000 each totaling $600,000 within the next 20 years.

EXPENDITURES

The historic expenditures for the transportation system were also reviewed. Expenditures include personal services, materials and services, capital outlay, debt service, and transfers out. The largest expense was materials and services and debt services, averaging $443,000 and $450,000 per year respectively. In total, the City has spent approximately $1.1 million per year to maintain and operate the transportation system. With the recent jurisdictional transfer of OR 211 to the City, annual maintenance and operation expenditures are expected to increase.

Deferring necessary repair and preservation means spending much more to fix the same streets later, and repair costs rise exponentially as streets are left unmaintained. Every $1 spent to keep a street in good condition avoids $6 to $14 needed later to rebuild the same street once it has deteriorated significantly[1]. Heavy truck traffic and wet weather comprise two of the most critical factors in pavement deterioration. Heavy trucks flex the pavement and create spaces underneath. Wet weather, with cracked pavement or poor drainage, can lead to water undermining pavement.

Assuming historic levels of expenditures, Sandy can expect to spend approximately $31.8 million through 2040 for transportation projects and programs including debt services.

FUNDING FORECAST

Table 1 summarizes the historic revenues and expenditures and the estimated funding available for the transportation system over the next 20 years. The estimate includes an annual escalation rate of 4.5 percent[2] on the current expenditures to account for rising costs and ensure that needed roadway maintenance and repair work will not be deferred through 2040.

Total funding collected through 2040 is estimated to be $42 million with the current sources. The majority of these funds are from the State Highway Trust Fund, Clackamas County vehicle registration fees and local SDC fees. These funds are estimates only and may change in the future. State gas tax does not increase with inflation and new fuel efficient and electric vehicles could reduce the funding. SDC fees are based on the future development. If the forecasted growth does not occur, then the amount of SDC revenue would be reduced.

Total expenditures are estimated to be approximately $31.8 million. Overall, the City is expected to have approximately $10 million available for transportation projects and programs over the next 20 years, as shown in Table 1.

[1] Smart Growth America, American Association of State Highway Officials (AASHTO)

[2] Escalation rate of 4.5 percent based on the Construction Cost Index

TABLE 1: SANDY TRANSPORTATION REVENUE AND EXPENDITURES

REVENUES	AVERAGE ANNUAL AMOUNT	ESTIMATED AMOUNT THROUGH 2040
STATE HIGHWAY TRUST FUND	$720,000	$18,300,000
LOCAL GAS TAX	$307,000	$6,390,578
CLACKAMAS COUNTY VEHICLE REGISTRATION FEE	$200,000	$4,163,243
SYSTEM DEVELOPMENT CHARGES	$445,000	$9,263,216
GRANTS	$40,000	$600,000
INTEREST	$62,000	$1,290,605
MISCELLANEOUS	$96,000	$1,998,357
SALE OF CAPITAL ASSETS	$600	$12,490
TOTAL REVENUES	**$1,870,600**	**$42,018,489**
EXPENDITURES	**AVERAGE ANNUAL AMOUNT**	**ESTIMATED AMOUNT THROUGH 2040**
PERSONAL SERVICES	$250,000	$5,204,054
MATERIALS & SERVICES	$443,000	$9,221,583
CAPITAL OUTLAY	$327,000	$6,806,902
DEBT SERVICE	$450,000	$9,367,297
TRANSFERS OUT	$58,000	$1,207,340
TOTAL EXPENDITURES	**$1,528,000**	**$31,807,177**
20 YEAR FUNDING FORECAST		**$10,211,312**

ADDITIONAL FUNDING SOURCES AND OPPORTUNITIES

New transportation funding opportunities include local taxes, assessments and charges, and state and federal appropriations, grants, and loans. Factors that constrain these resources, include the willingness of local leadership to burden citizens and businesses with taxes and fees; the portion of available local funds dedicated or diverted to transportation issues from other competing City programs; and the availability of state and federal funds. The City should consider all opportunities for providing or enhancing funding for the transportation improvements included in the TSP.

Counties and Cities have used the following sources to fund the capital and maintenance aspects for their transportation programs.

LOCAL FUNDING SOURCES

TRANSPORTATION UTILITY FEE

A transportation utility fee is a recurring monthly charge that could be paid by all residences and businesses within the City. The City can base the fee on the estimated number of trips a particular land use generates or as a flat fee per residence of business. This fee is typically collected through regular utility billing; however, it could be collected as a separate stand-alone assessment. Existing law places no express restrictions on the use of transportation utility fee funds, other than the revenue shall be used for transportation related projects, including construction, improvements, and repairs; however, many choose self-imposed restrictions or parameters on the use of the funds.

For every $1 per month in charged fees for residential units and $0.01 per month per 1,000 square feet of non-residential uses in the city, the City of Sandy could expect to collect about $115,000 annually. Philomath, for example, charges a fee of $4 per month for single family residential units, $3.20 per month for multi-family units, and between $13.60 and $45.50 (based on type and size of the land use) per month for non-residential uses. It should be noted that Philomath does not have a local option fuel tax like Sandy.

SANDY FUEL TAX INCREASE

A local fuel tax increase to 4 cents per gallon could generate an additional $305,000 annually or $6.1 million through 2040. Sandy citizens voted down a measure to increase the gas tax to 3 cents per gallon in 2016.

LOCAL IMPROVEMENT DISTRICTS

Local Improvement Districts (LIDs) can fund capital transportation projects that benefit a specific group of property owners. LIDs require owner/voter approval and a specific project definition. Assessments against benefiting properties pay for improvements. LIDs can supply match for other funds where a project has system wide benefit beyond benefiting the adjacent properties. LIDs are often used for sidewalk and pedestrian amenities that provide local benefit to residents along the

subject street. Property owners are assessed a proportional share of the cost at the end of the project, or the City may elect to allow for installment payments with interest.

URBAN RENEWAL

Urban renewal is a financial tool that funds projects and activities in an urban renewal district which have been identified in an urban renewal plan. The purpose is to make public investments in designated geographic areas to remove blight, to improve property values, and to leverage private investment. Improvements are funded with incremental increases in property taxes that result from construction of applicable improvements. This type of tax increment financing has been used in Oregon since 1960.

In 1998, the City of Sandy adopted the Sandy Urban Renewal Plan. It serves to guide development in the downtown area, as well as implement the goals and objectives of Sandy's Comprehensive Plan. It's anticipated that the plan will expire in 2048 if the maximum indebtedness remains at $67 million.

DEBT FINANCING

While not a direct funding source, debt financing is another funding method. Through debt financing, available funds can be leveraged, and the cost can be spread over the project's useful life. Though interest costs are incurred, the use of debt financing can serve not only as a practical means of funding major improvements but is oftentimes viewed as an equitable funding source for larger projects because it spreads the burden of repayment over existing and future customers who will benefit from the projects. One caution in relying on debt service is that a funding source must still be identified to fulfill annual repayment obligations. Three methods of debt financing are listed below:

- General Obligation (GO) Bonds – Subject to voter approval, a City can issue GO bonds to debt finance capital improvement projects. GO bonds are backed by the increased taxing authority of the City, and the annual principal and interest repayment is funded through a new, voter-approved assessment on property throughout the City (i.e., a property tax increase). Depending on the critical nature of projects identified in the TSP and the willingness of the electorate to accept increased taxation for transportation improvements, voter approved GO bonds may be a feasible funding option for specific projects. Proceeds may not be used for ongoing maintenance.
- Limited Tax General Obligation (LTGO) Bonds – Limited Tax General Obligation (LTGO) Bonds are similar to General Obligation (GO) bonds; however, they do not have to be voted on by constituents. A City pledges its general revenues to bondholders along with the utility revenues. The advantages to this option are that it does not require reserves or coverage (such as Revenue bonds) and does not require a vote.
- Revenue Bonds – Revenue bonds are debt instruments secured by rate revenue. For a City to issue revenue bonds for transportation projects, it would need to identify a stable source of ongoing rate funding. Interest costs for revenue bonds are slightly higher than for general obligation bonds due to the perceived stability offered by the "full faith and credit" of a jurisdiction.

ODOT FUNDING SOURCES

The Oregon Department of Transportation manages federal and state transportation funds to support projects throughout Oregon, including dedicated funds for multimodal and safety projects.

CONNECT OREGON

This program provides dedicated funding for air, rail, marine, bicycle, and pedestrian infrastructure throughout Oregon. Since the program's inception, over $1 billion has been awarded, including a dedicated bicycle and pedestrian project funding stream.[3]

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

The Statewide Transportation Improvement Program, also known as the STIP, is the Oregon Department of Transportation's capital improvement plan for state and federally-funded projects. The OTC and ODOT develop the STIP in coordination with a wide range of stakeholders and the public. The 2021-2024 STIP contains approximately $3 billion in projects and programs.

The three steps to developing the STIP include:

- Program allocation: The Commission will distribute funding among programs such as system enhancements, preservation, safety, non-highway, and local roads.
- Project selection: The Commission will review the considerations that guide project selection. ODOT will use data in management systems and advisory committees to create preliminary project lists, estimate costs and schedules, then narrow projects to a final recommended list to include in the draft STIP.
- Public review and approval: The Commission will put the draft STIP out for a formal public comment period. After taking public comment, the Commission will adopt a revised STIP and forward it for review and approval by the Federal Highway Administration and Federal Transit Administration.

The Commission allocates funding among the following major categories:

- Fix-It programs fund projects that fix or preserve the state's transportation system, including bridges, pavement, culverts, traffic signals, and others. ODOT uses data about the conditions of assets to choose the highest priority projects. In recent STIPs, the Commission has allocated most funding to Fix-It programs.
- Enhance programs fund projects that enhance or expand the transportation system. Area Commissions on Transportation recommend high-priority investments from state and local transportation plans in many of the Enhance programs.
- Safety programs reduce deaths and injuries on Oregon's roads. This includes the All Roads Transportation Safety program, which selects projects through a data-driven process to ensure resources have maximum impact on improving the safety of Oregon's state highways and local roads.

[3] *Connect Oregon.* https://www.oregon.gov/ODOT/Programs/Pages/ConnectOregon.aspx. Accessed April 15, 2021.

- Non-highway programs fund bicycle and pedestrian projects and public transportation. Area Commissions on Transportation often help recommend these projects to the Commission.
- Local government programs direct funding to local governments to fund priority projects.

HIGHWAY SAFETY IMPROVEMENT PROGRAM

The Highway Safety Improvement Program (HSIP) is a core federal-aid program under the Fixing America's Surface Transportation (FAST) Act that went into effect in December 2015. The primary goal of the HSIP is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state owned roads and tribal roads.

Following the HSIP requirements, ODOT developed a new safety program, known as the All Roads Transportation Safety (ARTS) Program. This program provides funding for safety projects on all public roadways within Oregon based on historic crash data. Hotspot safety projects are identified based on existing Safety Priority Index System (SPIS) sites and Safety Implementation Plans, including ODOT's Pedestrian and Bicycle Plan. Additionally, each project site must have had one fatal or serious injury crash within the last five (5) years. Approximately $31 to $37 million annually is available for All Roads Transportation Safety projects, with a third of these funds available for projects within ODOT's Region 1 which includes Sandy.[4]

MULTIMODAL ACTIVE TRANSPORTATION FUND

In 2017, the Oregon Legislature passed Keep Oregon Moving (House Bill 2017), which includes changes to the existing Connect Oregon Grant Fund program that necessitates aligning the implementing rules with the new statutes. The legislation bifurcated the program into two new parts, with a separate allocation of 7% for multimodal active transportation projects.

In 2019, the Oregon Legislature passed House Bill 2592 to clarify and amend House Bill 2017. The legislation establishes the Multimodal Active Transportation (MAT) Fund for bicycle and pedestrian projects, consisting of 7% of the Connect Oregon Fund plus revenues from Oregon's bicycle excise tax. The MAT is a separate grant program from Connect Oregon and requires a new set of administrative rules. The legislation also clarifies roles and responsibilities between ODOT and the Oregon Department of Parks and Recreation to provide funding to bicycle and pedestrian projects with up to $4 million of lottery revenues annually.

OREGON COMMUNITY PATHS PROGRAM

This grant program is dedicated to helping communities create and maintain connections through multiuse paths. ODOT will use monies from the state Multimodal Active Transportation fund and federal Transportation Alternatives Program fund for this program. The goal is to complement existing active transportation programs in communities across the state. Oregon Community Paths combines funds from the Multimodal Active Transportation Fund, Oregon Bicycle Excise Tax, and

[4] *All Roads Transportation Program: Frequently Asked Questions.* https://www.oregon.gov/ODOT/Engineering/Docs_TrafficEng/ARTS_FAQ.pdf. Accessed April 15, 2021.

federal Transportation Alternatives Program to fund primarily off-street pedestrian and bicycle facilities. The program is expected to fund $19 million in grants for 2022 to 2024.

SAFE ROUTES TO SCHOOL PROGRAMS

Safe Routes to School refers to efforts that improve, educate, or encourage children safely walking (by foot or mobility device) or biking to school. ODOT has two main types of Safe Routes to School programs: infrastructure and non-infrastructure. Infrastructure programs focus on making sure safe walking and biking routes exist through investments in crossings, sidewalks and bike lanes, flashing beacons, and the like. Non-infrastructure programs focus on education and outreach to assure awareness and safe use of walking and biking routes. ODOT manages funding competitions for both infrastructure and non-infrastructure programs at the annual levels of $10 million (increasing to $15 million in 2023) and $300,000 respectively.

The Oregon Trail School District SRTS Plan goal is to reduce barriers for students walking and biking to school and making it safer. The Plan includes both recommendations for short and long-term construction projects, as well as ideas for education and engagement events to promote healthy, active lifestyles. Several infrastructure improvements are candidates for the ODOT SRTS Competitive Grant Program, while others could be managed by the school district or integrated into the City's Transportation System Plan (TSP) update for future consideration. Members of the school community, including administration, teachers, parents, and students, can also contribute through education and encouragement activities to make walking or biking easier and more fun for the school commute.

IMMEDIATE OPPORTUNITY FUND

The purpose of the Immediate Opportunity Fund is to support primary economic development in Oregon through the construction and improvement of streets and roads. Access to this fund is discretionary and the fund may only be used when other sources of financial support are unavailable or insufficient. The Immediate Opportunity Fund is not a replacement or substitute for other funding sources.

appendix

DRAFT TECHNICAL MEMORANDUM #4

DATE: August 23, 2021

TO: Project Management Team

FROM: Reah Flisakowski, Dock Rosenthal | DKS Associates

SUBJECT: City of Sandy Transportation System Plan
Transportation System Existing Conditions Inventory (Task 3.1) Project #20020-001

This memorandum summarizes the transportation inventory of existing conditions for the City of Sandy. A review of the existing transportation conditions for walking, biking, transit, motor vehicles, freight, and safety are included in the inventory.

TRANSPORATION SYSTEM INVENTORY

To address changing transportation needs within the City though 2040, we must first look at the existing conditions. The transportation system review documented the existing pedestrian, bicycle, transit, and motor vehicle infrastructure. It also identified shortfalls and limitations of how people can travel within the City (such as lack of bike lanes or sidewalks). Solutions for the transportation infrastructure that do not maintain acceptable service levels for residents will be considered later in the process.

PEDESTRIAN NETWORK

Walking plays a key role in Sandy's transportation network and planning for pedestrians helps the City provide a complete multi-modal transportation system. It also supports healthy lifestyles and addresses a social equity issue ensuring that the young, the elderly, and those not financially able to afford motorized transport have access to goods, services, employment, and education.

Approximately one percent of commuters in the city walk to work, with one percent utilizing public transportation, which often includes walking at the beginning or end of the trip[1]. In addition to the work commute trips, walking trips are made to and from recreational areas, shopping areas, schools, or other activity generators. Continuous and direct sidewalk connections to all activity generators and along all streets, in addition to safe crossing opportunities along major roadways, are desirable to encourage non-motorized travel options.

[1] US Census Bureau, 2015-2019 American Community Survey

The existing pedestrian network in Sandy, shown in Figure 1, is composed of sidewalks, paved paths and unpaved trails, and is fairly well developed.[2]

Sidewalks provide for pedestrian movement and access and enhance connectivity and promote walking. Most local streets in Sandy were developed with sidewalks incorporated into the design. Although many areas have sidewalk coverage, a few streets do not have complete sidewalks on one side of the street, or even on both sides. These gaps are most significant along the following roads.

- US 26 east of SE Ten Eyck Road/Wolf Drive – On some stretches of highway, particularly in rural areas, wide shoulders provide a substitute for sidewalks. On this segment, eight feet is the minimum appropriate shoulder width.[3] The existing shoulders range between five and seven feet wide. Most of the design standards in the 2011 Sandy Transportation System Plan (TSP) also require a landscape buffer.
- Meinig Avenue between Barker Court and HWY 211 – Pedestrians in the southeastern residential area destined for the central business district of Sandy must use Wolf Drive or Hwy 211 via Meinig Avenue. For households, where Meinig Avenue provides a more direct connection the only way to avoid walking in the road is to detour through Meinig Memorial Park.
- Sandy Heights Street between Nettie Connett Drive and Tupper Road – Most of this segment has sidewalk on at least one side but Sandy Heights Street/Tupper Road is the only east-west connection from Meinig Avenue to Dubarko Road and provides important pedestrian access to the commercial area on the west side of the city.

Pedestrian Paths and Trails can serve both recreational and transportation needs for pedestrians. Some are considered shared use paths and are well suited for citywide pedestrian and bicycle travel, and others offer only recreational opportunities for pedestrians. They can be separated or adjacent to the street right-of-way and provide linear park facilities for pedestrian travel. Pedestrian trails exist within Meinig Memorial Park, along Tickle Creek, in Sandy River Park, through Sandy High School campus, and scattered throughout the residential neighborhoods providing accessways between disconnected streets or localized recreational walking and biking opportunities.

STREET CROSSINGS

There are 10 marked crosswalks on US 26 through Sandy. Between Orient Drive and Bluff Road, there are no mid-block crossings and the average spacing between signalized crossings is approximately a third of a mile. This is greater than the typical distance a pedestrian will walk and could encourage crossings outside of crosswalks. In downtown Sandy, there are several marked crosswalks at unsignalized intersections or mid-block locations and the average spacing is 745 feet or approximately 3 block lengths. There are other marked crosswalks along Dubarko Road, particularly at intersections of the Tickle Creek Trail, SE 362nd Drive, Bluff Road, and Bell Street.

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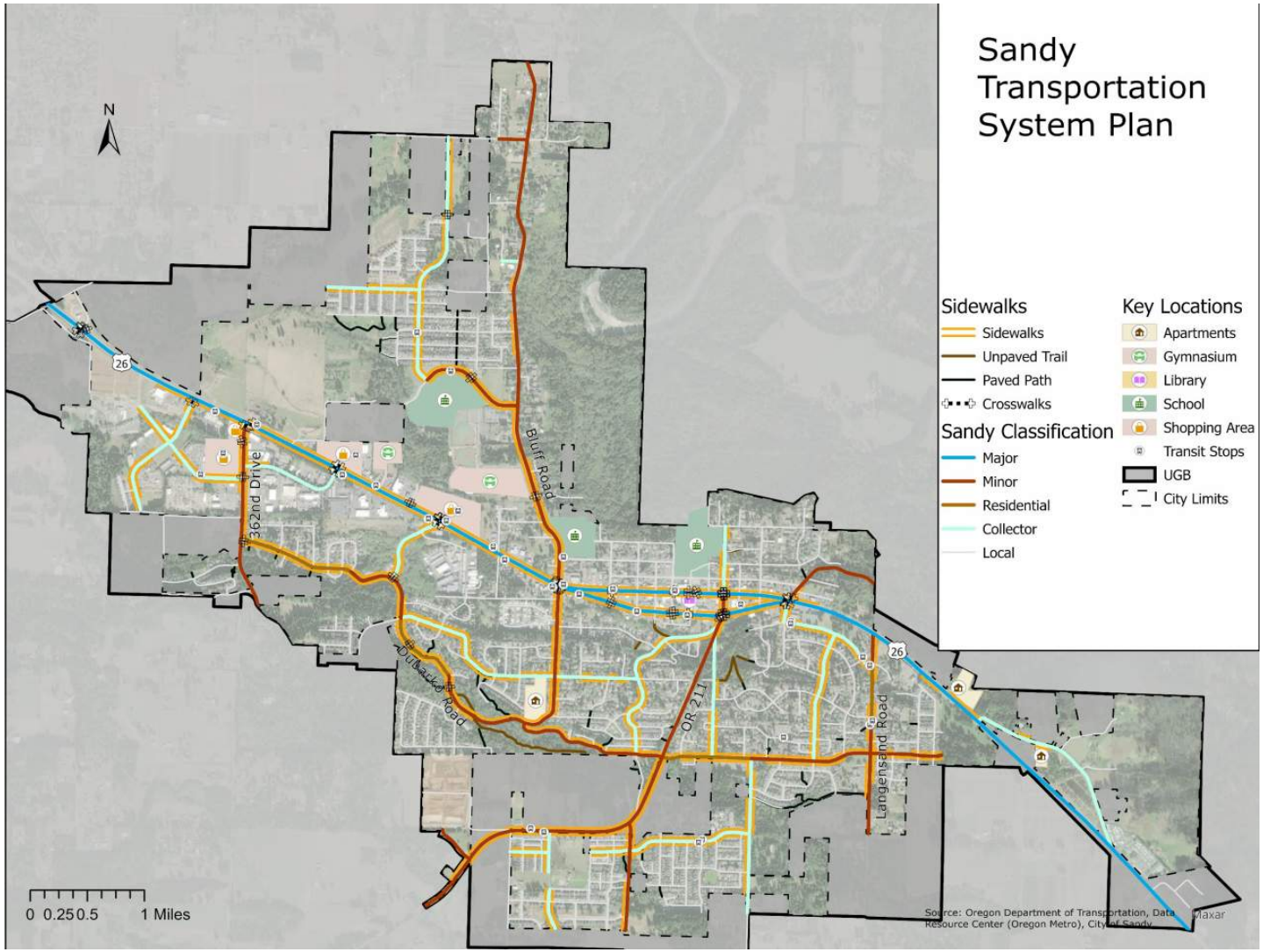
[2] Bicycle and pedestrian system inventory was only completed for roads with a functional classification of collector or higher. Traffic volumes and speeds on local streets are typically conducive to a shared system with motorized and non-motorized traffic.

[3] 2011 Sandy Transportation System Plan, Figure 8, Condition 2B. Highway Design Manual Appendix L, Bicycle and Pedestrian Design Guide, Table 1-2.

FIGURE 1: PEDESTRIAN FACILITIES



Curb Ramps

Many intersections in older parts of the City lack ADA-compliant ramps, which provide important connections between sidewalks, making it easier to cross streets and/or handle the vertical drop at curbs. The presence of curb ramps is fairly consistent at marked crosswalk locations, along US 26, particularly in the central business district, and in the newer neighborhoods in the City.

Non-compliant curb ramps from Kate Schmitz Avenue to Revenue Avenue along US 26 are being replaced through 2022 through an ODOT funded project.

BICYCLE NETWORK

Riding bicycles also plays a key role in the transportation system's ability to support healthy and active lifestyles and provide alternative travel choices to the automobile. While walking tends to be a competitive choice for trips under half a mile, bicycling tends to be suited for longer trips. Bicycle trips can often work well for distances between a half mile and three miles. Sandy's relatively compact size makes biking a great choice for many trips, with local jobs and housing typically in bikeable proximity, however the challenging topography may dissuade some riders. Few of Sandy's commuters currently travel by bicycle[4]. In addition to the work commute trips, bicycle trips are made to and from recreational or shopping areas, schools, or other activity generators. Continuous bicycle connections between all activity generators and arterial/collector roadways are desirable to allow for safe and attractive non-motorized travel options.

The bicycle network in Sandy, shown in Figure 2, is composed of bike lanes, roadway shoulders, shared roadways, and bicycle paths. The characteristics of these facilities are described below.

- **Bike lanes** are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. Standard width for a bicycle lane is six feet. Bike lanes are most appropriate on arterials and collectors, where high traffic volumes and speeds warrant greater separation of the travel modes.

  In Sandy, significant segments of continuous bicycle lanes exist along US 26, Bluff Road, Bell Street, Jewelberry Avenue, and Dubarko Road. In downtown Sandy, there are narrow parking lanes along US 26 (Proctor Boulevard and Pioneer Boulevard) which result in parked cars partially blocking the bike lane and pushing cyclists into the vehicle lane. These locations are marked in Figure 2.
- **Shoulder bikeways** are paved with striped shoulders wide enough for bicycle travel. Depending on traffic volumes, a paved shoulder between six and eight feet is needed to adequately provide for bicyclists, with a four-foot minimum width in constrained areas. Roadways with shoulders less than four feet are considered shared roadways. Some shoulder bikeways are signed to alert motorists to expect bicycle travel along the roadway. These facilities are typically found in rural areas.

  The bike lane along US 26 in Sandy could be considered a shoulder bikeway west of Champion Way due to the lack of pavement markings.

[4] US Census Bureau, 2015-2019 American Community Survey

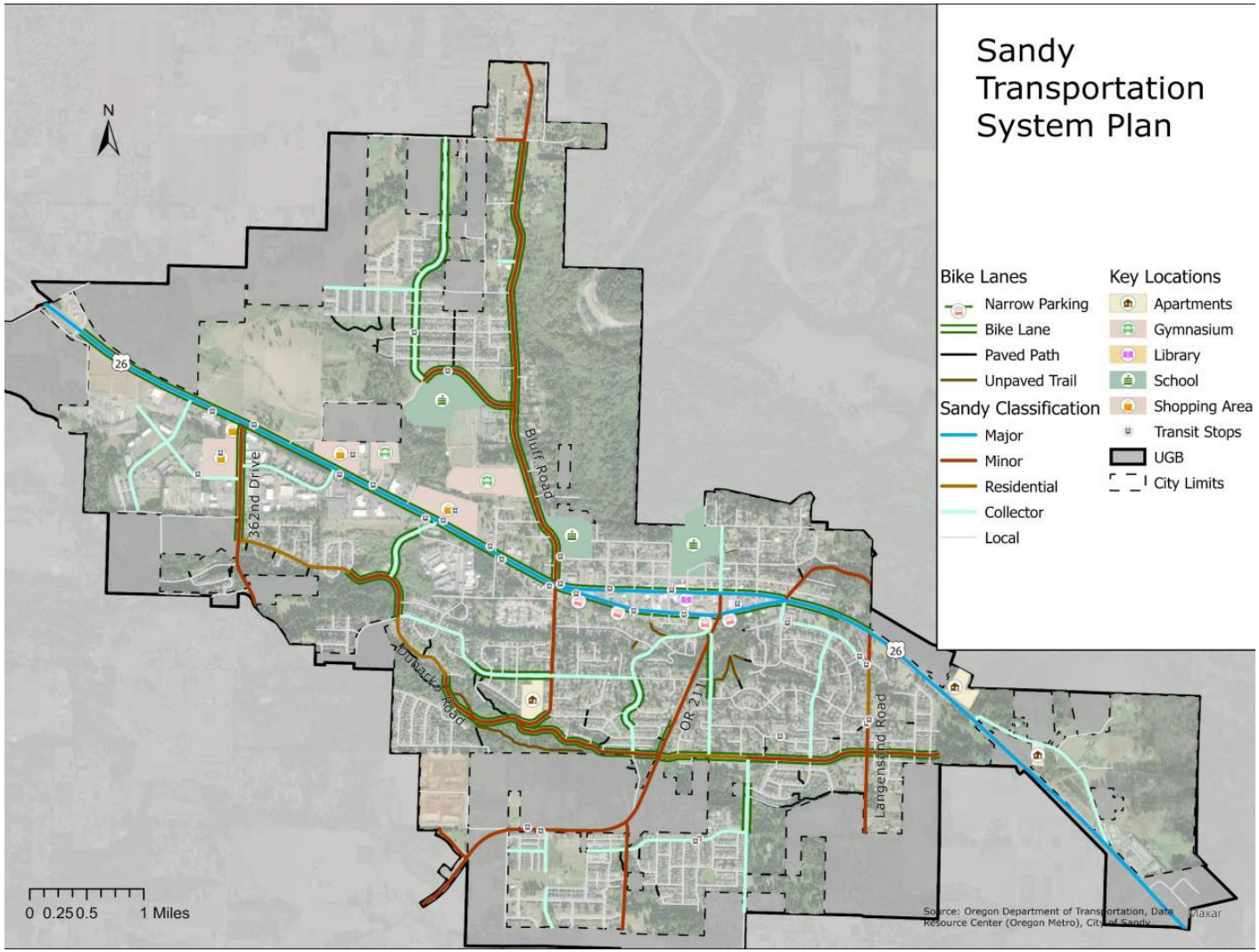
- **Shared roadways** include those on which bicyclists and motorists share the same travel lane. The most suitable roadways for shared bicycle use are those with low speeds (25 mph or less) and low traffic volumes (3,000 vehicles or fewer per day). Shared roadways, often signed as bicycle routes, serve to provide continuity to other bicycle facilities (e.g., bicycle lanes) or can be designated as a preferred route through the community. Common practice is to sign a route with standard Manual on Uniform Traffic Control Devices (MUTCD) green bicycle route signs with directional arrows and/or pavement markings. Shared roadways can have signs that highlight a special route or provide directional information in bicycling minutes or distance.

  Most local roadways in the City are considered shared roadways, but do not have signs or pavement markings.
- **Bicycle Paths** can serve both recreational and transportation needs. They include shared use paths, which allow for citywide pedestrian and bicycle travel, and short path segments providing accessways between disconnected streets or localized recreational biking opportunities. They can be separated or adjacent to the streets right-of-way and provide linear park facilities for bicycle travel.

BICYCLE PARKING

End-of-trip bicycle facilities are a fundamental component of a bicycle network. Lack of safe and secure facilities for either short-term or long-term parking can be an obstacle to promoting bicycle riding. Short-term parking accommodates visitors, customers, and others expecting to depart within two hours. It requires a standard rack, appropriate location and placement, and weather protection. Long-term parking accommodates employees, students, residents, commuters, and others who park for more than two hours. This parking requires a secure, weather-protected and convenient location. Short-term bicycle parking is available throughout Sandy's central business district and the commercial area to the west of Bluff Road.

FIGURE 2: BICYCLE FACILITIES



TRANSIT NETWORK

The Sandy Transit Master Plan[5] provides a detailed summary of the transit system. Below is a summary of the system from the Plan. The transit network in Sandy is shown in Figure 3.

FIXED BUS ROUTES

Sandy Area Metro (SAM) provides transit service in Sandy via four fixed bus routes including two local shopper routes and two regional routes connecting the City with downtown Gresham and Estacada. Clackamas County operates an additional fixed route service to Mount Hood. The bus routes include:

- Sandy Shoppers (A & B) – Every 60 minutes, afternoons and evenings, Monday through Friday
- Sandy/Gresham Express – Every 30 minutes, Monday through Friday; 60 minutes Saturday and Sunday
- Sandy/Estacada Express – Five trips daily, Monday through Saturday
- Mount Hood Express – Six trips daily (seven in winter), Monday through Sunday

System Characteristics

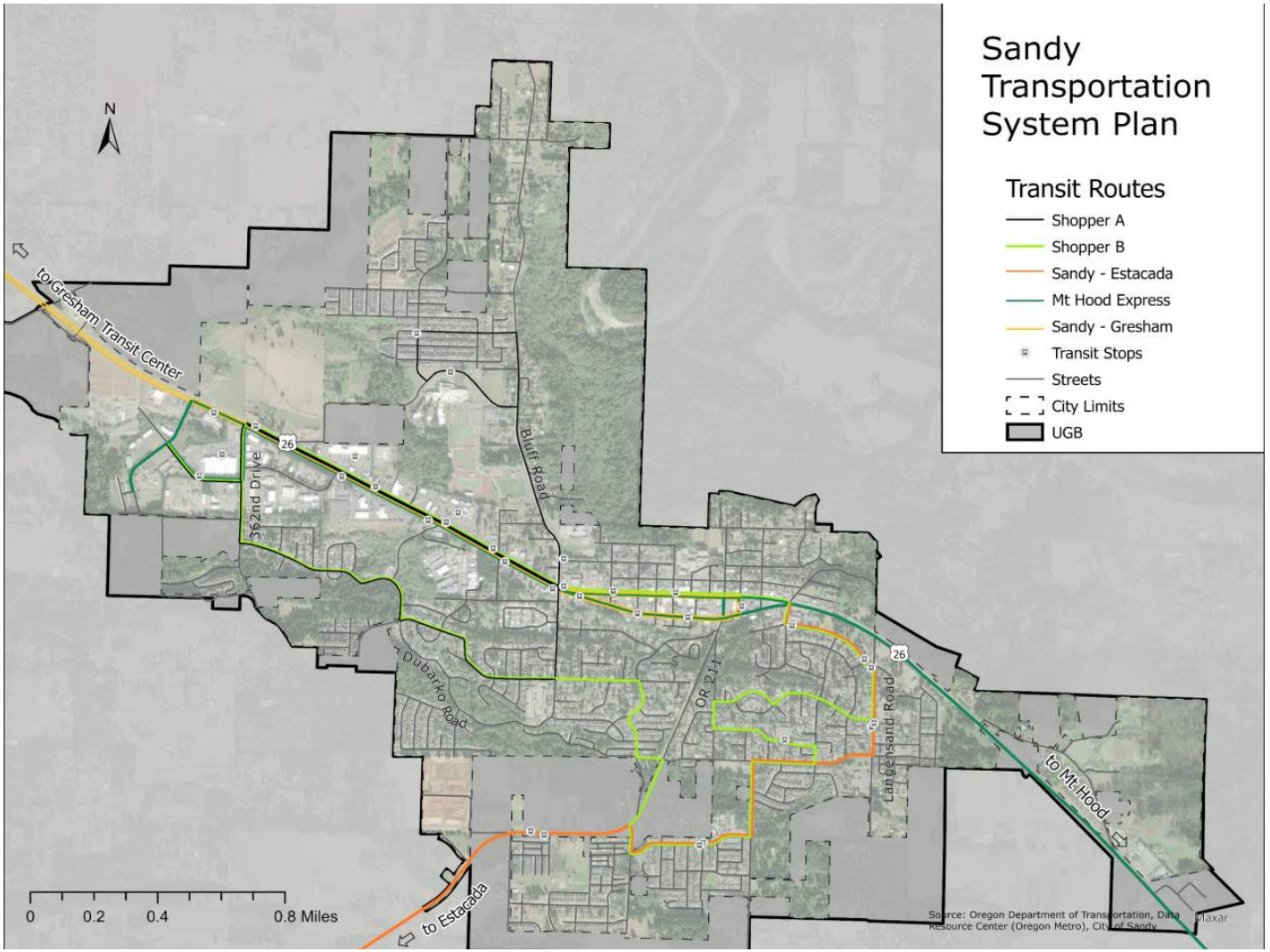
- Transit riders can transfer to TriMet routes at the Gresham Transit Center for access to transit service in the Portland Metro area.
- Sandy Transit is investing in seven new vehicles from 2019 to 2021.
- Bus stops with more than 10 boardings per day should have a shelter and a bench per Sandy Transit's standard. The bus stops in Sandy are currently meeting that standard.
  - The SAM stop at Gresham Transit Center is the highest ridership stop in Sandy Transit's system.
- There is poor connectivity between the regional fixed routes and the local shopper routes. Pedestrian improvements and a new shopper shuttle stop at Proctor Boulevard and Hoffman Avenue are proposed in the Transit Master Plan to remedy this issue.

DIAL-A-RIDE AND PARATRANSIT SERVICE

Sandy Transit's dial-a-ride and paratransit service provides public transportation to persons with disabilities who are unable to use regular fixed route buses. While federal guidelines require that service be provided within 3/4 mile of fixed route service, STAR service is provided for any trip that starts and ends within the City of Sandy. Current ridership of STAR service is approaching capacity. The Transit Master Plan recommends reviewing the operating practices of the STAR service rather than immediately adding another bus and driver to meet future increases in demand.

[5] Transit Master Plan (2020), City of Sandy

FIGURE 3: TRANSIT ROUTES



MOTOR VEHICLE NETWORK

The motor vehicle network in the City of Sandy is constructed around US 26 which provides access to all the various neighborhoods of the city. A majority of the households in Sandy are south of US 26 where there is good connectivity between areas provided by the minor arterials and collectors that intersect with Dubarko Road, the main east-west arterial. The newer residential areas west of Bluff Road have good local street connectivity but are relatively isolated from the rest of the city. Bluff Road is the only north-south street in the city that connects the north and south neighborhoods.

Vehicle classifications for streets helps support the movement of vehicles. It is recommended to determine the level of mobility, access, and use for vehicles. The vehicle classification system recognizes that individual streets do not act independently, but instead form a network that serves travel needs on a regional, citywide, neighborhood, and local level. From highest to lowest intended use, the recommended classifications are Major Arterial, Minor Arterial, Residential Arterial, Collector, and Local Streets. Streets with higher intended usage generally limit access to adjacent property in favor of more efficient motor vehicle traffic movement (i.e., mobility). Local roadways with lower intended usage have more driveway access and intersections, and generally accommodate shorter trips to nearby destinations.

FUNCTIONAL CLASSIFICATION

Major Arterial

Major arterials are typically three to five-lane highways that operate as two-way streets or as a one-way couplet. These roads are intended to handle high volumes of traffic, typically 16,000 ADT (Average Daily Traffic) or more. Major arterials provide greater regional mobility, are managed to favor through traffic capacity and safety over direct access and should generally be spaced approximately one mile apart. Private driveway access, on-street parking, and traffic calming measures are typically discouraged along major arterial routes and the provision of bike lanes or shoulders is required.

Minor Arterial

Minor arterials are high-volume, intra-city streets providing connectivity and parallel features and should generally be spaced approximately one mile apart. These roads have a typical capacity between 8,000 and 16,000 ADT. Minor arterials are generally the most critical classification for circulation in the urban areas of Sandy and are intended to serve longer local trips. Private driveway access is discouraged where access to facilities of lower classification is available and traffic calming measures and on-street parking should be avoided. The provision of bike lanes is required.

Residential Minor Arterial

Residential minor arterials are a hybrid between minor arterial and collector type streets that allows for moderate to high traffic volumes on streets where over 90% of the fronting lots are residential. These roads have similar typical capacity to minor arterials, 6,000 to 10,000 ADT. They are intended to provide some relief to the strained arterial system while ensuring a safe residential environment. Residential minor arterials may include on-street parking and traffic calming measures may be applied. Direct access to properties is managed in a manner similar to collector streets. The provision of bike lanes is required.

Collector

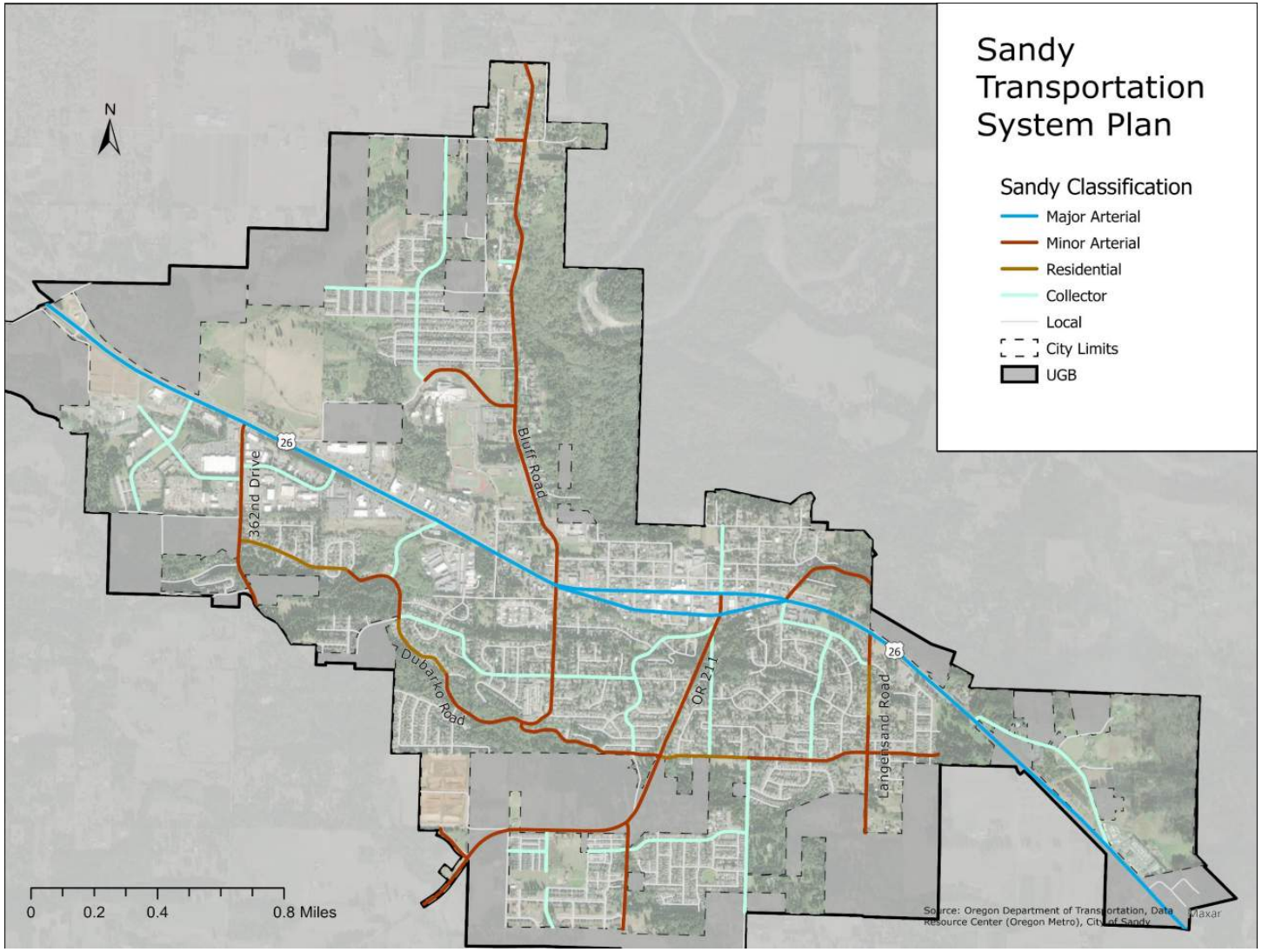
Collector streets provide both access and circulation within and between residential and commercial areas. These roads have a typical capacity between 1,000 and 6,000 ADT. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access (compared to arterials), and penetrate residential neighborhoods, distributing trips from the local street system to minor and major arterials. Collectors may provide on-street parking, may incorporate traffic calming measures, and should be spaced approximately a half mile apart. Bike lanes are required on collectors.

Local Street

Local streets have the sole function of providing immediate access to adjacent land. These streets have a typical capacity less than 1,000 ADT. Service to through traffic movements on local streets is deliberately discouraged by design. All other City streets in the City of Sandy that are not designated as arterial streets or collector streets are considered to be local streets. Local streets should allow on-street parking and may incorporate traffic calming measures. Bike lanes are not required.

The function classification system for the City of Sandy is shown in Figure 4.

FIGURE 4: FUNCTIONAL CLASSIFICATION



FREIGHT NETWORK

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The designation of through truck routes provides for this efficient movement, while maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. Through the City of Sandy, US 26 is an Oregon Freight Route and Reduction Review Route, meaning that any changes to the vehicle-carrying capacity requires a review. Vehicle-carrying capacity is defined as "a permanent reduction in the horizontal or vertical clearance of a highway section, by a permanent physical obstruction to motor vehicles located on useable right-of-way subject to Commission jurisdiction."

RAIL NETWORK

There are no existing freight or passenger rail facilities in Sandy.

AIR NETWORK

There are no airports within the City of Sandy. Regional and international air service for passengers and freight is provided via Portland International Airport (PDX). The airport is located approximately 25 miles (around 35 minutes) to the northwest of Sandy and is connected via US 26, I-84, and I-205.

WATERWAY NETWORK

Sandy is bordered by the Sandy River on the north side of the city. This waterway only serves recreational boating and is not navigable for marine freight facilities.

SYSTEM PERFORMANCE

EXISTING MOTOR VEHICLE OPERATIONS

Motor vehicle operations were evaluated in Synchro, a Highway Capacity Manual analysis tool, at 8 signalized intersections, 6 two-way-stop controlled (TWSC) intersections, and 1 all-way-stop controlled (AWSC) intersection. Intersection turning movement counts were collected in October 2020. The ODOT traffic volume patterns report that monitors the impact of COVID-19 indicated that traffic volumes on US 26 were within 5 percent of 2019 volumes for the week that counts were collected.

The turning movement counts were future adjusted to estimate the 30th highest hour volume. The nearest automatic traffic recorder indicated that seasonal peak volumes were typically 6.6 percent higher compared to October for the 5-year period from 2015 to 2019.

Two intersections exceed mobility targets: Orient Drive & US 26 and 362nd Drive & US 26. The intersection at Orient Drive serves high eastbound through traffic volumes and high southbound left traffic volumes that typically extend their green phases to the maximum length. This

intersection is just outside the urban growth boundary, resulting in a lower mobility target than the other signalized intersections along the US 26 corridor. The intersection at 362nd Drive serves a high eastbound through volume that is approaching the available capacity of the existing timing and a high northbound left volume. Existing intersection operations are shown in Table 2 below.

TABLE 2: EXISTING INTERSECTION OPERATIONS

	CONTROL TYPE	MOBILITY TARGET	LEVEL OF SERVICE	DELAY (SECONDS)	V/C RATIO
ORIENT DR/US 26	Signal	0.80	C	33	0.90
362ND DR/US 26	Signal	0.80	C	28	0.83
INDUSTRIAL WAY/ US 26	Signal[a]	0.80	C	28	0.72
362ND DR/INDUSTRIAL WAY (NORTH)	TWSC[b]	D	A [C]	8 [18]	0.24
362ND DR/INDUSTRIAL WAY (SOUTH)	AWSC	D	D	32	0.70
RUBEN LN/US 26	Signal[a]	0.80	C	27	0.73
BLUFF RD/US 26	Signal	0.85	D	36	0.79
BLUFF RD/BELL ST	TWSC	D	A [B]	8 [15]	0.08
MEINIG AVE (HWY 211)/PIONEER BLVD (US 26)	Signal	0.90	C	29	0.68
MEINIG AVE (HWY 211)/PROCTOR BLVD (US 26)	Signal	0.90	C	33	0.71
HWY 211/ DUBARKO RD	TWSC	0.90	A [D]	8 [29]	0.29
HWY 211/BORNSTEDT RD	TWSC	0.90	A [C]	9 [17]	0.36
TEN EYCK RD/US 26	Signal	0.85	C	31	0.58
LANGENSAND RD/US 26	TWSC	0.80	B [F]	13 [63]	0.30
VISTA LOOP DR W/US 26	TWSC	0.80	B [C]	10 [19]	0.09
VISTA LOOP DR E/US 26	TWSC	0.80	A [E]	10 [37]	0.05

a. This signal reported using HCM 2000 due to non-standard characteristics

b. Two-way Stop Controlled (TWSC) measures are reported as worst major [worst minor] approach for LOS and Delay and as worst movement for V/C

SAFETY

The most recent five years of available data, 2014 to 2018, was analyzed to evaluate collisions with fatalities or serious injuries and systemic and reoccurring safety issues within the City of Sandy. The safety data is summarized in Figure 5.

There were three sites in the top 10th percentile of the Safety Priority Index System (SPIS) locations for the most recent analysis. The Safety Priority Index System provides a ranking of locations of safety hotspots on roadways throughout Oregon. The three SPIS sites in the City of Sandy are:

- US 26 west of Orient Drive
- US 26 west of 362nd Drive
- US 26 west of Ruben Lane

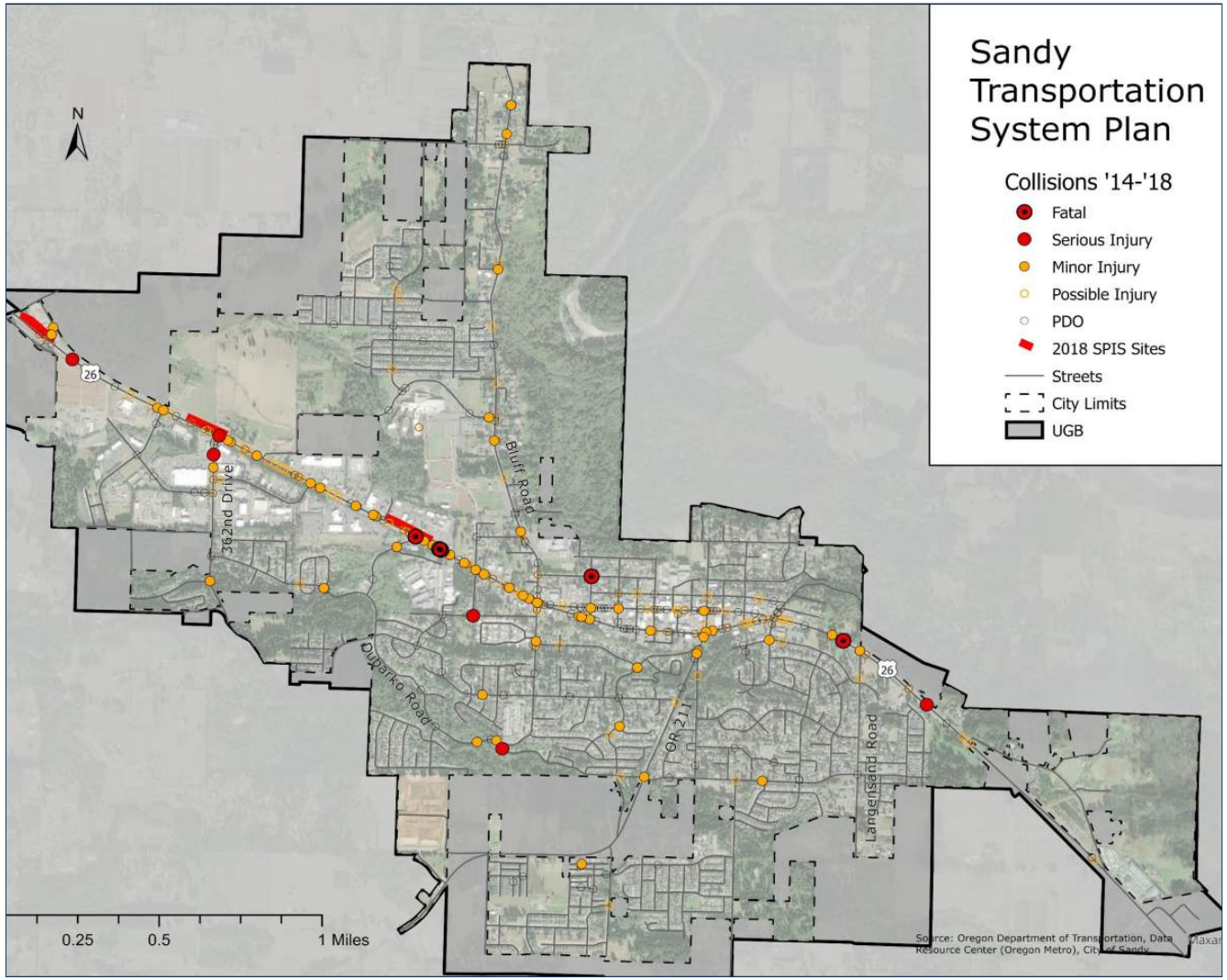
COLLISIONS BY SEVERITY

- **5 collisions with a fatality**
  - 4 of these collisions occurred along US 26.
  - 4 involved a pedestrian, alcohol was involved, and all occurred during low light conditions.
    - 2 pedestrian fatalities occurred near the intersection of US 26 & Ruben Lane (SPIS site).
      - 1 collision was caused by the pedestrian improperly crossing outside of the intersection, east of the intersection.
      - 1 collision was caused by the pedestrian disregarding the traffic signal and improperly crossing.
    - 1 pedestrian fatality occurred near the intersection of US 26 and Langensand Road, the driver was impaired.
    - 1 pedestrian fatality was speed related and occurred at the local intersection of Beers Avenue and Hood Street.
  - The 1 non-pedestrian fatality occurred near the intersection of US 26 and Ruben Lane (SPIS site). The driver veered left of the centerline and struck a tow truck.
- **8 collisions with a serious injury**
  - 5 of these collisions occurred along US 26.
    - A pedestrian, illegally in the road, that was not visible to the driver was stuck near the intersection of SE Orient Drive (SPIS site).
    - 3 collisions were caused by a failure to yield or improper turn.
      - A westbound left turning vehicle was struck by an eastbound though vehicle at the intersection of US 26 and 362nd Drive (SPIS site).
      - An eastbound left turning vehicle was struck by a westbound through vehicle at the intersection of US 26 and Ruben Lane (SPIS site).
      - A southbound left turning vehicle was struck by a northbound through vehicle at the intersection with Ruben Lane (SPIS site).
    - 1 collision occurred near the intersection of Langensand Road when a vehicle struck a parked vehicle at dawn.

- 1 collision occurred when a vehicle turning into the driveway that accesses Fred Meyer was struck by a vehicle traveling southbound on 362nd Drive.
- A southbound left turning vehicle was struck by a speeding westbound vehicle at the intersection of Sunset Street and University Avenue.
- A driver on Dubarko Road was careless, departed the road, and struck a fixed object near Bluff Road in wet conditions.

- **82 collisions with a minor injury and 210 collisions with a possible injury**
  - 148 were rear end collisions.
  - 70 were turning collisions.
  - 23 were collisions with a fixed object.
  - 169 occurred along US 26.
  - 27 occurred along Bluff Road.
  - 23 occurred along Dubarko Road.
  - 146 were intersection related.
    - 25 occurred at US 26 and 362nd Drive.
    - 18 occurred at HWY 211 and Dubarko Road.
    - 12 occurred at US 26 and Ruben Lane.
- **281 collisions with no injury, property damage only**
  - US 26 – 67 collisions.
  - 362nd – 22 collisions.
  - Bluff Road – 17 collisions.
  - Ruben Lane – 13 collisions.
  - 104 of these were rear end collisions.
- **20 collisions involving a pedestrian and 4 collisions involving a bicycle**

FIGURE 5: CITY OF SANDY SAFETY – 2014 TO 2018



CRITICAL CRASH RATE

The crash data above provides some information about locations where crashes are reoccurring issues but is not adjusted to reflect the volume of traffic using these facilities. The critical crash rate calculation adjusts the number of crashes at an intersection to a rate per million entering vehicles. This rate facilitates an easy comparison with similar facilities within the study area, the statewide critical rate, and the 90th percentile rate from ODOT's Analysis Procedures Manual (APM). There are two study intersections that were flagged in this analysis.

- US 26 and 362nd Drive – this intersection's crash rate exceeds the critical rate of the reference population sample and the statewide rate for four-leg, signalized intersections.
- HWY 211 and Dubarko Road – this intersection does not have a valid reference population to compare against because it is the only four-leg, stop controlled intersection in the population. However, the rate at this intersection significantly exceeds the statewide rate and the 90th percentile rate from the APM.

CRASH ANALYSIS SUMMARY

The analysis above revealed the TSP solutions analysis should focus on the following four locations.

- US 26 and 362nd Drive – This is a critical crash rate and SPIS location, most collisions at this intersection are rear end collisions caused by a failure to avoid a stopped vehicle and turning collisions caused by a driver not yielding.
- US 26 and Ruben Lane – This is a SPIS location and the location of three fatal crashes in the five years from 2014 to 2018. Most collisions at this intersection are turning collisions caused by a driver not yielding and rear end collisions caused by a failure to avoid a stopped vehicle or following too close.
- US 26 and Orient Drive – This is a SPIS location and the location of a serious pedestrian injury. Most collisions at this intersection are rear end collisions caused by a failure to avoid a stopped vehicle.
- HWY 211 and Dubarko Road – This is a critical crash rate location. Most collisions at this location are turning collisions caused by a driver not yielding.

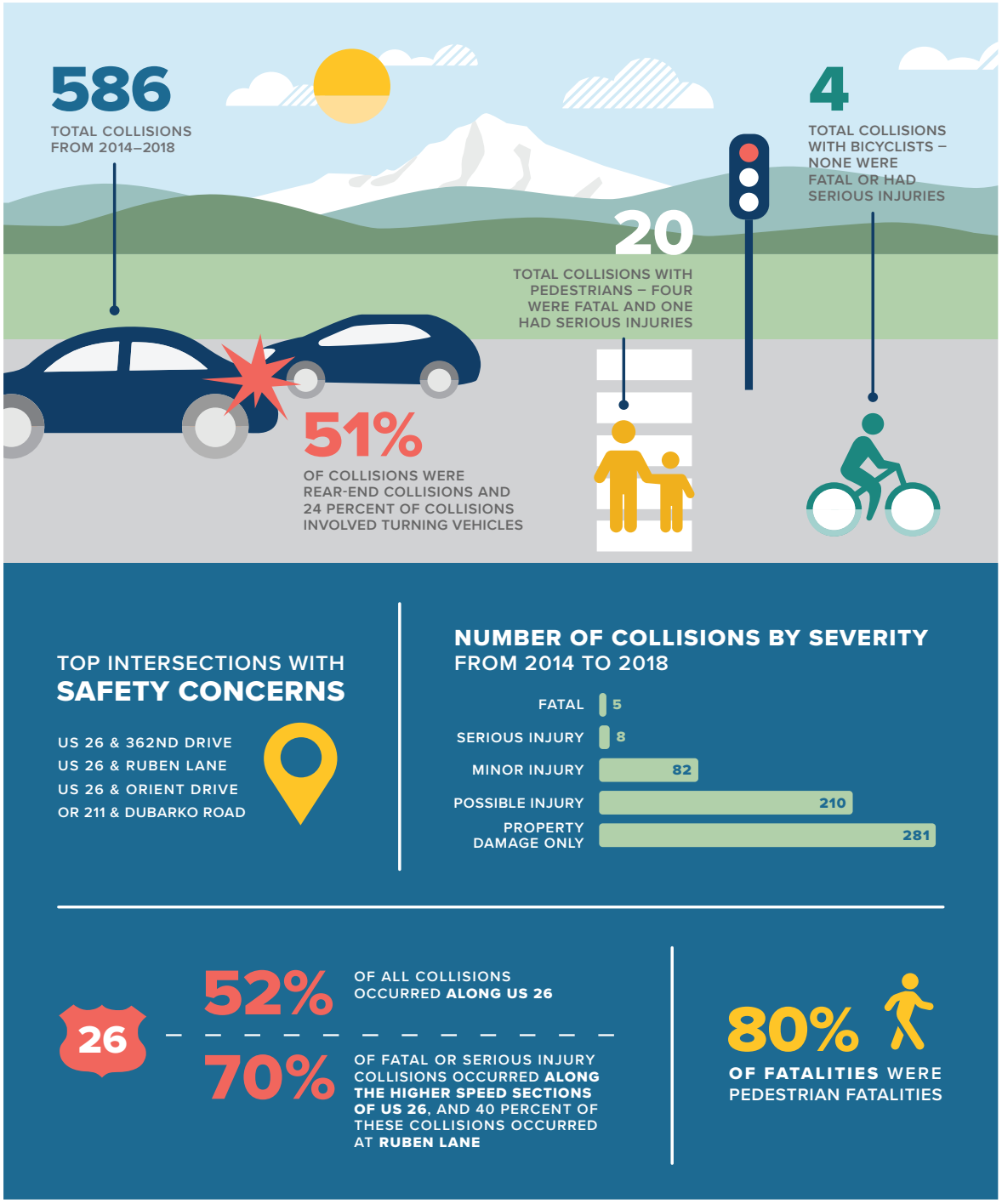


FIGURE 6. SAFETY STATISTICS FROM 2014 TO 2018

EXISTING CONDITIONS SUMMARY

- **Pedestrian Network**
  - Sidewalk gaps along Sandy Heights Street reflect poor east-west connections for the neighborhood south of US 26. Infill of these gaps will improve the quality of the pedestrian network.
  - Sidewalk gaps along US 26 east of SE Ten Eyck Road isolate pedestrians in the Sandy Vista Apartments and Grand Fir Apartments, sidewalk connecting the apartments with downtown Sandy is needed.
- **Bicycle Network**
  - Improved north-south and east-west connections are needed in the neighborhood south of US 26. Important connections without bike lanes or with gaps include Bluff Road, HWY 211, Meinig Road, Sandy Heights Street, and Tupper Road.
  - Bicycle Network gaps along US 26 east of SE Ten Eyck Road isolate people who bike from or to the Sandy Vista Apartments and Grand Fir Apartments. Bike lanes connecting the apartments with downtown Sandy are needed.
- **Transit Network**
  - Improved connections between the regional fixed route service and local fixed route service are needed to provide a better "last mile" connection for transit trips that start or end in Sandy.
  - The dial-a-ride/paratransit STAR system is approaching capacity and operational changes or additional vehicles will be needed to address the limits of the existing system.
- **Motor Vehicle Network**
  - Four intersections exceed mobility targets or have reoccurring safety issues.
    - US 26 and Orient Drive – safety and mobility targets.
    - US 26 and 362nd Drive – safety and mobility targets.
    - US 26 and Ruben Lane – safety.
    - HWY 211 and Dubarko Road – safety.

The issues identified above will inform the development of solutions for the Transportation System Plan.

APPENDIX

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SECTION 1. BICYCLE TRAVEL SHEDS

SECTION 2. PEDESTRIAN TRAVEL SHEDS

SECTION 3. TRAFFIC PERFORMANCE REPORTS

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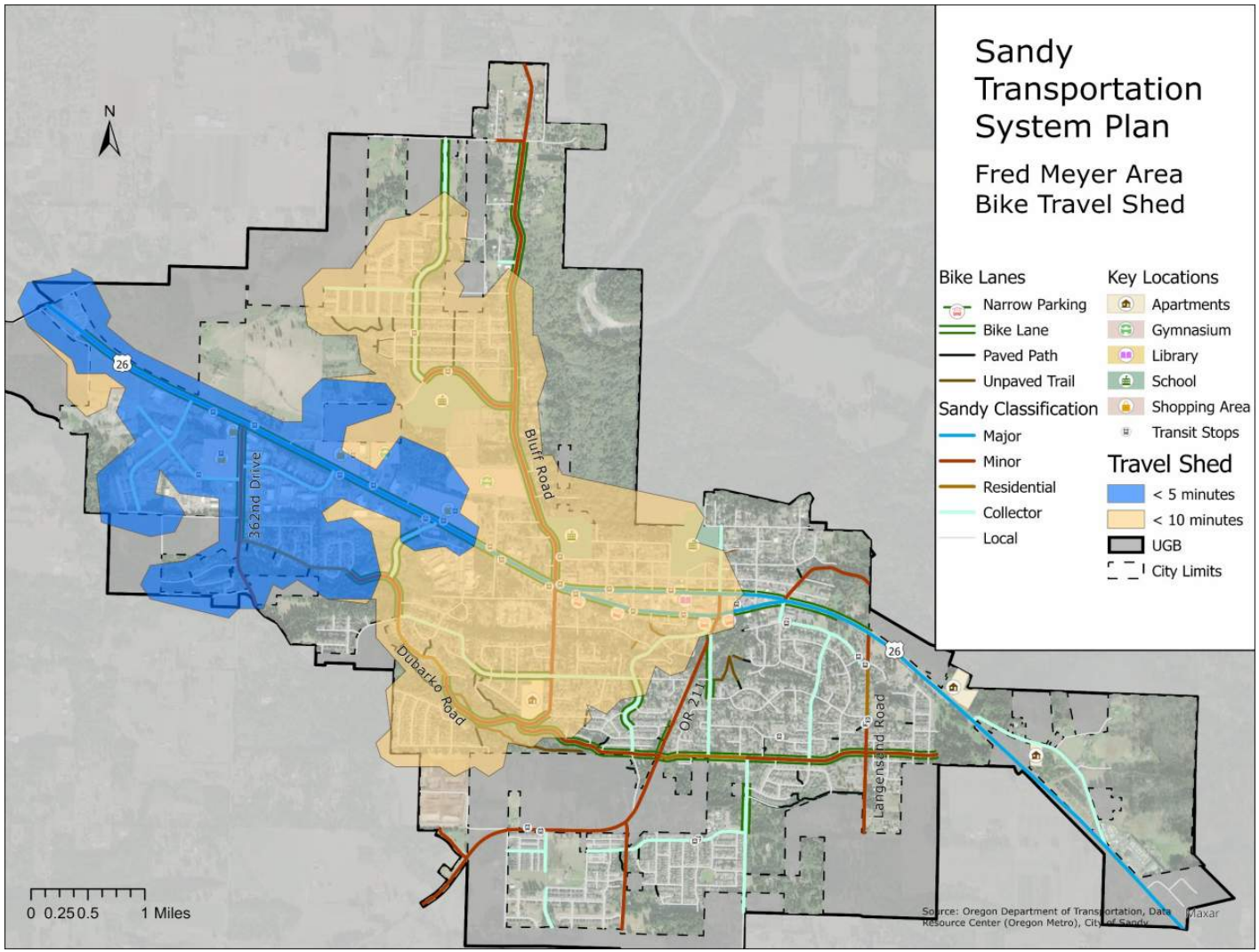
SECTION 1. BICYCLE TRAVEL SHEDS


Sandy Transportation System Plan
Fred Meyer Area Bike Travel Shed
Bike Lanes
Narrow Parking
Bike Lane
Paved Path
Unpaved Trail
Sandy Classification
Major
Minor
Residential
Collector
Local
Key Locations
Apartments
Gymnasium
Library
School
Shopping Area
Transit Stops
Travel Shed
< 5 minutes
< 10 minutes
UGB
City Limits
N
26
362nd Drive
Bluff Road
Dubarko Road
OR 211
Langensand Road
0 0.250.5 1 Miles
Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy, Maxar

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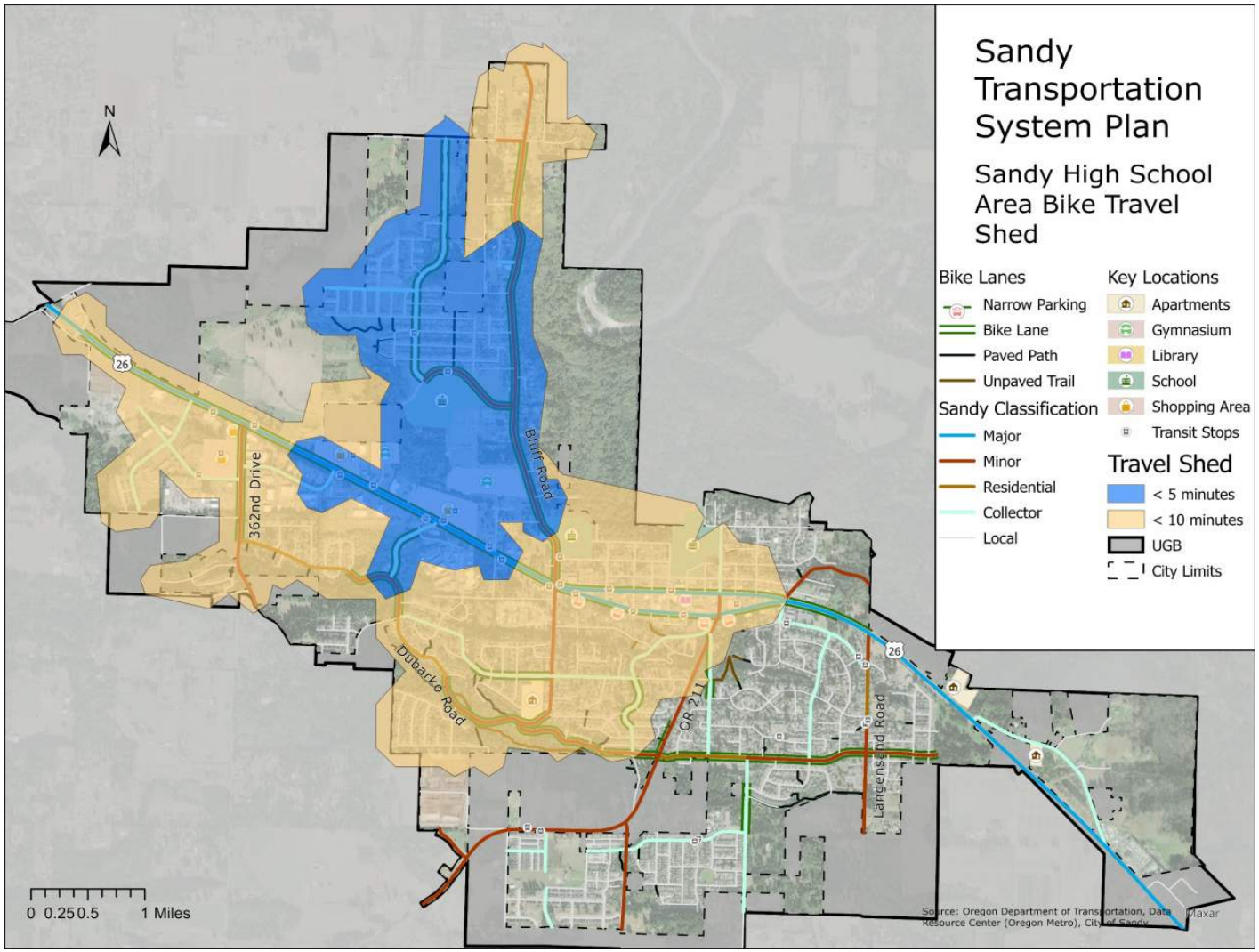
Sandy Transportation System Plan
Sandy High School Area Bike Travel Shed
Bike Lanes
Narrow Parking
Bike Lane
Paved Path
Unpaved Trail
Sandy Classification
Major
Minor
Residential
Collector
Local
Key Locations
Apartments
Gymnasium
Library
School
Shopping Area
Transit Stops
Travel Shed
< 5 minutes
< 10 minutes
UGB
City Limits
N
26
362nd Drive
Bluff Road
Dubarko Road
OR 211
Langensand Road
0 0.250.5 1 Miles
Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy, Maxar

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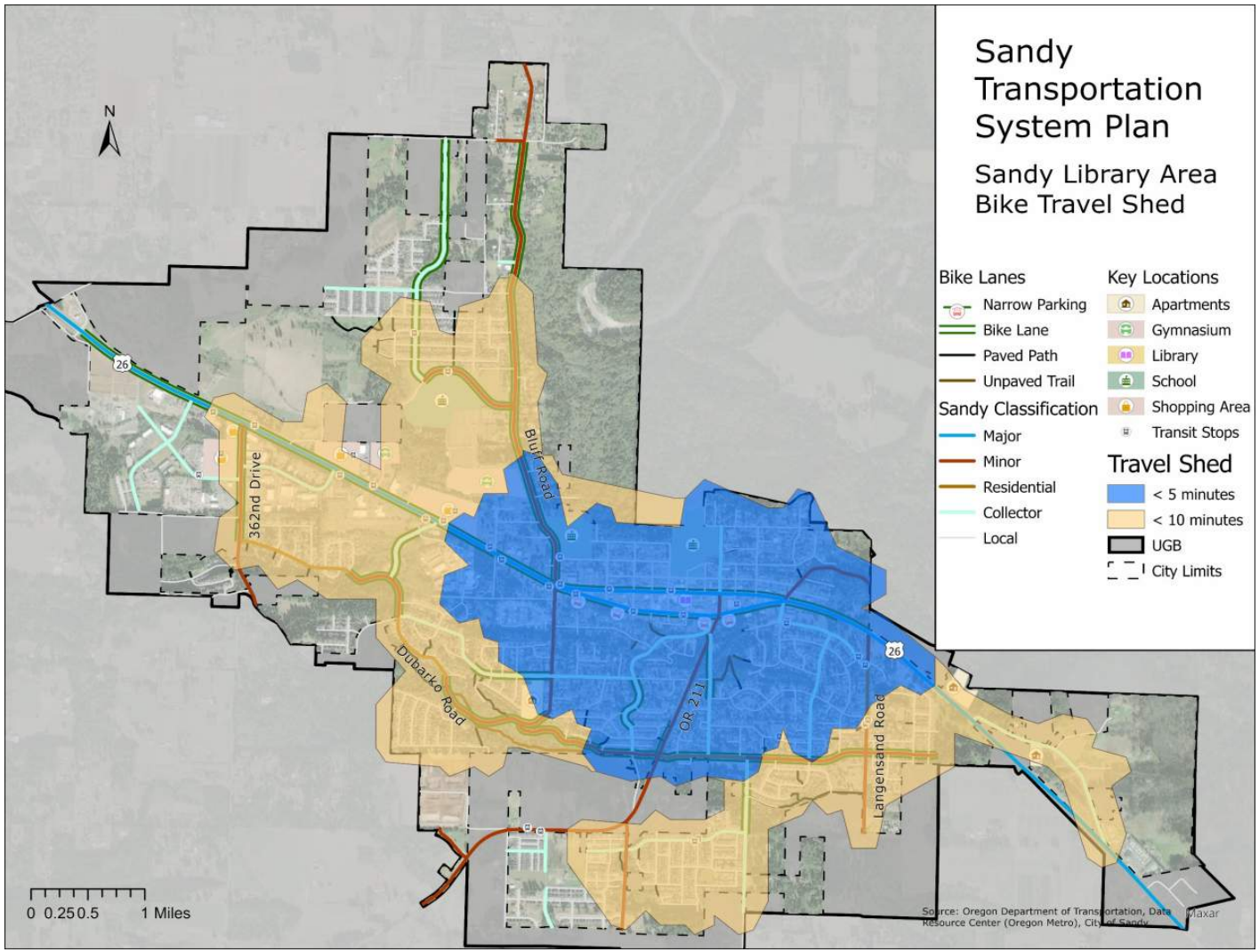
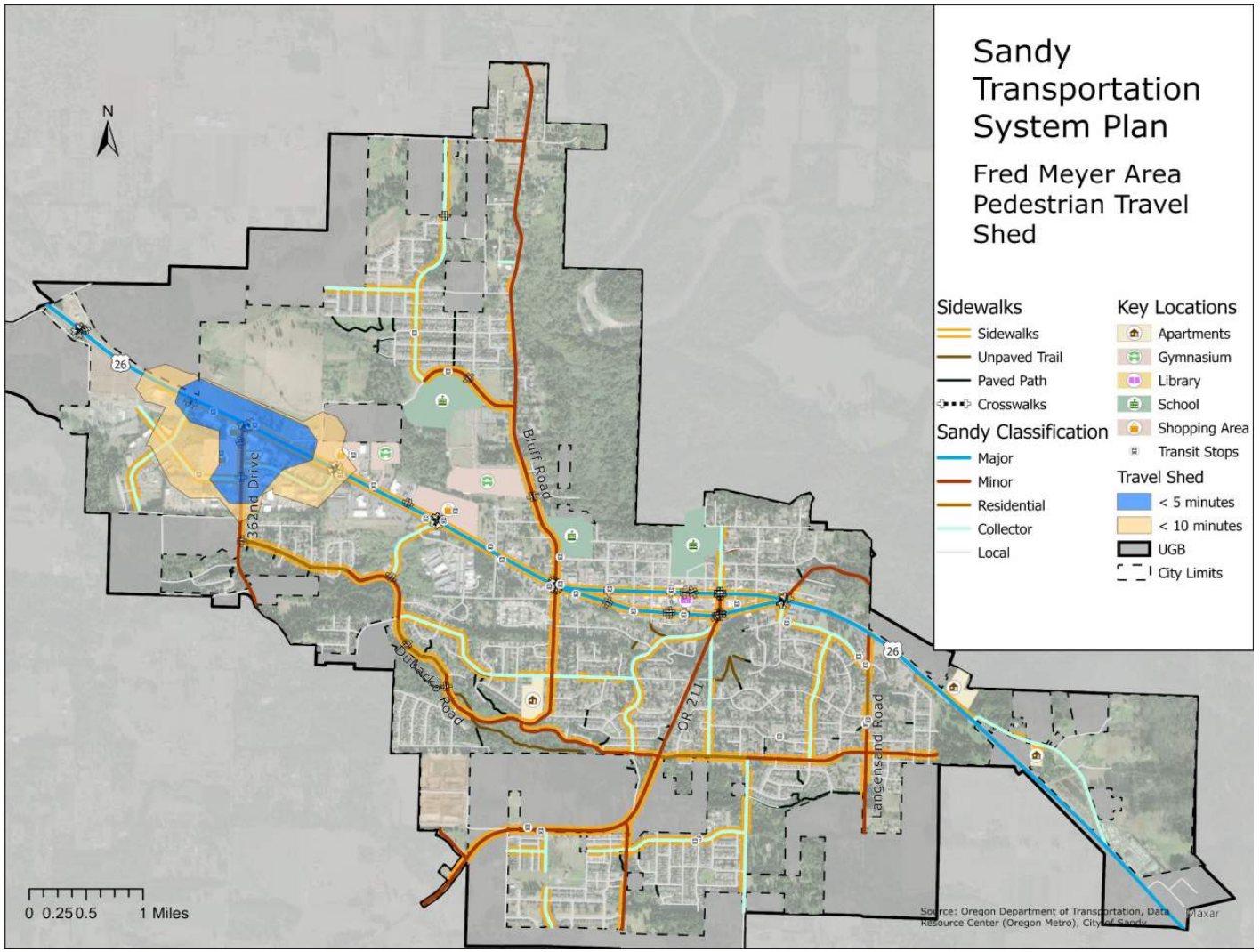
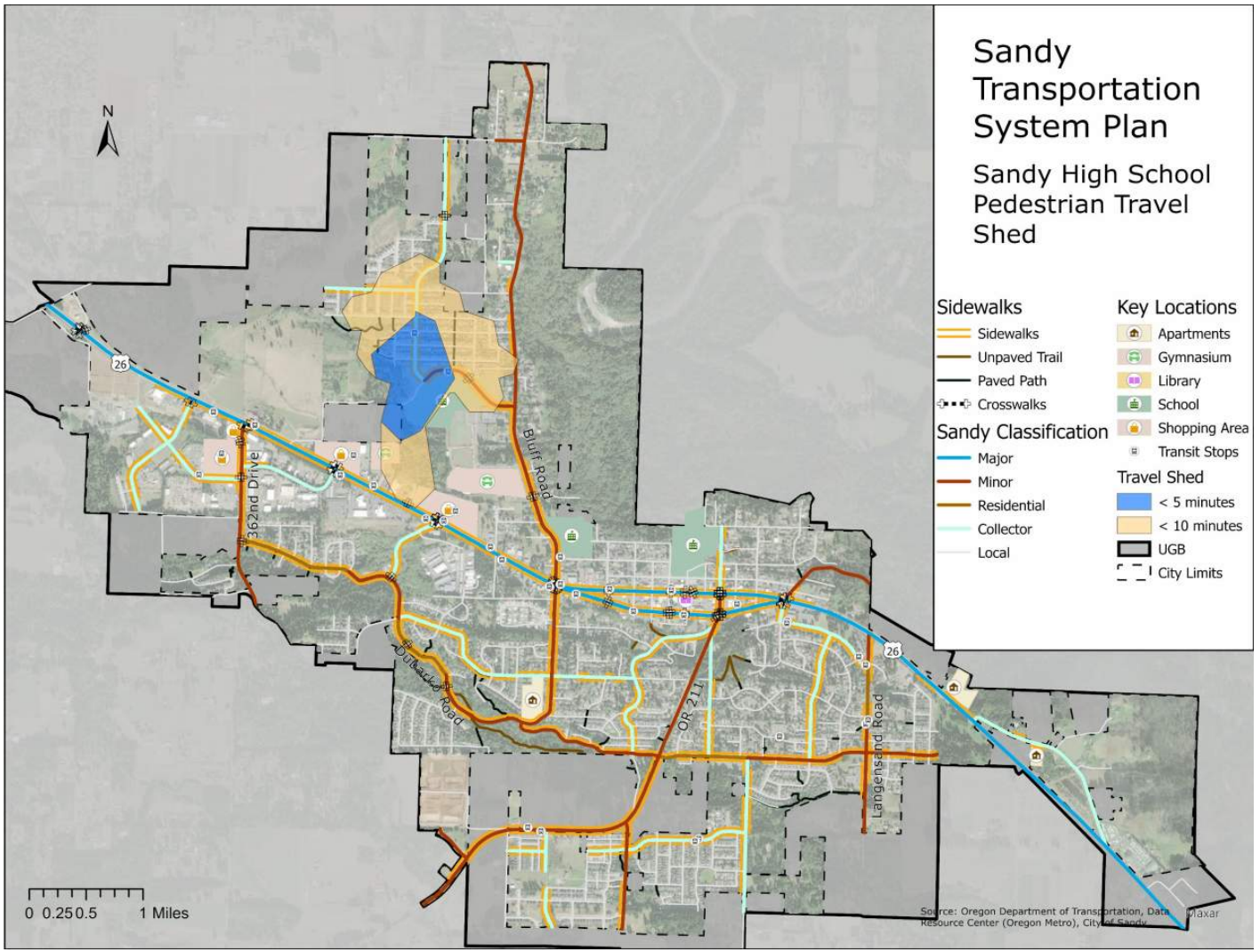

Sandy Transportation System Plan
Sandy Library Area Bike Travel Shed
Bike Lanes
Narrow Parking
Bike Lane
Paved Path
Unpaved Trail
Sandy Classification
Major
Minor
Residential
Collector
Local
Key Locations
Apartments
Gymnasium
Library
School
Shopping Area
Transit Stops
Travel Shed
< 5 minutes
< 10 minutes
UGB
City Limits
N
26
362nd Drive
Bluff Road
Dubarko Road
OR 211
Langensand Road
0 0.250.5 1 Miles
Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy, Maxar

DKS

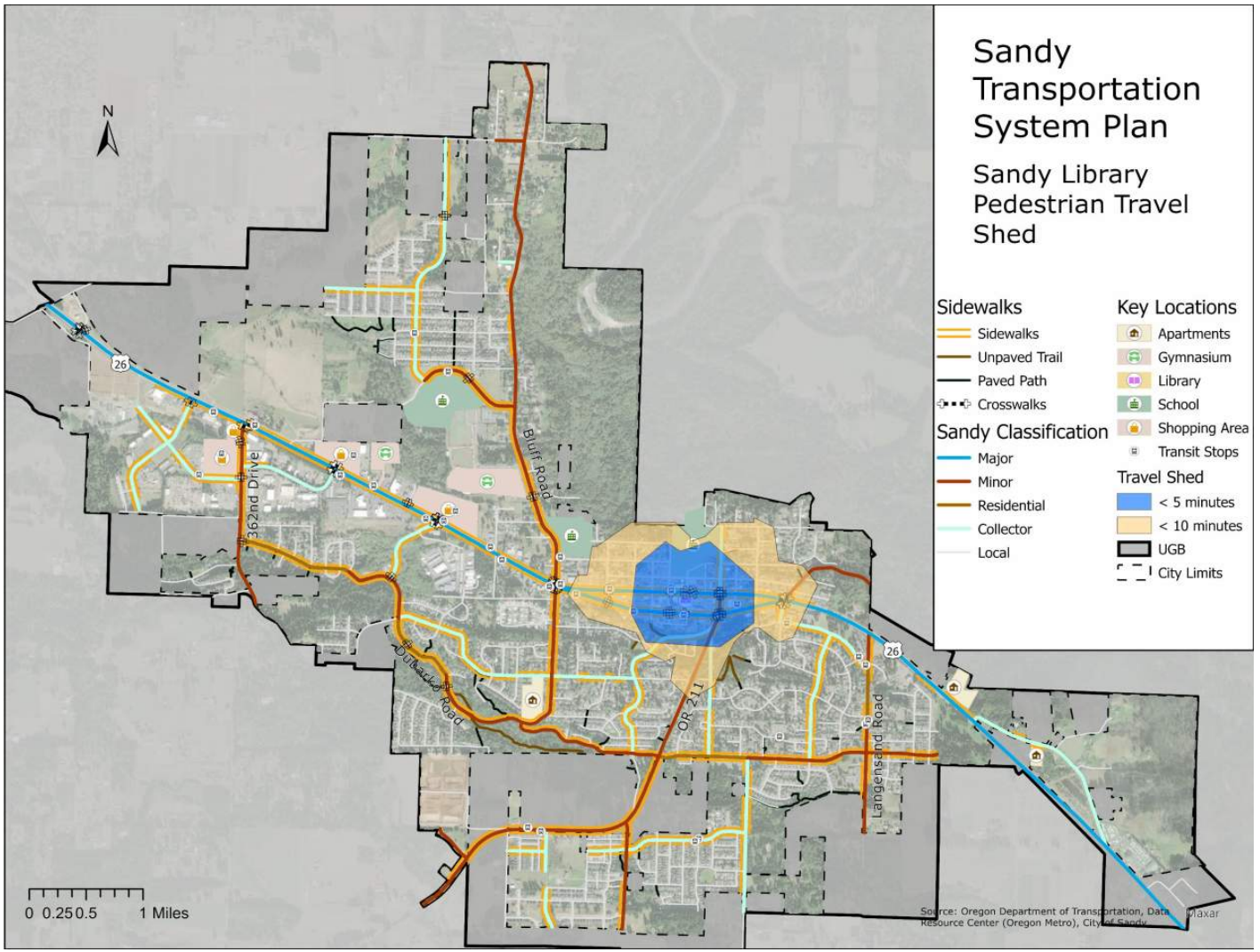
SECTION 2. PEDESTRIAN TRAVEL SHEDS


Sandy Transportation System Plan
Fred Meyer Area Pedestrian Travel Shed
Sidewalks
Sidewalks
Unpaved Trail
Paved Path
Crosswalks
Sandy Classification
Major
Minor
Residential
Collector
Local
Key Locations
Apartments
Gymnasium
Library
School
Shopping Area
Transit Stops
Travel Shed
< 5 minutes
< 10 minutes
UGB
City Limits
N
26
362nd Drive
Bluff Road
Orient Drive
OR 211
Langensand Road
0 0.250.5 1 Miles
Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy, Maxar

DKS


Sandy Transportation System Plan
Sandy High School Pedestrian Travel Shed
Sidewalks
Sidewalks
Unpaved Trail
Paved Path
Crosswalks
Sandy Classification
Major
Minor
Residential
Collector
Local
Key Locations
Apartments
Gymnasium
Library
School
Shopping Area
Transit Stops
Travel Shed
< 5 minutes
< 10 minutes
UGB
City Limits
N
26
362nd Drive
Bluff Road
Orient Drive
OR 211
Langensand Road
0 0.250.5 1 Miles
Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy, Maxar

DKS


Sandy Transportation System Plan
Sandy Library Pedestrian Travel Shed
Sidewalks
Sidewalks
Unpaved Trail
Paved Path
Crosswalks
Sandy Classification
Major
Minor
Residential
Collector
Local
Key Locations
Apartments
Gymnasium
Library
School
Shopping Area
Transit Stops
Travel Shed
< 5 minutes
< 10 minutes
UGB
City Limits
N
26
362nd Drive
Bluff Road
Orient Drive
OR 211
Langensand Road
0 0.250.5 1 Miles
Source: Oregon Department of Transportation, Data Resource Center (Oregon Metro), City of Sandy, Maxar

DKS

SECTION 3. TRAFFIC PERFORMANCE REPORTS

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26

01/20/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1790	5	5	1200	185	5	5	5	230	5	10
Future Volume (veh/h)	15	1790	5	5	1200	185	5	5	5	230	5	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	16	1946	5	5	1304	0	5	5	5	250	5	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	78	1940	865	77	1910		13	13	13	295	6	13
Arrive On Green	0.05	0.58	0.58	0.05	0.58	0.00	0.03	0.03	0.03	0.19	0.19	0.19
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	496	496	496	1579	32	69
Grp Volume(v), veh/h	16	1946	5	5	1304	0	15	0	0	266	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1489	0	0	1680	0	0
Q Serve(g_s), s	0.9	56.0	0.1	0.3	26.7	0.0	1.0	0.0	0.0	14.9	0.0	0.0
Cycle Q Clear(g_c), s	0.9	56.0	0.1	0.3	26.7	0.0	1.0	0.0	0.0	14.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.33		0.33	0.94		0.04
Lane Grp Cap(c), veh/h	78	1940	865	77	1910		38	0	0	314	0	0
V/C Ratio(X)	0.20	1.00	0.01	0.07	0.68		0.39	0.00	0.00	0.85	0.00	0.00
Avail Cap(c_a), veh/h	191	1940	865	188	1910		169	0	0	363	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	44.6	20.6	8.8	44.3	14.4	0.0	46.4	0.0	0.0	38.2	0.0	0.0
Incr Delay (d2), s/veh	0.8	21.1	0.0	0.2	1.3	0.0	2.4	0.0	0.0	15.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	22.7	0.0	0.1	8.3	0.0	0.4	0.0	0.0	7.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	41.7	8.8	44.5	15.7	0.0	48.8	0.0	0.0	53.2	0.0	0.0
LnGrp LOS	D	F	A	D	B		D	A	A	D	A	A
Approach Vol, veh/h		1967			1309	A		15			266	
Approach Delay, s/veh		41.7			15.8			48.8			53.2	
Approach LOS		D			B			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	60.0		22.2	8.5	60.0		6.5				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	10.5	53.0		20.0	10.5	53.0		10.5				
Max Q Clear Time (g_c+I1), s	2.9	28.7		16.9	2.3	58.0		3.0				
Green Ext Time (p_c), s	0.0	13.6		0.3	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1415	340	265	1115	320	305
Future Volume (veh/h)	1415	340	265	1115	320	305
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1744	1744	1786	1786
Adj Flow Rate, veh/h	1505	362	282	1186	340	324
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	4	4	1	1
Cap, veh/h	1727	770	423	2688	431	578
Arrive On Green	0.51	0.51	0.25	0.81	0.13	0.13
Sat Flow, veh/h	3455	1502	1661	3400	3300	1514
Grp Volume(v), veh/h	1505	362	282	1186	340	324
Grp Sat Flow(s),veh/h/ln	1683	1502	1661	1657	1650	1514
Q Serve(g_s), s	54.3	21.4	21.0	14.5	13.8	0.0
Cycle Q Clear(g_c), s	54.3	21.4	21.0	14.5	13.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1727	770	423	2688	431	578
V/C Ratio(X)	0.87	0.47	0.67	0.44	0.79	0.56
Avail Cap(c_a), veh/h	1732	773	423	2688	717	709
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.73	0.73	1.00	1.00
Uniform Delay (d), s/veh	29.6	21.6	46.1	3.8	58.1	33.5
Incr Delay (d2), s/veh	6.4	2.1	2.6	0.4	2.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.5	7.4	8.7	3.1	5.8	8.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.0	23.6	48.7	4.2	60.1	34.1
LnGrp LOS	D	C	D	A	E	C
Approach Vol, veh/h	1867			1468	664	
Approach Delay, s/veh	33.6			12.8	47.4	
Approach LOS	C			B	D	

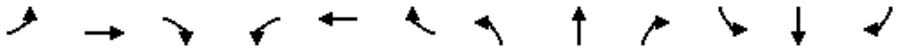
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	41.2	74.8			116.0	22.0
Change Period (Y+Rc), s	6.0	* 6			6.0	4.5
Max Green Setting (Gmax), s	25.0	* 69			98.0	29.5
Max Q Clear Time (g_c+I1), s	23.0	56.3			16.5	15.8
Green Ext Time (p_c), s	0.2	12.5			67.6	1.8

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

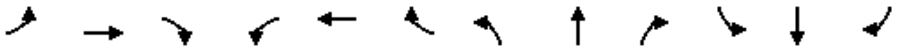
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1615	5	25	1245	35	40	20	70	160	10	65
Future Volume (vph)	50	1615	5	25	1245	35	40	20	70	160	10	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1627		1624	1638	1508
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	1676	3316		1644	3358	1471		1627		1624	1638	1508
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	1648	5	26	1270	36	41	20	71	163	10	66
RTOR Reduction (vph)	0	0	0	0	0	16	0	29	0	0	0	59
Lane Group Flow (vph)	51	1653	0	26	1270	20	0	103	0	86	87	7
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	18.7	96.2		5.0	82.5	82.5		13.7		15.7	15.7	15.7
Effective Green, g (s)	19.2	97.6		5.0	83.9	83.9		13.7		15.7	15.7	15.7
Actuated g/C Ratio	0.13	0.66		0.03	0.57	0.57		0.09		0.11	0.11	0.11
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	217	2186		55	1903	833		150		172	173	159
v/s Ratio Prot	0.03	c0.50		0.02	c0.38			c0.06		0.05	c0.05	
v/s Ratio Perm						0.01						0.00
v/c Ratio	0.24	0.76		0.47	0.67	0.02		0.69		0.50	0.50	0.04
Uniform Delay, d1	57.8	17.1		70.2	22.3	14.1		65.1		62.4	62.5	59.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	2.5		3.7	1.9	0.1		12.3		1.3	1.3	0.1
Delay (s)	58.1	19.6		73.9	24.2	14.1		77.3		63.8	63.8	59.5
Level of Service	E	B		E	C	B		E		E	E	E
Approach Delay (s)		20.8			24.9			77.3			62.6	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1630	110	40	1230	65	50	20	35	165	25	80
Future Volume (vph)	110	1630	110	40	1230	65	50	20	35	165	25	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1466	1644	3358	1431		1687	1461	1624	1649	1507
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1676	3318	1466	1644	3358	1431		1687	1461	1624	1649	1507
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	111	1646	111	40	1242	66	51	20	35	167	25	81
RTOR Reduction (vph)	0	0	28	0	0	25	0	0	32	0	0	74
Lane Group Flow (vph)	111	1646	83	40	1242	41	0	71	3	95	97	7
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6		8	8			4
Actuated Green, G (s)	12.6	92.1	92.1	9.7	89.2	89.2		13.7	13.7	13.1	13.1	13.1
Effective Green, g (s)	12.6	93.5	93.5	9.7	90.6	90.6		13.7	13.7	13.1	13.1	13.1
Actuated g/C Ratio	0.09	0.64	0.64	0.07	0.62	0.62		0.09	0.09	0.09	0.09	0.09
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	144	2124	938	109	2083	888		158	137	145	147	135
v/s Ratio Prot	0.07	c0.50		0.02	c0.37			c0.04		0.06	c0.06	
v/s Ratio Perm			0.06			0.03			0.00			0.00
v/c Ratio	0.77	0.77	0.09	0.37	0.60	0.05		0.45	0.02	0.66	0.66	0.05
Uniform Delay, d1	65.3	18.7	10.0	65.2	16.7	10.8		62.6	60.1	64.3	64.3	60.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.9	2.8	0.2	1.2	1.3	0.1		1.2	0.0	8.6	8.7	0.1
Delay (s)	86.2	21.6	10.2	66.4	18.0	10.9		63.8	60.1	72.9	73.0	60.9
Level of Service	F	C	B	E	B	B		E	E	E	E	E
Approach Delay (s)		24.7			19.0			62.6			69.4	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
6: Bluff Rd & US 26

01/20/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	1570	150	65	1155	150	95	40	60	155	45	115
Future Volume (veh/h)	120	1570	150	65	1155	150	95	40	60	155	45	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	122	1602	153	66	1179	153	97	41	61	158	46	117
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	357	2036	907	83	1285	640	119	71	106	182	66	169
Arrive On Green	0.21	0.60	0.60	0.05	0.44	0.44	0.07	0.11	0.12	0.11	0.15	0.15
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	637	948	1701	445	1132
Grp Volume(v), veh/h	122	1602	153	66	1179	153	97	0	102	158	0	163
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1586	1701	0	1577
Q Serve(g_s), s	7.8	45.6	5.7	5.0	47.9	5.8	7.1	0.0	7.7	11.6	0.0	12.4
Cycle Q Clear(g_c), s	7.8	45.6	5.7	5.0	47.9	5.8	7.1	0.0	7.7	11.6	0.0	12.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.72
Lane Grp Cap(c), veh/h	357	2036	907	83	1285	640	119	0	178	182	0	235
V/C Ratio(X)	0.34	0.79	0.17	0.80	0.92	0.24	0.81	0.00	0.57	0.87	0.00	0.69
Avail Cap(c_a), veh/h	357	2036	907	143	1297	646	188	0	375	188	0	373
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.5	18.9	11.0	59.7	33.6	11.0	58.2	0.0	53.4	55.8	0.0	51.1
Incr Delay (d2), s/veh	0.2	1.9	0.2	10.1	11.8	0.9	9.7	0.0	1.8	31.2	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	16.8	2.0	2.4	19.0	3.0	3.4	0.0	3.2	6.6	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	20.8	11.3	69.8	45.4	11.8	67.9	0.0	55.1	87.0	0.0	53.4
LnGrp LOS	D	C	B	E	D	B	E	A	E	F	A	D
Approach Vol, veh/h		1877			1398			199			321	
Approach Delay, s/veh		21.5			42.9			61.4			69.9	
Approach LOS		C			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	80.8	12.9	22.9	31.7	59.5	17.6	18.2
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.0	4.5
Max Green Setting (Gmax), s	11.0	55.2	14.0	29.5	11.0	* 56	14.0	29.5
Max Q Clear Time (g_c+I1), s	7.0	47.6	9.1	14.4	9.8	49.9	13.6	9.7
Green Ext Time (p_c), s	0.0	7.3	0.0	0.5	0.0	5.7	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	55	75	210	250	5
Future Vol, veh/h	5	55	75	210	250	5
Conflicting Peds, #/hr	1	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	180	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	1	1	3	3
Mvmt Flow	6	63	85	239	284	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	699	290	292	0	-	0
Stage 1	289	-	-	-	-	-
Stage 2	410	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.11	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.209	-	-	-
Pot Cap-1 Maneuver	403	744	1275	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	374	742	1273	-	-	-
Mov Cap-2 Maneuver	374	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	665	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1273	-	374	742	-	-
HCM Lane V/C Ratio	0.067	-	0.015	0.084	-	-
HCM Control Delay (s)	8	0	14.8	10.3	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0	0.3	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	40	410	35	25	470
Future Vol, veh/h	40	40	410	35	25	470
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	4	4	1	1	3	3
Mvmt Flow	43	43	436	37	27	500

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1009	457	0	0	473	0
Stage 1	455	-	-	-	-	-
Stage 2	554	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.13	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.227	-
Pot Cap-1 Maneuver	264	599	-	-	1084	-
Stage 1	635	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	257	598	-	-	1084	-
Mov Cap-2 Maneuver	257	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.1	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	359	1084	-
HCM Lane V/C Ratio	-	-	0.237	0.025	-
HCM Control Delay (s)	-	-	18.1	8.4	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Intersection Delay, s/veh	24.4
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	130	160	90	315	480	30
Future Vol, veh/h	130	160	90	315	480	30
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	138	170	96	335	511	32
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	16.1	21.3	31.5
HCM LOS	C	C	D

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	22%	45%	0%
Vol Thru, %	78%	0%	94%
Vol Right, %	0%	55%	6%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	405	290	510
LT Vol	90	130	0
Through Vol	315	0	480
RT Vol	0	160	30
Lane Flow Rate	431	309	543
Geometry Grp	1	1	1
Degree of Util (X)	0.696	0.529	0.842
Departure Headway (Hd)	5.813	6.168	5.584
Convergence, Y/N	Yes	Yes	Yes
Cap	616	580	646
Service Time	3.897	4.256	3.661
HCM Lane V/C Ratio	0.7	0.533	0.841
HCM Control Delay	21.3	16.1	31.5
HCM Lane LOS	C	C	D
HCM 95th-tile Q	5.5	3.1	9.2

Intersection	
Int Delay, s/veh	0.1

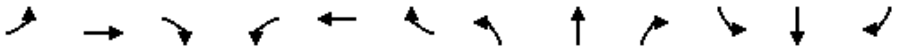
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	3	1055	850	5	5	0
Future Vol, veh/h	3	1055	850	5	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1122	904	5	5	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	909	0	-	0	1474	455
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	567	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	745	-	-	-	117	552
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	531	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	745	-	-	-	117	552
Mov Cap-2 Maneuver	-	-	-	-	117	-
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	531	-

Approach	SE	NW	SW
HCM Control Delay, s	0	0	37.2
HCM LOS			E

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	745	-	117
HCM Lane V/C Ratio	-	-	0.004	-	0.045
HCM Control Delay (s)	-	-	9.9	-	37.2
HCM Lane LOS	-	-	A	-	E
HCM 95th %tile Q(veh)	-	-	0	-	0.1

HCM 6th Signalized Intersection Summary
13: Hwy 211 & US 26/Procter Blvd 01/20/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	155	995	15	270	45	0	0	35	25
Future Volume (veh/h)	0	0	0	155	995	15	270	45	0	0	35	25
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	0.99		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				168	1082	16	293	49	0	0	38	27
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				224	1520	23	354	49	0	0	262	186
Arrive On Green				0.52	0.52	0.52	0.27	0.27	0.00	0.00	0.27	0.27
Sat Flow, veh/h				434	2949	45	1076	180	0	0	960	682
Grp Volume(v), veh/h				661	0	605	342	0	0	0	0	65
Grp Sat Flow(s),veh/h/ln				1708	0	1721	1256	0	0	0	0	1642
Q Serve(g_s), s				33.6	0.0	28.9	26.6	0.0	0.0	0.0	0.0	3.3
Cycle Q Clear(g_c), s				33.6	0.0	28.9	29.9	0.0	0.0	0.0	0.0	3.3
Prop In Lane				0.25		0.03	0.86		0.00	0.00		0.42
Lane Grp Cap(c), veh/h				880	0	887	403	0	0	0	0	448
V/C Ratio(X)				0.75	0.00	0.68	0.85	0.00	0.00	0.00	0.00	0.15
Avail Cap(c_a), veh/h				1118	0	1126	403	0	0	0	0	448
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.91	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.1	0.0	19.9	41.6	0.0	0.0	0.0	0.0	30.3
Incr Delay (d2), s/veh				5.9	0.0	4.2	17.9	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.5	0.0	12.4	11.2	0.0	0.0	0.0	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				26.9	0.0	24.2	59.5	0.0	0.0	0.0	0.0	30.4
LnGrp LOS				C	A	C	E	A	A	A	A	C
Approach Vol, veh/h					1266			342			65	
Approach Delay, s/veh					25.6			59.5			30.4	
Approach LOS					C			E			C	

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				34.0		60.7		34.0				
Change Period (Y+Rc), s				4.0		4.0		4.0				
Max Green Setting (Gmax), s				30.0		72.0		30.0				
Max Q Clear Time (g_c+I1), s				5.3		35.6		31.9				
Green Ext Time (p_c), s				0.2		21.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		32.7	
HCM 6th LOS		C	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	1310	365	0	0	0	0	240	125	25	185	0
Future Volume (veh/h)	75	1310	365	0	0	0	0	240	125	25	185	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	79	1379	0				0	253	132	26	195	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	97	1777					0	580	484	33	663	0
Arrive On Green	0.54	0.54	0.00				0.00	0.33	0.33	0.01	0.13	0.00
Sat Flow, veh/h	178	3268	1502				0	1772	1480	1647	1730	0
Grp Volume(v), veh/h	781	677	0				0	253	132	26	195	0
Grp Sat Flow(s),veh/h/ln	1763	1683	1502				0	1772	1480	1647	1730	0
Q Serve(g_s), s	39.9	33.8	0.0				0.0	12.3	7.2	1.7	11.2	0.0
Cycle Q Clear(g_c), s	39.9	33.8	0.0				0.0	12.3	7.2	1.7	11.2	0.0
Prop In Lane	0.10		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	959	915					0	580	484	33	663	0
V/C Ratio(X)	0.81	0.74					0.00	0.44	0.27	0.79	0.29	0.00
Avail Cap(c_a), veh/h	959	915					0	580	484	150	786	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.6	19.2	0.0				0.0	29.0	27.3	54.4	34.5	0.0
Incr Delay (d2), s/veh	7.6	5.4	0.0				0.0	2.4	1.4	22.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.8	14.1	0.0				0.0	5.5	2.7	0.9	5.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	24.5	0.0				0.0	31.4	28.7	76.6	34.7	0.0
LnGrp LOS	C	C					A	C	C	E	C	A
Approach Vol, veh/h		1458	A					385			221	
Approach Delay, s/veh		26.4						30.5			39.6	
Approach LOS		C						C			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	63.8	46.2	6.2	40.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.8
Max Green Setting (Gmax), s	52.0	50.0	10.0	35.2
Max Q Clear Time (g_c+I1), s	41.9	13.2	3.7	14.3
Green Ext Time (p_c), s	8.6	0.5	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	28.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1095	125	5	815	20	95	25	10	45	20	120
Future Volume (veh/h)	160	1095	125	5	815	20	95	25	10	45	20	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	168	1153	132	5	858	21	100	26	11	47	21	126
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	607	1607	716	399	1176	524	177	43	14	92	42	173
Arrive On Green	0.36	0.48	0.48	0.25	0.36	0.36	0.16	0.17	0.15	0.16	0.17	0.15
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	717	254	85	305	252	1032
Grp Volume(v), veh/h	168	1153	132	5	858	21	137	0	0	194	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1056	0	0	1589	0	0
Q Serve(g_s), s	7.8	29.9	5.5	0.3	25.3	1.0	2.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.8	29.9	5.5	0.3	25.3	1.0	14.8	0.0	0.0	12.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.73		0.08	0.24		0.65
Lane Grp Cap(c), veh/h	607	1607	716	399	1176	524	229	0	0	300	0	0
V/C Ratio(X)	0.28	0.72	0.18	0.01	0.73	0.04	0.60	0.00	0.00	0.65	0.00	0.00
Avail Cap(c_a), veh/h	607	2020	900	399	1793	800	261	0	0	335	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.0	22.8	16.5	31.4	30.3	22.6	44.7	0.0	0.0	43.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	2.8	0.6	0.0	4.0	0.1	2.3	0.0	0.0	3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	12.3	2.0	0.1	10.1	0.4	3.8	0.0	0.0	5.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	25.6	17.0	31.4	34.3	22.7	47.0	0.0	0.0	47.1	0.0	0.0
LnGrp LOS	C	C	B	C	C	C	D	A	A	D	A	A
Approach Vol, veh/h		1453			884			137			194	
Approach Delay, s/veh		24.8			34.0			47.0			47.1	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.1	56.5		22.4	43.6	44.0		22.4
Change Period (Y+Rc), s	4.5	4.0		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	10.5	66.0		19.5	15.5	61.0		19.5
Max Q Clear Time (g_c+I1), s	12.3	31.9		14.7	9.8	27.3		16.8
Green Ext Time (p_c), s	0.0	20.6		0.2	0.2	12.7		0.1

Intersection Summary		
HCM 6th Ctrl Delay		30.6
HCM 6th LOS		C

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	1050	850	0	5	20
Future Vol, veh/h	50	1050	850	0	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	6	6	0	0
Mvmt Flow	53	1105	895	0	5	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	895	0	-	0	1554	448
Stage 1	-	-	-	-	895	-
Stage 2	-	-	-	-	659	-
Critical Hdwy	4.16	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.23	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	748	-	-	-	106	564
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	748	-	-	-	98	564
Mov Cap-2 Maneuver	-	-	-	-	98	-
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	482	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	18.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	748	-	-	-	289
HCM Lane V/C Ratio	0.07	-	-	-	0.091
HCM Control Delay (s)	10.2	-	-	-	18.7
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	45	60	30	45	25	50	260	50	15	365	15
Future Vol, veh/h	10	45	60	30	45	25	50	260	50	15	365	15
Conflicting Peds, #/hr	1	0	0	0	0	1	4	0	1	1	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	125	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	2	2	2	2	2	2	3	3	3
Mvmt Flow	11	49	65	33	49	27	54	283	54	16	397	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	890	879	401	913	868	312	417	0	0	338	0	0
Stage 1	433	433	-	419	419	-	-	-	-	-	-	-
Stage 2	457	446	-	494	449	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	266	288	653	254	290	728	1142	-	-	1216	-	-
Stage 1	605	585	-	612	590	-	-	-	-	-	-	-
Stage 2	587	577	-	557	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	207	265	651	185	267	727	1138	-	-	1215	-	-
Mov Cap-2 Maneuver	207	265	-	185	267	-	-	-	-	-	-	-
Stage 1	567	573	-	575	555	-	-	-	-	-	-	-
Stage 2	484	542	-	451	560	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18	21.5	1.2	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1138	-	-	207	401	185	345	1215	-	-
HCM Lane V/C Ratio	0.048	-	-	0.053	0.285	0.176	0.221	0.013	-	-
HCM Control Delay (s)	8.3	0	-	23.4	17.5	28.6	18.4	8	0	-
HCM Lane LOS	A	A	-	C	C	D	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	1.2	0.6	0.8	0	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	240	60	210	235	35	115
Future Vol, veh/h	240	60	210	235	35	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	1	1	1	1
Mvmt Flow	267	67	233	261	39	128

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	334	0	1028	301
Stage 1	-	-	-	-	301	-
Stage 2	-	-	-	-	727	-
Critical Hdwy	-	-	4.11	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.209	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1231	-	260	741
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	480	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1231	-	211	741
Mov Cap-2 Maneuver	-	-	-	-	211	-
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	389	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.1	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	467	-	-	1231	-
HCM Lane V/C Ratio	0.357	-	-	0.19	-
HCM Control Delay (s)	16.9	-	-	8.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.6	-	-	0.7	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1085	85	20	845	25	20
Future Vol, veh/h	1085	85	20	845	25	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1154	90	21	899	27	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1244	0	1646	577
Stage 1	-	-	-	-	1154	-
Stage 2	-	-	-	-	492	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	534	-	92	465
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	586	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	534	-	88	465
Mov Cap-2 Maneuver	-	-	-	-	88	-
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	563	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	40.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	88	465	-	-	534	-
HCM Lane V/C Ratio	0.302	0.046	-	-	0.04	-
HCM Control Delay (s)	62.7	13.1	-	-	12	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-

appendix

TM #5: TRANSPORTATION SYSTEM NEEDS ANALYSIS

DATE: November 22, 2021

TO: Project Management Team

FROM: Reah Flisakowski, Dock Rosenthal | DKS Associates

SUBJECT: Sandy Transportation System Plan P# 20020-001

This memorandum summarizes the future transportation system performance and needs analysis for the City of Sandy, Oregon. This analysis includes the comprehensive review of motor vehicle, bicycle, pedestrian, transit systems, and safety needs. The analysis was based on future transportation system performance and the expected year 2040 travel conditions through the TSP planning area.

FUTURE TRAFFIC PERFORMANCE AND CAPACITY NEEDS

Future year 2040 operating conditions for vehicles were assessed using data and findings developed for the existing conditions analysis[1] and available growth pattern data for the study area and US 26. The study intersections are shown in Figure 1. The following sections summarize the methodology and operations analysis which is consistent with the Sandy Bypass Feasibility Report.[2] The findings were used to develop and evaluate the need for future system improvements.

JURISDICTIONAL MOBILITY STANDARDS

The mobility standards for intersections vary according to the agency of jurisdiction for each intersection. Five of the study intersections are under City jurisdiction (362nd Drive/Industrial Way – North and South, Bluff Road/Bell Street, OR 211/Bornstedt, and OR 211/Dubarko) while the remaining 11 intersections are under ODOT jurisdiction. Current ODOT mobility targets require a volume to capacity ratio between 0.80 and 0.90 or less to be maintained at study intersections (see Table 1) and the City of Sandy operating standards require that a level of service "D" or better be maintained for any signalized intersection and unsignalized intersections with stop control on the minor approach[3].

[1] Existing Transportation System Performance memo, DKS Associates, April 19, 2021.

[2] Sandy Bypass Feasibility Report, DKS Associates, October 2021.

[3] City of Sandy Transportation System Plan, DKS Associates, 2011.

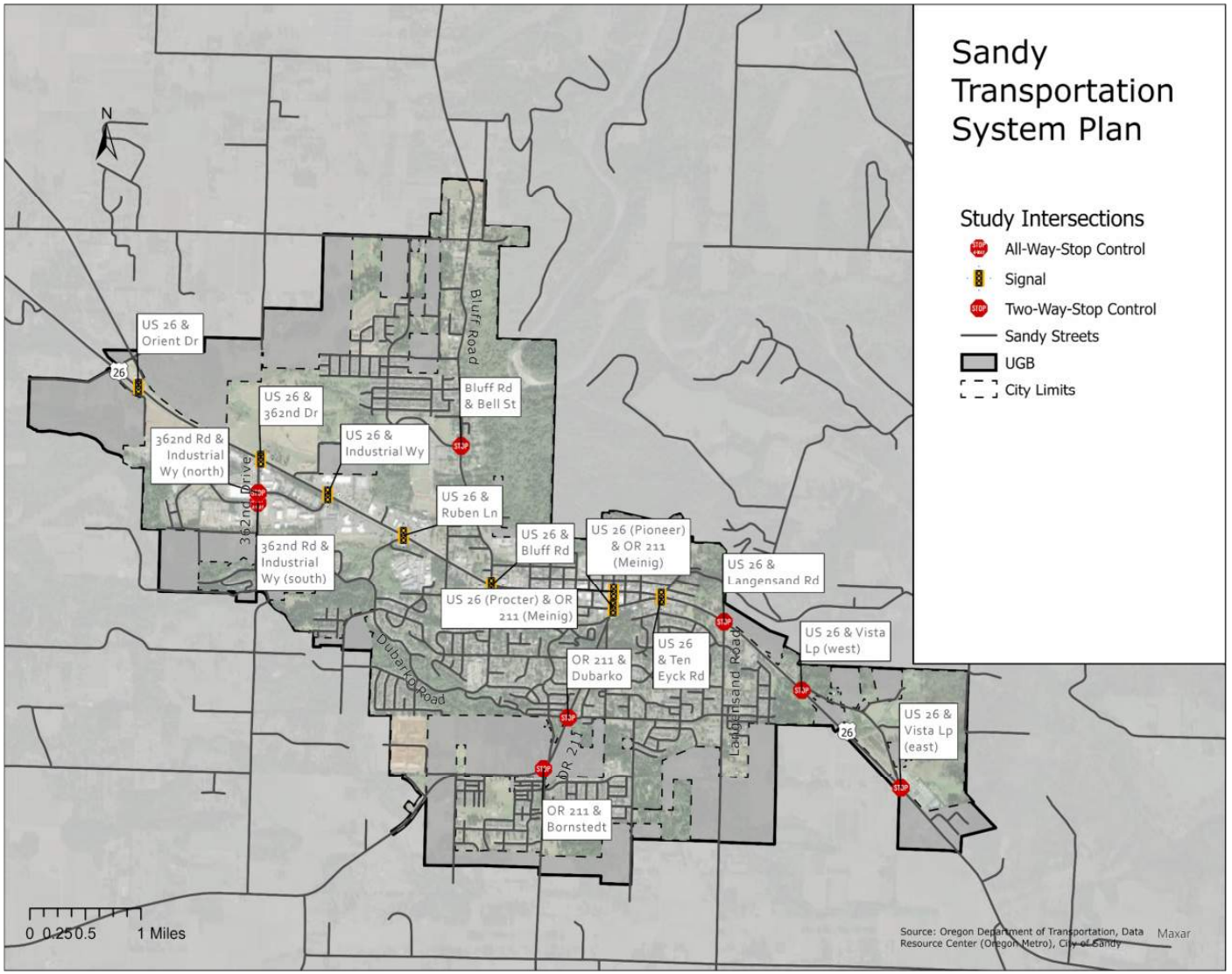


FIGURE 1: STUDY INTERSECTIONS WITH EXISTING CONTROL

2040 NO BUILD BASELINE CONDITIONS

FUTURE FORECASTING

Traffic forecasts for the future 2040 No Build conditions were developed using a combination of available data and prior modeling analysis and findings. The forecasts relied on recent year 2020 intersection counts[4], year 2029 analysis from the 2011 Sandy TSP, and ODOT Volume Tables. The forecasts were developed for the TSP study intersections and focused on the peak hour. Future volumes can be found in the operation reports in the appendix.

FUTURE NETWORK IMPROVEMENTS

A No Build Alternative would typically be based on the existing system and not include future improvements. However, there are several roadway projects that are fully funded and currently in the design phase with an anticipated year 2023 opening. It was determined these projects should be included in the No Build Alternative due to the high level of certainty that they will be part of the future system. These projects are listed below and shown in Figure 2.

- Extend Bell Street to 362nd Avenue (#14a)
- Extend 362nd Avenue to Bell Street (#15a)

FUTURE INTERSECTION OPERATIONS

Motor vehicle conditions were evaluated for the 2040 peak hour at the study intersections under each of the future improvement alternatives. The evaluation utilized the Highway Capacity Manual (HCM) 6th Edition methodology. Table 1 provides a summary of the intersection operations. The detailed intersection operation reports are shown in the appendix. The study intersections that are forecasted to exceed mobility targets include:

- **US 26 and Orient Drive** – The eastbound through movement at this intersection requires more capacity but is limited by the split phasing for Orient Drive/Jarl Road which serves a high southbound left turn volume with only a single approach lane.
- **US 26 and 362nd Drive** – More capacity is needed for the eastbound and westbound left and through movements at this intersection but green time for those movements is limited by the split phasing of the northbound and southbound approaches.
- **US 26 and Industrial Way** – The eastbound through movement and northbound approach are both over capacity at this intersection. The traffic signal split phasing of the northbound and southbound approaches limits the signal green time available to the US 26 movements.
- **362nd Drive and Industrial Way (north)** – High northbound and southbound volumes result in limited gaps for the Industrial Way approach at this two-way-stop-controlled intersection.
- **362nd Drive and Industrial Way (south)** – High traffic volumes at all approaches result in long delays for all movements at this all-way-stop-controlled intersection.

[4] Traffic counts were collected on October 22, 2020.

- **US 26 and Ruben Lane** - The eastbound through movement and southbound approach are both over capacity at this intersection. The split phasing of the northbound and southbound approaches also limits the green time available to the US 26 movements.
- **US 26 and Bluff Road** – The eastbound left and through, westbound left and through, and northbound left movements are all over capacity at this intersection.
- **OR 211 and Bornstedt Road** - High eastbound and westbound volumes result in limited gaps for the Bornstedt Road approach at this two-way-stop-controlled intersection.

TABLE 1: 2040 NO BUILD INTERSECTION OPERATIONS (PEAK HOUR)

STUDY INTERSECTION	CONTROL TYPE	JURISDICTION	MOBILITY TARGET	LEVEL OF SERVICE	DELAY (SECONDS)	V/C RATIO
US 26/ORIENT DRIVE	Signal	ODOT	0.80	F	134	**1.19**
US 26/362ND DRIVE	Signal	ODOT	0.80	F	121	**1.16**
US 26/INDUSTRIAL WAY	Signal[a]	ODOT	0.80	E	74	**1.10**
362ND DRIVE/ INDUSTRIAL WAY (NORTH)	TWSC[b]	City of Sandy	D	**B** **[F]**	11 [117]	0.49 [0.94]
362ND DRIVE/ INDUSTRIAL WAY (SOUTH)	AWSC	City of Sandy	D	**F**	214	1.43
US 26/RUBEN LANE	Signal[a]	ODOT	0.80	C	35	**0.97**
US 26/BLUFF ROAD	Signal	ODOT	0.85	F	112	**1.12**
BLUFF ROAD/BELL STREET	TWSC	City of Sandy	D	A [C]	9 [23]	0.29 [0.09]
PIONEER BOULEVARD (US 26)/MEINIG AVENUE (OR 211)	Signal	ODOT	0.90	C	30	0.81
PROCTOR BOULEVARD (US 26)/MEINIG AVENUE (OR 211)	Signal	ODOT	0.90	C	32	0.84
OR 211/ DUBARKO ROAD	Signal	City of Sandy	D	C	21	0.81
OR 211/BORNSTEDT ROAD	TWSC	City of Sandy	D	**A** **[F]**	10 [240]	0.35 [1.32]
US 26/TEN EYCK ROAD	Signal	ODOT	0.85	C	29	0.80
US 26/LANGENSAND ROAD	TWSC	ODOT	0.80	C [F]	16 [>300]	0.48 [0.91]
US 26/VISTA LOOP DRIVE W	Signal	ODOT	0.80	C	25	0.66
US 26/VISTA LOOP DRIVE E	TWSC	ODOT	0.80	B [F]	12 [117]	0.48 [0.25]

a. This signal reported using HCM 2000 due to non-standard characteristics.

b. Two-way Stop Controlled (TWSC) measures are reported as worst major [worst minor] approach for LOS and Delay and as worst movement for V/C.

FUTURE MOTOR VEHICLE NEEDS

Future improvement alternatives were previously developed and evaluated as part of the 2011 Sandy TSP[5] to enhance connectivity, provide access to developing lands, and address congestion in the US 26 corridor. The objective for each improvement alternative ranged from relying mainly on management and enhancement of the existing transportation system to large investments in new facilities to increase corridor capacity.

Two of the prior TSP alternatives were carried forward and incorporated into the Sandy Bypass Feasibility Reevaluation. The analysis conducted for the Sandy Bypass Feasibility Reevaluation forms the basis for the Sandy TSP update. The two alternatives evaluated include:

- Alternative #1 –local system enhancements and minor improvements
- Alternative #3 – Alternative #1 along with the proposed Sandy Bypass project

The addition of the Alternative #1 improvements would result in moderate changes to local travel patterns with better connectivity and intersection capacity. The 2040 No Build Alternative forecasts were refined to represent the 2040 Alternative #1 using growth rates available from the 2029 forecasts. The addition of the bypass would result in significant changes to regional travel patterns. Future 2040 Alternative #3 forecasts were developed using the Alternative #1 volumes, growth rates available from the 2029 forecasts, and current travel pattern data.

A travel pattern analysis was completed using StreetLight data which provided information on where vehicle trips are coming from through the city, how much delay these trips experience, and how long it takes them to make their trip. The data showed the proposed bypass would attract up to 28% of the total US 26 traffic during the peak hour. For a conservative analysis and for alignment with the 2011 Sandy TSP findings, the forecasting assumed 40% of the total US 26 traffic would divert to the bypass.

The 2040 Alternative #1 volumes were adjusted to account for use of the US 26 bypass to develop 2040 Alternative #3 volumes. US 26 is forecasted to serve approximately 3,800 vehicles during the peak hour under the 2040 No Build Alternative. Under the 2040 Alternative #3, US 26 is forecasted to serve approximately 2,300 vehicles and the bypass is forecasted to serve approximately 1,500 vehicles during the peak hour.

[5] Sandy TSP Update, Technical Memo #2: Transportation Alternatives and Improvement Strategies, DKS Associates, February 25, 2011.

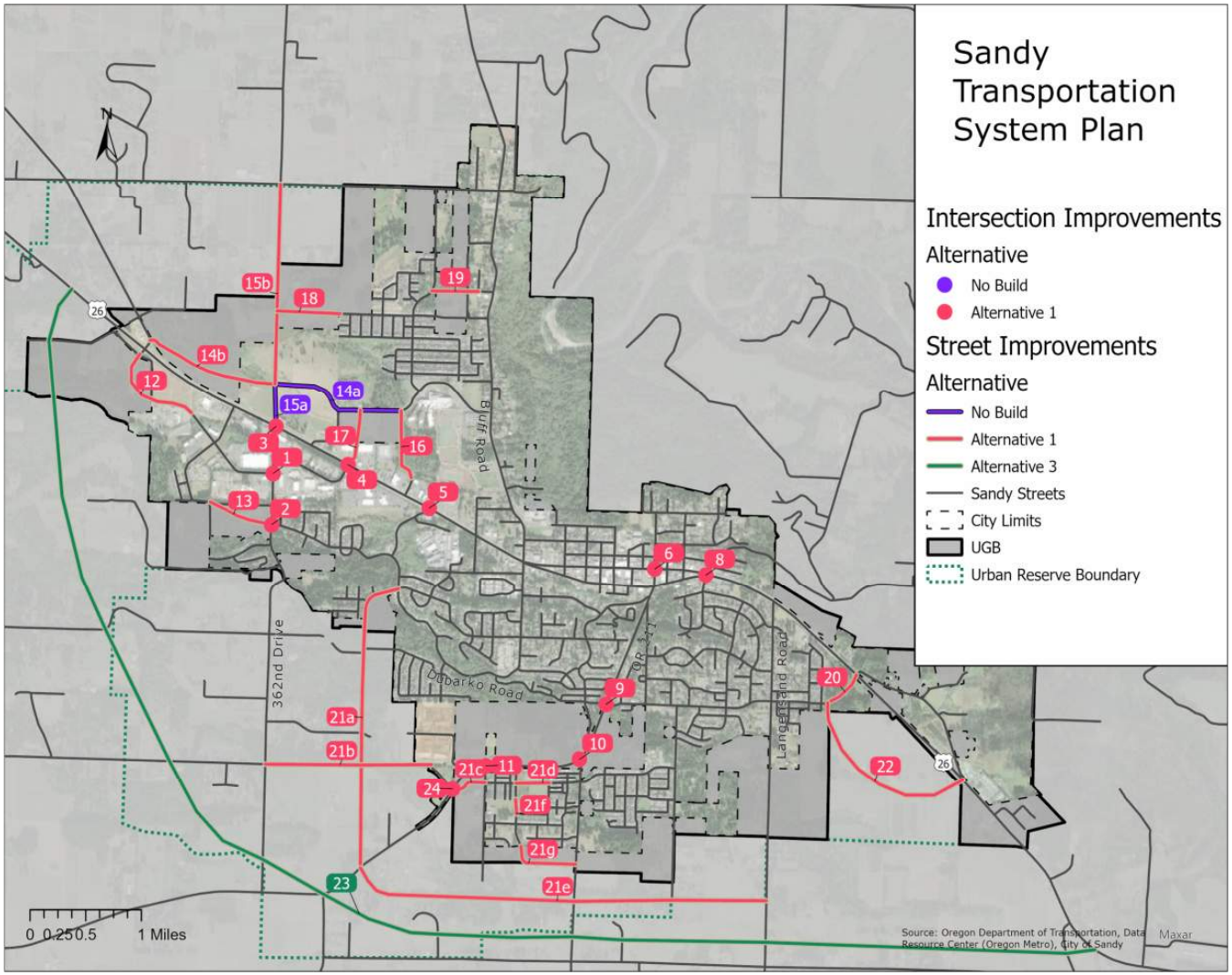


FIGURE 2: FUTURE STREET CONNECTIONS

ADDITIONAL MOTOR VEHICLE SYSTEM IMPROVEMENT STRATEGIES

NEIGHBORHOOD TRAFFIC MANAGEMENT (NTM)

Neighborhood traffic management strategies are commonly used to slow down or reduce automotive traffic with the intent of improving safety for pedestrians and bicyclists. Sandy currently has a neighborhood traffic management program that outlines the process for identifying, prioritizing, and mitigating problems related to traffic speeds and volumes on local streets.

TABLE 2: TRAFFIC CALMING DEVICES

Device	Benefits and Impacts				
	Safety	Speed Reduction	Traffic Diversion	Fuel Consumption, Pollution	Emergency Services
CHICANES	Possible Improvement	Possible	Possible	Small Increase	Possible Problems
CURB EXTENSIONS	Improve Pedestrian Crossing	Possible	No Effect	No Change	Possible Problems
DIVERTERS	Possible Improvement	Mixed Results	Yes	No Change	Possible Problems
ENTRANCE TREATMENTS	Possible Improvement	Unlikely	Mixed Results	No Change	Possible Problems
FORCED TURN CHANNELIZATION	Possible Improvement	No	Yes	Small Increase	Possible Problems
MEDIAN BARRIERS	Possible Improvement	No	Possible	No Change	Possible Problems
RUMBLE STRIPS	Possible Improvement	Possible	No Effect	No Change	No Effect
SPEED HUMPS	Possible Improvement	Yes	Possible	Small Increase	Possible Problems
TRAFFIC CIRCLES	Improved	Yes	Possible	No Change	Possible Problems

ADAPTIVE SIGNAL SYSTEMS

In corridors where traffic volumes fluctuate significantly between different days (e.g., weekdays vs. weekends), different times of day, and various seasons, as they do in Sandy with its high percentage of recreational traffic, it is difficult to design time of day plans that adequately respond to each of these unique time periods. Time of day plans (in place currently) are typically designed for average conditions. Therefore, the users of the system will experience times when signal timing does not seem to be reflective of actual needs.

Adaptive signal systems differ from time-of-day plans in that they measure congestion levels on every travel lane of every approach and continuously (every signal cycle) adjust signal timing at each intersection in the corridor to minimize delay for all users while maintaining the progression of vehicles on the major route. Under this type of control, there is no need to create customized timing plans to match changing flows for different times of day, week, or year. Users often experience far more responsive signal timing during off-peak hours and at times when traffic flows are atypical. In addition, adaptive signal systems are able to respond to changes in travel patterns resulting from inclement weather, incidents, construction, and recreational and holiday travel.

The City currently has an adaptive signal system planned for US 26 between Bluff Road and OR 211 to improve traffic flow through the downtown area. Extending the adaptive traffic signal system on US 26 to the west (between Bluff Road and Orient Drive) may be beneficial to reduce congestion and safety issues along a corridor.

TRANSPORTATION DEMAND MANAGEMENT (TDM)

Transportation Demand Management (TDM) is the general term used to describe any action that removes single occupant vehicle trips from the roadway network. As growth in the Sandy area occurs, the number of vehicle trips and travel demand in the area will also increase. The ability to change a user's travel behavior and provide alternative mode choices will help accommodate this growth and reduce impacts to the road system.

The most effective TDM measures for the City of Sandy may include strategies related to increased parking management in the downtown (parking time limits and pricing), carpools, and improved services for alternative modes of travel (walking, bicycling, and transit).

FUTURE BICYCLE SYSTEM NEEDS

Connectivity gaps on arterials and collectors are the biggest bicycle system need (see Figure 3). Locations directly adjacent to schools and major activity centers have good bicycle facilities but there are gaps in the system that restrict access from local neighborhoods. Local streets within Sandy have posted speeds of 25 mph and average daily traffic volumes less than 3,000 and can therefore operate effectively as shared roadways.

Collectors and arterials with significant bicycle facility gaps include:

- 362nd Drive
- Dubarko Road
- Bluff Road
- Sandy Heights Street
- Tupper Road
- OR 211
- Bornstedt Road
- Meinig Road
- Langensand Road
- US 26
- Jacoby Road
- Vista Loop

Additionally, there is narrow parking along the south side of the US 26 couplet (Pioneer Blvd) through downtown Sandy. The narrow width results in all but the smallest vehicles partially blocking the bike lane when using the parking in this area. The condition forces people cyclists to shift into the vehicle travel lane or ride too close to parked vehicles that could open their door which result a significant safety issue along that route. Due to the existing lack of local street connections, the bike lanes along US 26 provide a critical connection in the bicycle network. Even in the future, with the expected extension of Dubarko Road to US 26 and the extension of Bell Street to 362nd Drive, US 26 will continue to provide access to major destinations within the city. Providing an effective bicycle facility is important.

The 2021 City of Sandy Parks and Trails Master Plan Update concluded that the city is below the desired level of service for trails identified in the Statewide Comprehensive Outdoor Recreation Plan. To achieve the desired level of service for trails the city currently needs 7.5 miles of additional trails and will need 11 more miles in the future (to serve the new population). Other needs identified in the plan include improved trail connections throughout the city and safe pedestrian crossings along OR 211 and US 26.

Lack of secure, convenient bicycle parking is a deterrent to bicycle travel. Bicyclists need parking options that provide security against theft, vandalism, and weather. Like automobile parking, bicycle parking is most effective when located close to trip destinations, is easy to access, and is easy to find.

Sandy could benefit from improved bicycle parking facilities including long-term bicycle parking and other end-of-trip facilities. The City should consider establishing long-term parking requirements for large employment centers such as business parks and government buildings. Long-term bicycle parking facilities typically include bicycle lockers, attended facilities, and/or other secure provisions, while other end-of-trip facilities include showers and changing areas.

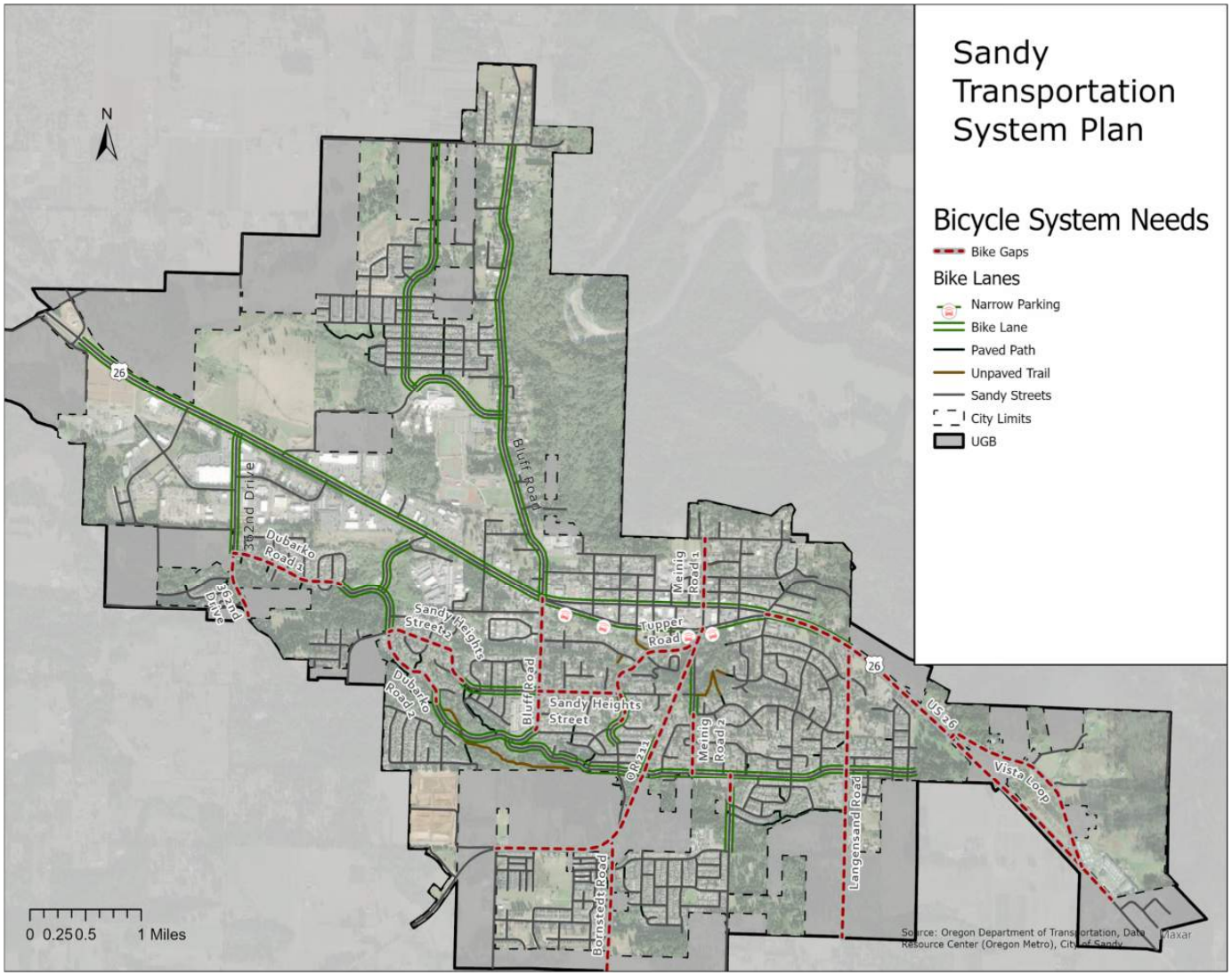


FIGURE 3: BICYCLE SYSTEM NEEDS

FUTURE PEDESTRIAN SYSTEM NEEDS

The following summarizes the critical needs for the pedestrian system in the City of Sandy. The needs are also shown in Figure 4.

CROSSWALKS

In general, the spacing between marked crosswalks is too long on collectors and arterials, creating a barrier for pedestrians that can result in attempts to cross at unprotected mid-block locations. Identified pedestrian crossing needs are summarized below.

- The Cedar Ridge Middle School and Sandy Grade School Safe Routes to School Plan identifies crossing improvement needs along Bluff Road and Pleasant Street in the vicinity of the two schools. Generally, these needs include increased visibility for people (including students) crossing the street and the need to slow traffic and increase awareness of drivers so that they expect to encounter pedestrians as they drive.
- The Sandy Transit Master Plan identifies crossing improvement needs in downtown Sandy to connect the Sandy Transit Center with points north and south of US 26. Also needed are improved crossings near the shopper shuttle route so that riders can safely access stops and allow the service to provide more direct connections to its destinations.
- Additional crossing needs are identified at major junctions in the pedestrian network and/or arterial crossings where pedestrians are likely to encounter higher traffic volumes. These locations include:
  - Bluff Road and Sandy Heights Street
  - Dubarko Road and OR 211
  - Dubarko Road and US 26 (when Dubarko Road connects to US 26)
  - OR 211 at Sandy Heights Street (pedestrian overcrossing)
- The Sandy Downtown Walkability Assessment identifies locations for specific crossing improvements.

SIDEWALKS

The pedestrian system has gaps on some higher volume corridors where mixed traffic results in a higher stress environment. There are also gaps near the schools and other activity generators resulting in higher stress connections to these locations that may dissuade people from walking. Most collectors and arterials in Sandy have at least partial sidewalk gaps which means there is a uniform need for filling sidewalk gaps throughout the city. The two most significant gaps from a connectivity perspective are OR 211 and Bluff Road north of US 26. With most of the growth in Sandy expected to occur off these two roads they provide, and will provide, the most direct routes from new development but cannot be effectively used by pedestrian today.

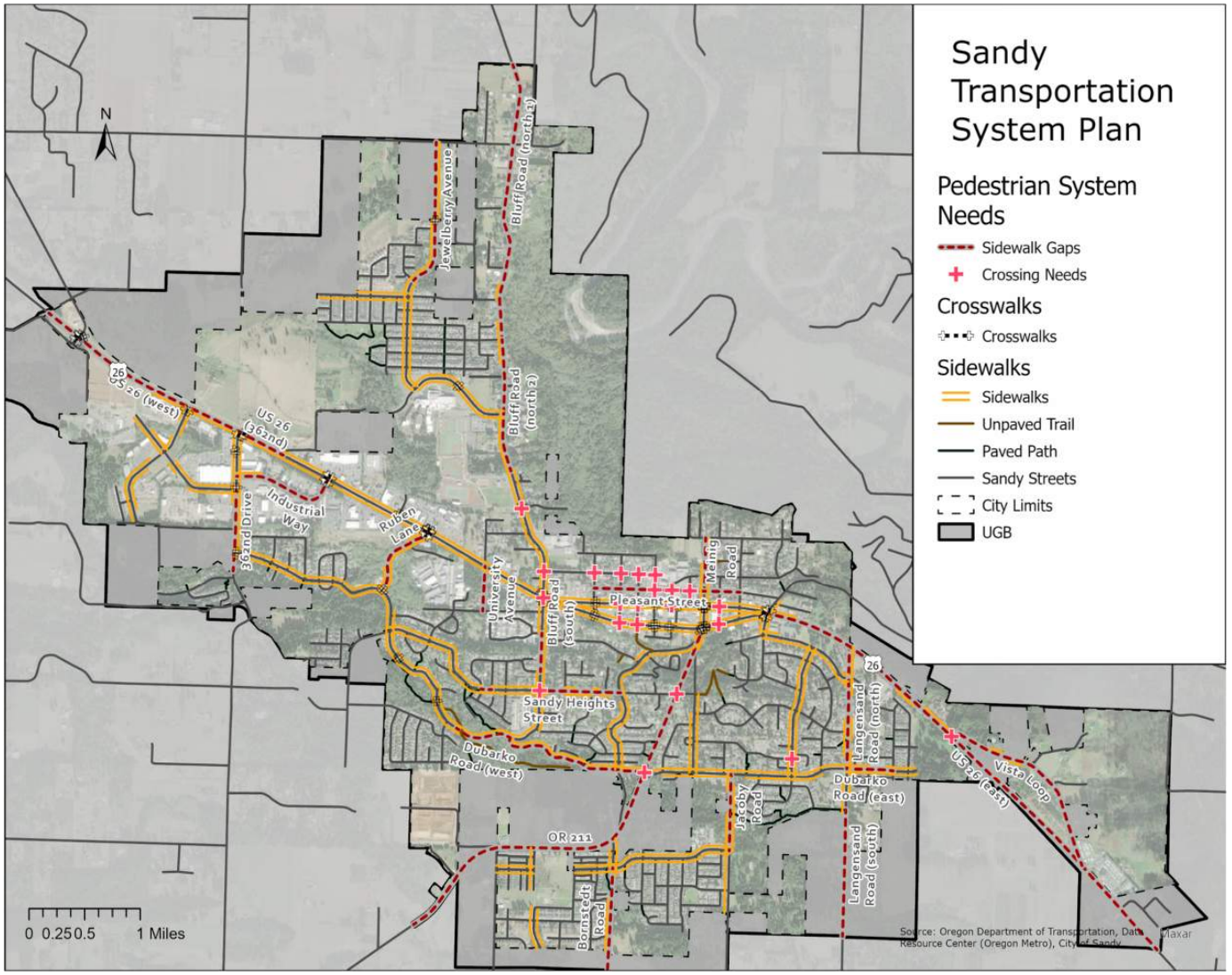


FIGURE 4: PEDESTRIAN SYSTEM NEEDS

OTHER PEDESTRIAN NEEDS

PEDESTRIAN REFUGE ISLANDS

Pedestrian refuge islands are raised concrete (typically) pads located in the center of a roadway separating opposing lanes of traffic. Their purpose is to provide shelter for pedestrians while crossing a single direction of traffic at a time. These crossing treatments are particularly suitable for wide streets with several lanes, such as US 26.

LEADING PEDESTRIAN INTERVAL

Including leading pedestrian intervals (LPIs) at signalized intersections with crossings provide pedestrians with a three to four-second head start into the intersection before parallel traffic is released by the green light. LPIs help ensure that pedestrians are well into the intersection and visible to drivers turning at the intersection prior to vehicles entering the crosswalk.

ACCESSIBLE PEDESTRIAN SIGNALS

Accessible pedestrian signals supplement pedestrian signal indications with audible and/or vibrotactile information. These treatments include directly-audible or transmitted tones, speech messages, talking signs, and/or vibrating surfaces. They are intended to make real-time pedestrian signal information accessible to visually-impaired pedestrians.

FUTURE TRANSIT SYSTEM NEEDS

The Sandy Transit Master Plan[6] includes an evaluation of existing transit service and provides a framework for service expansion. The Master Plan identified several needs for the transportation system:

- **Improved local service** - There is a severe need for transportation access between the Vista Apartments and the city. Many families who live there have only one car (if any), which is typically used by the working parent, and yet there is currently no sidewalk between Vista Loop and downtown, making walking or biking dangerous and nearly impossible.[7]
- **Manage flexible service capacity** – With free ADA qualifying rides the dial-a-ride system is expected to reach its capacity. Monitoring the capacity of the system is needed to ensure that ADA eligible riders are not denied service.
- **Expanded and enhanced regional service** – Growth in Clackamas County has increased demand for trips between Sandy and the urban areas of Clackamas County. A route linking Sandy and Clackamas would be in the interests of City of Sandy residents, workers and businesses, and would traverse many other jurisdictions.

[6] Transit Master Plan, April 2020

[7] An ODOT funded sidewalk infill project on the north side of US 26 from Ten Eyck Road to Vista Loop is expected to be completed in 2022.

- **Improved dispatch technology** - Currently, Sandy Transit uses an EZ Rider/Mobilitat software program to plan trips. However, if a dispatcher determines that a trip cannot be served or is not eligible, that trip is not loaded into the software at all. A consequence of this is that it is entered manually into a separate report. This makes capacity monitoring difficult and Sandy Transit cannot adequately track turn downs to determine the need for additional vehicle capacity to serve the general public or ADA paratransit customers.
- **Stop improvements** – Some moderate to high ridership stops lack adequate amenities for riders such as a shelter, bench, and/or lighting. The top two locations requiring improvements are at Gresham Transit Center and at 362nd Drive (westbound).
- **Pedestrian improvements** - The current Sandy Transit Center does not have adequate crosswalks north or south of Highway 26 causing pedestrians to cross a Highway on either side to access the Transit hub. At Evans Street Senior Apartments, traffic calming and other crossing improvements are needed. The Transit Center does not permit easy transfers between regional and local services (due to the one-way couplet on either side of it). The Gresham, Estacada and Mt. Hood Expresses connect there, but the local Shopper Shuttles cannot stop at or close to the Transit Center. This means that Sandy's fixed route services are not working as a network, providing for complete trips and the "last mile," is being provided by the more expensive dial-a-ride service.
- **Better street connectivity** - The lack of street connectivity requires that service is divided into more routes, with each route less frequent than it could be if fewer routes were necessary. The Dubarko Road extension and the Bell Street extension will significantly improve the street connectivity in Sandy.
- **On-Vehicle equipment and technology** – Automated passenger counters, upgrades to the real-time transit information, adoption of the latest Generalized Transit Feed Specification (GTFS) and other new onboard technology options such as efares would improve the experience of transit riders and increase the data available to SAM.

SAFETY NEEDS AND IMPROVEMENTS

There are four locations where the crash analysis demonstrates a need for safety related improvements. Other projects, such as bike lanes and sidewalk infill, also improve the safety for users of the transportation system by increasing the separation between vehicles and people.

- US 26 and 362nd Drive – This is a critical crash rate and SPIS location, most collisions at this intersection are rear end collisions caused by a failure to avoid a stopped vehicle and turning collisions caused by a driver not yielding.
- US 26 and Ruben Lane – This is a SPIS (Safety Priority Index System) location with three fatal crashes in the last five years. Most collisions at this intersection are turning collisions caused by a driver not yielding and rear end collisions caused by a failure to avoid a stopped vehicle or following too close.
- US 26 and Orient Drive – This is a SPIS location and the location of a serious pedestrian injury. Most collisions at this intersection are rear end collisions caused by a failure to avoid a stopped vehicle.
- OR 211 and Dubarko Road – This is a critical crash rate location. Most collisions at this location are turning collisions caused by a driver not yielding.

The three US 26 locations demonstrate crash causes that are attributable to high traffic volumes and urban traffic conditions. Implementing an adaptive traffic signal control plan along US 26 may

reduce the frequency of these collisions because those systems typically reduce congestion and delay along a corridor.

The turning collisions at OR 211 and Dubarko Road will likely be reduced with the installation of a traffic signal or roundabout at that intersection. That improvement has been assumed for the future no build condition.

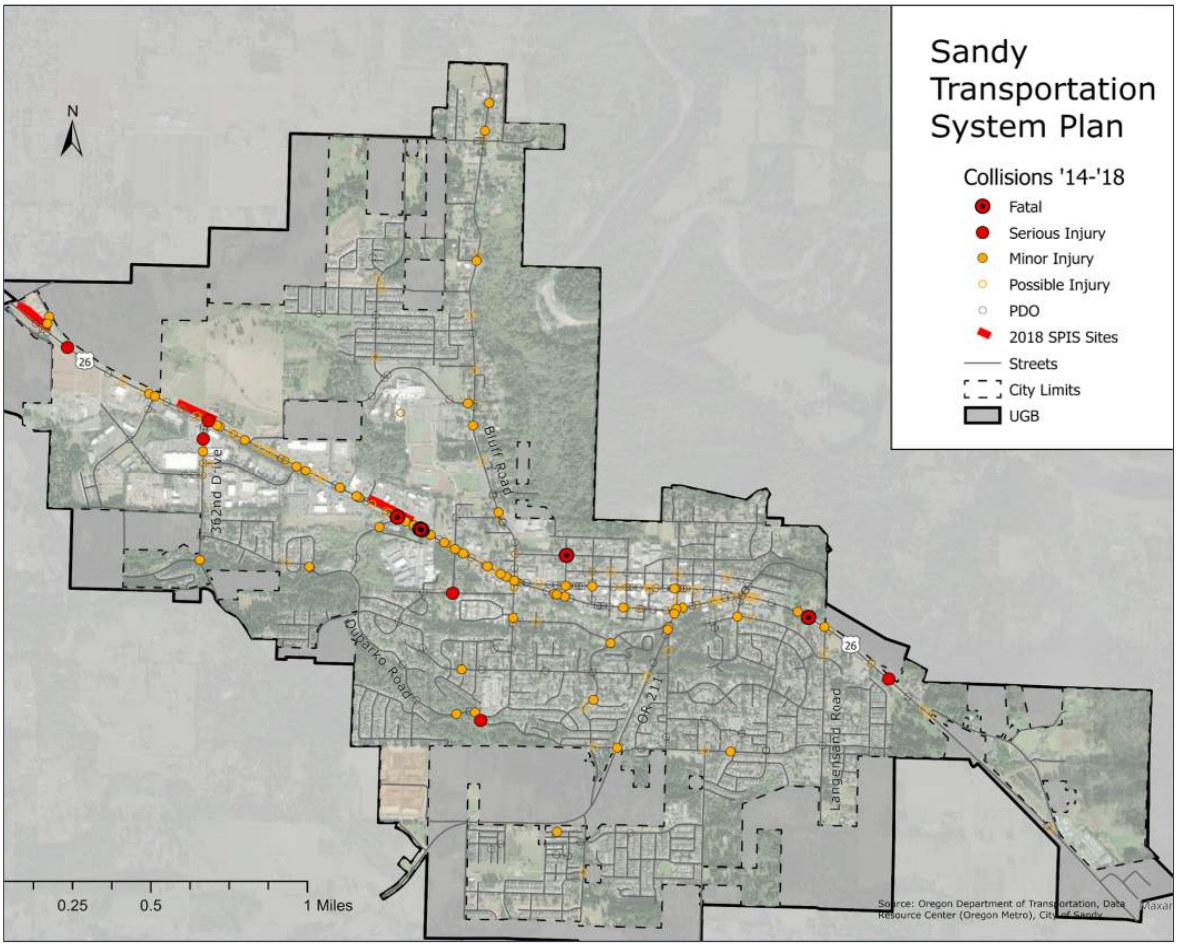


FIGURE 5: CITY OF SANDY SAFETY DATA SUMMARY

APPENDIX

CONTENTS

SECTION 1. FUTURE CONDITION HCM REPORTS

SECTION 1. FUTURE CONDITION HCM REPORTS

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26 06/28/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	2520	5	10	1750	225	10	50	10	260	10	20
Future Volume (veh/h)	60	2520	5	10	1750	225	10	50	10	260	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	63	2653	5	11	1842	0	11	53	11	274	11	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	81	1907	850	65	1847		14	69	14	288	12	22
Arrive On Green	0.05	0.57	0.57	0.04	0.56	0.00	0.07	0.06	0.07	0.19	0.19	0.19
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	227	1096	227	1501	60	115
Grp Volume(v), veh/h	63	2653	5	11	1842	0	75	0	0	306	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1551	0	0	1676	0	0
Q Serve(g_s), s	4.2	65.0	0.2	0.7	63.6	0.0	5.5	0.0	0.0	20.7	0.0	0.0
Cycle Q Clear(g_c), s	4.2	65.0	0.2	0.7	63.6	0.0	5.5	0.0	0.0	20.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.15		0.15	0.90		0.07
Lane Grp Cap(c), veh/h	81	1907	850	65	1847		98	0	0	321	0	0
V/C Ratio(X)	0.78	1.39	0.01	0.17	1.00		0.76	0.00	0.00	0.95	0.00	0.00
Avail Cap(c_a), veh/h	81	1907	850	80	1847		101	0	0	321	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	54.0	24.9	10.8	53.3	25.3	0.0	52.8	0.0	0.0	45.9	0.0	0.0
Incr Delay (d2), s/veh	35.6	179.5	0.0	0.7	20.2	0.0	24.9	0.0	0.0	37.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	69.1	0.1	0.3	26.1	0.0	2.8	0.0	0.0	12.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	89.7	204.4	10.8	54.1	45.5	0.0	77.7	0.0	0.0	83.5	0.0	0.0
LnGrp LOS	F	F	B	D	D		E	A	A	F	A	A
Approach Vol, veh/h		2721			1853	A		75			306	
Approach Delay, s/veh		201.3			45.6			77.7			83.5	
Approach LOS		F			D			E			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	68.0		26.0	8.5	69.0		11.3				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	5.0	61.0		21.0	5.0	61.0		7.0				
Max Q Clear Time (g_c+I1), s	6.2	65.6		22.7	2.7	67.0		7.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	133.9
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	1600	420	265	1525	340	335	150	325	150	175	170
Future Volume (veh/h)	300	1600	420	265	1525	340	335	150	325	150	175	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	316	1684	442	279	1605	358	353	158	342	158	184	179
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	198	1243	884	258	1397	820	761	402	343	236	248	210
Arrive On Green	0.08	0.37	0.36	0.16	0.56	0.54	0.23	0.23	0.23	0.14	0.14	0.14
Sat Flow, veh/h	1688	3367	1502	1661	3313	1502	3300	1772	1512	1688	1772	1502
Grp Volume(v), veh/h	316	1684	442	279	1605	358	353	158	342	158	184	179
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1502	1650	1772	1512	1688	1772	1502
Q Serve(g_s), s	11.0	48.0	22.3	15.8	54.8	15.9	12.0	9.8	29.4	11.6	13.0	15.1
Cycle Q Clear(g_c), s	11.0	48.0	22.3	15.8	54.8	15.9	12.0	9.8	29.4	11.6	13.0	15.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1243	884	258	1397	820	761	402	343	236	248	210
V/C Ratio(X)	1.59	1.35	0.50	1.08	1.15	0.44	0.46	0.39	1.00	0.67	0.74	0.85
Avail Cap(c_a), veh/h	198	1243	884	258	1397	820	761	402	343	376	395	335
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.20	0.20	0.20	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	41.0	15.6	52.8	28.5	13.2	43.1	42.7	50.2	53.1	53.7	54.6
Incr Delay (d2), s/veh	290.0	165.0	2.0	50.9	68.8	0.3	0.3	0.4	47.8	2.4	3.3	9.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.4	47.0	12.5	11.3	30.1	6.0	4.9	4.3	15.5	5.1	6.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	327.3	206.0	17.6	103.7	97.4	13.5	43.3	43.0	98.0	55.5	56.9	64.1
LnGrp LOS	F	F	B	F	F	B	D	D	F	E	E	E
Approach Vol, veh/h		2442			2242			853			521	
Approach Delay, s/veh		187.6			84.8			65.2			59.0	
Approach LOS		F			F			E			E	

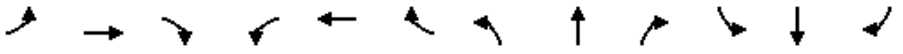
Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.8	52.0		22.2	15.0	58.8		34.0
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5
Max Green Setting (Gmax), s	7.8	* 46		29.0	11.0	42.0		29.5
Max Q Clear Time (g_c+I1), s	17.8	50.0		17.1	13.0	56.8		31.4
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	121.2
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

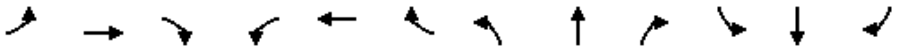
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1945	5	25	1795	50	170	35	250	230	15	170
Future Volume (vph)	65	1945	5	25	1795	50	170	35	250	230	15	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1620		1624	1638	1508
Flt Permitted	0.06	1.00		0.06	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	100	3316		101	3358	1471		1620		1624	1638	1508
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	66	1985	5	26	1832	51	173	36	255	235	15	173
RTOR Reduction (vph)	0	0	0	0	0	23	0	33	0	0	0	112
Lane Group Flow (vph)	66	1990	0	26	1832	28	0	431	0	125	125	61
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						4
Actuated Green, G (s)	74.3	70.3		71.1	68.7	68.7		22.6		17.3	17.3	17.3
Effective Green, g (s)	75.3	71.7		71.1	70.1	70.1		22.6		17.3	17.3	17.3
Actuated g/C Ratio	0.58	0.55		0.55	0.54	0.54		0.17		0.13	0.13	0.13
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	112	1828		83	1810	793		281		216	217	200
v/s Ratio Prot	c0.02	c0.60		0.01	0.55			c0.27		c0.08	0.08	
v/s Ratio Perm	0.32			0.16		0.02						0.04
v/c Ratio	0.59	1.09		0.31	1.01	0.03		1.53		0.58	0.58	0.31
Uniform Delay, d1	56.5	29.1		59.7	30.0	14.1		53.7		52.9	52.9	50.9
Progression Factor	0.43	0.45		0.79	0.67	2.57		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.8	45.0		0.8	19.5	0.0		257.3		2.8	2.7	0.5
Delay (s)	27.4	58.1		47.8	39.4	36.2		311.0		55.7	55.6	51.4
Level of Service	C	E		D	D	D		F		E	E	D
Approach Delay (s)		57.1			39.5			311.0			53.9	
Approach LOS		E			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	74.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	2045	195	45	1650	100	120	35	40	270	35	135
Future Volume (vph)	175	2045	195	45	1650	100	120	35	40	270	35	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1467	1644	3358	1432		1682	1461	1624	1646	1506
Flt Permitted	0.07	1.00	1.00	0.06	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	132	3318	1467	96	3358	1432		1682	1461	1624	1646	1506
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	177	2066	197	45	1667	101	121	35	40	273	35	136
RTOR Reduction (vph)	0	0	40	0	0	36	0	0	34	0	0	126
Lane Group Flow (vph)	177	2066	157	45	1667	65	0	156	6	153	155	10
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2		2	6		6		8	8			4
Actuated Green, G (s)	81.5	80.1	80.1	75.5	75.5	75.5		19.3	19.3	10.0	10.0	10.0
Effective Green, g (s)	81.5	81.5	81.5	75.5	76.9	76.9		19.3	19.3	10.0	10.0	10.0
Actuated g/C Ratio	0.63	0.63	0.63	0.58	0.59	0.59		0.15	0.15	0.08	0.08	0.08
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	175	2080	919	93	1986	847		249	216	124	126	115
v/s Ratio Prot	0.06	c0.62		0.01	c0.50			c0.09		c0.09	0.09	
v/s Ratio Perm	c0.57		0.11	0.27		0.05			0.00			0.01
v/c Ratio	1.01	0.99	0.17	0.48	0.84	0.08		0.63	0.03	1.23	1.23	0.09
Uniform Delay, d1	42.5	24.0	10.1	30.2	21.5	11.4		52.0	47.3	60.0	60.0	55.8
Progression Factor	0.66	0.41	0.29	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.3	4.6	0.0	2.3	4.5	0.2		3.9	0.0	156.7	154.7	0.2
Delay (s)	51.1	14.5	2.9	32.5	26.0	11.5		55.9	47.4	216.7	214.7	56.0
Level of Service	D	B	A	C	C	B		E	D	F	F	E
Approach Delay (s)		16.2			25.4			54.2			166.8	
Approach LOS		B			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	1910	155	95	1430	245	145	55	120	155	45	255
Future Volume (veh/h)	285	1910	155	95	1430	245	145	55	120	155	45	255
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	291	1949	158	97	1459	250	148	56	122	158	46	260
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	247	1681	748	75	1150	572	139	78	170	250	53	299
Arrive On Green	0.15	0.50	0.50	0.05	0.39	0.39	0.08	0.16	0.16	0.15	0.23	0.23
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	493	1075	1701	232	1313
Grp Volume(v), veh/h	291	1949	158	97	1459	250	148	0	178	158	0	306
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1569	1701	0	1546
Q Serve(g_s), s	16.1	54.9	6.5	5.0	43.0	13.8	9.0	0.0	11.8	9.6	0.0	20.9
Cycle Q Clear(g_c), s	16.1	54.9	6.5	5.0	43.0	13.8	9.0	0.0	11.8	9.6	0.0	20.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.69	1.00		0.85
Lane Grp Cap(c), veh/h	247	1681	748	75	1150	572	139	0	248	250	0	352
V/C Ratio(X)	1.18	1.16	0.21	1.30	1.27	0.44	1.06	0.00	0.72	0.63	0.00	0.87
Avail Cap(c_a), veh/h	247	1681	748	75	1150	572	139	0	428	250	0	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.13	0.13	0.13	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.9	27.5	15.4	52.5	33.5	24.6	50.5	0.0	43.8	44.1	0.0	40.7
Incr Delay (d2), s/veh	85.1	72.7	0.1	202.2	128.1	2.4	94.2	0.0	2.4	4.4	0.0	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	37.1	2.2	6.3	35.5	5.2	7.5	0.0	4.8	4.4	0.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	132.0	100.2	15.5	254.7	161.6	27.0	144.7	0.0	46.2	48.5	0.0	54.9
LnGrp LOS	F	F	B	F	F	C	F	A	D	D	A	D
Approach Vol, veh/h		2398			1806			326			464	
Approach Delay, s/veh		98.5			148.0			90.9			52.7	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	58.9	13.0	29.1	20.9	47.0	20.7	21.4
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.5	* 4.5
Max Green Setting (Gmax), s	5.0	49.2	9.0	29.5	12.0	* 43	9.0	* 30
Max Q Clear Time (g_c+I1), s	7.0	56.9	11.0	22.9	18.1	45.0	11.6	13.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	111.7
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	55	100	465	405	5
Future Vol, veh/h	5	55	100	465	405	5
Conflicting Peds, #/hr	1	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	180	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	1	1	3	3
Mvmt Flow	5	58	105	489	426	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1131	432	433	0	-	0
Stage 1	431	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.11	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.209	-	-	-
Pot Cap-1 Maneuver	223	619	1132	-	-	-
Stage 1	651	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	617	1130	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	589	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1130	-	201	617	-	-
HCM Lane V/C Ratio	0.093	-	0.026	0.094	-	-
HCM Control Delay (s)	8.5	0	23.4	11.4	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.3	-	-

Intersection	
Int Delay, s/veh	10.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	80	575	210	190	530
Future Vol, veh/h	55	80	575	210	190	530
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	1	1	3	3
Mvmt Flow	58	84	605	221	200	558

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1674	718	0	0	826	0
Stage 1	716	-	-	-	-	-
Stage 2	958	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.13	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.227	-
Pot Cap-1 Maneuver	104	426	-	-	800	-
Stage 1	481	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	78	425	-	-	800	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	277	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	116.9	0	2.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	151	800	-
HCM Lane V/C Ratio	-	-	0.941	0.25	-
HCM Control Delay (s)	-	-	116.9	11	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	6.8	1	-

Intersection	
Intersection Delay, s/veh	133.5
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	180	230	125	605	555	30
Future Vol, veh/h	180	230	125	605	555	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	189	242	132	637	584	32
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	35.2	214.3	101.6
HCM LOS	E	F	F

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	17%	44%	0%
Vol Thru, %	83%	0%	95%
Vol Right, %	0%	56%	5%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	730	410	585
LT Vol	125	180	0
Through Vol	605	0	555
RT Vol	0	230	30
Lane Flow Rate	768	432	616
Geometry Grp	1	1	1
Degree of Util (X)	1.407	0.809	1.116
Departure Headway (Hd)	6.863	7.495	7.139
Convergence, Y/N	Yes	Yes	Yes
Cap	538	488	511
Service Time	4.863	5.495	5.139
HCM Lane V/C Ratio	1.428	0.885	1.205
HCM Control Delay	214.3	35.2	101.6
HCM Lane LOS	F	E	F
HCM 95th-tile Q	34.7	7.6	18.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	175	1375	15	270	45	0	0	65	40
Future Volume (veh/h)	0	0	0	175	1375	15	270	45	0	0	65	40
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				184	1447	16	284	47	0	0	68	42
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				205	1702	20	422	60	0	0	362	224
Arrive On Green				0.56	0.56	0.56	0.35	0.35	0.00	0.00	0.35	0.35
Sat Flow, veh/h				366	3034	35	1018	169	0	0	1022	631
Grp Volume(v), veh/h				861	0	786	331	0	0	0	0	110
Grp Sat Flow(s),veh/h/ln				1712	0	1723	1187	0	0	0	0	1653
Q Serve(g_s), s				48.9	0.0	40.5	24.4	0.0	0.0	0.0	0.0	5.1
Cycle Q Clear(g_c), s				48.9	0.0	40.5	29.4	0.0	0.0	0.0	0.0	5.1
Prop In Lane				0.21		0.02	0.86		0.00	0.00		0.38
Lane Grp Cap(c), veh/h				960	0	967	482	0	0	0	0	586
V/C Ratio(X)				0.90	0.00	0.81	0.69	0.00	0.00	0.00	0.00	0.19
Avail Cap(c_a), veh/h				980	0	987	482	0	0	0	0	586
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.79	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.3	0.0	19.5	34.7	0.0	0.0	0.0	0.0	24.5
Incr Delay (d2), s/veh				12.8	0.0	7.5	6.2	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				22.0	0.0	17.5	8.9	0.0	0.0	0.0	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				34.1	0.0	26.9	40.9	0.0	0.0	0.0	0.0	24.7
LnGrp LOS				C	A	C	D	A	A	A	A	C
Approach Vol, veh/h					1647			331			110	
Approach Delay, s/veh					30.7			40.9			24.7	
Approach LOS					C			D			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	43.0	65.7	43.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	39.0	63.0	39.0
Max Q Clear Time (g_c+I1), s	7.1	50.9	31.4
Green Ext Time (p_c), s	0.3	10.8	0.9

Intersection Summary	
HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
14: Hwy 211 & Pioneer Blvd

06/28/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	1535	555	0	0	0	0	240	245	40	210	0
Future Volume (veh/h)	75	1535	555	0	0	0	0	240	245	40	210	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	79	1616	0				0	253	258	42	221	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	97	2082					0	403	334	52	498	0
Arrive On Green	0.63	0.63	0.00				0.00	0.23	0.23	0.01	0.10	0.00
Sat Flow, veh/h	153	3294	1502				0	1772	1470	1647	1730	0
Grp Volume(v), veh/h	908	787	0				0	253	258	42	221	0
Grp Sat Flow(s),veh/h/ln	1764	1683	1502				0	1772	1470	1647	1730	0
Q Serve(g_s), s	42.9	35.5	0.0				0.0	14.2	18.1	2.8	13.3	0.0
Cycle Q Clear(g_c), s	42.9	35.5	0.0				0.0	14.2	18.1	2.8	13.3	0.0
Prop In Lane	0.09		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1115	1064					0	403	334	52	498	0
V/C Ratio(X)	0.81	0.74					0.00	0.63	0.77	0.81	0.44	0.00
Avail Cap(c_a), veh/h	1115	1064					0	403	334	75	535	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.97	0.97	0.99	0.99	0.00
Uniform Delay (d), s/veh	15.3	14.0	0.0				0.0	38.3	39.8	54.1	41.5	0.0
Incr Delay (d2), s/veh	6.6	4.6	0.0				0.0	7.0	15.4	26.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.1	14.0	0.0				0.0	6.8	7.8	1.6	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	18.6	0.0				0.0	45.3	55.2	80.4	41.8	0.0
LnGrp LOS	C	B					A	D	E	F	D	A
Approach Vol, veh/h		1695	A					511			263	
Approach Delay, s/veh		20.4						50.3			48.0	
Approach LOS		C						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	73.5	36.5	7.5	29.0
Change Period (Y+Rc), s	4.0	* 4.8	4.0	4.8
Max Green Setting (Gmax), s	68.0	* 34	5.0	24.2
Max Q Clear Time (g_c+I1), s	44.9	15.3	4.8	20.1
Green Ext Time (p_c), s	19.7	0.5	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	1450	125	10	1180	25	100	25	10	175	20	120
Future Volume (veh/h)	170	1450	125	10	1180	25	100	25	10	175	20	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	179	1526	132	11	1242	26	105	26	11	184	21	126
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	343	2075	925	24	1398	623	272	64	23	258	24	142
Arrive On Green	0.20	0.62	0.62	0.01	0.43	0.43	0.25	0.26	0.24	0.25	0.26	0.24
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	842	250	92	812	96	558
Grp Volume(v), veh/h	179	1526	132	11	1242	26	142	0	0	331	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1185	0	0	1465	0	0
Q Serve(g_s), s	10.4	35.0	4.1	0.7	39.0	1.1	0.0	0.0	0.0	12.7	0.0	0.0
Cycle Q Clear(g_c), s	10.4	35.0	4.1	0.7	39.0	1.1	11.3	0.0	0.0	24.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.74		0.08	0.56		0.38
Lane Grp Cap(c), veh/h	343	2075	925	24	1398	623	354	0	0	418	0	0
V/C Ratio(X)	0.52	0.74	0.14	0.45	0.89	0.04	0.40	0.00	0.00	0.79	0.00	0.00
Avail Cap(c_a), veh/h	343	2075	925	66	1446	645	413	0	0	481	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.0	14.8	8.9	53.7	28.8	18.1	34.8	0.0	0.0	39.8	0.0	0.0
Incr Delay (d2), s/veh	1.0	2.4	0.3	7.9	8.8	0.1	0.5	0.0	0.0	7.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	13.4	1.4	0.3	15.8	0.4	3.3	0.0	0.0	9.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	17.2	9.2	61.7	37.5	18.2	35.3	0.0	0.0	47.1	0.0	0.0
LnGrp LOS	D	B	A	E	D	B	D	A	A	D	A	A
Approach Vol, veh/h		1837			1279			142			331	
Approach Delay, s/veh		18.8			37.4			35.3			47.1	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	72.3		32.1	26.4	51.5		32.1
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.0	* 61		31.3	15.5	49.2		31.3
Max Q Clear Time (g_c+I1), s	12.7	37.0		26.0	12.4	41.0		13.3
Green Ext Time (p_c), s	0.0	19.6		0.5	0.1	6.6		0.4

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1535	90	30	1230	25	70
Future Vol, veh/h	1535	90	30	1230	25	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1616	95	32	1295	26	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1711	0	2328	808
Stage 1	-	-	-	-	1616	-
Stage 2	-	-	-	-	712	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	350	-	32	328
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	453	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	350	-	29	328
Mov Cap-2 Maneuver	-	-	-	-	29	-
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	412	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	102.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	29	328	-	-	350	-
HCM Lane V/C Ratio	0.907	0.225	-	-	0.09	-
HCM Control Delay (s)	$ 334.4	19.1	-	-	16.3	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	3	0.8	-	-	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	1435	0	100	1140	0	5	5	100	5	0	120
Future Volume (veh/h)	170	1435	0	100	1140	0	5	5	100	5	0	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1723	1723	1716	1716	1723	1723	1723	1800	1723	1800
Adj Flow Rate, veh/h	179	1511	0	105	1200	0	5	5	105	5	0	126
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	2	6	6	2	2	2	0	2	0
Cap, veh/h	547	2609	1141	436	2509	0	74	0	3	74	0	3
Arrive On Green	0.07	0.78	0.00	0.06	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1674	3340	1460	1641	3346	0	75	75	1569	66	0	1654
Grp Volume(v), veh/h	179	1511	0	105	1200	0	115	0	0	131	0	0
Grp Sat Flow(s),veh/h/ln	1674	1670	1460	1641	1630	0	1719	0	0	1719	0	0
Q Serve(g_s), s	1.2	9.2	0.0	0.7	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.2	9.2	0.0	0.7	6.8	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.04		0.91	0.04		0.96
Lane Grp Cap(c), veh/h	547	2609	1141	436	2509	0	77	0	0	77	0	0
V/C Ratio(X)	0.33	0.58	0.00	0.24	0.48	0.00	1.48	0.00	0.00	1.70	0.00	0.00
Avail Cap(c_a), veh/h	888	4942	2160	660	4566	0	855	0	0	851	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.8	2.2	0.0	2.2	2.1	0.0	25.4	0.0	0.0	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.0	0.2	0.3	0.0	228.6	0.0	0.0	323.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.0	0.0	0.1	0.0	5.8	0.0	0.0	7.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.1	2.7	0.0	2.4	2.4	0.0	254.0	0.0	0.0	348.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	F	A	A	F	A	A
Approach Vol, veh/h		1690			1305			115			131	
Approach Delay, s/veh		2.6			2.4			254.0			348.6	
Approach LOS		A			A			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	43.0		0.0	7.1	43.6		0.0				
Change Period (Y+Rc), s	4.0	6.0		4.0	4.0	6.0		4.0				
Max Green Setting (Gmax), s	14.0	69.0		23.0	10.0	73.0		23.0				
Max Q Clear Time (g_c+I1), s	3.2	8.8		0.0	2.7	11.2		0.0				
Green Ext Time (p_c), s	0.3	17.7		0.0	0.1	26.4		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1535	1235	25	10	0
Future Vol, veh/h	5	1535	1235	25	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1616	1300	26	11	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1326	0	-	0	2131	663
Stage 1	-	-	-	-	1313	-
Stage 2	-	-	-	-	818	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	517	-	-	-	42	404
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	394	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	517	-	-	-	42	404
Mov Cap-2 Maneuver	-	-	-	-	42	-
Stage 1	-	-	-	-	214	-
Stage 2	-	-	-	-	394	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	117.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	517	-	-	-	42
HCM Lane V/C Ratio	0.01	-	-	-	0.251
HCM Control Delay (s)	12	-	-	-	117.3
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	0.8

HCM 6th Signalized Intersection Summary
20: Hwy 211 & Dubarko Rd

06/28/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	190	90	160	70	30	110	230	130	50	535	40
Future Volume (veh/h)	30	190	90	160	70	30	110	230	130	50	535	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1800	1800	1772	1772	1772	1772	1772	1772	1758	1758	1758
Adj Flow Rate, veh/h	32	200	95	168	74	32	116	242	137	53	563	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2	2	2	2	3	3	3
Cap, veh/h	429	238	113	317	327	141	294	748	631	494	704	594
Arrive On Green	0.03	0.21	0.21	0.10	0.28	0.28	0.06	0.42	0.42	0.04	0.40	0.40
Sat Flow, veh/h	1714	1152	547	1688	1173	507	1688	1772	1495	1674	1758	1482
Grp Volume(v), veh/h	32	0	295	168	0	106	116	242	137	53	563	42
Grp Sat Flow(s),veh/h/ln	1714	0	1700	1688	0	1680	1688	1772	1495	1674	1758	1482
Q Serve(g_s), s	1.0	0.0	11.3	5.0	0.0	3.3	2.8	6.2	4.0	1.3	19.2	1.2
Cycle Q Clear(g_c), s	1.0	0.0	11.3	5.0	0.0	3.3	2.8	6.2	4.0	1.3	19.2	1.2
Prop In Lane	1.00		0.32	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	429	0	351	317	0	468	294	748	631	494	704	594
V/C Ratio(X)	0.07	0.00	0.84	0.53	0.00	0.23	0.39	0.32	0.22	0.11	0.80	0.07
Avail Cap(c_a), veh/h	484	0	524	348	0	617	294	1067	900	530	1058	893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	0.0	25.9	18.3	0.0	18.9	14.3	13.2	12.5	11.8	18.0	12.6
Incr Delay (d2), s/veh	0.1	0.0	6.6	1.0	0.0	0.2	0.6	0.5	0.4	0.1	4.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.0	1.9	0.0	1.2	0.9	2.2	1.3	0.4	7.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	0.0	32.5	19.3	0.0	19.1	14.9	13.7	12.9	11.8	22.8	12.7
LnGrp LOS	C	A	C	B	A	B	B	B	B	B	C	B
Approach Vol, veh/h		327			274			495			658	
Approach Delay, s/veh		31.4			19.2			13.8			21.3	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	32.8	10.8	18.1	8.0	31.3	5.8	23.0
Change Period (Y+Rc), s	4.0	4.8	4.0	4.0	4.0	4.8	4.0	4.0
Max Green Setting (Gmax), s	4.0	40.2	8.0	21.0	4.0	40.2	4.0	25.0
Max Q Clear Time (g_c+I1), s	3.3	8.2	7.0	13.3	4.8	21.2	3.0	5.3
Green Ext Time (p_c), s	0.0	3.5	0.0	0.6	0.0	5.3	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	31

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	400	120	230	570	105	80
Future Vol, veh/h	400	120	230	570	105	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	1	1	1	1
Mvmt Flow	421	126	242	600	111	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	547	0	1568	484
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	1084	-
Critical Hdwy	-	-	4.11	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.209	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1027	-	123	585
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	326	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1027	-	~ 94	585
Mov Cap-2 Maneuver	-	-	-	-	~ 94	-
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	249	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	239.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	148	-	-	1027	-
HCM Lane V/C Ratio	1.316	-	-	0.236	-
HCM Control Delay (s)	239.8	-	-	9.6	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	12	-	-	0.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

appendix

memo

to	Kelly O'Neill, Development Services Director, City of Sandy
from	Darci Rudzinski and Brandon Crawford, MIG | APG
re	City of Sandy TSP Regulatory Solutions
	Technical Memorandum #6 Phase II
date	4/5/23

Introduction

The City of Sandy is updating transportation-related development code requirements as part of the Transportation System Plan Update (TSP) project. As part of this work, City staff worked with the consultant team to identify where adopted ordinances needed to be updated for consistency with the Draft TSP recommendations and to better meet State transportation requirements (specifically the Transportation Planning Rule, or "TPR," OAR 660, Division 12).[1]

Table 1 summarizes the recommended changes to Sandy Development Code ordinances. Proposed ordinance amendments update transportation facility standards, enhance multi-modal connectivity requirements, and add notification requirements.

The City is preparing to adopt the draft TSP in mid-2023 and is revisiting implementing Code amendments.[2] In addition to the TSP update and associated Code amendments, the City has been working on the Sandy Clear and Objective Code Audit (Code Audit) project, which also entails updates to the Sandy Development Code (SDC). The focus of the Code Audit project is to provide clear and objective requirements for housing development. The TSP project team has been coordinating with the project team for the Code Audit project to ensure that there are no conflicting recommendations. Several SDC sections that have transportation-related recommendations also include clear and objective updates. This memorandum reflects proposed Code language related to the Code Audit project to the extent that there are also TSP code update recommendations in the same section. The intent of including the proposed clear and objective Code Audit project updates with this draft TSP is to ensure consistency between the concurrent projects and to avoid confusion for staff, Planning Commission, and City Council review. Reviewers of this memorandum are asked to consider the merits of transportation-related changes; housing-related changes will be considered at a later date as part of the Sandy Clear and Objective Code Audit project.

[1] An audit of the Sandy Development Code (SDC) for consistency with the TPR was conducted in 2021.
[2] Note that the City has adopted an update to the SDC in May 2022; some of the items identified in the earlier audit and 2021 recommendations were addressed in that update.

The City intends on adopting the clear and objective modifications and the updated transportation-related Code sections as one package and through the same hearings and adoption process. Therefore, the TSP Code update recommendations will be adopted *after* the TSP is adopted in mid-2023. The complete Code update adoption is tentatively scheduled for late summer or early fall of 2023.

Table 1. Summary of Proposed Transportation-Related Code Amendments

Reference Number	Code Reference	Proposed Amendment	Implements
Sections 17.32 – 17.56 – Zoning Districts			
1.	Section 17.22.10 and 17.22.20	Add language to the Development Code procedures sections specifying the need to provide notice to public agencies providing transportation facilities and services, including ODOT and Sandy Area Metro (SAM), regarding proposals that are adjacent to transportation facilities or services.	Implements OAR 660-012-0045(2)(f)
Section 17.84 - Improvements Required with Development			
2.	Section 17.84.30 (B4)	Amend language to require pedestrian connections within new office parks and commercial developments. Currently the connections are "encouraged." Also see Recommendation 9 for definitions of accessways, shared-use paths, pathways, walkways, and sidewalks.	Implements OAR 660-012-0045(3)(e)
3.	Section 17.84.30 and 17.84.40	Add development requirements related to transit improvements and pedestrian connections to transit, where consistent with the updated TSP Transit Plan and/or the adopted Sandy Transit Master Plan.	Implements OAR 660-012-0045(4)(b) and (f)
4.	Section 17.84.50	Add language that clarifies the City's authority to apply conditions of approval related to needed transportation improvements.	Implements OAR 660-012-0045(2)(e)
5.	Section 17.84.50	Add language addressing nexus and rough proportionality for improvements required as a condition of development approval based on TIS findings, including off-site improvements concurrent with development.	Implements OAR 660-012-0045(3)(c)

Reference Number	Code Reference	Proposed Amendment	Implements
6.	Section 17.84.50	Add provisions that establish Traffic Letter criteria and requirements.	Implements OAR 660-012-0045(2)(e)
Section 17.98 – Parking, Loading, and Access Requirements			
7.	Section 17.98.20	Add language requiring bicycle parking facilities for transit transfer stations and park-and-ride lots.	Implements OAR 660-012-0045(3)(a)
8.	Section 17.98.80	The access spacing standards should be expanded to include access spacing tables from the TSP and give the City authority to require closing or consolidation of accesses.	Implements OAR 660-012-0045(2)(a)
Section 17.100 - Land Division			
9.	Section 17.100.110 and Section 17.10.30	Update definition of Streets in the definitions section to ensure consistency throughout the code. Move standards in definitions to Section 17.100.110 of the Development Code. Modify standards to ensure connectivity is maintained for cul-de-sacs and long blocks.	Implements OAR 660-012-0045(2)(a), OAR 660-012-0045 (6)
10.	Section 17.100.100	Update the Development Code to include specific acceptable alternatives to a street connection. Block length standards should be checked for consistency with TSP access standards.	Implements OAR 660-012-0045(3)(b)

Code amendments

The proposed code amendment language is presented in the order shown in Table 1. Recommended changes are in an adoption-ready format; text that is proposed to be added is shown as underlined, and text proposed to be removed is shown in ~~strikeout~~.

Recommendation 1

Recommendation: Add language to the Development Code procedures sections specifying the need to provide notice to public agencies providing transportation facilities and services, including ODOT and Sandy Area Metro (SAM), regarding proposals that are adjacent to, or that will have an impact on, transportation facilities or services.

Sec. 17.22.10. Type II quasi-judicial notice.

[Where a quasi-judicial hearing is required by this Code notice shall be mailed to the following:]

- *A. The applicant or authorized agent;*
- *B. Any person who owns property within 300 feet, of the development site;*
- *C. ODOT, when the site is located within 200 feet of an ODOT facility, including right-of-way, and maintenance yards;*
- *D. Sandy Area Metro (SAM), when the site is located within 200 feet of a SAM facility.*
- *E~~C~~. Any other person, agency, or organization that may be designated by the Code;*
- *F~~D~~. Interested parties, such as counties, state agencies, or public utility or service providers that may be affected by the specific development proposal shall receive notice of the scheduled public hearing;*
- *G~~E~~. Additional notices may also be mailed to other property owners or posted as determined appropriate by the Director and based on the impact of the proposed development.*

Sec. 17.22.20. Type III and Type IV quasi-judicial notice.

Where a quasi-judicial hearing is required by this Code notice shall be mailed to the following:

- *A. The applicant or authorized agent;*
- *B. Any person who owns property within 500 feet of the development site, except an application for annexation requires notice to the owner(s) of property that is within 1,000 feet of the subject property;*
- *C. ODOT, when the site is located within 200 feet of an ODOT facility, including right-of-way, and maintenance yards;*
- *D. Sandy Area Metro (SAM), when the site is located within 200 feet of a SAM facility.*
- *E~~C~~. Tenants of any existing manufactured-dwelling park for which a zoning district change is proposed;*
- *F~~D~~. Any other person, agency, or organization that has filed with the Director a request to receive notices of hearings and has paid a reasonable fee to cover the cost of providing notice;*
- *G~~E~~. Any other person, agency, or organization that may be designated by the Code;*
- *H~~F~~. Any other person, agency, or organization that may be designated by the City Council or its agencies;*

I~~G~~. Any other resident owner of property whom the Director determines is affected by the application;
J~~H~~. Any neighborhood or community organization recognized by the governing body and whose boundaries include the site;
K~~I~~. Interested parties, such as counties, state agencies, or public utility or service providers that may be affected by the specific development proposal shall receive notice of the scheduled public hearing;
L~~J~~. Additional notices may also be mailed to other property owners or posted as determined appropriate by the Director and based on the impact of the proposed development.

Recommendation 2

Recommendation: Amend language to require pedestrian connections within new office parks and commercial developments. Also see Recommendation 9 for definitions of accessways, pathways, and sidewalks.

Sec. 17.84.30. - Pedestrian and bicyclist requirements.

A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:
1. Sidewalks shall be a minimum of ~~five~~ six feet wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, and that meets the dimensional standards of Subsection 17.92.10.D and of the 2023 City of Sandy Transportation System Plan Typical Street Cross Section Standards (TSP Figures 18-24 and TSP Table 4), unless modified in accordance with Subsection 3., below.
2. Sidewalks along arterial and collector streets shall be separated from curbs with a planting area ~~except as necessary~~ ~~continue an existing curb-tight sidewalk~~ unless modified in accordance with Subsection 3, below. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of six feet wide.
3. Sidewalk improvements shall be made according to City standards. However, if the improvements are made as part of a discretionary review, the City standards may be modified if ~~,unless~~ the Director ~~City~~ determines that the public benefit in the particular case does not warrant imposing a severe adverse impact to a natural or other significant feature such as requiring removal of a ~~mature~~ tree with a trunk 11 inches DBH or greater, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.
a. ~~Narrow~~ Reduce width of landscape strips to no less than four feet in width measured from the interior edge of the curb to the sidewalk.
b. ~~Narrow~~ Reduce width of sidewalk or portion of sidewalk to no less than four feet in width.
c. Eliminate landscape strips.

d. ~~Narrow~~ Reduce width of on-street improvements by eliminating on-street parking.
e. Eliminate sidewalks.

[…]

5. Sidewalks shall be designed in conformance with Title 12 of the Sandy Municipal Code and with the City of Sandy Sidewalks Utility Standard Details.

B. Safe and convenient pedestrian and bicyclist facilities that ~~strive to~~ minimize travel distance to the extent practicable shall be provided ~~in conjunction with new development within and between new subdivisions, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks,~~ as follows:

1. New non-residential development shall provide safe and convenient bicycle and pedestrian facilities connecting to adjacent commercial developments, industrial areas, residential areas, public transit stops, and neighborhood activity centers such as schools and parks, as follows:

~~1.~~ a. For the purposes of this section, "safe and convenient" means pedestrian and bicyclist facilities that: are ~~reasonably~~ free from hazards ~~which~~ that would interfere with or discourage travel for short trips; provide a direct route of travel between destinations; and meet the travel needs of pedestrians and bicyclists considering destination and length of trip, and considering that the optimum trip length of pedestrians is 1/4 to 1/2 mile.

~~2.~~ b. To meet the intent of B., above, pedestrian rights-of-way connecting cul-de-sacs or passing through ~~unusually long or oddly shaped~~ blocks shall be a minimum of 15 feet wide with eight feet of pavement and seven feet of landscaping.

~~3.~~ c. Twelve foot ~~feet~~ wide pathways shall be provided where multiuse paths are planned in the TSP. ~~in areas with high bicycle volumes or multi-use by bicyclists, pedestrians, and joggers.~~

~~4.~~ d. ~~Pathways and sidewalks~~ Pedestrian connectivity shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian pathways/~~walkways~~ shall be provided in accordance with the following standards:

~~a.~~ i. The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the ~~main~~ primary entrance of the primary structure on the site to minimize out of direction pedestrian travel.

~~b.~~ ii. Pathways/~~walkways~~ at least five feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities ~~which~~ that abut the site but are not adjacent to the streets abutting the site.

~~c.~~ iii. ~~Walkways shall be as direct as possible and avoid unnecessary meandering~~ Pathways shall be direct. A pathway is direct when it follows a route when the length is not more than 20 feet longer or 120 percent of the straight-line distance, whichever is less;

~~d.~~ *iv. Pathway/ ~~Walkways~~/driveway crossings shall be minimized. Internal parking lot design shall comply with the standards in Section 17.98.60 to maintain ~~ease of~~ safe and comfortable access for pedestrians from abutting streets, pedestrian facilities, and transit stops.*

~~e.~~ *v. With the exception of pathway/~~walkways~~ /driveway crossings, pathways/~~walkways~~ shall be separated from vehicle parking or vehicle maneuvering areas by grade, different paving material, painted crosshatching, or landscaping. They shall be constructed in accordance with the sidewalk construction standards in the Utility Standard Details adopted by the City in 2004. (This provision does not require a separated ~~walkway~~ pathway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).*

~~f.~~ *vi. Pedestrian amenities such as covered pathways ~~walk-ways~~, awnings, visual corridors, and benches are encouraged. For every two benches provided, the minimum parking requirements shall ~~will~~ be reduced by one, up to a maximum ~~of four benches~~ reduction of two parking spaces per site. Benches shall have direct access to the pedestrian circulation system.*

2. *New multi-family development and residential subdivisions shall meet the following pedestrian standards:*
    a. *Internal connections. On sites larger than 10,000 square feet, an internal pedestrian connection system shall be provided. The system shall connect all main entrances (in the case of multi-family development) or lots (in the case of a subdivision) to the following onsite shared facilities: parking areas, bicycle parking, recreational areas, and outdoor areas; and to the following adjacent offsite improvements: public transit stops, schools, and parks.*
    b. *Public sidewalks shall be part of the pedestrian connection system for subdivisions and shall meet the standards in Section 17.100.270. Pedestrian and bicycle accessways, if required by Section 17.100.120.C, shall meet the minimum requirements of that section.*
    c. *On-site circulation systems required by the standards of this section shall be concrete or asphalt and shall meet the following minimum width requirements:*
        i. *The concrete or asphalt portion of the circulation system on sites with up to 20 residential units shall be at least 4 feet wide.*
        ii. *The concrete or asphalt portion of the circulation system on sites with more than 20 residential units shall be at least 5 feet wide.*
3. *Except as allowed in Subsection 4, below, where the system crosses driveways, parking areas, and loading areas, the system shall be clearly identifiable, through the use of elevation changes, speed bumps, a different paving material, or other similar methods approved as part of a discretionary review. Striping does not meet*

this requirement. Elevation changes and speed bumps shall be at least 4 inches high.

4. *Except as allowed in Subsection 4, below, where the system is parallel and adjacent to an auto travel lane, the system shall be a raised path or be separated from the auto travel lane by a raised curb, bollards, landscaping, or another physical barrier approved by the Director as part of a discretionary review. If a raised path is used it shall be at least 4 inches high and the ends of the raised portions shall be equipped with curb ramps. Bollard spacing shall be no further apart than 5 feet on center.*
5. *The pedestrian circulation system may be within an auto travel lane if the auto travel lane provides access to 16 or fewer parking spaces and the entire auto travel lane is surfaced with paving blocks or bricks.*

C. *Where a development site is traversed by or adjacent to a future trail linkage identified in ~~within~~ the 2023 Transportation System Plan, Figures 12, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with Subsection 17.84.90.D.*
D. *~~To provide for orderly development of an effective pedestrian network, p~~Pedestrian facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).*
E. *To ensure improved access between a development site and an existing developed facility such as a commercial center, school, park, or trail system, as part of a discretionary land use review, the Planning Commission or Director ~~may~~ shall require off-site pedestrian facility improvements concurrent with development.*

Sec. 17.98.60. - Design, size and access.

All off-street parking facilities, vehicular maneuvering areas, driveways, loading facilities, accessways, and private streets shall conform to the standards set forth in this section.

A. *Parking Lot Design. All areas for required parking and maneuvering of vehicles shall have a ~~durable hard~~ surface ~~such as~~ made of concrete or asphalt.*

C. Aisle Width.

[…]

D. Pedestrian Circulation.

1. *Pedestrian circulation shall be provided in the form of pathways in all new off-street parking lots. Pathways shall connect sidewalks adjacent to parking lots to the entrances of new buildings.*
2. *Crosswalks. Where a pathway crosses a parking area or driveway ("crosswalk"), it shall be clearly identified with pavement markings or contrasting paving materials (e.g., pavers, light-color concrete inlay between asphalt, or similar contrast). The crosswalk may be part of a speed table to improve driver-visibility of pedestrians.*
3. *Pathway Width and Surface. Pedestrian pathways shall be constructed in accordance with the sidewalk construction standards in the Utility Standard Details adopted by the City in 2004. Multi-use pathways (i.e., designed for shared use by bicyclists and pedestrians) shall be concrete or asphalt and shall conform to the Utility Standard Details.*

Recommendation 3

Recommendation: Add development requirements related to transit improvements and pedestrian connections to transit, where consistent with the updated TSP, and/or the adopted Sandy Transit Master Plan.

Sec. 17.84.40. Transit ~~and school bus transit~~ requirements.

A. Development sites located along existing or planned public transit routes, as indicated in the 2020 Sandy Transit Master Plan, shall~~, where appropriate,~~ incorporate bus pull-outs and/or shelters into the site design. A bus shelter and bench shall be required at each bus stop with 10 or more passenger boardings per day. These public transit stop improvements shall be installed in accordance with the guidelines and standards in the adopted 2009 Sandy Transit Master Plan, Appendix B~~. of the transit agency~~. ~~School bus pull-outs and/or shelters may also be required, where appropriate, as a condition of approval for a residential development of greater than 50 dwelling units where a school bus pick-up point is anticipated to serve a large number of children.~~

B. New developments at or near existing or planned transit ~~or school bus transit~~ stops shall design development sites to provide safe, convenient access to the transit system by meeting the following standards ~~as follows~~:

1. *Commercial and civic use developments shall provide a prominent entrance oriented towards arterial and collector streets, with front setbacks reduced as much as possible to provide access for pedestrians, bicycles, and transit.*
2. *All developments within 300 feet of a transit stop (as measured in walking distance from the nearest property line) shall provide ~~safe, convenient~~ pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of Subsection 17.84.30.B.*

Recommendation 4 and 5

Recommendation 4: Add language that clarifies the City's authority to apply conditions of approval related to needed transportation improvements.

Recommendation 5: Add language addressing nexus and rough proportionality for improvements required as a condition of development approval based on TIS findings, including off-site improvements concurrent with development.

Sec. 17.84.50. Street requirements.

A. Transportation Impact Study (No Dwellings). For development applications that do not propose any dwelling units, the City may require a transportation impact study that evaluates the impact of the proposed development on the transportation system. Unless the City does not require a transportation impact study, the applicant shall prepare the study in accordance with the following:

[…]

2. If the study identifies ~~level of service~~ vehicle operating conditions less than the minimum mobility targets ~~standard~~ established in the development code or the 2023 City of Sandy Transportation System Plan, or fails to demonstrate that average daily traffic on existing or proposed streets will meet the ADT standards established in the development code, the applicant shall propose improvements and funding strategies for mitigating identified problems or deficiencies that will be implemented concurrent with the proposed development.

B. Transportation Impact Study (Dwellings). For development applications that propose dwelling units, an applicant must submit a transportation impact study unless the application is exempt from this requirement pursuant to S~~s~~ubsection B.~~6~~7., below. Failure to submit the study will result in an incomplete application. A traffic impact study shall bear the seal of a Professional Engineer licensed in the State of Oregon and qualified in traffic or civil engineering. The applicant shall prepare the study in accordance with the following:

1. *The study area must include all existing and proposed site accesses and all existing and proposed streets and intersections where the development adds more than 20 vehicles during any peak hour as determined by using the ~~most recent edition of the~~ Institute of Transportation Engineers Trip Generation Manual (11th edition). The determination of peak hour vehicle addition shall include the cumulative impact of the proposed development and development on abutting properties that received a certificate of occupancy or recorded a plat within the past five years.*
2. *The study must analyze existing conditions and projected conditions upon completion of the proposed development.*
3. *The study must be performed for the weekday a.m. peak hour (one hour between 7:00 a.m. and 9:00 a.m.) and p.m. peak hour (one hour between 4:00 p.m. and 6:00 p.m.). Analysis of other time periods may be required for uses that generate their highest traffic volumes at other times of the day or on weekends.*

4. *The study must demonstrate that the transportation impacts from the proposed development will comply with the City's ~~level of service~~ mobility targets and average daily traffic standards and the Oregon Department of Transportation's mobility targets ~~standard~~.*
5. *If the study identifies ~~level of service~~ vehicle operating conditions less than the minimum mobility targets ~~standard~~ established in the ~~development code or the~~ 2023 City of Sandy Transportation System Plan, or fails to demonstrate that average daily traffic on existing or proposed streets will meet the ADT standards established in Chapter 17.10 of the development code or fails to meet the Oregon Department of Transportation's mobility targets ~~standard~~, the applicant shall propose improvements and funding strategies for mitigating identified problems or deficiencies that will be implemented concurrent with the proposed development.*
6. *If improvements and mitigation measures are necessary, pursuant to Subsection 5., above, the following criteria shall be met in order for the application to be approved:*
    a. *The improvements and funding strategies proposed as mitigation address the problems or deficiencies to the extent necessary to meet the City's mobility targets and average daily traffic standards and, if applicable, the Oregon Department of Transportation's (ODOT's) mobility target.*
    b. *If proposed mitigation requires improvements within City, County, or ODOT rights-of-way, the design has been approved by the City Engineer, Clackamas County, and ODOT when applicable.*

7~~6~~. A transportation impact study is not required under this section if:

a. *The cumulative impact of the proposed development and development on abutting properties that received a certificate of occupancy or recorded a plat within the past five years will generate no more than 20 vehicle trips in any weekday a.m. or p.m. peak hour as determined by using the ~~most recent edition of the~~ Institute of Transportation Engineers Trip Generation Manual (11th Edition); or*
[…]

C. *Transportation Impact Study (Dwellings)—Discretionary Track. As an alternative to the process outlined in Section 17.84.50.B., an applicant may choose to follow the process in Section 17.84.50.A.*
[…]

E. *Street Requirements (Discretionary). For development applications that do not propose dwelling units, or for applications that include dwellings and that elect to use the discretionary track, the following standards shall be met.*
[…]

~~3~~ c. To ensure improved access to a development site consistent with policies on orderly urbanization and extension of public facilities the Planning Commission or Director may require off-site improvements concurrent with development. Off-

site improvement requirements upon the site developer shall be reasonably related to the anticipated impacts of the development.

i. When necessary to meet transportation operations and safety standards, the City of Sandy, and ODOT where access to a state roadway is proposed, will identify conditions of approval consistent with the planned transportation system. The City may deny, approve, or approve the proposal with appropriate conditions based on the transportation standards in Section 17.100.110 and consistent with the City's adopted mobility targets, which requires a minimum level of service (LOS) D for signalized and unsignalized intersections and maximum volume to capacity ratio of 0.90 for roundabout intersections.

ii. Improvements required as a condition of development approval, when not voluntarily provided by the applicant, shall be roughly proportional to the impact of the development on transportation facilities. Findings supporting development approval shall indicate how the required improvements directly relate to and are roughly proportional to the impact of development.

F. Street Requirements (Dwellings/Clear and Objective Track). For development applications that propose dwelling units, all of the following standards shall be met, unless the applicant elects to use the discretionary standards under Subsection E., above.

1. Location of new arterial streets shall conform to the 2023 City of Sandy Transportation System Plan in accordance with the following:

a. Arterial streets shall be spaced at minimum intervals of 5,280 feet and maximum intervals of 6,000 feet.

b. Traffic signals shall not be spaced closer than 1,500 feet.

2. Local streets shall be designed to discourage through traffic. NOTE: for the purposes of this section, "through traffic" means the traffic traveling through an area that does not have a local origination or destination. To discourage through traffic and excessive vehicle speeds the following street design characteristics shall be considered, as well as other designs intended to discourage traffic:

a. Straight segments of local streets shall be kept to less than a quarter mile in length.

b. Local streets should typically intersect in "T" configurations rather than four-way intersections to minimize conflicts and discourage through traffic. Adjacent "T" intersections shall maintain a minimum of 150 feet between the nearest edges of the two rights-of-way.

c. Cul-de-sacs shall not exceed 400 feet in length nor serve more than 20 dwelling units, unless a proposal is successfully processed through the procedures in Chapter 17.66 of the Sandy Development Code. If successfully processed through the procedures in Chapter 17.66, cul-de-sacs longer than 400 feet or developments with only one access point may be required to provide an alternative access for emergency vehicle use only, install fire

prevention sprinklers, or provide other mitigating measures, determined by the City.

3. *Development sites shall be provided with access from a public street improved to City standards in accordance with the following:*
   a. *Where a development site abuts an existing public street not improved to City standards, the abutting street shall be improved to City standards along the full frontage of the property concurrent with development.*
   b. *Half-street improvements are considered the minimum required improvement. Three-quarter-street or full-street improvements shall be required where traffic volumes generated by the development are such that a half-street improvement would result in the street failing to meet the level of service standards in the 2023 City of Sandy Transportation System Plan.*
   c. *To ensure improved access to a development site and extension of public facilities, off-site improvements concurrent with development shall be required if the Transportation Impact Analysis indicates they are necessary to mitigate problems or deficiencies in off-site facilities, pursuant to Section 17.84.50.B. Off-site improvement requirements upon the site developer shall be reasonably related and roughly proportional to the anticipated impacts of the development.*
   d. *Reimbursement agreements for three-quarter-street improvements (i.e., curb face to curb face) may be requested by the developer per Chapter 12 of the SMC.*
   e. *A half-street improvement includes curb and pavement two feet beyond the center line of the right-of-way. A three-quarter-street improvement includes curbs on both sides of the side and full pavement between curb faces.*
4. *Public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property(ies) in accordance with the following:*
   a. *Wherever a proposed development abuts unplatted land or a future development with an approved tentative plat, street stubs shall be provided to allow access to future abutting developments and to extend the street system into the surrounding area. If the abutting land has an approved tentative plat, streets shall align with streets in the approved tentative plat.*
   b. *Where the stubbed street is over 100 feet long, street ends shall contain temporary turnarounds built to Oregon Fire Code standards and shall be designed to facilitate future extension in terms of grading, width, and temporary barricades, unless this requirement is waived by the Fire Marshal.*
   c. *In order to assure the eventual continuation or completion of the street, reserve strips shall be granted to the City of Sandy.*
5. *Public street improvements shall be required through a development site to provide for the logical extension of an existing street network or to connect a site with a nearby neighborhood activity center, such as a school or park. Where this street extension has the effect of dividing a parcel of land, a land partition shall be completed concurrent with the development.*

6. *Except for extensions of existing streets, no street names shall be used that will duplicate or be confused with names of existing streets. Street names and numbers shall conform to the established pattern in the surrounding area and be subject to approval of the Director.*
7. *Location, grades, alignment, and widths for all public streets shall be considered in relation to existing and planned streets, topographical conditions, public convenience and safety, and proposed land use in accordance with standards a. through f. below. Where topographical conditions present special circumstances, exceptions to these standards may be granted through the procedures in Chapter 17.66 of the Sandy Development Code, provided the City Engineer determines that the safety and capacity of the street network are not adversely affected.*
    a. *Location of streets in a development shall not preclude development of adjacent properties. Streets shall conform to planned street extensions identified in the 2023 City of Sandy Transportation System Plan, Figures 14 and 15, and/or provide for continuation of the existing street network in the surrounding area.*
    b. *Grades shall not exceed six percent on arterial streets and ten percent on collector streets and local streets.*
    c. *Arterial streets and collector streets shall be extended in alignment with existing streets by continuation of the street centerline. When staggered street alignments resulting in "T" intersections are unavoidable, they shall leave a minimum of 150 feet between the nearest edges of the two rights-of-way.*
    d. *Centerline radii of curves shall not be less than 500 feet on arterial streets, 300 feet on collector streets, and 100 feet on local streets.*
    e. *Streets shall be designed to intersect at right angles (i.e., 90 degrees or within three degrees of 90 degrees) and shall comply with the following:*
        i. *The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 feet of straight (tangent) alignment perpendicular to the intersection.*
        ii. *The intersection of a local street with another street shall have a minimum of 50 feet of straight (tangent) alignment perpendicular to the intersection.*
        iii. *Where right angle intersections are not possible, exceptions can be granted through the procedures in Chapter 17.66 of the Sandy Development Code, provided the alternative design is approved by the City Engineer and intersections not at right angles have a minimum corner radius of 20 feet along the right-of-way lines of the acute angle.*
        iv. *Intersections with arterial and collector streets shall have a minimum curb corner radius of 20 feet. All other intersections shall have a minimum curb corner radius of ten feet.*
    f. *Right-of-way and improvement widths shall be as specified by the 2023 City of Sandy Transportation System Plan, Figures 18 through 24 and Table 4. Exceptions to those specifications may be granted through the procedures*

in Chapter 17.66 of the Sandy Development Code, if approved by the City Engineer, to deal with specific unique physical constraints of the site.

8. *All public streets shall be designed in conformance with Title 12 of the Sandy Municipal Code and with the City of Sandy Utility Standard Details for Streets & Roads, Sidewalks, and Traffic Control Devices.*
9. *Private streets shall only be approved within a development site when all the following conditions are met:*
    a. *Extension of a public street through the development site is not needed for continuation of the existing street network or for future service to adjacent properties;*
    b. *The development site remains in one ownership, or adequate mechanisms are established (such as a homeowner's association invested with the authority to enforce payment) to ensure that a private street installed with a land division will be adequately maintained; and*
    c. *Where a private street is installed in connection with a land division, paving standards consistent with City standards for public streets shall be utilized to protect the interests of future homeowners.*

~~E~~G. Local streets shall be designed to discourage through traffic. NOTE: for the purposes of this section, "through traffic" means the traffic traveling through an area that does not have a local origination or destination. To discourage through traffic and excessive vehicle speeds the following street design characteristics shall be considered, as well as other designs intended to discourage traffic:

[…]

~~*3. Cul-de-sacs shall not exceed 400 feet in length nor serve more than 20 dwelling units, unless a proposal is successfully processed through the procedures in Chapter 17.66 of the Sandy Development Code.. Cul-de-sacs longer than 400 feet or developments with only one access point may be required to provide an alternative access for emergency vehicle use only, install fire prevention sprinklers, or provide other mitigating measures, determined by the City.*~~

Recommendation 6

Recommendation: Add new Traffic Letter requirements and standards.

Sec. 17.84.50. Street requirements.

[…]

D. Traffic Letter (Dwellings). For development applications that propose dwelling units, an applicant must submit a traffic letter where the development adds 20 or fewer vehicles during any peak hour as determined by using the Institute of Transportation Engineers Trip Generation Manual (5th Edition). Failure to submit the traffic letter will result in an incomplete application. Development applications that add 2 or fewer vehicles during any peak hour as determined by using the Institute of Transportation Engineers Trip Generation Manual (5th Edition) are exempt from the traffic letter requirement.

Recommendation 7

Recommendation: Add language requiring bicycle parking facilities for transit transfer stations and park-and-ride lots.

Sec. 17.98.20. - Off-Street Parking Requirements.

A. Off-Street Parking Requirements. Off street parking shall conform to the following standards:

[…]

9.

Community Service, Institutional and Semi-Public Uses	*Number of Parking Spaces*	*Number of Bicycle Spaces*
School—Senior High, Vocational or College	*6 per classroom, plus 1 per employee on the largest shift*	*5% or 2 whichever is greater*
Transit transfer stations and park-and-ride lots	*0*	*4*

Recommendation 8

Recommendation: The access spacing standards should be expanded to include access spacing tables from the TSP and give the City authority to require closing or consolidation of accesses.

Sec. 17.98.80. Access Management ~~to arterial and collector streets~~.

A. Access Spacing. All proposed development shall have access to a public right-of-way. Spacing requirements for access points and intersections are shown in the City of Sandy 2023 Transportation System Plan Tables 5 and 6 and in the following table:

Table 17.98.80.A.1: Minimum Access Spacing Standards for City Street Facilities

Cross-Section	*Major Arterial*	*Minor Arterial*	*Collector*	*Local Street*
Distance between public streets	*5,280 feet*	*5,280 feet*	*2,640 feet*	*400-600 feet*
Minimum driveway spacing (public street to driveway and driveway to driveway)	*See Table 17.98.80.A.2*	*400 feet or 200 with restricted right-in/right-out access*	*300 feet or 150 with restricted right-in/right-out access*	*20 feet*
Note: All distances measured from center to center of adjacent approaches.				

Table 17.98.80.A.2: Minimum Access Spacing Standards for US 26

Speed limit	Urban Expressway	Urban	STA[1]
> 55	2,640 feet	1,320 feet	n/a
50	2,640 feet	1,100 feet	n/a
40 & 45	2,640 feet	800 feet	n/a
30 & 35	n/a	500	See footnote
< 25	n/a	350 feet	See footnote

[1] Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 175 feet (55 meters) or mid-block if the current city block is less than 350 feet (110 meters).

Note: All distances measured from center to center of adjacent approaches.

~~Functional Classification~~	~~Distance between Private Accesses and other Private Access or Public Streets~~
~~Major Arterial*~~	~~See Table 17.98.80.A.2~~
~~Minor Arterial~~	~~300 feet~~
~~Residential Minor Arterial and Collector~~	~~150 feet~~
~~Local Street~~	

~~* Note: All major arterials in Sandy are ODOT facilities.~~

B. ~~A.~~ Location and design of all accesses to and/or from arterials and collectors (as designated in the 2023 City of Sandy Transportation System Plan) are subject to review and approval by the City Transportation Engineer or Public Works Director. Where ~~practical~~ access spacing requirements on a collector or arterial cannot be met, access from a lower functional order street may be required. ~~Accesses to arterials or collectors shall be located a minimum of 150 feet from any other access or street intersection.~~ Exceptions may only be granted as part of a discretionary review, when approved by the City Engineer. Evaluations of exceptions shall consider posted speed of the street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

C. ~~B.~~ No development site shall be allowed more than one access point to any arterial or collector street (as designated in the 2023 City of Sandy Transportation System Plan) except as approved by the City Transportation Engineer or Public Works Director as part of a discretionary review. Evaluations of exceptions shall be based on a traffic impact analysis and parking and circulation plan and consider posted speed of street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

D. ~~C.~~ When developed property is to be expanded or altered in a manner that significantly affects on-site parking or circulation (i.e., removes or changes the location of driveways, parking spaces, or drive aisles), both existing and proposed accesses shall be reviewed under

the standards in A and B above. As a part of an expansion or alteration approval, the City may require relocation and/or reconstruction of existing accesses not meeting those standards.

E. The City or other agency with access permit jurisdiction has the authority to require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), developing a frontage street, installing traffic control devices, and/or other mitigation as a condition of granting an access permit to ensure the safe and efficient operation of the street and highway system.

Recommendation 9

Recommendation: Update definition of Streets in the definitions section to ensure consistency throughout the Code. Move standards in definitions to Section 17.100.110 of the Development Code. Include reference to street specifications in the Bornstedt Village Overlay. Update standards for cul-de-sacs and blocks to ensure connectivity is maintained.

Sec. 17.10.30 Meaning of specific words

[…]

Accessway: A pathway, shared-use path, walkway, or pedestrian way connecting two rights-of-way to one another where no vehicle connection is made.

[…]

Public facility: Public facilities include, but are not limited to, sanitary sewer, water, storm drainage, street, communication, electrical and natural gas facilities necessary to support development. There are two types of public facilities: …

Public transit stops: A public transit stop is an existing or planned transit stop as shown in Figure 8 of the 2023 Sandy Transportation System Plan or the 2020 Sandy Transit Master Plan.

[…]

Sidewalk: A paved pedestrian way, pathway, or walkway within a public right-of-way that is generally located adjacent to and separated from the roadway by a curb, drainage facility (e.g., ditch or swale), or planter strip.

[…]

Street: Designated in the City of Sandy 2023 Transportation System Plan as follows:

- *A. Arterial, principal ~~major~~: These roadways serve the highest volume of motor vehicle traffic and are primarily used for longer distance regional trips. The only roadway in the city classified as a principal arterial is US 26. ~~These consist of state highways, which carry nearly all vehicle trips entering, leaving, or passing through the Sandy area.~~*
- *B. Arterial, minor: These interconnect and support the major arterial system and link major commercial, residential, industrial, and institutional areas. These roads have a typical capacity between 8,000 and 16,000 ADT.*
- *~~C. Residential minor arterial: A hybrid between minor arterial and collector street which allows moderate to high traffic volumes on streets where over 90 percent of the fronting lots are residential. Intended to provide some relief to the strained arterial system while ensuring a safe residential environment. Right-of-way width shall not be less than 62 feet~~*

~~nor more than 82 feet (or 88 feet if it's a green street with swales on both sides), street shall be a minimum three-lane cross section, and may include on-street parking.~~

D. *Collector streets: These provide both access and circulation within residential neighborhoods and commercial/industrial areas. <u>These roads have a typical capacity between 2,000 and 6,000 ADT.</u> Right-of-way width shall not be less than 44 feet nor more than 78 feet (or 82 feet if it's a green street with swales on both sides).*
E. *Local streets: The primary function is to provide access to immediately adjacent land. Service to through-traffic movement on local streets is discouraged. Right-of-way width shall be ~~50~~ <u>54</u> feet (or up to ~~56~~ <u>60</u> feet if it's a green street with swales on both sides). Average daily traffic (ADT) shall not exceed 1,000 vehicles/day. Proposed <u>developments</u> ~~projects~~ that result in more than 1,000 ADT on an existing or proposed local street shall be modified to not exceed the 1,000 ADT threshold on the local street or the proposal may be processed through the procedures in Chapter 17.66 of the Sandy Development Code. Proposed outright permitted projects in the C-1, Central Business District, are exempt from adherence to the ADT standards on local streets.*
F. *Cul-de-sac: A local street with only one outlet and having a bulb at the opposite end. A cul-de-sac shall not exceed 400 feet in length nor serve more than 20 dwelling units unless a proposal is successfully processed through the procedures in Chapter 17.66 of the Sandy Development Code.*
G. *Green street: A street with a water quality treatment and/or conveyance swale on either one or both sides. Swales shall be a minimum of eight feet wide. ADT standards and dimensional standards shall adhere to the <u>standards of the</u> ~~above classifications depending on the~~ street classification.*
H. *<u>Complete street: A street with facilities to support multiple modes of transportation, including motor vehicles, bicycles, and pedestrians. Complete streets are designed to accommodate multiple users and abilities.</u>*

[...]

<u>Pathway: A paved public or private route separated from the street right-of-way that is intended to provide pedestrian or bicycle access to adjacent streets and properties. Pathways can serve both recreational and commuter needs Pathways may also be known as shared-use paths, walkways or pedestrian ways, and these terms may be used interchangeably throughout the SMC.</u>

<u>Pedestrian way: A paved public or private route separated from the street right-of-way that is intended to provide pedestrian or bicycle access to adjacent streets and properties. Pedestrian ways can serve both recreational and commuter needs Pedestrian ways may also be known as shared-use paths, walkways or pathways, and these terms may be used interchangeably throughout the SMC.</u>

<u>[…]</u>

<u>Shared-Use Path: A paved public or private route separated from the street right-of-way that is intended to provide pedestrian or bicycle access to adjacent streets and properties. Shared-use paths can serve both recreational and commuter needs. Shared-use paths may also be known as</u>

walkways, pathways, or pedestrian ways, and these terms may be used interchangeably throughout the SMC.

[…]

Walkway: A paved public or private route separated from the street right-of-way that is intended to provide pedestrian or bicycle access to adjacent streets and properties. Walkways can serve both recreational and commuter needs. Walkways may also be known as shared-use paths, pedestrian ways, or pathways, and these terms may be used interchangeably throughout the SMC.

Sec. 17.100.110. Street standards and classification.

Functional definitions of each street type are described in the ~~2011~~ 2023 Transportation System Plan as summarized below. The descriptions below are intended to incorporate and implement the functional classifications in the ~~2011~~ 2023 Transportation System Plan, Chapter 5~~3~~ and Figures 18 - 24~~6-13~~.

A. *~~Major~~ Principal arterials are designed to carry high volumes of through traffic, mixed with some unavoidable local traffic, through or around the city.*
B. *Minor arterials are designed to collect and distribute traffic from major and minor arterials to neighborhood collectors and local streets, or directly to traffic destinations.*
C. *~~Residential minor arterials are a hybrid between minor arterial and collector type streets that allow for moderate to high traffic volumes on streets where over 90 percent of the fronting lots are residential.~~*
D. *Collector streets are designed to collect and distribute traffic from higher type arterial streets to local streets or directly to traffic destinations. Right-of-way width shall not be less than 44 feet nor more than 78 feet (or 82 feet if it's a green street with swales on both sides).*
E. *Local streets provide direct access to abutting property and connect to collector streets. Local streets shall be spaced no less than eight (660 feet) and no more than ten streets per mile (520 feet). Right-of-way width shall be 54 feet (or up to 60 feet if it's a green street with swales on both sides). Local streets shall not exceed the ADT standards set forth in Chapter 17.10, except that the ADT standard for local streets shall not apply to outright permitted development within the C-1 zone.*
F. *Development within the Bornstedt Village Overlay is subject to the roadway standards in Section 17.54.120.*
G. *The City may approve deviations from the street spacing standards in Section 17.100.110.A. to E. through an adjustment or variance pursuant to Chapter 17.66.*
H. *Cul-de-sacs and dead-end streets ~~are prohibited~~ shall only be used where the Director determines that street continuation is precluded by the following:*
    1. *Existing development.*
    2. *Areas in the Flood and Slope Hazard (FSH) Overlay District pursuant to SDC Chapter 17.60.*
    3. *The street continuation would connect a Local Street with an Arterial Street, as defined in the Sandy Transportation System Plan Table 4.*

I. *Where the Director determines that a cul-de-sac or dead-end street is allowed pursuant to Section 17.100.110(H), all of the following standards shall be met:*
   1. *The cul-de-sac shall be a minimum length of 200 feet and shall not exceed 400 feet, except where the Director through a Type II procedure determines that factors identified in Section 17.100.110(H) require a longer block length. The length of the block shall be measured along the centerline of the street from the near side of the intersecting street to the farthest point of the cul-de-sac.*
   2. *The cul-de-sac or dead-end street shall provide pedestrian and bicycle access to adjacent streets with installation of a pathway in accordance with the 2004 Utility Standard Details and SDC Section 17.84.30 – Pedestrian and Bicycle Requirements.*
   3. *The cul-de-sac shall terminate with a circular or hammer-head turnaround meeting the 2022 Oregon Fire Code.*
   4. *The cul-de-sac shall not provide access to more than 25 dwelling units.*

~~G~~ J. *Alleys are designed to provide access to multiple dwellings in areas where lot frontages are narrow, driveway spacing requirements cannot be met, and lots abut transit streets.*

…

Sec. 17.100.120. Blocks and accessways.

A. *Blocks. Blocks shall provide for two tiers of lots and shall provide minimum intersection spacing of 150 feet ~~at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to natural features~~.*
B. *Blocks in the Single-Family Residential zone, Low Density Residential zone, Medium Density Residential zone, High Density Residential zone, Central Business District zone, General Commercial zone, Village Commercial zone, and Industrial Park zone fronting local streets shall not exceed 400 feet in length, unless slopes in excess of 12 percent, perennial streams, or wetlands justify longer blocks.*
C. *Pedestrian and Bicycle Accessway Requirements. In any block in a residential or commercial district over ~~6~~400 feet in length, a pedestrian and bicycle accessway with a minimum improved surface of ten feet within a 15-foot right-of-way, tract, or easement shall be provided through the middle of the block. ~~To enhance public convenience and mobility, such accessways may be required to connect to cul-de-sacs, or between streets and other public or semipublic lands~~.*

Recommendation 10

Recommendation: Update the Development Code to include acceptable alternatives to a street connection.

Sec. 17.100.100. Streets generally.

No subdivision or partition shall be approved unless the subdivision lots or partition lots have frontage or approved access to an existing public street. In addition, all streets shall be graded and improved in conformance with the City's ~~adopted~~ construction standards and approved construction plans in Title 12 of the Sandy Municipal Code and the Utility Standard Details for Streets and Roads.

[...]

E. Exemptions.

1. A future street plan is not required for partitions of residentially zoned land when none of the parcels may be redivided under existing minimum density standards.

2. *When street connection standards are inconsistent with an adopted street spacing standard for arterials or collectors, a right turn in/right turn out only design including median control ~~may~~ shall be an acceptable alternative to a full intersection ~~approved~~. Where compliance with the standards would result in ~~unacceptable~~ sight distances that fall short of the current AASHTO Policy on Geometric Design of Highways and Streets, an accessway shall be an acceptable alternative to ~~may be approved in place of~~ a street connection.*

appendix

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TM #7: TSP SOLUTIONS

DATE: December 8, 2022

TO: Project Management Team

FROM: Reah Flisakowski, Dock Rosenthal | DKS Associates

SUBJECT: Sandy Transportation System Plan Project #20020-001

This memo summarizes the preliminary transportation solutions identified for the Sandy Transportation System Plan (TSP) update. The recommended solutions respond to system performance needs identified through the prior technical analysis by the consultant team, and on-going feedback and reviews by the Project Management Team and the Project Advisory Committee. The system solutions identified include pedestrian and bicycle enhancements, safety improvements, and a review of the transit projects, along with minor roadway capacity improvements for motor vehicles. In addition, a more in-depth evaluation was made regarding a US 26 bypass to help understand the trade-offs, expected benefits and potential risks of implementation.

The projects documented in this memo are needed to develop a future, multimodal transportation system for Sandy with an understanding that adequate funding will not be available to construct all recommended capital improvements. Evaluation criteria were used to provide an initial prioritization of transportation improvements. These criteria are based on the project's goals and objectives that were identified in Technical Memorandum 2. The project scores, from the evaluation criteria, and project cost estimates will be used to develop a high priority, financially constrained project list as part of Technical Memorandum 8: Planned and Financially Constrained Transportation System. The projects presented in this memo are still preliminary and will be refined through public engagement prior to adoption of the TSP update. Furthermore, inclusion of a project in this memo does not commit the City of Sandy to its ultimate construction.

APPROACH TO DEVELOPING NETWORK IMPROVEMENTS

Sandy's proposed approach to developing transportation projects is based on three tiers of priorities that includes:

1. **High Priority** – Add vehicle capacity by widening, constructing major improvements to existing roadways, or extending existing roadways to create parallel routes to congested corridors. Improve existing facilities with minor enhancements, such as upgrading roads to standards, filling in important system gaps, and safety improvements to intersections and corridors.

2. **Moderate Priority** – Add cost-effective improvements such as better traffic signal operations, encouraging walking, biking and transit, and applying new policies and standards.

3. **Lowest Priority** – add vehicle capacity to the system by constructing new facilities.

This approach could allow the City to maximize use of available funds, minimize impacts to the natural and built environments, and balance investments across all modes of travel.

Measurable evaluation criteria were developed from the City's specific transportation goals and objectives (see Technical Memorandum #2: Goals and Objectives). These evaluation criteria were used to screen and prioritize potential transportation solutions in the next phase of the evaluation process, see graphic below. The prioritized solutions, consequently, will be consistent with the goals and objectives. The recommended evaluation criteria for each goal are summarized below in Table 1.

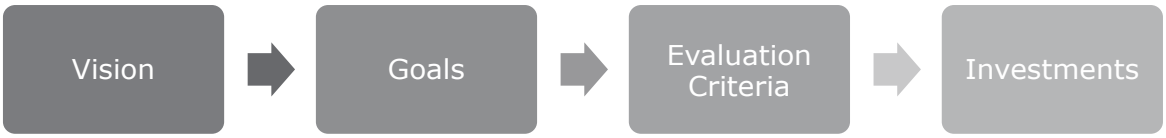


TABLE 1: RECOMMENDED EVALUATION CRITERIA

#	GOAL	DESCRIPTION	EVALUATION CRITERIA
1	MOBILITY & CONNECTIVITY	Provide a transportation system that prioritizes mobility and connectivity for all users.	(1) Project improves an existing facility or provides a new connection to existing local facilities. (2) Project addresses a critical system capacity need.
2	CAPITAL INVESTMENTS AND FUNDING	Promote cost effective investments to the transportation system.	(1) Project serves the needs of multiple system users. (2) Project extends the useful life of existing facilities.
3	COMMUNITY NEEDS	Provide a transportation system that supports specific community needs.	(1) Project improves access to natural features. (2) Project improves the human scale of US 26 and OR 211.
4	SYSTEM MANAGEMENT	Promote traffic management to achieve the efficient use of transportation infrastructure.	(1) Project reduces the local vehicle demand on US 26.
5	ENVIRONMENTAL	Minimize environmental impacts on natural resources and encourage carbon-neutral or efficient transportation alternatives.	(1) Project minimizes impact on natural resources. (2) Project reduces single occupant vehicle trips.
6	TRANSIT	Provide safe, efficient, high-quality transit service that gives Sandy residents, employees, employers, and visitors more freedom to meet their needs within the city, region, and state. Create a transit system that offers an alternative to private automobile use, supports efficient use of roadways, and reduces air pollution and energy use.	(1) Project improves the comfort and safety of existing transportation users. (2) Project improves the accessibility to transit for residents and visitors to Sandy.
7	SAFETY	Promote a safe transportation system for all users.	(1) Project addresses an identified safety need.
8	EQUITY	Support an equitable transportation system and provide transportation choices to all users.	(1) Project addresses the needs of a disadvantaged community.
9	HEALTH	Support options for exercise and healthy lifestyles to enhance the quality of life.	(1) Project promotes a healthy community.

TRANSPORTATION SOLUTIONS

The following sections summarize the evaluation of multimodal improvement options to provide early direction in developing recommended solutions. Sandy's high priority transportation solutions are generally cost-effective minor roadway improvements which include spot motor vehicle improvements, minor roadway extensions, enhancements to the pedestrian and bicycle network, and other programmatic improvements. The options consider the available right-of-way and environmental constraints to ease implementation. These identified solutions are preliminary and are subject to change. Community input and further technical analysis will ultimately lead to recommended solutions to be included in the TSP update.

UPDATE TO TSP PEDESTRIAN IMPROVEMENTS

Pedestrian enhancements throughout the city will be important to meet pedestrian mobility needs and to adequately connect to community destinations. The pedestrian projects in the 2011 TSP were reviewed and updated to identify future solutions. The recommended pedestrian system improvements are shown in Figure 1.

The existing sidewalk gaps were inventoried to identify priority corridors for sidewalk infill or shared use path projects. Beyond the evaluation criteria, priority corridors were identified based on their:

- Proximity to schools
- Proximity to major destinations
- The extent of existing gaps on a segment
- Lack of topographical constraints

Enhanced crossing locations were also identified, as needed, to facilitate safe crossing opportunities for US 26 and OR 211 based on the future sidewalk conditions for adjacent roadways. Several pedestrian crossing projects were carried forward from the Sandy Transit Master Plan[1] and local Safe Routes to School plans. Specific pedestrian improvements are identified in Tables 2 and 3.

[1] Sandy Transit Master Plan, April 2020.

FIGURE 1: PEDESTRIAN SYSTEM IMPROVEMENT

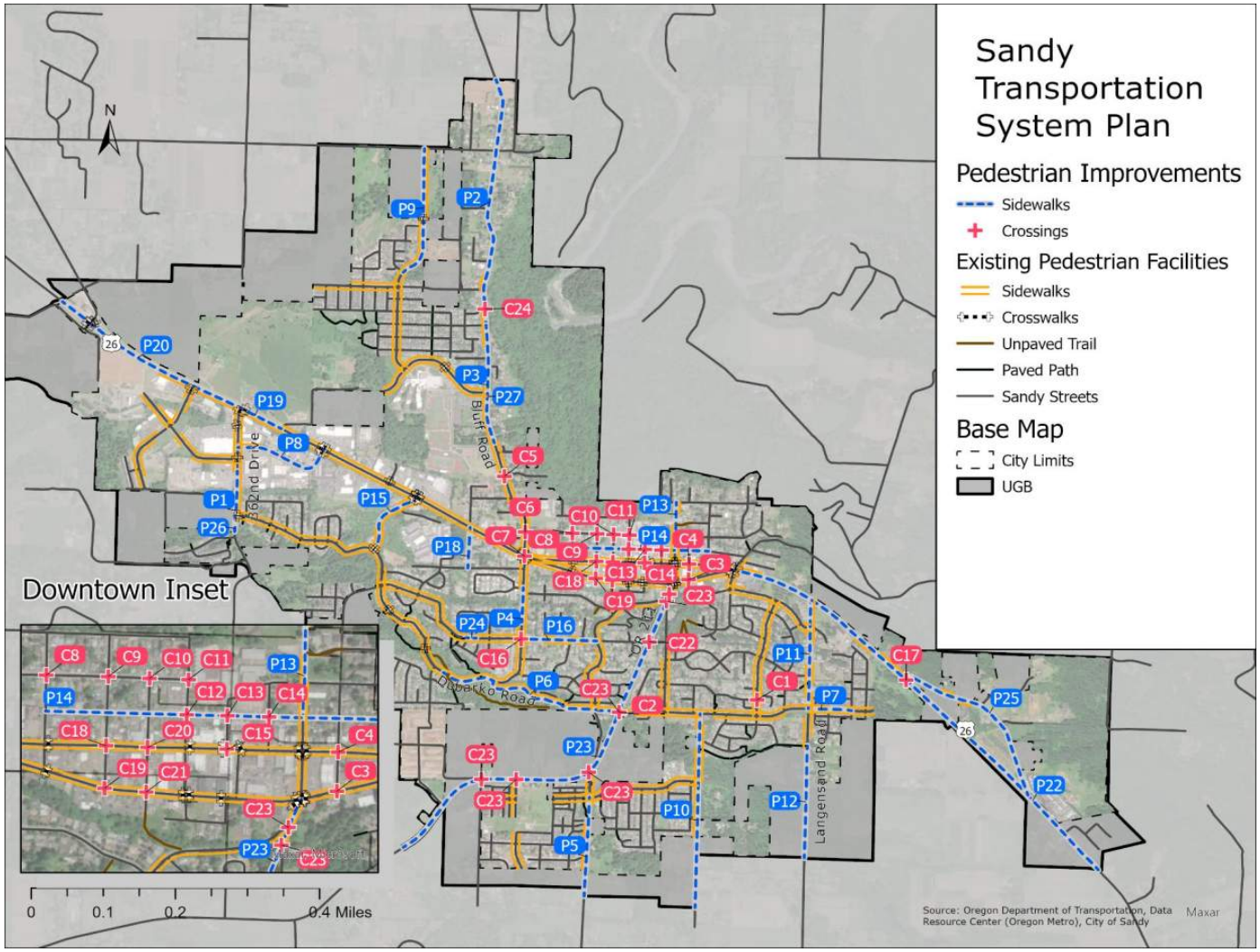


TABLE 2: PEDESTRIAN SYSTEM IMPROVEMENTS

ID	PROJECT	SEGMENT	DESCRIPTION	COST	PRIORITY
P1	362nd Drive	West Sidewalk of Chinook St. to Industrial Way	Infill sidewalk gaps	$1,000,000	FC
P2	Bluff Rd.	Green Mountain St. to Northern UGB	Infill sidewalk gaps	$900,000	Medium
P3	Bluff Rd	West sidewalk gap infill from Bell Street to 15931 SE Bluff Road	Infill sidewalk gaps, includes landscape buffer	$875,000	FC
P4	Bluff Rd	Strawbridge Pkwy to Nettie Connett Dr.	Infill sidewalk gaps	$650,000	Medium
P5	Bornstedt Rd.	Cascadia Village Dr to UGB	Infill sidewalk gaps	$1,750,000	Medium
P6	Dubarko Rd.	300 feet east of Melissa Ave. to 200 feet east OR 211	Infill sidewalk gaps	$3,950,000	Medium
P7	Dubarko Rd.	Langensand Rd. to Antler Ave.	Infill sidewalk gaps	$50,000	High
P8	Industrial Way	362nd Dr. to US 26	Infill sidewalk gaps	$2,200,000	Medium
P9	Jewelberry Rd.	Penny Ave. to Kelso Rd.	Infill sidewalk gaps	$250,000	Medium
P10	Jacoby Rd.	Dubarko Rd. to southern UGB	Infill sidewalk gaps/construct sidewalk	Included in B14	Medium
P11	Langensand Rd	Dubarko Rd. to US 26	Infill sidewalk gaps	$100,000	High
P12	Langensand Rd.	630 feet south of Dubarko Rd. to UGB	Infill sidewalk gaps	$1,150,000	Medium
P13	Meinig Avenue	Scenic St. to US 26	Infill sidewalk gaps	$150,000	Medium
P14	Pleasant St	Beers Ave. to Revenue Ave.	Infill sidewalk gaps	$250,000	High
P15	Ruben Ln	US 26 to Dubarko Rd.	Infill sidewalk gaps	$75,000	Medium
P16	Sandy Heights St	Bluff Rd. to Tupper Rd.	Infill sidewalk gaps	$225,000	High
P17	Downtown Core Pedestrian Improvements	Sidewalk infill side streets perpendicular to US 26	Infill sidewalk gaps	$350,000	High
P18	University Ave	Sunset St. to US 26	Construct sidewalk	$150,000	Medium
P19	US 26	Royal Ln to 362nd Dr.	Infill sidewalk	$550,000	Medium

ID	PROJECT	SEGMENT	DESCRIPTION	COST	PRIORITY
			gaps		
P20	US 26	362nd Dr. to West UGB	Infill sidewalk gaps	$1,200,000	Medium
P22	US 26A	Ten Eyck Rd. to East UGB	Infill sidewalk gaps	Included in B12	High
P23	OR 211	South UGB to US 26 – coordinate with D25	Construct sidewalk	Included in D25	Medium
P24	Sandy Heights St.	Nettie Connett Drive to Balken Ave	Construct sidewalk on northside	$125,000	Medium
P25	Vista Loop	Full extent	Construct sidewalk	Included in B15	Medium
P26	362nd Drive	East sidewalk infill from Chinook Street to Industrial Way	Infill sidewalk gaps	$625,000	Medium
P27	Bluff Road	East sidewalk infill mirroring west improvement	Infill sidewalk gaps, includes landscape buffer	$2,225,000	Medium

A. A project completing the gap on the northern side of US 26 from Ten Eyck to Vista Loop (west) is currently funded.

Many of the crossing improvements in Table 3 come from the Cedar Ridge Middle School and Sandy Grade School Safe Routes to School Plan (2020). The low cost of many of these improvements makes it likely that they would be grouped together and funded simultaneously. The cost of all improvements for each school is:

- Cedar Ridge Middle School (CRMS) – Improvements C5 through C10, $450,000.
- Sandy Grade School (SGS) Improvements C11 through C15, $875,000.

TABLE 3: ROADWAY CROSSING IMPROVEMENTS

ID	PROJECT	DESCRIPTION	COST	PRIORITY
C1	Sandy Shopper Crossing - Evans	Evans Street Senior Apartments, traffic calming, and other crossing improvements are needed. Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$25,000	High
C2	OR 211 Dubarko Crossing	Project may include pedestrian crossing advisory signage, curb extensions, marked crosswalks, and installation of RRFB. Coordinate with D9 and D20.	$125,000	High
C3	Sandy Transit Center - Pioneer	Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$125,000	Medium
C4	Sandy Transit Center - Proctor	Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$125,000	Medium

ID	PROJECT	DESCRIPTION	COST	PRIORITY
C5	CRMS - Bluff Road at Marcy	Install Rectangular Rapid Flashing Beacon (RRFB) with School Crossing Assembly (S1-1 and W16-7P), and high visibility crosswalks across the north and east sides of the intersection.	$125,000	FC
C6	CRMS - Bluff Road at Hood	Install a curb extension including perpendicular curb ramps and tactile domes at northeast corner of Hood St. Install a curb extension to provide clearance from existing pole, including perpendicular curb ramps and tactile domes, at southeast corner. Mark crosswalk and stop bar across the east leg of intersection.	$125,000	High
C7	CRMS - Bluff Road at US 26	Increase pedestrian signal crossing time. Reconfigure crossing to provide perpendicular curb ramps with tactile domes and reduce curb radius at all corners. Add pedestrian-scale lighting. Reallocate existing roadway space to provide buffered bike lanes along Highway 26 and consider the use of green pavement markings near Bluff Rd. Consider installing vertical delineators with buffered bike lanes contingent on city maintenance agreement or construct a fully grade-separated bicycle facility.	$125,000	FC
C8	CRMS - Hood Street at Beers	At Beers Ave, repaint stop bars on west and east sides of intersection. Consider installation of a 4 way stop at Beers Ave.	$25,000	FC
C9	CRMS - Hood Street at Scales	Install perpendicular curb ramps with tactile domes at northwest and southwest corners of the intersection of Hood St and Scales Ave. Install tactile domes at the northeast and southeast corners. Repaint stop bars.	$25,000	FC
C10	CRMS -Hood Street at Bruns	Install tactile dome at southwest corner of Bruns Ave and Hood St.	$25,000	FC
C11	SGS - Hood/Strauss	Relocate southbound school advance crossing assembly (S1-1 & W16-9P) and school speed limit assembly (S4-3P & R2-1) along Strauss Ave to approximately 100 ft and 175 ft north of intersection, respectively. Repair approximately 150 LF of degraded sidewalk along the east side of Strauss Ave at the intersection with Hood St and widen sidewalk at encroaching utility pole. Install a curb ramp on the east side of the south leg of the intersection of Strauss Ave at Hood St. Add tactile domes and a stop bar associated with the crosswalk across the west leg of the intersection.	$350,000	FC
C12	SGS - Pleasant/Strauss	Mark stop bars in advance of crosswalks. Consider revising the intersection of Pleasant St and Strauss Ave to be a four-way stop (currently STOP control north- and southbound only).	$25,000	FC
C13	SGS -	Mark stop bars in advance of crosswalks. Replace	$350,000	FC

ID	PROJECT	DESCRIPTION	COST	PRIORITY
	Pleasant/Alt	existing diagonal curb ramps at all four corners with perpendicular curb ramps with tactile domes. Construct a raised intersection at Pleasant St at Alt Ave.		
C14	SGS - Smith/Pleasant	Mark stop bars in advance of crosswalks. Relocate southbound school advance crossing assembly (S1-1 & W16-9P) and school speed limit assembly (S4-3P & R2-1) along Smith Ave to approximately 100 ft and 175 ft north of intersection, respectively.	$25,000	FC
C15	SGS - Alt/US 26	Increase pedestrian signal crossing time. Upgrade pedestrian pushbuttons to meet current standards with audible indications. Consolidate the two existing crosswalks across Highway 26 at Alt Ave with one high visibility continental crosswalk on the east side of the intersection including advance stop bar, bulb outs, curb ramps, and pedestrian scale lighting.	$125,000	FC
C16	Bluff/Sandy Heights	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	Medium
C17	Dubarko/US26	Install marked crosswalks on all four legs with tactile domes on the ramps, coordinate with D20, this project is not needed until the Dubarko Extension is complete.	$25,000	Medium
C18	Scales/Proctor	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	High
C19	Scales/Pioneer	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	High
C20	Bruns/Proctor	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	High
C21	Bruns/Pioneer	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	High
C22	OR 211	Pedestrian Overcrossing for Sandy Heights Street.	$6,000,000	Medium
C23	Hwy 211 Pedestrian Improvements	ADA Improvements along Highway 211	$500,000	FC Funded
C24	Green Mountain and Bluff Pedestrian Crossing	Construct curb extensions and mark crossing to Jonsrud Viewpoint	$75,000	High

Note: CRMS – Cedar Ridge Middle School and SGS – Sandy Grade School

UPDATE TO TSP BICYCLE IMPROVEMENTS

Sandy's existing bicycle facilities were inventoried and used as a starting point to develop future bicycle solutions. Bicycle enhancements throughout the city will be important to meet bicycle needs and provide an alternative to driving. The bicycle projects in the 2011 TSP were reviewed and updated to identify future solutions. The recommended bicycle system improvements are shown in Figure 2.

Beyond the evaluation criteria, corridors were included in the priority bicycle network based on:

- A comparison of the relative increase in the area accessible with the project
- Proximity to schools
- Proximity to major destinations
- Directness of route
- Ability to provide an off-highway connection

Recommended treatments included:

- Separated bike facilities – treatments could include a shared use path, separated bicycle lanes, or buffered bicycle lanes
- Bicycle lanes – treatments could include on-street bicycle lanes without a buffer

Specific bicycle improvements are identified below. The specific locations where system improvements were identified is shown in Table 3.

The proposed bicycle system enhancements are shown in Figure 2 and Table 4. The proposed off-road trail system improvements from the Sandy Parks and Trails Master Plan are shown in Table 5.

FIGURE 2: PROPOSED BICYCLE SYSTEM IMPROVEMENTS

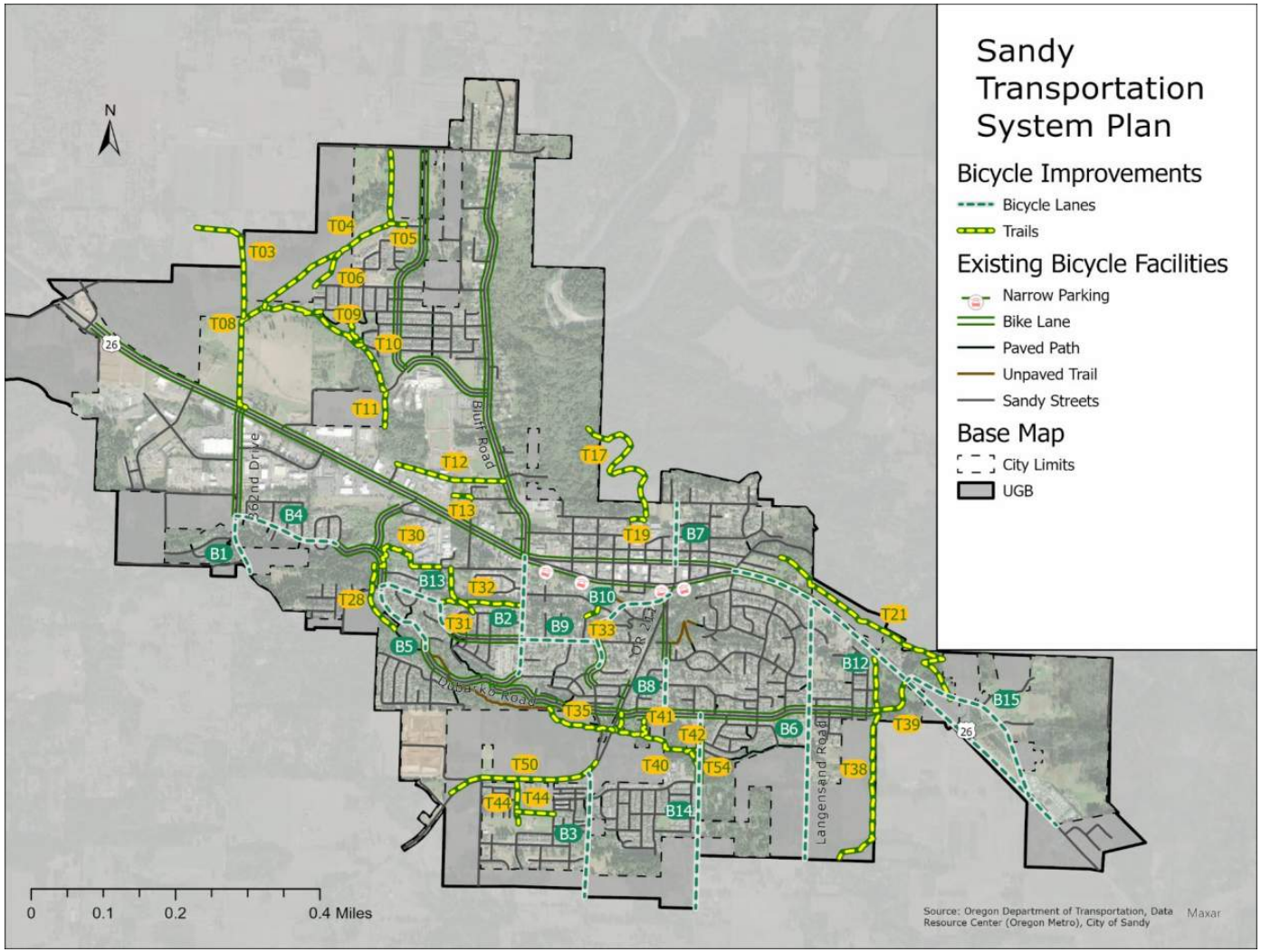


TABLE 4: BICYCLE SYSTEM IMPROVEMENTS

ID	PROJECT	SEGMENT	DESCRIPTION	COST	PRIORITY
B1	362nd Dr.	Dubarko Rd. to UGB	Widen shoulder to 6 feet minimum for bike access	$1,500,000	High
B2	Bluff Rd.*	US 26 to Miller Rd.	Re-stripe roadway to provide bike lanes	$50,000	High
B3	Bornstedt Rd	OR 211 to UGB	Widen roadway to provide bike lanes	$2,550,000	High
B4	Dubarko Rd.*	362nd Dr. to Eldridge Dr.	Re-stripe roadway to provide bike lanes	$50,000	High
B5	Dubarko Rd.*	Sandy Heights St. to Melissa Ave.	Re-stripe roadway to provide bike lanes	$50,000	High
B6	Langensand Rd.*	US 26 to UGB	Re-stripe roadway to provide bike lanes	$75,000	High
B7	Meinig Ave*	Scenic St. to US 26	Re-stripe roadway to provide bike lanes	$75,000	High
B8	Meinig Ave*	Barker Ct. to Dubarko Rd.	Re-stripe roadway to provide bike lanes	$25,000	High
B9	Sandy Heights St*	Bluff Rd. To Tupper Rd.	Re-stripe roadway to provide bike lanes	$50,000	High
B10	Tupper Rd.	Long Circle to OR 211	Widen roadway to provide bike lanes	$3,000,000	High
B12	US 26	Ten Eyck Road to UGB	Widen to provide a six-foot bike lane and sidewalk	$7,725,000	High
B13	Sandy Heights St	Dubarko Rd to Nettie Connett Dr	Re-stripe/widen Roadway to provide bike lanes	$2,275,000	Medium
B14	Jacoby Rd	Dubarko Rd to southern UGB	Re-stripe/widen Roadway to provide bike lanes and construct sidewalk	$3,925,000	Medium
B15	Vista Loop	Full extent	Re-stripe/widen Roadway to provide bike lanes and construct sidewalk	$2,075,000	Medium

*NOTE: REQUIRES THE ELMINATION OF ON STREET PARKING

TABLE 5: PROPOSED OFF-ROAD TRAIL IMPROVEMENTS (FROM SANDY PARKS AND TRAILS MASTER PLAN)[A]

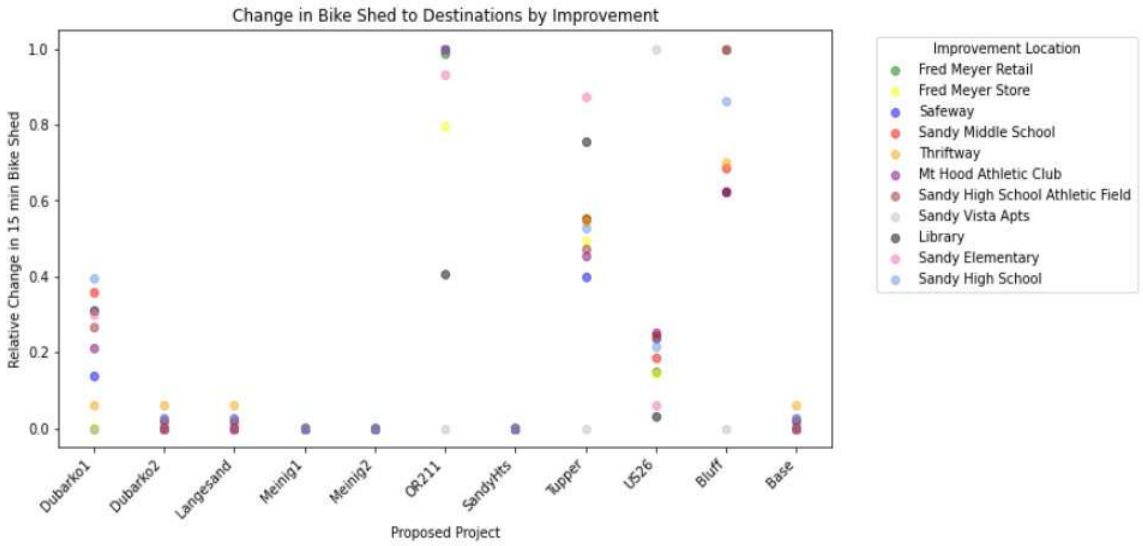
ID	PROJECT	DESCRIPTION	COST	PRIORIRTY
T03	362nd	6' - 8' wide gravel trail	$125,000	Medium
T04	Kelso to Powerline	6' - 8' wide gravel trail	$200,000	Medium
T05	Powerline	5' concrete path	$50,000	Medium
T06	Olson to Powerline	5' concrete path	$100,000	Medium
T08	Sandy Bluff Park to 362nd 3	6' - 8' wide gravel trail	150,000	Medium
T09	Sandy Bluff Park Pond Loop Trail 3	6' - 8' wide gravel trail	$50,000	Medium
T10	Bell Street to Sandy Bluff Park 3	6' - 8' wide gravel trail	$75,000	Medium
T11	Kate Schmidt to Bell Street 3	3' wide natural surface trail	$50,000	Medium
T12	SHS Trail Easement 1 3	3' wide natural surface trail	$100,000	Medium
T13	Meeker to MH Athletic Club	5' concrete path	$50,000	Medium
T17	Community Campus to Sandy River Trail	3' wide natural surface trail	$25,000	Medium
T19	Park Street to Community Campus	3' wide natural surface trail	$5,000	Medium
T21	Vista Loop to Hood Street	6' - 8' wide gravel trail	$50,000	Medium
T28	Tickle Creek Reroutes 3	6' - 8' wide gravel trail	$75,000	Medium
T30	Sunset Street to Tickle Creek	3' wide natural surface trail	$15,000	Medium
T31	Sunset Street to Nettie Connett Drive	5' wide concrete path	100,000	Medium
T32	Bluff Road to Sandy Heights	3' wide natural surface trail	$15,000	Medium
T33	Tupper Park to Gerilyn Court	5' concrete path	$50,000	Medium
T35	Tickle Creek Extension East to Dubarko Underpass	6' - 8' wide gravel trail	$75,000	Medium
T38	Tickle Creek to Deer Point Park	5' concrete path	450,000	Medium
T39	Dubarko Extension Road	8' wide asphalt trail	125,000	Medium
T40	Tickle Creek Extension Dubarko East to Jacoby	3 6' - 8' wide gravel trail	$100,000	Medium
T41	Alleyway to Tickle Creek Trail Connector	5' concrete path	$50,000	Medium

ID	PROJECT	DESCRIPTION	COST	PRIORIRTY
T42	Jacoby Road to Tickle Creek Connector	5' concrete path	$50,000	Medium
T44	Bornstedt Park	5' concrete path	$75,000	Medium
T50	Highway 211 Parkway		$400,000	Medium
T54	Cascadia to Tickle Creek	6' - 8' wide gravel trail	$30,000	Medium

A. The trail component of the existing Parks SDC is expected to fund these projects

The potential benefit of these bicycle projects on system connectivity was evaluated using a service area analysis tool in ArcGIS. This analysis measured the area accessible to people biking in 15 minutes from the key destinations in the city, including the commercial, educational, and cultural locations. The relative service area improvement of each bicycling system project was evaluated against the existing bicycle network. The results of this analysis are shown in Figure 3.

FIGURE 3: RELATIVE BENEFIT OF BICYCLE SYSTEM IMPROVEMENTS FOR KEY DESTINATIONS



Improvements to OR 211 (D25), Tupper Road (D10), and Bluff Road (B2) show the highest relative benefit to bicycle connectivity to most key destinations. The US 26 improvement (B12) is the only project that improves accessibility to the Sandy Vista Apartments.

TRANSIT SYSTEM IMPROVEMENTS

The projects in Table 6 were recommendations obtained from the Sandy Transit Master Plan[2] that can be referenced for more information about these specific projects. Most transit projects will be led by Sandy Area Metro and may require coordination with TriMet and the City of Gresham. TSP projects in other sections that were created to meet the needs of the transit improvements are noted.

TABLE 6: TRANSIT SYSTEM IMPROVEMENTS

PROJECT	DESCRIPTION
Local service improvements - Fixed routes	Add Saturday service, lengthening the service hours, adding an additional shuttle route that reaches the Vista Apartments.
Local service improvements - Flexible services	Add a bus and driver.
Local service improvements - Electric buses	Purchase one or more electric buses, a charging station, and the required maintenance equipment.
Additions to regional service - Gresham Express	Higher frequencies on Saturdays or Sundays, more night and morning service on Saturdays or Sundays, Occasional additional trips that go directly to important destinations.
Additions to regional service - New Clackamas Express	Coordinate with Clackamas County, the City of Boring and TriMet to plan and fund a route connecting these communities.
Additions to regional service - Improved bus stops	Coordinate with the City of Gresham and TriMet to invest in better stop amenities at the Gresham Transit Center.
Pedestrian Improvements - Transit Center	Improve access to the transit center by providing crossing treatments from every direction specifically at Proctor and Pioneer Blvd at Hoffman Ave. TSP projects include C3 & C4 – Hoffman Ave at Proctor and at Pioneer Crossing Improvement, these projects require coordination with ODOT.
Pedestrian Improvements - Evans St Crossing	Construct a crosswalk or traffic calming treatment on Evans St. TSP projects include C1 – Van Fleet Ave/Evans St Crossing Improvement, this project would be lead by SAM.

[2] Sandy Transit Master Plan, April 2020.

SAFETY IMPROVEMENTS

There are four locations where the historic crash analysis demonstrated a need for safety related improvements. The three locations on US 26 (362nd Drive, Ruben Lane, and Orient Drive) demonstrated crash causes that are attributable to high traffic volumes and urban traffic conditions. Implementing an adaptive traffic signal control plan along US 26 may reduce the frequency of these collisions because those systems typically reduce congestion and delay along a corridor. The turning collisions at OR 211 and Dubarko Road will likely be reduced with the installation of a traffic signal at that intersection, project D8. That improvement also serves driving needs and is included in Table 8. Potential safety improvements are shown in Table 7.

TABLE 7: SAFETY SYSTEM IMPROVEMENTS

PROJECT ID	NAME	DESCRIPTION	COST	PRIORITY
S1	US 26 Adaptive Signal System[A]	Install an adaptive signal control system on US 26 between Orient Drive and Bluff Road	$200,000	High
S2	US 26 at Ten Eyck Road Study	Study improvements to business access at Ten Eyck Road and US 26	$50,000	High
S3	US 26 Speed Zone Study	Study speeds east of Ten Eyck Road/Wolf Drive along US 26	$75,000	High

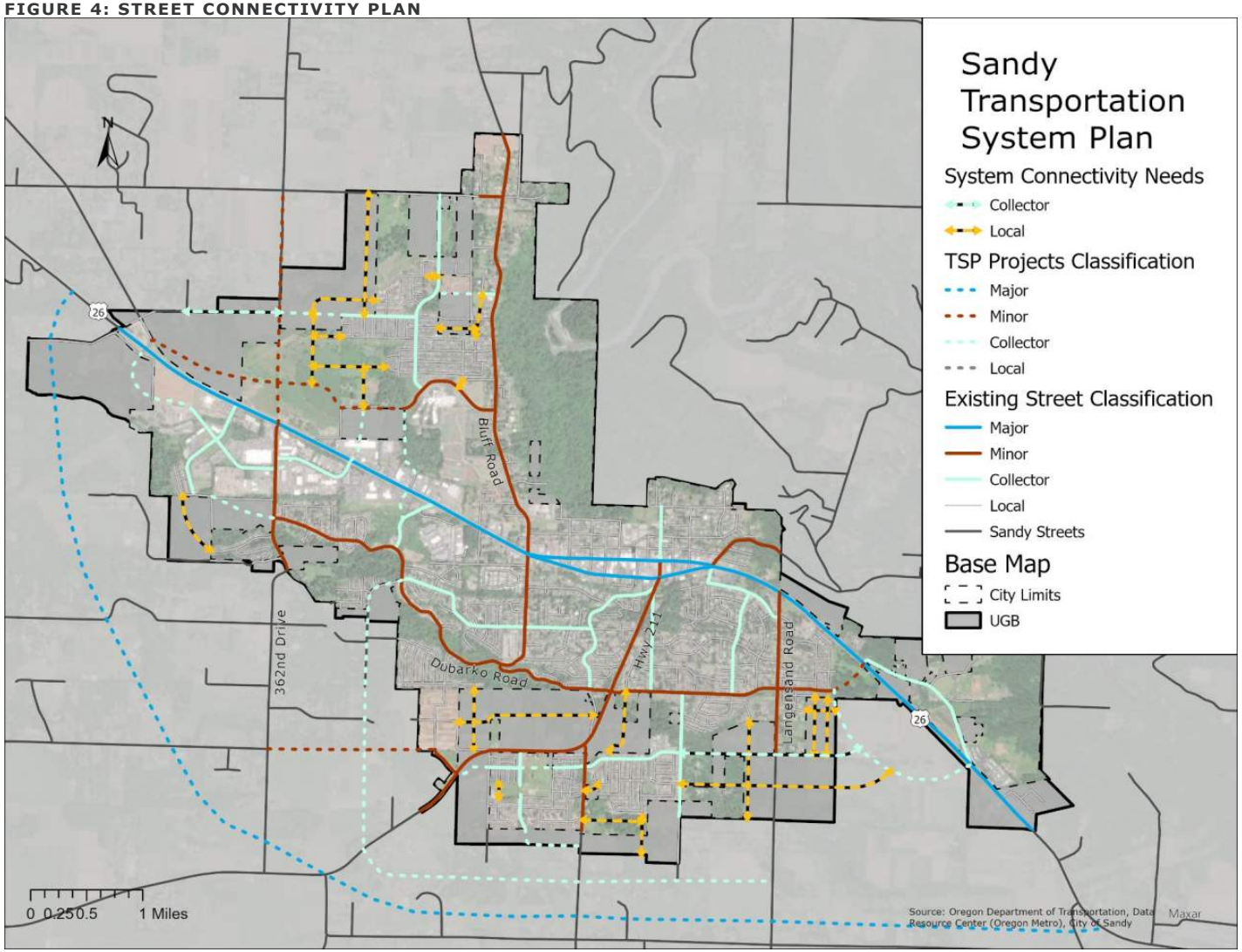
A. An adaptive signal system is currently in place between Bluff Road and Ten Eyck Road

UPDATE TO TSP SYSTEM CONNECTIVITY IMPROVEMENTS

By providing connectivity between neighborhoods, out-of-direction travel and vehicle miles traveled (VMT) can be reduced, the attractiveness of various travel modes enhanced, traffic levels can be balanced between various streets, and public safety response time is reduced. In the City of Sandy, several important new roadway connections will be needed within developed areas to reduce out of direction travel for vehicles, pedestrians, bicyclists, and transit services. New connections will be most critical in areas where a significant amount of new development is possible.

Figure 4 shows the Street Connectivity Plan for Sandy. In most cases, the connector alignments are not specific and are aimed at reducing potential neighborhood traffic impacts by balancing traffic flows on local streets. The arrows shown in the figures represent potential connections and the general direction for the placement of the connection. In each case, the specific alignments and design should be determined as part of development review, with consideration being given to the built environment, topography, and environmental conditions.

FIGURE 4: STREET CONNECTIVITY PLAN



Should new cul-de-sacs be created, bicycle and pedestrian accessways to provide a connection to the surrounding transportation system from the cul-de-sac shall be required per Section 17.100.120(D) of the SMC.

To protect existing neighborhoods from the potential traffic impacts caused by extending stub end streets, the City may require that appropriate traffic calming measures are incorporated into the design and construction of new street extensions. In addition, when a development constructs stub streets, the City may require the installation of signs indicating the potential for future connectivity to increase residents' awareness. Additionally, new developments that construct new streets or street extensions are required by Section 17.100.100(F) of the SMC to provide a proposed street map that:

- Provides full street connections with spacing of no more than 400 feet between connections except where prevented by barriers or access management standards on higher classified facilities.
- Provides bike and pedestrian accessways through the middle of the block when block lengths exceed 600 feet.
- Limits use of cul-de-sacs and other closed-end street systems to situations where existing barriers prevent full street connections.
- Includes no cul-de-sacs or close-end street longer than 400 feet. Those street segments longer than 400 feet, or developments with only one access point, may be required to provide an alternative access for emergency vehicle use only.
- Includes street cross-sections showing dimensions of right-of-way improvements, with streets designed for posted or expected speed limits which meet City design standards (or ODOT standards for state highways).

VEHICLE CAPACITY IMPROVEMENTS

Future improvement alternatives were previously developed and evaluated as part of the 2011 Sandy TSP[3] to enhance connectivity, provide access to developing lands, and address congestion in the US 26 corridor. The objective for each improvement alternative ranged from relying mainly on management and enhancement of the existing transportation system to large investments in new facilities to increase corridor capacity.

Two of the alternatives were carried forward into this plan. One alternative contains improvements to the street network that improve local connectivity for highway travel (Alternative #1) while the other alternative contains all the local connectivity projects in Alternative #1 and a US 26 bypass (Alternative #3). The phasing of projects based on the alternative is shown in Figure 5. Project descriptions can be found in Table 8.

[3] Sandy TSP Update, Technical Memo #2: Transportation Alternatives and Improvement Strategies, DKS Associates, February 25, 2011.

ALTERNATIVE #1

The improvements included in Alternative 1 were analyzed to assess operation benefits at the study intersections resulting from new system network and added capacity. Two intersections that did not meet mobility targets will do so with the improvements in Alternative #1.

- The intersection of US 26 and Industrial Way meets mobility targets with a reduction in demand at the eastbound, westbound, and northbound approaches.
- The intersection of OR 211 and Bornstedt Road meets mobility targets with the prohibition of the northbound left turn movement.

With the new local network connections north of US 26, particularly the Bell Street extension to Orient Drive, through volumes along US 26 are reduced in Alternative #1 which results in improvements to the operation of intersections along the highway.

Six intersections still fail to meet mobility targets under Alternative #1.

- **US 26 and Orient Drive** – There is a higher eastbound left traffic volume and lower eastbound through volume relative to the No Build condition however this reduction does not improve conditions enough for this intersection to meet mobility targets.
- **US 26 and 362nd Drive** – Lower traffic volumes for the eastbound and westbound approaches improve conditions at this intersection but it still fails to meet mobility targets.
- **362nd Drive and Industrial Way (north)** – With an additional southbound through lane that widens this intersection and increased traffic volumes, conditions remain LOS F for the Industrial Way approach.
- **362nd Drive and Industrial Way (south)** – The eastbound left turn lane improves conditions for that approach, but higher northbound and southbound volumes degrade conditions for the major approaches.
- **US 26 and Ruben Lane** – Lower traffic volumes for the eastbound and westbound approaches improve conditions at this intersection but it still fails to meet mobility targets.
- **US 26 and Bluff Road** – Lower traffic volumes for the eastbound left and through and westbound through movements improve conditions at this intersection but it still fails to meet mobility targets.

ALTERNATIVE #3 (US 26 BYPASS)

The improvements included in Alternative 1, combined with the bypass of the existing US 26 corridor, were analyzed to assess operation benefits at the study intersections. Because the impacts on the city street network will vary significantly with the locations and types of access allowed to the bypass, only the US 26 corridor intersections were evaluated to see how much the bypass could relieve congestion.

With the addition of a US 26 bypass only the intersection of US 26 and Orient Drive would exceed mobility targets. The eastbound through and southbound left movements at this intersection continue to compete for available green time in the cycle even with the addition of the bypass.

FIGURE 5: FUTURE STREET PROJECT IMPROVEMENTS

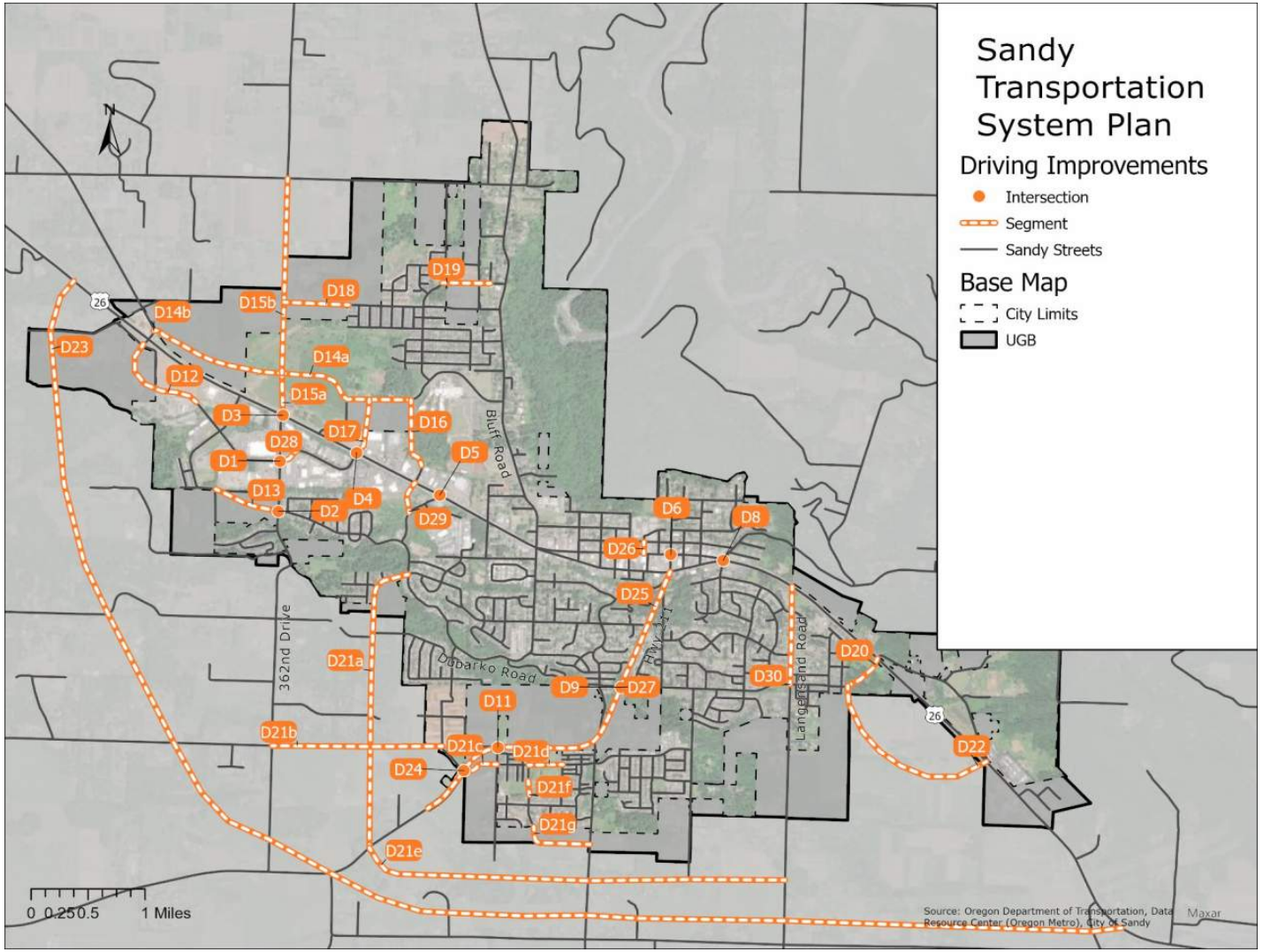


TABLE 8: STREET SYSTEM IMPROVEMENTS

PROJECT ID	NAME	DESCRIPTION	COST	PRIORITY
D1	362nd Drive & Industrial Way (south) Intersection Improvement	Reduce eastbound congestion. Project may include restriping to include an exclusive eastbound left turn lane and exclusive right turn lane.	$140,000	Medium
D2	362nd Drive & Dubarko Road Intersection Improvement	Reduce intersection congestion. Project may construct a traffic signal or roundabout.	$1,425,000	Medium
D3	US 26 & 362nd Drive Intersection Improvement	Reduce congestion for the westbound left turn and accommodate the 362nd Drive Extension 1. Project may include minor widening to accommodate a northbound through lane, construction of a three-lane southbound approach with a right turn lane, through lane, and left turn lane, and an eastbound left turn lane.	$6,525,000	FC - Funded
D4	US 26 & Industrial Way Intersection Improvement	Improve egress from commercial area and reduce northbound congestion. Project may include minor widening to accommodate a northbound left turn lane and restriping on the southbound approach to dual left turn lanes and a shared through/right turn lane.	$950,000	Low
D5	US 26 & Ruben Lane Intersection Improvement	Improve egress from commercial area and reduce northbound congestion. Project may include restriping southbound approach to dual left turns and a shared through/right lane and restriping the northbound approach to a left turn lane and shared through/right lane.	$950,000	Medium
D6	OR 211 & Proctor Boulevard Intersection Improvement	Reduce northbound congestion. Project may include restriping northbound approach to include an exclusive left turn lane and through/right lane.	$15,000	FC
D8	US 26 & Ten Eyck Road/Wolf Drive Intersection Improvement	Improve northbound and southbound approaches. Project may include striping left turn lanes on both minor street approaches.	$1,500,000	Low
D9	OR 211 & Dubarko Road Intersection Improvement	Reduce intersection congestion and improve safety. Project may include constructing a turn signal or roundabout. A traffic signal improvement may include minor widening for a northbound right turn lane, northbound left turn lane, and southbound left turn lane. Coordinate with C2 and D20.	$12,400,000	FC
D11	OR 211 & Arletha	Reduce northbound congestion. Project may	$3,150,000	Low

PROJECT ID	NAME	DESCRIPTION	COST	PRIORITY
	Court Intersection Improvement	include signage and approach modifications to prohibit left turns from the minor street approach.		
D12	Industrial Way Extension 1	Extend Industrial Way to Jarl Road/US 26 at Collector standards	$13,175,000	Low
D13	Dubarko Road Extension	Extend Dubarko Road to Champion Way at Collector standards	$7,450,000	Low
D14A	Bell Street Extension 1[A]	Extend Bell Street to 362nd Drive Extension 1 at Minor Arterial standards	$9,950,000	FC - Funded
D14B	Bell Street Extension 2	Extend Bell Street from 362ND Drive Extension 1 to Orient Drive at Minor Arterial standards	$9,900,000	Low
D15A	362nd Drive Extension 1[A]	Extend 362nd Drive to Bell Street Extension 1 at Minor Arterial standards	$3,000,000	FC - Funded
D15B	362nd Drive Extension 2	Extend 362nd Drive from Bell Street Extension 1 to Kelso Road at Minor Arterial standards	$14,000,000	Low
D16	Kate Schmidt Street Extension	Extend Kate Schmidt Street to Bell Street Extension 1 at Collector standards	$9,000,000	Medium
D17	Industrial Way Extension 2	Extend Industrial Way to Bell Street Extension 1 at Collector standards	$4,675,000	Medium
D18	Olson Road Extension	Extend Olson Road to 362nd Drive Extension 2 at Collector standards	$5,250,000	Low
D19	Agnes Street Extension	Extend Agnes Street to Bluff Road at Collector standards	$5,950,000	Low
D20	Dubarko Road Extension	Extend Dubarko Road to US 26/Vista Loop Road (west) at Minor Arterial standards, coordinate with D9 and C17	$3,900,000	FC
D21A	Sandy Heights Street/370th Avenue Extension	Extend Sandy Heights Street/370th Avenue to OR 211 at Collector standards	$24,350,000	Low
D21B	Gunderson Road Extension	Extend Gunderson Road from existing terminus near OR 211 to 362nd Drive at Collector standards	$13,750,000	Low
D21C	Cascadia Village Extension 1	Extend Cascadia Village from OR 211 to Arletha Court at Collector standards	$2,025,000	Low
D21D	Cascadia Village Extension 2	Extend Cascadia Village Drive from Village Boulevard to Pine Street at Collector standards	$2,175,000	Medium
D21E	New southern collector	Construct new a new road at Collector standards from OR 211 at the intersection with the Sandy Heights Street/370th Avenue	$33,550,000	Low

PROJECT ID	NAME	DESCRIPTION	COST	PRIORITY
		Extension to Langensand Road		
D21F	Village Boulevard Extension 1	Connect Village Boulevard at Collector standards between Cascadia Village Drive and Juniper Street	$875,000	FC
D21G	Village Boulevard Extension 2	Extend Village Boulevard at Collector standards from existing terminus south of Juniper Street to Bornstedt Road	$4,000,000	Low
D22	New eastern collector	Construct new a new road at Collector standards from Dubarko Road at the intersection with the Dubarko Road Extension to US 26/ Vista Loop Road (east)	$20,000,000	Low
D23	US 26 Bypass	Construct bypass from east of Orient Drive to Shorty's Corner (Firwood Road)	$390,000,000	Low
D24	OR 211 & Gunderson Road Intersection Improvement	Intersection improvement project includes a northbound left turn lane from OR 211 to Gunderson Road	$1,700,000	FC
D25	OR 211	Upgrade OR 211 to Minor Arterial standards from UGB to US 26, coordinate with P23	$22,000,000	Medium
D26	Alt Avenue	Reconstruct Alt Avenue from Proctor Blvd to Pleasant St to improve walkability and access to the Sandy Library	$11,000,000	High
D27	Hwy 211 & Dubarko Road Intersection Control Evaluation	Study intersection control and other options to improve safety and capacity	$50,000	FC
D28	Industrial Way Realignment	Realign Industrial Way (east of 362nd Drive) to connect with the intersection of Industrial Way (west of 362nd)	$4,150,000	Low
D29	Ruben Lane Realignment to Kate Schmitz	Realign Ruben Lane to the west to connect with Kate Schmitz Avenue and US 26	$3,700,000	Medium
D30	Langensand Road Truck Traffic Calming	Traffic calming measures along Langensand Road, potential treatments include bollards at the intersection of Langensand Road and US 26 and curb extensions along Langesand Road.	$175,000	Low
D31	Sandy Bypass Planning	Planning to support the proposed US 26 Sandy Bypass	$1,000,000	FC

A. This project is currently funded

FUNCTIONAL CLASSIFICATION

The motor vehicle classifications for streets help support the movement of vehicles by indicating the street's intended level of mobility, access, and use for vehicles. A city's street functional classification system is an important tool for managing the transportation system. It is based on a hierarchical system of roads in which streets of a higher classification, such as arterials, are designed for a higher level of mobility for through movements, while streets of a lower classification are designed to facilitate access to adjacent land uses. From highest to lowest intended use, the recommended classifications are Major Arterial, Minor Arterial, Neighborhood Arterial, Collector, and Local Streets. Streets with higher intended usage generally limit access to adjacent property in favor of more efficient motor vehicle traffic movement (i.e., mobility). Local roadways with lower intended usage have more driveway access and intersections, and generally accommodate shorter trips to nearby destinations.

In this TSP update, the Residential Minor Arterial functional classification has been removed with the following segments changed to Minor Arterial from Residential Minor Arterial:

- Dubarko Road
  - 362nd Drive to Eldrige Drive
  - Sandy Heights Street to Reich Court
  - Hwy 211 to Jacoby Road
- Langensand Road
  - Gary Street to McCormick Drive

The only other change in functional classification from the 2011 Sandy Transportation System Plan is OR 211 which is classified as a Minor Arterial (down from Major Arterial) due to the jurisdictional transfer from ODOT.

Major Arterial

Major arterials are typically three to five-lane highways that operate as two-way streets or as a one-way couplet. These roads are intended to handle high volumes of traffic, typically 16,000 ADT (Average Daily Traffic) or more. Major arterials provide greater regional mobility, are managed to favor through traffic capacity and safety over direct access and should generally be spaced approximately one mile apart. Private driveway access, on-street parking, and traffic calming measures are typically discouraged along major arterial routes and the provision of bike lanes or shoulders is required.

Minor Arterial

Minor arterials are high-volume, intra-city streets providing connectivity and parallel features, and should generally be spaced approximately one mile apart. These roads have a typical capacity between 8,000 and 16,000 ADT. Minor arterials are generally the most critical classification for circulation in the urban areas of Sandy and are intended to serve longer local trips. Private driveway access is discouraged where access to facilities of lower classification is available, and traffic calming measures and on-street parking should be avoided. The provision of bike lanes is required.

Collector

Collector streets provide both access and circulation within and between residential and commercial areas. These roads have a typical capacity between 2,000 and 6,000 ADT. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access (compared to arterials), and penetrate residential neighborhoods, distributing trips from the local street system to minor and major arterials. Collectors may provide on-street parking, may incorporate traffic calming measures, and should be spaced approximately one-half mile apart. The provision of bike lanes is required.

Local Street

Local streets have the sole function of providing immediate access to adjacent land. These streets have a typical capacity not exceeding 1,000 ADT. Service for through traffic movements on local streets is deliberately discouraged by design. All other City streets in the City of Sandy that are not designated as arterial streets or collector streets are local streets. Local streets may allow on-street parking and may incorporate traffic calming measures. Bike lanes are not required.

STREET CROSS SECTION STANDARDS

The design characteristics of Sandy's streets are defined in Section 17.100.110 of the SMC and were developed by the City to meet the function and demand for each facility type. Three updates to the design standards in the 2011 Sandy Transportation System Plan have been included in the design standards below. They are:

- A minimum bike lane width for Minor Arterials and Collectors of six feet.
- A minimum sidewalk width for Local streets of six feet. This makes sidewalk width consistent between functional class levels.
- Minimum local street travel lane width increased from 14 feet to 16 feet.
- Specific applications of the Blueprint for Urban Design along US 26 have been included for reference. The Blueprint for Urban Design controls the design of US 26 and the land use contexts below summarize conditions applicable to the City.

The actual design of a roadway can vary from segment to segment due to adjacent land uses, traffic demand, topography and/or resources. Some elements of a particular cross section design are necessary to provide for the unique needs of a class, but flexibility is also needed so that standards can be applied in a variety of circumstances. Minimum cross section dimensions are shown in Table 9.

Design standards for Major Arterials in Sandy (US 26) are controlled by the Blueprint for Urban Design in the Oregon Highway Design Manual and are not completely duplicated in the TSP. For reference, three land use contexts and highway design options are included in this discussion. Those contexts are:

- **Special Transportation Area (STA)** along Proctor Boulevard and Pioneer Boulevard between Bluff Road and Ten Eyck Road (Figure 6). In this urban context speeds are low, at or below 25 miles per hour, there are regular transit stops, and ample bicycle and pedestrian facilities to serve the expected higher volume of these users.

- **Commercial Corridor** west of Bluff Road (Figure 7). In this context speeds are moderate, typically between 30 and 35 miles per hour, there are regular transit stops and pedestrian and bicycle facilities should be buffered from the travel lanes.
- **Suburban Fringe** east of Ten Eyck Road (Figure 8). In this context speeds are higher, between 35 and 40 miles per hour. Pedestrian and bicycle facilities should be separated with a buffer and future uses of the surrounding land should be considered.

TABLE 9: STREET DIRECTIONAL CROSS SECTION DIMENTIONS[E]

CROSS SECTION	TOTAL ROW	SIDEWALK	PLANTER STRIP	PARKING	BIKE LANE	TRAVEL LANE	CENTER LANE[A]
MAJOR ARTERIAL - STA	58	7[CD]	-	8	6[A]	11	-
MAJOR ARTERIAL – COMMERCIAL CORRIDOR	102	6.5[C]	6.5[D]	-	7	12	14
MAJOR ARTERIAL – SUBURBAN FRINGE	94	10.5[CF]	8.5[D]	-	-	12	8
MINOR ARTERIAL – STANDARD	86	6.5[C]	5.5[D]	8	6	11	12
MINOR ARTERIAL – MINIMUM[B]	66	6.5[C]	5.5[D]	-	6	11	8
COLLECTOR - STANDARD	82	6.5[C]	5.5[D]	8	6	11	8
COLLECTOR – MINIMUM[B]	58	6.5[C]	5.5[D]	-	6	11	-
LOCAL	54	6.5[C]	5.5[D]	7	-	16[A]	-

A. Not directional, this element only appears once in the cross section

B. Minimum cross section designs can be applied per Section 17.66.00 SMC

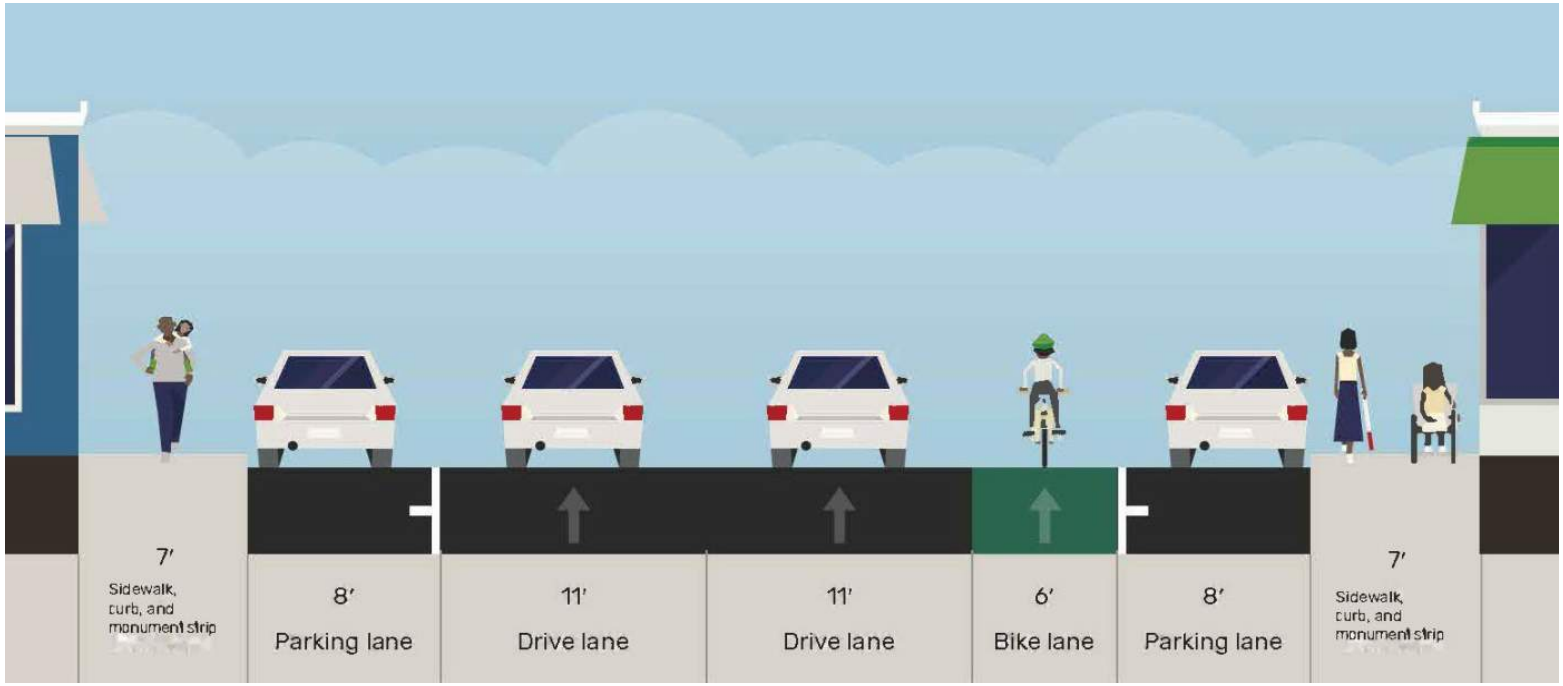
C. Includes 0.5’ monument strip

D. Includes 0.5’ curb

E. All dimensions in feet

F. As shared use path

FIGURE 6: US 26 SPECIAL TRANSPORTATION AREA[4]



[4] Streetmix.net accessed 12/03/2021

FIGURE 7: US 26 COMMERCIAL CORRIDOR[5]

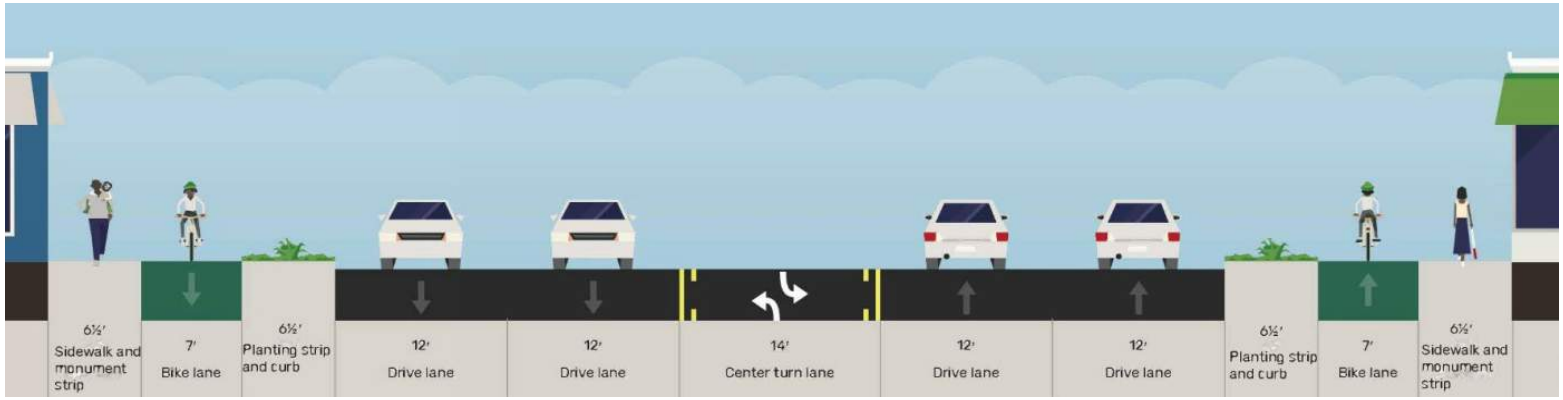
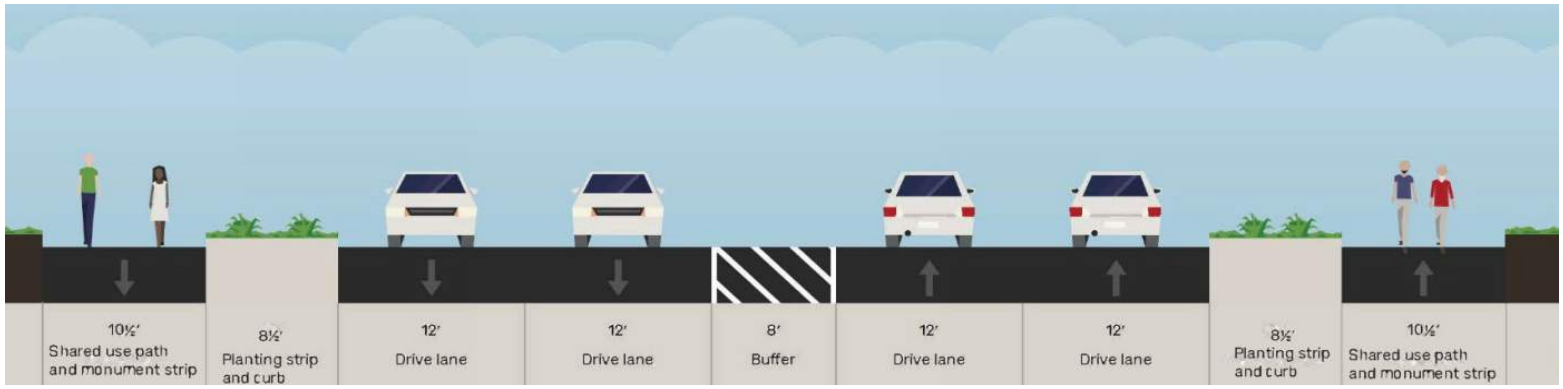


FIGURE 8: US 26 SUBURBAN FRINGE[6]



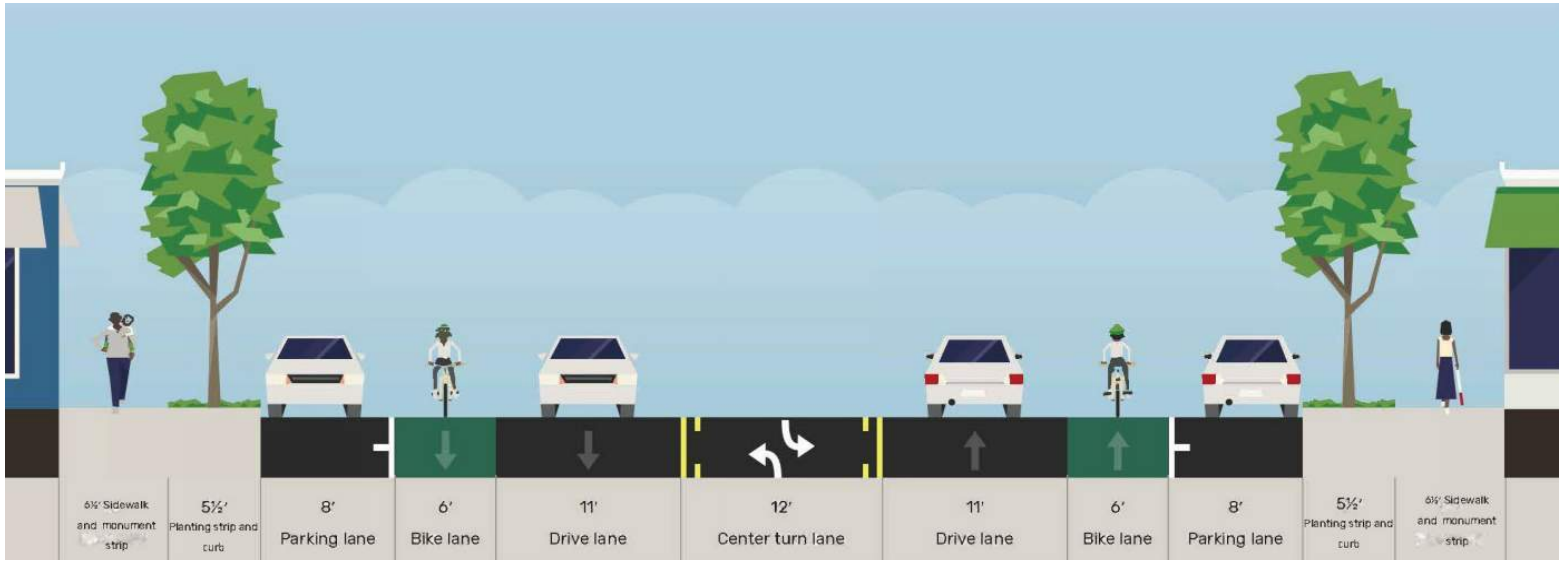
[5] Streetmix.net accessed 12/03/2021

[6] Streetmix.net accessed 12/03/2021

Minor Arterials

Some Minor arterials within Sandy include: 362nd Drive, Bluff Road, and OR 211. This street class should be spaced at 1-mile intervals which is approximately the distance between 362nd Drive and Bluff Road. The east-west and north-south spacing between most other minor arterials in Sandy is less than one mile. Design standards are shown in Figure 9.

FIGURE 9: MINOR ARTERIAL CROSS SECTION[7]

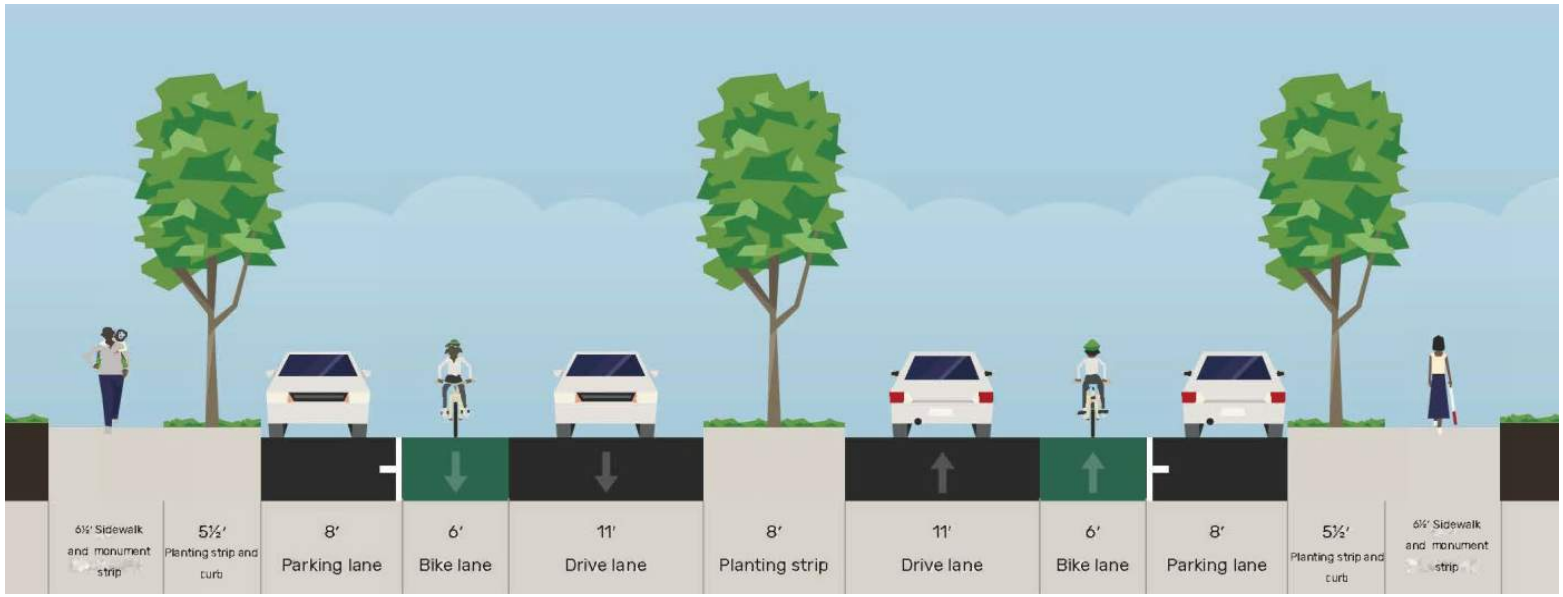


[7] Streetmix.net accessed 11/05/2021

Collectors

Some Collectors within Sandy include Industrial Way, Sandy Heights Street, and Jacoby Road. This street class should be spaced at half-mile intervals. Collector spacing in Sandy is currently less than half-mile intervals for all collectors (most are near 2000 feet). Design standards are show in Figure 10.

FIGURE 10: COLLECTOR CROSS SECTION[8]

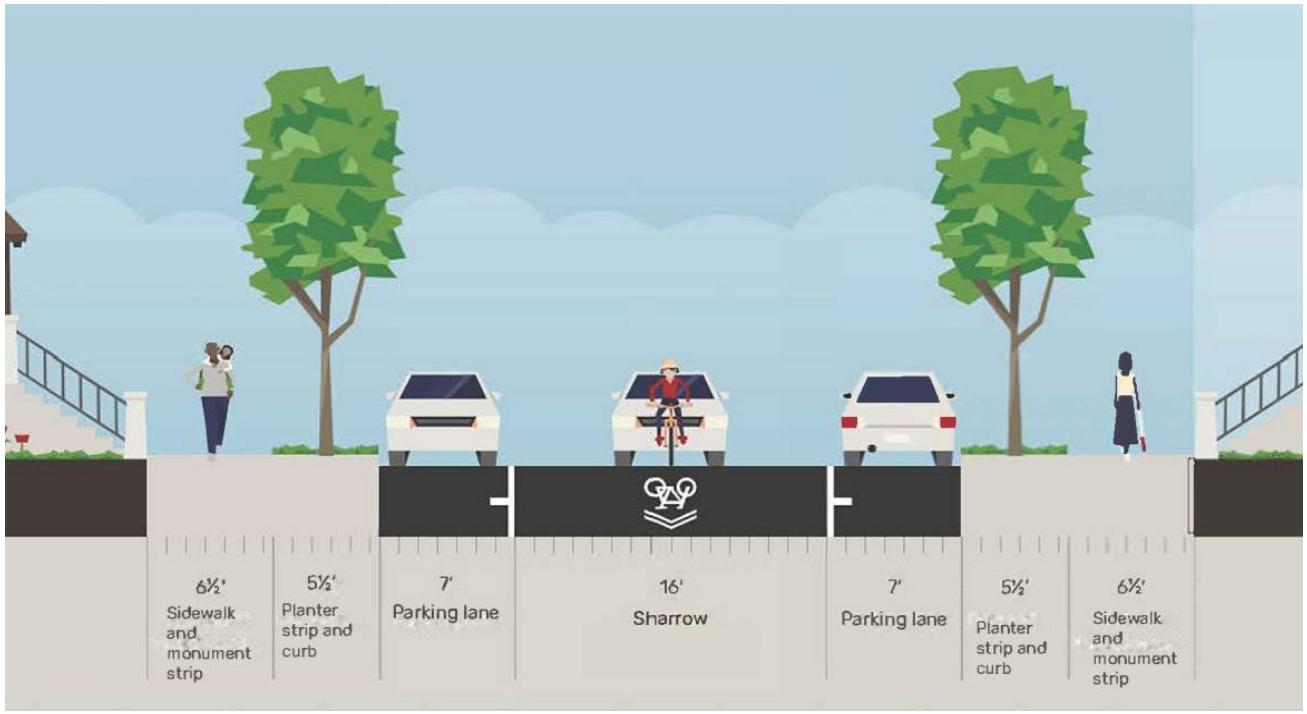


[8] Streetmix.net accessed 11/05/2021

Local Streets[9]

All streets not classified as Major Arterials, Minor/Residential Arterials, or Collectors are Local streets. Local streets should be spaced at 400 feet. Many local streets in Sandy are about 200 feet apart. Closer spacing of Local streets improves pedestrian connectivity but increases maintenance costs. Design standards are shown in Figures 11.

FIGURE 11: LOCAL STREET[10]



[9] The Junker Street Circulation Plan (2021) applies along Junker Street, Bruns Avenue, Strauss Avenue, and Pioneer Boulevard

[10] Streetmix.net accessed 11/05/2021

HIGH PRIORITY TRANSPORTATION IMPROVEMENTS

The preliminary list of high priority projects, shown in Table 9, addresses the multimodal needs previously identified based on the evaluation criteria. Community input and further technical analysis will further refine the recommended solutions to be included in the TSP update. The TSP planning process eliminates any project that may not be feasible for reasons other than financial (such as environmental or existing development limitations).

The full list includes 39 projects. Each project was assigned a primary source of funding for planning purposes (City or State) although such designations do not create any obligation for funding. The project design elements depicted are identified for the purpose of creating a reasonable cost estimate for planning purposes. The actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City and/or ODOT approval.

TABLE 10: PRELIMINARY HIGH PRIORITY PROJECTS

PROJECT ID	NAME	DESCRIPTION	COST	PRIMARY FUNDING
		PEDESTRIAN IMPROVEMENTS		
P1	362nd Dr.	Sidewalk infill Chinook Dr. to Industrial Wy.	$1,500,600	City
P7	Dubarko Rd.	Sidewalk infill Langensand Rd. to Antler Ave.	$47,580	City
P11	Langensand Rd.	Sidewalk infill Dubarko Rd. to US 26	$100,040	City
P14	Pleasant St.	Sidewalk infill Beers Ave. to Revenue Ave.	$211,060	City
P16	Sandy Heights St.	Sidewalk infill Bluff Rd. to Tupper Rd.	$214,720	City
P17	Downtown Core Pedestrian	Sidewalk infill side streets perpendicular to US 26	$350,140	City
P22	US 26[A]	Sidewalk infill Ten Eyck Rd. to Vista Loop Dr. West	Included in B12	ODOT
		ROADWAY CROSSING IMPROVEMENTS		
C1	Sandy Shopper Crossing - Evans	Evans Street Senior Apartments, traffic calming and other crossing improvements are needed. Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$17,550	City
C2	OR 211 Dubarko	Project may include pedestrian crossing	$111,150	City

PROJECT ID	NAME	DESCRIPTION	COST	PRIMARY FUNDING
	Crossing	advisory signage, curb extensions, marked crosswalks, and installation of RRFB. Coordinate with D9.		
C5	CRMS - Bluff Road at Marcy	Intersection improvement project may include: a Rectangular Rapid Flashing Beacon (RRFB) with School Crossing Assembly (S1-1 and W16-7P), and high visibility crosswalks across the north and east sides of the intersection.	$111,150	City
C6	CRMS - Bluff Road at Hood	Intersection improvement project may include: Install a curb extension including perpendicular curb ramps and tactile domes at northeast corner of Hood St. Install a curb extension to provide clearance from existing pole, including perpendicular curb ramps and tactile domes, at southeast corner. Mark crosswalk and stop bar across the east leg of intersection.	$17,550	City
C7	CRMS - Bluff Road at US 26	Intersection improvement project may include: Increase pedestrian signal crossing time to be based on a walking rate of 3.0 feet per second. Reconfigure crossing to provide perpendicular curb ramps with tactile domes and reduce curb radius at all corners. Add pedestrian-scale lighting. Reallocate existing roadway space to provide buffered bike lanes along Highway 26 and consider the use of green pavement markings in the vicinity of Bluff Rd. Consider installing vertical delineators with buffered bike lanes contingent on city maintenance agreement or construct a fully grade-separated bicycle facility.	$111,150	ODOT
C8	CRMS - Hood Street at Beers	At Beers Ave, repaint stop bars on west and east sides of intersection. Consider installation of a 4 way stop at Beers Ave.	$17,550	City
C9	CRMS - Hood Street at Scales	Install perpendicular curb ramps with tactile domes at northwest and southwest corners of the intersection of Hood St and Scales Ave. Install tactile domes at the northeast and	$17,550	City

PROJECT ID	NAME	DESCRIPTION	COST	PRIMARY FUNDING
		southeast corners. Repaint stop bars.		
C10	CRMS -Hood Street at Bruns	Install tactile dome at southwest corner of Bruns Ave and Hood St.	$17,550	City
C11	SGS - Hood/Strauss	Intersection improvement project may include: Relocate southbound school advance crossing assembly (S1-1 & W16-9P) and school speed limit assembly (S4-3P & R2-1) along Strauss Ave to approximately 100 ft and 175 ft north of intersection, respectively. Repair approximately 150 LF of degraded sidewalk along the east side of Strauss Ave at the intersection with Hood St and widen sidewalk at encroaching utility pole or relocate pole. Install a curb ramp on the east side of the south leg of the intersection of Strauss Ave at Hood St. Add tactile domes and a stop bar associated with the crosswalk across the west leg of the intersection.	$351,000	City
C12	SGS - Pleasant/Strauss	Intersection improvement project may include: Mark stop bars in advance of crosswalks. Consider revising the intersection of Pleasant St and Strauss Ave to be a four-way stop (currently STOP control north- and southbound only).	$17,550	City
C13	SGS - Pleasant/Alt	Intersection improvement project may include: Mark stop bars in advance of crosswalks. Replace existing diagonal curb ramps at all four corners with perpendicular curb ramps with tactile domes. Construct a raised intersection at Pleasant St at Alt Ave.	$351,000	City
C14	SGS - Smith/Pleasant	Mark stop bars in advance of crosswalks. Relocate southbound school advance crossing assembly (S1-1 & W16-9P) and school speed limit assembly (S4-3P & R2-1) along Smith Ave to approximately 100 ft and 175 ft north of intersection, respectively.	$17,550	City
C15	SGS - Alt/US 26	Intersection improvement project may include: Increase pedestrian signal crossing time to be based on a walking rate of 3.0 feet per second. Upgrade pedestrian push-buttons	$111,150	ODOT

PROJECT ID	NAME	DESCRIPTION	COST	PRIMARY FUNDING
		to meet current standards with audible indications. Consolidate the two existing crosswalks across Highway 26 at Alt Ave with one high visibility continental crosswalk on the east side of the intersection including advance stop bar, bulbouts, curb ramps, and pedestrian scale lighting.		
C18	Scales/Proctor	Intersection improvement project may include: marked crosswalks on all four legs with tactile domes on the ramps	$17,550	ODOT
C19	Scales/Pioneer	Intersection improvement project may include: marked crosswalks on all four legs with tactile domes on the ramps	$17,550	ODOT
C20	Bruns/Proctor	Intersection improvement project may include: marked crosswalks on all four legs with tactile domes on the ramps	$17,550	ODOT
C21	Bruns/Pioneer	Intersection improvement project may include: marked crosswalks on all four legs with tactile domes on the ramps	$17,550	ODOT
		BICYCLE IMPROVEMENTS		
B1	362nd Dr.	Widen shoulder to 6 feet minimum for bike access from Dubarko Rd. to UGB	$1,500,600	City
B2	Bluff Rd.	Re-stripe roadway to provide bike lanes from US 26 to Miller Rd.	$48,800	City
B3	Bornstedt Rd.	Widen roadway to provide bike lanes from OR 211 to UGB	$2,533,050	City
B4	Dubarko Rd.	Re-stripe roadway to provide bike lanes from 362nd Dr. to Eldridge Dr.	$43,920	City
B5	Dubarko Rd.	Re-stripe roadway to provide bike lanes from Sandy Heights St. to Melissa Ave.	$43,920	City
B6	Langensand Rd.	Re-stripe roadway to provide bike lanes from US 26 to UGB	$74,664	City
B7	Meinig Ave.	Re-stripe roadway to provide bike lanes from Scenic St. to US 26	$74,420	City

PROJECT ID	NAME	DESCRIPTION	COST	PRIMARY FUNDING
B8	Meinig Ave.	Re-stripe roadway to provide bike lanes from Barker Ct. to Dubarko Rd.	$20,740	City
B9	Sandy Heights	Re-stripe roadway to provide bike lanes from Bluff Rd. to Tupper Rd.	$48,800	City
B10	Tupper Rd.	Widen roadway to provide bike lanes from Long Circle to OR 211	$2,990,000	City
B12	US 26	Widen to provide a six-foot bike lane and sidewalk from Ten Eyck to East UGB	$7,716,500	ODOT
		SAFETY IMPROVEMENTS		
S1	US 26 Adaptive Signal System	Install an adaptive signal control system between Orient Drive and Ruben Lane	$200,000	ODOT
S2	US 26 at Ten Eyck Road Study	Study improvements to business access at Ten Eyck Road and US 26	$50,000	ODOT
S3	US 26 Speed Zone Study	Study speeds east of Ten Eyck Road/Wolf Drive along US 26	$75,000	ODOT
		DRIVING IMPROVEMENTS		
D3	US 26 & 362nd Drive Intersection Improvement	Reduce congestion for the westbound left turn and accommodate the 362nd Drive Extension 1. Project may include minor widening to accommodate a northbound through lane, construction of a three-lane southbound approach with a right turn lane, through lane, and left turn lane, and an eastbound left turn lane.	Funded	ODOT
D14A	Extend Bell St. to 362nd Dr[B]	Extend Bell Street to 362nd Drive Extension 1 at Minor Arterial cross section standards	Funded	City
D15A	Extend 362nd Dr to Bell Street[B]	Extend 362nd Drive to Bell Street Extension 1 at Minor Arterial cross section standards	Funded	City
D20	Extend Dubarko Rd. to US 26 opposite Vista Loop Dr. (West)	Extend Dubarko Road to US 26/Vista Loop Road (west) at Minor Arterial cross section standards. Coordinate with D9 and C17.	$3,744,000	City

PROJECT ID	NAME	DESCRIPTION	COST	PRIMARY FUNDING
D21F	Village Blvd Ext 1	Connect Village Boulevard at Collector standards between Cascadia Village Drive and Juniper Street	$865,800	City
D24	OR 211 Turn Lane to Gunderson	Intersection improvement project includes a northbound left turn lane from OR 211 to Gunderson Road	$1,000,000	City
D26	Alt Avenue	Reconstruct Alt Avenue from Proctor Blvd to Pleasant St to improve walkability and access to the Sandy Library	$10,941,750	City
D27	Hwy 211 & Dubarko Road Intersection Control Evaluation	Study intersection control and other options to improve safety and capacity	$50,000	City
TOTAL COST			$42,067,554	

A. A project completing the gap on the northern side of US 26 is currently funded.

B. This project is currently funded

APPENDIX

CONTENTS

SECTION 1. HCM RESULTS

SECTION 2. BYPASS PRELIMINARY DESIGN

SECTION 1. HCM RESULTS

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26

06/28/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	2205	15	10	1435	165	70	50	10	165	10	90
Future Volume (veh/h)	250	2205	15	10	1435	165	70	50	10	165	10	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	263	2321	16	11	1511	0	74	53	11	174	11	95
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	182	1735	774	73	1496		65	46	10	207	13	113
Arrive On Green	0.11	0.52	0.52	0.04	0.45	0.00	0.08	0.08	0.08	0.21	0.21	0.21
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	826	591	123	1008	64	550
Grp Volume(v), veh/h	263	2321	16	11	1511	0	138	0	0	280	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1540	0	0	1622	0	0
Q Serve(g_s), s	11.0	52.5	0.5	0.6	46.0	0.0	8.0	0.0	0.0	16.9	0.0	0.0
Cycle Q Clear(g_c), s	11.0	52.5	0.5	0.6	46.0	0.0	8.0	0.0	0.0	16.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.54		0.08	0.62		0.34
Lane Grp Cap(c), veh/h	182	1735	774	73	1496		121	0	0	333	0	0
V/C Ratio(X)	1.44	1.34	0.02	0.15	1.01		1.14	0.00	0.00	0.84	0.00	0.00
Avail Cap(c_a), veh/h	182	1735	774	73	1496		121	0	0	541	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.4	24.7	12.1	46.9	27.9	0.0	46.8	0.0	0.0	38.9	0.0	0.0
Incr Delay (d2), s/veh	227.8	156.2	0.0	0.6	25.8	0.0	124.9	0.0	0.0	6.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.9	55.0	0.2	0.3	21.0	0.0	7.3	0.0	0.0	7.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	273.3	180.9	12.1	47.4	53.8	0.0	171.7	0.0	0.0	45.3	0.0	0.0
LnGrp LOS	F	F	B	D	F		F	A	A	D	A	A
Approach Vol, veh/h		2600			1522	A		138			280	
Approach Delay, s/veh		189.2			53.7			171.7			45.3	
Approach LOS		F			D			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	50.0		24.9	8.5	56.5		12.0				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	10.5	43.0		33.0	4.0	49.5		7.5				
Max Q Clear Time (g_c+I1), s	13.0	48.0		18.9	2.6	54.5		10.0				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			134.3									
HCM 6th LOS			F									

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	1355	450	225	1415	250	185	260	300	50	150	65
Future Volume (veh/h)	200	1355	450	225	1415	250	185	260	300	50	150	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	211	1426	474	237	1489	263	195	274	316	53	158	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	261	1450	1003	463	1725	851	745	393	336	104	109	92
Arrive On Green	0.07	0.43	0.43	0.29	1.00	1.00	0.23	0.22	0.22	0.06	0.06	0.06
Sat Flow, veh/h	1688	3367	1502	3222	3313	1502	3300	1772	1511	1688	1772	1502
Grp Volume(v), veh/h	211	1426	474	237	1489	263	195	274	316	53	158	68
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1611	1657	1502	1650	1772	1511	1688	1772	1502
Q Serve(g_s), s	9.0	54.4	19.9	8.0	0.0	0.0	6.3	18.5	26.7	4.0	8.0	5.8
Cycle Q Clear(g_c), s	9.0	54.4	19.9	8.0	0.0	0.0	6.3	18.5	26.7	4.0	8.0	5.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	1450	1003	463	1725	851	745	393	336	104	109	92
V/C Ratio(X)	0.81	0.98	0.47	0.51	0.86	0.31	0.26	0.70	0.94	0.51	1.45	0.74
Avail Cap(c_a), veh/h	261	1450	1003	463	1725	851	761	402	343	234	245	208
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.51	0.51	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	36.5	10.5	42.5	0.0	0.0	41.4	46.5	49.7	59.1	61.0	60.0
Incr Delay (d2), s/veh	16.5	20.0	1.6	0.3	3.2	0.5	0.1	4.5	33.1	2.9	223.6	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.8	24.5	11.9	2.8	0.8	0.1	2.6	8.6	13.1	1.8	10.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	56.5	12.1	42.8	3.2	0.5	41.5	51.1	82.9	62.0	284.6	68.2
LnGrp LOS	D	E	B	D	A	A	D	D	F	E	F	E
Approach Vol, veh/h		2111			1989			785			279	
Approach Delay, s/veh		45.5			7.6			61.5			189.6	
Approach LOS		D			A			E			F	

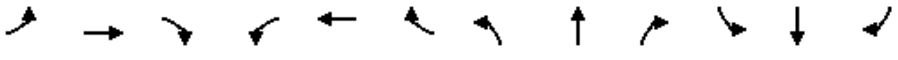
Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.7	60.0		12.0	13.0	71.7		33.4
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5
Max Green Setting (Gmax), s	10.0	* 54		18.0	9.0	55.0		29.5
Max Q Clear Time (g_c+I1), s	11.0	56.4		7.8	11.0	2.0		28.7
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	51.5		0.1

Intersection Summary	
HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1645	10	40	1595	50	170	25	100	220	45	135
Future Volume (vph)	50	1645	10	40	1595	50	170	25	100	220	45	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0	3.0	4.0		4.0	4.0	
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3315		1644	3358	1471	1693	1569		3317	1580	
Flt Permitted	0.08	1.00		0.06	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	140	3315		102	3358	1471	1693	1569		3317	1580	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	1679	10	41	1628	51	173	26	102	224	46	138
RTOR Reduction (vph)	0	0	0	0	0	20	0	91	0	0	71	0
Lane Group Flow (vph)	51	1689	0	41	1628	31	173	37	0	224	113	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	82.0	78.8		82.0	78.8	78.8	13.5	13.5		17.1	17.1	
Effective Green, g (s)	83.0	80.2		82.0	80.2	80.2	14.5	13.5		17.1	17.1	
Actuated g/C Ratio	0.64	0.62		0.63	0.62	0.62	0.11	0.10		0.13	0.13	
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	3.0	3.0		2.3	2.3	
Lane Grp Cap (vph)	133	2045		102	2071	907	188	162		436	207	
v/s Ratio Prot	c0.01	c0.51		0.01	0.48		c0.10	0.02		0.07	c0.07	
v/s Ratio Perm	0.23			0.24		0.02						
v/c Ratio	0.38	0.83		0.40	0.79	0.03	0.92	0.23		0.51	0.54	
Uniform Delay, d1	35.2	19.4		40.6	18.5	9.7	57.2	53.5		52.6	52.8	
Progression Factor	0.38	0.21		0.47	0.46	0.50	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	2.4		1.0	2.1	0.0	43.5	0.7		0.6	2.0	
Delay (s)	14.1	6.4		20.1	10.6	4.9	100.7	54.2		53.2	54.8	
Level of Service	B	A		C	B	A	F	D		D	D	
Approach Delay (s)		6.6			10.7			80.9			53.9	
Approach LOS		A			B			F			D	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
5: Ruben Lane & US 26

06/28/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	1625	210	55	1450	95	115	80	35	210	55	165
Future Volume (veh/h)	125	1625	210	55	1450	95	115	80	35	210	55	165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1758	1758	1758	1800	1800	1800
Adj Flow Rate, veh/h	126	1641	0	56	1465	96	116	81	35	212	56	167
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	0	0	0
Cap, veh/h	420	2226		232	1638	713	184	118	51	256	30	90
Arrive On Green	0.41	1.00	0.00	0.03	0.48	0.48	0.11	0.10	0.10	0.08	0.08	0.08
Sat Flow, veh/h	1688	3331	1502	1661	3383	1473	1674	1160	501	3326	393	1173
Grp Volume(v), veh/h	126	1641	0	56	1465	96	116	0	116	212	0	223
Grp Sat Flow(s),veh/h/ln	1688	1666	1502	1661	1692	1473	1674	0	1661	1663	0	1567
Q Serve(g_s), s	0.0	0.0	0.0	2.5	51.2	4.7	8.6	0.0	8.8	8.2	0.0	10.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.5	51.2	4.7	8.6	0.0	8.8	8.2	0.0	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		0.75
Lane Grp Cap(c), veh/h	420	2226		232	1638	713	184	0	169	256	0	121
V/C Ratio(X)	0.30	0.74		0.24	0.89	0.13	0.63	0.00	0.69	0.83	0.00	1.85
Avail Cap(c_a), veh/h	420	2226		234	1639	714	476	0	460	256	0	121
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.53	0.00	0.46	0.46	0.46	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.0	0.0	0.0	19.8	30.5	18.5	55.4	0.0	56.4	59.2	0.0	60.0
Incr Delay (d2), s/veh	0.1	1.2	0.0	0.1	4.0	0.2	2.2	0.0	3.0	19.2	0.0	412.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.4	0.0	0.9	20.7	1.6	3.8	0.0	3.9	4.2	0.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	1.2	0.0	19.9	34.5	18.7	57.6	0.0	59.3	78.3	0.0	472.7
LnGrp LOS	C	A		B	C	B	E	A	E	E	A	F
Approach Vol, veh/h		1767	A		1617			232			435	
Approach Delay, s/veh		3.3			33.0			58.5			280.5	
Approach LOS		A			C			E			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.9	90.9		14.0	31.8	66.9		17.3
Change Period (Y+Rc), s	4.0	* 5.4		4.0	* 5.4	* 5.4		4.0
Max Green Setting (Gmax), s	4.0	* 63		10.0	* 5	* 62		36.0
Max Q Clear Time (g_c+I1), s	4.5	2.0		12.0	2.0	53.2		10.8
Green Ext Time (p_c), s	0.0	59.0		0.0	0.1	8.3		0.8

Intersection Summary	
HCM 6th Ctrl Delay	48.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	1640	180	70	1370	295	90	5	25	265	145	85
Future Volume (veh/h)	80	1640	180	70	1370	295	90	5	25	265	145	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	82	1673	184	71	1398	301	92	5	26	270	148	87
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	127	1408	626	375	1675	834	115	30	155	216	191	112
Arrive On Green	0.04	0.42	0.42	0.19	0.57	0.57	0.07	0.12	0.13	0.13	0.18	0.19
Sat Flow, veh/h	1688	3367	1498	1647	2941	1465	1701	245	1275	1701	1053	619
Grp Volume(v), veh/h	82	1673	184	71	1398	301	92	0	31	270	0	235
Grp Sat Flow(s),veh/h/ln	1688	1683	1498	1647	1470	1465	1701	0	1520	1701	0	1672
Q Serve(g_s), s	3.4	46.0	6.6	0.0	42.9	12.3	5.9	0.0	2.0	14.0	0.0	14.7
Cycle Q Clear(g_c), s	3.4	46.0	6.6	0.0	42.9	12.3	5.9	0.0	2.0	14.0	0.0	14.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.84	1.00		0.37
Lane Grp Cap(c), veh/h	127	1408	626	375	1675	834	115	0	185	216	0	303
V/C Ratio(X)	0.65	1.19	0.29	0.19	0.83	0.36	0.80	0.00	0.17	1.25	0.00	0.78
Avail Cap(c_a), veh/h	127	1408	626	375	1675	834	186	0	414	216	0	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.55	0.55	0.55	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.3	32.0	11.4	36.3	19.4	12.8	50.6	0.0	43.1	48.0	0.0	42.8
Incr Delay (d2), s/veh	5.3	89.0	0.7	0.1	5.1	1.2	7.7	0.0	0.3	143.7	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	34.9	2.3	1.6	15.2	4.2	2.8	0.0	0.8	14.6	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.6	121.0	12.1	36.4	24.5	14.0	58.2	0.0	43.4	191.7	0.0	45.4
LnGrp LOS	C	F	B	D	C	B	E	A	D	F	A	D
Approach Vol, veh/h		1939			1770			123			505	
Approach Delay, s/veh		106.9			23.2			54.5			123.7	
Approach LOS		F			C			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.6	50.0	11.4	23.9	8.0	66.6	18.0	17.4
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.0	4.0	4.0	4.5
Max Green Setting (Gmax), s	4.6	45.2	12.0	31.5	4.0	46.0	14.0	29.5
Max Q Clear Time (g_c+I1), s	12.0	48.0	7.9	16.7	5.4	44.9	16.0	4.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	1.1	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	73.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	60	15	395	380	5
Future Vol, veh/h	5	60	15	395	380	5
Conflicting Peds, #/hr	1	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	180	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	1	1	3	3
Mvmt Flow	5	63	16	416	400	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	854	406	407	0	-	0
Stage 1	405	-	-	-	-	-
Stage 2	449	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.11	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.209	-	-	-
Pot Cap-1 Maneuver	326	641	1157	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	639	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	320	639	1155	-	-	-
Mov Cap-2 Maneuver	320	-	-	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	638	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1155	-	320	639	-	-
HCM Lane V/C Ratio	0.014	-	0.016	0.099	-	-
HCM Control Delay (s)	8.2	0	16.4	11.3	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.3	-	-

Intersection	
Int Delay, s/veh	17

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	185	85	505	245	15	670
Future Vol, veh/h	185	85	505	245	15	670
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	1	1	3	3
Mvmt Flow	195	89	532	258	16	705

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1046	663	0	0	790	0
Stage 1	661	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Critical Hdwy	6.66	6.26	-	-	4.145	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.538	3.338	-	-	2.2285	-
Pot Cap-1 Maneuver	235	456	-	-	822	-
Stage 1	508	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	231	455	-	-	822	-
Mov Cap-2 Maneuver	231	-	-	-	-	-
Stage 1	508	-	-	-	-	-
Stage 2	641	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	106.6	0	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	273	822	-
HCM Lane V/C Ratio	-	-	1.041	0.019	-
HCM Control Delay (s)	-	-	106.6	9.5	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	11	0.1	-

Intersection	
Intersection Delay, s/veh	221.9
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	100	255	65	650	850	5
Future Vol, veh/h	100	255	65	650	850	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	105	268	68	684	895	5
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	18.1	203.4	322
HCM LOS	C	F	F

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	9%	100%	0%	0%	0%
Vol Thru, %	91%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	715	100	255	850	5
LT Vol	65	100	0	0	0
Through Vol	650	0	0	850	0
RT Vol	0	0	255	0	5
Lane Flow Rate	753	105	268	895	5
Geometry Grp	4	7	7	7	7
Degree of Util (X)	1.376	0.237	0.514	1.66	0.009
Departure Headway (Hd)	7.422	9.469	8.203	7.144	6.423
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	497	382	443	519	561
Service Time	5.422	7.169	5.903	4.844	4.123
HCM Lane V/C Ratio	1.515	0.275	0.605	1.724	0.009
HCM Control Delay	203.4	15.1	19.3	323.8	9.2
HCM Lane LOS	F	C	C	F	A
HCM 95th-tile Q	30.9	0.9	2.9	48.1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	55	1390	15	250	50	0	0	100	25
Future Volume (veh/h)	0	0	0	55	1390	15	250	50	0	0	100	25
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				58	1463	16	263	53	0	0	105	26
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				68	1811	21	441	612	0	0	473	117
Arrive On Green				0.55	0.55	0.55	0.58	0.58	0.00	0.00	0.35	0.35
Sat Flow, veh/h				124	3284	38	1289	1772	0	0	1369	339
Grp Volume(v), veh/h				805	0	732	263	53	0	0	0	131
Grp Sat Flow(s),veh/h/ln				1724	0	1723	1289	1772	0	0	0	1708
Q Serve(g_s), s				43.2	0.0	36.5	17.5	1.5	0.0	0.0	0.0	6.0
Cycle Q Clear(g_c), s				43.2	0.0	36.5	23.5	1.5	0.0	0.0	0.0	6.0
Prop In Lane				0.07		0.02	1.00		0.00	0.00		0.20
Lane Grp Cap(c), veh/h				950	0	950	441	612	0	0	0	590
V/C Ratio(X)				0.85	0.00	0.77	0.60	0.09	0.00	0.00	0.00	0.22
Avail Cap(c_a), veh/h				1003	0	1002	441	612	0	0	0	590
HCM Platoon Ratio				1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.87	0.87	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				20.8	0.0	19.3	22.5	15.5	0.0	0.0	0.0	25.5
Incr Delay (d2), s/veh				9.2	0.0	6.0	5.1	0.2	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				19.1	0.0	15.7	5.1	0.6	0.0	0.0	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				30.0	0.0	25.3	27.6	15.8	0.0	0.0	0.0	25.7
LnGrp LOS				C	A	C	C	B	A	A	A	C
Approach Vol, veh/h					1537			316			131	
Approach Delay, s/veh					27.7			25.7			25.7	
Approach LOS					C			C			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	42.0	64.7	42.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	38.0	64.0	38.0
Max Q Clear Time (g_c+I1), s	8.0	45.2	25.5
Green Ext Time (p_c), s	0.4	15.4	1.1

Intersection Summary	
HCM 6th Ctrl Delay	27.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	1320	520	0	0	0	0	225	295	85	70	0
Future Volume (veh/h)	80	1320	520	0	0	0	0	225	295	85	70	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	84	1389	0				0	237	311	89	74	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	107	1853					0	451	375	111	620	0
Arrive On Green	0.57	0.57	0.00				0.00	0.25	0.25	0.02	0.12	0.00
Sat Flow, veh/h	188	3258	1502				0	1772	1473	1647	1730	0
Grp Volume(v), veh/h	789	684	0				0	237	311	89	74	0
Grp Sat Flow(s),veh/h/ln	1763	1683	1502				0	1772	1473	1647	1730	0
Q Serve(g_s), s	38.4	32.5	0.0				0.0	12.7	21.9	5.9	4.2	0.0
Cycle Q Clear(g_c), s	38.4	32.5	0.0				0.0	12.7	21.9	5.9	4.2	0.0
Prop In Lane	0.11		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1002	957					0	451	375	111	620	0
V/C Ratio(X)	0.79	0.71					0.00	0.53	0.83	0.80	0.12	0.00
Avail Cap(c_a), veh/h	1002	957					0	451	375	165	676	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.93	0.93	0.98	0.98	0.00
Uniform Delay (d), s/veh	18.5	17.2	0.0				0.0	35.3	38.7	53.0	33.0	0.0
Incr Delay (d2), s/veh	6.2	4.6	0.0				0.0	4.0	17.6	11.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	13.3	0.0				0.0	5.8	9.5	2.9	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	21.8	0.0				0.0	39.3	56.4	64.3	33.0	0.0
LnGrp LOS	C	C					A	D	E	E	C	A
Approach Vol, veh/h		1473	A					548			163	
Approach Delay, s/veh		23.4						49.0			50.1	
Approach LOS		C						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	66.6	43.4	11.4	32.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.8
Max Green Setting (Gmax), s	59.0	43.0	11.0	27.2
Max Q Clear Time (g_c+I1), s	40.4	6.2	7.9	23.9
Green Ext Time (p_c), s	14.8	0.2	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	1365	130	10	1175	20	90	25	10	135	20	150
Future Volume (veh/h)	155	1365	130	10	1175	20	90	25	10	135	20	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	163	1437	137	11	1237	21	95	26	11	142	21	158
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	366	1887	841	192	1494	666	193	254	108	331	38	283
Arrive On Green	0.22	0.56	0.56	0.12	0.46	0.46	0.21	0.21	0.20	0.21	0.21	0.20
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	1259	1201	508	1399	178	1339
Grp Volume(v), veh/h	163	1437	137	11	1237	21	95	0	37	142	0	179
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1259	0	1709	1399	0	1517
Q Serve(g_s), s	9.2	36.0	4.9	0.7	36.7	0.9	8.1	0.0	1.9	10.1	0.0	11.7
Cycle Q Clear(g_c), s	9.2	36.0	4.9	0.7	36.7	0.9	19.8	0.0	1.9	12.0	0.0	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		0.88
Lane Grp Cap(c), veh/h	366	1887	841	192	1494	666	193	0	362	331	0	321
V/C Ratio(X)	0.44	0.76	0.16	0.06	0.83	0.03	0.49	0.00	0.10	0.43	0.00	0.56
Avail Cap(c_a), veh/h	366	2121	945	192	1640	732	203	0	376	342	0	334
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.3	18.5	11.7	43.0	25.8	16.1	48.1	0.0	35.1	40.2	0.0	39.4
Incr Delay (d2), s/veh	0.5	3.0	0.4	0.1	5.4	0.1	1.5	0.0	0.1	0.7	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	14.3	1.7	0.3	14.3	0.3	2.6	0.0	0.8	3.5	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	21.5	12.1	43.1	31.2	16.2	49.5	0.0	35.2	40.9	0.0	40.9
LnGrp LOS	D	C	B	D	C	B	D	A	D	D	A	D
Approach Vol, veh/h		1737			1269			132			321	
Approach Delay, s/veh		22.3			31.0			45.5			40.9	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	17.1	65.7		27.3	27.9	54.8		27.3
Change Period (Y+Rc), s	4.5	4.0		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.6	69.3		22.7	17.5	55.8		22.7
Max Q Clear Time (g_c+I1), s	12.7	38.0		14.0	11.2	38.7		21.8
Green Ext Time (p_c), s	0.0	23.7		0.7	0.2	12.2		0.0

Intersection Summary	
HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1390	100	110	1220	25	85
Future Vol, veh/h	1390	100	110	1220	25	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1463	105	116	1284	26	89

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1568	0	2337	732
Stage 1	-	-	-	-	1463	-
Stage 2	-	-	-	-	874	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	398	-	32	368
Stage 1	-	-	-	-	183	-
Stage 2	-	-	-	-	373	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	398	-	~ 23	368
Mov Cap-2 Maneuver	-	-	-	-	~ 23	-
Stage 1	-	-	-	-	183	-
Stage 2	-	-	-	-	264	-

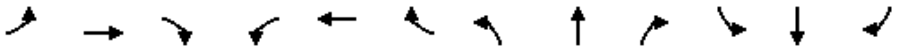
Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	122.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	23	368	-	-	398	-
HCM Lane V/C Ratio	1.144	0.243	-	-	0.291	-
HCM Control Delay (s)	$ 479.7	17.9	-	-	17.7	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	3.4	0.9	-	-	1.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary
17: Dubarko Ext/Vista Loop West & US 26

06/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	1350	5	100	1240	0	5	5	100	5	0	100
Future Volume (veh/h)	130	1350	5	100	1240	0	5	5	100	5	0	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1772	1772	1716	1716	1772	1772	1772	1800	1723	1800
Adj Flow Rate, veh/h	137	1421	5	106	1305	0	5	5	105	5	0	105
Peak Hour Factor	0.95	0.95	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	2	6	6	2	2	2	0	2	0
Cap, veh/h	177	2488	1119	136	2347	0	82	0	4	82	0	4
Arrive On Green	0.11	0.75	0.75	0.08	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1674	3340	1502	1688	3346	0	77	77	1614	78	0	1641
Grp Volume(v), veh/h	137	1421	5	106	1305	0	115	0	0	110	0	0
Grp Sat Flow(s),veh/h/ln	1674	1670	1502	1688	1630	0	1768	0	0	1719	0	0
Q Serve(g_s), s	3.7	8.7	0.0	2.8	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.7	8.7	0.0	2.8	8.6	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.04		0.91	0.05		0.95
Lane Grp Cap(c), veh/h	177	2488	1119	136	2347	0	86	0	0	86	0	0
V/C Ratio(X)	0.77	0.57	0.00	0.78	0.56	0.00	1.34	0.00	0.00	1.28	0.00	0.00
Avail Cap(c_a), veh/h	656	5089	2288	551	4754	0	969	0	0	938	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.0	2.6	1.5	20.7	3.0	0.0	23.0	0.0	0.0	23.0	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.4	0.0	6.9	0.4	0.0	166.7	0.0	0.0	141.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.2	0.0	1.1	0.1	0.0	4.8	0.0	0.0	4.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	3.0	1.5	27.6	3.4	0.0	189.7	0.0	0.0	164.6	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	F	A	A	F	A	A
Approach Vol, veh/h		1563			1411			115			110	
Approach Delay, s/veh		5.0			5.3			189.7			164.6	
Approach LOS		A			A			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	37.1		0.0	7.7	38.2		0.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	18.0	67.0		23.0	15.0	70.0		23.0				
Max Q Clear Time (g_c+I1), s	5.7	10.6		0.0	4.8	10.7		0.0				
Green Ext Time (p_c), s	0.2	20.0		0.0	0.2	23.6		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	17.2
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	21.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1450	5	100	1335	25	5	5	100	10	0	0
Future Vol, veh/h	5	1450	5	100	1335	25	5	5	100	10	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	100	150	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1526	5	105	1405	26	5	5	105	11	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1431	0	0	1531	0	0	2449	3177	763	2404	-	-
Stage 1	-	-	-	-	-	-	1536	1536	-	1628	-	-
Stage 2	-	-	-	-	-	-	913	1641	-	776	-	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	-	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	-	-
Pot Cap-1 Maneuver	471	-	-	431	-	-	16	10	347	17	0	0
Stage 1	-	-	-	-	-	-	121	176	-	106	0	0
Stage 2	-	-	-	-	-	-	294	156	-	356	0	0
Platoon blocked, %		-	-		-	-						-
Mov Cap-1 Maneuver	471	-	-	431	-	-	13	7	347	~ 4	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	13	7	-	~ 4	-	-
Stage 1	-	-	-	-	-	-	120	174	-	105	-	-
Stage 2	-	-	-	-	-	-	222	118	-	238	-	-

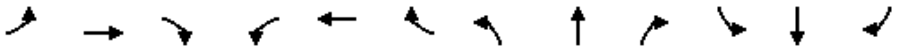
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.1	$ 357.9	$ 2367.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	79	471	-	-	431	-	-	4
HCM Lane V/C Ratio	1.466	0.011	-	-	0.244	-	-	2.632
HCM Control Delay (s)	$ 357.9	12.7	-	-	16	-	-	$ 2367.8
HCM Lane LOS	F	B	-	-	C	-	-	F
HCM 95th %tile Q(veh)	9.3	0	-	-	0.9	-	-	2.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary
20: Hwy 211 & Dubarko Rd

06/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	30	135	240	105	30	30	300	415	10	470	15
Future Volume (veh/h)	40	30	135	240	105	30	30	300	415	10	470	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1800	1800	1772	1772	1772	1772	1772	1772	1758	1758	1758
Adj Flow Rate, veh/h	42	32	142	253	111	32	32	316	437	11	495	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2	2	2	2	3	3	3
Cap, veh/h	378	43	193	436	355	102	302	728	614	337	693	584
Arrive On Green	0.03	0.15	0.15	0.15	0.27	0.27	0.03	0.41	0.41	0.01	0.39	0.39
Sat Flow, veh/h	1714	288	1277	1688	1322	381	1688	1772	1494	1674	1758	1482
Grp Volume(v), veh/h	42	0	174	253	0	143	32	316	437	11	495	16
Grp Sat Flow(s),veh/h/ln	1714	0	1565	1688	0	1703	1688	1772	1494	1674	1758	1482
Q Serve(g_s), s	1.2	0.0	6.2	6.8	0.0	3.9	0.7	7.4	14.2	0.2	13.8	0.4
Cycle Q Clear(g_c), s	1.2	0.0	6.2	6.8	0.0	3.9	0.7	7.4	14.2	0.2	13.8	0.4
Prop In Lane	1.00		0.82	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	378	0	236	436	0	458	302	728	614	337	693	584
V/C Ratio(X)	0.11	0.00	0.74	0.58	0.00	0.31	0.11	0.43	0.71	0.03	0.71	0.03
Avail Cap(c_a), veh/h	438	0	565	499	0	820	371	1158	977	434	1149	969
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	0.0	23.6	15.7	0.0	17.0	12.1	12.3	14.3	11.2	14.8	10.8
Incr Delay (d2), s/veh	0.1	0.0	3.3	1.0	0.0	0.3	0.1	0.9	3.3	0.0	2.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	2.3	2.4	0.0	1.4	0.2	2.5	4.6	0.1	5.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	0.0	26.9	16.7	0.0	17.3	12.2	13.1	17.5	11.2	17.8	10.8
LnGrp LOS	B	A	C	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h		216			396			785			522	
Approach Delay, s/veh		25.5			16.9			15.5			17.4	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	27.9	12.8	12.8	5.6	26.9	6.0	19.6
Change Period (Y+Rc), s	4.0	4.8	4.0	4.0	4.0	4.8	4.0	4.0
Max Green Setting (Gmax), s	4.0	37.2	11.0	21.0	4.0	37.2	4.0	28.0
Max Q Clear Time (g_c+I1), s	2.2	16.2	8.8	8.2	2.7	15.8	3.2	5.9
Green Ext Time (p_c), s	0.0	6.9	0.2	0.4	0.0	4.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

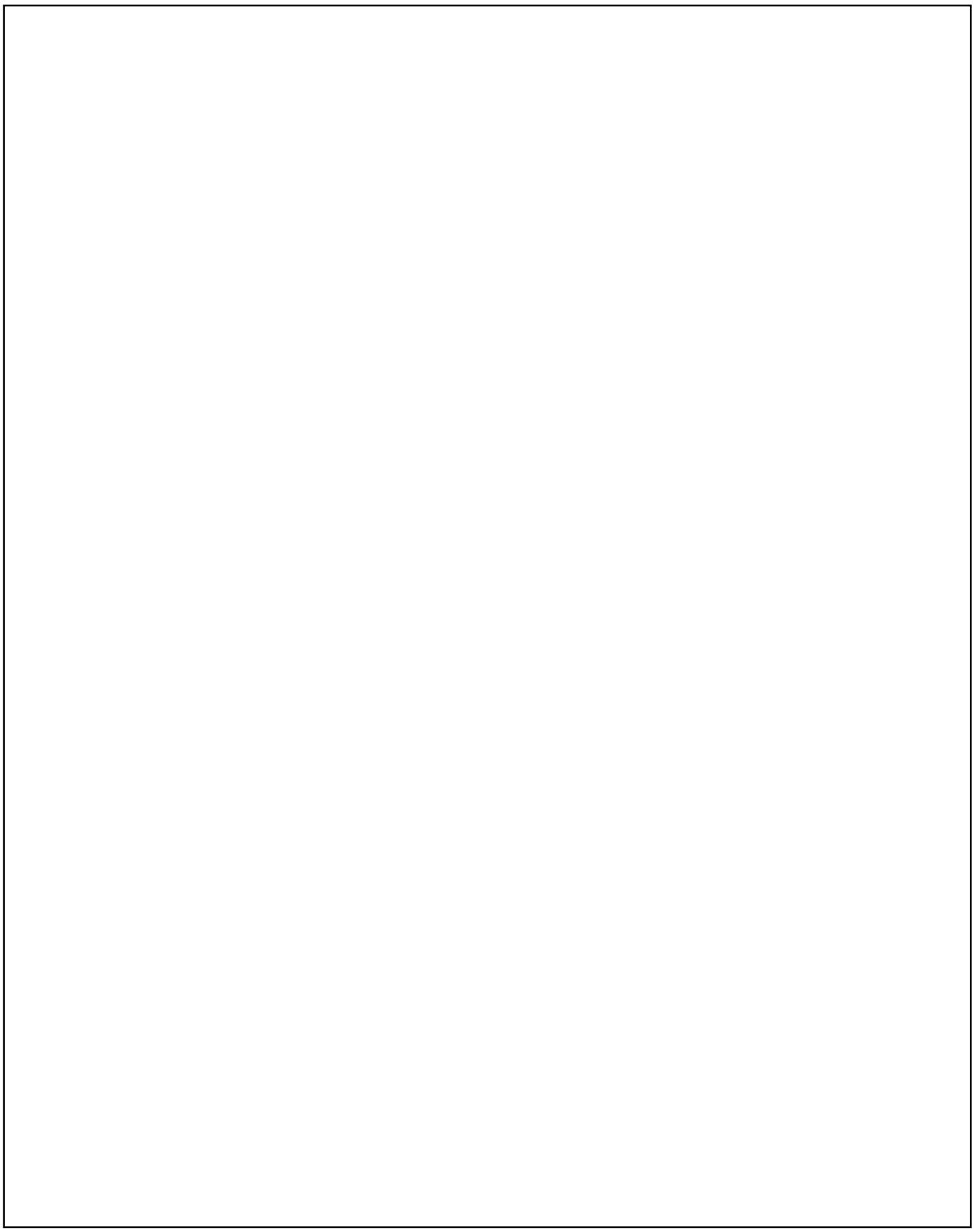
Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	740	60	210	615	0	15
Future Vol, veh/h	740	60	210	615	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	1	1	1	1
Mvmt Flow	779	63	221	647	0	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	842	0	-	811
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.11	-	-	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.209	-	-	3.309
Pot Cap-1 Maneuver	-	-	798	-	0	381
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	798	-	-	381
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	381	-	-	798	-
HCM Lane V/C Ratio	0.041	-	-	0.277	-
HCM Control Delay (s)	14.9	-	-	11.2	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	-



HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26

06/28/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	1525	5	5	745	165	25	40	10	245	20	30
Future Volume (veh/h)	100	1525	5	5	745	165	25	40	10	245	20	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	105	1605	5	5	784	0	26	42	11	258	21	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	145	1750	780	73	1583		32	52	14	303	25	38
Arrive On Green	0.09	0.52	0.52	0.04	0.48	0.00	0.07	0.06	0.07	0.22	0.22	0.22
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	507	818	214	1387	113	172
Grp Volume(v), veh/h	105	1605	5	5	784	0	79	0	0	311	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1540	0	0	1672	0	0
Q Serve(g_s), s	6.2	45.1	0.2	0.3	16.7	0.0	5.2	0.0	0.0	18.4	0.0	0.0
Cycle Q Clear(g_c), s	6.2	45.1	0.2	0.3	16.7	0.0	5.2	0.0	0.0	18.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.33		0.14	0.83		0.10
Lane Grp Cap(c), veh/h	145	1750	780	73	1583		97	0	0	365	0	0
V/C Ratio(X)	0.73	0.92	0.01	0.07	0.50		0.81	0.00	0.00	0.85	0.00	0.00
Avail Cap(c_a), veh/h	229	1765	787	73	1583		97	0	0	552	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.9	22.7	11.9	47.2	18.4	0.0	47.5	0.0	0.0	38.7	0.0	0.0
Incr Delay (d2), s/veh	4.2	8.4	0.0	0.2	0.5	0.0	36.8	0.0	0.0	8.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	17.0	0.1	0.1	5.7	0.0	3.0	0.0	0.0	8.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.1	31.1	11.9	47.5	18.9	0.0	84.3	0.0	0.0	46.7	0.0	0.0
LnGrp LOS	D	C	B	D	B		F	A	A	D	A	A
Approach Vol, veh/h		1715			789	A		79			311	
Approach Delay, s/veh		32.2			19.1			84.3			46.7	
Approach LOS		C			B			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.8	53.2		26.5	8.5	57.5		10.5				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	13.5	41.5		33.0	4.0	51.0		6.0				
Max Q Clear Time (g_c+I1), s	8.2	18.7		20.4	2.3	47.1		7.2				
Green Ext Time (p_c), s	0.1	7.3		1.1	0.0	3.5		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3: 362nd Dr & US 26

06/28/2021

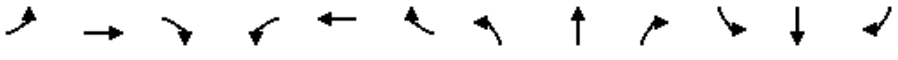
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	670	450	235	635	365	185	250	315	40	145	150
Future Volume (veh/h)	300	670	450	235	635	365	185	250	315	40	145	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	316	705	474	247	668	384	195	263	332	42	153	158
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	447	1461	1015	296	1306	750	761	402	343	203	214	181
Arrive On Green	0.13	0.43	0.43	0.18	0.79	0.76	0.23	0.23	0.23	0.12	0.12	0.12
Sat Flow, veh/h	1688	3367	1502	3222	3313	1502	3300	1772	1512	1688	1772	1502
Grp Volume(v), veh/h	316	705	474	247	668	384	195	263	332	42	153	158
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1611	1657	1502	1650	1772	1512	1688	1772	1502
Q Serve(g_s), s	14.2	19.5	19.4	9.6	9.3	13.3	6.3	17.5	28.3	2.9	10.8	13.4
Cycle Q Clear(g_c), s	14.2	19.5	19.4	9.6	9.3	13.3	6.3	17.5	28.3	2.9	10.8	13.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	1461	1015	296	1306	750	761	402	343	203	214	181
V/C Ratio(X)	0.71	0.48	0.47	0.83	0.51	0.51	0.26	0.65	0.97	0.21	0.72	0.87
Avail Cap(c_a), veh/h	614	1461	1015	397	1306	750	761	402	343	234	245	208
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	26.4	10.0	52.1	9.3	7.7	40.9	45.6	49.8	51.6	55.0	56.2
Incr Delay (d2), s/veh	1.8	1.1	1.5	8.0	1.2	2.1	0.1	3.3	39.8	0.4	7.4	27.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	7.6	11.8	3.8	2.5	3.5	2.6	8.0	14.3	1.3	5.3	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	27.5	11.5	60.1	10.5	9.7	41.0	48.9	89.6	51.9	62.4	83.7
LnGrp LOS	C	C	B	E	B	A	D	D	F	D	E	F
Approach Vol, veh/h		1495			1299			790			353	
Approach Delay, s/veh		21.0			19.7			64.1			70.7	
Approach LOS		C			B			E			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.9	60.4		19.7	21.1	55.2		34.0
Change Period (Y+Rc), s	4.0	6.0		4.0	4.0	6.0		4.5
Max Green Setting (Gmax), s	10.0	48.0		18.0	30.0	34.0		29.5
Max Q Clear Time (g_c+I1), s	11.6	21.5		15.4	16.2	15.3		30.3
Green Ext Time (p_c), s	0.3	15.5		0.2	0.9	15.8		0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	965	10	55	920	50	190	25	145	220	45	135
Future Volume (vph)	50	965	10	55	920	50	190	25	145	220	45	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0	3.0	4.0		4.0	4.0	
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3313		1644	3358	1471	1693	1555		3317	1580	
Flt Permitted	0.24	1.00		0.21	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	422	3313		361	3358	1471	1693	1555		3317	1580	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	985	10	56	939	51	194	26	148	224	46	138
RTOR Reduction (vph)	0	0	0	0	0	22	0	126	0	0	98	0
Lane Group Flow (vph)	51	995	0	56	939	29	194	48	0	224	86	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	77.3	72.6		76.1	72.0	72.0	19.2	19.2		16.7	16.7	
Effective Green, g (s)	78.3	74.0		76.1	73.4	73.4	20.2	19.2		16.7	16.7	
Actuated g/C Ratio	0.60	0.57		0.59	0.56	0.56	0.16	0.15		0.13	0.13	
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	3.0	3.0		2.3	2.3	
Lane Grp Cap (vph)	304	1885		251	1895	830	263	229		426	202	
v/s Ratio Prot	0.01	c0.30		c0.01	0.28		c0.11	0.03		c0.07	0.05	
v/s Ratio Perm	0.09			0.12		0.02						
v/c Ratio	0.17	0.53		0.22	0.50	0.03	0.74	0.21		0.53	0.43	
Uniform Delay, d1	19.9	17.2		23.3	17.1	12.6	52.4	48.7		52.9	52.2	
Progression Factor	0.58	0.61		0.40	0.46	0.06	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.9		0.2	0.8	0.1	10.3	0.5		0.8	0.8	
Delay (s)	11.7	11.5		9.4	8.6	0.8	62.7	49.2		53.7	53.1	
Level of Service	B	B		A	A	A	E	D		D	D	
Approach Delay (s)		11.5			8.3			56.3			53.4	
Approach LOS		B			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	1105	90	85	775	105	90	70	25	220	50	150
Future Volume (veh/h)	130	1105	90	85	775	105	90	70	25	220	50	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1758	1758	1758	1800	1800	1800
Adj Flow Rate, veh/h	131	1116	0	86	783	106	91	71	25	222	51	152
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	0	0	0
Cap, veh/h	634	2049		279	1248	543	163	111	39	409	49	145
Arrive On Green	0.57	1.00	0.00	0.05	0.37	0.37	0.10	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	1688	3331	1502	1661	3383	1472	1674	1237	436	3326	395	1179
Grp Volume(v), veh/h	131	1116	0	86	783	106	91	0	96	222	0	203
Grp Sat Flow(s),veh/h/ln	1688	1666	1502	1661	1692	1472	1674	0	1673	1663	0	1574
Q Serve(g_s), s	0.0	0.0	0.0	4.7	24.7	6.4	6.7	0.0	7.2	8.2	0.0	16.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.7	24.7	6.4	6.7	0.0	7.2	8.2	0.0	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		0.75
Lane Grp Cap(c), veh/h	634	2049		279	1248	543	163	0	150	409	0	194
V/C Ratio(X)	0.21	0.54		0.31	0.63	0.20	0.56	0.00	0.64	0.54	0.00	1.05
Avail Cap(c_a), veh/h	634	2049		300	1379	600	476	0	463	409	0	194
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.00	0.87	0.87	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.1	0.0	0.0	29.6	33.7	27.9	56.0	0.0	57.2	53.6	0.0	57.0
Incr Delay (d2), s/veh	0.1	0.9	0.0	0.3	2.1	0.7	1.8	0.0	2.8	1.1	0.0	77.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.3	0.0	1.9	10.3	2.3	3.0	0.0	3.2	3.5	0.0	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	0.9	0.0	30.0	35.8	28.6	57.8	0.0	59.9	54.6	0.0	134.8
LnGrp LOS	B	A		C	D	C	E	A	E	D	A	F
Approach Vol, veh/h		1247	A		975			187			425	
Approach Delay, s/veh		2.3			34.5			58.9			92.9	
Approach LOS		A			C			E			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	84.0		20.0	42.4	52.0		15.7
Change Period (Y+Rc), s	4.0	* 5.4		4.0	* 5.4	* 5.4		4.0
Max Green Setting (Gmax), s	8.0	* 53		16.0	* 9	* 52		36.0
Max Q Clear Time (g_c+I1), s	10.7	2.0		18.0	2.0	26.7		9.2
Green Ext Time (p_c), s	0.0	43.3		0.0	0.2	19.8		0.6

Intersection Summary	
HCM 6th Ctrl Delay	30.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	1175	90	45	790	210	60	5	15	255	60	90
Future Volume (veh/h)	75	1175	90	45	790	210	60	5	15	255	60	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	77	1199	92	46	806	214	61	5	15	260	61	92
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	536	1282	570	425	1037	516	77	36	109	278	137	206
Arrive On Green	0.24	0.38	0.38	0.22	0.35	0.35	0.05	0.09	0.10	0.16	0.21	0.22
Sat Flow, veh/h	1688	3367	1498	1647	2941	1464	1701	384	1152	1701	641	967
Grp Volume(v), veh/h	77	1199	92	46	806	214	61	0	20	260	0	153
Grp Sat Flow(s),veh/h/ln	1688	1683	1498	1647	1470	1464	1701	0	1536	1701	0	1609
Q Serve(g_s), s	0.0	37.7	3.5	0.0	26.9	7.7	3.9	0.0	1.3	16.6	0.0	9.1
Cycle Q Clear(g_c), s	0.0	37.7	3.5	0.0	26.9	7.7	3.9	0.0	1.3	16.6	0.0	9.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.75	1.00		0.60
Lane Grp Cap(c), veh/h	536	1282	570	425	1037	516	77	0	146	278	0	342
V/C Ratio(X)	0.14	0.94	0.16	0.11	0.78	0.41	0.79	0.00	0.14	0.93	0.00	0.45
Avail Cap(c_a), veh/h	536	1285	572	425	1123	559	139	0	419	278	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.0	32.7	13.9	33.8	31.7	10.9	52.0	0.0	45.5	45.4	0.0	37.5
Incr Delay (d2), s/veh	0.1	11.5	0.5	0.1	5.7	2.4	10.3	0.0	0.3	36.4	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	16.6	1.6	1.0	10.3	2.8	1.9	0.0	0.5	9.8	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	44.2	14.3	33.9	37.5	13.3	62.3	0.0	45.8	81.9	0.0	38.1
LnGrp LOS	C	D	B	C	D	B	E	A	D	F	A	D
Approach Vol, veh/h		1368			1066			81			413	
Approach Delay, s/veh		41.3			32.5			58.2			65.6	
Approach LOS		D			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	45.9	9.0	27.4	30.8	42.8	22.0	14.4
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.0	4.0	4.0	4.5
Max Green Setting (Gmax), s	4.0	41.2	9.0	38.5	4.0	42.0	18.0	29.5
Max Q Clear Time (g_c+I1), s	2.0	39.7	5.9	11.1	2.0	28.9	18.6	3.3
Green Ext Time (p_c), s	0.0	1.4	0.0	0.6	0.0	9.9	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	42.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	280	705	15	395	50	0	0	35	5
Future Volume (veh/h)	0	0	0	280	705	15	395	50	0	0	35	5
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				295	742	16	416	53	0	0	37	5
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				357	956	21	734	870	0	0	750	101
Arrive On Green				0.39	0.39	0.39	0.82	0.82	0.00	0.00	0.49	0.49
Sat Flow, veh/h				910	2439	54	1398	1772	0	0	1527	206
Grp Volume(v), veh/h				546	0	507	416	53	0	0	0	42
Grp Sat Flow(s),veh/h/ln				1684	0	1719	1398	1772	0	0	0	1734
Q Serve(g_s), s				32.1	0.0	28.0	13.1	0.6	0.0	0.0	0.0	1.4
Cycle Q Clear(g_c), s				32.1	0.0	28.0	14.5	0.6	0.0	0.0	0.0	1.4
Prop In Lane				0.54		0.03	1.00		0.00	0.00		0.12
Lane Grp Cap(c), veh/h				660	0	674	734	870	0	0	0	851
V/C Ratio(X)				0.83	0.00	0.75	0.57	0.06	0.00	0.00	0.00	0.05
Avail Cap(c_a), veh/h				735	0	750	734	870	0	0	0	851
HCM Platoon Ratio				1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.86	0.86	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				30.1	0.0	28.8	6.6	5.1	0.0	0.0	0.0	14.6
Incr Delay (d2), s/veh				11.4	0.0	7.6	2.7	0.1	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.9	0.0	12.9	2.7	0.3	0.0	0.0	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				41.5	0.0	36.4	9.4	5.2	0.0	0.0	0.0	14.6
LnGrp LOS				D	A	D	A	A	A	A	A	B
Approach Vol, veh/h					1053			469			42	
Approach Delay, s/veh					39.0			8.9			14.6	
Approach LOS					D			A			B	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	58.0	47.1	58.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	54.0	48.0	54.0
Max Q Clear Time (g_c+I1), s	3.4	34.1	16.5
Green Ext Time (p_c), s	0.1	9.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	850	520	0	0	0	0	360	270	15	300	0
Future Volume (veh/h)	85	850	520	0	0	0	0	360	270	15	300	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	89	895	0				0	379	284	16	316	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	153	1613					0	644	539	23	716	0
Arrive On Green	0.51	0.51	0.00				0.00	0.36	0.36	0.00	0.14	0.00
Sat Flow, veh/h	297	3143	1502				0	1772	1482	1647	1730	0
Grp Volume(v), veh/h	526	458	0				0	379	284	16	316	0
Grp Sat Flow(s),veh/h/ln	1757	1683	1502				0	1772	1482	1647	1730	0
Q Serve(g_s), s	22.9	20.0	0.0				0.0	19.0	16.6	1.1	18.5	0.0
Cycle Q Clear(g_c), s	22.9	20.0	0.0				0.0	19.0	16.6	1.1	18.5	0.0
Prop In Lane	0.17		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	902	864					0	644	539	23	716	0
V/C Ratio(X)	0.58	0.53					0.00	0.59	0.53	0.69	0.44	0.00
Avail Cap(c_a), veh/h	902	864					0	644	539	60	755	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.6	17.9	0.0				0.0	28.3	27.6	54.5	35.8	0.0
Incr Delay (d2), s/veh	2.8	2.3	0.0				0.0	3.9	3.7	20.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	8.2	0.0				0.0	8.4	6.2	0.6	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	20.2	0.0				0.0	32.2	31.2	74.5	36.1	0.0
LnGrp LOS	C	C					A	C	C	E	D	A
Approach Vol, veh/h		984	A					663			332	
Approach Delay, s/veh		20.8						31.8			37.9	
Approach LOS		C						C			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	60.5	49.5	5.5	44.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.8
Max Green Setting (Gmax), s	54.0	48.0	4.0	39.2
Max Q Clear Time (g_c+I1), s	24.9	20.5	3.1	21.0
Green Ext Time (p_c), s	13.6	0.9	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	850	150	10	750	20	100	25	10	50	20	150
Future Volume (veh/h)	190	850	150	10	750	20	100	25	10	50	20	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	200	895	158	11	789	21	105	26	11	53	21	158
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	599	2196	979	24	1025	457	203	263	111	341	39	293
Arrive On Green	0.35	0.65	0.65	0.01	0.32	0.32	0.21	0.22	0.21	0.21	0.22	0.21
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	1259	1201	508	1399	178	1339
Grp Volume(v), veh/h	200	895	158	11	789	21	105	0	37	53	0	179
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1259	0	1709	1399	0	1517
Q Serve(g_s), s	9.5	13.8	4.5	0.7	24.3	1.1	8.9	0.0	1.9	3.5	0.0	11.6
Cycle Q Clear(g_c), s	9.5	13.8	4.5	0.7	24.3	1.1	20.5	0.0	1.9	5.4	0.0	11.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		0.88
Lane Grp Cap(c), veh/h	599	2196	979	24	1025	457	203	0	374	341	0	332
V/C Ratio(X)	0.33	0.41	0.16	0.45	0.77	0.05	0.52	0.00	0.10	0.16	0.00	0.54
Avail Cap(c_a), veh/h	599	2196	979	74	1323	590	236	0	419	378	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	9.1	7.4	53.7	33.9	26.0	47.6	0.0	34.5	36.8	0.0	38.6
Incr Delay (d2), s/veh	0.2	0.6	0.4	7.9	5.6	0.2	1.5	0.0	0.1	0.2	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	5.0	1.5	0.3	10.0	0.4	2.9	0.0	0.8	1.2	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	9.6	7.8	61.7	39.5	26.2	49.1	0.0	34.5	37.0	0.0	39.7
LnGrp LOS	C	A	A	E	D	C	D	A	C	D	A	D
Approach Vol, veh/h		1253			821			142			232	
Approach Delay, s/veh		12.0			39.5			45.3			39.0	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	76.3		28.1	43.0	38.9		28.1
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.5	* 66		25.5	25.5	45.0		25.5
Max Q Clear Time (g_c+I1), s	2.7	15.8		13.6	11.5	26.3		22.5
Green Ext Time (p_c), s	0.0	19.2		0.6	0.4	8.6		0.1

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	740	150	35	800	25	40
Future Vol, veh/h	740	150	35	800	25	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	779	158	37	842	26	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	937	0	1274	390
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	495	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	703	-	162	614
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	584	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	703	-	153	614
Mov Cap-2 Maneuver	-	-	-	-	153	-
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	553	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	19.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	153	614	-	-	703	-
HCM Lane V/C Ratio	0.172	0.069	-	-	0.052	-
HCM Control Delay (s)	33.4	11.3	-	-	10.4	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	630	5	100	745	5	5	5	5	25	0	110
Future Volume (veh/h)	145	630	5	100	745	5	5	5	5	25	0	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1772	1772	1716	1716	1772	1772	1772	1800	1723	1800
Adj Flow Rate, veh/h	153	663	5	106	784	5	5	5	5	26	0	116
Peak Hour Factor	0.95	0.95	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	2	6	6	2	2	2	0	2	0
Cap, veh/h	678	1754	789	704	1662	11	235	3	3	207	0	7
Arrive On Green	0.11	0.53	0.53	0.09	0.50	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1674	3340	1502	1688	3321	21	581	581	581	313	0	1395
Grp Volume(v), veh/h	153	663	5	106	385	404	15	0	0	142	0	0
Grp Sat Flow(s),veh/h/ln	1674	1670	1502	1688	1630	1712	1743	0	0	1707	0	0
Q Serve(g_s), s	1.1	2.4	0.0	0.8	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.1	2.4	0.0	0.8	3.2	3.2	0.1	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.33		0.33	0.18		0.82
Lane Grp Cap(c), veh/h	678	1754	789	704	816	857	240	0	0	214	0	0
V/C Ratio(X)	0.23	0.38	0.01	0.15	0.47	0.47	0.06	0.00	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	2187	10812	4861	1697	4725	4963	2496	0	0	2385	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.5	2.9	2.3	3.5	3.4	3.4	10.4	0.0	0.0	10.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.1	0.3	0.3	0.1	0.0	0.0	2.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.7	3.0	2.3	3.6	3.7	3.7	10.5	0.0	0.0	13.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		821			895			15			142	
Approach Delay, s/veh		3.1			3.7			10.5			13.0	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	14.4		0.0	5.8	14.9		0.0				
Change Period (Y+Rc), s	4.0	7.0		4.0	4.0	7.0		4.0				
Max Green Setting (Gmax), s	21.0	57.0		27.0	14.0	64.0		27.0				
Max Q Clear Time (g_c+I1), s	3.1	5.2		0.0	2.8	4.4		0.0				
Green Ext Time (p_c), s	0.3	2.2		0.0	0.2	2.2		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	4.2
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	650	5	100	840	50	5	5	5	10	0	0
Future Vol, veh/h	5	650	5	100	840	50	5	5	5	10	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	100	150	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	684	5	105	884	53	5	5	5	11	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	937	0	0	689	0	0	1346	1841	342	1476	-	-
Stage 1	-	-	-	-	-	-	694	694	-	1121	-	-
Stage 2	-	-	-	-	-	-	652	1147	-	355	-	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	-	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	-	-
Pot Cap-1 Maneuver	727	-	-	901	-	-	110	74	654	88	0	0
Stage 1	-	-	-	-	-	-	399	442	-	220	0	0
Stage 2	-	-	-	-	-	-	423	272	-	635	0	0
Platoon blocked, %		-	-		-	-						-
Mov Cap-1 Maneuver	727	-	-	901	-	-	100	65	654	74	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	65	-	74	-	-
Stage 1	-	-	-	-	-	-	396	439	-	218	-	-
Stage 2	-	-	-	-	-	-	374	240	-	618	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	42.7	61.6
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	111	727	-	-	901	-	-	74
HCM Lane V/C Ratio	0.142	0.007	-	-	0.117	-	-	0.142
HCM Control Delay (s)	42.7	10	-	-	9.5	-	-	61.6
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.5	0	-	-	0.4	-	-	0.5

SECTION 2. BYPASS PRELIMINARY DESIGN

Please freeze/turnfreeze "XREF-TOPO" to make topo visible and not visible, unloading removes it from the sheet.

SE JARL RD

US 26

SE COLORADO RD

SE GUNDERSON RD

HWY 211

SANDY HIGH SCHOOL

SE 362ND DR

SE 367TH AVE

SE SEIBERT LN

SE BORNSTEDT RD

SE FRITSCHE LN

SE JACOBY RD

SE LANGENSAND RD

US 26 BYPASS

SE TRUBEL RD

US 26

SE FIRWOOD RD

Figure 13

Proposed Roadway Improvements

City of Sandy

TRANSPORTATION SYSTEM PLAN

Roadway Functional Classification

Recommended*	Existing	
	Major Arterial	Parcels
	Minor Arterial	City Limits
	Residential Minor Arterial	Urban Growth Boundary
	Collector	
	Local Streets	Urban Reserve Area
	County Arterial/Collectors	

*Note: Alignments are conceptual only, and will be refined based on topographic, environmental, and other constraints. Also note, the width of the line for the proposed bypass does not represent a proposed roadway width but rather a potential swath.

Project Number and Name

1) Industrial Way Extension West
2) Dubarko Road Extension
3) Bell Street Extension
4) 362nd Drive Extension
5) Kate Schmidt Street Extension
6) Industrial Way Extension North
7) Olson Road Extension
8) Agnes Street Extension
9) Extend Dubarko Road Extension
10) Gunderson Road, 370th Avenue, Cascadia Drive, Cascadia Boulevard Extension
11) Meadow Avenue Extension
12) 7-lane US 26 Extension
13) US 26 Bypass

Notes:

The ODOT Standard Freeway Section was used to determine property impacts, limits of grading and proposed ROW for this US 26 Bypass route.

The ODOT Standard Urban Freeway Section was used as an alternate for analysis but not shown on this map.

LIMITS OF GRADING — PROPOSED ROW — Recommended major arterial (from TSP, figure 13)

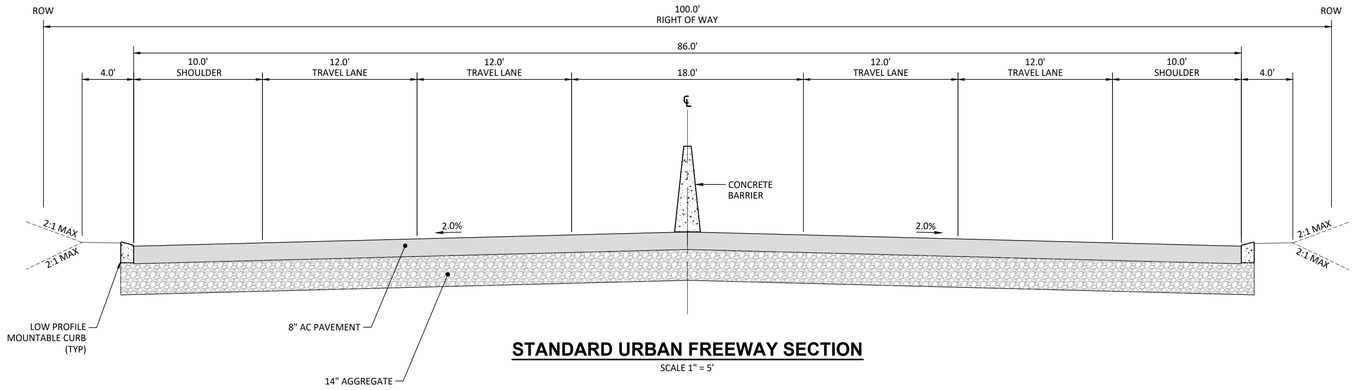
Recommended collector (from TSP, figure 13)

Recommended minor arterial (from TSP, figure 13)

0 250 500 1000

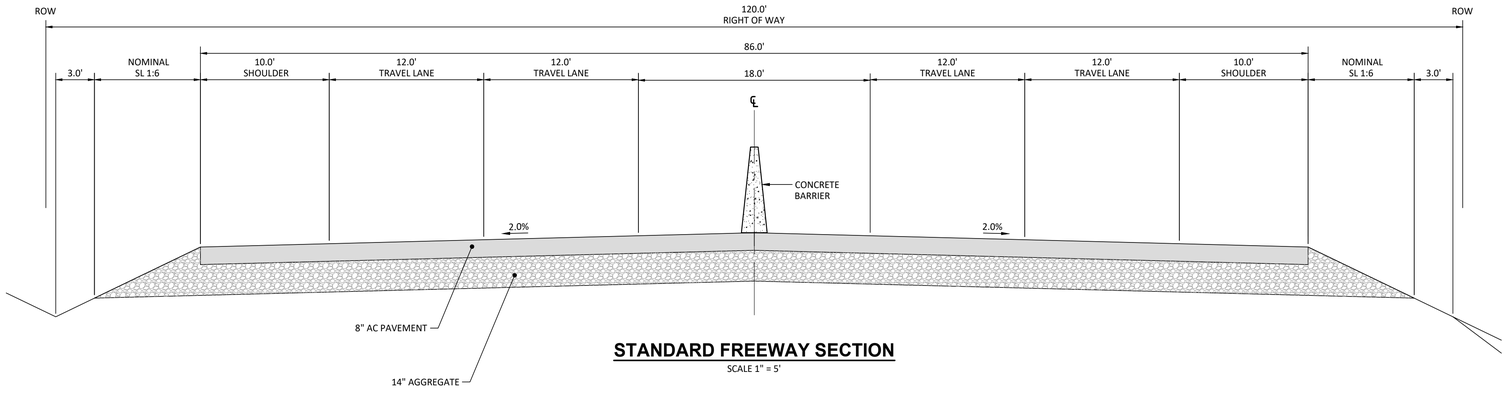
SCALE: 1" = 500'

US 26 Bypass - Alignment
Preliminary - Subject to Change
4/7/2021
DKS-44
1 of 1



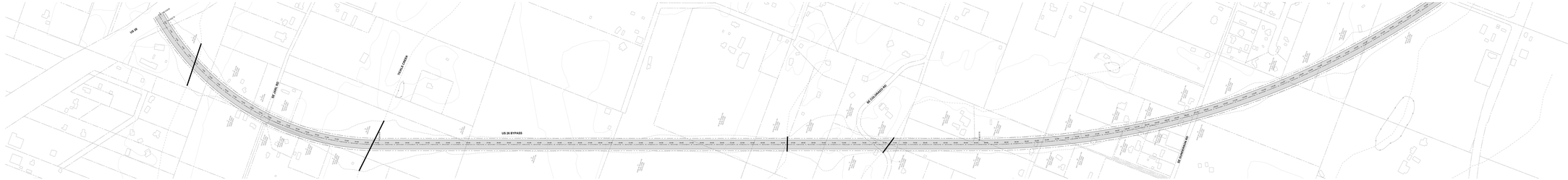
STANDARD URBAN FREEWAY SECTION

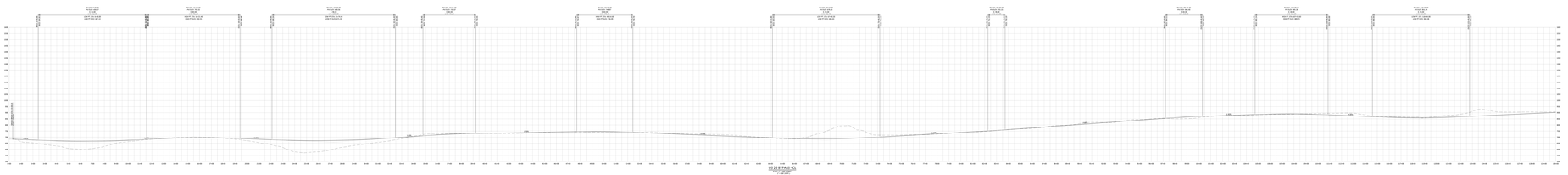
SCALE 1" = 5'



STANDARD FREEWAY SECTION

SCALE 1" = 5'





LEGEND

- Proposed ROW
- Proposed CL
- Proposed limit of grading
- Drainageway crossing with proposed 3 sided bridge or open bottom box culvert

Notes:

The ODOT Standard Freeway Section was used to determine property impacts, limits of grading and proposed ROW for this US 26 Bypass route.

The ODOT Standard Urban Freeway Section was used as an alternate for analysis but not shown on this map.

US 26 Bypass - Plan & Profile
Preliminary - Subject to Change
SHEET
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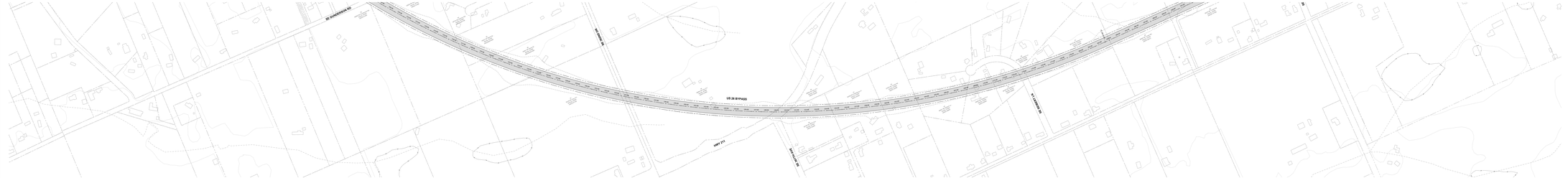
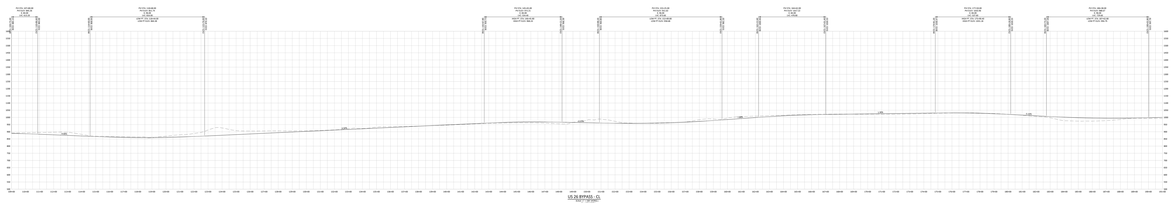
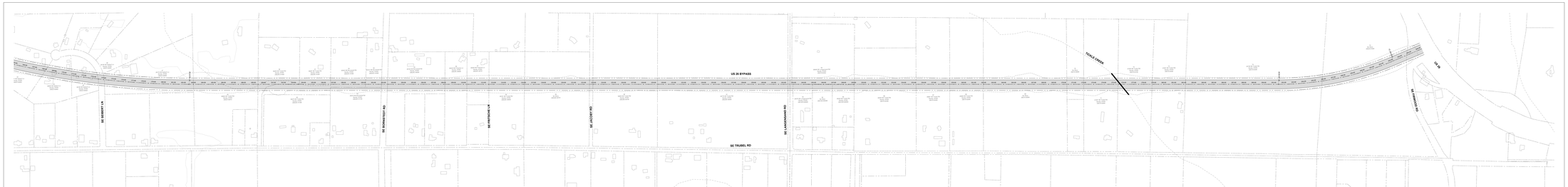
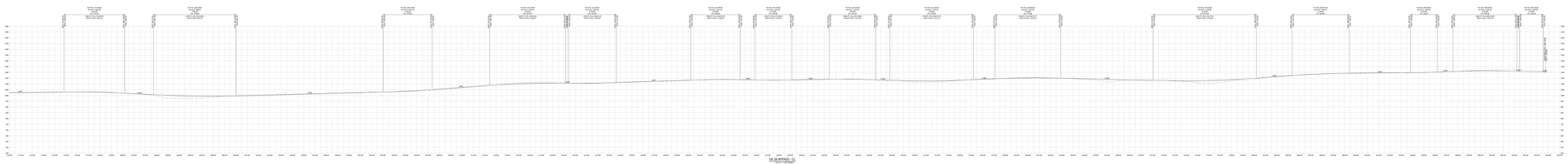
1 of 2





US 26 Bypass - Plan & Profile
Preliminary - Subject to Change
SHEET
SHEET 44
2 of 2





US 26 Bypass - Plan & Profile
Preliminary - Subject to Change
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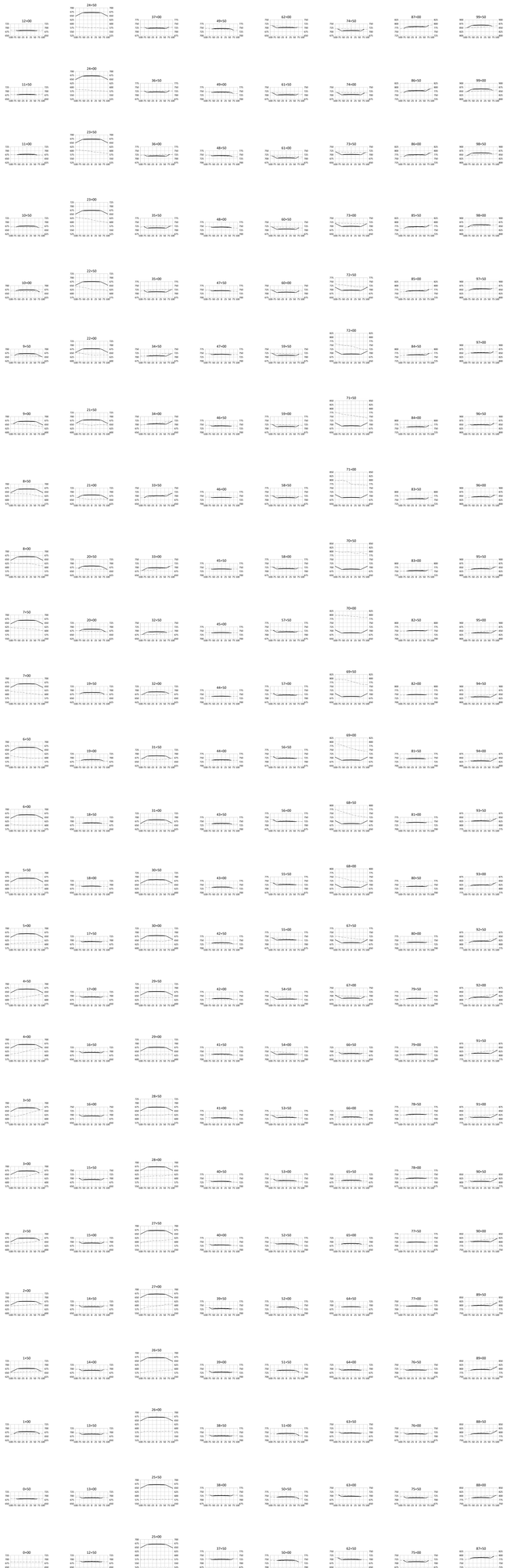
3 of 3



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US 26 Bypass - Freeway Section
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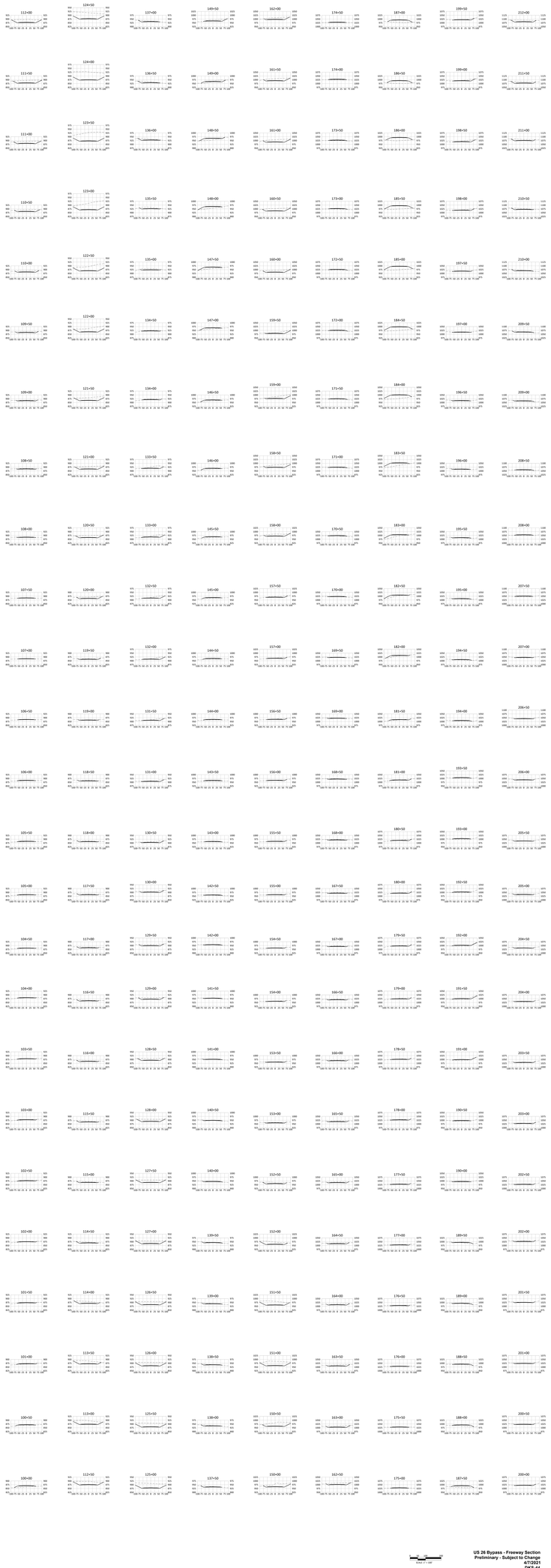
4/7/2021
DKS-44
1 of 3



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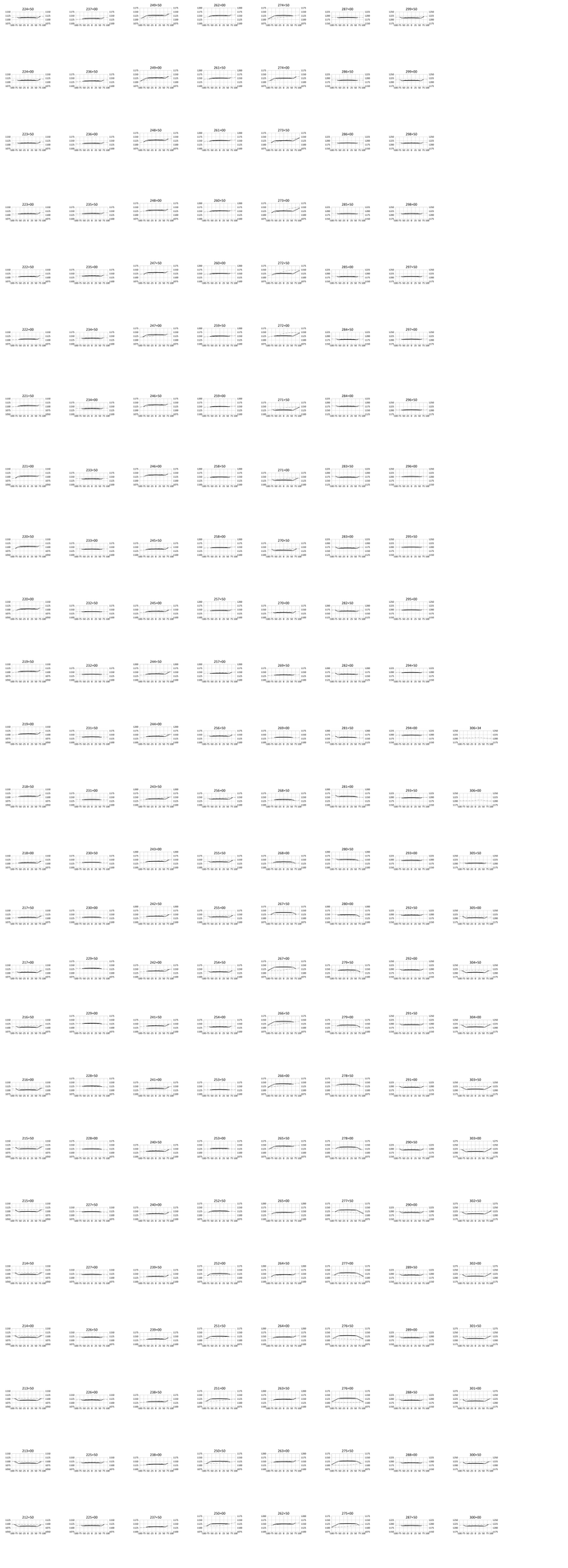
2 of 3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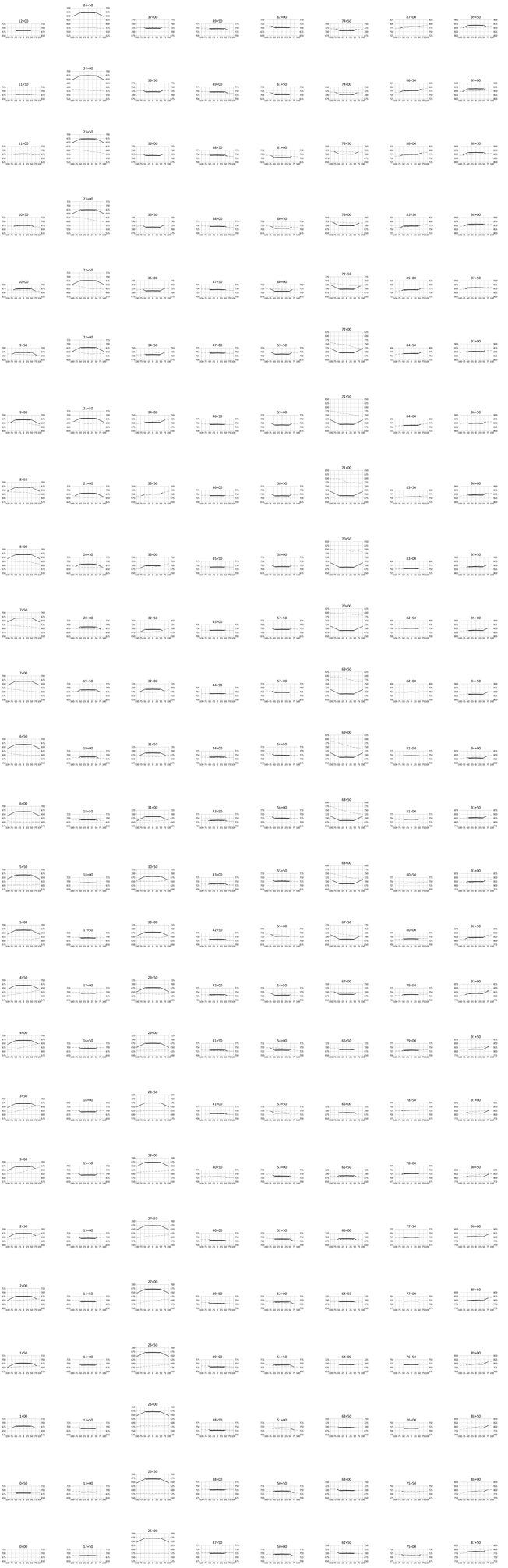

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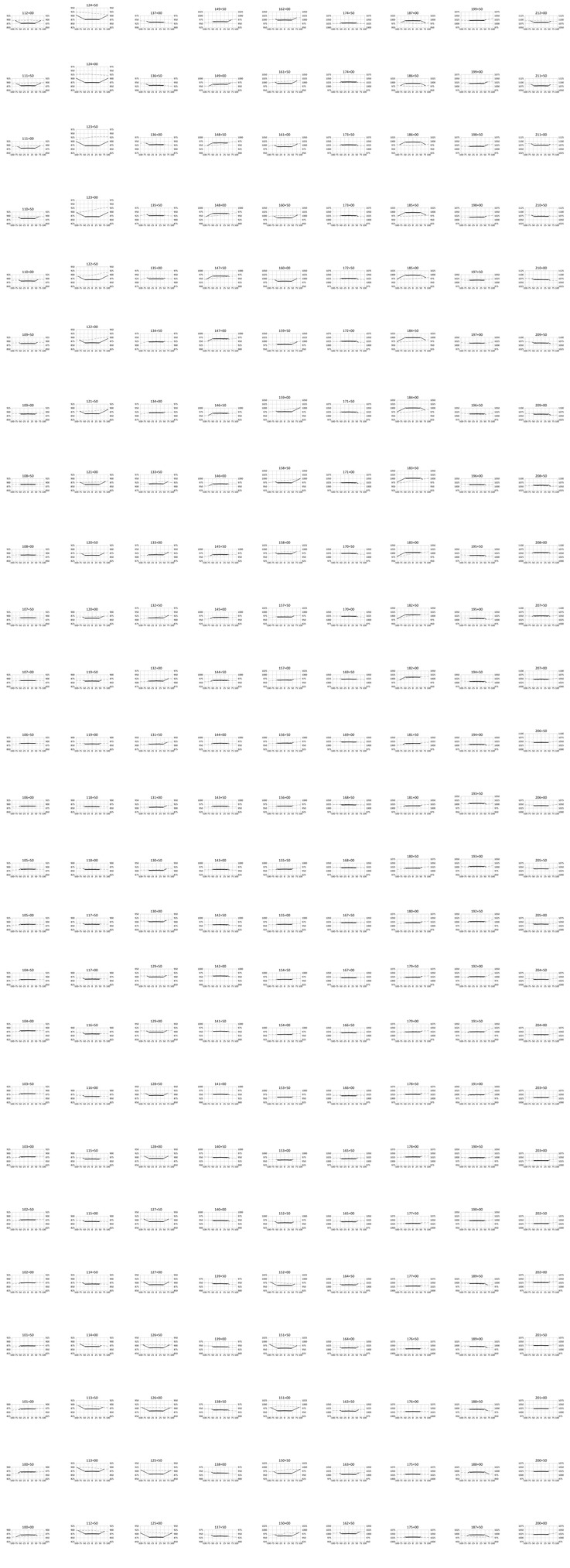

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appendix

TM 8: PLANNED AND FINANCIALLY CONSTRAINED SYSTEM

DATE: December 20, 2022

TO: Project Management Team

FROM: Reah Flisakowski, Dock Rosenthal | DKS

SUBJECT: Sandy TSP Update

Technical Memorandum #8: Planned and Financially Constrained System — Project #20020-001

This technical memorandum summarizes the financially constrained projects and their expected funding sources. Financially constrained projects are defined as projects that are anticipated to be funded and constructed within the planning horizon year (2042). The funding forecast for the next 20 years is $10.2 million. The financially constrained projects were selected from the larger list of future needs included in Technical Memorandum #7: TSP Solutions (December 2022). Twenty-four projects are included in the financially constrained list with three projects already under construction (D3, D14A, and D15A), one project funded (C23), and one project partially funded (D24). A map of the financially constrained projects is shown in Figure 1.

Projects that are not selected for the financially constrained list were included in the "Aspirational" list, which contains the remaining projects (included in the Appendix). An aspirational project may still be funded within the planning horizon year through grants, development fees, or other sources that provide additional revenue beyond the transportation funding forecast.

FINANCIALLY CONTRAINED SYSTEM

The list below describes each of the financially constrained projects, separated by project type. The project description includes TSP project number, location, planning level cost estimate, and potential funding source.

PEDESTRIAN IMPROVEMENTS (2 PROJECT)

- **P1** *362nd Drive:* This project constructs sidewalk to fill in existing gaps along the west side of 362nd Drive from Chinook Street to Industrial Way. By filling in sidewalk gaps along 362nd Drive this project improves the low-stress pedestrian network and access to the shopping center at 362nd Drive and US 26.
  - The $1,000,000 cost is expected to be primarily funded by developers as undeveloped parcels adjacent to 362nd Drive are developed, any remaining funds would come from System Development Charges (SDC).
- **P3** *Bluff Road:* This project constructs sidewalk to fill in existing gaps along the west side of Bluff Road from Bell Street to the parcel at 15931 SE Bluff Road. This project improves the low-

stress pedestrian network in the vicinity of Sandy High School, Jonsrud Viewpoint, and the residential area to the west of Bluff Road.

- The $875,000 cost is expected to be primarily funded through the road fund and System Development Charges (SDC).

CROSSING IMPROVEMENTS (12 PROJECTS)

- **C5** *CRMS - Bluff Road at Marcy Street*: This project improves the intersection crossing by constructing a Rectangular Rapid Flashing Beacon (RRFB) with School Crossing Assembly, and high visibility crosswalks across the north and east sides of the intersection.
  - The $125,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
- **C6** *CRMS - Bluff Road at Hood Street:* This project improves the intersection by modernizing the crossing, particularly with curb extensions.
  - The $125,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
- **C7** *CRMS - Bluff Road at US 26:* This project improves the intersection modernizing the crossing by reducing the curb radius at all corners, adding pedestrian-scale lighting and improvement of the bicycle network by providing buffered bike lanes along Highway 26 or construction of a fully grade-separated bicycle facility. Pending coordination with ODOT, the pedestrian signal crossing time may be increased, based on a slower walking speed.
  - The $125,000 cost, which does not assume a fully separated bike facility, is expected to be primarily funded by ODOT with additional funding expected from a Safe Routes to School grant and local funding from the road fund and urban renewal fund.
- **C8** *CRMS - Hood Street at Beers Avenue:* This project improves the intersection by repainting stop bars on Beers Avenue and improving the intersection control by installing stop signs for the Hood Street approaches, creating a 4-way stop intersection.
  - The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
- **C9** *CRMS - Hood Street at Scales Avenue:* This project improves the intersection by installing perpendicular curb ramps with tactile domes at the intersection of Hood St and Scales Ave and repainting stop bars.
  - The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
- **C10** *CRMS -Hood Street at Bruns Avenue:* This project improves the intersection by installing a tactile dome at the southwest corner of Bruns Ave and Hood St.
  - The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
- **C11** *SGS – Hood Street at Strauss Avenue:* This project improves the intersection by:
  - Relocating the southbound school advance crossing sign and school speed limit sign north of intersection.

- Repairing sidewalk along the east side of Strauss Avenue and mitigating the narrowing caused by a utility pole.
- Installing a curb ramp at the southeast corner of the intersection and adding tactile domes and a stop bar on the west leg of the intersection.
- The $350,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.

- **C12** *SGS – Pleasant Street at Strauss Avenue:* This project improves the intersection by marking stop bars in advance of crosswalks and potentially revising the control of the intersection to be all-way stop control.
  - The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
- **C13** *SGS – Pleasant Street at Alt Avenue:* This project improves the intersection by marking stop bars in advance of crosswalks, replace existing diagonal curb ramps with perpendicular curb ramps and tactile domes, and constructing a raised intersection.
  - The $350,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
- **C14** *SGS – Smith Avenue at Pleasant Street:* This project improves the intersection by marking stop bars in advance of crosswalks, relocating the southbound school advance crossing sign and school speed limit sign north of the intersection.
  - The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
- **C15** *SGS – Alt Avenue at Proctor Boulevard (US 26):* This project improves the intersection by increasing the pedestrian crossing time based on a walking rate of 3.0 feet per second, upgrading the pedestrian pushbuttons to meet current standards with audible indications, and consolidating the two existing crosswalks with one high visibility continental crosswalk on the east side of the intersection including an advance stop bar, bulb outs, curb ramps, and pedestrian scale lighting.
  - The $125,000 cost is expected to be primarily funded through an ODOT grant. Additional funding is expected from the road fund, urban renewal fund, and potential grant funding.
- **C23** *Highway 211 Pedestrian Improvements:* These American with Disabilities Act related ramp improvements along Highway 211 are currently funded by $500,000 received from ODOT as part of the jurisdictional transfer of Highway 211 from ODOT to the City of Sandy.

SAFETY IMPROVEMENTS (3 PROJECTS)

- **S1** *US 26 Adaptive Signal System:* This project extends the adaptive signal system from Orient Drive to Ruben Lane. An adaptive signal system improves performance and monitoring of traffic signals by providing real-time adjustments and improved data collection.
  - The $200,000 cost is expected to be funded by ODOT.
- **S2** *US 26 at Ten Eyck Road Study:* This project studies improvements or mitigations related to traffic impacts from access for business adjacent to the Ten Eyck Road and US 26 intersection.
  - The $50,000 cost is expected to be funded by ODOT and the road fund.

- **S3** *US 26 Speed Zone Study:* This project studies speeds east of Ten Eyck Road/Wolf Drive along US 26 for consideration of a potential reduction. It should be coordinated with C17 (Dubarko pedestrian crossing improvements) and D20 (Dubarko Road extension) to consider if an intersection control modification is necessary.
  - The $75,000 cost is expected to be primarily funded by ODOT.

DRIVING IMPROVEMENTS (10 PROJECTS)

- **D3** *US 26 & 362nd Drive Intersection Improvement:* This project is expected to reduce congestion for the westbound left turn and accommodate the 362nd Drive Extension 1 (D15a). The project includes minor widening on the south leg to accommodate a northbound through lane, construction of a three-lane southbound approach with a right turn lane, through lane, and left turn lane, and an eastbound left turn lane.
  - This project is currently funded with local funds without an additional westbound left turning movement. The additional westbound left turn lane is dependent on the 362nd Drive and Industrial Way improvements (D1) that would extend the second southbound lane from the Fred Meyer driveway to the Industrial Way intersection. The second westbound left turn lane should be coordinated with project D1.
- **D6** *Highway 211 & Proctor Boulevard Northbound Approach Modification:* This project restripes the northbound approach to clearly indicate the set back stop bar and associated keep clear distance.
  - The $15,000 cost is expected to be funded through the road fund.
- **D9** *Highway 211 & Dubarko Road Multimodal Intersection Improvement:* This project improves safety and multimodal connectivity and should be coordinated with the recommendations in project D27 Highway 211 & Dubarko Road Intersection Control Evaluation and C23 ADA improvements along Highway 211.
  - The $270,000 cost is expected to be funded through the road fund and system development charges.
- **D14a** *Bell Street extension to 362nd Drive extension:* This project extends Bell Street to 362nd Drive extension (D15a) at Minor Arterial cross section standards. It improves connectivity by providing a parallel route to US 26 from 362nd Drive to Bluff Road.
  - This project is currently funded with local funds.
- **D15a** *362nd Drive extension to Bell Street extension:* This project extends 362nd Drive to Bell Street extension (D14a) at Minor Arterial cross section standards. It improves connectivity by providing a parallel route to US 26 from 362nd Drive to Bluff Road.
  - This project is currently funded with local funds.
- **D20** *Dubarko Road to US 26 opposite Vista Loop Drive (West)* This project extends Dubarko Road to US 26/Vista Loop Road (west) at Minor Arterial cross section standards. It should be coordinated with D9 (US 26 Dubarko Road intersection improvement) and C17 (US 26 Dubarko Road pedestrian crossing improvement).
  - This project is expected to be constructed by development, with partial SDC credits, with an expected cost of $3,900,000.
- **D21F** *Village Blvd Extension 1:* This project connects Village Boulevard between Cascadia Village Drive and Juniper Street at Collector standards providing additional north-south connectivity for the neighborhood south of Highway 211.
  - The $875,000 cost is expected to be funded by the city through system development charges and partially by development.

- **D24** *Highway 211 roundabout at Gunderson:* This project improves the intersection of Highway 211 at Gunderson Road by constructing a roundabout.
  - The $1,000,000 cost is partially funded by development with the remaining amount provided by the road fund and system development charges.
- **D27** *Highway 211 & Dubarko Road Intersection Control Evaluation:* This project studies the intersection control options for Highway 211 and Dubarko road given the strain of high traffic volumes and difficult topography. The resulting solutions should improve safety and capacity.
  - The $50,000 cost is expected to be funded through the road fund and system development charges.
- **D31** *US 26 Sandy Bypass Planning:* This project includes preparation of planning documents to evaluate alternatives and the environmental impact of a potential US 26 bypass. This project consists of planning work only, not directly resulting in any capital improvement, and is not included in the map.
  - The $1,000,000 is expected to be funded by the city.

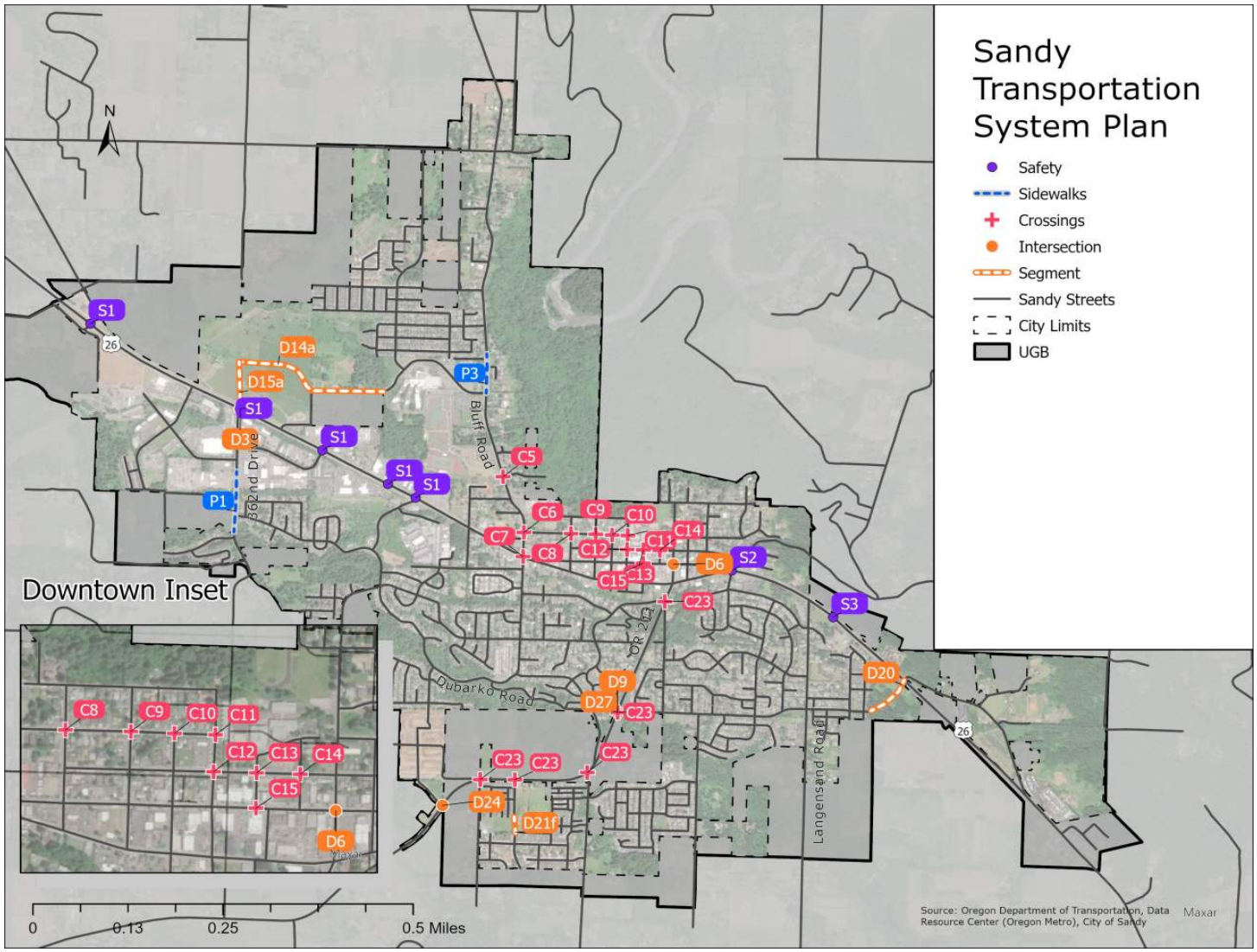

FIGURE 1: FINANCAILLY CONSTRAINED SYSTEM

SUMMARY

- 2 pedestrian projects at a cost of $1.9 million are expected to funded through a variety of sources including construction by development, the road fund, and system development charges (SDC).
- 11 crossing improvements at a cost of $1.3 million are expected to be primarily covered by the road fund and urban renewal funds with additional funding from a one-time Safe Routes to School grant administered by ODOT. Project C23 Highway 211 ADA improvements is already funded.
- 3 safety improvements at a cost of $325,000 are expected to be primarily covered by ODOT grants.
- 7 driving improvements at a cost of $7.3 million are expected to be covered by the local road fund and system development charges along with developer contributions.
- The total cost of the unfunded improvements is approximately $10.8 million.

APPENDIX

CONTENTS

SECTION 1. ASPIRATIONAL PROJECTS

DKS

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SECTION 1. ASPIRATIONAL PROJECTS

Pedestrian System

ID	PROJECT	SEGMENT	DESCRIPTION	COST	PRIORITY
P2	Bluff Rd.	Green Mountain St. to Northern UGB	Infill sidewalk gaps	$900,000	Medium
P4	Bluff Rd	Strawbridge Pkwy to Nettie Connett Dr.	Infill sidewalk gaps	$650,000	Medium
P5	Bornstedt Rd.	Cascadia Village Dr to UGB	Infill sidewalk gaps	$1,750,000	Medium
P6	Dubarko Rd.	300 feet east of Melissa Ave. to 200 feet east OR 211	Infill sidewalk gaps	$3,950,000	Medium
P7	Dubarko Rd.	Langensand Rd. to Antler Ave.	Infill sidewalk gaps	$50,000	High
P8	Industrial Way	362nd Dr. to US 26	Infill sidewalk gaps	$2,200,000	Medium
P9	Jewelberry Rd.	Penny Ave. to Kelso Rd.	Infill sidewalk gaps	$250,000	Medium
P10	Jacoby Rd.	Dubarko Rd. to southern UGB	Infill sidewalk gaps/construct sidewalk	Included in B14	Medium
P11	Langensand Rd	Dubarko Rd. to US 26	Infill sidewalk gaps	$100,000	High
P12	Langensand Rd.	630 feet south of Dubarko Rd. to UGB	Infill sidewalk gaps	$1,150,000	Medium
P13	Meinig Avenue	Scenic St. to US 26	Infill sidewalk gaps	$150,000	Medium
P14	Pleasant St	Beers Ave. to Revenue Ave.	Infill sidewalk gaps	$250,000	High
P15	Ruben Ln	US 26 to Dubarko Rd.	Infill sidewalk gaps	$75,000	Medium
P16	Sandy Heights St	Bluff Rd. to Tupper Rd.	Infill sidewalk gaps	$225,000	High
P17	Downtown Core Pedestrian Improvements	Sidewalk infill side streets perpendicular to US 26	Infill sidewalk gaps	$350,000	High
P18	University Ave	Sunset St. to US 26	Construct sidewalk	$150,000	Medium
P19	US 26	Royal Ln to 362nd Dr.	Infill sidewalk gaps	$550,000	Medium
P20	US 26	362nd Dr. to West UGB	Infill sidewalk gaps	$1,200,000	Medium
P22	US 26A	Ten Eyck Rd. to East UGB	Infill sidewalk gaps	Included in B12	High

ID	PROJECT	SEGMENT	DESCRIPTION	COST	PRIORITY
P23	OR 211	South UGB to US 26 – coordinate with D25	Construct sidewalk	Included in D25	Medium
P24	Sandy Heights St.	Nettie Connett Drive to Balken Ave	Construct sidewalk on northside	$125,000	Medium
P25	Vista Loop	Full extent	Construct sidewalk	Included in B15	Medium
P26	362nd Drive	East sidewalk infill from Chinook Street to Industrial Way	Infill sidewalk gaps	$625,000	Medium
P27	Bluff Road	East sidewalk infill mirroring west improvement	Infill sidewalk gaps, includes landscape buffer	$2,225,000	Medium

Crossing Improvements

ID	PROJECT	DESCRIPTION	COST	PRIORITY
C1	Sandy Shopper Crossing - Evans	Evans Street Senior Apartments, traffic calming, and other crossing improvements are needed. Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$25,000	High
C2	OR 211 Dubarko Crossing	Project may include pedestrian crossing advisory signage, curb extensions, marked crosswalks, and installation of RRFB. Coordinate with D9 and D20.	$125,000	High
C3	Sandy Transit Center - Pioneer	Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$125,000	Medium
C4	Sandy Transit Center - Proctor	Project may include pedestrian crossing advisory signage, curb extensions, and marked crosswalks.	$125,000	Medium
C6	CRMS - Bluff Road at Hood	Install a curb extension including perpendicular curb ramps and tactile domes at northeast corner of Hood St. Install a curb extension to provide clearance from existing pole, including perpendicular curb ramps and tactile domes, at southeast corner. Mark crosswalk and stop bar across the east leg of intersection.	$125,000	High
C16	Bluff/Sandy Heights	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	Medium
C17	Dubarko/US26	Install marked crosswalks on all four legs with tactile domes on the ramps, coordinate with D20, this project is not needed until the Dubarko Extension is complete.	$25,000	Medium
C18	Scales/Proctor	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	High

ID	PROJECT	DESCRIPTION	COST	PRIORITY
C19	Scales/Pioneer	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	High
C20	Bruns/Proctor	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	High
C21	Bruns/Pioneer	Install marked crosswalks on all four legs with tactile domes on the ramps.	$25,000	High
C22	OR 211	Pedestrian Overcrossing for Sandy Heights Street.	$6,000,000	Medium
C24	Green Mountain and Bluff Pedestrian Crossing	Construct curb extensions and mark crossing to Jonsrud Viewpoint	$75,000	High

Note: CRMS – Cedar Ridge Middle School and SGS – Sandy Grade School

Bicycle System Improvements

ID	PROJECT	SEGMENT	DESCRIPTION	COST	PRIORITY
B1	362nd Dr.	Dubarko Rd. to UGB	Widen shoulder to 6 feet minimum for bike access	$1,500,000	High
B2	Bluff Rd.*	US 26 to Miller Rd.	Re-stripe roadway to provide bike lanes	$50,000	High
B3	Bornstedt Rd	OR 211 to UGB	Widen roadway to provide bike lanes	$2,550,000	High
B4	Dubarko Rd.*	362nd Dr. to Eldridge Dr.	Re-stripe roadway to provide bike lanes	$50,000	High
B5	Dubarko Rd.*	Sandy Heights St. to Melissa Ave.	Re-stripe roadway to provide bike lanes	$50,000	High
B6	Langensand Rd.*	US 26 to UGB	Re-stripe roadway to provide bike lanes	$75,000	High
B7	Meinig Ave*	Scenic St. to US 26	Re-stripe roadway to provide bike lanes	$75,000	High
B8	Meinig Ave*	Barker Ct. to Dubarko Rd.	Re-stripe roadway to provide bike lanes	$25,000	High
B9	Sandy Heights St*	Bluff Rd. To Tupper Rd.	Re-stripe roadway to provide bike lanes	$50,000	High
B10	Tupper Rd.	Long Circle to OR 211	Widen roadway to provide bike lanes	$3,000,000	High
B12	US 26	Ten Eyck Road to UGB	Widen to provide a six-foot bike lane and sidewalk	$7,725,000	High

B13	Sandy Heights St	Dubarko Rd to Nettie Connett Dr	Re-stripe/widen Roadway to provide bike lanes	$2,275,000	Medium
B14	Jacoby Rd	Dubarko Rd to southern UGB	Re-stripe/widen Roadway to provide bike lanes and construct sidewalk	$3,925,000	Medium
B15	Vista Loop	Full extent	Re-stripe/widen Roadway to provide bike lanes and construct sidewalk	$2,075,000	Medium

Trail Improvements

ID	PROJECT	DESCRIPTION	COST	PRIORIRTY
T03	362nd	6' - 8' wide gravel trail	$125,000	Medium
T04	Kelso to Powerline	6' - 8' wide gravel trail	$200,000	Medium
T05	Powerline	5' concrete path	$50,000	Medium
T06	Olson to Powerline	5' concrete path	$100,000	Medium
T08	Sandy Bluff Park to 362nd 3	6' - 8' wide gravel trail	150,000	Medium
T09	Sandy Bluff Park Pond Loop Trail 3	6' - 8' wide gravel trail	$50,000	Medium
T10	Bell Street to Sandy Bluff Park 3	6' - 8' wide gravel trail	$75,000	Medium
T11	Kate Schmidt to Bell Street 3	3' wide natural surface trail	$50,000	Medium
T12	SHS Trail Easement 1 3	3' wide natural surface trail	$100,000	Medium
T13	Meeker to MH Athletic Club	5' concrete path	$50,000	Medium
T17	Community Campus to Sandy River Trail	3' wide natural surface trail	$25,000	Medium
T19	Park Street to Community Campus	3' wide natural surface trail	$5,000	Medium
T21	Vista Loop to Hood Street	6' - 8' wide gravel trail	$50,000	Medium

ID	PROJECT	DESCRIPTION	COST	PRIORIRTY
T28	Tickle Creek Reroutes 3	6' - 8' wide gravel trail	$75,000	Medium
T30	Sunset Street to Tickle Creek	3' wide natural surface trail	$15,000	Medium
T31	Sunset Street to Nettie Connett Drive	5' wide concrete path	100,000	Medium
T32	Bluff Road to Sandy Heights	3' wide natural surface trail	$15,000	Medium
T33	Tupper Park to Gerilyn Court	5' concrete path	$50,000	Medium
T35	Tickle Creek Extension East to Dubarko Underpass	6' - 8' wide gravel trail	$75,000	Medium
T38	Tickle Creek to Deer Point Park	5' concrete path	450,000	Medium
T39	Dubarko Extension Road	8' wide asphalt trail	125,000	Medium
T40	Tickle Creek Extension Dubarko East to Jacoby	3 6' - 8' wide gravel trail	$100,000	Medium
T41	Alleyway to Tickle Creek Trail Connector	5' concrete path	$50,000	Medium
T42	Jacoby Road to Tickle Creek Connector	5' concrete path	$50,000	Medium
T44	Bornstedt Park	5' concrete path	$75,000	Medium
T50	Highway 211 Parkway		$400,000	Medium
T54	Cascadia to Tickle Creek	6' - 8' wide gravel trail	$30,000	Medium

Driving Improvements

PROJECT ID	NAME	DESCRIPTION	COST	PRIORITY
D1	362nd Drive & Industrial Way (south)	Reduce eastbound congestion. Project may include restriping to include an	$140,000	Medium

PROJECT ID	NAME	DESCRIPTION	COST	PRIORITY
	Intersection Improvement	exclusive eastbound left turn lane and exclusive right turn lane.		
D2	362nd Drive & Dubarko Road Intersection Improvement	Reduce intersection congestion. Project may construct a traffic signal or roundabout.	$1,425,000	Medium
D4	US 26 & Industrial Way Intersection Improvement	Improve egress from commercial area and reduce northbound congestion. Project may include minor widening to accommodate a northbound left turn lane and restriping on the southbound approach to dual left turn lanes and a shared through/right turn lane.	$950,000	Low
D5	US 26 & Ruben Lane Intersection Improvement	Improve egress from commercial area and reduce northbound congestion. Project may include restriping southbound approach to dual left turns and a shared through/right lane and restriping the northbound approach to a left turn lane and shared through/right lane.	$950,000	Medium
D8	US 26 & Ten Eyck Road/Wolf Drive Intersection Improvement	Improve northbound and southbound approaches. Project may include striping left turn lanes on both minor street approaches.	$1,500,000	Low
D11	OR 211 & Arletha Court Intersection Improvement	Reduce northbound congestion. Project may include signage and approach modifications to prohibit left turns from the minor street approach.	$3,150,000	Low
D12	Industrial Way Extension 1	Extend Industrial Way to Jarl Road/US 26 at Collector standards	$13,175,000	Low
D13	Dubarko Road Extension	Extend Dubarko Road to Champion Way at Collector standards	$7,450,000	Low
D14B	Bell Street Extension 2	Extend Bell Street from 362ND Drive Extension 1 to Orient Drive at Minor Arterial standards	$9,900,000	Low
D15B	362nd Drive Extension 2	Extend 362nd Drive from Bell Street Extension 1 to Kelso Road at Minor Arterial standards	$14,000,000	Low
D16	Kate Schmidt Street Extension	Extend Kate Schmidt Street to Bell Street Extension 1 at Collector standards	$9,000,000	Medium
D17	Industrial Way Extension 2	Extend Industrial Way to Bell Street Extension 1 at Collector standards	$4,675,000	Medium

PROJECT ID	NAME	DESCRIPTION	COST	PRIORITY
D18	Olson Road Extension	Extend Olson Road to 362nd Drive Extension 2 at Collector standards	$5,250,000	Low
D19	Agnes Street Extension	Extend Agnes Street to Bluff Road at Collector standards	$5,950,000	Low
D21A	Sandy Heights Street/370th Avenue Extension	Extend Sandy Heights Street/370th Avenue to OR 211 at Collector standards	$24,350,000	Low
D21B	Gunderson Road Extension	Extend Gunderson Road from existing terminus near OR 211 to 362nd Drive at Collector standards	$13,750,000	Low
D21C	Cascadia Village Extension 1	Extend Cascadia Village from OR 211 to Arletha Court at Collector standards	$2,025,000	Low
D21D	Cascadia Village Extension 2	Extend Cascadia Village Drive from Village Boulevard to Pine Street at Collector standards	$2,175,000	Medium
D21E	New southern collector	Construct new a new road at Collector standards from OR 211 at the intersection with the Sandy Heights Street/370th Avenue Extension to Langensand Road	$33,550,000	Low
D21G	Village Boulevard Extension 2	Extend Village Boulevard at Collector standards from existing terminus south of Juniper Street to Bornstedt Road	$4,000,000	Low
D22	New eastern collector	Construct new a new road at Collector standards from Dubarko Road at the intersection with the Dubarko Road Extension to US 26/ Vista Loop Road (east)	$20,000,000	Low
D23	US 26 Bypass	Construct bypass from east of Orient Drive to Shorty's Corner (Firwood Road)	$390,000,000	Low
D25	OR 211	Upgrade OR 211 to Minor Arterial standards from UGB to US 26, coordinate with P23	$22,000,000	Medium
D26	Alt Avenue	Reconstruct Alt Avenue from Proctor Blvd to Pleasant St to improve walkability and access to the Sandy Library	$11,000,000	High

PROJECT ID	NAME	DESCRIPTION	COST	PRIORITY
D28	Industrial Way Realignment	Realign Industrial Way (east of 362nd Drive) to connect with the intersection of Industrial Way (west of 362nd)	$4,150,000	Low
D29	Ruben Lane Realignment to Kate Schmitz	Realign Ruben Lane to the west to connect with Kate Schmitz Avenue and US 26	$3,700,000	Medium
D30	Langensand Road Truck Traffic Calming	Traffic calming measures along Langensand Road, potential treatments include bollards at the intersection of Langensand Road and US 26 and curb extensions along Langesand Road.	$175,000	Low

appendix

TM 9: ALTERNATIVE MOBILITY TARGETS

DATE: June 8, 2023

TO: Project Management Team

FROM: Reah Flisakowski, Dock Rosenthal| DKS

SUBJECT: Sandy TSP Update
Alternative Mobility Targets

Project #20020-001

This technical memorandum summarizes an evaluation of locations where alternate mobility targets are needed on the state highway system within Sandy. This memorandum follows the evaluation process outlined in the Planning Business Line Team Operational Notice PB-02[1]. Final review and approval of alternative mobility targets for state highway corridors will be an action of the Oregon Transportation Commission (OTC).

INTRODUCTION

The Oregon Highway Plan (OHP) identifies highway mobility targets for maintaining acceptable and reliable levels of mobility on the state highway system, consistent with expectations for each facility type, location, and functional objectives[2]. The adopted mobility targets are the initial tool for identifying deficiencies and considering solutions for vehicular mobility on the state system. However, consistent with OHP Policy 1F, the ability to meet OHP mobility targets may not be compatible with a community's adopted land use plan, financial capacity, or goals. In these cases, alternative mobility targets can be explored for a facility to adjust long-term roadway performance expectations. Alternative mobility targets are only applied to intersections under state jurisdiction (i.e., an intersection located on the state highway system). Mobility targets for intersections under city jurisdiction are identified in the transportation standards memo of this TSP update. Mobility targets for intersections under county jurisdiction (none of which are included in this TSP) can be found in the Clackamas County Transportation System Plan.

It is important for a TSP to identify a broad range of system projects and services to address the deficiencies that would exist at the end of a 20-year planning horizon if the community grows in accordance with its adopted land use plan. However, it is also important to realistically identify which transportation projects and services are reasonably likely to be implemented over the 20-year planning horizon, based on financial limitations or other constraints. This exercise enables the

[1] Planning Business Line Team Operational Notice PB-02, Oregon Department of Transportation, effective May 2, 2013.

[2] *1999 Oregon Highway Plan, as amended May 2015*, Policy 1F: Highway Mobility Policy, Oregon Department of Transportation

community and the state to establish realistic expectations for how that transportation system will likely operate at the end of the 20-year planning horizon.

Local and/or state intersections will not be able to meet local level-of-service (LOS)[3] targets or, in the case of ODOT, volume-to-capacity (v/c)[4] ratio-based mobility targets, at the end of the 20-year planning horizon if the community grows in accordance with its land use in Sandy. This deficiency is related to two factors, limited funding and network connectivity. Financial constraints that have been faced by state and local governments over the last 20 years and are expected to continue into the foreseeable future which limits the investment that can be made in the transportation system. Network connectivity in Sandy is an issue that results in more traffic using US 26 due to a lack of available parallel routes. Exceeding existing mobility targets is particularly common in larger communities or in those with roadways that experience higher travel demands. In these cases, it is appropriate to adjust roadway performance expectations, as expressed through local targets or state mobility targets, to match the performance that is forecasted to exist at the end of the 20-year planning horizon, through the adoption of alternative mobility targets.

In these situations, adopting alternative mobility targets means adjusting roadway performance expectations to match realistic expectations for how the roadways are forecasted to operate, considering financial limitations and other constraints. In addition to establishing realistic expectations for future system performance, this process will help reduce the need to include state and local investment projects that both parties acknowledge are unlikely to be achieved or that are counter to a community's adopted land use plan and goals.

ALTERNATIVE MOBILITY TARGET NEED

In Sandy, US 26 bisects the city and is the regional transportation route for recreational traffic traveling to-and-from Mount Hood and Central Oregon. US 26 is classified as Statewide Highway, which typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports and major recreation areas that are not directly served by Interstate Highways. US 26 is a designated freight route in the OHP.

There are very few parallel routes in the city, a situation that results in frequent interaction between local trips and regional through trips. The mobility targets that apply along US 26 are based on the characteristics above, such as its classification as a Statewide Highway, but are also intended to be broad enough to apply to every similarly classified highway in the state. In some cases, the mobility target criteria that apply are not a good fit in a particular city. This is the case in Sandy.

[3] LOS targets are based on the delay experienced by drivers at a particular location where higher delay corresponds to worse levels of service.

[4] V/C ratios describe the ability of an intersection to handle additional traffic demands before experiencing excessive delay or long vehicle queues; v/c ratios that exceed 1.00 indicate that the vehicle demand exceeds the theoretical capacity.

Given the population and employment growth projected over the 20-year planning horizon, significant stretches of US 26 through Sandy are forecast to exceed ODOT's current mobility targets. Mobility targets are primarily used to evaluate development applications, along with other changes to the land use-transportation system that may result in an impact. When a particular intersection exceeds the established target prior to the evaluation of development impact it is referred to as an existing deficiency. It is not unusual for one or two intersections in a city to have existing deficiencies based on unique challenges where straightforward solutions are not available however, once a majority of the major intersections exceed the established mobility target, those targets are no longer serving the purpose of evaluating the impact of development on the system.

An evaluation of the disparity between the current targets and forecasted traffic operations confirmed the need for assessing alternative mobility targets to balance the community's vision established through the Sandy TSP goals and objectives. The findings of that evaluation are described below.

The purpose of alternate mobility targets is not to allow more congestion along US 26 in the city but to acknowledge the growth that has occurred, and is expected to occur in the future, based on an adopted comprehensive plan land use, and to provide a helpful metric to track the impact of that growth on the transportation system. Similarly, alternate mobility targets do not directly impact the likelihood of constructing a future Sandy Bypass. There are many factors and outcomes related to a future bypass, including mobility targets, but also including corridor travel time, funding availability, right-of-way, environmental impact, and infrastructure maintenance amongst others.

CURRENT MOBILITY TARGETS

All US 26 intersections in Sandy must comply with the volume-to-capacity (v/c) ratio targets presented in Table 6 of the OHP. ODOT v/c ratio mobility targets are based on highway classification, posted speed, and area type. Within Sandy, US 26 is classified as a Statewide Highway with a Special Transportation Area (STA) between Bluff Road and Ten Eyck Road/Wolf Drive. Therefore, the v/c target ranges from 0.80 to 0.90, as listed in Table 1 below.

The mobility targets in the OHP are based on conditions present during the 30th highest annual hour of traffic (30 HV), which in Sandy is estimated using the nearest ATR (Automatic Traffic Recorder) which indicates a seasonal peak month of August.

EXISTING AND FUTURE HIGHWAY OPERATIONS

A comparison of existing and future traffic operations along US 26 to adopted mobility targets during peak traffic conditions (30 HV) shows that most intersections meet targets today, with two intersections currently exceeding mobility targets. It is projected that traffic demand in the p.m. peak period at several intersections will exceed capacity by 2040.

Table 1 also demonstrates the results of doing nothing (retaining the system as it exists today) versus implementing the Financially Constrained projects and other likely funded projects included

in the TSP by 2040. The table compares baseline operations to the Oregon Highway Plan (OHP) mobility targets.

TABLE 1: INTERSECTION OPERATIONS ON US 26 WITHOUT AND WITH REASONABLY LIKELY IMPROVEMENTS (2018 AND 2040 PM PEAK HOUR, 30 HV)

STUDY INTERSECTION	TRAFFIC CONTROL	MOBILITY TARGET	EXISTING V/C	2040 NO BUILD V/C	2040 FINANCIALLY CONSTRAINED V/C
ORIENT DR/US 26	Signal	0.80	**0.90**	**1.17**	**1.17**
362ND DR/US 26	Signal	0.80	**0.83**	**1.19**	**1.16**
INDUSTRIAL WAY/ US 26	Signal[A]	0.80	0.72	**1.13**	**1.10**
RUBEN LN/US 26	Signal[A]	0.80	0.73	**0.99**	**0.97**
BLUFF RD/US 26	Signal	0.85	0.79	**1.12**	**1.12**
PIONEER BOULEVARD (US 26)/ MEINIG AVENUE (OR 211)	Signal	0.90	0.68	0.88	0.81
PROCTOR BOULEVARD (US 26)/MEINIG AVENUE (OR 211)	Signal	0.90	0.71	0.84	0.84
TEN EYCK RD/US 26	Signal	0.85	0.58	0.84	0.80
LANGENSAND RD/US 26	TWSC	0.80 [0.90]	0.32 [0.30]	0.51 **[1.2]**	0.48 **[0.91]**
VISTA LOOP DR W/US 26	TWSC	0.80 [0.90]	0.31 [0.09]	0.48 [0.62]	0.44 **[>2.0]**
VISTA LOOP DR E/US 26	TWSC	0.80 [0.90]	0 [0.05]	0.48 [0.25]	0.48 [0.25]

Bold and Red values indicate the adopted mobility target would not be met. At signalized study intersections the v/c, LOS and delay are reported as the intersection average and at unsignalized intersections the v/c, LOS and delay are reported for the worst highway approach/ worst side street approach.

A. This signal reported using HCM 2000 due to non-standard characteristics.

While many intersection projects along US 26 are identified in the TSP, they cannot solve the root cause of the intersection congestion during the p.m. period which is high eastbound through traffic. Exacerbating this condition further, the split phasing of the minor street approaches means that the local street connections onto US 26 cannot run simultaneously and therefore demand a higher proportion of the total cycle. The best short-term solution to solving intersection congestion along US 26 is better local street connectivity that would allow drivers to exit US 26 more quickly. Phase 2 of the Bell Street extension, from the 362nd Street extension to Orient Drive is the best

connectivity improvement to facilitate some of this traffic volume shift, however, due to funding limitations it is not included in the financially constrained project list.

The planned Dubarko Extension project (D20) is expected to shift some traffic off US 26 and marginally improve traffic signal operations along the highway. While the current unsignalized assumptions show this location as significantly exceeding the mobility target for the minor approach, the US 26 speed study (S3), another financially constrained project, will analyze this segment.

FACTORS LIMITING THE ABILITY TO MEET EXISTING MOBILITY TARGETS

Several factors combine to make compliance with current mobility targets within Sandy difficult. They include the following:

PROJECTED MULTIMODAL TRAVEL NEEDS

The importance of US 26 to statewide, regional, and local travel creates significant multimodal demands for both short and long trips along the corridor. These users include:

- People driving on US 26 to make local trips to homes, work, and shopping destinations.
- People driving for regional trips between the Portland metro area, and other cities to the west, and Mount Hood and central Oregon.
- Freight traveling to and through Sandy (US 26 is a freight route).
- Transit traveling along the main state facility or turning at a local street.
- People biking and walking along and across US 26.

Balancing the needs of each of these various users is incorporated in the goals of the Sandy TSP and factored into identifying reasonably likely to be funded projects and programs for the Sandy TSP.

EXISTING AND PLANNED DEVELOPMENT PATTERNS

In many areas along US 26, adjacent existing development, existing physical constraints, and planned urban form promoting increased density and mixed land use constrain the ability to widen the highway right-of-way or provide parallel alternate routes. Meeting existing mobility targets would require increasing the width of US 26 and in these constrained areas obtaining needed right-of-way for highway widening would require acquisition and removal of existing buildings near the highway, which would be very expensive and counter to the goals and objectives of the community[5]. Furthermore, the City of Sandy is built around US 26 which often limits travel options to the highway for residents travelling between the east and west sections of the city (and in some cases north and south). In cases where available capacity is restricting traffic demand (a

[5] Sandy TSP Update TM #2 Goals, Objectives, and Criteria June 23, 2021

bottleneck), widening will likely reduce the duration of congestion but may not improve conditions within the peak hour due to the additional traffic volume demand that will use the new capacity.

FINANCIAL FACTORS

Funding available for future transportation capacity improvements is limited which requires agencies to prioritize investments to address critical needs. The Sandy TSP identifies a comprehensive set of transportation projects estimated to cost $10.8 million that are deemed reasonably likely to be funded in the 20-year planning horizon, including some projects on US 26. However, there will be future ODOT facility mobility target deficiencies that will not be addressed due to the funding constraints.

Future development may also fund improvements through System Development Charges (SDCs). An estimate of expected SDCs in the 20-year planning horizon is included in the forecasted $10.8 million in available funding.

OTHER STRATEGIES BEING APPLIED TO ENHANCED MOBILITY

In addition to funding capacity improvements, the Sandy TSP identifies funding for programs and policies to improve multimodal conditions and help reduce motor vehicle demand. This includes 91 active transportation projects including bike routes, sidewalk and crossing improvements, and shared-use paths. However, with only $10.8 million available for projects most of these are not likely to be funded by 2040.

ALTERNATIVE MOBILITY TARGET EVALUATION

Figure 1 shows ODOT's methodology for determining alternative mobility targets[6]. A summary of each step of the process is discussed below. Table 2 lists the results for each individual intersection.

STEP 1: IMPLEMENT PLANNED IMPROVEMENTS

Prior to implementing alternative mobility targets, all feasible actions and improvements must be taken to meet the current targets. Even with the implementation of the Financially Constrained and Reasonably Likely Funded improvements in the City of Sandy's TSP, alternative mobility targets will be needed at the following study intersections:

- ORIENT DR/US 26
- 362ND DR/US 26
- INDUSTRIAL WAY/ US 26
- RUBEN LN/US 26
- BLUFF RD/US 26
- VISTA LP (WEST)/US 26

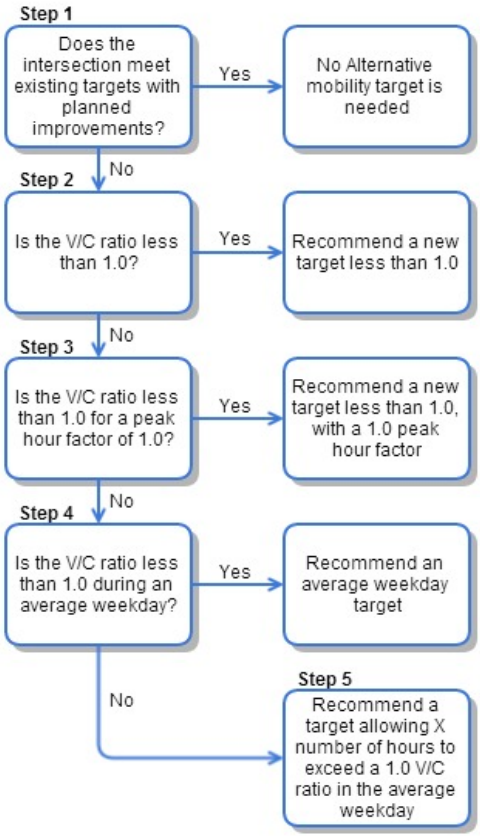

FIGURE 1: ALTERNATIVE MOBILITY TARGET METHODOLOGY

STEP 2: INCREASE V/C TARGETS, STAYING BELOW CAPACITY

In cases where the v/c is forecasted to be greater than the OHP mobility target but less than capacity (v/c = 1.0) during the 30 HV, establish the proposed alternative target consistent with the v/c values used in the OHP. This approach would work for one of the intersections needing alternative mobility targets, Ruben Lane and US 26.

STEP 3: REMOVE PEAKING WITHIN THE PEAK HOUR

In cases where v/c is forecasted to be greater than or equal to capacity during the 30 HV using the standard analysis procedures, evaluate the actual peak hour traffic volume for future year 30 HV

[6] Planning Business Line Team Operational Notice PB-02, Oregon Department of Transportation, effective May 2, 2013.

projections rather than expanding the peak 15 minutes to be the 30 HV. If the resulting v/c is less than 1.0, establish the proposed alternative target. Setting the Peak Hour Factor (PHF) for the 30 HV to 1.0 relaxes the peaking assumptions and allows for analysis of the peak hour volumes instead of the peak 15-minute volumes.

STEP 4: ANALYZE AVERAGE WEEKDAY CONDITIONS

In cases where v/c is forecasted to be greater than or equal to capacity during the design hour using the actual peak hour projection of traffic and in areas where design hours are affected by high seasonal traffic volumes, evaluate the annual average weekday (AWD) p.m. peak as the future year design hour rather than the 30 HV. If the resulting v/c is less than 1.0, establish the proposed alternative target. Analyzing average weekday conditions instead of the 30 HV gives a more accurate representation of typical conditions instead of peak seasonal conditions when there is an influx of recreational trips through Sandy.

STEP 5: HOURS OF CONGESTION

In cases where v/c is forecasted to be greater than or equal to 1.0 using the AWD p.m. peak as the future design hour, determine the duration of the period during which the future AWD p.m. peak hour will have a v/c greater than or equal to 1.0. Establish the proposed alternative target by increasing the number of hours that v/c can be greater than or equal to 1.0. An "hours of congestion" analysis assumes that traffic volumes that exceed capacity in the analysis hour are shifted to the "shoulder" hours, iteratively, until all traffic can be accommodated. The calculation of multi-hour conditions with peak spreading is fairly complex and it can be difficult to achieve consistent results. Also, because only the most congested intersections make it to Step 5 when considering alternative mobility targets, it is often found that over-capacity conditions would be present for several hours of the day making such a target fairly ineffective.

TABLE 2: INTERSECTION OPERATIONS ON US 26 WHEN APPLYING THE ALTERNATIVE MOBILTY TARGET METHODOLOGY (2040 PM PEAK HOUR)

STUDY INTERSECTION	CONTROL	MOBILITY TARGET	STEP 1: FC	STEP 2: 30 HV, V/C 1.0	STEP 3: 30 HV, V/C 1.0, PHF = 1.0	STEP 4: AVERAGE WEEKDAY	STEP 5: SECOND HOUR WITH PEAK SPREADING
ORIENT DR/US 26	Signal	0.80	**1.17**	**1.17**	**1.11**	**1.04**	**1.14**
362ND DR/US 26	Signal	0.80	**1.16**	**1.16**	**1.10**	**1.03**	**1.03**
INDUSTRIAL WAY/ US 26	Signal[A]	0.80	**1.10**	**1.10**	**1.08**	**1.03**	**1.05**
RUBEN LN/US 26	Signal[A]	0.80	**0.97**	0.97	0.95	0.89	0.90
BLUFF RD/US 26	Signal	0.85	**1.12**	**1.12**	**1.09**	**1.02**	**1.12**
PIONEER BOULEVARD (US 26)/MEINIG AVENUE (OR 211)	Signal	0.90	0.84	0.84	0.76	0.71	0.69
PROCTOR BOULEVARD (US 26)/MEINIG AVENUE (OR 211)	Signal	0.90	0.81	0.81	0.80	0.74	0.69
TEN EYCK RD/US 26	Signal	0.85	0.80	0.80	0.76	0.72	0.72
LANGENSAND RD/US 26	TWSC	0.80 [0.90]	0.48 **[0.91]**	0.48 **[0.91]**	0.45 [0.71]	0.44 [0.69]	0.37 [0.45]
VISTA LOOP DR W/US 26	TWSC	0.80 [0.90]	0.44 **[>2.0]**	0.44 **[>2.0]**	0.42 **[1.93]**	0.42 **[1.75]**	0.36 [0.89]
VISTA LOOP DR E/US 26	TWSC	0.80 [0.90]	0.48 [0.25]	0.48 [0.25]	0.45 [0.20]	0.44 [0.20]	0.39 [0.17]

Bold and Red values indicate the adopted mobility target would not be met. At signalized study intersections the v/c, LOS and delay are reported as the intersection average and at unsignalized intersections the v/c, LOS and delay are reported for the worst highway approach/ worst side street approach.

A. This signal reported using HCM 2000 due to non-standard characteristics.

As shown in Table 2, the intersections of Pioneer Boulevard, Proctor Boulevard, Ten Eyck, and Vista Loop Drive East all continue to meet current mobility targets and therefore would not require alternative mobility targets.

As shown in Table 2, even in the second hour of the peak period, with the additional volume spreading from the first hour, a mobility target of 1.0 volume to capacity ratio is not met. The second hour volumes along US 26 do not drop enough, relative to the first hour, to serve the excess demand that spreads over from the first hour. An additional four-hour turning movement count was collected from 3 p.m. to 7 p.m. on May 10th 2023 at the intersection of US 26 and 362nd

Drive to understand the relative turning movement volumes over the longer peak period. The hourly volume profile is shown in Figure 2 below. This count showed that the p.m. peak period has a duration of three hours staring around 3 p.m. and continuing until 6 p.m. at which point traffic volumes start to decrease. Applying this profile to the forecasted 2040 p.m. peak hour counts results in the intersection operations analysis shown in Table 3 for those intersections that continue to not meet current mobility targets through Step 5.

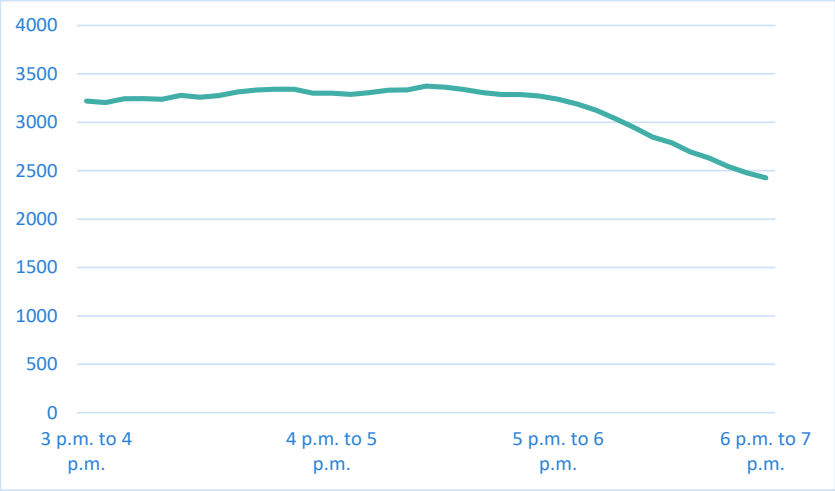

FIGURE 2: ROLLING HOUR VOLUMES AT US 26 & 362ND DRIVE

TABLE 3: AVERAGE WEEKDAY INTERSECTION OPERATIONS ON US 26 ACROSS THE PEAK PERIOD (INTERSECTIONS NOT MEETING TARGETS IN STEP 5)

STUDY INTERSECTION	CONTROL	MOBILITY TARGET	2040 3 P.M. TO 4 P.M.	2040 4 P.M. TO 5 P.M. (PEAK)	2040 5 P.M. TO 6 P.M.	2040 6 P.M. TO 7 P.M.
ORIENT DR/US 26	Signal	0.80	**1.01**	**1.04**	**1.03**	0.76
362ND DR/US 26	Signal	0.80	**1.01**	**1.03**	**1.02**	0.76
INDUSTRIAL WAY/ US 26	Signal[A]	0.80	**0.98**	**1.03**	**1.00**	0.73
RUBEN LN/US 26	Signal[A]	0.80	**0.87**	**0.89**	**0.88**	0.65
BLUFF RD/US 26	Signal	0.85	**1.00**	**1.02**	**1.01**	0.75

Bold and Red values indicate the adopted mobility target would not be met. At signalized study intersections the v/c, LOS and delay are reported as the intersection average and at unsignalized intersections the v/c, LOS and delay are reported for the worst highway approach/ worst side street approach.

A. This signal reported using HCM 2000 due to non-standard characteristics.

As shown above the average weekday intersection operations are consistent from 3 p.m. to 6 p.m. with slightly worse operations during the 4 to 5 p.m. peak hour. The intersections along US 26 from Orient Drive to Bluff Road are expected to exceed the existing mobility target for each of the individual hours during that period. At 6 p.m. the traffic volumes decrease to a level where the existing mobility targets are met. Based on these operations the proposed alternative mobility targets are described below.

RECOMMENDED ALTERNATIVE MOBILITY TARGETS

While the transportation investments identified as reasonably likely to be funded in the Sandy TSP will result in improved intersection performance on ODOT facilities by providing alternative routes off US 26, not all intersections will be able to meet state v/c mobility targets. There is a need to consider alternative mobility targets in select locations. Alternative mobility targets establish realistic expectations for future system performance and help the community continue to grow in accordance with its adopted land use plan. Table 4 shows the existing and proposed mobility targets.

TABLE 4: EXISTING AND PROPOSED MOBILITY TARGETS

INTERSECTION	CONTROL	EXISTING V/C MOBILITY TARGET [A]	PROPOSED MOBILITY TARGET[A]
ORIENT DR/US 26	Urban 4SG	0.80	Multi-hour from 3 p.m. to 6 p.m. at 1.05 v/c, PHF = 1.0, average weekday
362ND DR/US 26	Urban 4SG	0.80	Multi-hour from 3 p.m. to 6 p.m. at 1.05 v/c, PHF = 1.0, average weekday
INDUSTRIAL WAY/ US 26	Urban 4SG	0.80	Multi-hour from 3 p.m. to 6 p.m. at 1.05 v/c, PHF = 1.0, average weekday
RUBEN LN/US 26	Urban 4SG	0.80	Multi-hour from 3 p.m. to 6 p.m. 0.90 v/c, PHF = 1.0, average weekday
BLUFF RD/US 26	Urban 4SG	0.85	Multi-hour from 3 p.m. to 6 p.m. at 1.05 v/c, PHF =

INTERSECTION	CONTROL	EXISTING V/C MOBILITY TARGET [A]	PROPOSED MOBILITY TARGET[A]
			1.0, average weekday
PIONEER BOULEVARD (US 26)/MEINIG AVENUE (OR 211)	Urban 3SG	0.90	No Change
PROCTOR BOULEVARD (US 26)/MEINIG AVENUE (OR 211)	Urban 3SG	0.90	No Change
TEN EYCK RD/US 26	Urban 4SG	0.85	No Change
LANGENSAND RD/US 26	Urban 3ST	0.80 [0.90]	PHF = 1.0, Average weekday, 0.80 [0.90]
VISTA LOOP DR W/US 26	Urban 4ST	0.80 [0.90]	PHF = 1.0, Average weekday, 0.80 [1.80] [signal or lane warrant met]
VISTA LOOP DR E/US 26	Urban 3ST	0.80 [0.90]	No change

[A] For unsignalized intersections, the mobility target is listed for major approach (highway approach) [minor approach] (side street approach).

The proposed mobility targets in Table 4 result in the following changes to the existing mobility targets:

- Signalized intersections along US 26 from Orient Drive to Industrial Way and at Bluff Road will have a multi-hour volume to capacity ratio target of 1.05 from 3 p.m. to 6 p.m under average weekday conditions with a peak hour factor of 1.0.
- The signalized intersection of US 26 and Ruben Lane will have a multi-hour volume to capacity ratio target of 0.90 from 3 p.m. to 6 p.m under average weekday conditions with a peak hour factor of 1.0.
- The unsignalized intersection of US 26 and Langensand Road will continue with the current mobility target of 0.80 (0.90 for the minor approach/side street) under average weekday conditions with a peak hour factor of 1.0.
- The unsignalized intersection of US 26 and Vista Loop Drive West will be evaluated under average weekday conditions with a peak hour factor of 1.0. The major approach mobility target will remain at 0.80, the minor street target will be 1.80 while the minor approach traffic volumes do not meet one of the criteria of preliminary signal warrants (must evaluate all warrants) or turn lane warrants. If the minor approach does meet a signal warrant, the mobility target will be 0.80 for the intersection and will require the appropriate mitigation to bring operations to the target. If the minor approach does meet a lane warrant, the mobility target will be 0.90 for the minor approach and will require the appropriate mitigation bring operations to the target.

Since it is the through traffic volume along US 26 and a lack of parallel routes that result in many of the intersections exceeding the proposed target, development in the city, while increasing the vehicle demand in the transportation system, will also support the construction of new off-highway connections that can reduce the impact on US 26 and, if not improve, at least maintain the traffic operations at the intersections along the corridor.

The proposed targets provide a limitation on land use amendments within Sandy because many intersections are expected to just meet proposed targets with the expected amount of future development. Simultaneously, the proposed targets facilitate development within the existing land use plan by allowing for a higher utilization of the available capacity along US 26.

APPENDIX

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SECTION 1. HCM REPORTS

FINANCIALLY CONSTRAINED

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26 01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	2520	5	10	1750	225	10	50	10	260	10	20
Future Volume (veh/h)	60	2520	5	10	1750	225	10	50	10	260	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	63	2653	5	11	1842	0	11	53	11	274	11	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	82	1922	857	66	1863		14	70	14	313	101	193
Arrive On Green	0.05	0.57	0.57	0.04	0.56	0.00	0.07	0.06	0.07	0.19	0.19	0.19
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	227	1096	227	1688	545	1040
Grp Volume(v), veh/h	63	2653	5	11	1842	0	75	0	0	274	0	32
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1551	0	0	1688	0	1585
Q Serve(g_s), s	4.2	65.0	0.2	0.7	62.4	0.0	5.4	0.0	0.0	18.0	0.0	1.9
Cycle Q Clear(g_c), s	4.2	65.0	0.2	0.7	62.4	0.0	5.4	0.0	0.0	18.0	0.0	1.9
Prop In Lane	1.00		1.00	1.00		1.00	0.15		0.15	1.00		0.66
Lane Grp Cap(c), veh/h	82	1922	857	66	1863		98	0	0	313	0	294
V/C Ratio(X)	0.77	1.38	0.01	0.17	0.99		0.76	0.00	0.00	0.88	0.00	0.11
Avail Cap(c_a), veh/h	82	1922	857	80	1863		102	0	0	326	0	306
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.6	24.4	10.5	52.9	24.6	0.0	52.4	0.0	0.0	45.1	0.0	38.5
Incr Delay (d2), s/veh	34.1	174.4	0.0	0.7	18.3	0.0	24.4	0.0	0.0	21.8	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	68.0	0.0	0.3	25.1	0.0	2.8	0.0	0.0	9.5	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.6	198.8	10.5	53.6	42.8	0.0	76.7	0.0	0.0	66.9	0.0	38.7
LnGrp LOS	F	F	B	D	D		E	A	A	E	A	D
Approach Vol, veh/h		2721			1853			75			306	
Approach Delay, s/veh		195.9			42.9			76.7			63.9	
Approach LOS		F			D			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	68.0		25.1	8.5	69.0		11.2				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	5.0	61.0		21.0	5.0	61.0		7.0				
Max Q Clear Time (g_c+I1), s	6.2	64.4		20.0	2.7	67.0		7.4				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		128.7
HCM 6th LOS		F

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	1600	420	265	1525	340	335	150	325	150	175	170
Future Volume (veh/h)	300	1600	420	265	1525	340	335	150	325	150	175	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	316	1684	442	279	1605	358	353	158	342	158	184	179
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	198	1243	884	258	1397	820	761	402	343	236	248	210
Arrive On Green	0.08	0.37	0.36	0.16	0.56	0.54	0.23	0.23	0.23	0.14	0.14	0.14
Sat Flow, veh/h	1688	3367	1502	1661	3313	1502	3300	1772	1512	1688	1772	1502
Grp Volume(v), veh/h	316	1684	442	279	1605	358	353	158	342	158	184	179
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1502	1650	1772	1512	1688	1772	1502
Q Serve(g_s), s	11.0	48.0	22.3	15.8	54.8	15.9	12.0	9.8	29.4	11.6	13.0	15.1
Cycle Q Clear(g_c), s	11.0	48.0	22.3	15.8	54.8	15.9	12.0	9.8	29.4	11.6	13.0	15.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1243	884	258	1397	820	761	402	343	236	248	210
V/C Ratio(X)	1.59	1.35	0.50	1.08	1.15	0.44	0.46	0.39	1.00	0.67	0.74	0.85
Avail Cap(c_a), veh/h	198	1243	884	258	1397	820	761	402	343	376	395	335
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.20	0.20	0.20	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	41.0	15.6	52.8	28.5	13.2	43.1	42.7	50.2	53.1	53.7	54.6
Incr Delay (d2), s/veh	290.0	165.0	2.0	50.9	68.8	0.3	0.3	0.4	47.8	2.4	3.3	9.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.4	47.0	12.5	11.3	30.1	6.0	4.9	4.3	15.5	5.1	6.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	327.3	206.0	17.6	103.7	97.4	13.5	43.3	43.0	98.0	55.5	56.9	64.1
LnGrp LOS	F	F	B	F	F	B	D	D	F	E	E	E
Approach Vol, veh/h		2442			2242			853			521	
Approach Delay, s/veh		187.6			84.8			65.2			59.0	
Approach LOS		F			F			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.8	52.0		22.2	15.0	58.8		34.0				
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5				
Max Green Setting (Gmax), s	7.8	* 46		29.0	11.0	42.0		29.5				
Max Q Clear Time (g_c+I1), s	17.8	50.0		17.1	13.0	56.8		31.4				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	121.2
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis
4: Industrial Way & US 26 01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1945	5	25	1795	50	170	35	250	230	15	170
Future Volume (vph)	65	1945	5	25	1795	50	170	35	250	230	15	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1620		1624	1638	1508
Flt Permitted	0.06	1.00		0.06	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	100	3316		101	3358	1471		1620		1624	1638	1508
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	66	1985	5	26	1832	51	173	36	255	235	15	173
RTOR Reduction (vph)	0	0	0	0	0	23	0	33	0	0	0	112
Lane Group Flow (vph)	66	1990	0	26	1832	28	0	431	0	125	125	61
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						4
Actuated Green, G (s)	74.3	70.3		71.1	68.7	68.7		22.6		17.3	17.3	17.3
Effective Green, g (s)	75.3	71.7		71.1	70.1	70.1		22.6		17.3	17.3	17.3
Actuated g/C Ratio	0.58	0.55		0.55	0.54	0.54		0.17		0.13	0.13	0.13
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	112	1828		83	1810	793		281		216	217	200
v/s Ratio Prot	c0.02	c0.60		0.01	0.55			c0.27		c0.08	0.08	
v/s Ratio Perm	0.32			0.16		0.02						0.04
v/c Ratio	0.59	1.09		0.31	1.01	0.03		1.53		0.58	0.58	0.31
Uniform Delay, d1	56.5	29.1		59.7	30.0	14.1		53.7		52.9	52.9	50.9
Progression Factor	0.43	0.45		0.79	0.67	2.57		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.8	45.0		0.8	19.5	0.0		257.3		2.8	2.7	0.5
Delay (s)	27.4	58.1		47.8	39.4	36.2		311.0		55.7	55.6	51.4
Level of Service	C	E		D	D	D		F		E	E	D
Approach Delay (s)		57.1			39.5			311.0			53.9	
Approach LOS		E			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	74.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	2045	195	45	1650	100	120	35	40	270	35	135
Future Volume (vph)	175	2045	195	45	1650	100	120	35	40	270	35	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1467	1644	3358	1432		1682	1461	1624	1646	1506
Flt Permitted	0.07	1.00	1.00	0.06	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	132	3318	1467	96	3358	1432		1682	1461	1624	1646	1506
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	177	2066	197	45	1667	101	121	35	40	273	35	136
RTOR Reduction (vph)	0	0	40	0	0	36	0	0	34	0	0	126
Lane Group Flow (vph)	177	2066	157	45	1667	65	0	156	6	153	155	10
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2		2	6		6		8	8			4
Actuated Green, G (s)	81.5	80.1	80.1	75.5	75.5	75.5		19.3	19.3	10.0	10.0	10.0
Effective Green, g (s)	81.5	81.5	81.5	75.5	76.9	76.9		19.3	19.3	10.0	10.0	10.0
Actuated g/C Ratio	0.63	0.63	0.63	0.58	0.59	0.59		0.15	0.15	0.08	0.08	0.08
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	175	2080	919	93	1986	847		249	216	124	126	115
v/s Ratio Prot	0.06	c0.62		0.01	c0.50			c0.09		c0.09	0.09	
v/s Ratio Perm	c0.57		0.11	0.27		0.05			0.00			0.01
v/c Ratio	1.01	0.99	0.17	0.48	0.84	0.08		0.63	0.03	1.23	1.23	0.09
Uniform Delay, d1	42.5	24.0	10.1	30.2	21.5	11.4		52.0	47.3	60.0	60.0	55.8
Progression Factor	0.66	0.41	0.29	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.3	4.6	0.0	2.3	4.5	0.2		3.9	0.0	156.7	154.7	0.2
Delay (s)	51.1	14.5	2.9	32.5	26.0	11.5		55.9	47.4	216.7	214.7	56.0
Level of Service	D	B	A	C	C	B		E	D	F	F	E
Approach Delay (s)		16.2			25.4			54.2			166.8	
Approach LOS		B			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
6: Bluff Rd & US 26

01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	1910	155	95	1430	245	145	55	120	155	45	255
Future Volume (veh/h)	285	1910	155	95	1430	245	145	55	120	155	45	255
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	291	1949	158	97	1459	250	148	56	122	158	46	260
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	247	1681	748	75	1150	572	139	78	170	250	53	299
Arrive On Green	0.15	0.50	0.50	0.05	0.39	0.39	0.08	0.16	0.16	0.15	0.23	0.23
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	493	1075	1701	232	1313
Grp Volume(v), veh/h	291	1949	158	97	1459	250	148	0	178	158	0	306
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1569	1701	0	1546
Q Serve(g_s), s	16.1	54.9	6.5	5.0	43.0	13.8	9.0	0.0	11.8	9.6	0.0	20.9
Cycle Q Clear(g_c), s	16.1	54.9	6.5	5.0	43.0	13.8	9.0	0.0	11.8	9.6	0.0	20.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.69	1.00		0.85
Lane Grp Cap(c), veh/h	247	1681	748	75	1150	572	139	0	248	250	0	352
V/C Ratio(X)	1.18	1.16	0.21	1.30	1.27	0.44	1.06	0.00	0.72	0.63	0.00	0.87
Avail Cap(c_a), veh/h	247	1681	748	75	1150	572	139	0	428	250	0	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.13	0.13	0.13	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.9	27.5	15.4	52.5	33.5	24.6	50.5	0.0	43.8	44.1	0.0	40.7
Incr Delay (d2), s/veh	85.1	72.7	0.1	202.2	128.1	2.4	94.2	0.0	2.4	4.4	0.0	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	37.1	2.2	6.3	35.5	5.2	7.5	0.0	4.8	4.4	0.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	132.0	100.2	15.5	254.7	161.6	27.0	144.7	0.0	46.2	48.5	0.0	54.9
LnGrp LOS	F	F	B	F	F	C	F	A	D	D	A	D
Approach Vol, veh/h		2398			1806			326			464	
Approach Delay, s/veh		98.5			148.0			90.9			52.7	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	58.9	13.0	29.1	20.9	47.0	20.7	21.4
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.5	* 4.5
Max Green Setting (Gmax), s	5.0	49.2	9.0	29.5	12.0	* 43	9.0	* 30
Max Q Clear Time (g_c+I1), s	7.0	56.9	11.0	22.9	18.1	45.0	11.6	13.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	111.7
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	175	1375	15	270	45	0	0	65	40
Future Volume (veh/h)	0	0	0	175	1375	15	270	45	0	0	65	40
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				184	1447	16	284	47	0	0	68	42
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				205	1702	20	422	60	0	0	362	224
Arrive On Green				0.56	0.56	0.56	0.35	0.35	0.00	0.00	0.35	0.35
Sat Flow, veh/h				366	3034	35	1018	169	0	0	1022	631
Grp Volume(v), veh/h				861	0	786	331	0	0	0	0	110
Grp Sat Flow(s),veh/h/ln				1712	0	1723	1187	0	0	0	0	1653
Q Serve(g_s), s				48.9	0.0	40.5	24.4	0.0	0.0	0.0	0.0	5.1
Cycle Q Clear(g_c), s				48.9	0.0	40.5	29.4	0.0	0.0	0.0	0.0	5.1
Prop In Lane				0.21		0.02	0.86		0.00	0.00		0.38
Lane Grp Cap(c), veh/h				960	0	967	482	0	0	0	0	586
V/C Ratio(X)				0.90	0.00	0.81	0.69	0.00	0.00	0.00	0.00	0.19
Avail Cap(c_a), veh/h				980	0	987	482	0	0	0	0	586
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.79	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.3	0.0	19.5	34.7	0.0	0.0	0.0	0.0	24.5
Incr Delay (d2), s/veh				12.8	0.0	7.5	6.2	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				22.0	0.0	17.5	8.9	0.0	0.0	0.0	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				34.1	0.0	26.9	40.9	0.0	0.0	0.0	0.0	24.7
LnGrp LOS				C	A	C	D	A	A	A	A	C
Approach Vol, veh/h					1647			331			110	
Approach Delay, s/veh					30.7			40.9			24.7	
Approach LOS					C			D			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	43.0	65.7	43.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	39.0	63.0	39.0
Max Q Clear Time (g_c+I1), s	7.1	50.9	31.4
Green Ext Time (p_c), s	0.3	10.8	0.9

Intersection Summary	
HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	1535	555	0	0	0	0	240	245	40	210	0
Future Volume (veh/h)	75	1535	555	0	0	0	0	240	245	40	210	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	79	1616	0				0	253	258	42	221	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	97	2082					0	403	334	52	498	0
Arrive On Green	0.63	0.63	0.00				0.00	0.23	0.23	0.01	0.10	0.00
Sat Flow, veh/h	153	3294	1502				0	1772	1470	1647	1730	0
Grp Volume(v), veh/h	908	787	0				0	253	258	42	221	0
Grp Sat Flow(s),veh/h/ln	1764	1683	1502				0	1772	1470	1647	1730	0
Q Serve(g_s), s	42.9	35.5	0.0				0.0	14.2	18.1	2.8	13.3	0.0
Cycle Q Clear(g_c), s	42.9	35.5	0.0				0.0	14.2	18.1	2.8	13.3	0.0
Prop In Lane	0.09		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1115	1064					0	403	334	52	498	0
V/C Ratio(X)	0.81	0.74					0.00	0.63	0.77	0.81	0.44	0.00
Avail Cap(c_a), veh/h	1115	1064					0	403	334	75	535	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.97	0.97	0.99	0.99	0.00
Uniform Delay (d), s/veh	15.3	14.0	0.0				0.0	38.3	39.8	54.1	41.5	0.0
Incr Delay (d2), s/veh	6.6	4.6	0.0				0.0	7.0	15.4	26.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.1	14.0	0.0				0.0	6.8	7.8	1.6	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	18.6	0.0				0.0	45.3	55.2	80.4	41.8	0.0
LnGrp LOS	C	B					A	D	E	F	D	A
Approach Vol, veh/h		1695						511			263	
Approach Delay, s/veh		20.4						50.3			48.0	
Approach LOS		C						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	73.5	36.5	7.5	29.0
Change Period (Y+Rc), s	4.0	* 4.8	4.0	4.8
Max Green Setting (Gmax), s	68.0	* 34	5.0	24.2
Max Q Clear Time (g_c+I1), s	44.9	15.3	4.8	20.1
Green Ext Time (p_c), s	19.7	0.5	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	1450	125	10	1180	25	100	25	10	175	20	120
Future Volume (veh/h)	170	1450	125	10	1180	25	100	25	10	175	20	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	179	1526	132	11	1242	26	105	26	11	184	21	126
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	343	2075	925	24	1398	623	272	64	23	258	24	142
Arrive On Green	0.20	0.62	0.62	0.01	0.43	0.43	0.25	0.26	0.24	0.25	0.26	0.24
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	842	250	92	812	96	558
Grp Volume(v), veh/h	179	1526	132	11	1242	26	142	0	0	331	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1185	0	0	1465	0	0
Q Serve(g_s), s	10.4	35.0	4.1	0.7	39.0	1.1	0.0	0.0	0.0	12.7	0.0	0.0
Cycle Q Clear(g_c), s	10.4	35.0	4.1	0.7	39.0	1.1	11.3	0.0	0.0	24.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.74		0.08	0.56		0.38
Lane Grp Cap(c), veh/h	343	2075	925	24	1398	623	354	0	0	418	0	0
V/C Ratio(X)	0.52	0.74	0.14	0.45	0.89	0.04	0.40	0.00	0.00	0.79	0.00	0.00
Avail Cap(c_a), veh/h	343	2075	925	66	1446	645	413	0	0	481	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.0	14.8	8.9	53.7	28.8	18.1	34.8	0.0	0.0	39.8	0.0	0.0
Incr Delay (d2), s/veh	1.0	2.4	0.3	7.9	8.8	0.1	0.5	0.0	0.0	7.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	13.4	1.4	0.3	15.8	0.4	3.3	0.0	0.0	9.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	17.2	9.2	61.7	37.5	18.2	35.3	0.0	0.0	47.1	0.0	0.0
LnGrp LOS	D	B	A	E	D	B	D	A	A	D	A	A
Approach Vol, veh/h		1837			1279			142			331	
Approach Delay, s/veh		18.8			37.4			35.3			47.1	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	72.3		32.1	26.4	51.5		32.1
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.0	* 61		31.3	15.5	49.2		31.3
Max Q Clear Time (g_c+I1), s	12.7	37.0		26.0	12.4	41.0		13.3
Green Ext Time (p_c), s	0.0	19.6		0.5	0.1	6.6		0.4

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1535	90	30	1230	25	70
Future Vol, veh/h	1535	90	30	1230	25	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1616	95	32	1295	26	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1711	0	2328	808
Stage 1	-	-	-	-	1616	-
Stage 2	-	-	-	-	712	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	350	-	32	328
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	453	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	350	-	29	328
Mov Cap-2 Maneuver	-	-	-	-	29	-
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	412	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	102.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	29	328	-	-	350	-
HCM Lane V/C Ratio	0.907	0.225	-	-	0.09	-
HCM Control Delay (s)	$ 334.4	19.1	-	-	16.3	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	3	0.8	-	-	0.3	-

Intersection	
Int Delay, s/veh	30.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	170	1435	0	100	1140	0	5	5	100	5	0	120
Future Vol, veh/h	170	1435	0	100	1140	0	5	5	100	5	0	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	100	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	2	2	6	6	2	2	2	0	2	0
Mvmt Flow	179	1511	0	105	1200	0	5	5	105	5	0	126

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1200	0	0	1511	0	0	2679	3279	756	2526	3279	600
Stage 1	-	-	-	-	-	-	1869	1869	-	1410	1410	-
Stage 2	-	-	-	-	-	-	810	1410	-	1116	1869	-
Critical Hdwy	4.16	-	-	4.14	-	-	7.54	6.54	6.94	7.5	6.54	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Follow-up Hdwy	2.23	-	-	2.22	-	-	3.52	4.02	3.32	3.5	4.02	3.3
Pot Cap-1 Maneuver	572	-	-	439	-	-	11	9	351	14	9	449
Stage 1	-	-	-	-	-	-	75	120	-	148	203	-
Stage 2	-	-	-	-	-	-	340	203	-	225	120	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	572	-	-	439	-	-	~ 5	~ 5	351	-	5	449
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 5	~ 5	-	-	5	-
Stage 1	-	-	-	-	-	-	52	82	-	102	154	-
Stage 2	-	-	-	-	-	-	186	154	-	101	82	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	1.3	$ 824.8	
HCM LOS			F	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	48	572	-	-	439	-	-	-
HCM Lane V/C Ratio	2.412	0.313	-	-	0.24	-	-	-
HCM Control Delay (s)	$ 824.8	14.1	-	-	15.8	-	-	-
HCM Lane LOS	F	B	-	-	C	-	-	-
HCM 95th %tile Q(veh)	12.1	1.3	-	-	0.9	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1535	1235	25	10	0
Future Vol, veh/h	5	1535	1235	25	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1616	1300	26	11	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1326	0	-	0	2131	663
Stage 1	-	-	-	-	1313	-
Stage 2	-	-	-	-	818	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	517	-	-	-	42	404
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	394	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	517	-	-	-	42	404
Mov Cap-2 Maneuver	-	-	-	-	42	-
Stage 1	-	-	-	-	214	-
Stage 2	-	-	-	-	394	-

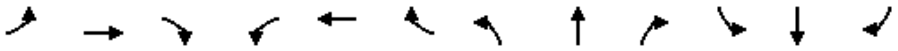
Approach	EB	WB	SB
HCM Control Delay, s	0	0	117.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	517	-	-	-	42
HCM Lane V/C Ratio	0.01	-	-	-	0.251
HCM Control Delay (s)	12	-	-	-	117.3
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	0.8

SECTION 2. HCM REPORTS

FINANCIALLY CONSTRAINED WITHOUT PEAKING

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26 01/03/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	2520	5	10	1750	225	10	50	10	260	10	20
Future Volume (veh/h)	60	2520	5	10	1750	225	10	50	10	260	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	60	2520	5	10	1750	0	10	50	10	260	10	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	83	1945	868	67	1884		13	66	13	302	94	189
Arrive On Green	0.05	0.58	0.58	0.04	0.57	0.00	0.06	0.06	0.06	0.18	0.18	0.18
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	222	1109	222	1688	527	1055
Grp Volume(v), veh/h	60	2520	5	10	1750	0	70	0	0	260	0	30
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1552	0	0	1688	0	1582
Q Serve(g_s), s	3.9	64.5	0.2	0.6	53.9	0.0	5.0	0.0	0.0	16.7	0.0	1.8
Cycle Q Clear(g_c), s	3.9	64.5	0.2	0.6	53.9	0.0	5.0	0.0	0.0	16.7	0.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	0.14		0.14	1.00		0.67
Lane Grp Cap(c), veh/h	83	1945	868	67	1884		93	0	0	302	0	283
V/C Ratio(X)	0.72	1.30	0.01	0.15	0.93		0.76	0.00	0.00	0.86	0.00	0.11
Avail Cap(c_a), veh/h	83	1945	868	82	1900		104	0	0	333	0	312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.3	23.6	10.0	51.7	22.0	0.0	51.6	0.0	0.0	44.5	0.0	38.3
Incr Delay (d2), s/veh	24.3	137.0	0.0	0.6	8.9	0.0	20.1	0.0	0.0	18.7	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	58.0	0.0	0.3	19.7	0.0	2.5	0.0	0.0	8.6	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.5	160.5	10.0	52.3	30.9	0.0	71.6	0.0	0.0	63.2	0.0	38.5
LnGrp LOS	E	F	A	D	C		E	A	A	E	A	D
Approach Vol, veh/h		2585			1760			70			290	
Approach Delay, s/veh		158.3			31.0			71.6			60.6	
Approach LOS		F			C			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	67.5		24.0	8.5	68.5		10.7				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	5.0	61.0		21.0	5.0	61.0		7.0				
Max Q Clear Time (g_c+I1), s	5.9	55.9		18.7	2.6	66.5		7.0				
Green Ext Time (p_c), s	0.0	4.6		0.3	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	103.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	1600	420	265	1525	340	335	150	325	150	175	170
Future Volume (veh/h)	300	1600	420	265	1525	340	335	150	325	150	175	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	300	1600	420	265	1525	340	335	150	325	150	175	170
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	198	1243	884	268	1418	820	761	402	343	226	237	201
Arrive On Green	0.08	0.37	0.36	0.26	0.86	0.82	0.23	0.23	0.23	0.13	0.13	0.13
Sat Flow, veh/h	1688	3367	1502	1661	3313	1502	3300	1772	1512	1688	1772	1502
Grp Volume(v), veh/h	300	1600	420	265	1525	340	335	150	325	150	175	170
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1502	1650	1772	1512	1688	1772	1502
Q Serve(g_s), s	11.0	48.0	20.8	16.3	55.6	7.3	11.3	9.3	27.5	11.0	12.3	14.4
Cycle Q Clear(g_c), s	11.0	48.0	20.8	16.3	55.6	7.3	11.3	9.3	27.5	11.0	12.3	14.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1243	884	268	1418	820	761	402	343	226	237	201
V/C Ratio(X)	1.51	1.29	0.48	0.99	1.08	0.41	0.44	0.37	0.95	0.66	0.74	0.85
Avail Cap(c_a), veh/h	198	1243	884	268	1418	820	761	402	343	376	395	335
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.25	0.25	0.25	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	41.0	15.3	46.6	9.4	4.5	42.8	42.4	49.5	53.5	54.1	55.0
Incr Delay (d2), s/veh	255.4	135.4	1.8	24.9	38.1	0.4	0.2	0.4	34.8	2.5	3.3	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.5	41.9	11.6	8.7	10.8	2.0	4.6	4.1	13.6	4.8	5.7	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	292.7	176.4	17.1	71.5	47.5	4.9	43.1	42.8	84.3	56.0	57.5	62.7
LnGrp LOS	F	F	B	E	F	A	D	D	F	E	E	E
Approach Vol, veh/h		2320			2130			810			495	
Approach Delay, s/veh		162.6			43.7			59.6			58.8	
Approach LOS		F			D			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.6	52.0		21.4	15.0	59.6		34.0				
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5				
Max Green Setting (Gmax), s	7.0	* 46		29.0	11.0	42.0		29.5				
Max Q Clear Time (g_c+I1), s	18.3	50.0		16.4	13.0	57.6		29.5				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	95.2
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis
4: Industrial Way & US 26 01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1945	5	25	1795	50	170	35	250	230	15	170
Future Volume (vph)	65	1945	5	25	1795	50	170	35	250	230	15	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1620		1624	1638	1508
Flt Permitted	0.06	1.00		0.06	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	99	3316		100	3358	1471		1620		1624	1638	1508
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	65	1945	5	25	1795	50	170	35	250	230	15	170
RTOR Reduction (vph)	0	0	0	0	0	23	0	33	0	0	0	114
Lane Group Flow (vph)	65	1950	0	25	1795	27	0	422	0	122	123	56
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						4
Actuated Green, G (s)	74.5	70.5		71.3	68.9	68.9		22.6		17.1	17.1	17.1
Effective Green, g (s)	75.5	71.9		71.3	70.3	70.3		22.6		17.1	17.1	17.1
Actuated g/C Ratio	0.58	0.55		0.55	0.54	0.54		0.17		0.13	0.13	0.13
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	112	1834		83	1815	795		281		213	215	198
v/s Ratio Prot	c0.02	c0.59		0.01	0.53			c0.26		c0.08	0.08	
v/s Ratio Perm	0.32			0.16		0.02						0.04
v/c Ratio	0.58	1.06		0.30	0.99	0.03		1.50		0.57	0.57	0.28
Uniform Delay, d1	54.9	29.0		59.6	29.5	14.0		53.7		53.0	53.0	50.9
Progression Factor	0.45	0.48		0.78	0.67	2.58		1.00		1.00	1.00	1.00
Incremental Delay, d2	3.2	35.8		0.7	14.1	0.0		243.5		2.7	2.7	0.5
Delay (s)	28.2	49.8		47.3	33.9	36.0		297.2		55.8	55.7	51.4
Level of Service	C	D		D	C	D		F		E	E	D
Approach Delay (s)		49.1			34.1			297.2			54.0	
Approach LOS		D			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	67.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	2045	195	45	1650	100	120	35	40	270	35	135
Future Volume (vph)	175	2045	195	45	1650	100	120	35	40	270	35	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1467	1644	3358	1432		1682	1461	1624	1646	1506
Flt Permitted	0.08	1.00	1.00	0.06	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	138	3318	1467	96	3358	1432		1682	1461	1624	1646	1506
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	2045	195	45	1650	100	120	35	40	270	35	135
RTOR Reduction (vph)	0	0	40	0	0	35	0	0	34	0	0	125
Lane Group Flow (vph)	175	2045	155	45	1650	65	0	155	6	151	154	10
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2		2	6		6		8	8			4
Actuated Green, G (s)	81.6	80.2	80.2	75.6	75.6	75.6		19.2	19.2	10.0	10.0	10.0
Effective Green, g (s)	81.6	81.6	81.6	75.6	77.0	77.0		19.2	19.2	10.0	10.0	10.0
Actuated g/C Ratio	0.63	0.63	0.63	0.58	0.59	0.59		0.15	0.15	0.08	0.08	0.08
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	178	2082	920	93	1988	848		248	215	124	126	115
v/s Ratio Prot	0.06	c0.62		0.01	c0.49			c0.09		0.09	c0.09	
v/s Ratio Perm	0.55		0.11	0.27		0.05			0.00			0.01
v/c Ratio	0.98	0.98	0.17	0.48	0.83	0.08		0.62	0.03	1.22	1.22	0.09
Uniform Delay, d1	41.8	23.5	10.1	30.2	21.3	11.3		52.0	47.4	60.0	60.0	55.8
Progression Factor	0.66	0.42	0.28	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.3	3.1	0.0	2.3	4.2	0.2		3.9	0.0	150.8	151.8	0.2
Delay (s)	43.7	12.9	2.9	32.5	25.4	11.5		55.9	47.4	210.8	211.8	56.0
Level of Service	D	B	A	C	C	B		E	D	F	F	E
Approach Delay (s)		14.3			24.8			54.2			163.6	
Approach LOS		B			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	90.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	1910	155	95	1430	245	145	55	120	155	45	255
Future Volume (veh/h)	285	1910	155	95	1430	245	145	55	120	155	45	255
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	285	1910	155	95	1430	245	145	55	120	155	45	255
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	253	1692	753	75	1150	572	139	77	168	247	52	295
Arrive On Green	0.15	0.50	0.50	0.05	0.39	0.39	0.08	0.16	0.16	0.15	0.22	0.23
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	493	1075	1701	232	1314
Grp Volume(v), veh/h	285	1910	155	95	1430	245	145	0	175	155	0	300
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1568	1701	0	1545
Q Serve(g_s), s	16.5	55.3	6.3	5.0	43.0	13.5	9.0	0.0	11.6	9.4	0.0	20.5
Cycle Q Clear(g_c), s	16.5	55.3	6.3	5.0	43.0	13.5	9.0	0.0	11.6	9.4	0.0	20.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.69	1.00		0.85
Lane Grp Cap(c), veh/h	253	1692	753	75	1150	572	139	0	246	247	0	347
V/C Ratio(X)	1.13	1.13	0.21	1.27	1.24	0.43	1.04	0.00	0.71	0.63	0.00	0.86
Avail Cap(c_a), veh/h	253	1692	753	75	1150	572	139	0	428	247	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.15	0.15	0.15	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.8	27.4	15.2	52.5	33.5	24.5	50.5	0.0	43.9	44.2	0.0	40.8
Incr Delay (d2), s/veh	65.8	59.5	0.1	192.3	117.3	2.3	87.9	0.0	2.4	4.2	0.0	13.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	34.2	2.2	6.1	33.8	5.1	7.2	0.0	4.7	4.3	0.0	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	112.5	86.8	15.3	244.8	150.8	26.8	138.4	0.0	46.2	48.4	0.0	54.2
LnGrp LOS	F	F	B	F	F	C	F	A	D	D	A	D
Approach Vol, veh/h		2350			1770			320			455	
Approach Delay, s/veh		85.2			138.7			88.0			52.2	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	59.3	13.0	28.7	21.3	47.0	20.5	21.2
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.5	* 4.5
Max Green Setting (Gmax), s	5.0	49.2	9.0	29.5	12.0	* 43	9.0	* 30
Max Q Clear Time (g_c+I1), s	7.0	57.3	11.0	22.5	18.5	45.0	11.4	13.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	101.7
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	175	1375	15	270	45	0	0	65	40
Future Volume (veh/h)	0	0	0	175	1375	15	270	45	0	0	65	40
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				175	1375	15	270	45	0	0	65	40
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				202	1672	19	426	61	0	0	363	223
Arrive On Green				0.55	0.55	0.55	0.35	0.35	0.00	0.00	0.35	0.35
Sat Flow, veh/h				366	3034	35	1029	172	0	0	1024	630
Grp Volume(v), veh/h				818	0	747	315	0	0	0	0	105
Grp Sat Flow(s),veh/h/ln				1711	0	1723	1201	0	0	0	0	1653
Q Serve(g_s), s				45.2	0.0	37.8	22.6	0.0	0.0	0.0	0.0	4.8
Cycle Q Clear(g_c), s				45.2	0.0	37.8	27.5	0.0	0.0	0.0	0.0	4.8
Prop In Lane				0.21		0.02	0.86		0.00	0.00		0.38
Lane Grp Cap(c), veh/h				943	0	950	486	0	0	0	0	586
V/C Ratio(X)				0.87	0.00	0.79	0.65	0.00	0.00	0.00	0.00	0.18
Avail Cap(c_a), veh/h				980	0	987	486	0	0	0	0	586
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.83	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.2	0.0	19.6	33.9	0.0	0.0	0.0	0.0	24.5
Incr Delay (d2), s/veh				10.6	0.0	6.6	5.5	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				20.1	0.0	16.3	8.3	0.0	0.0	0.0	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.8	0.0	26.1	39.4	0.0	0.0	0.0	0.0	24.6
LnGrp LOS				C	A	C	D	A	A	A	A	C
Approach Vol, veh/h					1565			315			105	
Approach Delay, s/veh					29.1			39.4			24.6	
Approach LOS					C			D			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	43.0	64.6	43.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	39.0	63.0	39.0
Max Q Clear Time (g_c+I1), s	6.8	47.2	29.5
Green Ext Time (p_c), s	0.3	13.4	1.0

Intersection Summary	
HCM 6th Ctrl Delay	30.5
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
14: Hwy 211 & Pioneer Blvd

01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	1535	555	0	0	0	0	240	245	40	210	0
Future Volume (veh/h)	75	1535	555	0	0	0	0	240	245	40	210	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	75	1535	0				0	240	245	40	210	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	97	2088					0	403	334	49	495	0
Arrive On Green	0.63	0.63	0.00				0.00	0.23	0.23	0.01	0.09	0.00
Sat Flow, veh/h	153	3294	1502				0	1772	1470	1647	1730	0
Grp Volume(v), veh/h	863	747	0				0	240	245	40	210	0
Grp Sat Flow(s),veh/h/ln	1764	1683	1502				0	1772	1470	1647	1730	0
Q Serve(g_s), s	38.5	32.2	0.0				0.0	13.3	17.0	2.7	12.6	0.0
Cycle Q Clear(g_c), s	38.5	32.2	0.0				0.0	13.3	17.0	2.7	12.6	0.0
Prop In Lane	0.09		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1118	1067					0	403	334	49	495	0
V/C Ratio(X)	0.77	0.70					0.00	0.60	0.73	0.81	0.42	0.00
Avail Cap(c_a), veh/h	1118	1067					0	403	334	75	535	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.97	0.97	0.99	0.99	0.00
Uniform Delay (d), s/veh	14.4	13.3	0.0				0.0	38.0	39.4	54.1	41.2	0.0
Incr Delay (d2), s/veh	5.2	3.8	0.0				0.0	6.2	13.0	23.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.0	12.6	0.0				0.0	6.3	7.2	1.4	5.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.6	17.1	0.0				0.0	44.2	52.4	77.5	41.6	0.0
LnGrp LOS	B	B					A	D	D	E	D	A
Approach Vol, veh/h		1610						485			250	
Approach Delay, s/veh		18.5						48.3			47.3	
Approach LOS		B						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	73.7	36.3	7.3	29.0
Change Period (Y+Rc), s	4.0	* 4.8	4.0	4.8
Max Green Setting (Gmax), s	68.0	* 34	5.0	24.2
Max Q Clear Time (g_c+I1), s	40.5	14.6	4.7	19.0
Green Ext Time (p_c), s	22.0	0.5	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	1450	125	10	1180	25	100	25	10	175	20	120
Future Volume (veh/h)	170	1450	125	10	1180	25	100	25	10	175	20	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	170	1450	125	10	1180	25	100	25	10	175	20	120
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	377	2114	942	23	1367	610	264	62	22	249	24	137
Arrive On Green	0.22	0.63	0.63	0.01	0.42	0.42	0.24	0.24	0.23	0.24	0.24	0.23
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	845	255	88	811	98	559
Grp Volume(v), veh/h	170	1450	125	10	1180	25	135	0	0	315	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1188	0	0	1469	0	0
Q Serve(g_s), s	9.6	31.0	3.7	0.7	36.5	1.1	0.0	0.0	0.0	12.0	0.0	0.0
Cycle Q Clear(g_c), s	9.6	31.0	3.7	0.7	36.5	1.1	10.8	0.0	0.0	22.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.74		0.07	0.56		0.38
Lane Grp Cap(c), veh/h	377	2114	942	23	1367	610	342	0	0	403	0	0
V/C Ratio(X)	0.45	0.69	0.13	0.44	0.86	0.04	0.39	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	377	2114	942	66	1446	645	417	0	0	481	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.9	13.4	8.3	53.8	28.9	18.6	35.5	0.0	0.0	40.4	0.0	0.0
Incr Delay (d2), s/veh	0.5	1.8	0.3	7.8	7.4	0.1	0.5	0.0	0.0	6.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	11.6	1.3	0.3	14.7	0.4	3.2	0.0	0.0	8.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.4	15.2	8.6	61.6	36.3	18.8	36.1	0.0	0.0	46.6	0.0	0.0
LnGrp LOS	D	B	A	E	D	B	D	A	A	D	A	A
Approach Vol, veh/h		1745			1215			135			315	
Approach Delay, s/veh		16.9			36.1			36.1			46.6	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	73.6		30.9	28.6	50.5		30.9
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.0	* 61		31.3	15.5	49.2		31.3
Max Q Clear Time (g_c+I1), s	12.7	33.0		24.8	11.6	38.5		12.8
Green Ext Time (p_c), s	0.0	21.5		0.6	0.2	8.0		0.4

Intersection Summary	
HCM 6th Ctrl Delay	27.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1535	90	30	1230	25	70
Future Vol, veh/h	1535	90	30	1230	25	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1535	90	30	1230	25	70

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1625	0	2210	768
Stage 1	-	-	-	-	1535	-
Stage 2	-	-	-	-	675	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	378	-	38	349
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	473	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	378	-	35	349
Mov Cap-2 Maneuver	-	-	-	-	35	-
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	436	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	75.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	35	349	-	-	378	-
HCM Lane V/C Ratio	0.714	0.201	-	-	0.079	-
HCM Control Delay (s)	236.4	17.9	-	-	15.3	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	2.5	0.7	-	-	0.3	-

Intersection	
Int Delay, s/veh	45.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	170	1435	0	100	1140	0	5	5	100	5	0	120
Future Vol, veh/h	170	1435	0	100	1140	0	5	5	100	5	0	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	100	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	3	3	2	2	6	6	2	2	2	0	2	0
Mvmt Flow	170	1435	0	100	1140	0	5	5	100	5	0	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1140	0	0	1435	0	0	2545	3115	718	2400	3115	570
Stage 1	-	-	-	-	-	-	1775	1775	-	1340	1340	-
Stage 2	-	-	-	-	-	-	770	1340	-	1060	1775	-
Critical Hdwy	4.16	-	-	4.14	-	-	7.54	6.54	6.94	7.5	6.54	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Follow-up Hdwy	2.23	-	-	2.22	-	-	3.52	4.02	3.32	3.5	4.02	3.3
Pot Cap-1 Maneuver	603	-	-	469	-	-	13	11	371	18	11	470
Stage 1	-	-	-	-	-	-	86	134	-	164	220	-
Stage 2	-	-	-	-	-	-	359	220	-	243	134	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	603	-	-	469	-	-	6	6	371	~ 3	6	470
Mov Cap-2 Maneuver	-	-	-	-	-	-	6	6	-	~ 3	6	-
Stage 1	-	-	-	-	-	-	62	96	-	118	173	-
Stage 2	-	-	-	-	-	-	210	173	-	121	96	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	1.2	$ 591.4	$ 569.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	57	603	-	-	469	-	-	65
HCM Lane V/C Ratio	1.93	0.282	-	-	0.213	-	-	1.923
HCM Control Delay (s)	$ 591.4	13.3	-	-	14.7	-	-	$ 569.8
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	10.5	1.2	-	-	0.8	-	-	11.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1535	1235	25	10	0
Future Vol, veh/h	5	1535	1235	25	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1535	1235	25	10	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1260	0	-	0	2026	630
Stage 1	-	-	-	-	1248	-
Stage 2	-	-	-	-	778	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	548	-	-	-	50	424
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	413	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	548	-	-	-	50	424
Mov Cap-2 Maneuver	-	-	-	-	50	-
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	413	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	94.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	548	-	-	-	50
HCM Lane V/C Ratio	0.009	-	-	-	0.2
HCM Control Delay (s)	11.6	-	-	-	94.2
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	0.7

SECTION 3. HCM REPORTS

AVERAGE WEEKDAY

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26 01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	2350	5	10	1635	210	10	45	10	245	10	20
Future Volume (veh/h)	55	2350	5	10	1635	210	10	45	10	245	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	58	2474	5	11	1721	0	11	47	11	258	11	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	84	1946	868	67	1885		15	62	15	301	97	185
Arrive On Green	0.05	0.58	0.58	0.04	0.57	0.00	0.06	0.06	0.06	0.18	0.18	0.18
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	247	1054	247	1688	545	1040
Grp Volume(v), veh/h	58	2474	5	11	1721	0	69	0	0	258	0	32
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1547	0	0	1688	0	1585
Q Serve(g_s), s	3.7	64.1	0.2	0.7	51.7	0.0	4.9	0.0	0.0	16.4	0.0	1.9
Cycle Q Clear(g_c), s	3.7	64.1	0.2	0.7	51.7	0.0	4.9	0.0	0.0	16.4	0.0	1.9
Prop In Lane	1.00		1.00	1.00		1.00	0.16		0.16	1.00		0.66
Lane Grp Cap(c), veh/h	84	1946	868	67	1885		91	0	0	301	0	282
V/C Ratio(X)	0.69	1.27	0.01	0.16	0.91		0.76	0.00	0.00	0.86	0.00	0.11
Avail Cap(c_a), veh/h	84	1946	868	82	1913		105	0	0	335	0	314
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.8	23.4	9.9	51.4	21.4	0.0	51.3	0.0	0.0	44.2	0.0	38.2
Incr Delay (d2), s/veh	19.8	126.4	0.0	0.7	7.5	0.0	19.3	0.0	0.0	18.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	54.9	0.0	0.3	18.6	0.0	2.4	0.0	0.0	8.4	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	149.8	9.9	52.0	29.0	0.0	70.6	0.0	0.0	62.3	0.0	38.4
LnGrp LOS	E	F	A	D	C		E	A	A	E	A	D
Approach Vol, veh/h		2537			1732			69			290	
Approach Delay, s/veh		147.8			29.1			70.6			59.6	
Approach LOS		F			C			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	67.1		23.7	8.5	68.1		10.5				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	5.0	61.0		21.0	5.0	61.0		7.0				
Max Q Clear Time (g_c+I1), s	5.7	53.7		18.4	2.7	66.1		6.9				
Green Ext Time (p_c), s	0.0	6.4		0.3	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	96.7
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	1495	390	245	1425	315	315	140	305	140	165	160
Future Volume (veh/h)	280	1495	390	245	1425	315	315	140	305	140	165	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	295	1574	411	258	1500	332	332	147	321	147	174	168
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	198	1243	881	273	1429	823	755	399	340	223	234	199
Arrive On Green	0.08	0.37	0.36	0.26	0.86	0.83	0.23	0.23	0.23	0.13	0.13	0.13
Sat Flow, veh/h	1688	3367	1502	1661	3313	1502	3300	1772	1512	1688	1772	1502
Grp Volume(v), veh/h	295	1574	411	258	1500	332	332	147	321	147	174	168
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1502	1650	1772	1512	1688	1772	1502
Q Serve(g_s), s	11.0	48.0	20.3	15.3	56.0	6.7	11.2	9.1	27.2	10.8	12.3	14.2
Cycle Q Clear(g_c), s	11.0	48.0	20.3	15.3	56.0	6.7	11.2	9.1	27.2	10.8	12.3	14.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1243	881	273	1429	823	755	399	340	223	234	199
V/C Ratio(X)	1.49	1.27	0.47	0.94	1.05	0.40	0.44	0.37	0.94	0.66	0.74	0.85
Avail Cap(c_a), veh/h	198	1243	881	273	1429	823	761	402	343	376	395	335
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.35	0.35	0.35	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	41.0	15.3	45.7	8.9	4.3	43.0	42.6	49.6	53.6	54.3	55.1
Incr Delay (d2), s/veh	244.7	126.3	1.8	19.8	29.6	0.5	0.2	0.3	33.8	2.5	3.4	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.9	40.3	11.3	8.1	9.1	1.9	4.6	4.0	13.3	4.7	5.7	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	282.0	167.3	17.1	65.4	38.5	4.8	43.2	42.9	83.4	56.1	57.7	62.4
LnGrp LOS	F	F	B	E	F	A	D	D	F	E	E	E
Approach Vol, veh/h		2280			2090			800			489	
Approach Delay, s/veh		155.1			36.5			59.3			58.8	
Approach LOS		F			D			E			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.1	52.0		21.2	15.0	60.1		33.8
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5
Max Green Setting (Gmax), s	7.0	* 46		29.0	11.0	42.0		29.5
Max Q Clear Time (g_c+I1), s	17.3	50.0		16.2	13.0	58.0		29.2
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	0.0		0.1

Intersection Summary	
HCM 6th Ctrl Delay	89.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

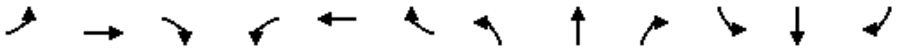
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis
4: Industrial Way & US 26 01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	1815	5	25	1675	45	160	35	235	215	15	160
Future Volume (vph)	60	1815	5	25	1675	45	160	35	235	215	15	160
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1621		1624	1638	1508
Flt Permitted	0.06	1.00		0.06	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	99	3316		100	3358	1471		1621		1624	1638	1508
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	61	1852	5	26	1709	46	163	36	240	219	15	163
RTOR Reduction (vph)	0	0	0	0	0	21	0	33	0	0	0	118
Lane Group Flow (vph)	61	1857	0	26	1709	25	0	406	0	116	118	45
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						4
Actuated Green, G (s)	74.8	70.8		71.6	69.2	69.2		22.6		16.8	16.8	16.8
Effective Green, g (s)	75.8	72.2		71.6	70.6	70.6		22.6		16.8	16.8	16.8
Actuated g/C Ratio	0.58	0.56		0.55	0.54	0.54		0.17		0.13	0.13	0.13
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	112	1841		83	1823	798		281		209	211	194
v/s Ratio Prot	c0.02	c0.56		0.01	0.51			c0.25		0.07	c0.07	
v/s Ratio Perm	0.30			0.17		0.02						0.03
v/c Ratio	0.54	1.01		0.31	0.94	0.03		1.44		0.56	0.56	0.23
Uniform Delay, d1	51.8	28.9		59.7	27.6	13.8		53.7		53.1	53.1	50.8
Progression Factor	0.45	0.47		0.77	0.66	2.84		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	18.2		0.9	7.8	0.0		219.1		2.3	2.3	0.4
Delay (s)	25.3	31.9		46.7	25.9	39.3		272.8		55.3	55.4	51.1
Level of Service	C	C		D	C	D		F		E	E	D
Approach Delay (s)		31.7			26.6			272.8			53.6	
Approach LOS		C			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	54.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	1910	180	40	1540	95	110	35	35	250	35	125
Future Volume (vph)	165	1910	180	40	1540	95	110	35	35	250	35	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1467	1644	3358	1432		1684	1461	1624	1648	1506
Flt Permitted	0.10	1.00	1.00	0.05	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	174	3318	1467	95	3358	1432		1684	1461	1624	1648	1506
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	167	1929	182	40	1556	96	111	35	35	253	35	126
RTOR Reduction (vph)	0	0	39	0	0	35	0	0	30	0	0	116
Lane Group Flow (vph)	167	1929	143	40	1556	61	0	146	5	144	144	10
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2		2	6		6		8	8			4
Actuated Green, G (s)	82.1	80.7	80.7	76.1	76.1	76.1		18.7	18.7	10.0	10.0	10.0
Effective Green, g (s)	82.1	82.1	82.1	76.1	77.5	77.5		18.7	18.7	10.0	10.0	10.0
Actuated g/C Ratio	0.63	0.63	0.63	0.59	0.60	0.60		0.14	0.14	0.08	0.08	0.08
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	200	2095	926	93	2001	853		242	210	124	126	115
v/s Ratio Prot	0.05	c0.58		0.01	c0.46			c0.09		c0.09	0.09	
v/s Ratio Perm	0.48		0.10	0.24		0.04			0.00			0.01
v/c Ratio	0.83	0.92	0.15	0.43	0.78	0.07		0.60	0.02	1.16	1.14	0.08
Uniform Delay, d1	38.1	21.1	9.8	27.9	19.8	11.1		52.2	47.8	60.0	60.0	55.7
Progression Factor	0.61	0.40	0.27	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.7	2.8	0.1	1.9	3.1	0.2		3.3	0.0	130.6	123.7	0.2
Delay (s)	32.0	11.2	2.7	29.7	22.8	11.2		55.5	47.8	190.6	183.7	55.9
Level of Service	C	B	A	C	C	B		E	D	F	F	E
Approach Delay (s)		12.0			22.3			54.0			147.2	
Approach LOS		B			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	1780	145	90	1335	230	135	50	110	145	40	240
Future Volume (veh/h)	265	1780	145	90	1335	230	135	50	110	145	40	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	270	1816	148	92	1362	235	138	51	112	148	41	245
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	265	1716	764	75	1150	572	139	74	162	246	48	288
Arrive On Green	0.16	0.51	0.51	0.05	0.39	0.39	0.08	0.15	0.15	0.14	0.22	0.22
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	490	1077	1701	221	1322
Grp Volume(v), veh/h	270	1816	148	92	1362	235	138	0	163	148	0	286
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1567	1701	0	1544
Q Serve(g_s), s	17.3	56.1	5.9	5.0	43.0	12.8	8.9	0.0	10.8	9.0	0.0	19.6
Cycle Q Clear(g_c), s	17.3	56.1	5.9	5.0	43.0	12.8	8.9	0.0	10.8	9.0	0.0	19.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.69	1.00		0.86
Lane Grp Cap(c), veh/h	265	1716	764	75	1150	572	139	0	236	246	0	336
V/C Ratio(X)	1.02	1.06	0.19	1.23	1.18	0.41	0.99	0.00	0.69	0.60	0.00	0.85
Avail Cap(c_a), veh/h	265	1716	764	75	1150	572	139	0	427	246	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.28	0.28	0.28	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.4	27.0	14.7	52.5	33.5	24.3	50.5	0.0	44.1	44.1	0.0	41.1
Incr Delay (d2), s/veh	34.3	30.8	0.2	177.7	92.2	2.2	73.6	0.0	2.2	3.4	0.0	11.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	27.7	0.0	5.8	29.8	4.8	6.7	0.0	4.4	4.0	0.0	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.7	57.8	14.8	230.2	125.7	26.5	124.0	0.0	46.4	47.4	0.0	52.7
LnGrp LOS	F	F	B	F	F	C	F	A	D	D	A	D
Approach Vol, veh/h		2234			1689			301			434	
Approach Delay, s/veh		57.7			117.6			82.0			50.9	
Approach LOS		E			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	60.1	13.0	27.9	22.1	47.0	20.4	20.5
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.5	* 4.5
Max Green Setting (Gmax), s	5.0	49.2	9.0	29.5	12.0	* 43	9.0	* 30
Max Q Clear Time (g_c+I1), s	7.0	58.1	10.9	21.6	19.3	45.0	11.0	12.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	80.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Hwy 211 & US 26/Procter Blvd 01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	165	1285	15	250	40	0	0	60	35
Future Volume (veh/h)	0	0	0	165	1285	15	250	40	0	0	60	35
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				174	1353	16	263	42	0	0	63	37
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				202	1659	20	432	59	0	0	370	217
Arrive On Green				0.55	0.55	0.55	0.35	0.35	0.00	0.00	0.35	0.35
Sat Flow, veh/h				369	3027	37	1046	167	0	0	1044	613
Grp Volume(v), veh/h				806	0	737	305	0	0	0	0	100
Grp Sat Flow(s),veh/h/ln				1711	0	1723	1213	0	0	0	0	1657
Q Serve(g_s), s				44.3	0.0	37.2	21.6	0.0	0.0	0.0	0.0	4.6
Cycle Q Clear(g_c), s				44.3	0.0	37.2	26.1	0.0	0.0	0.0	0.0	4.6
Prop In Lane				0.22		0.02	0.86		0.00	0.00		0.37
Lane Grp Cap(c), veh/h				938	0	944	491	0	0	0	0	587
V/C Ratio(X)				0.86	0.00	0.78	0.62	0.00	0.00	0.00	0.00	0.17
Avail Cap(c_a), veh/h				980	0	987	491	0	0	0	0	587
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.86	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.2	0.0	19.6	33.4	0.0	0.0	0.0	0.0	24.4
Incr Delay (d2), s/veh				10.1	0.0	6.4	5.0	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				19.7	0.0	16.0	7.9	0.0	0.0	0.0	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.4	0.0	26.0	38.4	0.0	0.0	0.0	0.0	24.5
LnGrp LOS				C	A	C	D	A	A	A	A	C
Approach Vol, veh/h					1543			305			100	
Approach Delay, s/veh					28.8			38.4			24.5	
Approach LOS					C			D			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	43.0	64.3	43.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	39.0	63.0	39.0
Max Q Clear Time (g_c+I1), s	6.6	46.3	28.1
Green Ext Time (p_c), s	0.3	14.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	1430	520	0	0	0	0	225	230	35	195	0
Future Volume (veh/h)	70	1430	520	0	0	0	0	225	230	35	195	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	74	1505	0				0	237	242	37	205	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	98	2095					0	403	334	45	491	0
Arrive On Green	0.64	0.64	0.00				0.00	0.23	0.23	0.01	0.09	0.00
Sat Flow, veh/h	154	3293	1502				0	1772	1470	1647	1730	0
Grp Volume(v), veh/h	846	733	0				0	237	242	37	205	0
Grp Sat Flow(s),veh/h/ln	1764	1683	1502				0	1772	1470	1647	1730	0
Q Serve(g_s), s	36.9	30.9	0.0				0.0	13.1	16.8	2.5	12.3	0.0
Cycle Q Clear(g_c), s	36.9	30.9	0.0				0.0	13.1	16.8	2.5	12.3	0.0
Prop In Lane	0.09		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1122	1071					0	403	334	45	491	0
V/C Ratio(X)	0.75	0.68					0.00	0.59	0.72	0.82	0.42	0.00
Avail Cap(c_a), veh/h	1122	1071					0	403	334	75	535	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.98	0.98	0.99	0.99	0.00
Uniform Delay (d), s/veh	14.0	12.9	0.0				0.0	37.9	39.3	54.2	41.3	0.0
Incr Delay (d2), s/veh	4.7	3.6	0.0				0.0	6.1	12.6	18.8	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.2	12.1	0.0				0.0	6.2	7.0	1.3	5.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	16.5	0.0				0.0	44.0	51.9	73.0	41.6	0.0
LnGrp LOS	B	B					A	D	D	E	D	A
Approach Vol, veh/h		1579						479			242	
Approach Delay, s/veh		17.7						48.0			46.4	
Approach LOS		B						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	74.0	36.0	7.0	29.0
Change Period (Y+Rc), s	4.0	* 4.8	4.0	4.8
Max Green Setting (Gmax), s	68.0	* 34	5.0	24.2
Max Q Clear Time (g_c+I1), s	38.9	14.3	4.5	18.8
Green Ext Time (p_c), s	22.7	0.5	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1355	115	10	1100	25	95	25	10	165	20	110
Future Volume (veh/h)	160	1355	115	10	1100	25	95	25	10	165	20	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	168	1426	121	11	1158	26	100	26	11	174	21	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	387	2117	943	24	1355	604	260	64	23	248	25	132
Arrive On Green	0.23	0.63	0.63	0.01	0.42	0.42	0.24	0.24	0.23	0.24	0.24	0.23
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	840	265	96	813	104	546
Grp Volume(v), veh/h	168	1426	121	11	1158	26	137	0	0	311	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1201	0	0	1463	0	0
Q Serve(g_s), s	9.4	30.0	3.6	0.7	35.7	1.2	0.0	0.0	0.0	11.7	0.0	0.0
Cycle Q Clear(g_c), s	9.4	30.0	3.6	0.7	35.7	1.2	10.9	0.0	0.0	22.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.73		0.08	0.56		0.37
Lane Grp Cap(c), veh/h	387	2117	943	24	1355	604	343	0	0	399	0	0
V/C Ratio(X)	0.43	0.67	0.13	0.45	0.85	0.04	0.40	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	387	2117	943	66	1446	645	420	0	0	480	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.3	13.1	8.2	53.7	28.9	18.9	35.7	0.0	0.0	40.5	0.0	0.0
Incr Delay (d2), s/veh	0.5	1.7	0.3	7.9	7.0	0.1	0.6	0.0	0.0	6.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	11.2	1.2	0.3	14.3	0.4	3.2	0.0	0.0	8.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	14.9	8.5	61.7	36.0	19.0	36.3	0.0	0.0	46.6	0.0	0.0
LnGrp LOS	D	B	A	E	D	B	D	A	A	D	A	A
Approach Vol, veh/h		1715			1195			137			311	
Approach Delay, s/veh		16.6			35.8			36.3			46.6	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	73.7		30.7	29.2	50.1		30.7
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.0	* 61		31.3	15.5	49.2		31.3
Max Q Clear Time (g_c+I1), s	2.7	32.0		24.6	11.4	37.7		12.9
Green Ext Time (p_c), s	0.0	21.8		0.6	0.2	8.4		0.4

Intersection Summary	
HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1430	85	30	1150	25	65
Future Vol, veh/h	1430	85	30	1150	25	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1505	89	32	1211	26	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1594	0	2175	753
Stage 1	-	-	-	-	1505	-
Stage 2	-	-	-	-	670	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	389	-	41	357
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	476	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	389	-	38	357
Mov Cap-2 Maneuver	-	-	-	-	38	-
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	437	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	72.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	38	357	-	-	389	-
HCM Lane V/C Ratio	0.693	0.192	-	-	0.081	-
HCM Control Delay (s)	215.8	17.5	-	-	15.1	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	2.5	0.7	-	-	0.3	-

Intersection	
Int Delay, s/veh	35.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	160	1340	0	95	1065	0	5	5	95	5	0	110
Future Vol, veh/h	160	1340	0	95	1065	0	5	5	95	5	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	100	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	2	2	6	6	2	2	2	0	2	0
Mvmt Flow	168	1411	0	100	1121	0	5	5	100	5	0	116

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1121	0	0	1411	0	0	2508	3068	706	2365	3068	561
Stage 1	-	-	-	-	-	-	1747	1747	-	1321	1321	-
Stage 2	-	-	-	-	-	-	761	1321	-	1044	1747	-
Critical Hdwy	4.16	-	-	4.14	-	-	7.54	6.54	6.94	7.5	6.54	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Follow-up Hdwy	2.23	-	-	2.22	-	-	3.52	4.02	3.32	3.5	4.02	3.3
Pot Cap-1 Maneuver	613	-	-	479	-	-	14	12	378	19	12	476
Stage 1	-	-	-	-	-	-	89	138	-	168	224	-
Stage 2	-	-	-	-	-	-	364	224	-	249	138	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	613	-	-	479	-	-	7	7	378	~ 4	7	476
Mov Cap-2 Maneuver	-	-	-	-	-	-	7	7	-	~ 4	7	-
Stage 1	-	-	-	-	-	-	65	100	-	122	177	-
Stage 2	-	-	-	-	-	-	218	177	-	126	100	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	1.2	$ 503.8	$ 393.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	63	613	-	-	479	-	-	78
HCM Lane V/C Ratio	1.754	0.275	-	-	0.209	-	-	1.552
HCM Control Delay (s)	$ 503.8	13.1	-	-	14.5	-	-	$ 393.6
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	10.1	1.1	-	-	0.8	-	-	9.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1430	1150	25	10	0
Future Vol, veh/h	5	1430	1150	25	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1505	1211	26	11	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1237	0	-	0	1987	619
Stage 1	-	-	-	-	1224	-
Stage 2	-	-	-	-	763	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	559	-	-	-	53	432
Stage 1	-	-	-	-	241	-
Stage 2	-	-	-	-	421	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	559	-	-	-	53	432
Mov Cap-2 Maneuver	-	-	-	-	53	-
Stage 1	-	-	-	-	239	-
Stage 2	-	-	-	-	421	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	89
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	559	-	-	-	53
HCM Lane V/C Ratio	0.009	-	-	-	0.199
HCM Control Delay (s)	11.5	-	-	-	89
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	0.7

SECTION 4. HCM REPORTS

AVERAGE WEEKDAY SECOND HOUR WITH SPREADING

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26

01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	2570	10	30	1670	215	10	0	10	235	0	10
Future Volume (veh/h)	40	2570	10	30	1670	215	10	0	10	235	0	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	42	2705	11	32	1758	0	11	0	11	247	0	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	81	2027	904	70	1977		23	0	23	293	0	260
Arrive On Green	0.05	0.60	0.60	0.04	0.60	0.00	0.04	0.00	0.04	0.17	0.00	0.17
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	719	0	719	1688	0	1502
Grp Volume(v), veh/h	42	2705	11	32	1758	0	22	0	0	247	0	11
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1438	0	0	1688	0	1502
Q Serve(g_s), s	2.6	64.0	0.3	2.0	48.5	0.0	1.6	0.0	0.0	15.1	0.0	0.6
Cycle Q Clear(g_c), s	2.6	64.0	0.3	2.0	48.5	0.0	1.6	0.0	0.0	15.1	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	81	2027	904	70	1977		46	0	0	293	0	260
V/C Ratio(X)	0.52	1.33	0.01	0.45	0.89		0.48	0.00	0.00	0.84	0.00	0.04
Avail Cap(c_a), veh/h	87	2027	904	86	1995		101	0	0	349	0	311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.4	21.2	8.5	49.7	18.4	0.0	50.4	0.0	0.0	42.5	0.0	36.6
Incr Delay (d2), s/veh	3.1	154.0	0.0	2.8	5.7	0.0	2.9	0.0	0.0	14.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	63.1	0.1	0.8	16.4	0.0	0.6	0.0	0.0	7.5	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.6	175.2	8.5	52.5	24.2	0.0	53.3	0.0	0.0	57.4	0.0	36.7
LnGrp LOS	D	F	A	D	C		D	A	A	E	A	D
Approach Vol, veh/h		2758			1790			22			258	
Approach Delay, s/veh		172.6			24.7			53.3			56.5	
Approach LOS		F			C			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	67.4		22.4	8.5	68.0		7.4				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	5.0	61.0		21.0	5.0	61.0		7.0				
Max Q Clear Time (g_c+I1), s	4.6	50.5		17.1	4.0	66.0		3.6				
Green Ext Time (p_c), s	0.0	9.0		0.4	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	111.0
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1760	335	225	1490	0	300	0	305	0	0	0
Future Volume (veh/h)	0	1760	335	225	1490	0	300	0	305	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	0	1853	353	237	1568	0	316	0	321	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	176	1243	881	544	2351	996	755	399	340	1	1	1
Arrive On Green	0.00	0.37	0.36	0.59	1.00	0.00	0.23	0.00	0.23	0.00	0.00	0.00
Sat Flow, veh/h	1688	3367	1502	1661	3313	1502	3300	1772	1512	1688	1772	1502
Grp Volume(v), veh/h	0	1853	353	237	1568	0	316	0	321	0	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1502	1650	1772	1512	1688	1772	1502
Q Serve(g_s), s	0.0	48.0	16.5	4.6	0.0	0.0	10.6	0.0	27.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	48.0	16.5	4.6	0.0	0.0	10.6	0.0	27.2	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	1243	881	544	2351	996	755	399	340	1	1	1
V/C Ratio(X)	0.00	1.49	0.40	0.44	0.67	0.00	0.42	0.00	0.94	0.00	0.00	0.00
Avail Cap(c_a), veh/h	317	1243	881	544	2351	996	761	402	343	376	395	335
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.43	0.43	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	41.0	14.5	19.3	0.0	0.0	42.7	0.0	49.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	225.1	1.4	0.1	0.7	0.0	0.2	0.0	33.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	57.4	9.2	3.1	0.2	0.0	4.3	0.0	13.3	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	266.1	15.9	19.4	0.7	0.0	43.0	0.0	83.3	0.0	0.0	0.0
LnGrp LOS	A	F	B	B	A	A	D	A	F	A	A	A
Approach Vol, veh/h		2206			1805			637			0	
Approach Delay, s/veh		226.1			3.1			63.3			0.0	
Approach LOS		F			A			E				

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.2	52.0		0.0	0.0	96.2		33.8
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5
Max Green Setting (Gmax), s	7.0	* 46		29.0	11.0	42.0		29.5
Max Q Clear Time (g_c+I1), s	6.6	50.0		0.0	0.0	2.0		29.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	39.0		0.1

Intersection Summary	
HCM 6th Ctrl Delay	117.2
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis
4: Industrial Way & US 26 01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1730	5	25	1580	55	215	35	240	235	15	145
Future Volume (vph)	80	1730	5	25	1580	55	215	35	240	235	15	145
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1629		1624	1638	1508
Flt Permitted	0.06	1.00		0.06	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	98	3316		101	3358	1471		1629		1624	1638	1508
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	1765	5	26	1612	56	219	36	245	240	15	148
RTOR Reduction (vph)	0	0	0	0	0	26	0	27	0	0	0	94
Lane Group Flow (vph)	82	1770	0	26	1612	30	0	473	0	127	128	54
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						4
Actuated Green, G (s)	77.4	71.8		71.0	68.6	68.6		21.0		17.4	17.4	17.4
Effective Green, g (s)	78.4	73.2		71.0	70.0	70.0		21.0		17.4	17.4	17.4
Actuated g/C Ratio	0.60	0.56		0.55	0.54	0.54		0.16		0.13	0.13	0.13
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	133	1867		83	1808	792		263		217	219	201
v/s Ratio Prot	c0.03	c0.53		0.01	0.48			c0.29		c0.08	0.08	
v/s Ratio Perm	0.34			0.16		0.02						0.04
v/c Ratio	0.62	0.95		0.31	0.89	0.04		1.80		0.59	0.58	0.27
Uniform Delay, d1	47.6	26.6		55.0	26.6	14.1		54.5		52.9	52.9	50.6
Progression Factor	0.66	0.57		0.75	0.65	2.03		1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	8.5		0.9	5.1	0.1		374.4		3.0	3.0	0.4
Delay (s)	35.7	23.8		42.0	22.4	28.7		428.9		55.9	55.9	51.0
Level of Service	D	C		D	C	C		F		E	E	D
Approach Delay (s)		24.3			22.9			428.9			54.1	
Approach LOS		C			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	72.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1790	140	35	1420	75	145	45	40	310	40	110
Future Volume (vph)	125	1790	140	35	1420	75	145	45	40	310	40	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1467	1644	3358	1432		1683	1461	1624	1646	1506
Flt Permitted	0.11	1.00	1.00	0.06	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	190	3318	1467	102	3358	1432		1683	1461	1624	1646	1506
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	126	1808	141	35	1434	76	146	45	40	313	40	111
RTOR Reduction (vph)	0	0	34	0	0	34	0	0	33	0	0	102
Lane Group Flow (vph)	126	1808	107	35	1434	42	0	191	7	175	178	9
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2		2	6		6		8	8			4
Actuated Green, G (s)	80.3	78.9	78.9	70.3	70.3	70.3		21.3	21.3	10.0	10.0	10.0
Effective Green, g (s)	80.3	80.3	80.3	70.3	71.7	71.7		21.3	21.3	10.0	10.0	10.0
Actuated g/C Ratio	0.62	0.62	0.62	0.54	0.55	0.55		0.16	0.16	0.08	0.08	0.08
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	243	2049	906	83	1852	789		275	239	124	126	115
v/s Ratio Prot	0.04	c0.54		0.01	c0.43			c0.11		0.11	c0.11	
v/s Ratio Perm	0.28		0.07	0.22		0.03			0.00			0.01
v/c Ratio	0.52	0.88	0.12	0.42	0.77	0.05		0.69	0.03	1.41	1.41	0.07
Uniform Delay, d1	36.8	20.9	10.3	27.2	22.8	13.5		51.3	45.7	60.0	60.0	55.7
Progression Factor	0.58	0.44	0.29	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.1	0.1	2.0	3.2	0.1		6.5	0.0	225.9	225.9	0.2
Delay (s)	21.7	11.3	3.0	29.2	26.0	13.6		57.8	45.7	285.9	285.9	55.9
Level of Service	C	B	A	C	C	B		E	D	F	F	E
Approach Delay (s)		11.4			25.5			55.7			230.9	
Approach LOS		B			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	310	1720	145	80	1470	170	135	60	100	140	40	235
Future Volume (veh/h)	310	1720	145	80	1470	170	135	60	100	140	40	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	316	1755	148	82	1500	173	138	61	102	143	41	240
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	269	1725	768	75	1150	572	139	89	148	243	48	283
Arrive On Green	0.16	0.51	0.51	0.05	0.39	0.39	0.08	0.15	0.15	0.14	0.21	0.22
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	593	991	1701	225	1319
Grp Volume(v), veh/h	316	1755	148	82	1500	173	138	0	163	143	0	281
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1584	1701	0	1544
Q Serve(g_s), s	17.6	56.4	5.9	5.0	43.0	9.0	8.9	0.0	10.7	8.7	0.0	19.2
Cycle Q Clear(g_c), s	17.6	56.4	5.9	5.0	43.0	9.0	8.9	0.0	10.7	8.7	0.0	19.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		0.85
Lane Grp Cap(c), veh/h	269	1725	768	75	1150	572	139	0	237	243	0	332
V/C Ratio(X)	1.17	1.02	0.19	1.10	1.30	0.30	0.99	0.00	0.69	0.59	0.00	0.85
Avail Cap(c_a), veh/h	269	1725	768	75	1150	572	139	0	432	243	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.32	0.32	0.32	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.2	26.8	14.5	52.5	33.5	23.1	50.5	0.0	44.2	44.1	0.0	41.2
Incr Delay (d2), s/veh	90.4	16.9	0.2	132.3	143.6	1.4	73.6	0.0	2.2	3.0	0.0	10.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.9	24.5	0.0	4.8	38.0	3.3	6.7	0.0	4.4	3.9	0.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	136.6	43.7	14.7	184.8	177.1	24.5	124.0	0.0	46.4	47.1	0.0	52.1
LnGrp LOS	F	F	B	F	F	C	F	A	D	D	A	D
Approach Vol, veh/h		2219			1755			301			424	
Approach Delay, s/veh		55.0			162.4			82.0			50.4	
Approach LOS		E			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	60.4	13.0	27.6	22.4	47.0	20.2	20.4
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.5	* 4.5
Max Green Setting (Gmax), s	5.0	49.2	9.0	29.5	12.0	* 43	9.0	* 30
Max Q Clear Time (g_c+I1), s	7.0	58.4	10.9	21.2	19.6	45.0	10.7	12.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	96.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	115	1200	10	225	35	0	0	55	25
Future Volume (veh/h)	0	0	0	115	1200	10	225	35	0	0	55	25
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	0.99		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				121	1263	11	237	37	0	0	58	26
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				148	1629	15	446	60	0	0	410	184
Arrive On Green				0.52	0.52	0.52	0.35	0.35	0.00	0.00	0.35	0.35
Sat Flow, veh/h				285	3127	28	1087	170	0	0	1156	518
Grp Volume(v), veh/h				729	0	666	274	0	0	0	0	84
Grp Sat Flow(s),veh/h/ln				1716	0	1724	1256	0	0	0	0	1674
Q Serve(g_s), s				38.9	0.0	33.2	18.4	0.0	0.0	0.0	0.0	3.7
Cycle Q Clear(g_c), s				38.9	0.0	33.2	22.1	0.0	0.0	0.0	0.0	3.7
Prop In Lane				0.17		0.02	0.86		0.00	0.00		0.31
Lane Grp Cap(c), veh/h				894	0	898	506	0	0	0	0	594
V/C Ratio(X)				0.82	0.00	0.74	0.54	0.00	0.00	0.00	0.00	0.14
Avail Cap(c_a), veh/h				983	0	988	506	0	0	0	0	594
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.90	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.9	0.0	20.6	31.6	0.0	0.0	0.0	0.0	24.1
Incr Delay (d2), s/veh				8.1	0.0	5.5	3.7	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.2	0.0	14.4	6.7	0.0	0.0	0.0	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				30.1	0.0	26.1	35.3	0.0	0.0	0.0	0.0	24.2
LnGrp LOS				C	A	C	D	A	A	A	A	C
Approach Vol, veh/h					1395			274			84	
Approach Delay, s/veh					28.1			35.3			24.2	
Approach LOS					C			D			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	43.0	61.3	43.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	39.0	63.0	39.0
Max Q Clear Time (g_c+I1), s	5.7	40.9	24.1
Green Ext Time (p_c), s	0.2	16.4	1.0

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1320	495	0	0	0	0	215	225	30	150	0
Future Volume (veh/h)	50	1320	495	0	0	0	0	215	225	30	150	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	53	1389	0				0	226	237	32	158	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	78	2131					0	403	334	39	484	0
Arrive On Green	0.64	0.64	0.00				0.00	0.23	0.23	0.01	0.09	0.00
Sat Flow, veh/h	121	3328	1502				0	1772	1470	1647	1730	0
Grp Volume(v), veh/h	772	670	0				0	226	237	32	158	0
Grp Sat Flow(s),veh/h/ln	1766	1683	1502				0	1772	1470	1647	1730	0
Q Serve(g_s), s	30.8	26.1	0.0				0.0	12.4	16.3	2.1	9.4	0.0
Cycle Q Clear(g_c), s	30.8	26.1	0.0				0.0	12.4	16.3	2.1	9.4	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1130	1078					0	403	334	39	484	0
V/C Ratio(X)	0.68	0.62					0.00	0.56	0.71	0.83	0.33	0.00
Avail Cap(c_a), veh/h	1130	1078					0	403	334	75	535	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.96	0.96	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.7	11.8	0.0				0.0	37.6	39.2	54.4	40.2	0.0
Incr Delay (d2), s/veh	3.4	2.7	0.0				0.0	5.3	11.6	22.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5	10.1	0.0				0.0	5.8	6.8	1.1	4.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.0	14.5	0.0				0.0	43.0	50.8	77.2	40.5	0.0
LnGrp LOS	B	B					A	D	D	E	D	A
Approach Vol, veh/h		1442						463			190	
Approach Delay, s/veh		15.3						47.0			46.6	
Approach LOS		B						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	74.4	35.6	6.6	29.0
Change Period (Y+Rc), s	4.0	* 4.8	4.0	4.8
Max Green Setting (Gmax), s	68.0	* 34	5.0	24.2
Max Q Clear Time (g_c+I1), s	32.8	11.4	4.1	18.3
Green Ext Time (p_c), s	24.0	0.4	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
15: Wolf Drive/SE Ten Eyck Rd & US 26

01/03/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	1190	135	0	1035	30	90	25	5	155	15	95
Future Volume (veh/h)	180	1190	135	0	1035	30	90	25	5	155	15	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	189	1253	142	0	1089	32	95	26	5	163	16	100
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	447	2365	1054	1	1313	586	254	64	11	240	20	116
Arrive On Green	0.26	0.70	0.70	0.00	0.41	0.41	0.22	0.22	0.21	0.22	0.22	0.21
Sat Flow, veh/h	1688	3367	1501	1621	3233	1442	892	291	49	854	90	528
Grp Volume(v), veh/h	189	1253	142	0	1089	32	126	0	0	279	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1501	1621	1617	1442	1233	0	0	1472	0	0
Q Serve(g_s), s	10.2	19.4	3.4	0.0	33.2	1.5	0.0	0.0	0.0	10.2	0.0	0.0
Cycle Q Clear(g_c), s	10.2	19.4	3.4	0.0	33.2	1.5	9.9	0.0	0.0	20.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.75		0.04	0.58		0.36
Lane Grp Cap(c), veh/h	447	2365	1054	1	1313	586	323	0	0	369	0	0
V/C Ratio(X)	0.42	0.53	0.13	0.00	0.83	0.05	0.39	0.00	0.00	0.76	0.00	0.00
Avail Cap(c_a), veh/h	447	2365	1054	66	1446	645	434	0	0	483	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.5	7.8	5.4	0.0	29.3	19.8	37.4	0.0	0.0	41.6	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.9	0.3	0.0	6.2	0.2	0.6	0.0	0.0	4.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	6.7	1.1	0.0	13.3	0.5	3.0	0.0	0.0	7.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	8.6	5.6	0.0	35.4	20.0	37.9	0.0	0.0	45.8	0.0	0.0
LnGrp LOS	C	A	A	A	D	C	D	A	A	D	A	A
Approach Vol, veh/h		1584			1121			126			279	
Approach Delay, s/veh		11.4			35.0			37.9			45.8	
Approach LOS		B			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	81.8		28.2	33.1	48.7		28.2
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.0	* 61		31.3	15.5	49.2		31.3
Max Q Clear Time (g_c+I1), s	10.0	21.4		22.1	12.2	35.2		11.9
Green Ext Time (p_c), s	0.0	24.7		0.6	0.2	9.5		0.3

Intersection Summary	
HCM 6th Ctrl Delay	24.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1210	90	30	1055	25	105
Future Vol, veh/h	1210	90	30	1055	25	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1274	95	32	1111	26	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1369	0	1894	637
Stage 1	-	-	-	-	1274	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	477	-	63	425
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	504	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	477	-	59	425
Mov Cap-2 Maneuver	-	-	-	-	59	-
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	470	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	34
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	59	425	-	-	477	-
HCM Lane V/C Ratio	0.446	0.26	-	-	0.066	-
HCM Control Delay (s)	108.1	16.4	-	-	13.1	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	1.7	1	-	-	0.2	-

Intersection	
Int Delay, s/veh	10.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	100	1170	0	75	960	0	5	5	70	5	5	120
Future Vol, veh/h	100	1170	0	75	960	0	5	5	70	5	5	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	100	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	2	2	6	6	2	2	2	0	2	0
Mvmt Flow	105	1232	0	79	1011	0	5	5	74	5	5	126

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1011	0	0	1232	0	0	2108	2611	616	1998	2611	506
Stage 1	-	-	-	-	-	-	1442	1442	-	1169	1169	-
Stage 2	-	-	-	-	-	-	666	1169	-	829	1442	-
Critical Hdwy	4.16	-	-	4.14	-	-	7.54	6.54	6.94	7.5	6.54	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Follow-up Hdwy	2.23	-	-	2.22	-	-	3.52	4.02	3.32	3.5	4.02	3.3
Pot Cap-1 Maneuver	675	-	-	561	-	-	29	24	433	36	24	517
Stage 1	-	-	-	-	-	-	139	196	-	209	265	-
Stage 2	-	-	-	-	-	-	415	265	-	335	196	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	675	-	-	561	-	-	13	17	433	18	17	517
Mov Cap-2 Maneuver	-	-	-	-	-	-	13	17	-	18	17	-
Stage 1	-	-	-	-	-	-	117	165	-	176	228	-
Stage 2	-	-	-	-	-	-	263	228	-	227	165	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.9	142.9	90.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	95	675	-	-	561	-	-	162
HCM Lane V/C Ratio	0.886	0.156	-	-	0.141	-	-	0.845
HCM Control Delay (s)	142.9	11.3	-	-	12.5	-	-	90.6
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	5	0.6	-	-	0.5	-	-	5.8

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1245	1150	15	10	0
Future Vol, veh/h	0	1245	1150	15	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1311	1211	16	11	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1227	0	-	0	1875	614
Stage 1	-	-	-	-	1219	-
Stage 2	-	-	-	-	656	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	564	-	-	-	63	435
Stage 1	-	-	-	-	242	-
Stage 2	-	-	-	-	478	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	564	-	-	-	63	435
Mov Cap-2 Maneuver	-	-	-	-	63	-
Stage 1	-	-	-	-	242	-
Stage 2	-	-	-	-	478	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	73.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	564	-	-	-	63
HCM Lane V/C Ratio	-	-	-	-	0.167
HCM Control Delay (s)	0	-	-	-	73.3
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	0.6

SECTION 5. HCM REPORTS

3 PM TO 4 PM WITH PROFILE

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26

06/08/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	2290	5	10	1595	205	10	45	10	240	10	20
Future Volume (veh/h)	55	2290	5	10	1595	205	10	45	10	240	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	55	2290	5	10	1595	0	10	45	10	240	10	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	85	1976	882	69	1915		13	60	13	285	89	178
Arrive On Green	0.05	0.59	0.59	0.04	0.58	0.00	0.06	0.06	0.06	0.17	0.17	0.17
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	238	1072	238	1688	527	1055
Grp Volume(v), veh/h	55	2290	5	10	1595	0	65	0	0	240	0	30
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1549	0	0	1688	0	1582
Q Serve(g_s), s	3.5	64.0	0.2	0.6	42.7	0.0	4.5	0.0	0.0	15.0	0.0	1.8
Cycle Q Clear(g_c), s	3.5	64.0	0.2	0.6	42.7	0.0	4.5	0.0	0.0	15.0	0.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	0.15		0.15	1.00		0.67
Lane Grp Cap(c), veh/h	85	1976	882	69	1915		87	0	0	285	0	267
V/C Ratio(X)	0.65	1.16	0.01	0.15	0.83		0.75	0.00	0.00	0.84	0.00	0.11
Avail Cap(c_a), veh/h	85	1976	882	84	1945		107	0	0	341	0	319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.8	22.5	9.3	50.4	18.7	0.0	50.6	0.0	0.0	43.9	0.0	38.4
Incr Delay (d2), s/veh	13.7	77.5	0.0	0.6	3.6	0.0	15.5	0.0	0.0	14.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	41.7	0.0	0.3	14.5	0.0	2.1	0.0	0.0	7.5	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.5	100.0	9.3	51.0	22.3	0.0	66.1	0.0	0.0	58.8	0.0	38.6
LnGrp LOS	E	F	A	D	C		E	A	A	E	A	D
Approach Vol, veh/h		2350			1605			65			270	
Approach Delay, s/veh		99.0			22.5			66.1			56.6	
Approach LOS		F			C			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	67.0		22.4	8.5	68.0		10.1				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	5.0	61.0		21.0	5.0	61.0		7.0				
Max Q Clear Time (g_c+I1), s	5.5	44.7		17.0	2.6	66.0		6.5				
Green Ext Time (p_c), s	0.0	12.3		0.4	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	67.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	1460	380	240	1390	305	305	135	300	135	160	155
Future Volume (veh/h)	275	1460	380	240	1390	305	305	135	300	135	160	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	275	1460	380	240	1390	305	305	135	300	135	160	155
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	198	1243	864	307	1495	840	718	379	323	208	219	185
Arrive On Green	0.08	0.37	0.36	0.30	0.90	0.87	0.22	0.21	0.21	0.12	0.12	0.12
Sat Flow, veh/h	1688	3367	1502	1661	3313	1502	3300	1772	1511	1688	1772	1502
Grp Volume(v), veh/h	275	1460	380	240	1390	305	305	135	300	135	160	155
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1502	1650	1772	1511	1688	1772	1502
Q Serve(g_s), s	11.0	48.0	18.7	12.3	33.0	4.5	10.4	8.4	25.3	9.9	11.3	13.1
Cycle Q Clear(g_c), s	11.0	48.0	18.7	12.3	33.0	4.5	10.4	8.4	25.3	9.9	11.3	13.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1243	864	307	1495	840	718	379	323	208	219	185
V/C Ratio(X)	1.39	1.17	0.44	0.78	0.93	0.36	0.42	0.36	0.93	0.65	0.73	0.84
Avail Cap(c_a), veh/h	198	1243	864	307	1495	840	761	402	343	376	395	335
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.43	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	41.0	15.7	41.3	5.1	3.1	43.8	43.5	50.1	54.3	54.9	55.7
Incr Delay (d2), s/veh	202.5	87.3	1.6	5.4	5.8	0.5	0.2	0.3	29.5	2.5	3.5	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	33.6	10.1	6.1	3.3	1.3	4.3	3.7	12.1	4.4	5.3	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	239.7	128.3	17.3	46.7	10.8	3.6	44.1	43.8	79.7	56.8	58.4	63.0
LnGrp LOS	F	F	B	D	B	A	D	D	E	E	E	E
Approach Vol, veh/h		2115			1935			740			450	
Approach Delay, s/veh		122.8			14.2			58.5			59.5	
Approach LOS		F			B			E			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.7	52.0		20.0	15.0	62.7		32.3
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5
Max Green Setting (Gmax), s	7.0	* 46		29.0	11.0	42.0		29.5
Max Q Clear Time (g_c+I1), s	14.3	50.0		15.1	13.0	35.0		27.3
Green Ext Time (p_c), s	0.0	0.0		0.9	0.0	7.0		0.5

Intersection Summary	
HCM 6th Ctrl Delay	68.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	1770	5	25	1635	45	155	35	230	210	15	155
Future Volume (vph)	60	1770	5	25	1635	45	155	35	230	210	15	155
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1621		1624	1639	1508
Flt Permitted	0.06	1.00		0.06	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	99	3316		100	3358	1471		1621		1624	1639	1508
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	1770	5	25	1635	45	155	35	230	210	15	155
RTOR Reduction (vph)	0	0	0	0	0	20	0	33	0	0	0	125
Lane Group Flow (vph)	60	1775	0	25	1635	25	0	387	0	111	114	30
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						4
Actuated Green, G (s)	75.0	71.0		71.8	69.4	69.4		22.6		16.6	16.6	16.6
Effective Green, g (s)	76.0	72.4		71.8	70.8	70.8		22.6		16.6	16.6	16.6
Actuated g/C Ratio	0.58	0.56		0.55	0.54	0.54		0.17		0.13	0.13	0.13
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	112	1846		83	1828	801		281		207	209	192
v/s Ratio Prot	c0.02	c0.54		0.01	0.49			c0.24		0.07	c0.07	
v/s Ratio Perm	0.29			0.16		0.02						0.02
v/c Ratio	0.54	0.96		0.30	0.89	0.03		1.38		0.54	0.55	0.16
Uniform Delay, d1	49.4	27.5		55.3	26.3	13.7		53.7		53.1	53.2	50.5
Progression Factor	0.49	0.47		0.76	0.65	3.05		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	10.4		0.8	5.2	0.0		190.5		1.8	2.0	0.2
Delay (s)	26.4	23.4		42.9	22.3	41.9		244.2		54.9	55.2	50.7
Level of Service	C	C		D	C	D		F		D	E	D
Approach Delay (s)		23.5			23.1			244.2			53.3	
Approach LOS		C			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	1865	175	40	1500	95	105	35	35	245	35	120
Future Volume (vph)	160	1865	175	40	1500	95	105	35	35	245	35	120
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1467	1644	3358	1432		1684	1461	1624	1648	1506
Flt Permitted	0.11	1.00	1.00	0.06	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	190	3318	1467	96	3358	1432		1684	1461	1624	1648	1506
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	1865	175	40	1500	95	105	35	35	245	35	120
RTOR Reduction (vph)	0	0	39	0	0	36	0	0	30	0	0	111
Lane Group Flow (vph)	160	1865	136	40	1500	59	0	140	5	140	140	9
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2		2	6		6		8	8			4
Actuated Green, G (s)	82.5	81.1	81.1	75.1	75.1	75.1		18.3	18.3	10.0	10.0	10.0
Effective Green, g (s)	82.5	82.5	82.5	75.1	76.5	76.5		18.3	18.3	10.0	10.0	10.0
Actuated g/C Ratio	0.63	0.63	0.63	0.58	0.59	0.59		0.14	0.14	0.08	0.08	0.08
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	225	2105	930	93	1976	842		237	205	124	126	115
v/s Ratio Prot	0.05	c0.56		0.01	c0.45			c0.08		c0.09	0.08	
v/s Ratio Perm	0.40		0.09	0.24		0.04			0.00			0.01
v/c Ratio	0.71	0.89	0.15	0.43	0.76	0.07		0.59	0.02	1.13	1.11	0.08
Uniform Delay, d1	36.2	19.8	9.6	26.1	19.9	11.5		52.3	48.2	60.0	60.0	55.7
Progression Factor	0.59	0.39	0.26	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	2.4	0.1	1.9	2.8	0.2		3.0	0.0	119.7	113.1	0.2
Delay (s)	25.0	10.2	2.6	27.9	22.7	11.6		55.4	48.2	179.7	173.1	55.9
Level of Service	C	B	A	C	C	B		E	D	F	F	E
Approach Delay (s)		10.7			22.2			53.9			140.3	
Approach LOS		B			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	84.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	1735	140	90	1300	225	130	50	105	140	40	235
Future Volume (veh/h)	260	1735	140	90	1300	225	130	50	105	140	40	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	260	1735	140	90	1300	225	130	50	105	140	40	235
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	275	1736	773	75	1150	572	139	74	155	243	48	279
Arrive On Green	0.16	0.52	0.52	0.05	0.39	0.39	0.08	0.15	0.15	0.14	0.21	0.22
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	506	1063	1701	225	1320
Grp Volume(v), veh/h	260	1735	140	90	1300	225	130	0	155	140	0	275
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1569	1701	0	1544
Q Serve(g_s), s	16.8	56.7	5.5	5.0	43.0	12.2	8.4	0.0	10.3	8.5	0.0	18.8
Cycle Q Clear(g_c), s	16.8	56.7	5.5	5.0	43.0	12.2	8.4	0.0	10.3	8.5	0.0	18.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.68	1.00		0.85
Lane Grp Cap(c), veh/h	275	1736	773	75	1150	572	139	0	229	243	0	327
V/C Ratio(X)	0.95	1.00	0.18	1.20	1.13	0.39	0.93	0.00	0.68	0.58	0.00	0.84
Avail Cap(c_a), veh/h	275	1736	773	75	1150	572	139	0	428	243	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.35	0.35	0.35	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.6	26.6	14.2	52.5	33.5	24.1	50.2	0.0	44.3	44.0	0.0	41.4
Incr Delay (d2), s/veh	20.1	12.7	0.2	168.2	70.2	2.0	56.1	0.0	2.1	2.6	0.0	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	23.6	1.9	5.6	26.3	4.6	5.7	0.0	4.2	3.8	0.0	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.6	39.3	14.4	220.7	103.7	26.1	106.3	0.0	46.5	46.6	0.0	51.5
LnGrp LOS	E	D	B	F	F	C	F	A	D	D	A	D
Approach Vol, veh/h		2135			1615			285			415	
Approach Delay, s/veh		40.9			99.4			73.8			49.9	
Approach LOS		D			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	60.7	13.0	27.3	22.7	47.0	20.2	20.1
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.5	* 4.5
Max Green Setting (Gmax), s	5.0	49.2	9.0	29.5	12.0	* 43	9.0	* 30
Max Q Clear Time (g_c+I1), s	7.0	58.7	10.4	20.8	18.8	45.0	10.5	12.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	65.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	160	1255	15	245	40	0	0	60	35
Future Volume (veh/h)	0	0	0	160	1255	15	245	40	0	0	60	35
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				160	1255	15	245	40	0	0	60	35
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				194	1601	20	435	61	0	0	371	216
Arrive On Green				0.53	0.53	0.53	0.35	0.35	0.00	0.00	0.35	0.35
Sat Flow, veh/h				367	3029	38	1055	172	0	0	1047	611
Grp Volume(v), veh/h				747	0	683	285	0	0	0	0	95
Grp Sat Flow(s),veh/h/ln				1711	0	1722	1227	0	0	0	0	1657
Q Serve(g_s), s				40.2	0.0	34.1	19.6	0.0	0.0	0.0	0.0	4.3
Cycle Q Clear(g_c), s				40.2	0.0	34.1	23.9	0.0	0.0	0.0	0.0	4.3
Prop In Lane				0.21		0.02	0.86		0.00	0.00		0.37
Lane Grp Cap(c), veh/h				905	0	910	496	0	0	0	0	588
V/C Ratio(X)				0.83	0.00	0.75	0.57	0.00	0.00	0.00	0.00	0.16
Avail Cap(c_a), veh/h				980	0	987	496	0	0	0	0	588
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.90	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.7	0.0	20.3	32.5	0.0	0.0	0.0	0.0	24.3
Incr Delay (d2), s/veh				8.5	0.0	5.7	4.3	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.7	0.0	14.7	7.2	0.0	0.0	0.0	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				30.2	0.0	25.9	36.8	0.0	0.0	0.0	0.0	24.4
LnGrp LOS				C	A	C	D	A	A	A	A	C
Approach Vol, veh/h					1430			285			95	
Approach Delay, s/veh					28.2			36.8			24.4	
Approach LOS					C			D			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	43.0	62.1	43.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	39.0	63.0	39.0
Max Q Clear Time (g_c+I1), s	6.3	42.2	25.9
Green Ext Time (p_c), s	0.3	16.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	1395	505	0	0	0	0	220	225	35	190	0
Future Volume (veh/h)	70	1395	505	0	0	0	0	220	225	35	190	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	70	1395	0				0	220	225	35	190	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	100	2098					0	403	334	43	488	0
Arrive On Green	0.64	0.64	0.00				0.00	0.23	0.23	0.01	0.09	0.00
Sat Flow, veh/h	157	3290	1502				0	1772	1470	1647	1730	0
Grp Volume(v), veh/h	785	680	0				0	220	225	35	190	0
Grp Sat Flow(s),veh/h/ln	1764	1683	1502				0	1772	1470	1647	1730	0
Q Serve(g_s), s	31.9	27.0	0.0				0.0	12.0	15.4	2.3	11.4	0.0
Cycle Q Clear(g_c), s	31.9	27.0	0.0				0.0	12.0	15.4	2.3	11.4	0.0
Prop In Lane	0.09		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1125	1074					0	403	334	43	488	0
V/C Ratio(X)	0.70	0.63					0.00	0.55	0.67	0.82	0.39	0.00
Avail Cap(c_a), veh/h	1125	1074					0	403	334	75	535	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.98	0.98	0.99	0.99	0.00
Uniform Delay (d), s/veh	13.0	12.1	0.0				0.0	37.5	38.8	54.3	41.0	0.0
Incr Delay (d2), s/veh	3.6	2.9	0.0				0.0	5.1	10.2	20.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	10.5	0.0				0.0	5.7	6.3	1.2	5.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	15.0	0.0				0.0	42.6	49.0	74.5	41.3	0.0
LnGrp LOS	B	B					A	D	D	E	D	A
Approach Vol, veh/h		1465						445			225	
Approach Delay, s/veh		15.8						45.8			46.4	
Approach LOS		B						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	74.2	35.8	6.8	29.0
Change Period (Y+Rc), s	4.0	* 4.8	4.0	4.8
Max Green Setting (Gmax), s	68.0	* 34	5.0	24.2
Max Q Clear Time (g_c+I1), s	33.9	13.4	4.3	17.4
Green Ext Time (p_c), s	23.8	0.5	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	1320	110	10	1075	25	95	25	10	160	20	105
Future Volume (veh/h)	155	1320	110	10	1075	25	95	25	10	160	20	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	155	1320	110	10	1075	25	95	25	10	160	20	105
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	444	2179	971	23	1302	581	247	61	21	234	25	122
Arrive On Green	0.26	0.65	0.65	0.01	0.40	0.40	0.22	0.23	0.21	0.22	0.23	0.21
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	847	273	93	814	113	540
Grp Volume(v), veh/h	155	1320	110	10	1075	25	130	0	0	285	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1212	0	0	1467	0	0
Q Serve(g_s), s	8.2	25.0	3.1	0.7	32.7	1.2	0.0	0.0	0.0	10.2	0.0	0.0
Cycle Q Clear(g_c), s	8.2	25.0	3.1	0.7	32.7	1.2	10.4	0.0	0.0	20.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.73		0.08	0.56		0.37
Lane Grp Cap(c), veh/h	444	2179	971	23	1302	581	324	0	0	375	0	0
V/C Ratio(X)	0.35	0.61	0.11	0.44	0.83	0.04	0.40	0.00	0.00	0.76	0.00	0.00
Avail Cap(c_a), veh/h	444	2179	971	66	1446	645	427	0	0	481	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.9	11.3	7.4	53.8	29.4	20.0	37.1	0.0	0.0	41.4	0.0	0.0
Incr Delay (d2), s/veh	0.3	1.3	0.2	7.8	6.1	0.1	0.6	0.0	0.0	4.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	9.2	1.0	0.3	13.1	0.4	3.1	0.0	0.0	8.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.2	12.5	7.6	61.6	35.5	20.1	37.7	0.0	0.0	46.0	0.0	0.0
LnGrp LOS	C	B	A	E	D	C	D	A	A	D	A	A
Approach Vol, veh/h		1585			1110			130			285	
Approach Delay, s/veh		14.2			35.4			37.7			46.0	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	75.7		28.8	32.9	48.3		28.8
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.0	* 61		31.3	15.5	49.2		31.3
Max Q Clear Time (g_c+I1), s	12.7	27.0		22.6	10.2	34.7		12.4
Green Ext Time (p_c), s	0.0	22.9		0.6	0.2	9.6		0.3

Intersection Summary	
HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1395	85	30	1120	25	65
Future Vol, veh/h	1395	85	30	1120	25	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1395	85	30	1120	25	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1480	0	2015	698
Stage 1	-	-	-	-	1395	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	432	-	52	388
Stage 1	-	-	-	-	199	-
Stage 2	-	-	-	-	504	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	432	-	48	388
Mov Cap-2 Maneuver	-	-	-	-	48	-
Stage 1	-	-	-	-	199	-
Stage 2	-	-	-	-	469	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	51.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	48	388	-	-	432	-
HCM Lane V/C Ratio	0.521	0.168	-	-	0.069	-
HCM Control Delay (s)	143.1	16.1	-	-	14	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	1.9	0.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	12.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	155	1305	0	95	1040	0	5	5	95	5	0	105
Future Vol, veh/h	155	1305	0	95	1040	0	5	5	95	5	0	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	100	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	3	3	2	2	6	6	2	2	2	0	2	0
Mvmt Flow	155	1305	0	95	1040	0	5	5	95	5	0	105

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1040	0	0	1305	0	0	2325	2845	653	2195	2845	520
Stage 1	-	-	-	-	-	-	1615	1615	-	1230	1230	-
Stage 2	-	-	-	-	-	-	710	1230	-	965	1615	-
Critical Hdwy	4.16	-	-	4.14	-	-	7.54	6.54	6.94	7.5	6.54	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Follow-up Hdwy	2.23	-	-	2.22	-	-	3.52	4.02	3.32	3.5	4.02	3.3
Pot Cap-1 Maneuver	658	-	-	526	-	-	20	17	410	26	17	506
Stage 1	-	-	-	-	-	-	108	161	-	191	248	-
Stage 2	-	-	-	-	-	-	391	248	-	278	161	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	658	-	-	526	-	-	11	11	410	9	11	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	11	11	-	9	11	-
Stage 1	-	-	-	-	-	-	83	123	-	146	203	-
Stage 2	-	-	-	-	-	-	254	203	-	157	123	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	1.1	221.2	83.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	92	658	-	-	526	-	-	144
HCM Lane V/C Ratio	1.141	0.236	-	-	0.181	-	-	0.764
HCM Control Delay (s)	221.2	12.1	-	-	13.3	-	-	83.7
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	7.1	0.9	-	-	0.7	-	-	4.6

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1395	1120	25	10	0
Future Vol, veh/h	5	1395	1120	25	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1395	1120	25	10	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1145	0	-	0	1841	573
Stage 1	-	-	-	-	1133	-
Stage 2	-	-	-	-	708	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	606	-	-	-	67	463
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	449	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	606	-	-	-	66	463
Mov Cap-2 Maneuver	-	-	-	-	66	-
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	449	-

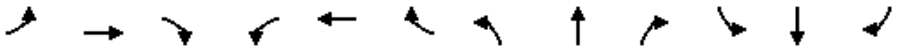
Approach	EB	WB	SB
HCM Control Delay, s	0	0	69
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	606	-	-	-	66
HCM Lane V/C Ratio	0.008	-	-	-	0.152
HCM Control Delay (s)	11	-	-	-	69
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	0.5

SECTION 6. HCM REPORTS

5 PM TO 6 PM WITH PROFILE

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26 06/08/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	2330	5	10	1620	210	10	45	10	245	10	20
Future Volume (veh/h)	55	2330	5	10	1620	210	10	45	10	245	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	55	2330	5	10	1620	0	10	45	10	245	10	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	85	1970	879	68	1908		13	60	13	290	90	181
Arrive On Green	0.05	0.59	0.59	0.04	0.58	0.00	0.06	0.06	0.06	0.17	0.17	0.17
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	238	1072	238	1688	527	1055
Grp Volume(v), veh/h	55	2330	5	10	1620	0	65	0	0	245	0	30
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1549	0	0	1688	0	1582
Q Serve(g_s), s	3.5	64.0	0.2	0.6	44.4	0.0	4.5	0.0	0.0	15.4	0.0	1.8
Cycle Q Clear(g_c), s	3.5	64.0	0.2	0.6	44.4	0.0	4.5	0.0	0.0	15.4	0.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	0.15		0.15	1.00		0.67
Lane Grp Cap(c), veh/h	85	1970	879	68	1908		87	0	0	290	0	271
V/C Ratio(X)	0.65	1.18	0.01	0.15	0.85		0.75	0.00	0.00	0.85	0.00	0.11
Avail Cap(c_a), veh/h	85	1970	879	84	1939		106	0	0	339	0	318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.0	22.7	9.4	50.6	19.2	0.0	50.8	0.0	0.0	43.9	0.0	38.3
Incr Delay (d2), s/veh	14.0	87.8	0.0	0.6	4.1	0.0	15.7	0.0	0.0	15.7	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	44.5	0.0	0.3	15.2	0.0	2.1	0.0	0.0	7.7	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	110.5	9.5	51.2	23.4	0.0	66.5	0.0	0.0	59.6	0.0	38.4
LnGrp LOS	E	F	A	D	C		E	A	A	E	A	D
Approach Vol, veh/h		2390			1630			65			275	
Approach Delay, s/veh		109.3			23.5			66.5			57.3	
Approach LOS		F			C			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	67.0		22.8	8.5	68.0		10.1				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	5.0	61.0		21.0	5.0	61.0		7.0				
Max Q Clear Time (g_c+I1), s	5.5	46.4		17.4	2.6	66.0		6.5				
Green Ext Time (p_c), s	0.0	11.4		0.4	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		73.3
HCM 6th LOS		E

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	1480	385	245	1410	310	310	140	300	140	165	160
Future Volume (veh/h)	275	1480	385	245	1410	310	310	140	300	140	165	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	275	1480	385	245	1410	310	310	140	300	140	165	160
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	198	1243	864	301	1484	840	718	379	323	214	225	190
Arrive On Green	0.08	0.37	0.36	0.30	0.90	0.86	0.22	0.21	0.21	0.13	0.13	0.13
Sat Flow, veh/h	1688	3367	1502	1661	3313	1502	3300	1772	1511	1688	1772	1502
Grp Volume(v), veh/h	275	1480	385	245	1410	310	310	140	300	140	165	160
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1502	1650	1772	1511	1688	1772	1502
Q Serve(g_s), s	11.0	48.0	19.0	13.0	38.7	4.8	10.5	8.8	25.3	10.3	11.7	13.5
Cycle Q Clear(g_c), s	11.0	48.0	19.0	13.0	38.7	4.8	10.5	8.8	25.3	10.3	11.7	13.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1243	864	301	1484	840	718	379	323	214	225	190
V/C Ratio(X)	1.39	1.19	0.45	0.81	0.95	0.37	0.43	0.37	0.93	0.65	0.73	0.84
Avail Cap(c_a), veh/h	198	1243	864	301	1484	840	761	402	343	376	395	335
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.40	0.40	0.40	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	41.0	15.8	42.1	5.8	3.3	43.9	43.6	50.1	54.0	54.6	55.5
Incr Delay (d2), s/veh	202.5	94.0	1.7	6.6	7.0	0.5	0.3	0.4	29.5	2.5	3.4	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	34.7	10.3	6.4	3.8	1.4	4.3	3.9	12.1	4.5	5.4	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	239.7	135.0	17.4	48.7	12.8	3.8	44.2	44.0	79.6	56.6	58.1	62.7
LnGrp LOS	F	F	B	D	B	A	D	D	E	E	E	E
Approach Vol, veh/h		2140			1965			750			465	
Approach Delay, s/veh		127.3			15.9			58.3			59.2	
Approach LOS		F			B			E			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.2	52.0		20.5	15.0	62.2		32.3
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5
Max Green Setting (Gmax), s	7.0	* 46		29.0	11.0	42.0		29.5
Max Q Clear Time (g_c+I1), s	15.0	50.0		15.5	13.0	40.7		27.3
Green Ext Time (p_c), s	0.0	0.0		0.9	0.0	1.3		0.5

Intersection Summary	
HCM 6th Ctrl Delay	70.5
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	1800	5	25	1660	45	160	35	235	215	15	160
Future Volume (vph)	60	1800	5	25	1660	45	160	35	235	215	15	160
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1621		1624	1639	1508
Flt Permitted	0.06	1.00		0.06	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	99	3316		100	3358	1471		1621		1624	1639	1508
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	1800	5	25	1660	45	160	35	235	215	15	160
RTOR Reduction (vph)	0	0	0	0	0	21	0	33	0	0	0	121
Lane Group Flow (vph)	60	1805	0	25	1660	24	0	397	0	114	116	39
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						4
Actuated Green, G (s)	74.9	70.9		71.7	69.3	69.3		22.6		16.7	16.7	16.7
Effective Green, g (s)	75.9	72.3		71.7	70.7	70.7		22.6		16.7	16.7	16.7
Actuated g/C Ratio	0.58	0.56		0.55	0.54	0.54		0.17		0.13	0.13	0.13
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	112	1844		83	1826	799		281		208	210	193
v/s Ratio Prot	c0.02	c0.54		0.01	0.49			c0.24		0.07	c0.07	
v/s Ratio Perm	0.29			0.16		0.02						0.03
v/c Ratio	0.54	0.98		0.30	0.91	0.03		1.41		0.55	0.55	0.20
Uniform Delay, d1	50.2	28.1		57.1	26.8	13.8		53.7		53.1	53.1	50.7
Progression Factor	0.46	0.45		0.77	0.66	3.03		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	12.8		0.8	5.9	0.0		205.5		2.0	2.2	0.3
Delay (s)	25.3	25.4		44.6	23.5	41.7		259.2		55.1	55.4	51.0
Level of Service	C	C		D	C	D		F		E	E	D
Approach Delay (s)		25.4			24.3			259.2			53.5	
Approach LOS		C			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Ruben Lane & US 26 06/08/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	1890	180	40	1525	95	110	35	35	250	35	125
Future Volume (vph)	165	1890	180	40	1525	95	110	35	35	250	35	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1467	1644	3358	1432		1684	1461	1624	1648	1506
Flt Permitted	0.10	1.00	1.00	0.06	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	184	3318	1467	95	3358	1432		1684	1461	1624	1648	1506
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	165	1890	180	40	1525	95	110	35	35	250	35	125
RTOR Reduction (vph)	0	0	39	0	0	35	0	0	30	0	0	115
Lane Group Flow (vph)	165	1890	141	40	1525	60	0	145	5	142	143	10
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2		2	6		6		8	8			4
Actuated Green, G (s)	82.2	80.8	80.8	75.7	75.7	75.7		18.6	18.6	10.0	10.0	10.0
Effective Green, g (s)	82.2	82.2	82.2	75.7	77.1	77.1		18.6	18.6	10.0	10.0	10.0
Actuated g/C Ratio	0.63	0.63	0.63	0.58	0.59	0.59		0.14	0.14	0.08	0.08	0.08
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	211	2097	927	93	1991	849		240	209	124	126	115
v/s Ratio Prot	0.05	c0.57		0.01	c0.45			c0.09		c0.09	0.09	
v/s Ratio Perm	0.44		0.10	0.24		0.04			0.00			0.01
v/c Ratio	0.78	0.90	0.15	0.43	0.77	0.07		0.60	0.02	1.15	1.13	0.08
Uniform Delay, d1	37.2	20.4	9.7	26.7	19.7	11.2		52.2	47.9	60.0	60.0	55.7
Progression Factor	0.60	0.39	0.26	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	2.6	0.1	1.9	2.9	0.2		3.3	0.0	125.1	121.0	0.2
Delay (s)	28.7	10.6	2.7	28.6	22.6	11.4		55.6	47.9	185.1	181.0	55.9
Level of Service	C	B	A	C	C	B		E	D	F	F	E
Approach Delay (s)		11.3			22.1			54.1			144.3	
Approach LOS		B			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM 6th Signalized Intersection Summary
6: Bluff Rd & US 26

06/08/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	1765	145	90	1320	230	135	50	110	145	40	240
Future Volume (veh/h)	265	1765	145	90	1320	230	135	50	110	145	40	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	265	1765	145	90	1320	230	135	50	110	145	40	240
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	270	1726	769	75	1150	572	139	73	160	243	47	284
Arrive On Green	0.16	0.51	0.51	0.05	0.39	0.39	0.08	0.15	0.15	0.14	0.21	0.22
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	490	1077	1701	221	1323
Grp Volume(v), veh/h	265	1765	145	90	1320	230	135	0	160	145	0	280
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1567	1701	0	1544
Q Serve(g_s), s	17.2	56.4	5.7	5.0	43.0	12.5	8.7	0.0	10.6	8.8	0.0	19.1
Cycle Q Clear(g_c), s	17.2	56.4	5.7	5.0	43.0	12.5	8.7	0.0	10.6	8.8	0.0	19.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.69	1.00		0.86
Lane Grp Cap(c), veh/h	270	1726	769	75	1150	572	139	0	233	243	0	331
V/C Ratio(X)	0.98	1.02	0.19	1.20	1.15	0.40	0.97	0.00	0.69	0.60	0.00	0.85
Avail Cap(c_a), veh/h	270	1726	769	75	1150	572	139	0	427	243	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.32	0.32	0.32	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.0	26.8	14.5	52.5	33.5	24.2	50.4	0.0	44.2	44.2	0.0	41.2
Incr Delay (d2), s/veh	26.2	18.4	0.2	168.2	77.2	2.1	66.7	0.0	2.2	3.2	0.0	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	24.8	2.0	5.6	27.4	4.7	6.3	0.0	4.3	3.9	0.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.2	45.2	14.6	220.7	110.7	26.3	117.1	0.0	46.4	47.4	0.0	52.1
LnGrp LOS	E	F	B	F	F	C	F	A	D	D	A	D
Approach Vol, veh/h		2175			1640			295			425	
Approach Delay, s/veh		46.4			104.9			78.8			50.5	
Approach LOS		D			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	60.4	13.0	27.6	22.4	47.0	20.2	20.4
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.5	* 4.5
Max Green Setting (Gmax), s	5.0	49.2	9.0	29.5	12.0	* 43	9.0	* 30
Max Q Clear Time (g_c+I1), s	7.0	58.4	10.7	21.1	19.2	45.0	10.8	12.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	70.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	165	1275	15	250	40	0	0	60	35
Future Volume (veh/h)	0	0	0	165	1275	15	250	40	0	0	60	35
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				165	1275	15	250	40	0	0	60	35
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				198	1613	20	436	60	0	0	371	216
Arrive On Green				0.53	0.53	0.53	0.35	0.35	0.00	0.00	0.35	0.35
Sat Flow, veh/h				372	3025	37	1057	169	0	0	1047	611
Grp Volume(v), veh/h				760	0	695	290	0	0	0	0	95
Grp Sat Flow(s),veh/h/ln				1711	0	1723	1226	0	0	0	0	1657
Q Serve(g_s), s				41.0	0.0	34.7	20.1	0.0	0.0	0.0	0.0	4.3
Cycle Q Clear(g_c), s				41.0	0.0	34.7	24.4	0.0	0.0	0.0	0.0	4.3
Prop In Lane				0.22		0.02	0.86		0.00	0.00		0.37
Lane Grp Cap(c), veh/h				913	0	919	496	0	0	0	0	588
V/C Ratio(X)				0.83	0.00	0.76	0.59	0.00	0.00	0.00	0.00	0.16
Avail Cap(c_a), veh/h				980	0	987	496	0	0	0	0	588
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.89	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.6	0.0	20.1	32.7	0.0	0.0	0.0	0.0	24.3
Incr Delay (d2), s/veh				8.8	0.0	5.8	4.5	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				18.1	0.0	15.0	7.3	0.0	0.0	0.0	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				30.3	0.0	25.9	37.1	0.0	0.0	0.0	0.0	24.4
LnGrp LOS				C	A	C	D	A	A	A	A	C
Approach Vol, veh/h					1455			290			95	
Approach Delay, s/veh					28.2			37.1			24.4	
Approach LOS					C			D			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	43.0	62.7	43.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	39.0	63.0	39.0
Max Q Clear Time (g_c+I1), s	6.3	43.0	26.4
Green Ext Time (p_c), s	0.3	15.6	1.0

Intersection Summary	
HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
14: Hwy 211 & Pioneer Blvd

06/08/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	1415	515	0	0	0	0	225	230	35	195	0
Future Volume (veh/h)	70	1415	515	0	0	0	0	225	230	35	195	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	70	1415	0				0	225	230	35	195	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	99	2100					0	403	334	43	488	0
Arrive On Green	0.64	0.64	0.00				0.00	0.23	0.23	0.01	0.09	0.00
Sat Flow, veh/h	155	3292	1502				0	1772	1470	1647	1730	0
Grp Volume(v), veh/h	795	690	0				0	225	230	35	195	0
Grp Sat Flow(s),veh/h/ln	1764	1683	1502				0	1772	1470	1647	1730	0
Q Serve(g_s), s	32.7	27.7	0.0				0.0	12.4	15.8	2.3	11.7	0.0
Cycle Q Clear(g_c), s	32.7	27.7	0.0				0.0	12.4	15.8	2.3	11.7	0.0
Prop In Lane	0.09		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1125	1074					0	403	334	43	488	0
V/C Ratio(X)	0.71	0.64					0.00	0.56	0.69	0.82	0.40	0.00
Avail Cap(c_a), veh/h	1125	1074					0	403	334	75	535	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.98	0.98	0.99	0.99	0.00
Uniform Delay (d), s/veh	13.1	12.2	0.0				0.0	37.6	38.9	54.3	41.1	0.0
Incr Delay (d2), s/veh	3.8	3.0	0.0				0.0	5.4	10.8	20.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.3	10.7	0.0				0.0	5.8	6.5	1.2	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.9	15.2	0.0				0.0	43.0	49.8	74.5	41.4	0.0
LnGrp LOS	B	B					A	D	D	E	D	A
Approach Vol, veh/h		1485						455			230	
Approach Delay, s/veh		16.1						46.4			46.4	
Approach LOS		B						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	74.2	35.8	6.8	29.0
Change Period (Y+Rc), s	4.0	* 4.8	4.0	4.8
Max Green Setting (Gmax), s	68.0	* 34	5.0	24.2
Max Q Clear Time (g_c+I1), s	34.7	13.7	4.3	17.8
Green Ext Time (p_c), s	23.8	0.5	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1340	115	10	1090	25	95	25	10	165	20	110
Future Volume (veh/h)	160	1340	115	10	1090	25	95	25	10	165	20	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	160	1340	115	10	1090	25	95	25	10	165	20	110
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	427	2156	961	23	1312	585	252	63	21	239	25	127
Arrive On Green	0.25	0.64	0.64	0.01	0.41	0.41	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	1688	3367	1500	1621	3233	1442	843	270	93	812	108	547
Grp Volume(v), veh/h	160	1340	115	10	1090	25	130	0	0	295	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1500	1621	1617	1442	1206	0	0	1466	0	0
Q Serve(g_s), s	8.6	26.1	3.3	0.7	33.2	1.2	0.0	0.0	0.0	11.0	0.0	0.0
Cycle Q Clear(g_c), s	8.6	26.1	3.3	0.7	33.2	1.2	10.4	0.0	0.0	21.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.73		0.08	0.56		0.37
Lane Grp Cap(c), veh/h	427	2156	961	23	1312	585	331	0	0	384	0	0
V/C Ratio(X)	0.37	0.62	0.12	0.44	0.83	0.04	0.39	0.00	0.00	0.77	0.00	0.00
Avail Cap(c_a), veh/h	427	2156	961	66	1446	645	424	0	0	481	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.9	11.8	7.7	53.8	29.3	19.8	36.5	0.0	0.0	41.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	1.4	0.3	7.8	6.2	0.1	0.6	0.0	0.0	5.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	9.7	1.1	0.3	13.3	0.4	3.1	0.0	0.0	8.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	13.2	8.0	61.6	35.5	19.9	37.1	0.0	0.0	46.2	0.0	0.0
LnGrp LOS	C	B	A	E	D	B	D	A	A	D	A	A
Approach Vol, veh/h		1615			1125			130			295	
Approach Delay, s/veh		14.9			35.4			37.1			46.2	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	75.0		29.5	31.9	48.7		29.5
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.0	* 61		31.3	15.5	49.2		31.3
Max Q Clear Time (g_c+I1), s	12.7	28.1		23.4	10.6	35.2		12.4
Green Ext Time (p_c), s	0.0	22.8		0.6	0.2	9.4		0.3

Intersection Summary	
HCM 6th Ctrl Delay	26.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1415	85	30	1140	25	65
Future Vol, veh/h	1415	85	30	1140	25	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1415	85	30	1140	25	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1500	0	2045	708
Stage 1	-	-	-	-	1415	-
Stage 2	-	-	-	-	630	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	424	-	50	382
Stage 1	-	-	-	-	194	-
Stage 2	-	-	-	-	498	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	424	-	46	382
Mov Cap-2 Maneuver	-	-	-	-	46	-
Stage 1	-	-	-	-	194	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	54.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	46	382	-	-	424	-
HCM Lane V/C Ratio	0.543	0.17	-	-	0.071	-
HCM Control Delay (s)	152.9	16.3	-	-	14.1	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	2	0.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	14.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	160	1325	0	95	1055	0	5	5	95	5	0	110
Future Vol, veh/h	160	1325	0	95	1055	0	5	5	95	5	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	100	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	3	3	2	2	6	6	2	2	2	0	2	0
Mvmt Flow	160	1325	0	95	1055	0	5	5	95	5	0	110

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1055	0	0	1325	0	0	2363	2890	663	2230	2890	528
Stage 1	-	-	-	-	-	-	1645	1645	-	1245	1245	-
Stage 2	-	-	-	-	-	-	718	1245	-	985	1645	-
Critical Hdwy	4.16	-	-	4.14	-	-	7.54	6.54	6.94	7.5	6.54	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Follow-up Hdwy	2.23	-	-	2.22	-	-	3.52	4.02	3.32	3.5	4.02	3.3
Pot Cap-1 Maneuver	650	-	-	517	-	-	19	16	404	24	16	500
Stage 1	-	-	-	-	-	-	104	156	-	187	244	-
Stage 2	-	-	-	-	-	-	386	244	-	270	156	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	650	-	-	517	-	-	10	10	404	8	10	500
Mov Cap-2 Maneuver	-	-	-	-	-	-	10	10	-	8	10	-
Stage 1	-	-	-	-	-	-	78	118	-	141	199	-
Stage 2	-	-	-	-	-	-	246	199	-	149	118	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	1.1	262.6	102.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	85	650	-	-	517	-	-	136
HCM Lane V/C Ratio	1.235	0.246	-	-	0.184	-	-	0.846
HCM Control Delay (s)	262.6	12.3	-	-	13.5	-	-	102.9
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	7.6	1	-	-	0.7	-	-	5.4

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1415	1140	25	10	0
Future Vol, veh/h	5	1415	1140	25	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1415	1140	25	10	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1165	0	-	0	1871	583
Stage 1	-	-	-	-	1153	-
Stage 2	-	-	-	-	718	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	595	-	-	-	64	456
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	444	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	595	-	-	-	63	456
Mov Cap-2 Maneuver	-	-	-	-	63	-
Stage 1	-	-	-	-	261	-
Stage 2	-	-	-	-	444	-

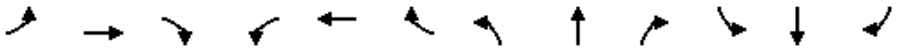
Approach	EB	WB	SB
HCM Control Delay, s	0	0	72.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	595	-	-	-	63
HCM Lane V/C Ratio	0.008	-	-	-	0.159
HCM Control Delay (s)	11.1	-	-	-	72.6
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	0.5

SECTION 7. HCM REPORTS

6 PM TO 7 PM WITH PROFILE

HCM 6th Signalized Intersection Summary
1: SE Jarl Road/SE Orient Drive & US 26 06/08/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1730	5	5	1205	155	5	35	5	180	5	15
Future Volume (veh/h)	40	1730	5	5	1205	155	5	35	5	180	5	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1603	1603	1603	1772	1772	1772
Adj Flow Rate, veh/h	40	1730	5	5	1205	0	5	35	5	180	5	15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	4	4	4	14	14	14	2	2	2
Cap, veh/h	82	2046	913	75	2004		8	58	8	232	54	161
Arrive On Green	0.05	0.61	0.61	0.05	0.60	0.00	0.05	0.05	0.05	0.14	0.14	0.14
Sat Flow, veh/h	1688	3367	1502	1661	3313	1478	174	1216	174	1688	390	1171
Grp Volume(v), veh/h	40	1730	5	5	1205	0	45	0	0	180	0	20
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1478	1563	0	0	1688	0	1561
Q Serve(g_s), s	2.3	41.1	0.1	0.3	22.4	0.0	2.8	0.0	0.0	10.2	0.0	1.1
Cycle Q Clear(g_c), s	2.3	41.1	0.1	0.3	22.4	0.0	2.8	0.0	0.0	10.2	0.0	1.1
Prop In Lane	1.00		1.00	1.00		1.00	0.11		0.11	1.00		0.75
Lane Grp Cap(c), veh/h	82	2046	913	75	2004		75	0	0	232	0	215
V/C Ratio(X)	0.49	0.85	0.01	0.07	0.60		0.60	0.00	0.00	0.78	0.00	0.09
Avail Cap(c_a), veh/h	94	2173	969	92	2138		118	0	0	374	0	346
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.0	15.7	7.7	45.3	12.2	0.0	46.2	0.0	0.0	41.3	0.0	37.4
Incr Delay (d2), s/veh	2.8	3.6	0.0	0.2	0.7	0.0	2.8	0.0	0.0	5.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	13.2	0.0	0.1	6.7	0.0	1.2	0.0	0.0	4.6	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	19.3	7.7	45.5	12.9	0.0	49.0	0.0	0.0	46.8	0.0	37.5
LnGrp LOS	D	B	A	D	B		D	A	A	D	A	D
Approach Vol, veh/h		1775			1210			45			200	
Approach Delay, s/veh		19.9			13.0			49.0			45.8	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	64.0		17.6	8.5	64.3		8.8				
Change Period (Y+Rc), s	4.5	7.0		5.0	4.5	7.0		4.5				
Max Green Setting (Gmax), s	5.0	61.0		21.0	5.0	61.0		7.0				
Max Q Clear Time (g_c+I1), s	4.3	24.4		12.2	2.3	43.1		4.8				
Green Ext Time (p_c), s	0.0	15.2		0.5	0.0	14.1		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		19.3
HCM 6th LOS		B

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	1100	285	180	1050	230	230	105	225	105	120	120
Future Volume (veh/h)	205	1100	285	180	1050	230	230	105	225	105	120	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1772	1786	1772	1786	1772	1772	1772
Adj Flow Rate, veh/h	205	1100	285	180	1050	230	230	105	225	105	120	120
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	4	4	2	1	2	1	2	2	2
Cap, veh/h	304	1238	793	437	1727	909	567	298	254	168	176	149
Arrive On Green	0.08	0.37	0.36	0.45	1.00	1.00	0.17	0.17	0.17	0.10	0.10	0.10
Sat Flow, veh/h	1688	3367	1502	1661	3313	1502	3300	1772	1511	1688	1772	1502
Grp Volume(v), veh/h	205	1100	285	180	1050	230	230	105	225	105	120	120
Grp Sat Flow(s),veh/h/ln	1688	1683	1502	1661	1657	1502	1650	1772	1511	1688	1772	1502
Q Serve(g_s), s	11.0	39.9	14.4	3.2	0.0	0.0	8.1	6.8	18.9	7.8	8.5	10.2
Cycle Q Clear(g_c), s	11.0	39.9	14.4	3.2	0.0	0.0	8.1	6.8	18.9	7.8	8.5	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	304	1238	793	437	1727	909	567	298	254	168	176	149
V/C Ratio(X)	0.68	0.89	0.36	0.41	0.61	0.25	0.41	0.35	0.89	0.63	0.68	0.80
Avail Cap(c_a), veh/h	304	1243	795	437	1727	909	761	402	343	376	395	335
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	38.6	17.9	28.2	0.0	0.0	47.9	47.8	52.9	56.2	56.6	57.3
Incr Delay (d2), s/veh	5.4	9.7	1.3	0.3	1.1	0.5	0.3	0.4	16.8	2.8	3.4	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	17.1	7.0	3.2	0.3	0.1	3.3	3.0	8.3	3.4	4.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	48.3	19.1	28.5	1.1	0.5	48.2	48.3	69.7	59.1	60.0	64.7
LnGrp LOS	D	D	B	C	A	A	D	D	E	E	E	E
Approach Vol, veh/h		1590			1460			560			345	
Approach Delay, s/veh		41.8			4.4			56.9			61.4	
Approach LOS		D			A			E			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.9	51.8		16.9	15.0	71.8		26.3
Change Period (Y+Rc), s	6.0	* 6		4.0	4.0	6.0		4.5
Max Green Setting (Gmax), s	7.0	* 46		29.0	11.0	42.0		29.5
Max Q Clear Time (g_c+I1), s	5.2	41.9		12.2	13.0	2.0		20.9
Green Ext Time (p_c), s	0.1	3.9		0.7	0.0	35.7		0.8

Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Notes

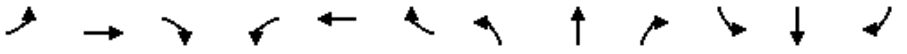
User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1335	5	20	1230	35	120	25	175	160	10	120
Future Volume (vph)	45	1335	5	20	1230	35	120	25	175	160	10	120
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	*1.00	*0.94		1.00	*0.97	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	1676	3316		1644	3358	1471		1620		1624	1638	1508
Flt Permitted	0.13	1.00		0.09	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	235	3316		163	3358	1471		1620		1624	1638	1508
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	1335	5	20	1230	35	120	25	175	160	10	120
RTOR Reduction (vph)	0	0	0	0	0	17	0	32	0	0	0	106
Lane Group Flow (vph)	45	1340	0	20	1230	18	0	288	0	85	85	14
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6		6						4
Actuated Green, G (s)	73.9	68.9		68.7	66.3	66.3		26.4		14.9	14.9	14.9
Effective Green, g (s)	74.9	70.3		68.7	67.7	67.7		26.4		14.9	14.9	14.9
Actuated g/C Ratio	0.58	0.54		0.53	0.52	0.52		0.20		0.11	0.11	0.11
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4		3.0		2.3	2.3	2.3
Lane Grp Cap (vph)	196	1793		113	1748	766		328		186	187	172
v/s Ratio Prot	c0.01	c0.40		0.00	0.37			c0.18		c0.05	0.05	
v/s Ratio Perm	0.12			0.09		0.01						0.01
v/c Ratio	0.23	0.75		0.18	0.70	0.02		0.88		0.46	0.45	0.08
Uniform Delay, d1	31.2	23.0		38.0	23.6	15.1		50.2		53.8	53.8	51.4
Progression Factor	0.32	0.41		0.68	0.66	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	2.5		0.4	2.1	0.0		22.3		1.0	1.0	0.1
Delay (s)	10.1	11.8		26.1	17.7	15.2		72.6		54.8	54.8	51.5
Level of Service	B	B		C	B	B		E		D	D	D
Approach Delay (s)		11.7			17.8			72.6			53.4	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	1405	130	30	1135	70	80	25	25	185	25	90
Future Volume (vph)	120	1405	130	30	1135	70	80	25	25	185	25	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.94	1.00	1.00	*0.97	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97		1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1676	3318	1467	1644	3358	1432		1683	1461	1624	1647	1506
Flt Permitted	0.20	1.00	1.00	0.11	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	359	3318	1467	184	3358	1432		1683	1461	1624	1647	1506
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	1405	130	30	1135	70	80	25	25	185	25	90
RTOR Reduction (vph)	0	0	36	0	0	29	0	0	22	0	0	83
Lane Group Flow (vph)	120	1405	94	30	1135	41	0	105	3	104	106	7
Confl. Peds. (#/hr)			1			3	1		4	4		1
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2		2	6		6		8	8			4
Actuated Green, G (s)	85.5	84.1	84.1	75.2	75.2	75.2		16.3	16.3	9.8	9.8	9.8
Effective Green, g (s)	85.5	85.5	85.5	75.2	76.6	76.6		16.3	16.3	9.8	9.8	9.8
Actuated g/C Ratio	0.66	0.66	0.66	0.58	0.59	0.59		0.13	0.13	0.08	0.08	0.08
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	5.4	5.4	2.3	5.4	5.4		2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	350	2182	964	133	1978	843		211	183	122	124	113
v/s Ratio Prot	0.03	c0.42		0.00	c0.34			c0.06		0.06	c0.06	
v/s Ratio Perm	0.20		0.06	0.13		0.03			0.00			0.00
v/c Ratio	0.34	0.64	0.10	0.23	0.57	0.05		0.50	0.02	0.85	0.85	0.06
Uniform Delay, d1	18.7	13.2	8.1	16.0	16.6	11.3		53.0	49.8	59.4	59.4	55.8
Progression Factor	0.45	0.42	0.21	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	1.0	0.1	0.5	1.2	0.1		1.1	0.0	39.6	39.5	0.1
Delay (s)	8.7	6.6	1.9	16.5	17.8	11.4		54.1	49.9	99.0	98.9	56.0
Level of Service	A	A	A	B	B	B		D	D	F	F	E
Approach Delay (s)		6.4			17.4			53.3			86.1	
Approach LOS		A			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	1310	105	65	980	170	100	35	80	105	30	175
Future Volume (veh/h)	195	1310	105	65	980	170	100	35	80	105	30	175
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1730	1730	1730	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	195	1310	105	65	980	170	100	35	80	105	30	175
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	5	5	5	1	1	1	1	1	1
Cap, veh/h	368	1893	843	75	1124	560	123	59	136	200	39	230
Arrive On Green	0.22	0.56	0.56	0.05	0.38	0.38	0.07	0.13	0.13	0.12	0.17	0.18
Sat Flow, veh/h	1688	3367	1499	1647	2941	1464	1701	475	1085	1701	226	1318
Grp Volume(v), veh/h	195	1310	105	65	980	170	100	0	115	105	0	205
Grp Sat Flow(s),veh/h/ln	1688	1683	1499	1647	1470	1464	1701	0	1560	1701	0	1544
Q Serve(g_s), s	11.2	30.7	3.6	4.3	34.0	8.9	6.4	0.0	7.6	6.4	0.0	13.9
Cycle Q Clear(g_c), s	11.2	30.7	3.6	4.3	34.0	8.9	6.4	0.0	7.6	6.4	0.0	13.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.70	1.00		0.85
Lane Grp Cap(c), veh/h	368	1893	843	75	1124	560	123	0	195	200	0	269
V/C Ratio(X)	0.53	0.69	0.12	0.87	0.87	0.30	0.81	0.00	0.59	0.53	0.00	0.76
Avail Cap(c_a), veh/h	368	1893	843	75	1150	572	139	0	426	200	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.0	17.3	11.3	52.2	31.5	23.8	50.3	0.0	45.3	45.7	0.0	43.0
Incr Delay (d2), s/veh	0.7	1.5	0.2	60.4	9.4	1.4	24.7	0.0	1.7	1.8	0.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	11.2	1.3	3.0	13.4	3.3	3.6	0.0	3.1	2.8	0.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	18.8	11.6	112.6	40.9	25.1	74.9	0.0	47.0	47.4	0.0	45.8
LnGrp LOS	D	B	B	F	D	C	E	A	D	D	A	D
Approach Vol, veh/h		1610			1215			215			310	
Approach Delay, s/veh		20.7			42.5			60.0			46.3	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	65.8	12.0	23.2	28.8	46.0	17.4	17.8
Change Period (Y+Rc), s	4.0	4.8	4.0	4.5	4.8	* 4	4.5	* 4.5
Max Green Setting (Gmax), s	5.0	49.2	9.0	29.5	12.0	* 43	9.0	* 30
Max Q Clear Time (g_c+I1), s	6.3	32.7	8.4	15.9	13.2	36.0	8.4	9.6
Green Ext Time (p_c), s	0.0	14.4	0.0	0.7	0.0	6.1	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	33.5
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Hwy 211 & US 26/Procter Blvd

06/08/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	120	945	10	185	30	0	0	45	25
Future Volume (veh/h)	0	0	0	120	945	10	185	30	0	0	45	25
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	0.99		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1730	1730	1730	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				120	945	10	185	30	0	0	45	25
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				5	5	5	2	2	0	0	2	2
Cap, veh/h				159	1321	15	456	69	0	0	378	210
Arrive On Green				0.44	0.44	0.44	0.35	0.35	0.00	0.00	0.35	0.35
Sat Flow, veh/h				366	3035	34	1114	195	0	0	1067	593
Grp Volume(v), veh/h				561	0	514	215	0	0	0	0	70
Grp Sat Flow(s),veh/h/ln				1711	0	1723	1309	0	0	0	0	1660
Q Serve(g_s), s				30.3	0.0	26.4	12.9	0.0	0.0	0.0	0.0	3.1
Cycle Q Clear(g_c), s				30.3	0.0	26.4	16.0	0.0	0.0	0.0	0.0	3.1
Prop In Lane				0.21		0.02	0.86		0.00	0.00		0.36
Lane Grp Cap(c), veh/h				745	0	750	525	0	0	0	0	589
V/C Ratio(X)				0.75	0.00	0.69	0.41	0.00	0.00	0.00	0.00	0.12
Avail Cap(c_a), veh/h				980	0	987	525	0	0	0	0	589
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.98	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				26.1	0.0	25.0	29.1	0.0	0.0	0.0	0.0	23.9
Incr Delay (d2), s/veh				6.9	0.0	5.0	2.3	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				13.6	0.0	11.7	4.9	0.0	0.0	0.0	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.0	0.0	30.0	31.4	0.0	0.0	0.0	0.0	24.0
LnGrp LOS				C	A	C	C	A	A	A	A	C
Approach Vol, veh/h					1075			215			70	
Approach Delay, s/veh					31.6			31.4			24.0	
Approach LOS					C			C			C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	43.0	51.9	43.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	39.0	63.0	39.0
Max Q Clear Time (g_c+I1), s	5.1	32.3	18.0
Green Ext Time (p_c), s	0.2	15.6	0.8

Intersection Summary	
HCM 6th Ctrl Delay	31.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
14: Hwy 211 & Pioneer Blvd

06/08/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1050	380	0	0	0	0	165	170	25	145	0
Future Volume (veh/h)	50	1050	380	0	0	0	0	165	170	25	145	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1772	1772	1730	1730	0
Adj Flow Rate, veh/h	50	1050	0				0	165	170	25	145	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	97	2125					0	403	334	32	477	0
Arrive On Green	0.64	0.64	0.00				0.00	0.23	0.23	0.01	0.09	0.00
Sat Flow, veh/h	150	3298	1502				0	1772	1470	1647	1730	0
Grp Volume(v), veh/h	589	511	0				0	165	170	25	145	0
Grp Sat Flow(s),veh/h/ln	1764	1683	1502				0	1772	1470	1647	1730	0
Q Serve(g_s), s	19.6	17.1	0.0				0.0	8.7	11.1	1.7	8.6	0.0
Cycle Q Clear(g_c), s	19.6	17.1	0.0				0.0	8.7	11.1	1.7	8.6	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1137	1084					0	403	334	32	477	0
V/C Ratio(X)	0.52	0.47					0.00	0.41	0.51	0.78	0.30	0.00
Avail Cap(c_a), veh/h	1137	1084					0	403	334	75	535	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	0.98	0.98	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.4	10.0	0.0				0.0	36.2	37.1	54.4	40.1	0.0
Incr Delay (d2), s/veh	1.7	1.5	0.0				0.0	3.0	5.3	21.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	6.5	0.0				0.0	4.0	4.4	0.9	4.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	11.5	0.0				0.0	39.2	42.5	76.1	40.3	0.0
LnGrp LOS	B	B					A	D	D	E	D	A
Approach Vol, veh/h		1100						335			170	
Approach Delay, s/veh		11.8						40.9			45.6	
Approach LOS		B						D			D	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	74.9	35.1	6.1	29.0
Change Period (Y+Rc), s	4.0	* 4.8	4.0	4.8
Max Green Setting (Gmax), s	68.0	* 34	5.0	24.2
Max Q Clear Time (g_c+I1), s	21.6	10.6	3.7	13.1
Green Ext Time (p_c), s	19.5	0.3	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	995	85	5	810	20	70	20	5	120	15	80
Future Volume (veh/h)	120	995	85	5	810	20	70	20	5	120	15	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1702	1702	1702	1800	1800	1800	1758	1758	1758
Adj Flow Rate, veh/h	120	995	85	5	810	20	70	20	5	120	15	80
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	7	7	7	0	0	0	3	3	3
Cap, veh/h	649	2361	1052	16	1071	478	209	55	12	193	23	98
Arrive On Green	0.38	0.70	0.70	0.01	0.33	0.33	0.17	0.18	0.16	0.17	0.18	0.16
Sat Flow, veh/h	1688	3367	1501	1621	3233	1442	869	312	66	808	131	556
Grp Volume(v), veh/h	120	995	85	5	810	20	95	0	0	215	0	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1501	1621	1617	1442	1247	0	0	1495	0	0
Q Serve(g_s), s	5.2	13.8	2.0	0.3	24.6	1.0	0.0	0.0	0.0	7.6	0.0	0.0
Cycle Q Clear(g_c), s	5.2	13.8	2.0	0.3	24.6	1.0	7.6	0.0	0.0	15.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.74		0.05	0.56		0.37
Lane Grp Cap(c), veh/h	649	2361	1052	16	1071	478	270	0	0	306	0	0
V/C Ratio(X)	0.18	0.42	0.08	0.32	0.76	0.04	0.35	0.00	0.00	0.70	0.00	0.00
Avail Cap(c_a), veh/h	649	2361	1052	66	1446	645	447	0	0	486	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.4	7.0	5.2	54.1	32.8	24.9	40.6	0.0	0.0	44.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.6	0.2	6.9	5.0	0.2	0.6	0.0	0.0	2.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	4.7	0.6	0.2	10.0	0.4	2.4	0.0	0.0	5.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	7.5	5.3	61.0	37.8	25.1	41.2	0.0	0.0	46.2	0.0	0.0
LnGrp LOS	C	A	A	E	D	C	D	A	A	D	A	A
Approach Vol, veh/h		1200			835			95			215	
Approach Delay, s/veh		8.9			37.7			41.2			46.2	
Approach LOS		A			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	81.7		23.3	46.3	40.4		23.3
Change Period (Y+Rc), s	4.5	* 4.5		5.5	4.5	4.0		5.5
Max Green Setting (Gmax), s	4.6	* 61		31.3	15.5	49.2		31.3
Max Q Clear Time (g_c+I1), s	2.3	15.8		17.2	7.2	26.6		9.6
Green Ext Time (p_c), s	0.0	19.4		0.5	0.2	9.8		0.2

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1050	65	20	845	20	50
Future Vol, veh/h	1050	65	20	845	20	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	6	6	0	0
Mvmt Flow	1050	65	20	845	20	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1115	0	1513	525
Stage 1	-	-	-	-	1050	-
Stage 2	-	-	-	-	463	-
Critical Hdwy	-	-	4.22	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.26	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	599	-	113	502
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	606	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	599	-	109	502
Mov Cap-2 Maneuver	-	-	-	-	109	-
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	586	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	22.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	109	502	-	-	599	-
HCM Lane V/C Ratio	0.183	0.1	-	-	0.033	-
HCM Control Delay (s)	45.3	13	-	-	11.2	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	0.6	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	985	0	70	785	0	5	5	70	5	0	80
Future Vol, veh/h	120	985	0	70	785	0	5	5	70	5	0	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	100	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	3	3	2	2	6	6	2	2	2	0	2	0
Mvmt Flow	120	985	0	70	785	0	5	5	70	5	0	80

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	785	0	0	985	0	0	1758	2150	493	1660	2150	393
Stage 1	-	-	-	-	-	-	1225	1225	-	925	925	-
Stage 2	-	-	-	-	-	-	533	925	-	735	1225	-
Critical Hdwy	4.16	-	-	4.14	-	-	7.54	6.54	6.94	7.5	6.54	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.5	5.54	-
Follow-up Hdwy	2.23	-	-	2.22	-	-	3.52	4.02	3.32	3.5	4.02	3.3
Pot Cap-1 Maneuver	823	-	-	697	-	-	54	48	522	65	48	612
Stage 1	-	-	-	-	-	-	190	249	-	294	346	-
Stage 2	-	-	-	-	-	-	498	346	-	382	249	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	823	-	-	697	-	-	39	37	522	42	37	612
Mov Cap-2 Maneuver	-	-	-	-	-	-	39	37	-	42	37	-
Stage 1	-	-	-	-	-	-	162	213	-	251	311	-
Stage 2	-	-	-	-	-	-	389	311	-	276	213	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.9	34.3	19.1
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	201	823	-	-	697	-	-	340
HCM Lane V/C Ratio	0.398	0.146	-	-	0.1	-	-	0.25
HCM Control Delay (s)	34.3	10.1	-	-	10.7	-	-	19.1
HCM Lane LOS	D	B	-	-	B	-	-	C
HCM 95th %tile Q(veh)	1.8	0.5	-	-	0.3	-	-	1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1050	845	20	5	0
Future Vol, veh/h	5	1050	845	20	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1050	845	20	5	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	865	0	-	0	1390	433
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	535	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	774	-	-	-	133	571
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	551	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	774	-	-	-	132	571
Mov Cap-2 Maneuver	-	-	-	-	132	-
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	551	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	33.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	774	-	-	-	132
HCM Lane V/C Ratio	0.006	-	-	-	0.038
HCM Control Delay (s)	9.7	-	-	-	33.3
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.1

SECTION 8. US 26 AND 362ND TRAFFIC COUNT

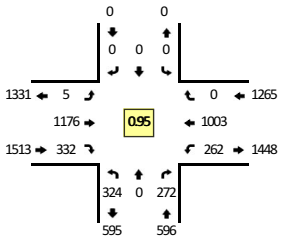
Type of peak hour being reported: Intersection Peak

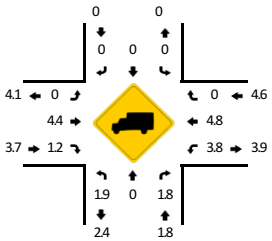
Method for determining peak hour: Total Entering Volume

LOCATION: 362nd Dr -- US 26
CITY/STATE: Sandy, OR

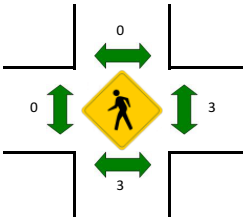
QC JOB #: 16204201
DATE: Wed, May 10 2023

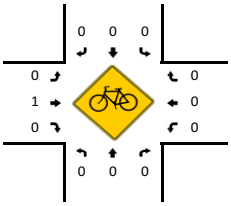
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

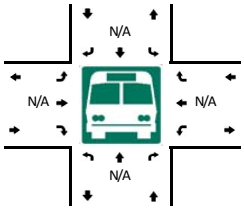


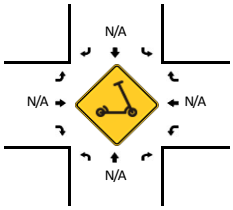


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	362nd Dr (Northbound)				362nd Dr (Southbound)				US 26 (Eastbound)				US 26 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	16	0	13	0	0	0	0	0	0	109	21	1	23	96	0	0	279	
3:05 PM	17	0	15	0	0	0	0	0	0	90	24	0	14	78	0	0	238	
3:10 PM	22	0	24	0	0	0	0	0	0	97	21	0	24	96	0	0	284	
3:15 PM	25	0	28	0	0	0	0	0	0	102	36	1	14	75	0	0	281	
3:20 PM	23	0	26	0	0	0	0	0	0	80	24	1	15	67	0	0	236	
3:25 PM	30	0	27	0	0	0	0	0	0	65	24	1	26	113	0	0	286	
3:30 PM	14	0	23	0	0	0	0	0	0	112	20	0	22	63	0	0	254	
3:35 PM	27	0	26	0	0	0	0	0	0	96	28	0	17	80	0	0	274	
3:40 PM	32	0	23	0	0	0	0	0	0	77	20	0	30	88	0	0	270	
3:45 PM	15	0	17	0	0	0	0	0	0	100	22	0	21	92	0	0	267	
3:50 PM	16	0	17	0	0	0	0	0	0	124	21	0	17	64	0	0	259	
3:55 PM	28	0	25	0	0	0	0	0	0	90	35	0	25	89	0	0	292	3220
4:00 PM	21	0	22	0	0	0	0	0	0	99	28	0	23	70	0	0	263	3204
4:05 PM	28	0	20	0	0	0	0	0	0	105	29	1	23	71	0	0	277	3243
4:10 PM	30	0	39	0	0	0	0	0	0	99	32	0	12	73	0	0	285	3244
4:15 PM	24	0	27	0	0	0	0	0	0	99	35	0	14	76	0	0	275	3238
4:20 PM	29	0	18	0	0	0	0	0	0	90	29	1	18	91	0	0	276	3278
4:25 PM	42	0	26	0	0	0	0	0	0	86	26	0	11	76	0	0	267	3259
4:30 PM	35	0	19	0	0	0	0	0	0	82	26	0	35	73	0	0	270	3275
4:35 PM	30	0	22	0	0	0	0	0	0	122	32	0	22	84	0	0	312	3313
4:40 PM	37	0	23	1	0	0	0	0	0	85	30	1	23	90	0	0	290	3333
4:45 PM	33	0	25	0	0	0	0	0	0	85	20	0	28	84	0	0	275	3341
4:50 PM	19	0	26	0	0	0	0	0	0	111	29	0	16	58	0	0	259	3341
4:55 PM	17	0	12	0	0	0	0	0	0	101	22	0	16	84	0	0	252	3301
5:00 PM	37	0	28	0	0	0	0	0	0	91	18	0	19	70	0	0	263	3301
5:05 PM	25	0	15	0	0	0	0	0	0	84	30	0	14	96	0	0	264	3288
5:10 PM	20	0	25	0	0	0	0	0	0	114	31	0	20	94	0	0	304	3307
5:15 PM	32	0	24	0	0	0	0	0	0	103	34	0	18	89	0	0	300	3332
5:20 PM	19	0	27	0	0	0	0	0	0	97	27	2	27	79	0	0	278	3334
5:25 PM	19	0	26	0	0	0	0	0	0	101	33	2	24	102	0	0	307	3374
5:30 PM	24	0	17	0	0	0	0	0	0	95	26	0	21	75	0	0	258	3362
5:35 PM	20	0	15	0	0	0	0	0	0	97	25	0	35	97	0	0	289	3339
5:40 PM	15	0	31	0	0	0	0	0	0	110	27	0	14	60	0	1	258	3307
5:45 PM	21	0	26	0	0	0	0	0	0	83	23	0	16	86	0	0	255	3287
5:50 PM	22	0	32	0	0	0	0	0	0	81	27	0	27	70	0	0	259	3287
5:55 PM	21	0	23	0	0	0	0	0	0	94	31	0	15	52	0	0	236	3271
6:00 PM	20	0	18	0	0	0	0	0	0	82	22	0	20	68	0	0	230	3238
6:05 PM	23	0	23	0	0	0	0	0	0	78	21	0	19	51	0	0	215	3189

5-Min Count Period Beginning At	362nd Dr (Northbound)				362nd Dr (Southbound)				US 26 (Eastbound)				US 26 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:10 PM	11	0	18	0	0	0	0	0	0	98	17	0	16	80	0	0	240	3125
6:15 PM	19	0	23	0	0	0	0	0	0	90	18	0	14	50	0	0	214	3039
6:20 PM	21	0	20	0	0	0	0	0	0	61	15	1	14	55	0	0	187	2948
6:25 PM	25	0	17	0	0	0	0	0	0	75	14	0	19	56	0	0	206	2847
6:30 PM	13	0	19	0	0	0	0	0	0	91	27	0	12	39	0	0	201	2790
6:35 PM	12	0	29	0	0	0	0	0	0	71	23	0	8	50	0	0	193	2694
6:40 PM	19	0	16	0	0	0	0	0	0	77	17	0	13	53	0	0	195	2631
6:45 PM	15	0	18	0	0	0	0	0	0	63	12	0	7	52	0	0	167	2543
6:50 PM	19	0	19	0	0	0	0	0	0	67	22	0	15	52	0	0	194	2478
6:55 PM	16	0	16	0	0	0	0	0	0	62	20	0	18	52	0	0	184	2426

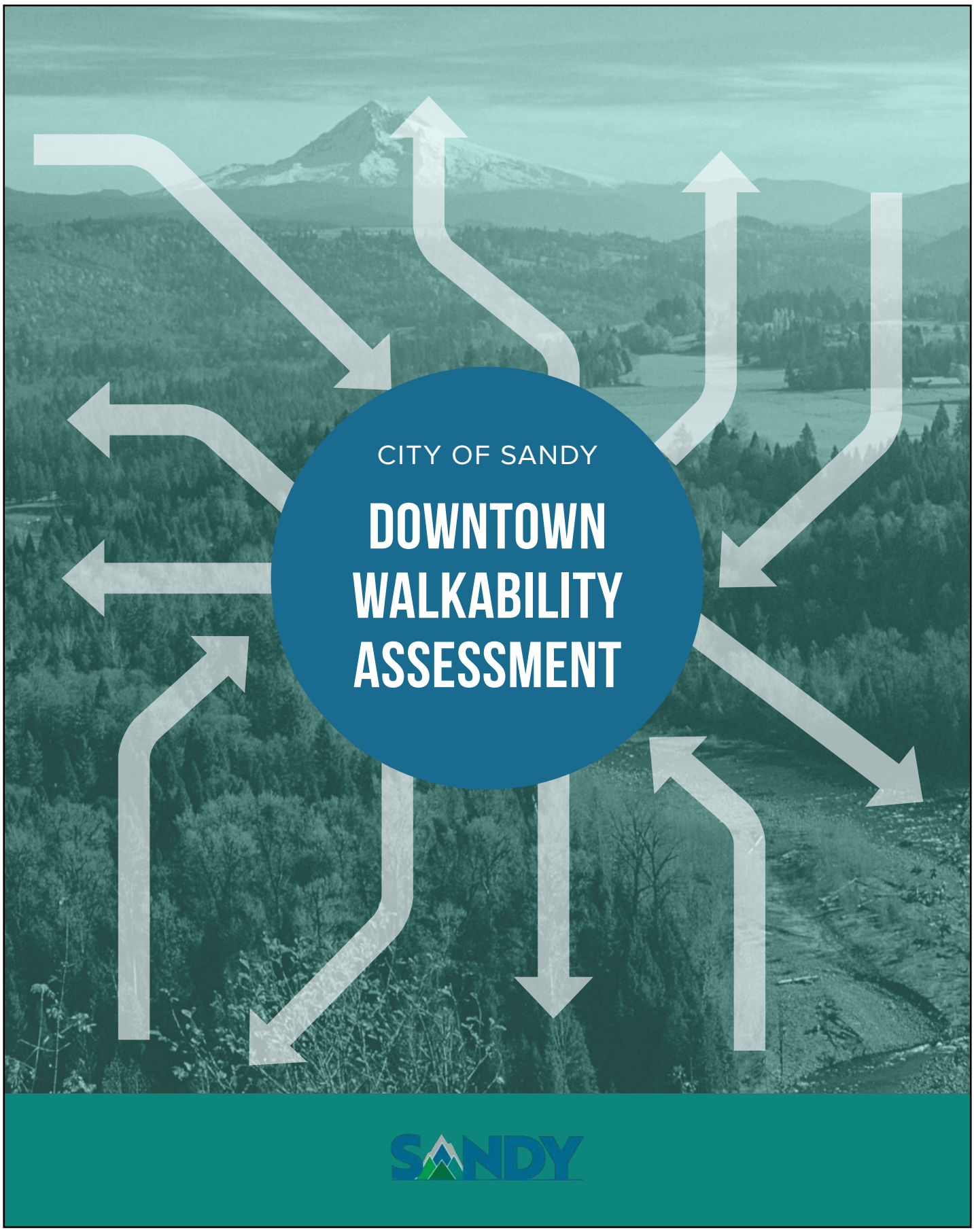
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	280	0	308	0	0	0	0	0	0	1204	376	16	276	1080	0	0	3540
Heavy Trucks	8	0	4		0	0	0		0	56	4		8	32	0		112
Buses																	
Pedestrians		4				0				0				8			12
Bicycles	0	0	0		0	0	0		0	4	0		0	0	0		4
Scooters																	

Comments:

Report generated on 5/18/2023 10:23 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

appendix


CITY OF SANDY
DOWNTOWN WALKABILITY ASSESSMENT
SANDY

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

The purpose of the Downtown Walkability Assessment (DWA) is to evaluate the existing pedestrian conditions in downtown Sandy, understand barriers from the community, and create recommendations for improvements.

The purpose of the Downtown Walkability Assessment (DWA) is to evaluate the existing pedestrian conditions in downtown Sandy, understand barriers from the community, and create recommendations for improvements. A walkable and rollable downtown Sandy has benefits for Sandy residents, visitors, and local businesses, including but not limited to improvements in health, safety, accessibility, equity, economic vitality, and reductions in greenhouse gas emissions. Completion of the recommendations as contained in this document will create a more vibrant city center.

Information for the assessment was primarily gathered through a public engagement process with a technical assessment of conditions completed by city staff. The public process consisted of a survey, pop-up mapping activity, and community walking audit. Collectively, over 200 members of the community provided feedback on walkability. The technical assessment of walkability conditions was completed using a modified version of the Pedestrian Environment Quality Index (PEQI), a scoring method that assesses numerous walkability factors and designates scores to intersections and street segments based upon the presence or absence of existing amenities. The information gathered from both the public process and assessment of existing conditions were the primary factors in creating a prioritized list of twenty-five recommendations. The recommendations are based on various factors including but not limited to existing conditions, cost, pedestrian demand, proximity to attractions, and proximity to services. With adequate funding, the recommendations within this assessment can likely be completed within ten years.

WHAT MAKES A CITY WALKABLE?

Walkability refers to how safe, welcome, and mobile pedestrians feel in a built environment. Higher walkability is associated with better health, higher economic prosperity, and a greener environment.

INTRODUCTION

As the City of Sandy continues to experience population growth, a vibrant city center will help build community and enhance quality of life for all Sandy residents.

Historically, the City of Sandy's downtown has centered around the Highway 26 couplet of Pioneer and Proctor Boulevards. Pioneer and Proctor Boulevards, from Bluff Road to Ten Eyck Road, are home to local businesses as well as civic and community spaces. Both Pioneer Boulevard and Proctor Boulevard route travelers to Sandy River, Mount Hood, and Central Oregon. Sandy's downtown is essential to residents and visitors alike, yet it also poses challenges as a high-volume vehicle and truck route. The DWA identifies existing barriers in downtown Sandy and provides solutions benefiting Sandy residents, visitors, and local businesses.

PURPOSE AND OBJECTIVES

The DWA assesses the current pedestrian environment of downtown Sandy and its connectivity to surrounding residential and parkland or open space areas. The DWA identifies several goals and objectives that drive the assessment. The goals for this assessment were created with the following guiding values related to walkability and the idea of creating a more vibrant downtown:

- **Livability**: Provide a high quality of life by providing alternative transportation options to a mix of amenities.
- **Safety and Health**: Enable people to safely walk, run, or roll (i.e., wheelchairs) around and to/from downtown.
- **Accessibility**: Provide pedestrian conditions that are suitable for individuals of all mobility levels, including people with visual, hearing, and mobility impairments.
- **Feasibility**: Use resources efficiently to make improvements.
- **Economic Vitality**: Encourage visitors and residents to invest in local businesses within the downtown.
- **Community**: Encourage community engagement and socializing through walking and rolling.

Overall, the recommendations are categorized into three main goals.

GOALS

1. IMPROVE PEDESTRIAN **SAFETY AND COMFORT** IN DOWNTOWN
2. IMPROVE PEDESTRIAN **ACCESSIBILITY** IN DOWNTOWN
3. IMPROVE PEDESTRIAN **CONNECTIVITY** IN DOWNTOWN

In order to achieve these goals, the City has identified three key objectives for this project:

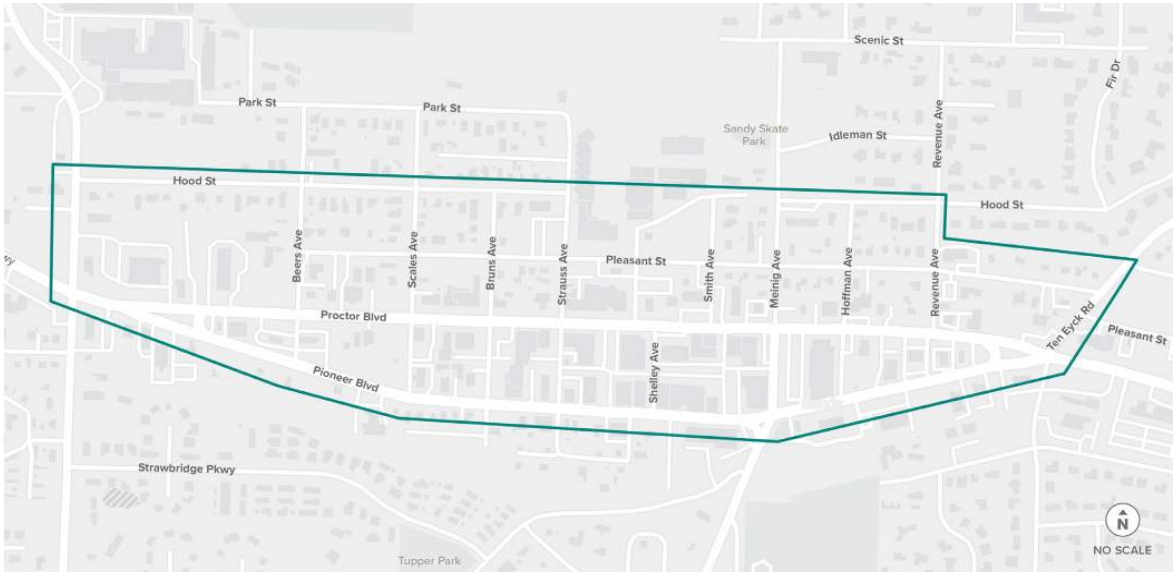
OBJECTIVES

1. IDENTIFY **WALKABILITY AND ROLLABILITY BARRIERS** IN DOWNTOWN SANDY
2. IDENTIFY **WALKABILITY IMPROVEMENTS THAT ARE REALISTIC AND FEASIBLE** FOR DOWNTOWN SANDY
3. IDENTIFY **PRIORITY AREAS** FOR WALKABILITY IMPROVEMENTS BASED ON AREAS OF HIGH PEDESTRIAN TRAFFIC AND PROXIMITY TO FACILITIES AND/OR ATTRACTIONS

PROJECT BOUNDARY

The boundary of the Downtown Walkability Assessment (DWA) is defined in Figure 1 below. The study area is bounded to the north by Hood Street, to the south by Pioneer Boulevard, to the east by Ten Eyck Road, and to the west by Bluff Road.

FIGURE 1. MAP OF DOWNTOWN WALKABILITY ASSESSMENT BOUNDARY



NEED FOR ASSESSMENT

Realizing the potential for a downtown core to serve a growing population, the City of Sandy started the urban renewal district in 1998 to implement goals and objectives of the Comprehensive Plan and to implement downtown development strategies. Several Comprehensive Plan policies were used for guidance in the urban renewal plan including connecting developments with safe and direct sidewalks, improving bicycle and pedestrian travel between residential areas and the downtown, and achieving a pedestrian-oriented city center. It was believed that enhancing public safety, providing for a more productive use of land in the urban renewal area, and making improvements to infrastructure would assist in creating a vibrant city center.

Since the adoption of the Urban Renewal Plan in 1998, the City has adopted design standards for street right-of-way infrastructure, design standards for buildings, installed wayfinding signage, and created a parking district to assist businesses with parking availability. Other projects have also been completed, such as the undergrounding of transmission and communication lines, remodeling of public buildings, and the implementation of the SandyNet fiber system to provide the community with increased Internet speeds.

Another significant service introduction in Sandy was the Sandy Area Metro (SAM) transit department in 2000, decreasing vehicle trips and providing an alternative mode of transportation. SAM provides access to downtown Sandy as well as connections to Gresham, Estacada, and Mount Hood. The Sandy Transit Center is located in downtown Sandy next to the Sandy Historical Society.

In 2015, the City of Sandy's City Council set goals for the 2015-2017 biennium. The City Council set several goals relevant to, and serving as a catalyst for, the Downtown Walkability Assessment, including the following:

- Conduct sidewalk inventories each year to improve pedestrian safety.
- Expand City Hall frontage and include upgrades to security and accessibility.
- Explore solutions to traffic problems at the crosswalk by the Sandy library.
- Work with ODOT to improve signal timing on Highway 26.
- Continue installation of signs per the downtown wayfinding plan.
- Continue the Urban Renewal "façade" program.
- Maintain and build on downtown community events.

Similarly, Clackamas County's Transportation System Plan (TSP), completed in 2013, acknowledges challenges specific to Clackamas County and sets goals relevant to the Downtown Walkability Assessment. The TSP for Clackamas County addresses congestion, traffic crash fatalities, environmental impacts of motor vehicles, economic growth and tourism, and equity and access within the transportation system. Goals relevant to the DWA include:

GOAL 1 Provide a transportation system that optimizes benefits to the environment, the economy, and the community.

GOAL 2 Plan the transportation system to create a prosperous and adaptable economy and further the economic well-being of businesses and residents of the County.

GOAL 3 Promote a transportation system that maintains or improves our safety, health, and security.

GOAL 4 Provide an equitable transportation system.

In 2015, the County added the Clackamas County Active Transportation Plan (ATP) to the TSP. The ATP solidified the County's commitment to pedestrian and bicycle facilities. The ATP also determined bicycle routes in the County to increase bicycle access, as well as to spur tourism and economic development. The DWA complements the TSP as it promotes safety, health, and economic development efforts in the City of Sandy.

The Cedar Ridge Middle School and Sandy Grade School Safe Routes to School Plan was completed and published in 2020. The plan's vision stated "the Oregon Trail School District community envisions a future where children and their families safely, comfortably, and conveniently walk and bicycle as part of the daily school commute and a healthy lifestyle." The plan identified barriers to walking and rolling to Cedar Ridge Middle School and Sandy Grade School, and provided recommendations based on safety assessments, observations made at student drop-off and pick-up, and community meetings. The plan prioritized ensuring students could walk and bike to and from campus within a quarter mile of the schools – a distance that would include the City of Sandy's downtown area.

Two other projects are currently underway in Sandy: the Pleasant Street Master Plan and the Sandy Community Campus. The Pleasant Street Master Plan will define a vision for an expanded downtown Sandy north of Proctor Boulevard focusing on a pedestrian-centric commercial corridor. The Pleasant Street commercial corridor will give pedestrians an option in downtown that is not located on a high-volume trucking route. The development of the Sandy Community Campus (formerly owned and operated by the Oregon Trail School District as the former location of the Cedar Ridge Middle School) to the north of Pleasant Street will eventually transform the property into a multi-generational community/ aquatic facility. This facility located in the downtown and within close walking distance of schools and the

library will benefit the community for decades into the future.

In addition to City of Sandy goals and objectives, the evolving concerns around increases in obesity, decreases in physical activity, especially among youth, and environmental impacts caused by petroleum-based transportation have Planning Division staff concerned. Creating a walkability assessment that defines obstacles and creates recommendations to implement safe walking routes will hopefully encourage more active lifestyles through walking, reduce the use of petroleum-based vehicles, provide additional civic and community spaces, and create more opportunities for local businesses and residents.

Following several downtown developments and programs as well as City of Sandy and Clackamas County planning goals, the Downtown Walkability Assessment was initiated in 2017. The completion of the assessment took a two-year hiatus between planning internships due to staff workloads. The Downtown Walkability Assessment was primarily created through input from the community. Community input was collected through a walking audit, pop-up public mapping sessions, a community

survey, and a stakeholder committee. Technical analysis of existing walkability conditions and needs in Sandy's downtown aligned with community outreach efforts to create the DWA.

BENEFITS OF WALKABILITY

There are numerous benefits to creating and enhancing walkable environments. The benefits of walkability to communities can be broken into the following categories:[1]

HEALTH

The health benefits for walkability can be separated into three main categories – reductions in cardiovascular issues, weight loss, and reductions in vehicular crashes. Walkable neighborhoods lower rates of traffic fatalities, reduce pollution from vehicles, and improve physical health by increasing opportunities for physical activity.

When discussing health benefits correlated to walkability, it is important to note there are benefits beyond improving physical health, such as helping people maintain or improve mental health.

EQUITY AND ACCESSIBILITY

Creating and enhancing walkable and rollable environments benefits all people, but particularly benefits vulnerable populations such as older adults, youth, people with visual and/or mobility impairments, low-income communities, and communities of color.[2] For example, as adults age, they may lose the ability or desire to drive a motor vehicle and are more likely to have visual and/or mobility impairments. Building a connected walkable and rollable network helps older adults and/or visually- and mobility-impaired populations to access services and resources, and maintain a sense of independence. Sidewalk and intersection improvements especially benefit those with mobility impairments. Similarly, youth without access to a driver's license rely on a connected walkable street network to access educational facilities, for example the Sandy Public Library, AntFarm, and Sandy Grade School.

ECONOMIC

A pedestrian-friendly environment is an important component of, or contributor to, a thriving downtown. The compact nature of infrastructure and customer-oriented businesses in downtowns create a great setting for walkability. "A bustling downtown flourishes when people get out of their vehicles and browse through shops, stop to have a bite to eat, and interact with their fellow community members."[3] Foot traffic provides more exposure for local downtown businesses, which can significantly help the profitability of business.

1 Speck, Jeff. "Walkable City Rules: 101 Steps to Making Better Places." 2018. Island Press.
2 Speck, Jeff. "Walkable City Rules" pp 8-9.
3 https://extension.ucdavis.edu/sites/default/files/walkability.pdf

When accessibility and safety increase in the city center, a higher concentration of businesses is more likely. A more compact urban environment creates an ideal destination for walking from business to business, rather than necessitating driving to multiple destinations. Multiple small businesses in a downtown are also more likely entrepreneurial 'mom and pop' businesses that help create a sense of place and enable existing residents to become independent business owners. Having business owners who are invested in the community is valuable to the long-term success of Sandy and the vibrancy of the downtown.

WALK SCORE

Walk Score uses a patented methodology based on state-of-the-art research and analysis of hundreds of walking routes to nearby amenities in cities all over the country. Points are given according to the walking distance to amenities. Walk Score also analyzes variables such as block length and intersection density.

Real estate values also benefit from increases in walkability. Walk Score is a website that calculates neighborhood walkability, giving point values primarily based on vicinity to amenities while also factoring in population density and road metrics.[1] One study found an increase in real estate values of approximately $500 to $3,000 per one Walk Score point.[2] According to Redfin, research has shown that one point of Walk Score is worth $3,250 in home value.[3] Additionally, owning and operating vehicles are large expenses for most Americans. The average household cost to own and operate one car in the U.S. is $9,000 per year.[4]

COMMUNITY

Increasing the vibrancy of walkable environments can also help increase the number of social interactions, creating more connections and relationships amongst communities and neighborhoods.[5] In fact, a University of New Hampshire study found that residents living in more walkable neighborhoods trusted their neighbors more, and volunteered and participated in community projects more often than residents living in less walkable neighborhoods.[6] When communities connect parks, schools, libraries, and commercial areas, residents socialize and build community ties. Enhancing the pedestrian environment in downtown Sandy encourages a strengthened sense of community and identity.

CLIMATE

There are also significant environmental benefits associated with more walking, as has been published for decades by major environmental advocacy groups. Since transportation is responsible for one-third of all U.S. greenhouse gas emissions, walking would help decrease the amount of vehicle usage, and thus, lead to less smog and less traffic.[7] Reducing greenhouse gas emissions in Sandy should be an altruistic goal for decades to come.

1 "Walk Score Methodology." Walk Score. Web. <http://www.walkscore.com/methodology.shtml>.

2 Cortright, Joe. "Walking the Walk How Walkability Raises Home Values in U.S. Cities." Walk Score Blog. CEOs for Cities, Aug 2009. Web. <http://blog.walkscore.com/wp-content/uploads/2009/08/WalkingTheWalk_CEOsforCities.pdf>.

3 Bokhari, Sheharyar . "How Much is a Point of Walk Score Worth?." Redfin. 3 Aug 2016. Web. <https://www.redfin.com/blog/2016/08/how-much-is-a-point-of-walk-score-worth.html>.

4 Sam Schwartz Engineering , and America Walks. "Benefits of Walking." America Walks . Web. <http://americawalks.org/learning-center/benefits-of-walking-2/>.

5 Zhou, Xuemei, Zhipeng Lu, Chia-Yuan Yu, Chanam Lee and George Mann. "Health Impacts of a Walkable Community." Active Living Research. Mar 2014. Web. <http://activelivingresearch.org/sites/default/files/2014_WalkableCommunities_Zhu-Lee.pdf>.

6 Shannon H. Rogers et al., "Examining Walkability and Social Capital as Indicators of Quality of Life at the Municipal and Neighborhood Scales," Journal of Applied Research in Quality of Life 6, no. 2 (2011): 2013.

7 Sam Schwartz Engineering , and America Walks. "Benefits of Walking." America Walks . Web. <http://americawalks.org/learning-center/benefits-of-walking-2/>.

EXISTING CONDITIONS

The walkability of the existing conditions in downtown Sandy were evaluated through a technical walking audit that assessed pedestrian conditions across multiple factors and criteria.

TECHNICAL WALKING AUDIT – PEDESTRIAN ENVIRONMENTAL QUALITY INDEX (PEQI) ANALYSIS

BACKGROUND

To evaluate the existing walkability conditions in downtown Sandy, staff conducted a technical walking audit. While there are various toolkits to choose from when conducting a walking score audit, the Planning Division used the Pedestrian Environmental Quality Index (PEQI) walkability measurement system, developed by the San Francisco Department of Public Health (SFDPH). The PEQI assessment was chosen for its level of detail in assessing pedestrian conditions, evaluating thirty factors of walkability with separate criteria for intersections and street segments. The final product of the PEQI assessment provides scores to intersections and street segments on a 0 to 100 scale with 0 being the lowest score possible and 100 the highest score possible. For this audit, 30 intersections and 53 street segments were assessed within the project boundaries.

MEASUREMENT SYSTEM

To measure walkability conditions, the PEQI method designated scores for various factors of walkability. The creators of the PEQI, developed a list of different factors, referred to as 'indicators' in the PEQI assessment, for street segments and intersections associated with pedestrian environment and safety. The indicators were further divided into five categories, referred to as 'domains'. The domains include intersection safety, traffic, street design, land use, and perceived safety.

According to the SFDPH, the list of factors was created "based on a review of transportation, planning and public health literature, including existing pedestrian quality or 'walkability' indices and level-of-service metrics, design guidelines, and factors associated with increased walking and improved pedestrian safety in empirical research."[1] The table below includes the full list of walkability factors included in the PEQI method.

PEQI TERMS AND FORMULAS

TERMS:

- **Indicators**: factors of walkability
- **Indicator Response Category**: measurement of factors
- **Domain**: categories of walkability factors

FORMULAS:

- **Indicator Response Category Score Weighed** = (indicator score) x (indicator response category score)
- **Adjusted Score** = (unadjusted score - minimum score) x (100/maximum score - minimum score)

1 "The Pedestrian Environmental Quality Index (PEQI): An assessment of the physical condition of streets and intersections." Sustainable Technology & Policy Program (STPP) UCLA. San Francisco Department of Public Health, Fall 2008. Web. <http://stpp.ucla.edu/sites/default/files/SF%20PEQI%20Methods.pdf>.

TABLE 1. PEQI TABLE OF INDICATORS (ORIGINAL)

INTERSECTION	STREET INTERSECTION			
INTERSECTION SAFETY	**TRAFFIC**	**STREET DESIGN**	**LAND USE**	**PERCEIVED SAFETY**
Crosswalks	Number of lanes	Sidewalk width	Storefronts/retail use	Pedestrian scale lighting
Ladder crosswalks	Two-way traffic	Sidewalk impediments	Public art/ historical sites	Graffiti
Pedestrian signal	Vehicle speed limit	Sidewalk obstructions		Litter
Traffic signal	Traffic volume	Presence of curb		Construction sites
Crossing speed	Traffic calming features	Driveway cuts		Abandoned buildings
Crosswalk scramble		Trees		
No turn on red signals		Presence of buffers		
Additional signs for pedestrians		Planters/gardens		
Traffic calming features		Public seating		

Once the factors of walkability were chosen, referred to as “indicators” for scoring, they were given scores by the SFDPH. The three sections of the PEQI scoring system were as follows: indicators, indicator response categories, and domain weight. All intersections and street sections were given scores based on a survey SFDPH conducted. The survey consulted national experts (i.e., city and transportation planners and consultants, and pedestrian advocates) on the importance of each indicator to the pedestrian walking experience. Based on the survey responses to each indicator, a response category was given a score, and domain weights were decided. The final score used for calculations was the ‘indicator response category score weighted,’ which was equal to the indicator score times the indicator response category. For the full scores original PEQI see Appendix A.

MODIFICATIONS

Since its creation, the PEQI scoring system has continued to evolve. Indicators for the PEQI performed in Sandy were chosen from several versions of the PEQI method. Some factors used in the San Francisco PEQI assessment were omitted from the Sandy PEQI and other factors were added or given different weights to better evaluate the conditions and needs in downtown Sandy. It was important that the modifications were not extreme so comparisons of walkability to other geographic locations could still be made. Adjustments included omissions and additions of indicators, changes to scores of indicator responses, and changes to domain weights. See Table 2 for an overview of the modifications. Score changes were evaluated to fit within the existing value range and correctly reflect relative importance to the other indicator and indicator response scores. In total, there were 9 indicators for intersections and 21 indicators for street segments assessed in Sandy with the modified system, resulting in one additional indicator for intersections.

TABLE 2. MODIFICATIONS TO PEQI INDICATORS FOR SANDY TECHNICAL ADULT

INTERSECTION	STREET INTERSECTION			
INTERSECTION SAFETY	**TRAFFIC**	**STREET DESIGN**	**LAND USE**	**PERCEIVED SAFETY**
Crosswalks	Number of lanes	Continuous sidewalk		Pedestrian scale lighting
High visibility crosswalks	Two-way traffic	Sidewalk width	Consumer-focused businesses and public spaces	Graffiti
Intersection lighting	Vehicle speed limit	Width of throughway		
Pedestrian signal & countdown		Sidewalk impediments		
Traffic control	Transportation Systems Plan classification	Sidewalk obstructions		Vacant lots
Pedestrian engineering countermeasures	Traffic calming features	Driveway cuts, trees, presence of buffers, planters/gardens, public seating/ public art		Derelict/vacant buildings
Intersection calming features				
Unprotected crossing distance				

DATA COLLECTION, ENTRY, AND MAPPING

Using the original PEQI audit form as a template, an audit form was created with modifications reflecting the indicators chosen for the Sandy PEQI Technical Walking Audit. The audit form listed all potential response options to all indicators for intersections and street segments, with separate response areas for different sides of street segments (i.e., north and south sides, or west and east sides). See form in Appendix A.

The audit forms were completed by walking the areas of the assessment and gathering the data through visual evaluation. There were a few factors not determined by walking and, therefore, they were omitted from the audit form. The factors not included on the audit form were unprotected crossing distance measured in Google Earth, and Transportation System Plan classifications. A total of 30 intersections and 53 street segments were audited, with separate evaluations for each side of the street segments. See Figure 2 below for a map identifying locations of all street segments and intersections included in the PEQI assessment.

Once the information was gathered for all the intersection and street segments in the assessment, data entry and analysis followed. Scores were determined by the responses to each of the indicator response categories to determine the individual score for each factor. The indicator response category weight was calculated by multiplying the domain weight by the indicator category response score. Then all the weighted scores for every factor in an intersection or street segment were added together to give a final score for the individual intersection or street segment. Once all individual intersections and street segment scores were calculated they were adjusted to fit the 0 to 100 scale, which required a preliminary calculation of the highest possible score and lowest possible score of intersections and street segments. The minimum and maximum scores for this audit are contained in Table 3.

FIGURE 2. MAP OF INTERSECTIONS AND STREET SEGMENTS ASSESSED FOR PEQI

TABLE 3. POSSIBLE SCORES: INTERSECTIONS AND STREET SEGMENTS

	MAXIMUM SCORE	MINIMUM SCORE
INTERSECTION	175	65
STREET SEGMENT	348	118

Once the maximum and minimum scores were calculated, the scores were adjusted. The adjustment to the scores was completed using the following equation:

Adjusted score = (unadjusted score – minimum score) * (100/maximum score – min score)

Once the scores were adjusted, they could be compared to the scale of walkability created by SFDPH.

TABLE 4. DESCRIPTION OF PEQI SCORES

INTERSECTION AND STREET SEGMENT SCORE RANGE	PEDESTRIAN CONDITIONS
0 - 20	Environment not suitable for pedestrians; pedestrian conditions absent
21 - 40	Poor pedestrian conditions exist
41 - 60	Basic pedestrian conditions exist, but room for improvement
61 - 80	Reasonable pedestrian conditions exist; some important pedestrian conditions present
81 - 100	Ideal pedestrian conditions exist; many important pedestrian conditions present

RESULTS AND ANALYSIS

In this section, street segment refers to individual sides of each street segment; that is, the north/south or east/west side of 53 street segments (blocks) were assessed but there were 106 street segment scores (one for each side of the road on each segment).

The average intersection score (see Table 5) was 45 and the average street segment score (see Table 6) was 51. Both of these scores fell in the middle scoring category with corresponding pedestrian conditions of 'basic pedestrian conditions exist, but room for improvement.' For intersections, the most common scores were in the 21 to 40 range, which reflected that 'poor pedestrian conditions exist' at half of all intersections. For the street segments, the most common scoring category was 41 to 60 range, where 'basic pedestrian conditions exist, but there is room for improvement.'

TABLE 5. INTERSECTION PEQI SCORES BY RANGE

SCORE RANGE	NUMBER OF INTERSECTIONS IN RANGE	PERCENTAGE OF INTERSECTIONS IN RANGE
0 - 20	1	3%
21 - 40	15	50%
41 - 60	7	23%
61 - 80	6	20%
81 - 100	1	3%

TABLE 6. STREET SEGMENTS PEQI SCORES BY RANGE

SCORE RANGE	NUMBER OF STREET SEGMENTS IN RANGE	PERCENTAGE OF STREET SEGMENTS IN RANGE
0 - 20	0	0%
21 - 40	20	19%
41 - 60	67	63%
61 - 80	19	18%
81 - 100	0	0%

FIGURE 3. PEQI SCORES FINAL MAP

SIDEWALKS

When assessing the street segments with the lowest scores – those between 21 to 40 – almost all had pavement gaps in the sidewalks. Note that for this assessment, the "not continuous sidewalks" determination means there is not consistent sidewalk infrastructure throughout the street segment, which can range from large portions of no sidewalk infrastructure to areas where asphalt in driveway or parking lot entryways act as the sidewalks.

The existing sidewalks within the assessment boundary were of fair width; a majority fell between five to eight feet. A few sidewalk segments were very narrow, with a width of less than five feet.

In comparison to sidewalk width, sidewalk clearpath widths were much narrower in most sidewalk sections, with most less than four feet or four to six feet. The primary reason is the presence of obstructions. Throughout the study area there were numerous types of sidewalk obstructions, temporary and permanent, including but not limited to utility poles, sign poles, mailboxes, flower pots, utility boxes, parked cars, and more. Seventy-five percent of the street segments with continuous sidewalks had temporary and/or permanent obstructions. Impediments were also a sidewalk walkability concern in the study area. Impediment conditions included uneven sidewalks, and crumbling concrete sidewalks. All the conditions listed above are important when addressing walkability and accessibility. Having continuous sidewalk infrastructure in good condition is the foundation of a pedestrian-friendly environment. Furthermore, connected, sizable, and smooth sidewalk infrastructure is more accessible.

FIGURE 4. MISSING SIDEWALKS

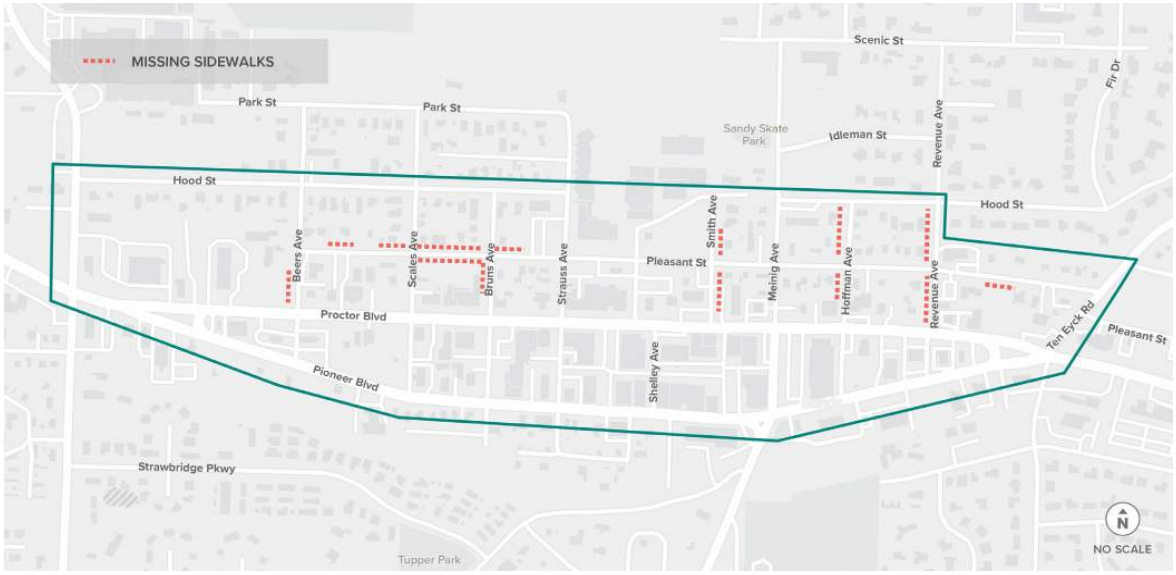
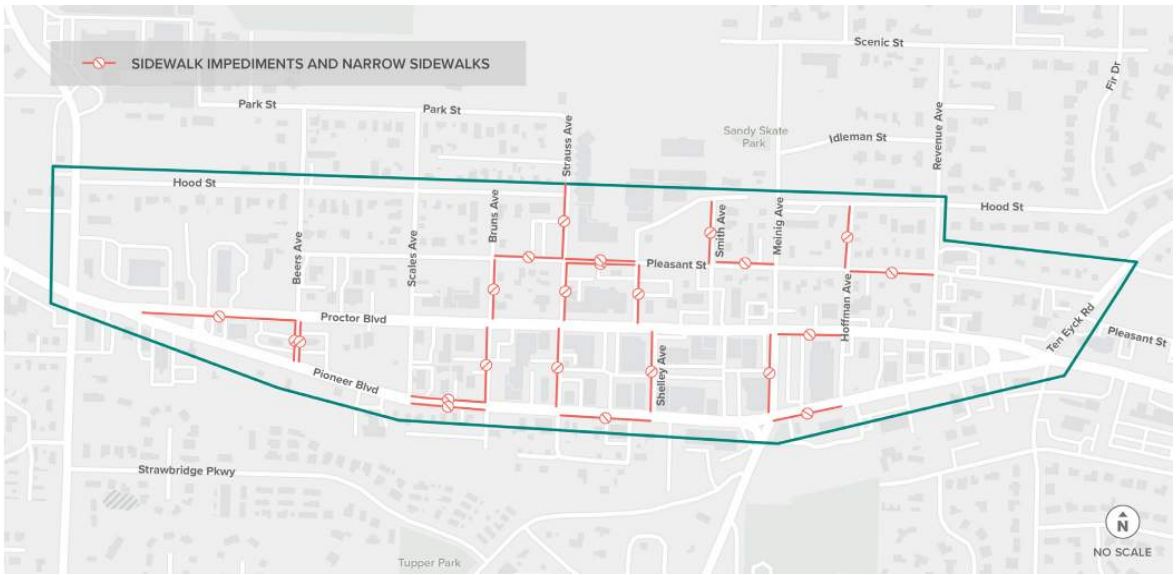


FIGURE 5. SIDEWALK IMPEDIMENTS AND NARROW SIDEWALKS



COMFORT AND AMENITIES

Driveway cuts are an important part of comfort for pedestrians. Forty-two percent (45 of 106) of street side segments had more than three driveway cuts for their block. Less than one percent of street segments had no driveway cuts. Twenty-seven percent of street segments had street trees. The trees assessed were limited to street trees between the clearpath pedestrian zone and the curb. Buffers between pedestrian areas and traffic existed on almost every street segment; buffers included on-street parking and bike lanes. Almost every street segment had buffers between the pedestrian areas and traffic (travel lanes). Parallel parking was present along almost every street in the study area. Also, the south side of Pioneer Boulevard and the north side of Proctor Boulevard both include existing bike lanes.

Planters were found throughout the downtown, predominantly located on Proctor Boulevard and on almost every street segment between Beers Avenue and Ten Eyck Road. Planters were found on 24.5 percent of sides of street segments. Public seating and public art were amenities that were less prevalent throughout the study area. Only four segments contained public art, which consisted of murals and sculptures. Public seating was found along ten street segments, again most heavily concentrated along Proctor Boulevard and the couplet area west of Meinig Avenue.

Within the couplet – Pioneer Boulevard, Proctor Boulevard, and their connecting roads – there are an abundance of customer-focused businesses and entities. Along Pleasant Street a few customer-focused businesses exist, but the main public amenities are Sandy Grade School and the Sandy Aquatics Center.

Outdoor public spaces beyond sidewalk infrastructure were scarce in the assessment boundaries, with Memorial Plaza across from City Hall as the major public space in the downtown.

SAFETY

Numerous derelict and/or vacant buildings and vacant lots were found throughout the study area. Their presence can reduce the comfort and aesthetic of the pedestrian environment. There was no graffiti of significant size found within the project area. Intersection lighting was found throughout the assessment area and every intersection had at least one light, except for Alt Avenue/Shelley Avenue/ Proctor Boulevard, which had several pedestrian scale lights around the intersection. Only nine percent of street segments had pedestrian scale lighting.

Data pulled from the Sandy Police Department's crash reports from 2006 to 2016 showed that in that time period, there were a total of 26 motor vehicle crashes involving pedestrians within the city limits. Of those, six were located within the DWA project boundary.

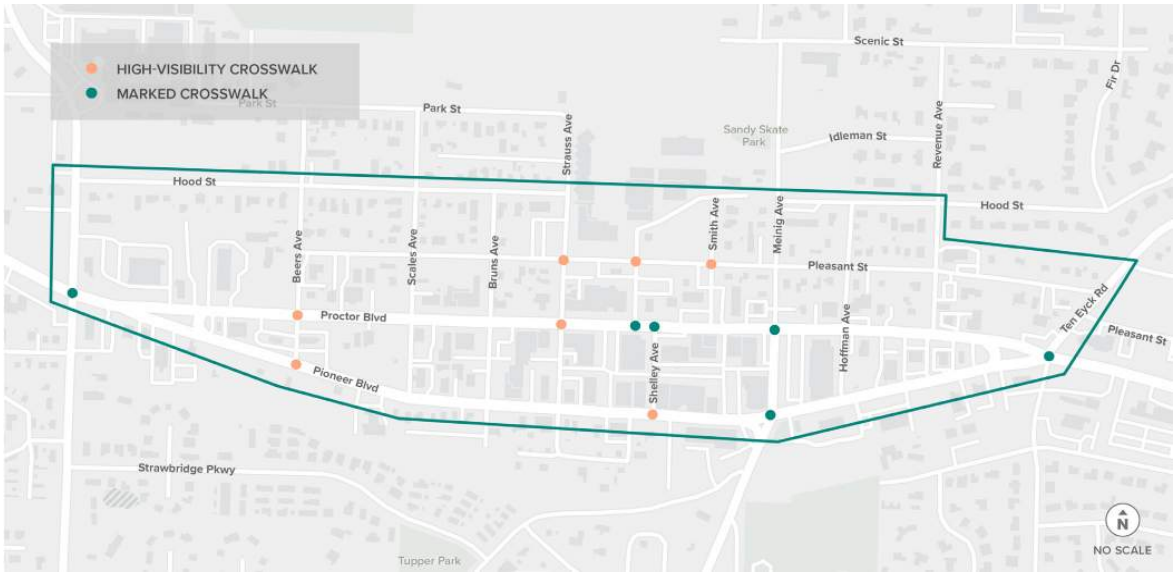
For more detail on motor vehicle crashes involving pedestrians, see Appendix A. To see mapped locations on incidents within the project boundary see, Appendix A.

INTERSECTIONS

Almost all the intersections within the assessment area had the basic intersection elements assessed in the PEQI, which included traffic control, intersection lighting, and curb ramps. The only intersection without lighting was Proctor Boulevard at Revenue Avenue. This intersection was also the lowest scoring – the only one to score under 20, due to the lack of intersection lighting, marked crosswalks, and traffic control devices (traffic lights, stop signs, etc.). Only seven of the intersections had high visibility markings. All of the marked intersections in the project area are shown in Figure 6. All the intersections had at least one curb ramp, many with truncated domes. Intersections were not assessed for full ADA compliance; they were simply assessed for the existence of curb ramps and truncated domes.

Many of the curb ramps on Pioneer Boulevard and Proctor Boulevard were oriented to encourage east/west crossing but not to encourage crossing the boulevards, unless there was a marked intersection. Only a few intersections contained intersection calming features or pedestrian engineering countermeasures, such as bulb-outs and additional signage. More intersection calming features and/or pedestrian engineering countermeasures could be beneficial for improving perceived safety of pedestrian crossings across Pioneer Boulevard and Proctor Boulevard.

FIGURE 6. MARKED INTERSECTIONS



ACCESSIBILITY AND CONNECTIVITY

In addition to PEQI assessments conducted by staff, existing conditions were evaluated by reviewing accessibility standards.

The information in Table 7 on the following page was provided by the Oregon Department of Transportation (ODOT). The information provided insight into some conditions of accessibility in downtown, specifically addressing pedestrian crossing times, pedestrian push buttons, and curb ramps. In the Sandy area there were several training and service centers for those with disabilities, such as Guide Dogs for the Blind and Oral Hull Center for the Blind and Low Vision, that used downtown Sandy as a training area, making it even more important that downtown is accessible for all users. The accessibility information addressed in this assessment was informed by comments related to accessibility expressed by the public.

Table 7 shows the crossing times at all signalized intersections in downtown. The total walk time shown in the table was calculated by totaling the "Walk" time (in seconds) plus the flashing "Don't Walk" time. The timing for pedestrian signals was determined by ODOT, which uses the Manual on Uniform Traffic Control Devices (MUTCD) as a guide.

There is potential to allow longer cross times for those with disabilities, providing a comfortable window to cross busy downtown streets, particularly along Highway 26. These suggestions were responses to concerns expressed by the public.

ACCESSIBILITY COMPLIANCE OF CURB RAMPS AND PUSH BUTTONS

The *Oregon Department of Transportation Americans with Disabilities Act Transition Plan* (2017) details information on curb ramps. In 2011, ODOT evaluated curb ramps at approximately 7,000 street intersections on all state highways, within incorporated cities, and other developed areas. A "Good-Fair-Poor" rating was developed to determine the physical conditions of these ramps, as defined further in the design recommendations in *Public Right-of-Way Accessibility Guidelines*. A "Good" rating indicated curb ramps met the ADA guidelines and the ramp was usable by most, if not all, people with disabilities. A "Fair" rating indicated that curb ramps met ADA guidelines but lacked a detectable warning, such as a truncated dome. A "Poor" rating described curb ramps that did not meet one or more ADA guidelines, making the ramp a barrier for all people with disabilities.

ODOT provides signals at numerous street intersections that control pedestrian traffic as well as vehicular traffic. ODOT has an inventory of these signal-controlled intersections and will refine this inventory to better evaluate pedestrian signals for full accessibility based on current standards. This refinement will improve the inventory of accessibility features at curb ramp locations where a traffic signal push-button is required to activate a street crossing signal.

ACCESSIBILITY ANALYSIS

ADA accessibility conditions in downtown Sandy currently meet some standards, but are not adequate for people with certain disabilities. Some efforts and evaluations have been made but further analysis is needed. Additionally, while certain conditions are deemed compliant or up to standards by governing agencies, the community has expressed that an extra step should be taken to ensure safety and accessibility.

TABLE 7. PEDESTRIAN CROSSING SIGNALS TIMING

INTERSECTION	CROSSING	PHASE #	WALK (SECONDS)	FLASHING DON'T WALK (SECONDS)	TOTAL TIME OF PED. SIGNAL (SECONDS)
Hwy 26 @ Bluff Rd	North across Bluff Rd	6	8	20	**28**
	East across Pioneer/Proctor	8	10	29	**39**
	South across Bluff Rd	2	7	18	**25**
	West across Hwy 26	4	8	29	**37**
Pioneer Blvd @ Strauss Ave	North across Strauss Ave	2	7	10	**17**
	East across Pioneer Blvd	4	7	10	**17**
	South across Strauss Ave	2	7	10	**17**
	West across Pioneer Blvd	4	7	10	**17**
Proctor Blvd @ Alt Ave/ Shelley Ave	North across Alt Ave	6	7	10	**17**
	East across Proctor Blvd	8	7	12	**19**
	South across Shelley Ave	6	7	12	**19**
	West across Proctor Blvd	4	7	12	**19**
Pioneer Blvd @ Meinig Ave	North across Meinig Ave	2	7	13	**20**
	East across Pioneer Blvd	8	7	14	**21**
	South across Meinig Ave	2	7	13	**20**
	West across Pioneer Blvd	4	7	10	**17**
Proctor Blvd @ Meinig Ave	North across Meinig Ave	6	7	12	**19**
	East across Proctor Blvd	8	7	15	**22**
	South across Meinig Ave	6	7	12	**19**
	West across Proctor Blvd	4	7	15	**22**
Hwy 26 @ Ten Eyck Rd	North across Ten Eyck Rd	6	7	19	**26**
	South across Ten Eyck Rd	2	7	15	**22**
	West across Pioneer Blvd	5	7	15	**22**
	West across Proctor Blvd	4	7	11	**18**

FIGURE 7. CURB RAMP AND PUSH BUTTON ACCESSIBILITY CONDITIONS

Source: Oregon Department of Transportation

CONNECTIVITY

Walkable connections, via sidewalks and paths, to Sandy's downtown are also vital to creating a pedestrian network. To encourage walking in the downtown, it is also important to provide easy ways to walk into the downtown.

The following streets are the major connections from neighborhoods to downtown. The Community Walking Audit Checklist was used to evaluate the condition of each connecting street, and the evaluations were completed in October and November of 2019.

1. **Ten Eyck Road**
   Condition: The sidewalks could use improvement as there is no sidewalk on the east side and the sidewalk ends at Hood Court. A curb ramp is also missing when crossing Pleasant Street on Ten Eyck Road.

2. **Pathways throughout Meinig Park**
   Condition: While the pathways throughout Meinig Park are well-marked and developed, there is a significant amount of debris from plants making it slippery for walking and rolling. The lighting on the pathways is also not sufficient for pedestrians.

3. **Bluff Road north of Highway 26**
   Condition: There is adequate sidewalk infrastructure on Bluff Road north of Highway 26, but some overgrown vegetation makes it difficult to walk. There is a vehicle blind spot at Bluff Road and Hood Road, which presents a dangerous crossing for pedestrians.

4. **Bluff Road south of Highway 26**
   Condition: There is adequate sidewalk infrastructure on Bluff Road south of Highway 26, but it is not very wide. Furthermore, the Bluff Road and Highway 26 intersection has a quick pedestrian signal, presenting a challenge to mobility-impaired pedestrians.

5. **Wolf Drive**
   Condition: There are sidewalks on both sides of Wolf Drive from Kimberly Drive to Pioneer Boulevard. However, some street signs are missing and others are hard to see, which can present distractions for drivers. Wolf Drive also could use ADA improvements as there are several missing curb ramps.

6. **Strawbridge Parkway**
   Condition: Strawbridge Parkway has adequate pedestrian infrastructure.

7. **Tupper Road**
   Condition: There is only one sidewalk on the south side of the street, and pedestrians walking and rolling may have a difficult time due to tree debris on the sidewalk.

WALKABILITY IMPROVEMENTS FROM 2000-PRESENT

Other previous City of Sandy improvements to walkability and alternative transportation over the last twenty years or so, include but are not limited to:

- Undergrounding utilities on Proctor Boulevard
- Construction of sidewalks north of downtown
  - » North side of Pleasant Street from Meinig Avenue to Revenue Avenue
  - » Bruns Avenue, both sides, from Pleasant Street to Hood Street
  - » Beers Avenue, both sides, from Pleasant Street to Hood Street
- Creation of the Tickle Creek Trail and Sandy River Trail
- Street furniture upgrades
- Implementation of the downtown flower basket program

PUBLIC ENGAGEMENT

In assessing the conditions of the downtown pedestrian environment, it was important to engage the community to understand their perception of walkability.

Engaging the community to understand their perception of walkability was crucial in assessing the conditions of the downtown pedestrian environment – understanding reasons they do or do not walk, barriers to walkability, and their concerns about the current pedestrian conditions. The community engagement and feedback process consisted of three different outreach techniques – a survey, a pop-up mapping activity, and a community walking audit. This chapter details each of the public outreach techniques and summarizes the feedback received from the participants.

ADVISORY COMMITTEE

The Downtown Walkability Assessment Advisory Committee consisted of interested citizens, elected officials, and representatives from agencies/ departments (see Acknowledgments). The advisory committee met three times throughout the course of the study and provided feedback on various aspects of the assessment.

SURVEY

BACKGROUND

DOWNTOWN WALKABILITY ASSESSMENT

- Survey conducted to receive **public feedback** on a range of walkability factors and existing conditions
- Consisted of **27 questions**
- Most surveys were completed online through **Survey Monkey**, an online survey platform
- Total of **150 surveys** were completed
- Majority of survey respondents were **Sandy residents** and **local business patrons**

* THE FULL SURVEY CAN BE FOUND IN APPENDIX B.

SURVEY DISTRIBUTION

The survey was primarily distributed and completed online through SurveyMonkey. There were e-blasts sent by the Sandy Chamber network and several postings on the City of Sandy's Facebook page. There was also a Sandy Post Article, published on February 14, 2018, that informed and encouraged community members to complete the survey. A notice was also included with the monthly City of Sandy utility bill. Additionally, there was a session at the Senior Center where senior attendees were provided background information on the assessment and had the opportunity to complete paper versions of the survey.

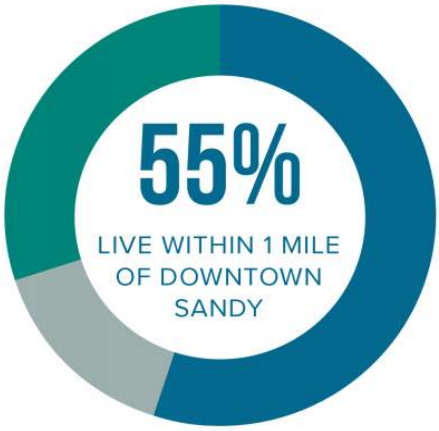
SURVEY ANALYSIS

A summarized analysis of the responses to the Downtown Walkability Assessment survey is shown in the following section. To see detailed full survey responses, see Appendix B.

DEMOGRAPHICS

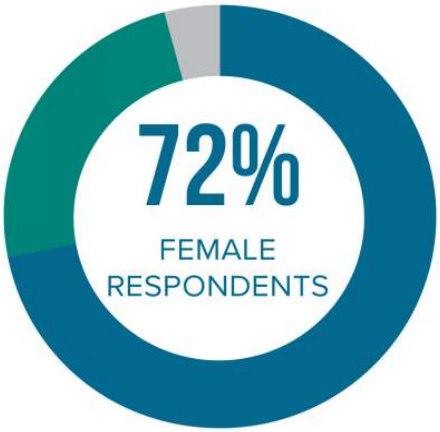
Of the 150 people who participated in the survey:

WHERE THEY LIVE



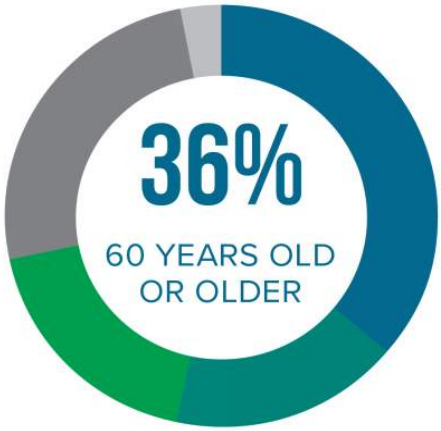
- **15%** LIVE BETWEEN 1-2 MILES
- **30%** LIVE OVER 2 MILES

GENDER



- **24%** MALE RESPONDENTS
- **4%** DID NOT RESPOND

AGE



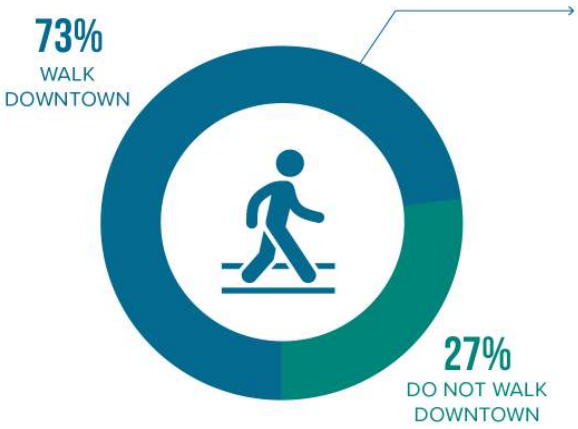
- **17%** 50-59
- **18%** 40-49
- **15%** 30-39
- **30%** UNDER 30

TIME LIVING IN SANDY

10 YEARS MAJORITY OF SURVEY RESPONDENTS HAVE LIVED IN SANDY FOR OVER **10 YEARS**

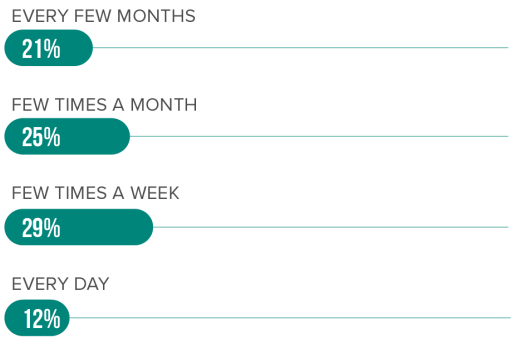
19 YEARS AVERAGE NUMBER OF YEARS LIVING IN SANDY FOR SURVEY RESPONDENTS IS **19 YEARS**

PEDESTRIAN BEHAVIORS

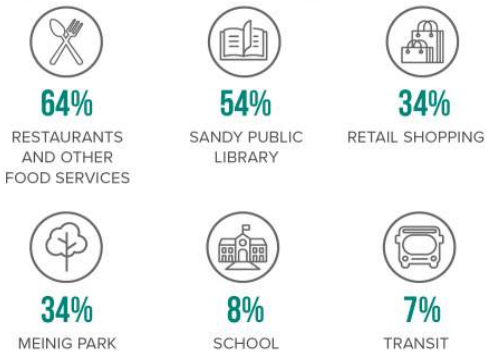


OF THOSE WHO DO WALK DOWNTOWN, RESPONDENTS TYPICALLY WALK:

MOST RESPONDENTS WALK DOWNTOWN:

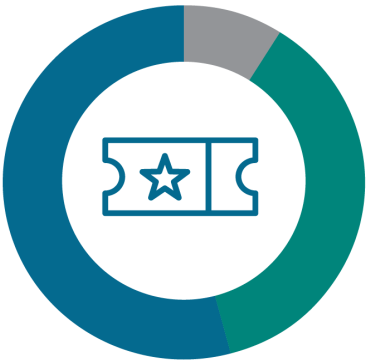


MOST POPULAR WALKING DESTINATIONS:



Some essential service destinations such as transit and school were less popular than other destinations, with much lower response rates of seven percent and eight percent, respectively. It is important to note that the Oregon Trail School District's system of student-to-school pairing does not necessarily correlate to location of school. For example, a student that lives on Pleasant Street may not attend Sandy Grade School although it is the closest elementary school to their residence. The proximity of school to home combined with the small percentage of people under 30 years of age responding to this survey provided some indication as to why a low percentage of survey respondents walk to school. Other destinations listed included trails, banks, work, and the Olin Bignall Aquatic Center. Several comments also noted that the purpose of walking was not to reach a destination, but rather for exercising.

"IF THERE WERE MORE EVENTS, ATTRACTIONS, OR DESTINATIONS..."



54% I WOULD WALK DOWNTOWN MORE

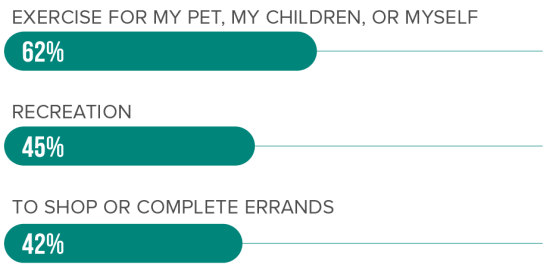
37% DEPENDS ON WHAT IT IS

9% I WOULD NOT WALK MORE

Planning staff wanted to understand if having more attractions and destinations in the downtown would influence pedestrian walking behaviors. The study found that 54 percent of survey respondents said they would walk downtown more often if there were more events, attractions, or destinations to walk to in the downtown. Meanwhile, 37 percent said 'maybe, depends on what it is' and nine percent said that additional attractions and destinations would not increase their desire to walk downtown. Throughout the survey, various comments stated that some community members thought there were not enough destinations downtown. When asked what events, attractions, and/or destinations would encourage people to walk downtown the suggestions included events similar to First Fridays, better restaurants, family-friendly events, more retail stores, and more festivals (i.e., Mountain Festival).

Understanding the reasons pedestrians walk in downtown Sandy is important for identifying barriers and helping prioritize improvements. The majority of survey respondents, 62 percent, said they walk downtown 'for exercise for my pet, my children, or myself,' followed by 45 percent of respondents doing so for recreation, and 42 percent of respondents saying they walk to shop or complete errands. Several respondents stated they walk during breaks at work and because it is more efficient than driving around downtown. One survey respondent commented "the street layout wastes gas and time. Walking is faster. Really! This is because of how the streets are laid out and the signals work."

TOP REASONS RESPONDENTS WALK DOWNTOWN:



To understand connectivity and walkability barriers, survey respondents were asked if they typically take the fastest route when walking to the downtown. Sixty percent of survey respondents said they do take the fastest route and 26 percent said they do not use the fastest route. There was an assortment of reasons people chose to forgo the fastest route, with 38 percent of survey respondents doing so for recreation purposes, 35 percent choosing routes that feel safest, and 31 percent saying they opt for the most aesthetically-pleasing route. Two written comments included, "I take the safest route, which means routing longer based on sidewalk consistency and availability," and "I try and use pathways, side streets, anywhere away from Pioneer Boulevard and Proctor Boulevard."

FACTORS AFFECTING WALKABILITY

Determining safety of the downtown walking environment is important in defining barriers that must be overcome. Survey respondents were asked about traffic safety concerns as a pedestrian downtown. Respondents' answers included:

SAFETY CONCERNS:

NOT CONCERNED ABOUT TRAFFIC DANGERS
54%

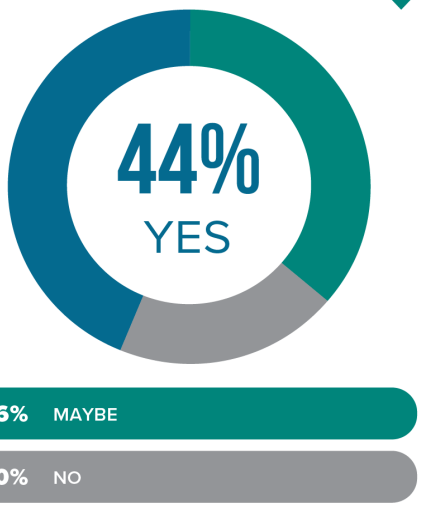
FEEL SAFE AND SATISFIED WALKING DOWNTOWN
35%

CONCERNED ABOUT THE CONDITIONS OF SIDEWALKS (UNEVEN, CRACKED, OBSTRUCTIONS, ETC.)
27%

Other safety concerns that were mentioned included pollution from traffic, congestion, traffic volume, driver blind spots of pedestrian areas, poor lighting at night, and long crossing distances. Following safety rules is important for pedestrian safety, but some conditions can lead to impatience, such as long wait times at pedestrian crossing signals. Forty-seven percent of respondents stated, 'I always cross at crosswalks, wait for pedestrian signal to walk, and follow pedestrian rules,' 40 percent said they typically follow pedestrian rules, ten percent said they sometimes follow the rules, and two percent said they do not follow any pedestrian safety rules because they are inconvenient.

Comfort in surroundings is an important aspect of walkability and while improving safety contributes to a positive pedestrian environment, amenities are extremely important in cultivating desirable pedestrian environments. Survey respondents were asked if they find walking downtown to be a pleasant experience. Forty-four percent said yes, 36 percent said maybe, and 20 percent said no.

"DO YOU FIND WALKING DOWNTOWN A PLEASANT EXPERIENCE?"



Those respondents who did not find walking downtown to be a pleasant experience were asked why. They had the following responses:

NOT ENOUGH LIGHTING AT NIGHT
32%

NOT ENOUGH SEPARATION FROM TRAFFIC
30%

DIFFICULT AND TIME CONSUMING TO CROSS THE STREET
30%

Other comments regarding the unpleasant environment in downtown included poor weather conditions, lack of bus availability, pollution, not enough appealing destinations, vacant storefronts, and cars that stop too quickly or do not stop at all when they are attempting to cross streets.

When asked about the condition of pedestrian amenities downtown, 37 percent of respondents said they felt there were already enough pedestrian

amenities downtown, 47 percent said maybe, and 15 percent said there were not enough amenities. Written comments about pedestrian amenities included installation of more landscaping, more lighting, and reducing the number of overflowing trash receptacles. Additionally, several respondents noted that Pioneer Boulevard and Proctor Boulevard were popular pedestrian areas, yet they may not be the best locations for certain amenities such as benches. One respondent said, "It seems ridiculous to have benches alongside Proctor and Pioneer, where traffic is nearly nonstop; it's better to place them in areas away from traffic."

To understand negative impacts on walkability, survey respondents were asked to identify the factors having the largest impact on their decision to walk downtown and to scale the impact. The most popular responses (strong impact, small impact, no impact) for each factor are depicted in Table 8.

TABLE 8. SURVEY RESPONSES TO WALKABILITY FACTORS

STRONG IMPACT	SMALL IMPACT	NO IMPACT
Automobile volume	Visually unappealing surroundings	I do not like to walk
Automobile speed	Bad weather	Travel with small children
Personal safety	Automobile noise	Difficult terrain (hills)
No sidewalks	Sidewalks in poor condition	Too many stops to make
Lack of continuous sidewalks along the same side of the road		Too much to carry
Lack of driver awareness for pedestrians		I do not have time
		Destinations are too far away
		Too many sidewalk obstructions (utility boxes, light poles, etc.)
		Crosswalk signals are too long

Based on the responses to the question about automobile behaviors, the survey respondents believed that traffic volume, speed, and lack of driver awareness had the strongest negative impact on walkability. Additionally, lack of sidewalks or continuous sidewalks on the same side of the street were also very popular choices for causing a strong negative impact. Other factors that had less impact or no impact are listed in the second and third columns of the table. Other written comments regarding negative impacts on walkability included poorly-timed crosswalk signals that did not provide enough time to cross the street, exhaust and pollution from vehicles, and lack of destinations to stop at in downtown Sandy.

WALKABILITY IMPROVEMENTS

Survey respondents were asked what they believed were the most important walkability improvements with the most popular level of importance for each improvement listed below.

TABLE 9. SURVEY RESPONSES TO IMPROVEMENTS

VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT
More sidewalks	Better street lighting	Walking groups
Improved sidewalks	Education/enforcement for motorists, pedestrians, and bicyclists	
Better intersections (pedestrian signals, crosswalks, etc.)	Beautification of surroundings	
More separation from vehicle traffic		
Reduced vehicle speed		
More downtown events (art fairs, music, etc.)		
Increase sidewalk connectivity between residential neighborhoods and downtown		

Survey respondents felt that infrastructure improvements were the most important factor but added that more events in downtown would encourage an increase in walking. Written comments included suggestions such as providing better parking and increasing the number of places to shop. One suggestion was to add more visible signalized intersections for pedestrians, such as the flashing light signage installed on Powell Boulevard at Roberts Avenue in Gresham.

Survey respondents were then asked to list their top three walkability improvements including a first, second, and third improvement from a list of potential improvements. The responses to each category were factored into a weighted average, with the lowest average number being the highest priority (see Table 10 on the following page).

TABLE 10. WEIGHTED AVERAGE OF SURVEY RESPONSES TO PRIORITY OF WALKABILITY IMPROVEMENTS

IMPROVEMENT CATEGORY	WEIGHTED AVERAGE	
Education / enforcement of motorists, pedestrians and bicyclists	**1.59**	HIGHEST PRIORITY
More separation from vehicle traffic	**1.72**	
Reduce vehicle traffic	**1.72**	
More sidewalks	**1.92**	
More downtown events	**1.96**	
Better street lighting	**1.97**	
Better intersections	**2.00**	
More connecting sidewalks between residential neighborhoods and downtown	**2.02**	
Improved sidewalks	**2.14**	
Beautification of surroundings	**2.21**	
Walking programs	**2.22**	LOWEST PRIORITY

Note: A lower number denotes a higher priority

The top priority improvements were related to improving traffic conditions in the downtown, followed by recommendations for improving basic pedestrian features such as sidewalks, street lighting, and intersection crossings. Respondents also stated that holding more downtown events should remain a high priority.

POP-UP MAPPING

FIGURE 8. POP-UP MAPPING ACTIVITY RESULTS

BACKGROUND

The purpose of the pop-up mapping activity was to determine popular pedestrian routes and prioritize improvements for highly used pedestrian routes. The pop-up mapping activity included placing blank maps at several popular host locations throughout downtown. Community members visiting the host locations could choose to participate in the activity by drawing routes they typically walked downtown. The host locations included Mountain Moka, AntFarm, the Sandy Public Library, and Sandy City Hall. The activity was available at the above locations from May 7, 2018 to May 18, 2018. Additionally, there was a booth that included the activity at the Mount Hood Farmers Market, located in downtown Sandy, on May 11, 2018. To see the activity page and example, refer to Appendix B.

RESULTS

A total of 68 participants completed the pop-up mapping activity. It is important to note that the library was the most popular location for participation in the pop-up mapping activity. The number of responses per street segment were compiled, calculated, and mapped (Figure 8). As informed by the responses to the activity, thicker line widths indicate a higher propensity of pedestrian traffic on that street segment.

The most popular pedestrian routes were unsurprisingly Pioneer Boulevard and Proctor Boulevard. Of those streets, the most popular blocks were concentrated towards the middle of the couplet between Scales Avenue and Smith Avenue on Proctor Boulevard.

The most common comments noted by respondents pertained to safety concerns at the intersection directly in front of the Sandy Public Library, currently being addressed with the redesign of Alt Avenue in the Pleasant Street Master Plan. Another common concern was the poor condition of sidewalks and/or lack of sidewalks in the downtown area. Sidewalk connection into the downtown was also a concern for numerous respondents. A full list of comments from the activity can be found in Appendix B.

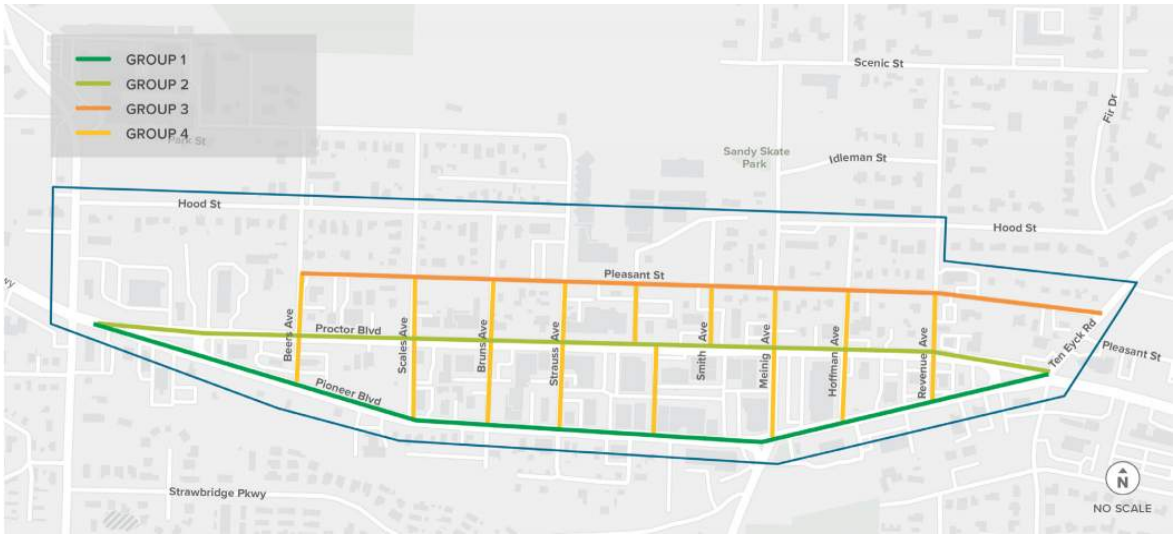
COMMUNITY WALKING AUDIT

INTRODUCTION

The intention of the Community Walking Audit event was to get community members involved to better understand the community perception of walkability and to identify pedestrian access barriers. In contrast to the technical walking audit, the Community Walking Audit focused primarily on addressing big picture concerns. The template for the Community Walking Audit was adapted from the *Safe Routes to School Handbook Audit Toolkit* template. The original template from the handbook and the revised version used for the Community Walking Audit can be found in Appendix B.

The Community Walking Audit was hosted on May 16, 2018. Eighteen community volunteers participated in the event, with individuals of varying mobility levels. Two volunteers with mobility impairments were able to inform staff of inadequate conditions and accessibility concerns for people with disabilities. The community volunteers who participated included interested citizens, elected officials, and city staff. Volunteers were divided into four groups, covering different sections of downtown. Figure 9 details the areas assessed. Furthermore, participants completed an exit survey listing their top concerns and priorities for pedestrian improvements.

FIGURE 9. COMMUNITY WALKING AUDIT GROUP ROUTES



SUMMARY OF RESPONSES

For purposes of assessing the Community Walking Audit, it is important to note that audit groups consisted of four to five people, with each person wearing a high visibility safety vest. It is likely that motorists were more aware and responsive to audit groups due to the high visibility vests and walking in small groups, as compared to typical pedestrians.

All four audit groups had recurring checklist items representing various walkability issues, including the following:

- Poorly marked crosswalks
- Lack of pedestrian-activated signals
- Parked cars blocking the view of vehicles approaching intersections
- Motorists speeding
- Motorists not looking for pedestrians
- A lack of trees and landscaping
- Trip hazards and sidewalk obstructions
- Presence of vacant or derelict buildings

Other comments were about specific areas, such as short pedestrian crosswalk timing at the signalized intersections of Meinig Avenue and Highway 26, and Ten Eyck Road and Highway 26, as well as the poor condition of the sidewalk in front of Two Brothers Mexican Restaurant (38786 Pioneer Boulevard). (Note: Since the audit, this sidewalk has been repaired.) See Appendix B for a full summary of audit responses and comments from each audit group.

The primary benefit of having two individuals with mobility impairments participating in the audit was to identify accessibility issues throughout downtown. Some of the key accessibility concerns identified during the audit were the following:

- Curb ramps are often too steep.
- Pedestrian signals downtown require push-button activation, which can be a difficult task for some individuals. A more accessible alternative would be to have an automatic pedestrian cycle at intersections with signals.
- Navigating mailboxes on the sidewalk is difficult for low-vision individuals using canes. The City should remove mailboxes no longer in use.
- The voice command at the Alt Avenue crosswalk could be misunderstood to be saying “Halt” in stead of “Alt.” A clearer alternative may be to fully state “Alt Avenue” and increase the volume of the voice command.
- Ten Eyck Road and Highway 26 intersection is missing an audible signal.
- Absence of a pedestrian signal between the pedestrian island and the sidewalk on the southwest side of the Meinig Avenue and Pioneer Boulevard intersection.

EXIT SURVEY RESPONSES

The exit survey provided after the audit asked for the top concerns in each of the following categories: sidewalk concerns, intersection and street crossing concerns, comfort concerns, overall concerns, and top improvements needed. The most common responses in each category are listed below.

Sidewalk Concerns:

- Narrow sidewalks
- Sidewalk obstructions of all types (utility poles, mailboxes, etc.)

Intersection & Street Crossing Concerns:

- Motorists having difficulty seeing pedestrians
- Motorists not stopping at crosswalks
- Needing more signage and markings at intersections
- Lack of marked crosswalks

Comfort Concerns:

- Vehicle speeds
- Noise pollution
- Lack of trees and landscaping

Overall Concerns:

- Traffic – too fast and noisy
- Crosswalk safety
- More signage and markings needed
- Lack of adequate lighting

Top Improvements Needed:

- Flashing light crosswalks
- More planter strips and trees
- Improving and repairing sidewalks

To see the full list of exit survey responses, see Appendix B.

SUMMARY OF COMMON WALKABILITY CONCERNS

Throughout the public engagement process for the Downtown Walkability Audit, the community expressed reoccurring concerns, including:

- Lack of crosswalks and unsafe crosswalks on Pioneer Boulevard and Proctor Boulevard (especially the crosswalk in front of the library at the intersection of Proctor Boulevard and Alt Avenue)
- Noise and speed of traffic on Pioneer Boulevard and Proctor Boulevard
- High traffic volume on Pioneer Boulevard and Proctor Boulevard
- Connectivity issues, including but not limited to:
  - » Missing sidewalks
  - » Not enough marked crosswalks on Pioneer Boulevard and Proctor Boulevard
  - » Missing pedestrian connections from surrounding neighborhoods to downtown
- Lack of destinations and/or attractions to walk to in downtown
- Accessibility (ADA) issues
- Poor lighting
- Sidewalk obstructions (old mailboxes, utility poles, etc.)
- Lack of amenities – no recycling, few and full trash receptacles, more landscaping needed
- Lack of pedestrian signals or signage
- Poor sidewalk conditions, including but not limited to:
  - » Uneven, crumbling sidewalks
  - » Narrow sidewalks
- Obstructed sight lines from parked cars

RECOMMENDATIONS

A list of recommended actions was created based on the results from the PEQI audit, existing conditions report, and the information gathered through the public process for the DWA.

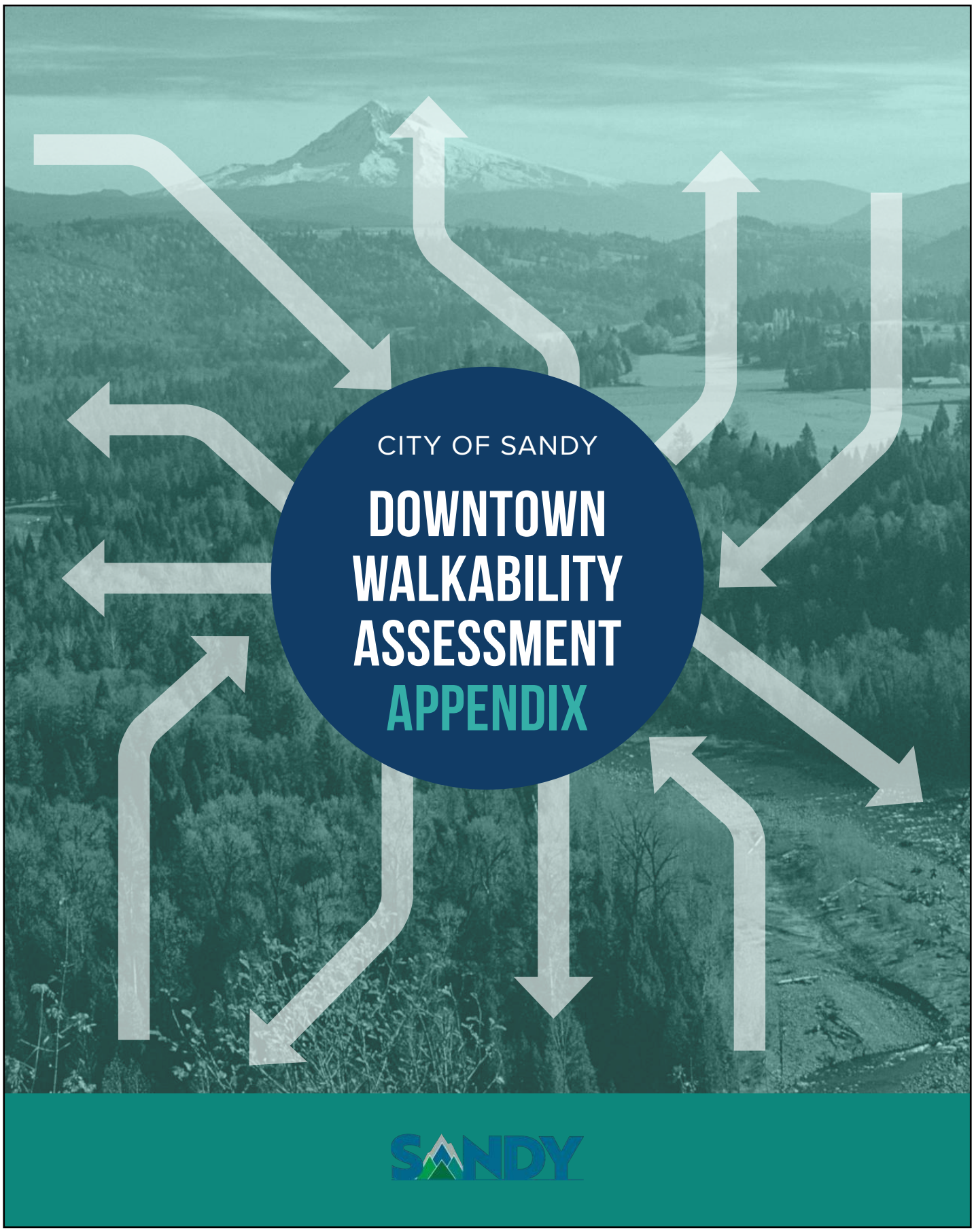
Based on the results from the PEQI audit, existing conditions report, and the information gathered through the public process for the Downtown Walkability Audit, a list of recommendations has been created. The recommendations are grouped based on the related DWA goals.

The partner(s) listed are the agencies and/or departments which the City of Sandy's Planning Division will need to partner with to achieve the goals as identified within this assessment. A single circle indicates a shorter timeline to implement the action while two circles indicate a longer timeline for implementation.

TABLE 11. RECOMMENDATIONS BY RELEVANT GOAL

GOAL	RECOMMENDED ACTION	PARTNER(S)	TIMELINE ESTIMATE
PEDESTRIAN SAFETY AND COMFORT	A. Reduce speed limits in downtown	ODOT	●
	B. Enforce speed limits in downtown	Sandy Police Department	●
	C. Reduce speed on Hwy 26 east of downtown to provide for a better transition to reduced speeds in the downtown (reduction of 40 mph current speed limit)	ODOT	●
	D. Create traffic calming measures, such as rumble strips	ODOT, Public Works	● ●
	E. Plant additional landscaping and street trees on high volume streets	Urban Renewal Agency (URA), local businesses, local community groups	●
	F. Improve sight lines for pedestrian visibility by ensuring parking and street trees are placed in safe locations to intersections	Public Works	●
	G. Increase the number of marked crosswalks on Highway 26 in the downtown couplet	ODOT, Public Works	●
	H. Transition all marked crosswalks on Pioneer Blvd. and Proctor Blvd. to high visibility crosswalk paint	ODOT, Public Works	●
	I. Increase signage and/or install signalized flashing beacons at marked crosswalks	ODOT, Public Works	●
	J. Increase the number of pedestrian bulb-outs at intersections	ODOT, Public Works, URA	● ●
	K. Increase the number of pedestrian scale streetlights on street segments in the downtown	Public Works, URA, PGE	●

GOAL	RECOMMENDED ACTION	PARTNER(S)	TIMELINE ESTIMATE
PEDESTRIAN ACCESSIBILITY	A. Construct missing sidewalks within project boundaries	Public Works, URA	● ●
	B. Create a sidewalk maintenance plan to provide continuation of pedestrian enhancements	Public Works, URA	● ●
	C. Increase pedestrian walk signal timings at the intersections at the edges of downtown (Bluff Rd. and Ten Eyck Rd.) and at major intersections within the downtown couplet	ODOT, Public Works	●
	D. Widen narrow sidewalks within the project boundaries	Public Works, ODOT, URA, local businesses	● ●
	E. Improve sidewalks with major impediments and in poor condition	Public Works, URA, local businesses	●
	F. Improve and prioritize ADA accessibility along sidewalks and pedestrian crossings in downtown	ODOT, Public Works	● ●
	F1. Increase the number of audible crosswalk signals	ODOT, Public Works	●
	F2. Increase the number of truncated domes at curb cuts	ODOT, Public Works, URA	●
	F3. Transition to automated pedestrian signals	ODOT, Public Works	●
PEDESTRIAN CONNECTIVITY	A. Install wayfinding signage for pedestrians detailing distance from certain locations to the downtown via walking/rolling	Public Works, URA	●
	B. Construct sidewalks on connecting streets with missing sidewalks (see connectivity)	Public Works	● ●
	C. Complete and widen sidewalks on Pleasant St. (for more information reference Pleasant Street Master Plan) to create a more pedestrian friendly environment on Pleasant St.	Public Works, Oregon Trail School District, URA and businesses	● ●
	D. Reconfigure the crosswalk at the intersection of Alt Ave. and Proctor Blvd. in accordance with the Pleasant Street Master Plan to safely connect Pleasant St. to the south side of Proctor Blvd.	ODOT, Public Works, URA	● ●
	E. Encourage more events in the downtown with instructions on pedestrian access from neighboring areas	Economic Development, local businesses and institutions	●


CITY OF SANDY
DOWNTOWN WALKABILITY ASSESSMENT
APPENDIX
SANDY

APPENDIX CONTENTS

APPENDIX A: EXISTING CONDITIONS

1. FULL SCORE ORIGINAL PEQI
2. PEQI AUDIT FORM (REVISED)
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4. PEDESTRIAN CRASH DATA MAPPED

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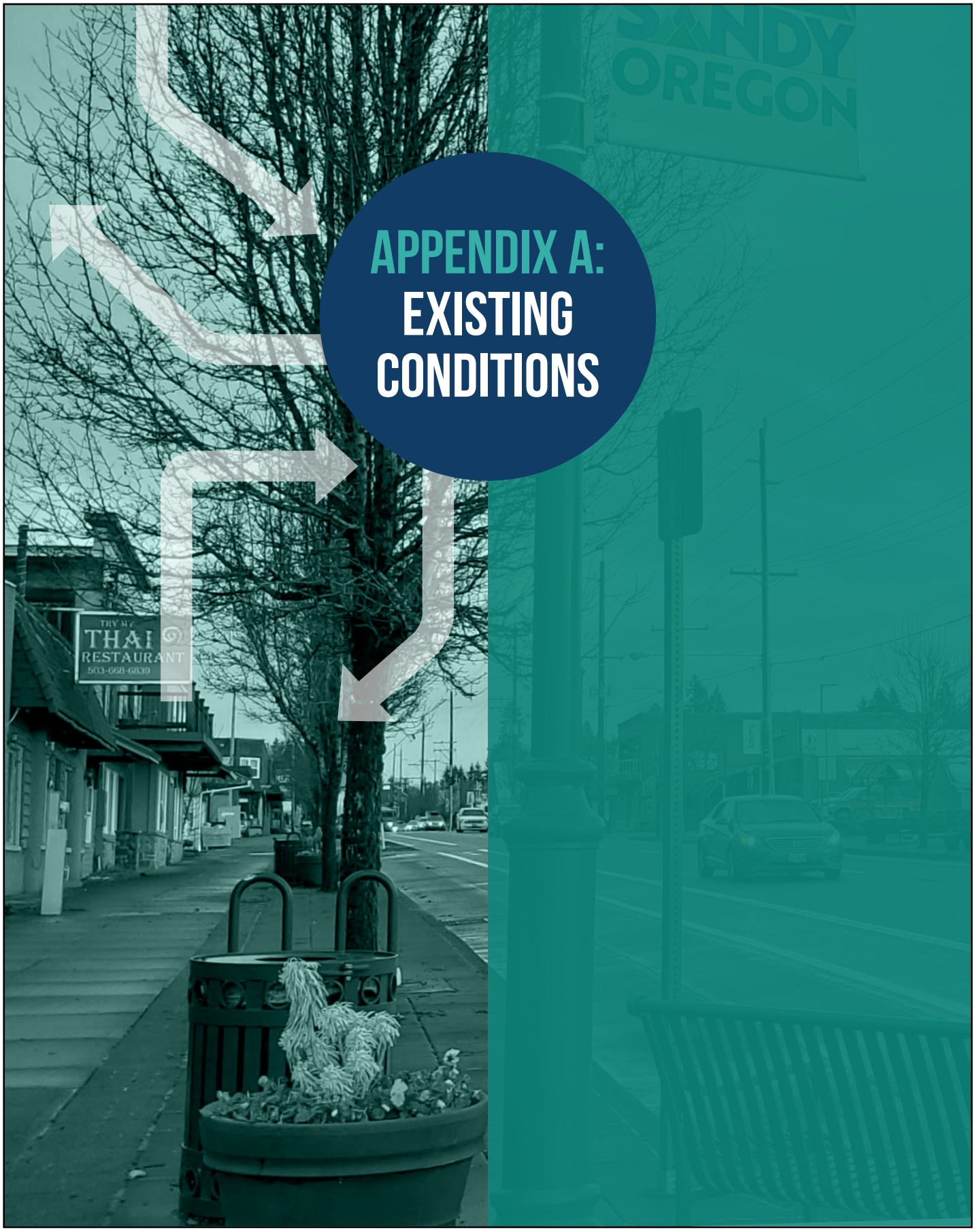
1. FULL SURVEY
2. SURVEY RESPONSES
3. POP-UP MAP ACTIVITY
4. POP-UP MAP COMMENTS
5. COMMUNITY WALKING AUDIT ORIGINAL FORM
6. COMMUNITY WALKING AUDIT REVISED FORM
7. AUDIT RESPONSE SUMMARY
8. EXIT SURVEY RESPONSES



APPENDIX A: EXISTING CONDITIONS

Appendix A: Pedestrian Environmental Quality Index (PEQI Original)

Pedestrian Environmental Quality Index (PEQI)

Date entered into database:___/___/___

Street & Intersection Audit Form

Project: **Survey Date:**

Auditor(s):

INTERSECTION

This is the intersection of: (Primary) **and:** (Secondary)

(The street you plan to walk down) (The street you will cross)

*Intersection CNN:*_____

Are these two lane or one lane streets and alleys? **Yes** ☐ **No** ☐ Street type _____

	All ways	1 missing	2 missing	3 missing	None
1. Crosswalks	☐	☐	☐	☐	☐
2. High visibility crosswalks	☐	☐	☐	☐	☐

	4+ streetlights	3 streetlights	2 streetlights	1 streetlight	None
3. Intersection lighting	☐	☐	☐	☐	☐

	4 Way Stop/ Traffic Light	2 Way Stop	Yield (no roundabout)	Roundabout	Uncontrolled
4. Traffic Control	☐	☐	☐	☐	☐

ons 5-8 unless there is a traffic signal

5a. Is there a signal for pedestrians? All ways ☐ Some ways ☐ None ☐

5b. If YES does the signal count down? All ways ☐ Some ways ☐ None ☐

10. Curb ramps

☐ Missing one or more ramp ☐ All corners ramped

☐ Missing one or more both (ramp & td) ☐ Missing one or more truncated dome

11. Intersection traffic calming features Y / N

☐ *a) Raised crosswalks* ☐ *e) Diagonal diverter*

☐ *b) Pavement treatments* ☐ *f) Partial closure*

☐ *c) Bike lane thru intersection* ☐ *g) Traffic calming circle*

☐ *d) Bulb-outs* ☐ *h) Mini-circle*

12. Pedestrian Engineering Countermeasures Y / N

☐ *a) Flashing beacon* ☐ *d) Crosswalk scramble*

☐ *b) No Turn on Red Signs* ☐ *e) Red visibility curb*

☐ *c) Additional signs* ☐ *f) Advanced stop/yield lines*

☐ *g) Pedestrian leading interval*

STREET SEGMENT

This street is: (Primary) **between:** (Street #1) **and:** (Street #2)

*Side A CNN:*_____ *Side B CNN:*_____ *Street type :*_____

13. Number of lanes: ☐ Shared / pedestrian only street ☐ 1 ☐ 2 ☐ 3 ☐ 4+

14. Posted speed limit: ☐ 25 mph / none posted ☐ Under 25 mph ☐ Over 25 mph ☐ School Zone

15. Street traffic calming features Y / N

☐ *a) Trees in median* ☐ *c) Speed enforcement*

☐ *b) Speed hump / bump* ☐ *d) Protected bike lane*

☐ *e) Chicane*

Please indicate whether Side A and Side B are North, South, East, or West relative to the street centerline.

	SIDE A N / S / E / W	SIDE B N / S / E / W
*For questions 16-22 you will select one answer for **each** side of the street*		
16. Continuous sidewalk	No ☐ Yes ☐	Yes ☐ No ☐
17. Width of sidewalk _____ *(if no sidewalk, skip #17-20, this side)*	Less than 5 ft ☐ 5 ft to 8 ft ☐ 8 ft to 12 ft ☐ 12 ft or more ☐	☐ Less than 5 ft ☐ 5 ft to 8 ft ☐ 8 ft to 12 ft _____ ☐ 12 ft or more
18. Width of throughway *The throughway is the part without furniture, signs, plantings, newspaper or utility boxes* _____	Less than 4 ft ☐ 4 ft to 6 ft ☐ 6 ft to 8 ft ☐ 8 ft or more ☐	☐ Less than 4 ft ☐ 4 ft to 6 ft ☐ 6 ft to 8 ft _____ ☐ 8 ft or more
19. Large sidewalk <u>obstructions</u>: *An obstruction is any object in the throughway.*	None ☐ Temporary ☐ Permanent ☐	☐ None ☐ Temporary ☐ Permanent
20. Sidewalk impediments: *Anything that poses a tripping hazard.*	None ☐ Minor ☐ Significant ☐	☐ None ☐ Minor ☐ Significant
21. Trees	None ☐ Sporadically lined ☐ Continuously lined ☐	☐ None ☐ Sporadically lined ☐ Continuously lined
22. Driveway cuts C - Y/N	Total ft of driveway ___	___ Total ft of driveway C - Y/N
For questions 23-26, check Yes or No on each side:	Yes ☐ No ☐	Yes ☐ No ☐
23. Presence of buffers *Check all that apply.*	Time restricted parallel parking ☐ Parallel parking ☐ Bike lane ☐	☐ Time restricted parallel parking ☐ Parallel parking (& angled parking) ☐ Bike lane
24. Planters and gardens	☐ ☐	☐ ☐
25. Public seating	☐ ☐	☐ ☐
26. Public art	☐ ☐	☐ ☐
For questions 27-28, select one answer for each side of the street:		
27. Retail use and public places *Retail that covers an entire block counts as three or more.*	None ☐ 1 or 2 ☐ 3 or more ☐	☐ None ☐ 1 or 2 ☐ 3 or more
28. Pedestrian-scale lighting	None ☐ Sporadic ☐ Continuous ☐	☐ None ☐ Sporadic ☐ Continuous (every 30 ft.)
For questions 29-31, check Yes or No on each side:	Yes ☐ No ☐	Yes ☐ No ☐
29. Illegal graffiti *Select NO if there is only a little*	☐ ☐	☐ ☐
30. Derelict/Vacant Buildings	☐ ☐	☐ ☐
31 Vacant Lots	☐ ☐	☐ ☐

Notes:

_____
_____
_____
_____

Notes:

_____
_____
_____
_____

Table 2. The Pedestrian Environmental Quality Index (PEQI): Indicator, Domain, and Overall Street Segment Score Values Based on Expert Survey Findings (n= 20)

Intersection or Street Segment Assessment	Domain (Domain Score Weight[a])	Indicator	Indicator Score	Indicator Response Category	Indicator Response Category Score	Indicator Response Category Score, Weighted[a]
Intersections	Intersection Safety (1.05)					
		Crosswalks	2.10	4 Directions	10.00	21
				3 Directions	8.62	18
				2 Directions	6.96	15
				1 Direction	5.30	11
				None	3.64	8
		Ladder Crosswalk	2.40	4 Directions	10.00	24
				3 Directions	8.40	20
				2 Directions	6.55	16
				1 Direction	4.72	11
				None	3.18	8
		Countdown in Signal	2.40	4 Directions/w countdown	8.20	21
				4 Directions/wo countdown		19
				3 Directions/w countdown	6.20	17
				3 Directions/wo countdown		15
				2 Directions/w countdown	4.10	13
				2 Directions/wo countdown		11
				1 Direction/w countdown		9
				1 Direction/wo countdown		7
				None	2.70	5
		Crossing Speed	2.40	Slower than 3.5 ft/sec	8.18	20
				Faster than 3.5 ft/sec	3.64	9
		Crosswalk Scramble	2.40	Yes	8.00	19
				No	2.00	5
		No Turn on Red	2.40	4	8.00	19
				3		15
				2		11
				1		8
				No	2.00	5
		Traffic Calming Features (TCFs)	2.40	5 or more TCFs	8.18	20
				3 - 4 TCFs	7.27	17
				1 - 2 TCFs	6.36	15
				0 TFCs	3.64	9
		Additional Signs for Pedestrians	2.40	Yes	7.00	17
				No	3.00	7
Street Segment	*Traffic (0.76)*					
		Number of Lanes	2.40	No Lanes	10.0	24
				1	9.1	22
				2	7.7	19
				3	3.6	9
				4+	1.8	4
		Two Way Traffic	1.80	Yes	5.5	10
				No (One-way Traffic)	3.6	7
		Vehicle Speed	2.70	Less than 20 mph	10.0	27
				20-30 mph	7.3	22
				30-40 mph	4.5	12
				More than 40 mph	0.9	2
		Traffic Volume	2.40	Less than 1,000	9.1	22
				1000 - 5000	7.3	17
				5000 - 10,000	4.5	11
				More than 10,000	2.7	7
		TCFs	2.40	Yes	8.2	20
				No	2.7	7
Street Segment	*Street Design (1.10)*					
		Width of Sidewalk	2.40	Greater than 12ft	9.09	22
				8 -12 ft	7.73	19
				5 - 8 ft	5.45	13
				Less Than 5 ft	2.73	7
				No Sidewalk	0.61	1
		Sidewalk Impediments	2.40	None	10.00	24
				Few	5.45	13
				Not Applicable	5.00	12
				Significant	0.91	2
		Large SW Obstructions	2.10	No	7.27	15
				Yes, Temporary		10
				Yes, Permanent		9
				Yes, Permanent & Temporary	3.64	8
				Not Applicable	5.00	5
		Presence of Curb	2.10	Continuous Curb	8.18	17
				No Curb	3.18	7
		Driveway Cuts	1.80	More than 5	8.18	15
				Few (less than 5)	5.45	10
				None	2.73	5
		Trees	1.80	Continuously Lined	9.09	16
				Sporadically Lined	6.36	11
				None	3.64	7
		Planters/Gardens	1.20	Yes	7.73	9
				No	3.18	4
		Public Seating	1.80	Yes	7.27	13
				No	3.64	7
		Presence of a Buffer	2.10	Bike Lane and Paralle Parking	10.00	21
				Bike Lane and Time Restricted Paralle Parking		19
				Bike Lane	7.00	15
				Paralle Parking	6.00	13
				Time Resticted Parallel Parking	6.00	11
				None	2.00	4
Street Segment	*Land Use (0.18)*					
		Public Art/ Historic Sites	1.80	Yes	7.7	14
				No	3.2	6
		Restaurant and Retail Use	2.10	More than 2	9.1	19
				1 or 2	6.4	13
				None	4.1	9
Street Segment	*Perceived Safety (0.43)*					
		Illegal Graffiti	1.40	Little to None	6.36	9
				Yes	3.64	5
		Litter	1.80	Little to None	6.82	10
				Yes- A Lot	2.73	5
		Lighting	2.40	Yes - Public & Private		25
				Yes - Public	8.18	20
				Yes - Private		15
				No	2.73	7
		Construction Sites	1.80	No	7.27	13
				Yes	3.64	7
		Abandoned Buildings	1.80	No	8.18	15
				Yes	2.73	5
Street Segment	*Overall [c] 2.47*					

a The Domain Score Weight is used to obtain Domain Scores for each of the 5 PEQI Domains. The Domain Score is calculated by adding together all the Weighted Indicator Category Scores in the Domain, and then multiplying by the Domain Score Weight for a maximum Domain Score of 100 in each Domain.

b Indicator Category scores are weighted by the Indicator Scores by multiplying the two values.

c Combines the four *Street Segment* Domains to create an overall Street Segment PEQI Score.

Appendix A; PEQI Indicator Scores Values (Revised)

Intersection Segment

Indicator	Domain Weight	Indicator Category Response	Indicator Response Category Score	Indicator Score Weighted
Crosswalks	2.1	4	10.00	21
		3	8.62	18
		2	6.96	15
		1	5.30	11
		None	3.64	8
High Visibility Crosswalks	2.4	4	10.00	24
		3	8.40	20
		2	6.55	16
		1	4.72	11
		None	3.18	8
Intersection Lighting (# of streetlights)	2.1	2 or more	8.18	17
		1	6.36	13
		None	2.70	6
Traffic Control	2.4	Traffic signal/ 4 way stop	10.00	24
		2 way stop	7.70	18
		Yield	6.36	15
		Uncontrolled	2.73	7
Pedestrian Signal & Countdown	2.4	4 w/ countdown	8.92	21
		4 w/o countdown	8.12	19
		3 w/ countdown	7.20	17
		3 w/o countdown	6.41	15
		2 w/ countdown	5.32	13
		2 w/o countdown	4.52	11
		1 w/ countdown	3.77	9
		1 w/o countdown	2.97	7
		None	2.12	5
Unprotected Crossing Distance	2.1	Equal to or less than 55 ft.	8.18	17
		Greater than 55 ft.	3.64	8
Curb Ramps	2.1	All corners ramped and truncated	8.62	18
		One or more ramps with truncated domes	7.27	15
		One or more ramps	6.36	13
		No ramps	3.64	8
Intersection Calming Feature	2.4	Yes	3.64	20
		No	6.36	9
Pedestrian Engineering Counter Measures	2.1	5+	8.62	18
		3 to 4	7.27	15
		1 to 2	6.36	13
		0	3.64	8

Street Segment

Indicator	Domain Weight	Indicator Response Category	Indicator Response Category Score	Indicator Score Weighted
Number of Lanes	2.4	No Lanes	10.00	24
		1 Lane	9.15	22
		2 Lanes	7.78	19
		3 Lanes	3.69	9
		4 Lanes	1.81	4
Two-way traffic	1.8	Yes (Two way)	5.52	10
		No (One - way)	3.57	6
Vehicle Speed	2.7	Under 25	10.00	27
		25 or Not Posted	7.39	20
		Over 25	4.55	12
TSP Classification Transportation System Plan (TSP)	2.4	Major arterial	9.12	22
		Minor arterial	7.35	18
		Collector	4.55	11
		Local streets	2.42	6
Traffic Calming Features (TCFs)	2.4	5 TCFs	8.18	20
		3 to 4 TCFs	7.27	17
		1 to 2 TCFs	6.36	15
		0 TCFs	3.64	9
Continuous Sidewalk	2.1	Yes	8.18	17
		No	3.18	7
Width of Sidewalk	2.4	Greater than 8 ft.	9.09	22
		7 ft. - 8 ft.	7.73	19
		4 ft. -6 ft.	5.45	13
		Less than 4 ft.	2.73	7
		None	0.61	1
Width of Throughway *** numbers based off the narrowest point of the sidewalk	2.4	Greater than 8 ft.	9.09	22
		6 ft. - 8 ft.	7.73	19
		4 ft. - 6 ft.	5.45	13
		Less than 4 ft.	2.73	7
		None	0.61	1
Large Sidewalk Obstructions	2.1	None	7.27	15
		Temporary	4.90	10
		Permanent	4.15	9
		Temp & permanent	3.64	8
		No sidewalk	2.50	5
Sidewalk Impediments	2.4	None	10.00	24
		Minor	5.45	13
		No sidewalk	5.18	12
		Significant	0.91	2

Indicator	Domain Weight	Indicator Response Category	Indicator Response Category Score	Indicator Score Weighted
Trees	1.8	Continuously lined (every 30 ft. per code)	9.09	16
		Sporadically lined	6.36	11
		None	3.64	7
Driveway Cuts	1.8	None	8.18	15
		Equal to or less than 3	5.45	10
		More than 3	2.73	5
Presence of buffers	2.1	BL & PP	10.00	21
BL - Bike Lane		BL & TRPP	9.09	19
PP - Parallel Parking (& angled parking)		BL	7.22	15
TRPP - Time Restricted Parallel Parking		PP	6.31	13
		TRPP	5.27	11
		None	2.00	4
Presence Planters & Gardens	1.2	Yes	7.73	9
		No	3.18	4
Public seating	1.8	Yes	7.27	13
		No	3.64	7
Public art	1.8	Yes	7.73	14
		None	3.20	6
Consumer businesses and public places	2.1	3 or more	9.10	19
		1 or 2	6.41	13
		None	4.13	9
Ped Scale lighting	2.1	Continuous	9.10	19
		Sporadic	6.42	13
		None	3.64	8
Graffiti	1.4	No	6.36	9
		Yes	3.64	5
Vacant Lots	1.8	No	6.82	12
		Yes	2.73	5
Derelict/ Vacant Buildings	1.8	No	6.82	12
		Yes	2.73	5

Appendix C: Sandy Police Department Recorded Motor Vehicle Crashes Involving Pedestrians from 2006 - 2016

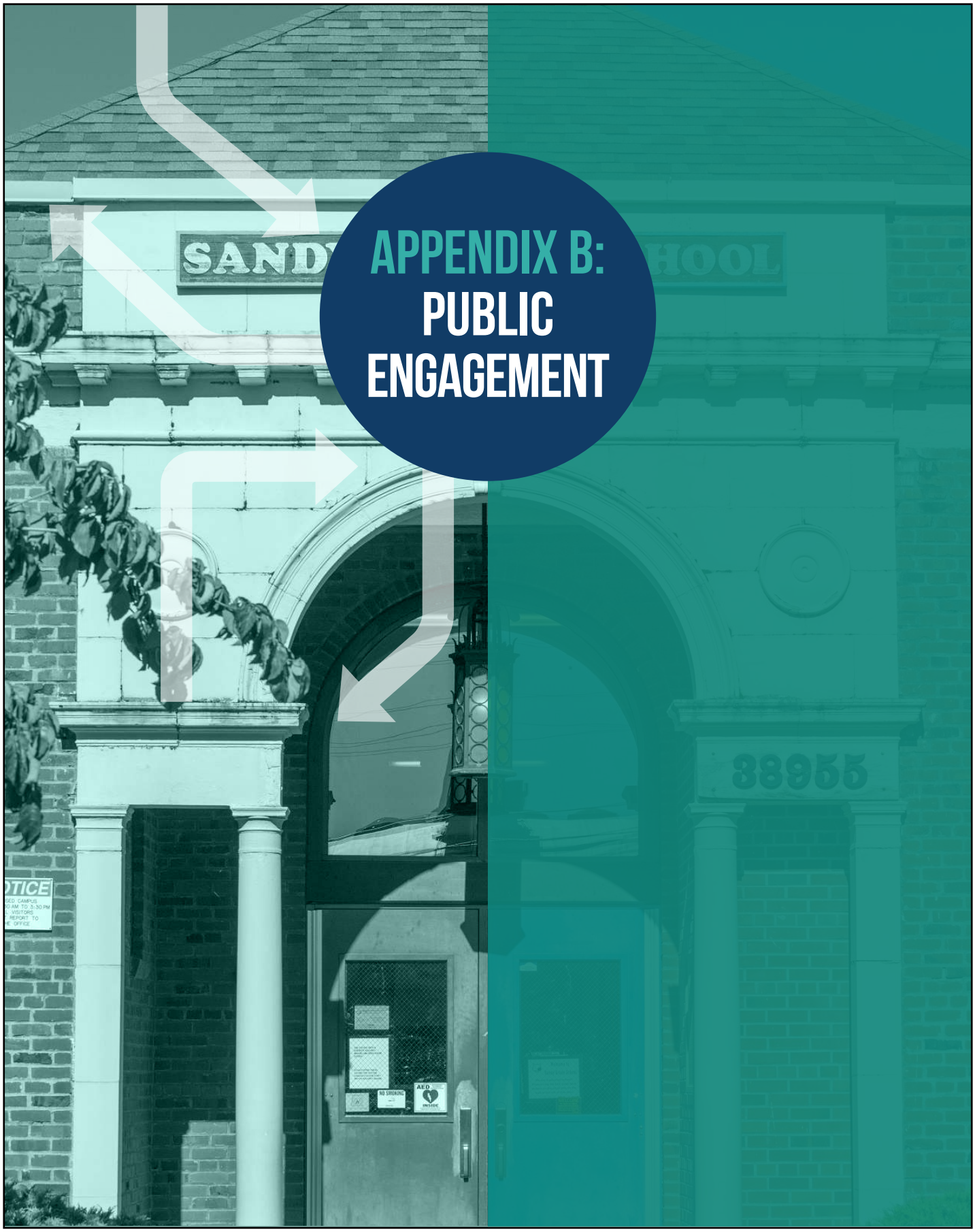
Report Number	Address	Crash Date	Map Icon
10-1325	Bluff Rd & SE Marcy St	8/25/2010 0:56	
10-1879	**Proctor Blvd & Meinig Ave**	**12/10/2010 17:00**	**A**
11-0056	Bluff Rd & Hood St	1/10/2011 7:14	
11-0785	Gary St & Barker Ct	5/21/2011 16:35	
11-0858	**Proctor Blvd & Strauss Ave**	**6/2/2011 12:04**	**B**
11-1011	US-26 & Ruben Ln	6/28/2011 21:45	
11-1123	US-26 & Ruben Ln	7/20/2011 8:33	
11-1902_	Mt Hood Hwy & University Ave	11/30/2011 19:19	
12-1008	**Proctor Blvd & Beers Ave**	**7/14/2012 22:30**	**C**
12-1402	SE Langensand Rd & Dubarko Dr	10/5/2012 13:30	
13-0040	HWY 26 / Kate Schmitz Ave	1/8/2013 18:05	
13-0387	US-26 & Ruben Ln	4/1/2013 14:00	
13-0474	**Proctor Blvd & Meinig Ave**	**4/20/2013 14:09**	**D**
13-1289	**Meinig Ave & Pioneer Blvd**	**8/30/2013 19:45**	**E**
14-0104	**Beers Ave & Hood St**	**1/17/2014 23:28**	**F**
14-1316	Long Circle & Tupper Rd	7/14/2014 23:40	
14-1668	35744 Mount Hood & Southeast 362nd	9/13/2014 21:52	
14-1881	149 Northeast 6th & North Broadway	10/17/2014 7:35	
15-0635	36900 Mount Hood & Kate Schmitz	5/1/2015 22:14	
15-1216	37699 Mount Hood & Ruben	8/15/2015 20:47	
15-1579	38499 Hood & Southeast Bluff	10/16/2015 7:20	
16-1250	Mount Hood & Industrial	7/22/2016 10:39	
16-1337	37495 Mount Hood & Ruben	8/5/2016 5:00	
16-1747	Clackamas & Southwest Beech	10/12/2016 9:37	
16-1976	17898 Southeast Langensand & Mount Hood	11/18/2016 18:40	
16-2016	Hwy 26 / 362nd	11/25/2016 19:30	

Note: Highlighted sections are recorded crashes within the DWA project boundary.

Source: Sandy Police Department Records

Legend
DWA Boundary
A Ped Crash 1
D Ped Crash 2
B Ped Crash 2
C Ped Crash 3
E Ped Crash 5
F Ped Crash 6
Scenic St
Mc Elroy St
Idleman St
Park St
Hood St
Pleasant St
Beers Ave
Scales Ave
Strauss Ave
Alt Ave
Smith Ave
SE Meinig Ave
Revenue Ave
Hoffman Ave
Bruns Ave
Shelley Ave
U.S. Hwy 26
26
SE Ten Eyck Rd
Circle Dr
Koch Ct
Junker St
McCormick Dr
Tupper Rd
211
Strawbridge Pkwy
Davis St
Google Earth
DWA Appendix pg. 95

2 / 2



APPENDIX B: PUBLIC ENGAGEMENT

Appendix B: Downtown Walkability Assessment Survey

The City of Sandy Planning Department is conducting a Downtown Walkability Assessment. The purpose of the study is to assess the current walkable environment of downtown Sandy and its connectivity to surrounding residential areas. The study will identify the existing barriers and generate recommendations to create a more pedestrian-friendly environment in downtown Sandy. This survey will help City staff gather data from the public on walkability to understand the walkability needs of downtown Sandy better.
This survey will take approximately 10 minutes.

* 1. Approximately how far do you live from downtown Sandy?

- ○ 0.5 miles
- ○ 1 mile
- ○ 1.5 miles
- ○ 2 miles
- ○ Over 2 miles
- ○ I don't know

* 2. What is your relationship to downtown Sandy? (Choose all that apply)

- ☐ Downtown Resident
- ☐ Downtown Employee
- ☐ Downtown Property and/or Business Owner
- ☐ Local Business Supporter (shop downtown)
- ☐ Sandy Resident
- ☐ Oregon Trail School District Student
- ☐ Other (please specify)

* 3. Do you walk to and/or around downtown Sandy?

- ○ Yes
- ○ No

* 4. How often do you walk to or around downtown?

- ○ Everyday
- ○ A few times a week
- ○ A few times a month
- ○ Every few months
- ○ Once or twice a year
- ○ Never

5. Where do you walk to? (Choose all that apply)

- ☐ School
- ☐ Library
- ☐ Retail shopping
- ☐ Restaurants or other food services
- ☐ Transportation
- ☐ Meinig Park
- ☐ Other (please specify)

6. How far do you usually walk?

- ○ Less than 0.5 mi
- ○ 0.5 mi – 1 mi
- ○ 1 mi – 1.5 mi
- ○ 1.5 – 2 mi
- ○ More than 2 mi
- ○ I don't know

* 7. Why do you walk? (Choose all that apply)

- [ ] Exercise for myself, my pet or my children
- [ ] To get to work
- [ ] To access public transit
- [ ] To get myself or my children to school
- [ ] To do shopping or errands
- [ ] For recreation
- [ ] For environmental considerations
- [ ] To meet neighbors and get to know my community better
- [ ] Other (please specify)

8. Which of the following factors have a negative impact on your decision to walk downtown? For those that do have an impact, how much of an impact do they have?

	Strong impact	Small impact	No impact
No sidewalks	○	○	○
Sidewalks in poor condition	○	○	○
Lack of consistent sidewalks along same side of the road	○	○	○
Crosswalk signals are too long	○	○	○
Too many sidewalk obstructions (utility boxes, light poles, etc.)	○	○	○
Lack of driver awareness for pedestrians	○	○	○
Automobile noise	○	○	○
Automobile speed	○	○	○
Automobile volume	○	○	○
Personal safety	○	○	○
Visually unappealing surroundings	○	○	○
I do not have time	○	○	○
Destinations are too far away	○	○	○
Bad weather	○	○	○
Travel with small children	○	○	○
Too much to carry	○	○	○
Too many stops to make	○	○	○
I do not like to walk	○	○	○
Difficult terrain (hills)	○	○	○
Other (specify below)	○	○	○

Other (please specify)

9. What safety concerns do you have about walking downtown? (Choose all that apply)

- [ ] None, I feel safe and satisfied walking downtown
- [ ] I am concerned about potential criminal activity
- [ ] I am concerned about traffic dangers
- [ ] I am concerned about conditions of sidewalks (uneven, cracked, obstructions, etc.)
- [ ] I am concerned about conditions of crosswalks
- [ ] Other (please specify)

10. Do you obey pedestrian safety rules?

- ( ) I always cross at crosswalks, wait for pedestrian signal to walk, and follow other pedestrian rules
- ( ) I typically cross at crosswalks, wait for pedestrian signal to walk, and follow other pedestrian rules
- ( ) I sometimes cross at crosswalks, wait for pedestrian signal to walk, and follow other pedestrian rules
- ( ) No, it is too inconvenient for me to follow pedestrian safety rules
- ( ) I do not have a good understanding on pedestrian safety rules

11. Do you find walking downtown as a pleasant experience?

- ( ) Yes
- ( ) Maybe
- ( ) No

12. If no, why? (Choose all that apply)

- [ ] Too loud
- [ ] Not enough separation from traffic
- [ ] Not visually appealing
- [ ] Often not sure where to go/ lack of pedestrian wayfinding signs
- [ ] Not enough lighting at night
- [ ] Difficult and time consuming to cross streets
- [ ] Other (please specify)

13. Do you feel there are enough pedestrian amenities downtown (benches, trash receptacles, lighting, landscaping, etc.)

- ( ) Yes
- ( ) Maybe, it's okay needs some improvement
- ( ) No, in serious need of improvement

Suggestions for other pedestrian amenities.

14. Do you usually take the fastest route when walking to/from your residence to downtown or around downtown?

- ( ) Yes
- ( ) No
- ( ) Not sure

Comments

15. What are the reasons you take alternative/longer routes? (Choose all that apply)

- [ ] Feels safer
- [ ] Prettier
- [ ] Recreational purposes
- [ ] Easier terrain (less hills)
- [ ] Sidewalks and crosswalks in better condition
- [ ] Other (please specify)

16. Would you walk downtown if there were more events, attractions, or destinations downtown to walk to?

- ◯ Yes
- ◯ Maybe, depends on what it is.
- ◯ No

17. What are the attractions/events/destinations that would encourage you to walk to and/or around downtown?

18. Would you participate in walking programs?

- ◯ Yes
- ◯ Maybe
- ◯ No

19. How important do you think the following improvements would be in supporting walking in downtown Sandy?

	Very important	Somewhat important	Not important	Not sure
More sidewalks	○	○	○	○
Improved sidewalks	○	○	○	○
More connecting sidewalks (along same side of the road) between residential neighborhoods and downtown	○	○	○	○
Better intersections (pedestrian signals, crosswalks)	○	○	○	○
Better street lighting	○	○	○	○
More separation from vehicle traffic	○	○	○	○
Reduced vehicle speed	○	○	○	○
Education/ enforcement for motorists, pedestrians, and bicyclists	○	○	○	○
More downtown events (art fairs, music, etc.)	○	○	○	○
Walking groups	○	○	○	○
Beautification of surroundings	○	○	○	○
Other (specify below)	○	○	○	○

Other/ Comments

20. Choose your top 3 priorities for walkability improvements.

	1st Priority	2nd Priority	3rd Priority
More sidewalks	○	○	○
Improved sidewalks	○	○	○
More connecting sidewalks (along same side of the road) between residential neighborhoods and downtown	○	○	○
Better intersections	○	○	○
Better street lighting	○	○	○
More separation from vehicle traffic	○	○	○
Reduced vehicle traffic	○	○	○
Education/enforcement for motorists, pedestrians, & bicyclists	○	○	○
More downtown events	○	○	○
Walking programs	○	○	○
Beautification of surroundings	○	○	○
Other (specify below)	○	○	○

Other/ Comments

21. Do you have any other comments you would like to share related to downtown walkability?

22. What is your age?

- 17 or younger
- 18-20
- 21-29
- 30-39
- 40-49
- 50-59
- 60 or older

23. What is your gender?

- Female
- Male
- I choose not to answer.

24. Please describe your race/ethnicity.

25. About how long have you lived in Sandy?

Years

26. Please provide your email below if you would like to receive email updates on the Downtown Walkability Assessment.

27. If the City of Sandy was to create a bicycle plan would you be interested in participating?

- Yes
- Maybe
- No

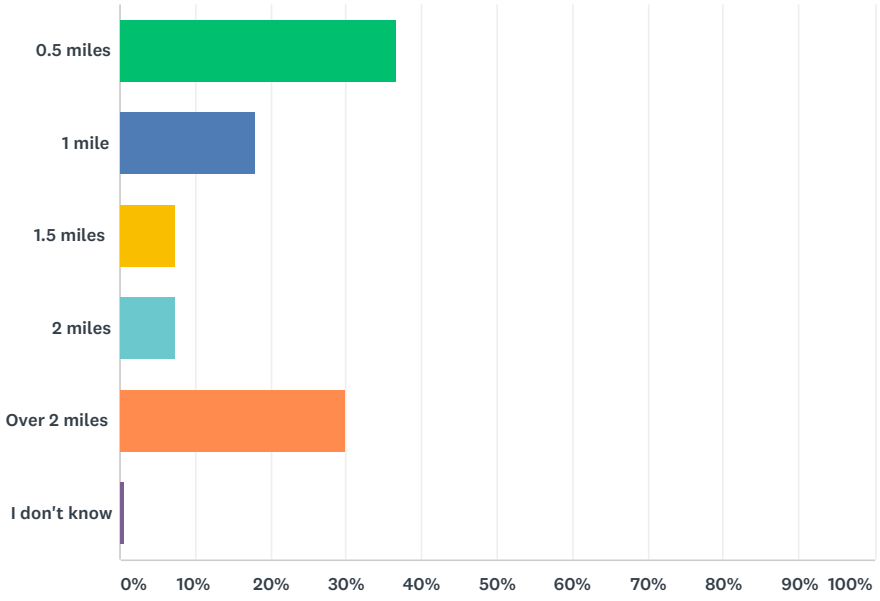
Comments

Use this link to be directed to the Pleasant Street Master Plan Survey - https://www.surveymonkey.com/r/pleasantstmp

Appendix B: Downtown Walkability Survey Responses

Q1 Approximately how far do you live from downtown Sandy?

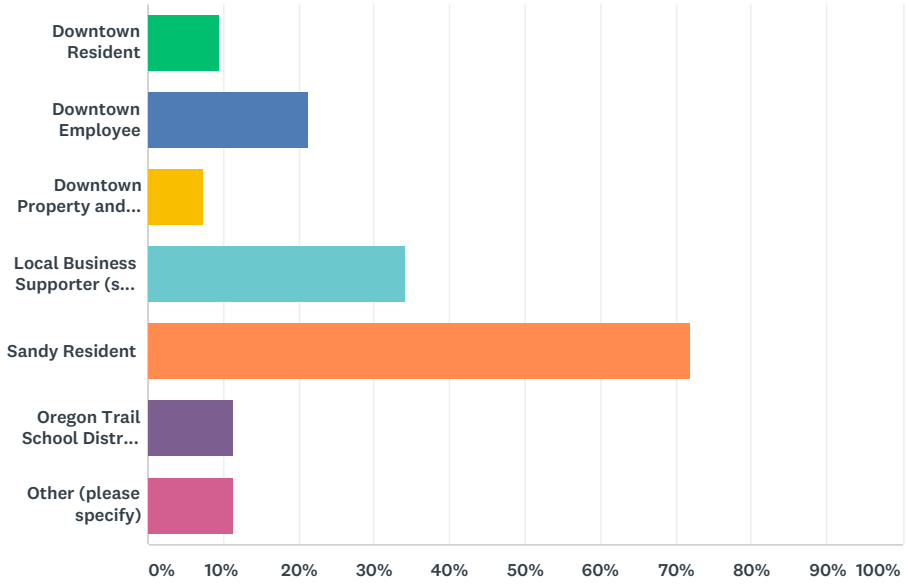
Answered: 150 Skipped: 0



ANSWER CHOICES	RESPONSES	
0.5 miles	36.67%	55
1 mile	18.00%	27
1.5 miles	7.33%	11
2 miles	7.33%	11
Over 2 miles	30.00%	45
I don't know	0.67%	1
TOTAL		150

Q2 What is your relationship to downtown Sandy? (Choose all that apply)

Answered: 150 Skipped: 0



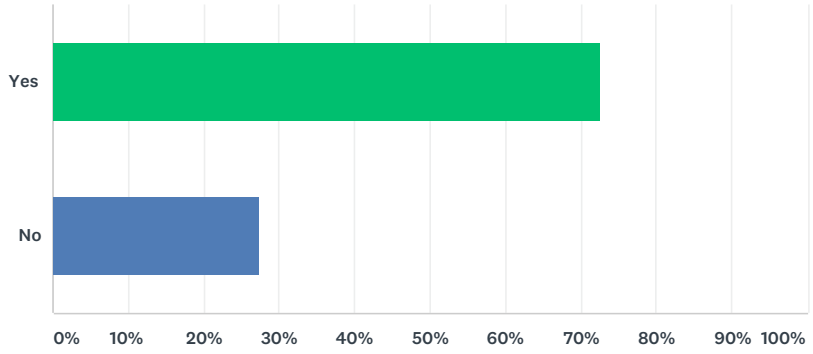
ANSWER CHOICES	RESPONSES	
Downtown Resident	9.33%	14
Downtown Employee	21.33%	32
Downtown Property and/or Business Owner	7.33%	11
Local Business Supporter (shop downtown)	34.00%	51
Sandy Resident	72.00%	108
Oregon Trail School District Student	11.33%	17
Other (please specify)	11.33%	17
Total Respondents: 150		

#	OTHER (PLEASE SPECIFY)	DATE
1	Builder	3/13/2018 10:28 AM
2	son lives there	2/27/2018 2:01 PM
3	Small business owner	2/23/2018 9:57 AM
4	City employee	2/8/2018 5:06 PM
5	City of Sandy Transit Employee	2/8/2018 10:28 AM
6	Former business owner.	2/6/2018 7:50 PM
7	Sandy Fire District No. 72	2/6/2018 6:22 PM
8	visit often	2/6/2018 5:37 PM
9	Parent of OTSD students	2/6/2018 4:50 PM

10	Rent room in house, landlord-roommate is property owner	2/6/2018 4:28 PM
11	Local Realtor for over 15 years , Chamber pres 2010, Main Street Sandy involved	2/5/2018 12:24 PM
12	Swim at the Maverick Aquatics	2/4/2018 5:03 PM
13	The pool aerobics, shopping, stopping for coffe	2/4/2018 9:32 AM
14	Wife works downtown Sandy, we live in the wider Sandy area	2/4/2018 9:15 AM
15	Greater sandy area	2/1/2018 9:04 PM
16	Frequent customer and community member	2/1/2018 8:20 PM
17	Live in Boring, teach at SHS	1/29/2018 1:05 PM

Q3 Do you walk to and/or around downtown Sandy?

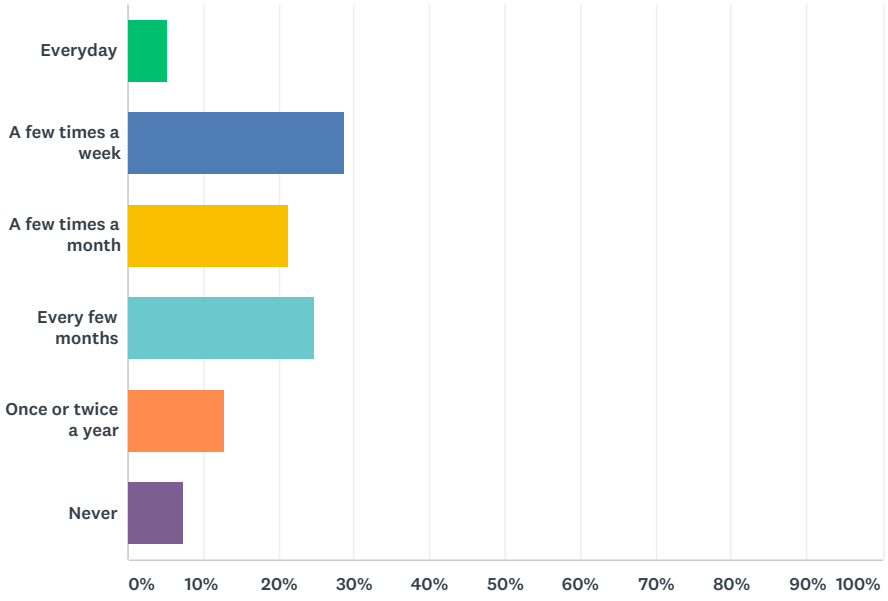
Answered: 150 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	72.67%	109
No	27.33%	41
TOTAL		150

Q4 How often do you walk to or around downtown?

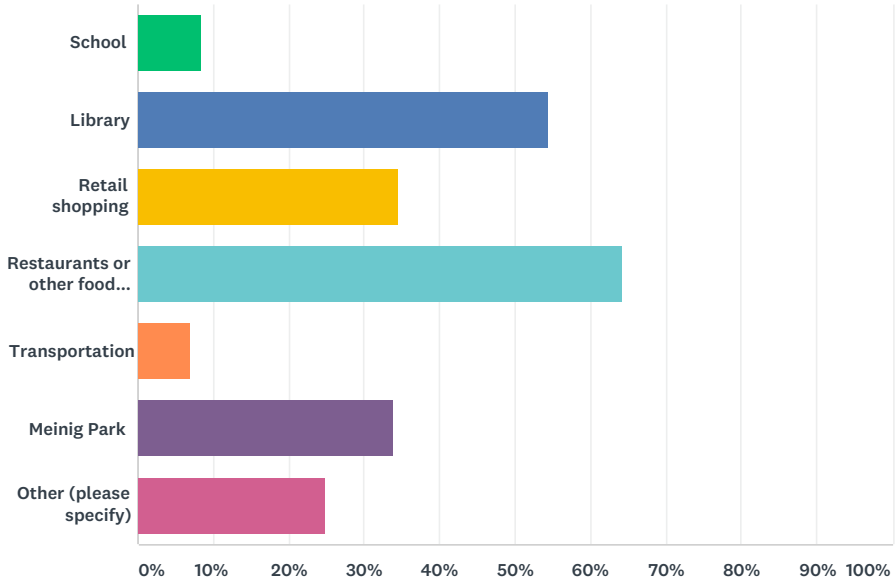
Answered: 150 Skipped: 0



ANSWER CHOICES	RESPONSES	
Everyday	5.33%	8
A few times a week	28.67%	43
A few times a month	21.33%	32
Every few months	24.67%	37
Once or twice a year	12.67%	19
Never	7.33%	11
TOTAL		150

Q5 Where do you walk to? (Choose all that apply)

Answered: 145 Skipped: 5



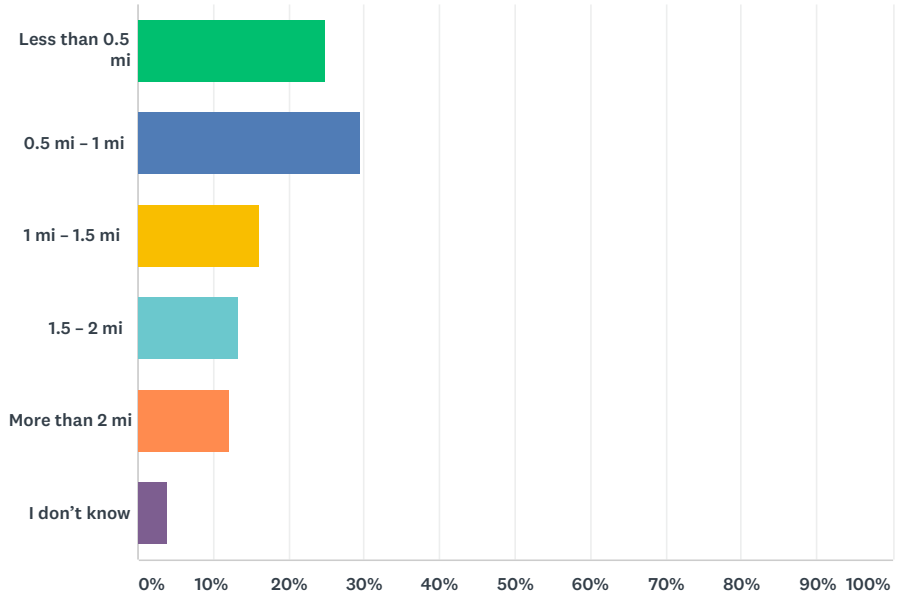
ANSWER CHOICES	RESPONSES	
School	8.28%	12
Library	54.48%	79
Retail shopping	34.48%	50
Restaurants or other food services	64.14%	93
Transportation	6.90%	10
Meinig Park	33.79%	49
Other (please specify)	24.83%	36
Total Respondents: 145		

#	OTHER (PLEASE SPECIFY)	DATE
1	n	3/27/2018 11:27 AM
2	sandy aqautic center & sandy community center	3/27/2018 11:26 AM
3	senior center/action center/ st. Michael's church	3/27/2018 11:20 AM
4	Tickles Creek Trail	3/27/2018 11:19 AM
5	occasionally First Friday	3/19/2018 1:17 PM
6	I use the trail to run on	3/13/2018 10:28 AM
7	trails	2/27/2018 2:01 PM
8	Banks	2/27/2018 10:52 AM
9	work	2/23/2018 9:57 AM

10	Work	2/22/2018 10:38 AM
11	parade and festival	2/22/2018 10:07 AM
12	US Bank	2/21/2018 12:14 PM
13	Other businesses, work	2/19/2018 5:23 AM
14	Neighborhood exercize	2/15/2018 12:58 PM
15	Only Mountain Days.	2/14/2018 12:55 PM
16	Dont walk in town	2/11/2018 9:48 PM
17	Sandy Pool	2/8/2018 6:43 PM
18	bank	2/8/2018 12:44 PM
19	Walking for exercise	2/8/2018 10:28 AM
20	Run around town	2/8/2018 5:15 AM
21	I walk from home into town sometimes, but I don't like the area of the highway, I generally stay to the north of 26 and then turn around.	2/7/2018 7:10 PM
22	site visits for work	2/7/2018 9:55 AM
23	Walk dogs daily	2/7/2018 8:58 AM
24	Walk to exercise	2/6/2018 10:28 PM
25	Daily walk -exercise	2/6/2018 8:20 PM
26	Walk perimeter with my dog for exercise	2/6/2018 7:45 PM
27	None	2/6/2018 5:47 PM
28	Really aren't that many great eating establishments or interesting shops.	2/6/2018 5:40 PM
29	Tickle creek trail and surrounding parks	2/6/2018 5:35 PM
30	Work, and just going for walks on breaks	2/6/2018 4:50 PM
31	Live outside city limits	2/4/2018 5:03 PM
32	Counseling	2/4/2018 3:59 PM
33	Offices	2/2/2018 11:46 AM
34	exercise	2/1/2018 9:24 PM
35	Within the older part of downtown. Fire station to museum if the sun shines.	2/1/2018 5:57 PM
36	I’m a runner, so mostly run through and around town	2/1/2018 5:41 PM

Q6 How far do you usually walk?

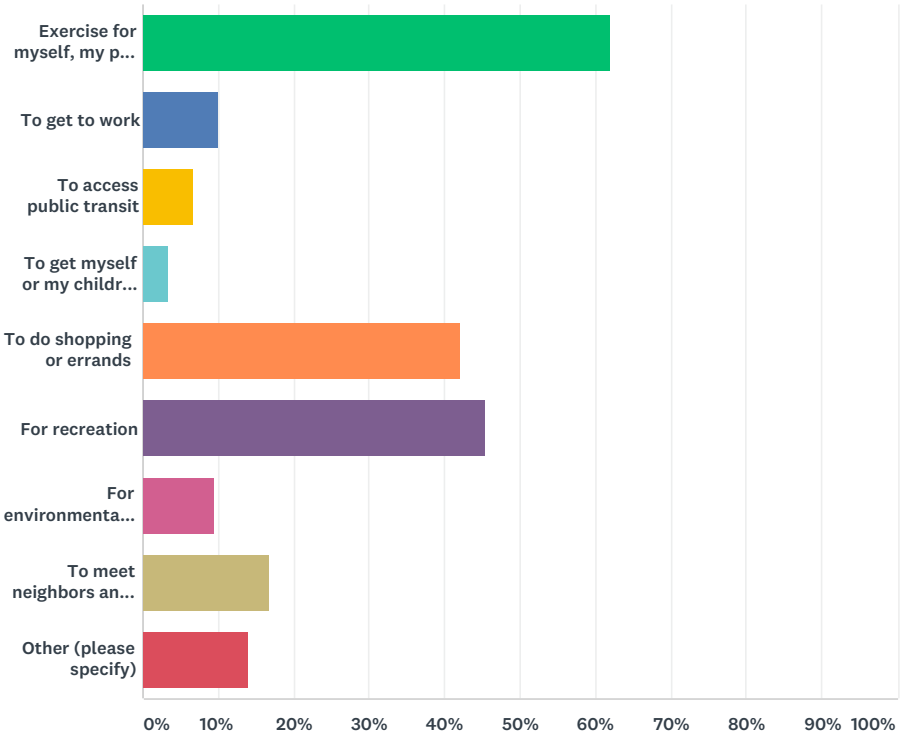
Answered: 149 Skipped: 1



ANSWER CHOICES	RESPONSES	
Less than 0.5 mi	24.83%	37
0.5 mi – 1 mi	29.53%	44
1 mi – 1.5 mi	16.11%	24
1.5 – 2 mi	13.42%	20
More than 2 mi	12.08%	18
I don't know	4.03%	6
TOTAL		149

Q7 Why do you walk? (Choose all that apply)

Answered: 150 Skipped: 0



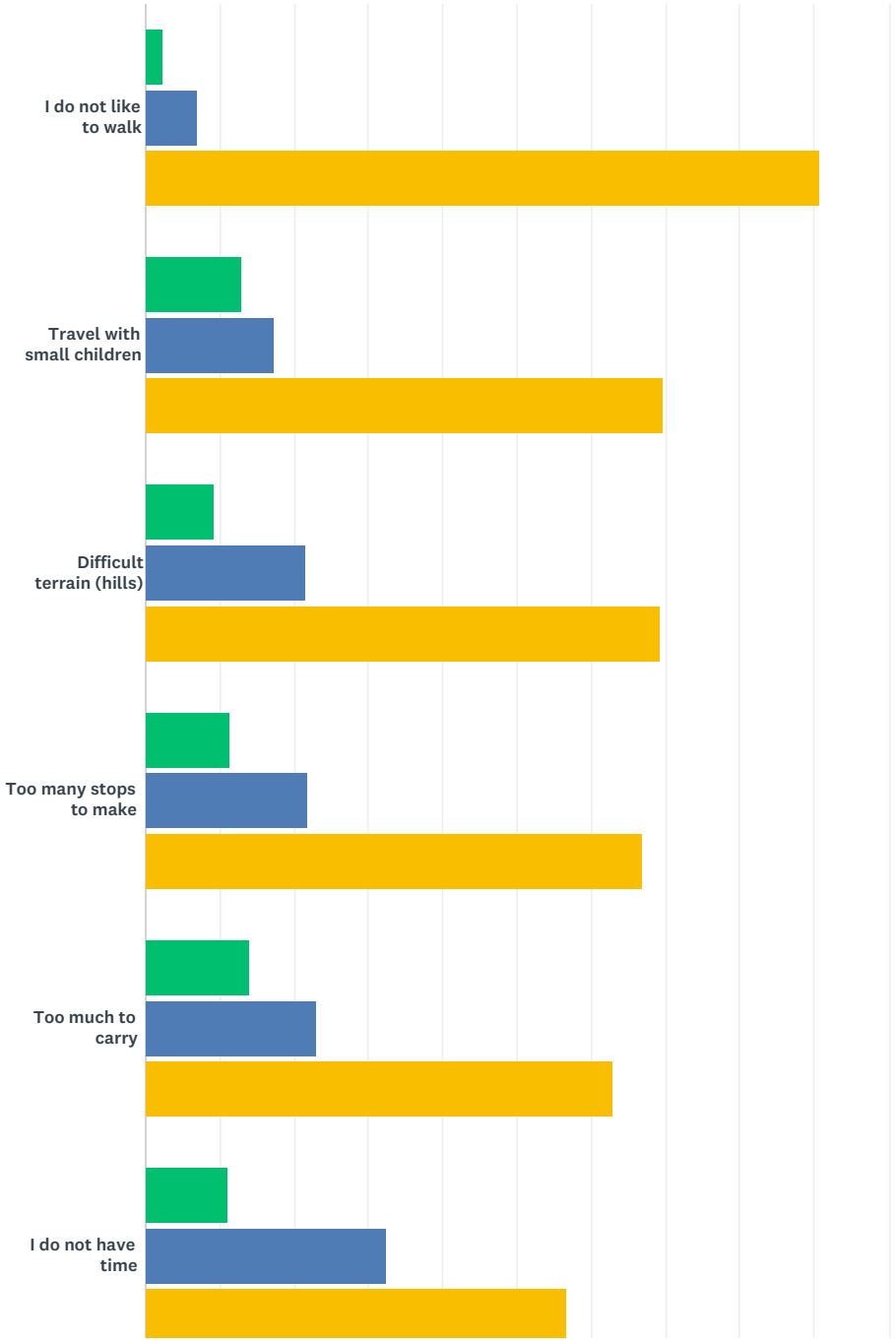
ANSWER CHOICES	RESPONSES	
Exercise for myself, my pet or my children	62.00%	93
To get to work	10.00%	15
To access public transit	6.67%	10
To get myself or my children to school	3.33%	5
To do shopping or errands	42.00%	63
For recreation	45.33%	68
For environmental considerations	9.33%	14
To meet neighbors and get to know my community better	16.67%	25
Other (please specify)	14.00%	21
Total Respondents: 150		

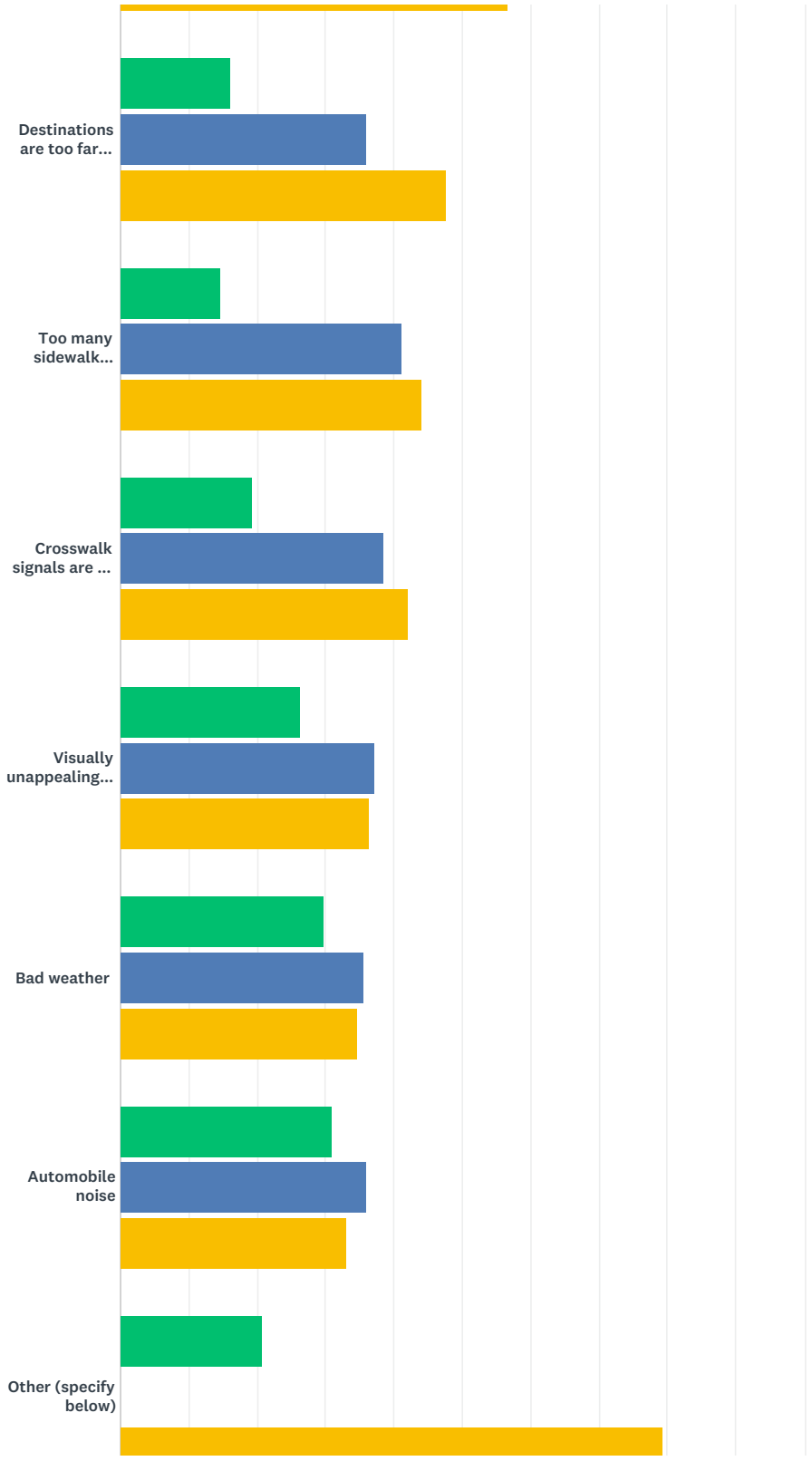
#	OTHER (PLEASE SPECIFY)	DATE
1	na	3/27/2018 11:26 AM
2	n/a	3/27/2018 11:23 AM

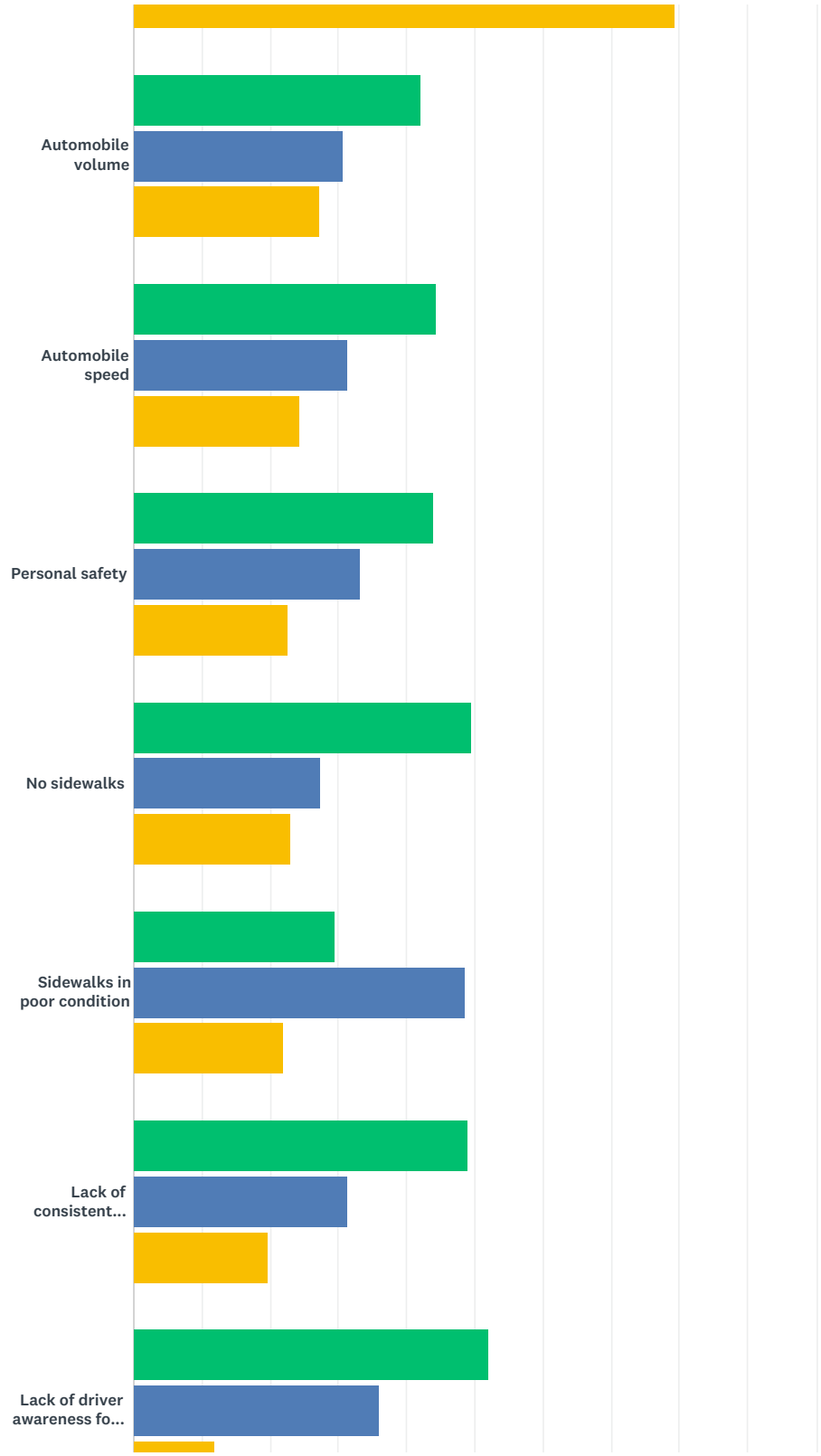
3	interacting w/ downtown businesses is a part of my job	3/27/2018 11:14 AM
4	special events	3/19/2018 1:17 PM
5	See the awesome beauty of the creek!	3/13/2018 10:28 AM
6	special events	2/22/2018 10:07 AM
7	the street layout wastes gas and time. Walking is faster. Really! This is because of how the streets are laid out and the signals work.	2/16/2018 7:15 AM
8	Only during Mountain Days, downtown is not walk friendly with 26 through the middle.	2/14/2018 12:55 PM
9	I walk from where I park to the store or establishment I am going to, i.e. Beer Den, Library, CCB, etc.	2/12/2018 3:29 PM
10	HAVE LUNCH DURING WORK	2/11/2018 9:11 PM
11	for lunch	2/8/2018 12:44 PM
12	Events	2/8/2018 5:15 AM
13	lunch break, get out of the office	2/7/2018 8:56 AM
14	Get lunch	2/6/2018 7:57 PM
15	Food!	2/6/2018 4:28 PM
16	First Friday	2/5/2018 4:08 PM
17	I don't walk downtown	2/2/2018 4:42 PM
18	To get food at lunch	2/2/2018 2:24 PM
19	easier than trying to find parking	2/2/2018 7:34 AM
20	Sometimes it's the most logical choice.	2/1/2018 8:20 PM
21	Store to store	1/29/2018 1:05 PM

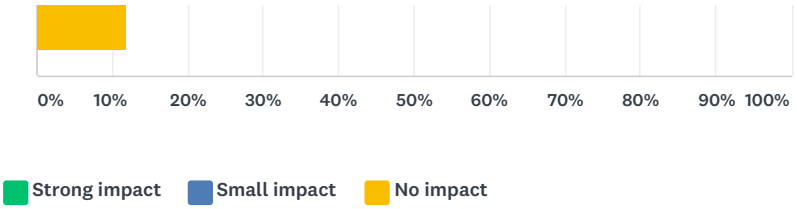
Q8 Which of the following factors have a negative impact on your decision to walk downtown? For those that do have an impact, how much of an impact do they have?

Answered: 147 Skipped: 3




Destinations are too far...
Too many sidewalk...
Crosswalk signals are ...
Visually unappealing...
Bad weather
Automobile noise
Other (specify below)


Automobile volume
Automobile speed
Personal safety
No sidewalks
Sidewalks in poor condition
Lack of consistent...
Lack of driver awareness fo...

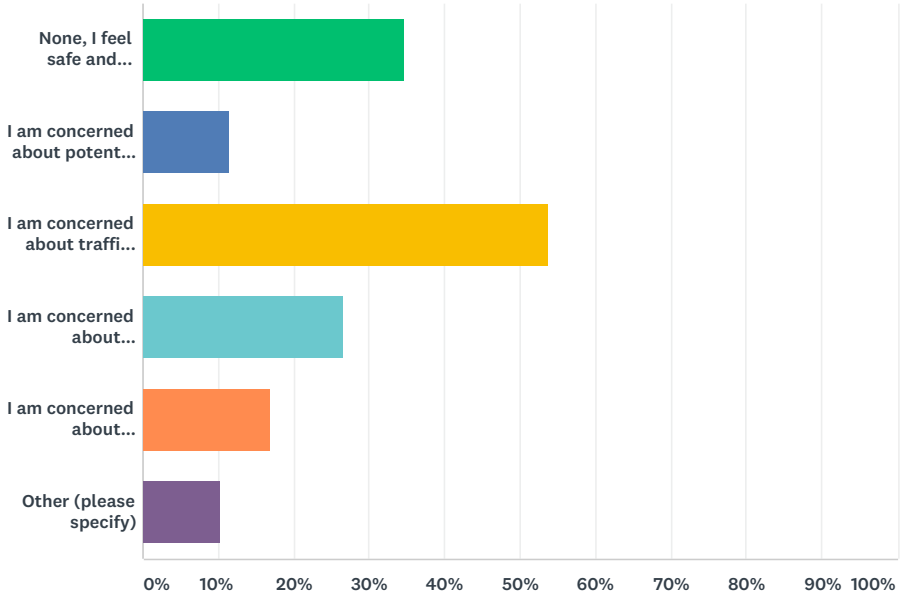


	STRONG IMPACT	SMALL IMPACT	NO IMPACT	TOTAL
I do not like to walk	2.29% 3	6.87% 9	90.84% 119	131
Travel with small children	12.88% 17	17.42% 23	69.70% 92	132
Difficult terrain (hills)	9.23% 12	21.54% 28	69.23% 90	130
Too many stops to make	11.28% 15	21.80% 29	66.92% 89	133
Too much to carry	14.07% 19	22.96% 31	62.96% 85	135
I do not have time	11.03% 15	32.35% 44	56.62% 77	136
Destinations are too far away	16.18% 22	36.03% 49	47.79% 65	136
Too many sidewalk obstructions (utility boxes, light poles, etc.)	14.71% 20	41.18% 56	44.12% 60	136
Crosswalk signals are too long	19.29% 27	38.57% 54	42.14% 59	140
Visually unappealing surroundings	26.28% 36	37.23% 51	36.50% 50	137
Bad weather	29.71% 41	35.51% 49	34.78% 48	138
Automobile noise	30.99% 44	35.92% 51	33.10% 47	142
Other (specify below)	20.75% 11	0.00% 0	79.25% 42	53
Automobile volume	42.14% 59	30.71% 43	27.14% 38	140
Automobile speed	44.29% 62	31.43% 44	24.29% 34	140
Personal safety	43.97% 62	33.33% 47	22.70% 32	141
No sidewalks	49.63% 67	27.41% 37	22.96% 31	135
Sidewalks in poor condition	29.41% 40	48.53% 66	22.06% 30	136
Lack of consistent sidewalks along same side of the road	48.91% 67	31.39% 43	19.71% 27	137
Lack of driver awareness for pedestrians	52.11% 74	35.92% 51	11.97% 17	142

#	OTHER (PLEASE SPECIFY)	DATE
1	lack of sidewalks between my neighborhood and downtown sandy	3/27/2018 11:14 AM
2	lack of appealing destinations	3/19/2018 1:17 PM
3	I don’t not walk sandy to do any shopping because it is too spread out, I live out of town. But I come in to run the trail and up around to Fred Meyer then through the business/commercial side street then up beside ford/check car dealers, the business road does not have sidewalks all the way through frustrating for me and CrossFit people that use that road and neither does Ruben road	3/13/2018 10:28 AM
4	Crosswalk signals don't give enough time	2/23/2018 11:26 AM
5	there really aren't enough places to stop and walk to, the ones that I'd want to walk to aren't close together	2/22/2018 10:07 AM
6	I would like to see a consistent and safe sidewalk down 211 from Sandy to Arletha Ct with all the new homes.	2/14/2018 12:55 PM
7	I walk in Sandy but not in town	2/11/2018 9:48 PM
8	Exhaust and other pollution from vehicles, especially diesel fumes.	2/10/2018 6:12 PM
9	Cross walks are a pain	2/9/2018 5:07 PM
10	snow and Ice is an issue in the winter	2/8/2018 4:48 PM
11	Sandy need to outlaw EXHAUST brakes in the City Limits. We like 2000 feet from H26 and we hear them when we are inside of our house. This is one simple action the City Council can take. Exhaust brakes are not allowed in all of Mult. County so why no in a town like Sandy?	2/8/2018 12:46 PM
12	parking along both pioneer and proctor obstructs sight of oncoming traffic. The highway itself is a giant negative	2/8/2018 10:04 AM
13	Poor sidewalk and street lighting!	2/7/2018 8:36 PM
14	I grew up in the country and have walked all kinds of environments and terrain	2/7/2018 8:58 AM
15	You risk your life walking in Sandy!	2/7/2018 5:46 AM
16	Our own police department does not follow the pedestrian laws why should others. When we contacted them about enforcement we we're told there is no money in the budget. Just because there is no money to enforce it doesn't mean our own force can't follow it.	2/6/2018 5:47 PM
17	compared to alot of palces Sandy is very walkable..it's not parkable as in poor parking for cars and business	2/6/2018 5:37 PM
18	There isn’t much downtown	2/6/2018 5:23 PM
19	distance between the stores/restaurants	2/5/2018 12:24 PM
20	I am unable to walk a long distance.	2/4/2018 10:20 AM
21	I have no reason to walk downtown. The places I would go are not in close proximity to one another.	2/2/2018 4:42 PM
22	Drivers cant see when there is a pedestiran waiting. we neeed those flsing pedestrian lights at the cross walks.	2/2/2018 11:46 AM
23	Rusty mailboxes that clearly aren’t used. Ever. And unlit sidewalks that are super uneven.	2/1/2018 9:45 PM
24	Retail and food spread too far	2/1/2018 9:04 PM
25	not enough courtyards, green spaces, outdoor eaterys	2/1/2018 6:37 PM
26	If you walk from east to west it's not bad, however I have to walk back 2% grade	2/1/2018 5:57 PM

Q9 What safety concerns do you have about walking downtown? (Choose all that apply)

Answered: 147 Skipped: 3



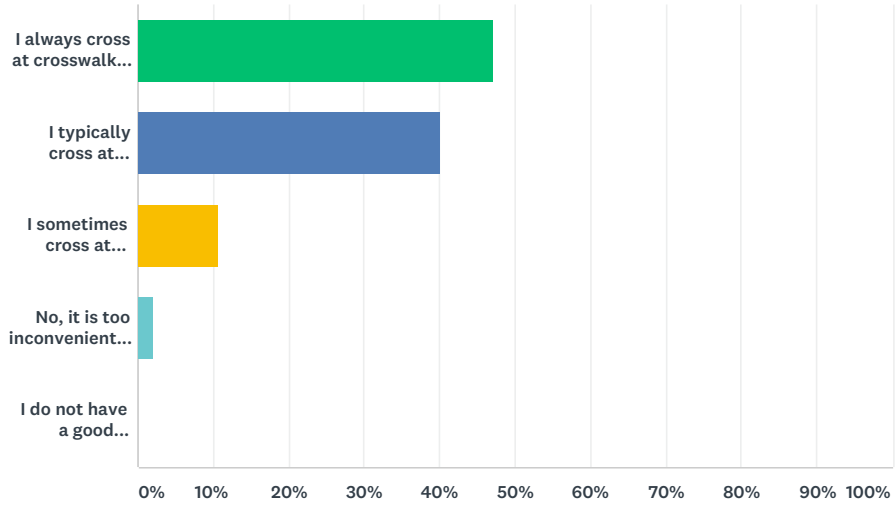
ANSWER CHOICES	RESPONSES	
None, I feel safe and satisfied walking downtown	34.69%	51
I am concerned about potential criminal activity	11.56%	17
I am concerned about traffic dangers	53.74%	79
I am concerned about conditions of sidewalks (uneven, cracked, obstructions, etc.)	26.53%	39
I am concerned about conditions of crosswalks	17.01%	25
Other (please specify)	10.20%	15
Total Respondents: 147		

#	OTHER (PLEASE SPECIFY)	DATE
1	Just having sidewalks, it would be great to have a sidewalk from dubarko to the donut shop on 211. People walk that almost every day and it's scary sometimes.	3/13/2018 10:28 AM
2	There are many, many more cars now. They speed and disobey our laws. You cannot pull out onto the main roadways without waiting for a red light to stop the massive flow of cars. THANKS for the changes!	2/23/2018 9:57 AM
3	Signals at library create pedestrian and vehicle danger. Flashing pedestrian signal preferred.	2/15/2018 12:58 PM
4	Pollution and noise.	2/10/2018 6:12 PM
5	congestion and traffic volume blind spots and speed	2/8/2018 4:48 PM
6	poor lighting at night, too far between crosswalks	2/8/2018 12:44 PM

7	Lack of consistent sidewalks is HUGE! As well as obstructions/ overgrowth. Have a stroller. Makes it very challenging	2/8/2018 5:15 AM
8	Traffic dangers only, I feel very safe walking in Sandy.	2/7/2018 7:10 PM
9	criminal activity, traffic dangers, sidewalk conditions and crosswalk conditions	2/7/2018 8:56 AM
10	Traffic NOISE and speed is most unpleasant. Breathing the fumes is gross.	2/7/2018 5:46 AM
11	The traffic speed needs to be addressed. It is very rare to see cars actually travelling the speed limit of 25 mph	2/7/2018 3:28 AM
12	The homeless are starting to make their way here.	2/6/2018 7:39 PM
13	Nothing attracts me to walk there	2/6/2018 5:35 PM
14	They cant see when we are waitng to walk.	2/2/2018 11:46 AM
15	Auto speed and running red lights	2/2/2018 8:05 AM

Q10 Do you obey pedestrian safety rules?

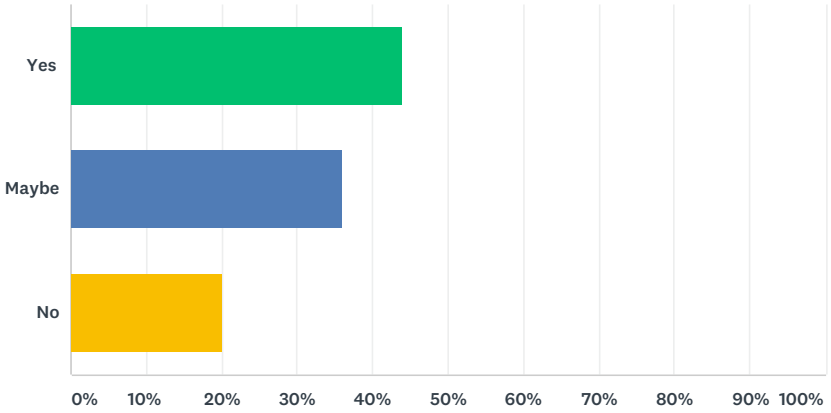
Answered: 149 Skipped: 1



ANSWER CHOICES	RESPONSES	
I always cross at crosswalks, wait for pedestrian signal to walk, and follow other pedestrian rules	46.98%	70
I typically cross at crosswalks, wait for pedestrian signal to walk, and follow other pedestrian rules	40.27%	60
I sometimes cross at crosswalks, wait for pedestrian signal to walk, and follow other pedestrian rules	10.74%	16
No, it is too inconvenient for me to follow pedestrian safety rules	2.01%	3
I do not have a good understanding on pedestrian safety rules	0.00%	0
TOTAL		149

Q11 Do you find walking downtown as a pleasant experience?

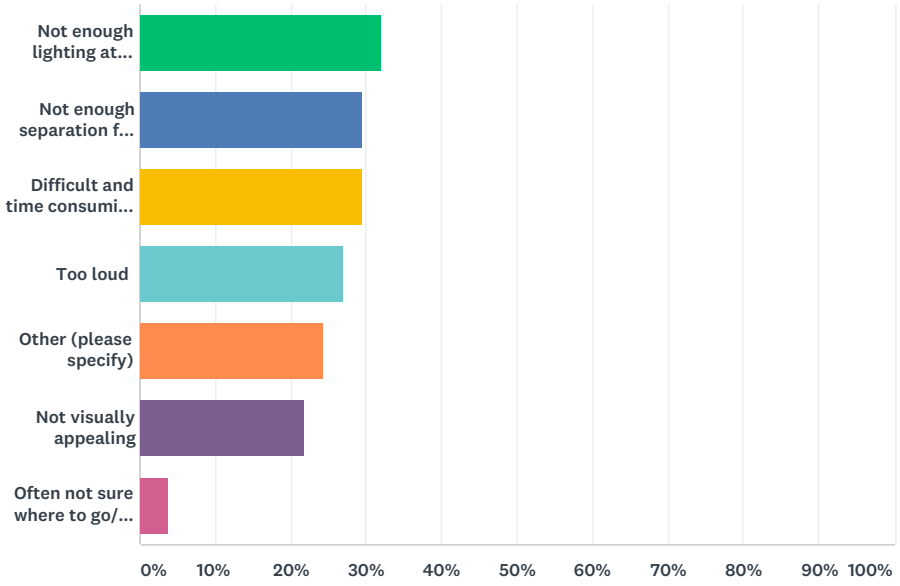
Answered: 150 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	44.00%	66
Maybe	36.00%	54
No	20.00%	30
TOTAL		150

Q12 If no, why? (Choose all that apply)

Answered: 78 Skipped: 72



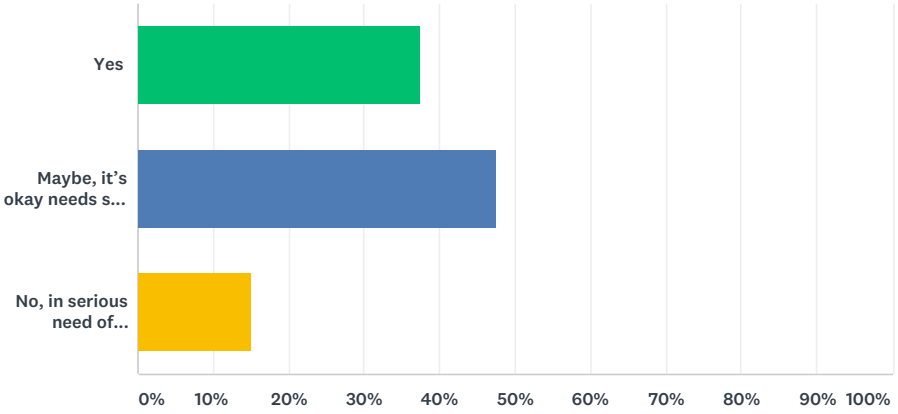
ANSWER CHOICES	RESPONSES	
Not enough lighting at night	32.05%	25
Not enough separation from traffic	29.49%	23
Difficult and time consuming to cross streets	29.49%	23
Too loud	26.92%	21
Other (please specify)	24.36%	19
Not visually appealing	21.79%	17
Often not sure where to go/ lack of pedestrian wayfinding signs	3.85%	3
Total Respondents: 78		

#	OTHER (PLEASE SPECIFY)	DATE
1	weather conditions, bus availability	3/27/2018 11:20 AM
2	Walking to Downtown is fine until I get here - then it's loud and fast	2/22/2018 12:42 PM
3	Traffic comes too fast! Drivers are in a hurry too many times.	2/16/2018 7:19 AM
4	walk away from town	2/11/2018 9:50 PM
5	Pollution from vehicles	2/10/2018 6:16 PM
6	Let's face it... there really isn't THAT much in downtown Sandy worth walking all around for. There are those 1 or 2 spots you go to and that is it...	2/8/2018 9:55 PM
7	I can’t see the question so I can’t answer this	2/8/2018 7:09 PM
8	None	2/8/2018 12:48 PM

9	Consistent sidewalks/ obstructions using stroller	2/8/2018 5:15 AM
10	NA	2/7/2018 10:26 AM
11	I haven't really walked at night, but while driving the lighting seems a little sparse, but I'd have to really pay attn for proper input	2/7/2018 9:01 AM
12	No Lighting on Pioneer Blvd. like has been installed on Proctor Blvd.	2/6/2018 6:26 PM
13	No problems	2/6/2018 5:12 PM
14	No family friendly destinations other than library. Too many bars and head shops.	2/6/2018 4:51 PM
15	Why what? I don't understand the question.	2/6/2018 4:29 PM
16	The main roads have stores that are closed and not being used as store fronts	2/5/2018 12:35 PM
17	I am physically unable to walk very far.	2/4/2018 10:22 AM
18	Cars stoop fast or dont stop when your trying to cross.	2/2/2018 11:47 AM
19	Not enough appealing destinations.	2/1/2018 10:23 PM

Q13 Do you feel there are enough pedestrian amenities downtown (benches, trash receptacles, lighting, landscaping, etc.)

Answered: 139 Skipped: 11



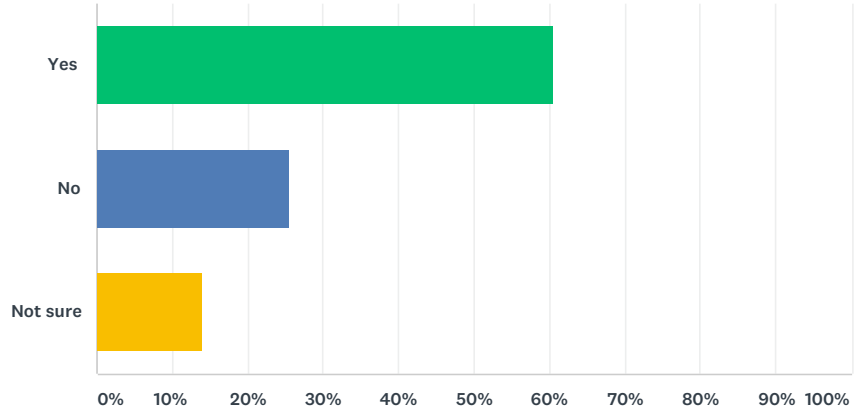
ANSWER CHOICES	RESPONSES	
Yes	37.41%	52
Maybe, it's okay needs some improvement	47.48%	66
No, in serious need of improvement	15.11%	21
TOTAL		139

#	SUGGESTIONS FOR OTHER PEDESTRIAN AMENITIES.	DATE
1	Replace bench in bus shelter by senior center	3/27/2018 11:20 AM
2	garbage cans that get emptied regularly	2/28/2018 5:34 PM
3	More trash cans by the Library (often overflowing)	2/27/2018 2:22 PM
4	Need more benches and trash recepticles	2/23/2018 11:26 AM
5	Extending trash receptacles along Proctor east and west from where they are now would be nice, but not urgent The biggest issues is lighting. Frankly, after the sun goes down, especially in the wet, dreary months Sandy looks like a bad Hollywoord stereotype of a deserted city. The lighting even on Proctor isn't very bright, and is more brown than anything, which just makes it seem darker and more deserted. More, brighter, and "whiter" lighting would help a lot I spent a lot of time walking along Proctor after dark, especially in the winter months since the sun goes down so early, and it is noticeable	2/19/2018 5:29 AM
6	Permanently close the street between Clackamas County Bank and Leathers. It serves no purpose and is out of alignment. Cheaper to just close this street!	2/16/2018 7:19 AM
7	Landscaping between sidewalks and traffic. maybe some art, and more trash cans. Some of the sidewalks are in rough shape as well.	2/15/2018 12:57 PM
8	It seems ridiculous to have benches alongside Proctor or Pioneer, where traffic is nearly nonstop. Better to place them in areas away from traffic.	2/10/2018 6:16 PM
9	needs blinking cross walks indicators need more/some green spaces	2/8/2018 4:50 PM
10	lighting, crosswalks, benches are good, love the flower pots and hanging baskets in the summer	2/8/2018 12:46 PM
11	More trash cans	2/7/2018 11:59 PM

12	More trash cans if they get emptied regularly.	2/7/2018 7:11 PM
13	More recycling options	2/7/2018 6:47 PM
14	Needs much more landscaping, benches that don't face Highway 26, leave the Christmas lights up longer, incorporate more art or other visually appealing street furniture, potted plants, etc.	2/7/2018 9:57 AM
15	Maybe more trash receptacles.... ppl who litter REALLY upset me, I grew up here and find myself picking up garbage.. not sure if it would help, but hopefully it would because ppl are just lazy and disrespectful nowadays. It's sad	2/7/2018 9:01 AM
16	There is lots of this but no one would want to use these due to the unpleasant and unhealthy traffic thundering past, you will notice these things go unused and could be reused in a nicer location away from the highway.	2/7/2018 5:50 AM
17	There should be more benches	2/7/2018 3:29 AM
18	Better lighting and emergency call boxes would be nice	2/6/2018 5:48 PM
19	Lighting	2/6/2018 5:36 PM
20	Love the flowers every year and the banners	2/5/2018 12:35 PM
21	lighting is poor, obstructions, trash is overflowing in many cans. No recycling options.	2/1/2018 9:25 PM
22	Trash cans sometimes are overflowing. Would be nice to have more trees and natural plantings, and downtown parks.	2/1/2018 6:27 PM

Q14 Do you usually take the fastest route when walking to/from your residence to downtown or around downtown?

Answered: 129 Skipped: 21



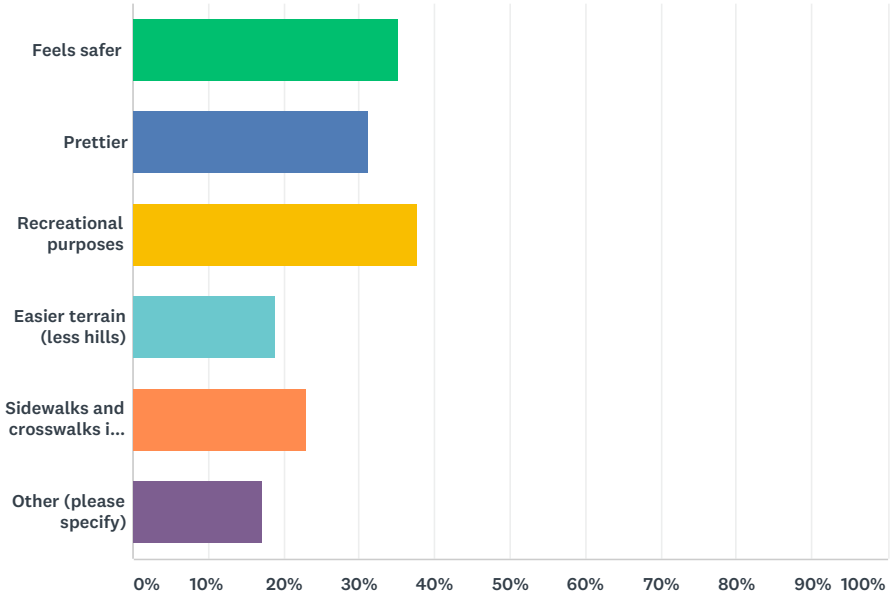
ANSWER CHOICES	RESPONSES	
Yes	60.47%	78
No	25.58%	33
Not sure	13.95%	18
TOTAL		129

#	COMMENTS	DATE
1	i live far away, dont walk downtown	3/27/2018 11:37 AM
2	Most times, yes	2/23/2018 9:57 AM
3	N/A	2/22/2018 10:08 AM
4	Fastest, or at least most direct	2/19/2018 5:29 AM
5	I walk through Meining Park since it's a time saver. I wish the park had more lighting though.	2/16/2018 7:19 AM
6	I take the safest route which means routing longer based on sidewalk consistency and availability.	2/14/2018 12:56 PM
7	I don't walk to downtown from my home.	2/12/2018 3:30 PM
8	Try to use pathways, side streets, anywhere away from Proctor and Pioneer.	2/10/2018 6:16 PM
9	I have not spent relaxing time in downtown for many years	2/8/2018 4:50 PM
10	WE take the most direct which may not be the fastest.	2/8/2018 12:48 PM
11	N/A	2/8/2018 12:46 PM
12	Not always. Depends on other factors.	2/7/2018 8:39 PM
13	If I'm tracking mileage I take the long road. If I'm short on time, the short road.	2/7/2018 7:11 PM
14	I would like to take the fastest route from my residence to downtown but there are no sidewalks (on 211), too narrow of a shoulder, and too many speeding cars	2/7/2018 9:57 AM
15	NO, I can not walk in to town even though it is one mile, it would be TOO DANGEROUS. I live on Vista Loop, forty years ago I used to walk in now there is too much and faster highway traffic. Where are our sidewalks to Vista Loop BY THE WAY???	2/7/2018 5:50 AM

16	I don't walk from my home, only from work.	2/6/2018 7:58 PM
17	I also walk for exercise	2/6/2018 4:29 PM
18	Live outside city limits	2/4/2018 5:04 PM
19	I take the safest.	2/1/2018 10:23 PM
20	Sometimes	2/1/2018 7:33 PM

Q15 What are the reasons you take alternative/longer routes? (Choose all that apply)

Answered: 122 Skipped: 28



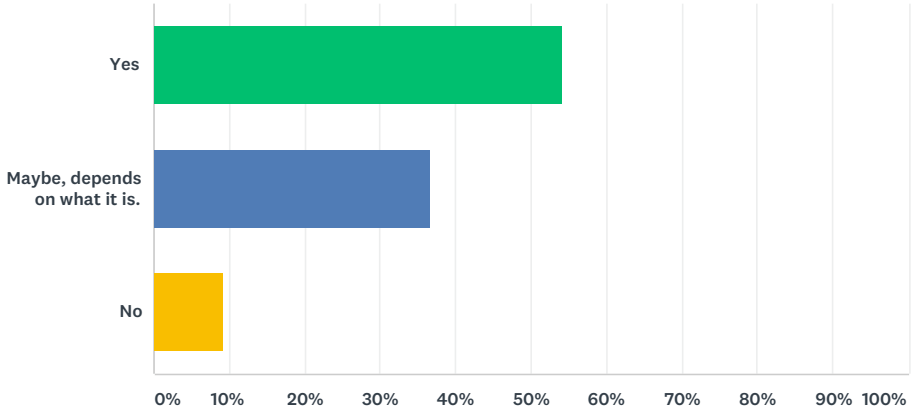
ANSWER CHOICES	RESPONSES	
Feels safer	35.25%	43
Prettier	31.15%	38
Recreational purposes	37.70%	46
Easier terrain (less hills)	18.85%	23
Sidewalks and crosswalks in better condition	22.95%	28
Other (please specify)	17.21%	21
Total Respondents: 122		

#	OTHER (PLEASE SPECIFY)	DATE
1	Running training	3/13/2018 10:29 AM
2	good for health	2/27/2018 2:03 PM
3	N/A	2/22/2018 10:08 AM
4	My wife and I enjoy going through Meinig Park.	2/19/2018 10:10 AM
5	I don't really do this. It's my nature to take a route that is some combination of the fastest or most direct. I'm walking to get somewhere, not walking just to walk	2/19/2018 5:29 AM
6	There is no longer route that is prettier. Walking through Meining Park is prettier than the longer route! Although better lighting in the park will make it feel safer.	2/16/2018 7:19 AM
7	Prefer to walk other than downtown	2/11/2018 9:50 PM

8	Less air pollution, hopefully!!	2/10/2018 6:16 PM
9	Less traffic	2/8/2018 5:48 PM
10	Variety	2/8/2018 12:48 PM
11	quieter, quicker than waiting for crosswalk signals	2/8/2018 12:46 PM
12	Less trash and debris in certain areas going by businesses.	2/7/2018 8:39 PM
13	I would just to change scenery and get in a longer walk	2/7/2018 9:01 AM
14	I would like to walk in Sandy. I used to quite a lot. That was before the traffic became so heavy and fast. The speed of traffic really needs to be addressed!!!	2/7/2018 5:50 AM
15	I take my car. No need to walk for one stop along a very busy very loud highway	2/6/2018 5:37 PM
16	shops and restaurants	2/6/2018 5:02 PM
17	Don't take longer routes.	2/2/2018 2:26 PM
18	Depends if I am with my kids. I would make it easier and safer for them.	2/2/2018 11:33 AM
19	Sometimes Sandy is a parking lot due ro traffic signals and volume taking side roads slow, but sometimes you need to go south to go east!	2/2/2018 8:13 AM
20	Avoid traffic	2/1/2018 9:05 PM
21	I run early in the morning when it’s dark- I stick to the better lit streets	2/1/2018 5:42 PM

Q16 Would you walk downtown if there were more events, attractions, or destinations downtown to walk to?

Answered: 142 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	54.23%	77
Maybe, depends on what it is.	36.62%	52
No	9.15%	13
TOTAL		142

Q17 What are the attractions/events/destinations that would encourage you to walk to and/or around downtown?

Answered: 81 Skipped: 69

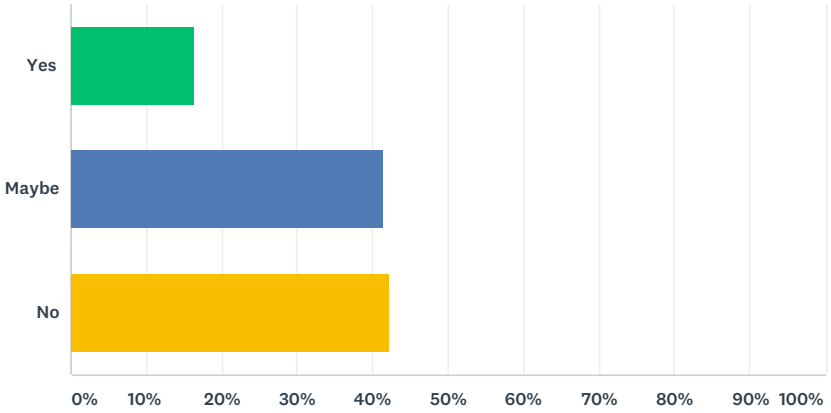
#	RESPONSES	DATE
1	stores, coffee shop, book store	3/27/2018 11:31 AM
2	Sandy Festivals/ entertainment/ amusement park setup	3/27/2018 11:20 AM
3	a new recreation center, more retail & res	3/27/2018 11:15 AM
4	Better restaurants!!!music venue	3/19/2018 1:23 PM
5	having a street that is more pedestrian friendly.	3/3/2018 3:48 PM
6	recreation/ parks	2/27/2018 6:06 PM
7	Open markets	2/27/2018 2:25 PM
8	trails, resturants, parks,etc.	2/27/2018 2:09 PM
9	Farmers market	2/27/2018 10:57 AM
10	walk for exercise	2/23/2018 11:34 AM
11	More retail shops, music	2/23/2018 10:13 AM
12	Anything on the norht side of the highway. Like Pleasant St.	2/22/2018 12:45 PM
13	Saturday Market, city-wide events where most of the downtown businesses participate.	2/22/2018 11:17 AM
14	Restaurants, festivals, events	2/22/2018 10:44 AM
15	Brewpubs	2/22/2018 10:40 AM
16	Not Sure	2/22/2018 10:15 AM
17	antique shows art shows	2/21/2018 12:23 PM
18	Shops, restaurants	2/20/2018 4:35 PM
19	Concerts, lectures or plays	2/19/2018 10:15 AM
20	I pretty much live downtown. Anywhere I go I usually end up walking through downtown anyway	2/19/2018 5:35 AM
21	Library events; Ant Farm events; First Friday; Mt Hood Market, etc. etc.	2/16/2018 7:26 AM
22	Restaurants, Parks	2/14/2018 1:00 PM
23	There just aren't that many options	2/12/2018 3:39 PM
24	music events	2/11/2018 9:56 PM
25	I used to walk to the grocery on Meinig, but there isn't a market in downtown anymore.	2/10/2018 11:23 PM
26	I enjoy First Fridays, Farmers Market, Ant Farm	2/10/2018 6:25 PM
27	Not really a lot of space to do decent events that would be attractive...	2/8/2018 10:00 PM
28	Festivals etc	2/8/2018 7:11 PM
29	street fairs, artists, music, dance	2/8/2018 5:09 PM
30	art, green space, events	2/8/2018 4:57 PM
31	First Friday types of events	2/8/2018 12:51 PM
32	easier to get to the event ie mt festival is hard b/c parking is so challenging; bazaars, gardening things	2/8/2018 12:51 PM
33	Better restaurants, and outdoor venues	2/8/2018 12:40 PM

34	Festivals, markets, music, beer garden, more shopping options.	2/8/2018 10:34 AM
35	Food and beverage events if we had better restaurants and breweries.	2/8/2018 10:27 AM
36	More parks, greater pedestrian paths - room, family/ pet- friendly events	2/8/2018 5:19 AM
37	music, retail,	2/7/2018 9:46 PM
38	Music events, performances, street fairs	2/7/2018 9:09 PM
39	A park on Pleasant St that I dind't have to cross the highway to get to.	2/7/2018 7:14 PM
40	Playgrounds or pretty scenery	2/7/2018 6:49 PM
41	Shopping	2/7/2018 6:09 PM
42	Clothing shops	2/7/2018 11:58 AM
43	Music, art, fun family events	2/7/2018 10:29 AM
44	rock climbing gym, events like The Moth, art gallery open houses, bigger farmer's market, better restaurants, a co-op grocery store - though the actual decision to walk to these events has more to do with the safety of the walk than the types of events	2/7/2018 10:18 AM
45	Community building, networking of the people	2/7/2018 9:07 AM
46	more, creative fun retail and food places	2/7/2018 8:59 AM
47	Local events	2/7/2018 8:38 AM
48	More farmer's markets/craft bazaars, etc.	2/7/2018 3:31 AM
49	More shopping and Restaurants	2/6/2018 9:06 PM
50	More dining options	2/6/2018 8:03 PM
51	Retail	2/6/2018 7:56 PM
52	Farmers markets type things	2/6/2018 7:50 PM
53	Music events and family events.	2/6/2018 7:43 PM
54	More family friendly events	2/6/2018 5:52 PM
55	Movie theater in downtown Sandy... Better restaurants. Disappointed that the new firehouse is right in the center of town. Would have preferred nice eating establishments and quaint little shops and art galeries.	2/6/2018 5:44 PM
56	Family events	2/6/2018 5:42 PM
57	arts & craft fairs, diffrent theme shopping pop-ups	2/6/2018 5:41 PM
58	Markets, concerts, a real slash pad	2/6/2018 5:40 PM
59	wine/beer festivals	2/6/2018 5:06 PM
60	Anything family friendly, sidewalk cafes, concerts, toy or antique stores etc.	2/6/2018 4:54 PM
61	Brewfest/community food festivals	2/6/2018 4:36 PM
62	Food carts and restaurants	2/6/2018 4:32 PM
63	More afternoon and evening events like First Friday	2/6/2018 4:30 PM
64	More hints like first Friday	2/5/2018 4:12 PM
65	Sales, stores (antiques, clothes & supplies stores, coffee, food, restaurants, bread stores, etc)	2/5/2018 12:46 PM
66	Music, art exhibits, sporting events, etc.	2/4/2018 5:09 PM
67	First Friday type events. Art shows	2/4/2018 10:24 AM
68	First Fridays are nice.	2/3/2018 11:08 PM
69	boutiques, restaurants	2/2/2018 4:45 PM
70	Shoping!!	2/2/2018 11:55 AM
71	Kids events: Art walks, bike events.	2/2/2018 11:39 AM

72	Family events (No Adult Beverages)	2/2/2018 8:33 AM
73	outdoor concert in summer/fall; art celebration	2/2/2018 8:20 AM
74	Expanded farmers market, better shops and restaurants	2/1/2018 10:26 PM
75	Sandy mt days. Recreational running.	2/1/2018 9:49 PM
76	Large public events that encourage community, like "x-fest". Brew-fest, art-fest, kid-fest, bikes, etc.	2/1/2018 8:26 PM
77	I'm attracted to Downtown Gresham and Downtown Old Troutdale. Appealing shops and restaurants. Bring that to Sandy and we would have so much more desire for hanging out and shopping in our community. We have nothing to draw us in. And not to mention, public parking is not convenient.	2/1/2018 8:12 PM
78	Parade	2/1/2018 7:36 PM
79	Mt Days, wine/pub events, farmer markets	2/1/2018 6:41 PM
80	festivals or community events?	2/1/2018 6:30 PM
81	Mt festival and library events	1/29/2018 1:10 PM

Q18 Would you participate in walking programs?

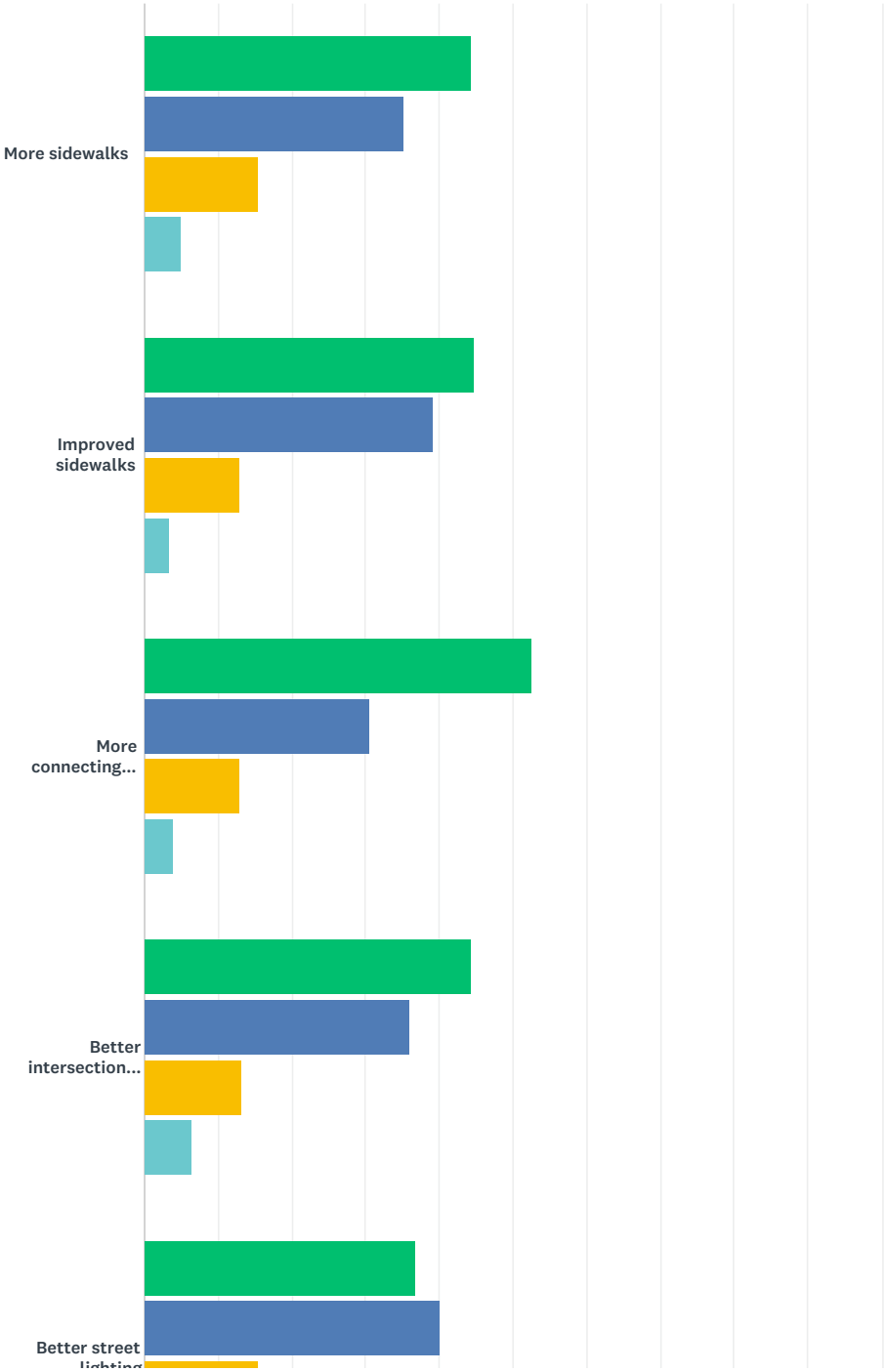
Answered: 128 Skipped: 22

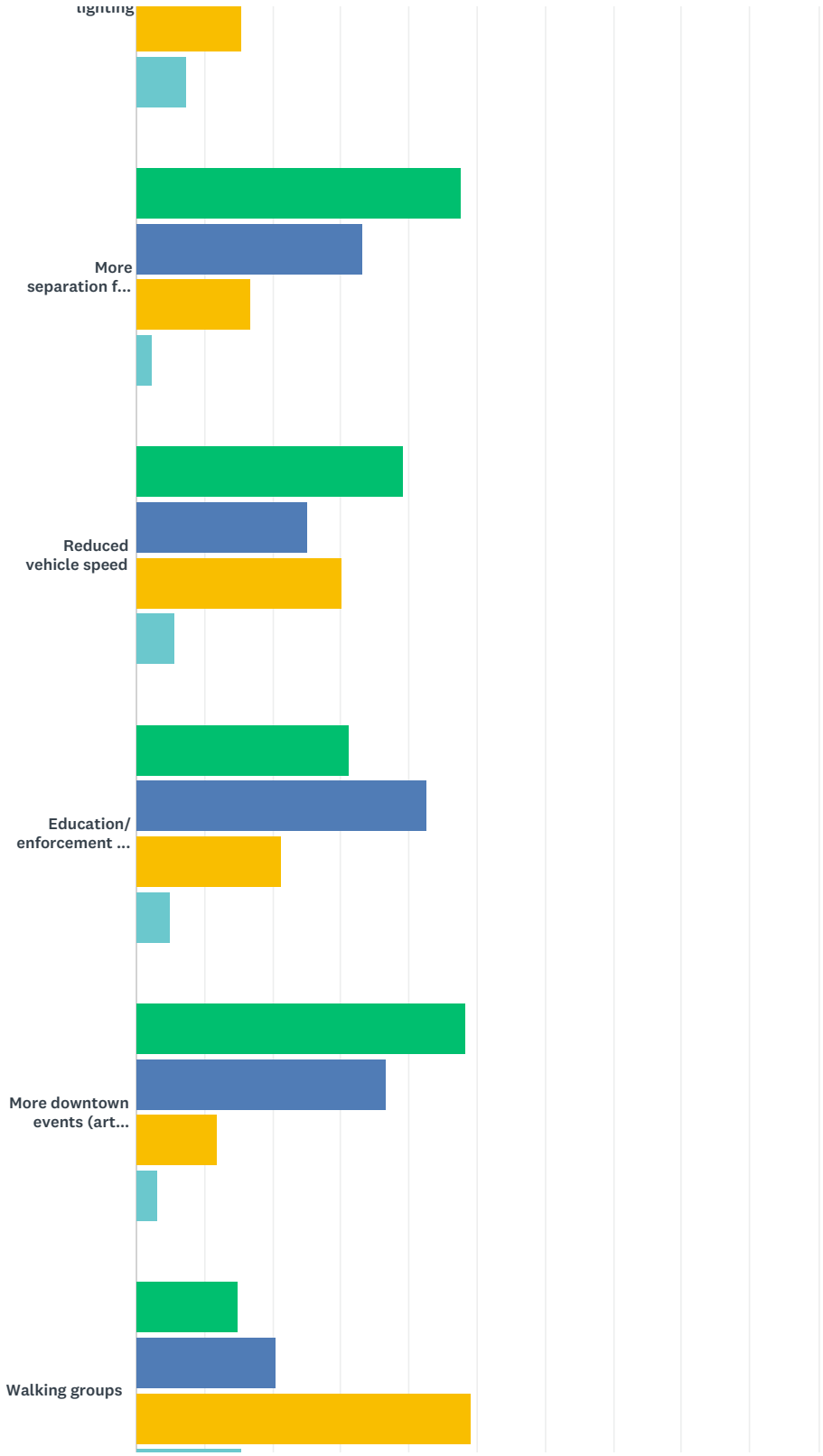


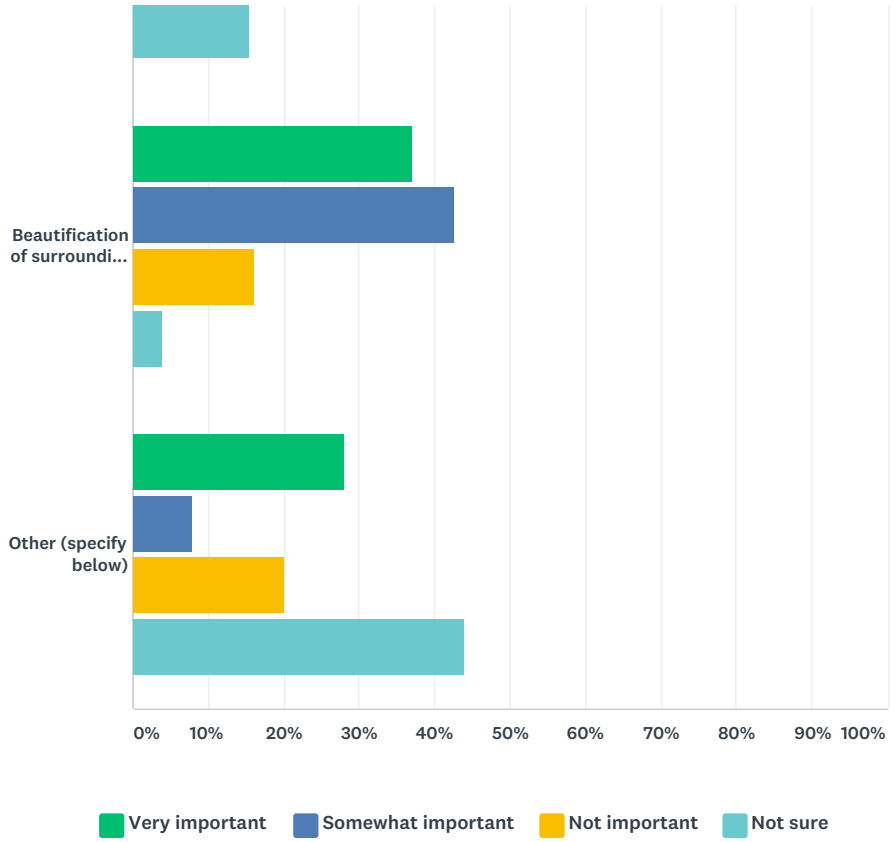
ANSWER CHOICES	RESPONSES	
Yes	16.41%	21
Maybe	41.41%	53
No	42.19%	54
TOTAL		128

Q19 How important do you think the following improvements would be in supporting walking in downtown Sandy?

Answered: 127 Skipped: 23




lighting
More separation f...
Reduced vehicle speed
Education/ enforcement ...
More downtown events (art...
Walking groups



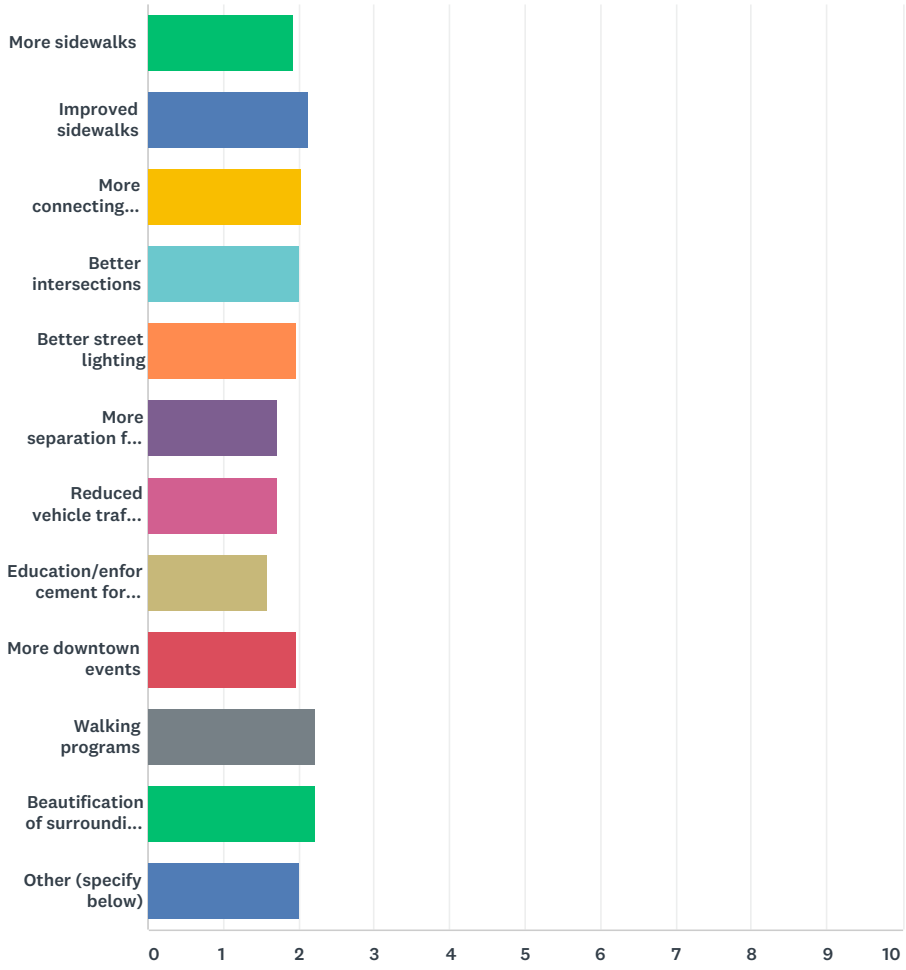
	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT	NOT SURE	TOTAL
More sidewalks	44.26% 54	35.25% 43	15.57% 19	4.92% 6	122
Improved sidewalks	44.72% 55	39.02% 48	13.01% 16	3.25% 4	123
More connecting sidewalks (along same side of the road) between residential neighborhoods and downtown	52.42% 65	30.65% 38	12.90% 16	4.03% 5	124
Better intersections (pedestrian signals, crosswalks)	44.26% 54	36.07% 44	13.11% 16	6.56% 8	122
Better street lighting	36.89% 45	40.16% 49	15.57% 19	7.38% 9	122
More separation from vehicle traffic	47.62% 60	33.33% 42	16.67% 21	2.38% 3	126
Reduced vehicle speed	39.02% 48	25.20% 31	30.08% 37	5.69% 7	123
Education/ enforcement for motorists, pedestrians, and bicyclists	31.15% 38	42.62% 52	21.31% 26	4.92% 6	122
More downtown events (art fairs, music, etc.)	48.41% 61	36.51% 46	11.90% 15	3.17% 4	126
Walking groups	14.75% 18	20.49% 25	49.18% 60	15.57% 19	122

Beautification of surroundings	37.10% 46	42.74% 53	16.13% 20	4.03% 5	124
Other (specify below)	28.00% 7	8.00% 2	20.00% 5	44.00% 11	25

#	OTHER/ COMMENTS	DATE
1	Leave it alone. We don't need more people, we don't need to have intersections changed, save our money and ASK THE PEOPLE WHO HAVE LIVED HERE FOR TEN YEARS OR MORE AND NOT THE CITY PLANNERS WHO ARE NOT FROM THE AREA.....	2/23/2018 10:03 AM
2	I don't like the working on a few questions..."too inconvenient" to use crosswalks, etc? There are plenty of other reasons for that kind of walking behavior. Safety and walkability starts with education and enforcement for *drivers*, not pedestrians.	2/22/2018 10:44 AM
3	better parking for those who don't live within walking distance of downtown and more places to shop (if there aren't places to go, why would I walk through town?)	2/22/2018 10:15 AM
4	Close some streets. Provide visible crossing lights for pedestrians like lights on the streets. Make safety number 1 priority because drivers go way too fast through downtown Sandy, esp during peak times.	2/16/2018 7:26 AM
5	Only intersection that could use work (other than Alt by the library, but you know about that already) is the one not in downtown, but on University and 26 -- really poor lighting, wish ODOT would put one of those flashing pedestrian light things there - they said not enough people have died to warrant putting one of those in... and they said it was up to the city to put better lighting there... even though it is ODOT ROW...	2/8/2018 10:00 PM
6	Continued prevention of transient/criminal activity.	2/8/2018 10:34 AM
7	Pet friendly events	2/8/2018 5:19 AM
8	25 mph speed limit should be ok if it was enforced and/or if the street was actually designed for that speed, and there was a vegetation buffer between traffic lanes and sidewalk, more bulb-outs, striped crosswalks, etc.	2/7/2018 10:18 AM
9	Traffic calming is your priority. The speed of traffic and the noise is so unpleasant. Whoever is making these plans and reading this survey I dare you to walk around Sandy, especially on a weekend. Be careful though.	2/7/2018 5:59 AM
10	An electric radar, posting current speed and speed limit. Not many people see the 25mph signs coming into town. Seems to me it would be very effective and cheap to put into place	2/6/2018 5:06 PM
11	Bypass the town, make the highway go around the town then residents will be able to walk without fear, and enjoy the town they live in, instead of just pass through.	2/6/2018 4:54 PM
12	The store owners need to be taught to clean up the outside of their stores (boom swept, wash window sills, make the stores attractive and eye catching.	2/5/2018 12:46 PM
13	Sandy downtown is not a walking town and not what most residents in the area come to downtown Sandy for.	2/4/2018 9:20 AM
14	People and heavy traffic just don't mix. Quit trying to mix pedestrian traffic with Hwy 26. It just won't work. Move pedestrian related activities north of south of Hwy 26	2/3/2018 11:48 AM
15	I honestly think that if we had more pedestrian signals cars would stop and it would be fine. the ones with the flashing light when someone wants to cross, I see them on Division st in Gresham. Then the pedestrian needs to wait for cars to stop! not just hit the light a walk!!	2/2/2018 11:55 AM
16	Sandy needs to increase the size of the Police Force so that ENFORCING Speeders, Red Light Runners and also DUI Check points. Due to Traffic and Special Events over the years to be an increase of Police presence	2/2/2018 8:33 AM
17	crosswalks with in-ground flashing lights; huge fines for ignoring ppl in crosswalks;	2/2/2018 8:20 AM
18	Education wouldn't work, it's mostly the out of towners zipping through town. Enforcement might work.	2/1/2018 9:28 PM

Q20 Choose your top 3 priorities for walkability improvements.

Answered: 124 Skipped: 26



	1ST PRIORITY	2ND PRIORITY	3RD PRIORITY	TOTAL	WEIGHTED AVERAGE
More sidewalks	34.62% 9	38.46% 10	26.92% 7	26	1.92
Improved sidewalks	27.91% 12	30.23% 13	41.86% 18	43	2.14
More connecting sidewalks (along same side of the road) between residential neighborhoods and downtown	34.09% 15	29.55% 13	36.36% 16	44	2.02
Better intersections	25.00% 6	50.00% 12	25.00% 6	24	2.00
Better street lighting	26.67% 8	50.00% 15	23.33% 7	30	1.97

More separation from vehicle traffic	50.00% 19	28.95% 11	21.05% 8	38	1.71
Reduced vehicle traffic	44.00% 11	40.00% 10	16.00% 4	25	1.72
Education/enforcement for motorists, pedestrians, & bicyclists	59.09% 13	22.73% 5	18.18% 4	22	1.59
More downtown events	39.13% 18	26.09% 12	34.78% 16	46	1.96
Walking programs	0.00% 0	77.78% 7	22.22% 2	9	2.22
Beautification of surroundings	26.32% 10	26.32% 10	47.37% 18	38	2.21
Other (specify below)	50.00% 3	0.00% 0	50.00% 3	6	2.00

#	OTHER/ COMMENTS	DATE
1	More places to draw people into shopping and walking downtown	2/22/2018 10:15 AM
2	My dream is to either funnel traffic through an underground tunnel from the east side of town to the west end, or to build several tunnels for pedestrians to get from north to south side of Sandy, the bisected city.	2/10/2018 6:25 PM
3	Need the ease and places to walk then can add the walking programs.	2/8/2018 12:51 PM
4	3- pet friendly events	2/8/2018 5:19 AM
5	The lack of sidewalks on 211 is a major issue, but, aside from that one road, I would focus my improvement priorities on better intersections (striping, bulb-outs, flashy pedestrian crossing lights, etc.) and more separation from vehicle traffic (wider sidewalks, landscaping buffer)	2/7/2018 10:18 AM
6	speed of traffic needs to be reduced... enforcement is key	2/7/2018 3:31 AM
7	More money for our police force and not wasted on any of this	2/7/2018 1:14 AM
8	Walkabality is not one of my priorites.	2/4/2018 9:20 AM
9	Pedestrian signals. This will help cars see that someone wants to walk when the pedestrian is hidden behind a parked car we have to stop fast!	2/2/2018 11:55 AM
10	Removal of rusty mailboxes that clearly aren’t being used.	2/1/2018 9:49 PM
11	Good weather, lol.	2/1/2018 6:30 PM

Q21 Do you have any other comments you would like to share related to downtown walkability?

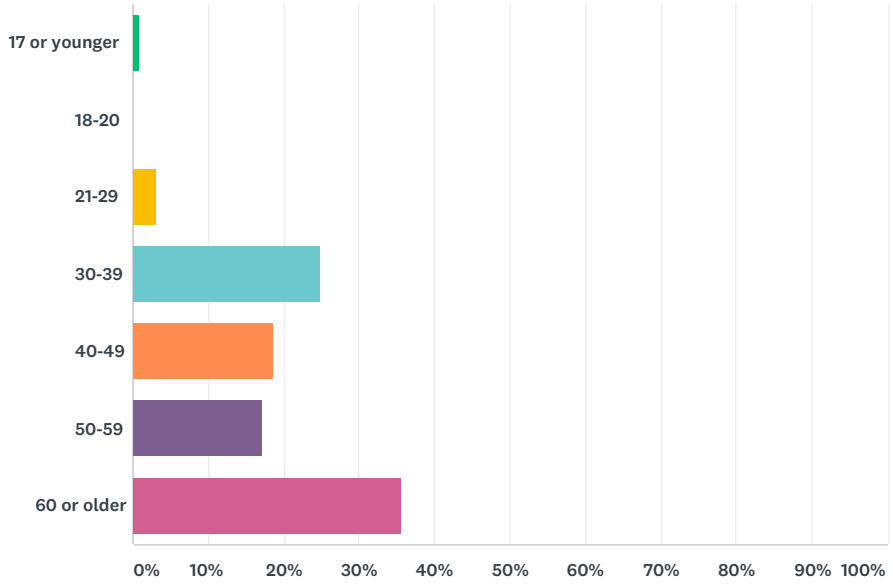
Answered: 32 Skipped: 118

#	RESPONSES	DATE
1	bicycles should be licensed like cars	3/27/2018 11:42 AM
2	need more parking	3/27/2018 11:31 AM
3	Most things are accessible. New businesses attract more people.	3/27/2018 11:20 AM
4	we enjoy the walking it makes for quality family time, talking etc.	2/27/2018 2:09 PM
5	I don't like crossing both streets to get from my neighborhood to Meinig for summer music,.	2/22/2018 12:45 PM
6	I think downtown is perfectly fine for walking, it's just that there isn't a draw to do so.	2/22/2018 10:15 AM
7	Big trucks using air brakes should be prohibited from Shorty's Corner on. The air brakes echo against the hills north of the highway. Quite unpleasant at all hours.	2/21/2018 12:23 PM
8	Nothing comes to mind	2/19/2018 10:15 AM
9	It's a great town to walk in, but especially at night in winter it feels like a dreary deserted place	2/19/2018 5:35 AM
10	Need a sidewalk down 211 from Downtown to Arletha Ct. Reduced speed on 211 in this area to 35 or possibly less. What happened to 26B Plan?	2/14/2018 1:00 PM
11	Sandy does not offer the topography or layout to promote increased walkability. Tighter road, two way traffic rather than two lanes, more establishments that would invite someone to make more stops than just the place they are going to.	2/12/2018 3:39 PM
12	Connectivity is high priority -- having pathways, trails, alleyways where pedestrians and maybe bicycles can commute across	2/10/2018 6:25 PM
13	Move the hwy traffic out of downtown. If not that then find ways to calm traffic and reduce noise (noise barriers, alternative crossing designs, more inside places to talk/Walk)	2/8/2018 4:57 PM
14	No	2/8/2018 12:51 PM
15	We would love to see the walkability of downtown Sandy improved. We moved here just over a year ago and one of our most talked about goals is to take advantage of being able to walk and enjoy the downtown area.	2/8/2018 10:34 AM
16	The residential sidewalks need ATTENTION as well. Awful!	2/8/2018 5:19 AM
17	I think putting in attractions on our side of the highway would be nice, generally when I get past Cedar Ridge there's nothing really to go to unless I cross. So I walk the neighborhoods.	2/7/2018 7:14 PM
18	Fix the signal problem by the library. Too confusing for some drivers that dont know the law about controlled crosswalks. Too many cars stopping and letting people cross aginst the lights	2/7/2018 12:52 PM
19	Some people dont want to walk around that much or dont have time, there needs to be more parking available downtown besides the street parking. No one likes parking on the street where ypur car can be hit or scraped.	2/7/2018 11:58 AM
20	I heard that pervious paving can help reduce traffic noise. Might be something to look into.	2/7/2018 10:18 AM
21	Pedestrians should be just as respectful of the rules of people/cars as drivers. There are a tremendous amt of ambivalent young people that could cause a problem.	2/7/2018 9:07 AM
22	More people would walk if the parking wasn't such a mess. We have been avoiding Sandy because it is impossible to park especially when those busses are running. Offering the bus up the mountain and to Portland is great but no one planned a "park and ride" place so where do you think all those cars are???Crowding out locals that would have been shopping and walking in Sandy. I sure we are not the only ones. Sandy has become so crowded that it is unpleasant for locals who would be the 'walkers' you are trying to attract. I used to shop in downtown Sandy. Not now.Look at the big picture.	2/7/2018 5:59 AM

23	See above	2/7/2018 1:14 AM
24	It is ridiculous to have a major highway running thru this town	2/6/2018 9:06 PM
25	More efforts need to be spent on reducing speed downtown and enforcing it. I have to cross Pioneer to get from our parking lot to work and numerous times a week the crosswalks are ignored by drivers and the red lights are constantly being run.	2/6/2018 8:03 PM
26	People do not follow the speed limit coming downtown, and I have yet to see any improvements on this	2/6/2018 5:06 PM
27	Ensure drivers know to actually stop for pedestrians. Sandy police, CCSO, and City of Sandy vehicles have all blown past me while waiting at marked crosswalks, with a stroller nonetheless.	2/6/2018 4:30 PM
28	Build more places that folks can go and enjoy an outdoor experience - the vacant area on Pioneer & Junker - that old decaying building in back of the Red Boot - should be torn down (unsafe). And build something there that has potential for new businesses to go in! It's in a perfect walkable part. Obviousely the parking lot behind AEC and the library and shopping center in the center of town are the keys to the most opportunities... but don't let a gas station or some non-small store building go in there... there were some plans for living spaces with a business storefront... that'd be great. Flower shop is in poor condition and looks bad too. It could be so much more. There's a cute project in Happy Valley on Sunnyside - and 132nd... a dress shop, a pub, and hair & insurance - and a little garden area with seating areas for folks that want to enjoy grass and grab a table. I'd love to see something like that there in that location! If you are at the library... or are a business in town in AEC's building - where do you go to eat? Subway, Pizza, Ritas. Ant Farm is now the main restaurant of choice in Sandy. ?? Look at downtown Gresham's model. It's a great mix of restaurants and stores. I love Sandy and would love to see it grow positive.	2/5/2018 12:46 PM
29	None	2/4/2018 5:09 PM
30	The intersection of HWY 26 and Bluff where Senior/ Community Center is ndds readjusting; it is just too crazy	2/2/2018 8:20 AM
31	Better lighting would be amazing. Not to mention better keeping up with the brush over growing into the sidewalk.	2/1/2018 9:49 PM
32	The crosswalk/light at Shelly/library is a mess. Because of how it’s offset, pedestrians wait for their light, but so often motorists drive through their green light, then stop at the offset crosswalk and wave pedestrians across, which is so dangerous. I’ve seen the school kids standing there so confused because their light says don’t walk, but cars have stopped and are impatiently waving them across. I’m not sure the solution, but it’s a strange place for a stoplight anyway.	2/1/2018 5:47 PM

Q22 What is your age?

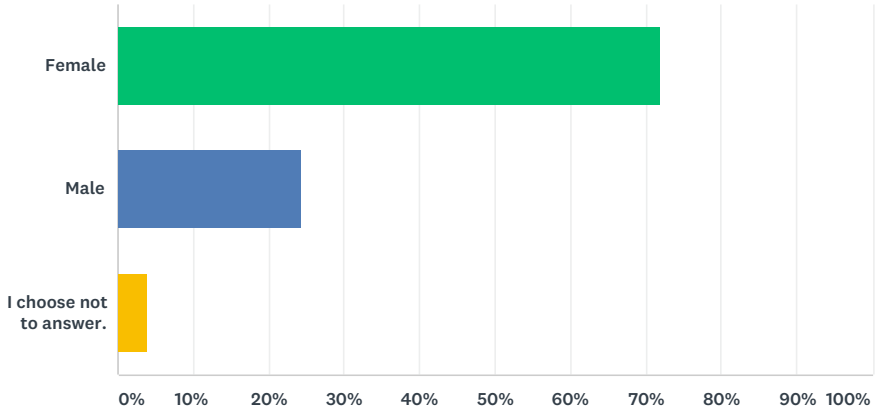
Answered: 129 Skipped: 21



ANSWER CHOICES	RESPONSES	
17 or younger	0.78%	1
18-20	0.00%	0
21-29	3.10%	4
30-39	24.81%	32
40-49	18.60%	24
50-59	17.05%	22
60 or older	35.66%	46
TOTAL		129

Q23 What is your gender?

Answered: 128 Skipped: 22



ANSWER CHOICES	RESPONSES	
Female	71.88%	92
Male	24.22%	31
I choose not to answer.	3.91%	5
TOTAL		128

Q24 Please describe your race/ethnicity.

Answered: 91 Skipped: 59

#	RESPONSES	DATE
1	white	3/27/2018 11:33 AM
2	white	3/27/2018 11:31 AM
3	white	3/27/2018 11:24 AM
4	white	3/27/2018 11:20 AM
5	White	3/27/2018 11:20 AM
6	Caucasian	3/27/2018 11:15 AM
7	white	3/19/2018 1:23 PM
8	Caucasian	3/13/2018 10:32 AM
9	Caucasion	3/3/2018 3:48 PM
10	white	2/28/2018 5:36 PM
11	White	2/27/2018 2:25 PM
12	White	2/27/2018 10:57 AM
13	white	2/23/2018 11:34 AM
14	white	2/23/2018 11:29 AM
15	white	2/23/2018 11:23 AM
16	White	2/23/2018 11:21 AM
17	Caucasian	2/23/2018 10:13 AM
18	NATIVE AMERICAN INDIAN	2/23/2018 10:03 AM
19	white	2/22/2018 12:45 PM
20	White	2/22/2018 11:17 AM
21	Bright White	2/22/2018 10:40 AM
22	white	2/22/2018 10:15 AM
23	Human	2/21/2018 12:23 PM
24	White	2/20/2018 4:35 PM
25	white	2/19/2018 10:15 AM
26	American .... just American	2/19/2018 5:35 AM
27	White	2/16/2018 7:26 AM
28	N/A	2/14/2018 1:00 PM
29	white	2/12/2018 3:39 PM
30	OTHER	2/11/2018 9:14 PM
31	Caucasian	2/10/2018 11:23 PM
32	white anglosaxon	2/10/2018 6:25 PM
33	Sandy. I mean, white, er, caucasian.	2/8/2018 10:00 PM
34	caucasian	2/8/2018 5:09 PM
35	White	2/8/2018 4:57 PM

36	White	2/8/2018 12:51 PM
37	caucasian	2/8/2018 12:51 PM
38	White	2/8/2018 12:40 PM
39	White	2/8/2018 10:34 AM
40	White	2/8/2018 10:27 AM
41	Caucasian	2/8/2018 10:11 AM
42	Caucasian	2/8/2018 12:38 AM
43	white	2/8/2018 12:37 AM
44	Caucasian	2/8/2018 12:01 AM
45	caucasian	2/7/2018 9:46 PM
46	white	2/7/2018 9:22 PM
47	White	2/7/2018 9:09 PM
48	white	2/7/2018 7:14 PM
49	White	2/7/2018 6:49 PM
50	White	2/7/2018 6:09 PM
51	White	2/7/2018 1:32 PM
52	Na	2/7/2018 12:52 PM
53	No.	2/7/2018 11:58 AM
54	Native American	2/7/2018 10:29 AM
55	white	2/7/2018 10:18 AM
56	Caucasian	2/7/2018 9:07 AM
57	American	2/7/2018 8:38 AM
58	opinionated old white woman	2/7/2018 5:59 AM
59	Doesn’t matter	2/7/2018 1:14 AM
60	White	2/6/2018 9:06 PM
61	human	2/6/2018 8:20 PM
62	caucasion	2/6/2018 7:56 PM
63	White	2/6/2018 6:29 PM
64	White	2/6/2018 5:52 PM
65	Caucasian	2/6/2018 5:44 PM
66	White	2/6/2018 5:42 PM
67	Color blind because its not supposed to matter right?	2/6/2018 5:40 PM
68	White	2/6/2018 5:15 PM
69	white	2/6/2018 5:06 PM
70	White	2/6/2018 4:54 PM
71	White	2/6/2018 4:36 PM
72	Why?	2/6/2018 4:35 PM
73	White	2/6/2018 4:32 PM
74	White	2/6/2018 4:30 PM
75	White	2/5/2018 4:12 PM
76	Caucasian	2/5/2018 12:46 PM

77	AngloAmerican	2/4/2018 5:09 PM
78	human	2/4/2018 4:04 PM
79	Caucasian	2/3/2018 11:08 PM
80	White	2/2/2018 2:29 PM
81	White	2/2/2018 11:55 AM
82	White	2/2/2018 11:39 AM
83	White	2/2/2018 8:33 AM
84	white	2/2/2018 8:20 AM
85	White	2/1/2018 9:49 PM
86	white	2/1/2018 9:28 PM
87	Caucasian	2/1/2018 8:26 PM
88	White	2/1/2018 7:36 PM
89	human	2/1/2018 6:30 PM
90	Caucasian	2/1/2018 5:47 PM
91	white	1/29/2018 1:10 PM

Q25 About how long have you lived in Sandy?

Answered: 122 Skipped: 28

ANSWER CHOICES	RESPONSES	
Years	100.00%	122

#	YEARS	DATE
1	12	3/27/2018 11:38 AM
2	12	3/27/2018 11:33 AM
3	12	3/27/2018 11:31 AM
4	28	3/27/2018 11:26 AM
5	30	3/27/2018 11:24 AM
6	12	3/27/2018 11:20 AM
7	28	3/27/2018 11:20 AM
8	6	3/27/2018 11:15 AM
9	9	3/19/2018 1:23 PM
10	20	3/13/2018 10:32 AM
11	2	3/3/2018 3:48 PM
12	3	2/27/2018 6:06 PM
13	32	2/27/2018 2:25 PM
14	7	2/27/2018 2:09 PM
15	35	2/27/2018 10:57 AM
16	45	2/23/2018 11:34 AM
17	12	2/23/2018 11:32 AM
18	88	2/23/2018 11:29 AM
19	20	2/23/2018 11:23 AM
20	0	2/23/2018 11:21 AM
21	0	2/23/2018 10:13 AM
22	10	2/23/2018 10:03 AM
23	20	2/22/2018 12:45 PM
24	2	2/22/2018 11:17 AM
25	4	2/22/2018 10:44 AM
26	14	2/22/2018 10:40 AM
27	36	2/22/2018 10:15 AM
28	14	2/21/2018 12:23 PM
29	5	2/20/2018 4:35 PM
30	14	2/19/2018 10:15 AM
31	29	2/19/2018 9:36 AM
32	3	2/19/2018 5:35 AM
33	13	2/16/2018 3:24 PM

34	17	2/16/2018 7:26 AM
35	3	2/15/2018 1:00 PM
36	30	2/14/2018 1:00 PM
37	10	2/12/2018 3:39 PM
38	5	2/11/2018 9:14 PM
39	27	2/10/2018 11:23 PM
40	40	2/10/2018 6:25 PM
41	28	2/8/2018 10:00 PM
42	15	2/8/2018 9:38 PM
43	10	2/8/2018 7:11 PM
44	29	2/8/2018 6:46 PM
45	0	2/8/2018 5:09 PM
46	15	2/8/2018 4:57 PM
47	13	2/8/2018 12:51 PM
48	57	2/8/2018 12:51 PM
49	4	2/8/2018 12:40 PM
50	1	2/8/2018 10:34 AM
51	7	2/8/2018 10:27 AM
52	2	2/8/2018 10:11 AM
53	5	2/8/2018 5:19 AM
54	45	2/8/2018 12:38 AM
55	5	2/8/2018 12:37 AM
56	7	2/8/2018 12:01 AM
57	3	2/7/2018 9:46 PM
58	28	2/7/2018 9:22 PM
59	17	2/7/2018 9:09 PM
60	20	2/7/2018 7:14 PM
61	3	2/7/2018 6:49 PM
62	8	2/7/2018 6:09 PM
63	43	2/7/2018 1:32 PM
64	50	2/7/2018 12:52 PM
65	3	2/7/2018 11:58 AM
66	12	2/7/2018 10:29 AM
67	1	2/7/2018 10:18 AM
68	30	2/7/2018 9:42 AM
69	35	2/7/2018 9:07 AM
70	30	2/7/2018 8:59 AM
71	2	2/7/2018 8:38 AM
72	2	2/7/2018 7:54 AM
73	40	2/7/2018 5:59 AM
74	12	2/7/2018 3:31 AM

75	10	2/7/2018 1:14 AM
76	2	2/6/2018 10:37 PM
77	35	2/6/2018 9:06 PM
78	6	2/6/2018 8:20 PM
79	10	2/6/2018 7:56 PM
80	25	2/6/2018 7:56 PM
81	26	2/6/2018 7:50 PM
82	7	2/6/2018 7:43 PM
83	58	2/6/2018 6:29 PM
84	8	2/6/2018 6:03 PM
85	47	2/6/2018 5:52 PM
86	7	2/6/2018 5:44 PM
87	35	2/6/2018 5:42 PM
88	15	2/6/2018 5:41 PM
89	16	2/6/2018 5:40 PM
90	35	2/6/2018 5:15 PM
91	3	2/6/2018 5:06 PM
92	25	2/6/2018 4:54 PM
93	1	2/6/2018 4:36 PM
94	25	2/6/2018 4:35 PM
95	2	2/6/2018 4:32 PM
96	5	2/6/2018 4:30 PM
97	10	2/5/2018 4:12 PM
98	13	2/5/2018 12:46 PM
99	0	2/4/2018 5:09 PM
100	28	2/4/2018 4:04 PM
101	8	2/4/2018 10:24 AM
102	50	2/4/2018 9:38 AM
103	12	2/4/2018 9:20 AM
104	31	2/3/2018 11:08 PM
105	15	2/3/2018 11:48 AM
106	40	2/2/2018 4:45 PM
107	41	2/2/2018 2:29 PM
108	29	2/2/2018 11:55 AM
109	12	2/2/2018 11:39 AM
110	13	2/2/2018 8:33 AM
111	65	2/2/2018 8:20 AM
112	14	2/1/2018 10:26 PM
113	10	2/1/2018 9:49 PM
114	15	2/1/2018 9:28 PM
115	13	2/1/2018 8:26 PM

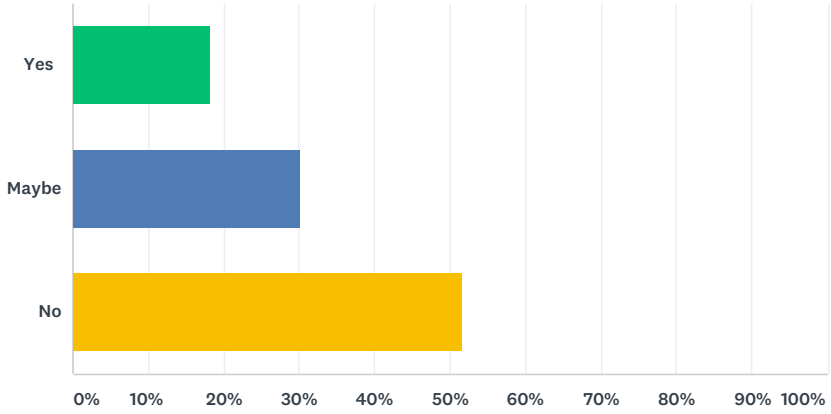
116	13	2/1/2018 8:12 PM
117	17	2/1/2018 7:36 PM
118	30	2/1/2018 6:41 PM
119	14	2/1/2018 6:30 PM
120	50	2/1/2018 6:00 PM
121	9	2/1/2018 5:47 PM
122	30	1/29/2018 1:10 PM

Q26 Please provide your email below if you would like to receive email updates on the Downtown Walkability Assessment.

Answered: 33 Skipped: 117

Q27 If the City of Sandy was to create a bicycle plan would you be interested in participating?

Answered: 126 Skipped: 24

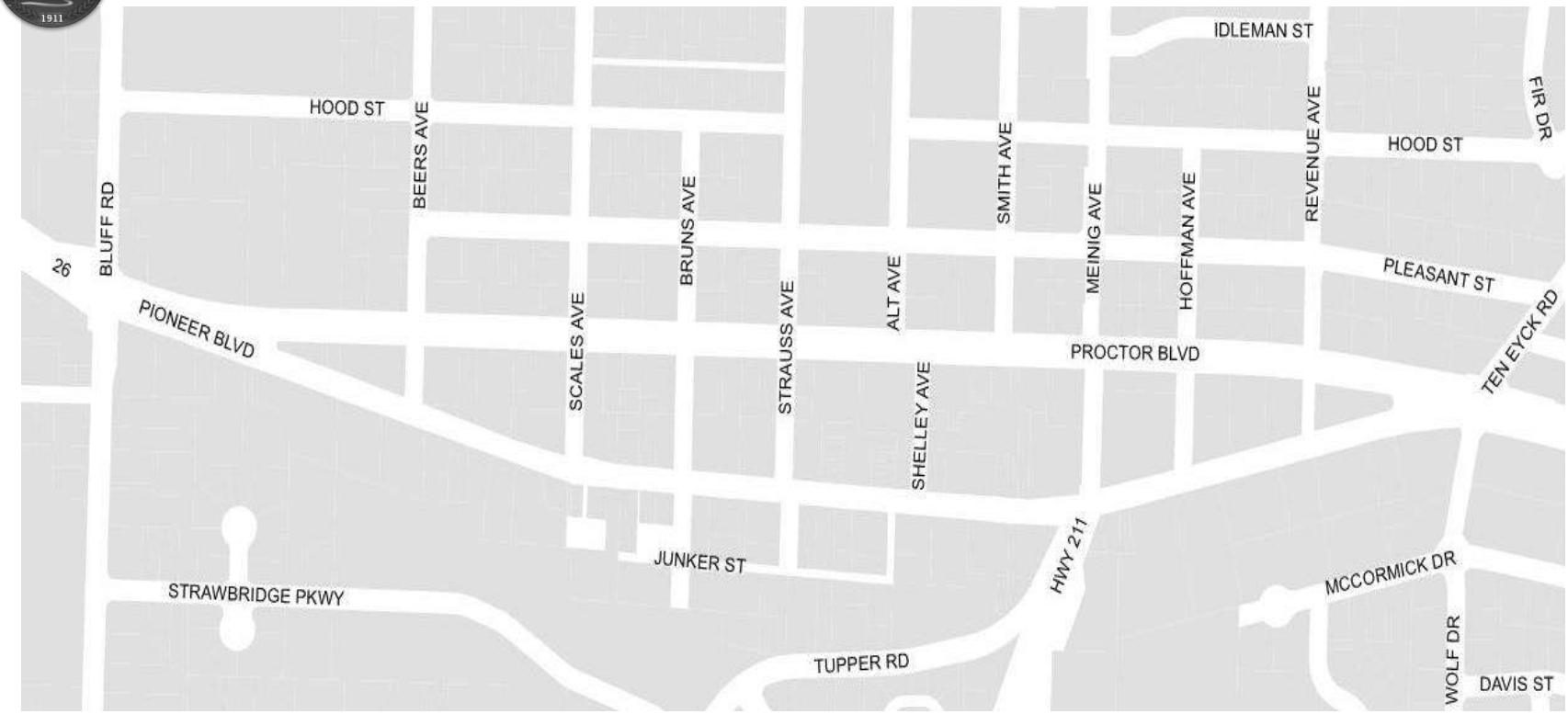


ANSWER CHOICES	RESPONSES	
Yes	18.25%	23
Maybe	30.16%	38
No	51.59%	65
TOTAL		126

#	COMMENTS	DATE
1	Yes please	3/27/2018 11:15 AM
2	There are already so many bikes in the roadway out by Dodge Park who don't get out of the way for cars, buses, tractors or horse trailers. Tell them to ride in their own neighborhoods for safety's sake. There are not even fog lines and we have 5-abreast bicyclists jamming up the roads. Why is it that they can never be considerate of the cars and drivers who actually PAY for the roadways through taxes???? I know I sound bitter, I'm sick of the bicyclists and so are all of my neighbors. Move over or GET OFF THE ROAD!	2/23/2018 10:03 AM
3	Definitely!	2/22/2018 10:44 AM
4	It would be great to have some bicycle paths to connect us to Boring and the Springwater trail!	2/22/2018 10:15 AM
5	Please make bicycle/pedestrian paths SEPARATE from traffic. On the side of the road is not acceptable anymore due to too many drivers texting (they do it anyway!) or having to swerve to avoid an accident or having a distracted moment for whatever reason. There needs to be a buffer zone between the road and the path.	2/16/2018 7:26 AM
6	I am really not into the whole bicycle movement, and would probably advocate more for better ped and auto uses rather than bikes.	2/15/2018 1:00 PM
7	When the main road is a state highway, and, almost everywhere else is hills, it doesn't really invite a bike friendly layout.	2/12/2018 3:39 PM
8	not likely but it would be good for younger people and families	2/8/2018 12:51 PM
9	I do not ride a bike but may in the future.	2/8/2018 10:34 AM
10	Hell no.	2/7/2018 11:58 AM

11	Not on your life! This is even more dangerous that trying to walk or drive in our city. Wondering if the real problem of TRAFFIC is eluding you?	2/7/2018 5:59 AM
12	I would really like to see better cycling connections.	2/6/2018 8:20 PM
13	we don't need a bicycle plan (really)	2/6/2018 5:41 PM
14	Less Portland please!!!!	2/6/2018 5:40 PM
15	I am an avid bicycler yet am involved in a lot of other civic activities and probably would not have a huge amount of time to take part, yet very interested in bicycle access issues. Thanks! :-)	1/29/2018 1:10 PM

DOWNTOWN MAPPING ACTIVITY



Tell us where you walk!

As a part of the City of Sandy's Downtown Walkability Assessment we would like to see where community members frequently walk downtown to help prioritize locations for walkability improvements.

Instructions:

On the map above draw what streets or pathways you typically walk in downtown Sandy.

Comments on Walkability:

_____

_____

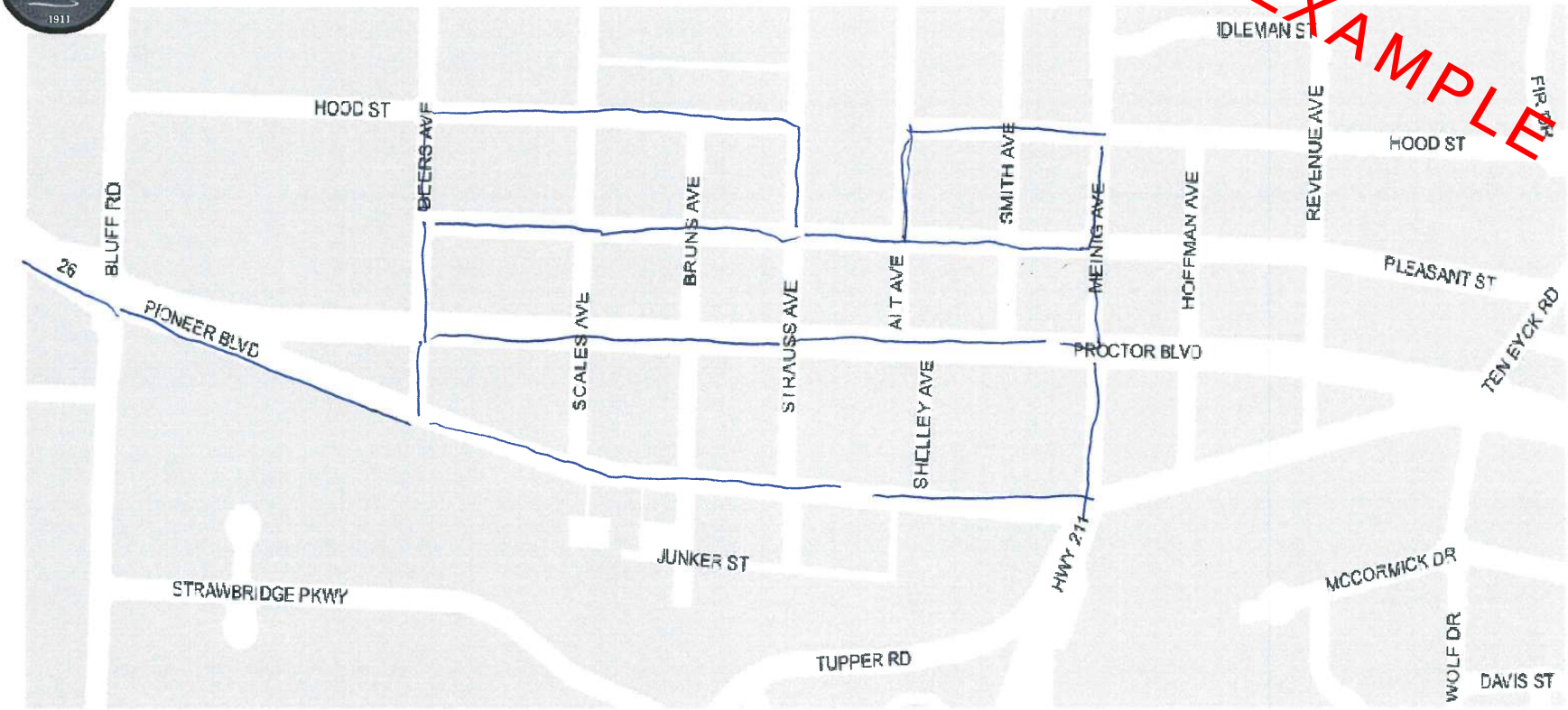
_____

_____

For more information about the Downtown Walkability Assessment visit https://www.ci.sandy.or.us/downtown-planning orcontact Emma Porricolo at eporricolo@ci.sandy.or.us or (503) 783 – 2586.

DOWNTOWN MAPPING ACTIVITY

EXAMPLE



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As a part of the City of Sandy's Downtown Walkability Assessment we would like to see where community members frequently walk downtown to help prioritize locations for walkability improvements.

Instructions:

On the map above draw what streets or pathways you typically walk in downtown Sandy.

Comments on Walkability:

As a pedestrian - always have to look out for cars paying attention to me! They move fast!

For more information about the Downtown Walkability Assessment visit https://www.ci.sandy.or.us/downtown-planning orcontact Emma Porricolo at eporricolo@ci.sandy.or.us or (503) 783 – 2586.

Appendix B: Pop-up Mapping Activity Comments

POP-UP MAPPING ACTIVITY COMMENTS

- Love walking in town. The crosswalk at the library is very dangerous since some cars think they should stop while others don't. If it was closer to the light it would be betters
- I love to walk up for my morning coffee although I don't feel as safe as I used to ever since the bus station is located where it is at.
- Fun fun fun, sidewalks all the ways
- Generally pretty good. I get nervous about crossing the crossroads and driveways
- Good, but highway is a problem, don't have answers. Low income housing is in the wrong place. Need to be near grocery stores, etc. Too many people with families walk along the highway.
- The intersection of library/ Leathers/ CCB is TERRIBLE. Why no alignment? Traffic on Pioneer and Proctor is awful – many drivers SPEED! One time I was nearly hit by a car that the driver obviously wasn't paying attention. Sandy is not walk friendly because of HWY 26 traffic.
- Fun, keeps growing!
- Lots of car exhaust but we like to walk to local spots sometimes it's hard to get across the one-ways
- Bluff Rd lacks sidewalks on both sides. South of high school sidewalks is on the east side, but switches to the west side without a crosswalk. Motorists do not typically know that all intersections are unmarked crosswalks.
- I walk to the library from the HS part of town. Better sidewalks in town would be nice, but I never feel unsafe.
- Traffic lights on Shelley and Proctor are very confusing for pedestrians to cross Proctor
- I usually park in one spot and walk all over town rather than move my car. Hard to cross Proctor and Pioneer expect at light or well marked crosswalk. Not enough sidewalks cleared of snow and ice in winter. Drivers wrongfully stop at crosswalk in front of library even when the signal indicated don't walk.
- Love to see the flowers and peak in the windows of the store…
- I love to walk but City of Sandy is not very walker friendly – too noisy, too much traffic, not enough safe places to cross the road. A path for walkers, anywhere, would be appreciated.
- Better crosswalks – old ones worked better at the library, that one is lame. But keep up ped development
- Solid 10/10 sidewalks are very sidewalk but about 6/5 on people, they almost hit me 2 times a day.
- The area in front of the library is a danger to pedestrian and vehicles alike. With the stopping point so far away from the crosswalk there is confusion if cars should wait there or continue to the crosswalk. Needs reconfiguring.
- Very hard and dangerous to use bad intersection at Alt/Shelley and Proctor. Very hard to get across Pioneer from city parking lots behind Otto's to attend the farmers market.
- The light on Shelley Ave for walkers and the one at the library create a lot of confusion
- Safest town to walk in
- Don't walk down Ten Eyck Rd as it is too dangerous! Need sidewalks to Vista View Apartments!
- Need a crosswalk by Shell Gas station
- Shelley Ave and Proctor Blvd intersection confusing for cars and crossers
- I avoid walking along the highway. I walk from Bluff Road to the library/ AntFarm. But I hate that light by the library. I avoid it and make sure to cross at different intersections.
- Something absolutely must be done about this. I witness a preschool class cross against the light because a truck stopped for them. What if the other lane mowed them down?

- The light in front of the library is so dangerous.
- Nice route. Path on 211 would be nice
- I mostly walk on sidewalks – those behind CCD are cracked and raised – have had major faceplant there :(.
- Crosswalk in front of library – worst, most dangerous crosswalk in Sandy. Ask library staff if want details. Need crosswalk at Scales and Pioneer
- I walk to the library but I DREAD that light in front. It's a terrible idea.
- I walk everywhere I never usually ride in a car or truck. I'm either biking, walking or skating.
- I walk some places of Sandy by myself or with my parents everyday
- Crosswalk at Bruns Ave and Pioneer Blvd. – difficult to get walker or wheelchair through and around utility boxes
- Cars should not stop at crosswalk for library. They should stop at previous crosswalk.
- Crossing Pioneer to City parking is hard. Crosswalk at Farmers Market to parking would be good
- Crossing Pioneer and Proctor is really difficult. Cars don't stop and the signalized intersections are slow to response to the pedestrian push button.
- Would really like to be able to walk on a sidewalk along 211.
- As a pedestrian always have to look out for cars paying attention to me! They move fast!
- Trucks speed through town even though this is supposed to be a "Safety Corridor". Don't like this
    - Note from staff – Downtown roads are not an official safety corridor. The safety corridor stops directly before downtown on the east side.
- Crossing Proctor or Pioneer can be taking your life into your hands.
- Would like to see more connectivity to neighborhoods south of downtown.
- Long wait for crossing at Pioneer Blvd./Meinig Ave intersection and Proctor Blvd./Meinig Ave. intersection.
- I walk a lot but it is extremely loud and unpleasant with traffic noise.
- I actually walk every street. ☺

Appendix B: Sample General Walk Audit Checklist

Taken from Safe Routes to School Let's Go For a Walk: A Toolkit for Planning and Conducting a Walk Audit.

Directions: Please fill out the following checklist to note problems in the walking environment. You may use the checklist either for each block you walk, or for your entire route.

1. Sidewalks:

- ☐ No sidewalks or paths
- ☐ Sidewalks are broken, cracked, or have trip hazards
- ☐ Sidewalks are blocked by overgrown landscaping, poles, signs, plants, vehicles, etc.
- ☐ Sidewalk is not continuous
- ☐ Sidewalk is not wide enough (two people cannot easily walk together side by side)
- ☐ Sidewalk has nothing separating it from the street (grass, trees, parked cars)
- ☐ Other problems: _____
  _____

Overall, the quality and safety of sidewalks is:

2. Street Crossings and Intersections:

- ☐ The road is too wide to cross easily
- ☐ Traffic signals do not give enough time to cross the street
- ☐ The crossing does not have a pedestrian-activated button
- ☐ There is no crosswalk or it is poorly marked
- ☐ I have to walk too far to find a safe, marked crosswalk
- ☐ Intersection does not have a curb ramp for carts, wheelchairs, strollers, walkers, etc.
- ☐ Traffic signal made us wait too long
- ☐ Parked cars blocked our view of traffic
- ☐ Other problems: _____
  _____

Overall, the quality and safety of street crossings and intersections is:

3. Driver Behavior:

- ☐ Drivers do not stop at stop signs or stop behind the crosswalk
- ☐ Drivers appear to be speeding
- ☐ Drivers do not yield to people walking
- ☐ Drivers are distracted (on the phone, texting, paying attention to passengers rather than road)
- ☐ Drivers aren't looking out for people walking, make unexpected turns, seem hostile, or pull out of driveways without looking
- ☐ Other problems: _____
  _____

Overall, the quality and safety of driver behavior is:

4. Safety:

- ☐ Car speeds are too fast
- ☐ There's too much traffic
- ☐ Street lights and/or crosswalks are few or not present
- ☐ There are people on the street who seem threatening
- ☐ Unleashed dogs or other loose intimidating animals are present
- ☐ Other problems: _____
  _____

Overall, the feeling of safety in this area is:

5. Comfort:

- ☐ There is not enough shade from canopies, awnings, or trees
- ☐ There are few or no street trees or other landscaping
- ☐ There are vacant lots or rundown buildings
- ☐ The street needs benches and places to rest
- ☐ Other problems: _____
  _____

Overall, the comfort and appeal in this area is:

Additional Comments:

_____
_____
_____
_____
_____
_____
_____
_____

Survey adapted in part from the Microscale Audit of Pedestrian Streetscapes and the AARP Walk Audit Tookit.

Appendix B: Community Walk Audit Checklist

Downtown Sandy Walkability Assessment:
Community Walk Audit Checklist

Block # _____

Directions: Please fill out the following checklist to note problems in the walking environment and note any concerns not listed in the checklist. Fill out one form for each designated block.

1) Sidewalks:

- ☐ No sidewalks or paths
- ☐ Sidewalks are broken, cracked, or have trip hazards
- ☐ Sidewalks are blocked by overgrown landscaping, poles, signs, plants, vehicles, etc.
- ☐ Sidewalk is not continuous
- ☐ Sidewalk is not wide enough (two people cannot easily walk together side by side)
- ☐ Sidewalk has nothing separating it from the street (landscaping, street trees, parked cars)
- ☐ Other concerns:

_____

_____

Overall, the quality and safety of the sidewalk is:

2) Street Crossings and Intersections:

- ☐ The road is too wide to cross easily
- ☐ Traffic signals do not give enough time to cross the street
- ☐ The crossing does not have a pedestrian-activated button
- ☐ There is no crosswalk or it is poorly marked
- ☐ I have to walk too far to find a safe, marked crosswalk
- ☐ Intersection does not have a curb ramp for wheelchairs, strollers, walkers, etc.
- ☐ Parked cars blocking view of vehicles approaching intersection
- ☐ Other concerns:

_____

_____

Overall, the quality and safety of street crossings and intersections is:

3) Driver Behavior:

- ☐ Drivers do not stop at stop signs or behind the crosswalk
- ☐ Drivers appear to be speeding
- ☐ Drivers do not yield to pedestrians
- ☐ Drivers are distracted (on the phone, texting, paying attention to passengers rather than the road)
- ☐ Drivers aren't looking out for people walking, make unexpected turns, seem hostile, or pull out of driveways without looking
- ☐ Other concerns:

Overall, the quality and safety of driver behavior is:

_____

_____

4) Safety:

- ☐ There are too few street lights or they are not present
- ☐ Vehicle speeds are too fast
- ☐ There's too much traffic
- ☐ There are people on the street who seem threatening
- ☐ Unleashed dogs or other loose intimidating animals are present
- ☐ Other concerns:

Overall, the feeling of safety in this area is:

_____

_____

5) Comfort:

- ☐ There is not enough shade from canopies, awnings, or trees
- ☐ There are few or not street trees and other landscaping
- ☐ There are vacant lots or rundown buildings
- ☐ More benches and places to rest are needed
- ☐ Other concerns:

Overall, the comfort and appeal in this area is:

_____

_____

Additional Comments:

_____

_____

Appendix B: Community Walk Audit Group Responses

GROUP 1

Downtown Sandy Walkability Assessment:
Community Walk Audit Checklist

Block # _1 – 9 (Pioneer Blvd.)_

Directions: Please fill out the following checklist to note problems in the walking environment and note any concerns not listed in the checklist. Fill out one form for each designated block.

1) Sidewalks:

- ☒ No sidewalks or paths
- ☒ Sidewalks are broken, cracked, or have trip hazards
- ☒ Sidewalks are blocked by overgrown landscaping, poles, signs, plants, vehicles, etc.
- ☐ Sidewalk is not continuous
- ☒ Sidewalk is not wide enough (two people cannot easily walk together side by side)
- ☐ Sidewalk has nothing separating it from the street (landscaping, street trees, parked cars)

Overall, the quality and safety of the sidewalk is:

Other concerns:

__See notes in additional comments_____

2) Street Crossings and Intersections:

- ☐ The road is too wide to cross easily
- ☐ Traffic signals do not give enough time to cross the street
- ☒ The crossing does not have a pedestrian-activated button
- ☒ There is no crosswalk or it is poorly marked
- ☒ I have to walk too far to find a safe, marked crosswalk
- ☐ Intersection does not have a curb ramp for wheelchairs, strollers, walkers, etc.
- ☒ Parked cars blocking view of vehicles approaching intersection

Overall, the quality and safety of street crossings and intersections is:

Other concerns:

_See notes in additional comments_____

3) Driver Behavior:

☒ Drivers do not stop at stop signs or behind the crosswalk

☒ Drivers appear to be speeding

☐ Drivers do not yield to pedestrians

☐ Drivers are distracted (on the phone, texting, paying attention to passengers rather than the road)

☒ Drivers aren't looking out for people walking, make unexpected turns, seem hostile, or pull out of driveways without looking

Overall, the quality and safety of driver behavior is:

Other concerns:

See notes in additional comments

4) Safety:

☐ There are too few street lights or they are not present

☒ Vehicle speeds are too fast

☒ There's too much traffic

☐ There are people on the street who seem threatening

☐ Unleashed dogs or other loose intimidating animals are present

Overall, the feeling of safety in this area is:

Other concerns:

See notes in additional comments

5) Comfort:

☒ There is not enough shade from canopies, awnings, or trees

☒ There are few or not street trees and other landscaping

☒ There are vacant lots or rundown buildings

☒ More benches and places to rest are needed

Overall, the comfort and appeal in this area is:

Other concerns:

See notes in additional comments

Additional Comments: See next page

Additional Comments from Group 1:

1) Sidewalks
   - No protection from noise and exhaust
   - Foliage needs trimming
   - Too loud for conversation
   - Sidewalks in front of Two Brothers is in bad shape
   - 5 utility covers in 1 block – uneven sidewalks
   - Cracks in sidewalk by Arco
   - Sidewalks and curb changes = tripping hazards
   - Need signal for walking at Arco
   - Restricted room on sidewalks across from Shell Gas Station → fire hydrant, mailboxes,
   - No crosswalk by Sandlandia (food carts), would be a good place to have a one
   - Sidewalk not wide enough by Mtn Moka, Double Dragon, Shelley intersection West
   - Trip hazards – Strauss intersection and by Sandy Action Center
   - No sidewalks west past Shell Gas Station

2) Street Crossings and Intersections
   - Parked cars blocking view of vehicles when exiting Taco Time and DQ
   - Strauss intersections not wheelchair accessible
   - Meinig St potholes
   - 26 to 211 horrible crossings
   - Lots of food cart traffic → congestion
   - No button at 211/ Pioneer crosswalk from west side of pedestrian island

3) Driver Behavior
   - Some drivers have tinted windows, its hard to see/make eye contact with drivers
   - Group was wearing vests – makes them most visible pedestrians, therefore difficult to determine typical driver behavior

4) Safety
   - Graffiti
   - Low hanging branches

5) Comfort
   - Nice landscaping on island at Hwy 26/ Ten Eyck Rd
   - No Bench at bus stop

Downtown Sandy Walkability Assessment: **GROUP 2**

Community Walk Audit Checklist Block # _10 – 19 (Proctor Blvd.)

Directions: Please fill out the following checklist to note problems in the walking environment and note any concerns not listed in the checklist. Fill out one form for each designated block.

1) Sidewalks:

☐ No sidewalks or paths
☒ Sidewalks are broken, cracked, or have trip hazards
☒ Sidewalks are blocked by overgrown landscaping, poles, signs, plants, vehicles, etc.
☒ Sidewalk is not continuous
☐ Sidewalk is not wide enough (two people cannot easily walk together side by side)
☐ Sidewalk has nothing separating it from the street (landscaping, street trees, parked cars)

Overall, the quality and safety of the sidewalk is:

Other concerns:

__See notes in additional comments_____

2) Street Crossings and Intersections:

☐ The road is too wide to cross easily
☐ Traffic signals do not give enough time to cross the street
☒ The crossing does not have a pedestrian-activated button
☒ There is no crosswalk or it is poorly marked
☐ I have to walk too far to find a safe, marked crosswalk
☐ Intersection does not have a curb ramp for wheelchairs, strollers, walkers, etc.
☐ Parked cars blocking view of vehicles approaching intersection

Overall, the quality and safety of street crossings and intersections is:

Other concerns:

_See notes in additional comments_____

3) Driver Behavior:

☐ Drivers do not stop at stop signs or behind the crosswalk

☒ Drivers appear to be speeding

☐ Drivers do not yield to pedestrians

☒ Drivers are distracted (**on the phone**, texting, paying attention to passengers rather than the road)

☒ Drivers aren't looking out for people walking, make unexpected turns, seem hostile, or pull out of driveways without looking

Overall, the quality and safety of driver behavior is:

Other concerns:

See notes in additional comments

4) Safety:

☐ There are too few street lights or they are not present

☒ Vehicle speeds are too fast

☐ There's too much traffic

☐ There are people on the street who seem threatening

☐ Unleashed dogs or other loose intimidating animals are present

Overall, the feeling of safety in this area is:

Other concerns:

See notes in additional comments

5) Comfort:

☐ There is not enough shade from canopies, awnings, or trees

☐ There are few or not street trees and other landscaping

☐ There are vacant lots or rundown buildings

☐ More benches and places to rest are needed

Overall, the comfort and appeal in this area is:

Other concerns:

See notes in additional comments

Additional Comments: See next page

Additional Comments from Group 2:

Block #10

- Sidewalks wide enough on N sides
- Missing sidewalk in front of Funtime RV
- Flashing crosswalk signage would be helpful on Beers Ave intersection
- Light seems to be timed well on Bluff

Block #11

- Would be good to have painted crosswalk
- No street parking by DQ or Big Apple

Block #12

- Does utility box need to be on sidewalks
- Needs pruning/ weeding

Block #13

- Vehicle obstruction by cleaners
- Parking signs are inconsistent
- Have to walk around parked cars near Mt. Hood Cleaners

Block #14

- Bank takes good care of block
- People are conditioned to only stop at lights, if you don't make eye contact they won't stop
- Should have crossing flags @ Alt/Proctor and DQ intersection
- Saw someone speeding out of library parking lot

Block #15

- Trip hazard in Shelley/Proctor intersection
- Nice landscaping by the library

Block #16

- Brick issue by Meinig on south side of Proctor

Block #17

- Proximity to light makes it better to cross
- No curb cuts to cross N/S but encourages people to cross at light at Meinig
- No buffer from traffic
- Driveway cuts are poor
- Traffic is a little faster

Block #18

- North side is better
- Monster pole in sidewalk
- Hard to get to Police Station from Library on south side (sidewalk disappears)
- A frame sign and flower pots → hard to navigate

Downtown Sandy Walkability Assessment: **GROUP 3**

Community Walk Audit Checklist Block # _20 – 29 (Pleasant St.)_

Directions: Please fill out the following checklist to note problems in the walking environment and note any concerns not listed in the checklist. Fill out one form for each designated block.

1) Sidewalks:

☒ No sidewalks or paths
☒ Sidewalks are broken, cracked, or have trip hazards
☒ Sidewalks are blocked by overgrown landscaping, poles, signs, plants, vehicles, etc.
☒ Sidewalk is not continuous
☒ Sidewalk is not wide enough (two people cannot easily walk together side by side)
☒ Sidewalk has nothing separating it from the street (landscaping, street trees, parked cars)

Overall, the quality and safety of the sidewalk is:

Other concerns:

__See notes in additional comments_____

2) Street Crossings and Intersections:

☐ The road is too wide to cross easily
☐ Traffic signals do not give enough time to cross the street
☒ The crossing does not have a pedestrian-activated button
☒ There is no crosswalk or it is poorly marked
☐ I have to walk too far to find a safe, marked crosswalk
☒ Intersection does not have a curb ramp for wheelchairs, strollers, walkers, etc.
☐ Parked cars blocking view of vehicles approaching intersection

Overall, the quality and safety of street crossings and intersections is:

Other concerns:

_See notes in additional comments_____

3) Driver Behavior:

☒ Drivers do not stop at stop signs or behind the crosswalk

☒ Drivers appear to be speeding

☒ Drivers do not yield to pedestrians

☐ Drivers are distracted (on the phone, texting, paying attention to passengers rather than the road)

☐ Drivers aren't looking out for people walking, make unexpected turns, seem hostile, or pull out of driveways without looking

Overall, the quality and safety of driver behavior is:

Other concerns:

See notes in additional comments

4) Safety:

☒ There are too few street lights or they are not present

☒ Vehicle speeds are too fast

☐ There's too much traffic

☐ There are people on the street who seem threatening

☐ Unleashed dogs or other loose intimidating animals are present

Overall, the feeling of safety in this area is:

Other concerns:

See notes in additional comments

5) Comfort:

☒ There is not enough shade from canopies, awnings, or trees

☒ There are few or not street trees and other landscaping

☒ There are vacant lots or rundown buildings

☐ More benches and places to rest are needed

Overall, the comfort and appeal in this area is:

Other concerns:

See notes in additional comments

Additional Comments: See next page

Additional Comments from Group 3:

Block #20

- Parked cars across sidewalks
- Crumbling sidewalk
- No weld covers, slippery when wet

Block #21

- More traffic at intersection
- No sidewalk.. gravel
- Were friendly drivers, not fast

Block #22

- Curb crumble
- No sidewalks for ½ of north side

Block #23

- Unsafe with jagged uneven surfaces
- Water peter protrudes
- Crumbling
- La Bamba access bad for accessibility

Block #24

- Driveways deep so cars pull out real far
- Load vehicles and more traffic
- No sign at proctor

Block #25

- Poor ADA Conditions
- Driveways making sidewalk uneven
- Visibility notes @ intersection

Block #26

- Pot hole in crossing

Block # 27

- storm grate odd
- Tripping hazard (small old pole, not shaven down)
- Varying curb heights
- 1” curb

Block #28

- Narrow, vacant driveways are not safe for disability can and chair tend to get off track
- Foliage overgrown narrowing sidewalk area
- Mailbox base same as top for canes
- No lighting
- Sidewalk section missing

Block #29

- No sidewalks
- Sidewalk narrow – 3’
- Slanted
- Pole obstruction
- Electric box in walkway
- ADA put out into road rather than into the intersection rather than in direction not on diagonal, slope should go straight across
- St sign 1’ within curb
- Crosswalk needed

Downtown Sandy Walkability Assessment: **GROUP 4**

Community Walk Audit Checklist Block # 30 – 38 (side streets)

Directions: Please fill out the following checklist to note problems in the walking environment and note any concerns not listed in the checklist. Fill out one form for each designated block.

1) Sidewalks:

☒ No sidewalks or paths
☒ Sidewalks are broken, cracked, or have trip hazards
☒ Sidewalks are blocked by overgrown landscaping, poles, signs, plants, vehicles, etc.
☒ Sidewalk is not continuous
☒ Sidewalk is not wide enough (two people cannot easily walk together side by side)
☒ Sidewalk has nothing separating it from the street (landscaping, street trees, parked cars)

Overall, the quality and safety of the sidewalk is:

Other concerns:

See notes in additional comments

2) Street Crossings and Intersections:

☐ The road is too wide to cross easily
☐ Traffic signals do not give enough time to cross the street
☐ The crossing does not have a pedestrian-activated button
☒ There is no crosswalk or it is poorly marked
☒ I have to walk too far to find a safe, marked crosswalk
☐ Intersection does not have a curb ramp for wheelchairs, strollers, walkers, etc.
☒ Parked cars blocking view of vehicles approaching intersection

Overall, the quality and safety of street crossings and intersections is:

Other concerns:

See notes in additional comments

3) Driver Behavior:

☒ Drivers do not stop at stop signs or behind the crosswalk

☒ Drivers appear to be speeding

☒ Drivers do not yield to pedestrians

☐ Drivers are distracted (on the phone, texting, paying attention to passengers rather than the road)

☒ Drivers aren't looking out for people walking, make unexpected turns, seem hostile, or pull out of driveways without looking

Overall, the quality and safety of driver behavior is:

Other concerns:

See notes in additional comments

4) Safety:

☒ There are too few street lights or they are not present

☒ Vehicle speeds are too fast

☒ There's too much traffic

☐ There are people on the street who seem threatening

☐ Unleashed dogs or other loose intimidating animals are present

Overall, the feeling of safety in this area is:

Other concerns:

See notes in additional comments

5) Comfort:

☒ There is not enough shade from canopies, awnings, or trees

☒ There are few or not street trees and other landscaping

☒ There are vacant lots or rundown buildings

☐ More benches and places to rest are needed

Overall, the comfort and appeal in this area is:

Other concerns:

See notes in additional comments

Additional Comments: See next page

Additional Comments from Group 4:

1) Sidewalks:
   - Sidewalks not wide enough
   - Missing sidewalks
   - No crossing at Smith, no curb cuts
   - At intersection of Strauss/ Pioneer ADA accessible path requires to go into street to get around obstacles and uneven sidewalks
   - Curb ramp drop off is too steep
   - No parking, curb paint needs to be redone
   - Crosswalks need to be repainted
   - Street trees are a good barrier from traffic
   - Crosswalks would have poor visibility at night
   - Meinig/ 211 need to have push to activate walk signal between pedestrian island and sidewalk.

2) Street Crossings and Intersections:
   - Street trees and cars blocking visibility for cars pulling out from side streets
   - Need more crosswalk signage
   - Not all crosswalks are high visibility crosswalks
   - Some steep crosswalk entrances
   - Cars pull out past crosswalks for better visibility before turning
   - Mt Hood Cleaners trucks often parked on Proctor → create visibility issues
   - Road cracked and uneven on Smith Ave

3) Driver Behavior
   - Cars are speeding
   - Better visibility for pedestrians and other vehicles depending on where cars are allowed to park

All groups discussion summary:

- Utility covers needed
- Conditions of roads to sidewalk and entrances
- Tickets to slow down
- Lack of marked crosswalks between Pioneer and Proctor
- Strauss & Pioneer utility boxes
- Lights on Shelley and Alt
- Quicker pedestrian response times
- Crosswalk verbalization add “Avenue” to Alt Ave crosswalk so it doesn’t sound like ‘halt’
- Lighting crosswalks button to show gesture (if no audible indication)
- Short light at Meinig could use better timing
- Short light to cross at Hwy 26 and Ten Eyck and needs audible signals
- Sidewalk in front of Two Brothers in very bad condition
- Repaint curbs to indicate no parking -- @ library and Joe’s Donuts
- NW corner of Strauss and Proctor intersection is not ADA accessible, too many obstructions and impediments to have enough space to meet ADA standards

Surveyor #	Sidewalks			Intersections & Street Crossings			Comfort & Appeal			Overall			Top Improvements		
	Concern 1	Concern 2	Concern 3	Concern 1	Concern 2	Concern 3	Concern 1	Concern 2	Concern 3	Concern 1	Concern 2	Concern 3	Improvement 1	Improvement 2	Improvement 3
1	sidewalks too narrow, obstructions too often (light pole, fire dyrants, lock room)	block I - no sidewalk at all	211 turn missing walk button 0 almost got hit by cars	intersections cracked/uneven - trip hazards	missing cross button		noise!	few benches (facing bad directions if present (view traffic not waterfall for example)	inconsistent street trees/ lack canopy	noise and traffic - deterance	accessability - too narrow too often	congestions of cars - cannot enjoy walk	add trees and flowers/ trim what is present to try to detract from noise	improve and repair cracks in sidewalks	more benches and trash bings - add to Pleasant Street, better appeal
2	no sidewalk in front of Hathaway			library crosswalk	speeding	crossing when one lane stops but you can't see the other lane	speeding	drivers on phones		library crosswalk					
3	roguh pavement areas (inconsistent), some new	sidewalks have many difference obstacles, off and on		bluff across hwy 26 has 30 sec (for pedestrians) but cars may not see 'WALK"	Hwy 26 east turning right onto 211 - nothing for pedestrians		Noise, exhuast from vehicles	landscaping by gas stations is lovely		inconsistency of sidwealks - good, bad, so-so	cannot see whether drivers are watching when windows are hgihly tinted		something seperating pedestrians from traffic (small shrubs)	keep crosswalk paint bright and current	slow traffic to speed limit?
4				Strauss			need trash cans			paint and mark crosswalks					
5	lack of furnishing zone/planter strip buffer	not wide enough and/or too many obstacles	curmbling or missing in places	way too few safe crossings - need more high visiblity crossings, flashy lights, or signalized corssings	cars don't stop at marked intersection	pedestrian walk signal button is all but nonresponsive	lots of weeds	lack of buffer between pedestrians through zone and vehicle traffic	cars are way too fast and noisy - lets switch to all driverless eletric cars	safe intersection crossings	protective barrier between sidewalk and traffic lanes	speed and noise of traffic on Proctor and Pioneer	high visiblity (flashing ligh intersection every 2 to 3 blocks)	wider sidewalks with planter strip/ vegetation buffer btw sidewalk and traffic	driverless vehicles that are programmed to drive the speed limit and yeild to pedestrians and are quieter
6	sidewalks narrowed in many places from poles, etc.	lots of obstacles	cracks, crumbling	speeding traffic	not enough crosswalks	low visibility for cars seeing pedestrians at some intersections	speeding traffic	noise	exhaust fumes & places to rest (benches not right on street facing traffic)	speeding traffic	obstacles	limited places to safely cross	walk signals that make noise and flashing lights to alert pedestrians and cars when ppl corss	underground utilities (for narrow spots)	repair crumbling sidewalks
7	sidewalk obsturctions - too narrow	no sidewalk at entrance to town on N side of Pleasant	sidewalks disintegrating	non-responsive crosswalks - take too long to activita walk	from bluff to beers - no crosswalk	no pedestrian buttons	drivers not looking for pedestrians	not enough shade/trees	vehicle noise/pollution	non-reponsive crosswalks	drivers not looking for pedestrians	sidewalk obstructions	underground utilities	plant shade trees	reduce speed. Ticket fast drivers
8	sidewalk obstructions	sidewalks are too narrow	no bicycle lane, cars parked	bluff and 26 cars don't stop	pedestrian buttons are unclear		vehicle speed	unsafe crossing, parking lot		speed	lack of visibility for crossing business entrances	obstructions in the middle of the sidewalks	underground utilities	better crosswalk signals	sidewalk access from Shell to Bluff
9	too many sidewalk obstructions	lack of maintainence	power poles in sidewalk and PGE meter also	more painted crosswalks	crosswalk warning lights added		vehicles too fast	vehicles reckless behavior	weeds						
10	too many telephone poles	missing sidewalks - too many	deteriorating conrete (Two bros, sandy grade, etc.)	cars don't stop at crosswalks	no pedestrian signal button at Pioneer/211 interschange, west side of street	inadequate signage	not enough street trees (Pioneer)	vehicles traveling too fast	no street furniture (Pioneer)	underground the utility poles	speed and crosswalk enforcement	add sidewalks where they currently don't exist			
11	incomplete/missin g sidewalks	steep curb cutouts	cracks/trees in sidewalks	cars can not see pedestrians	not marked at every crosswalk	not enough lights around crosswalks	vehicles travel too fast	parked cars block view	nothing protecting pedestrians from cars	crosswalks not marked well (reflective stripes)	need ped lights at all crosswalks	speed too high	wider sidewalks	clearly mark all crosswalks	more lights along all sidewalks
12	incomplete/ missing sidewalks	extremely narrow sidewalks	(non ADA) - with curb cut steepness	unsafe crosswalks	timeing for crosswalks	parked cars block sight	not enough benches	note enough street trees	parked cars haning over sidewalks/street poles/trees in sidewalk	auto cross signals would be more ADA accessible with beeps/ voice for all disabilities	slow speed through town	clearly mark all pedestrian corssings	see previous answers		
13	mailboxes blocking sidewalks	sidealks not wide enough					turn down lots/buildings	no trash recepticles - recycling too		no lighting on Pleasant	low lighting on Proctor/Pioneer				
14	unclearly makred no parking areas	sidewalks too narrow	missing sidewalks	lack of marked crossawlks	ramps not ADA compliant	width of side streets with street parking	too few public seating areas	lack of public art - to make consistent style	lack of greenery	lack of clearly marked crosswalks	lack of sidewalks	Alt confustions (light, cross)	uneven sidewalks	narrow sidewalks	lack of sidewalks

Surveyor #	Sidewalks			Intersections & Street Crossings			Comfort & Appeal			Overall			Top Improvements		
	Concern 1	Concern 2	Concern 3	Concern 1	Concern 2	Concern 3	Concern 1	Concern 2	Concern 3	Concern 1	Concern 2	Concern 3	Improvement 1	Improvement 2	Improvement 3
15	lack of sidewalk between Pioneer and Proctor			steep roads into 2b on wolf (steep, icy)			too many cars on Pioneer/ Procotor			getting across Pioneer/proctor as a pedestrian			flashing yellow for pedestrians	underpass at Alt ($$)	
16	sidewalks not continuous - missing	narrow sidewalks	sidewalks obstructions would not allow wheelchair passage	not enough pedestrian corssings, marked	diffiuclt for pedestrians to see around parked cars at intersections	cars not aware of pedestrians due to not clear sight lines	noise and air pollution	run down buildings or vacant lots		cars not aware of ped b/c of unclear sight lines	noise and air pollution	sidewalks not continuous - missing			
17	sidewalks too narrow	don’t use diagonal wheelchair ramps, ever and replace those that exist. It messes with orientation for those w/ low vision and blindness	angle of driveways ae too steep. Make sure there is an edge no more than 1', no less than 1/2'	cars have to creep into crosswalk to know if perpedendicular traffic is coming - poor visibility	cars should not be allow to park on the sidealks area off driveways		no lights on street	no trash cans	mailboxes hang into sidewalks and becomes unknown obstacle for white can users	Alt Street Audible Pedestrian signal should say 'Alt AVE' and begning phrase is inaudible and muffled due to high traffic volume	lack of sidewalks in some places				

appendix

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MEMORANDUM

DATE: March 19, 2021

TO: Kelly O'Neil Jr., Development Services Director | City of Sandy

FROM: Reah Flisakowski, PE and Kamilah Buker

SUBJECT: Sandy Junker Street Circulation Plan Project #20189-000

The purpose of this memorandum is to develop a circulation plan and conceptual cross-sections for Junker Street, Strauss Avenue, and Bruns Avenue south of Pioneer Boulevard (US 26) in Sandy, Oregon. The circulation plan and conceptual cross-section will be used by city staff to guide future fronting improvements to the facilities.

EXISTING CONDITIONS

This section summarizes the existing transportation conditions in the study area including roadway network, traffic control, traffic volume characteristics, conditions for walking and biking, and driveway locations.

STUDY AREA

The study area focused on the segments of Junker Street, Strauss Avenue and Bruns Avenue south of Pioneer Boulevard, as shown in Figure 1. The area is located in the south portion of downtown Sandy and serves both commercial and residential land uses. In general, the east-west portion of Junker Street runs parallel to Pioneer Boulevard, and the north-south portion of Junker Street parallel to Strauss Avenue. Bruns Avenue and Junker Street are short blocks that connect to Pioneer Boulevard. Bruns Avenue does not connect to Junker Street. Bruns Avenue and the east-west portion of Junker Street terminate at a public parking lot (Pioneer Parking Lot) south of Pioneer Boulevard. The Pioneer Boulevard/Strauss Avenue intersection is controlled by a traffic signal. The Pioneer Boulevard intersections at Bruns Avenue and Junker Street are controlled by stop signs on the local street approaches.

FIGURE 1: STUDY AREA MAP

All of the study roadway segments are classified as Local Streets. Table 1 summarizes the characteristics of the study area streets, including pavement width, existing right-of-way, and cross-section elements. Bruns Avenue has urban improvements including curbs, sidewalks, and on-street parking on both sides of the facility. The remaining roadways have limited urban improvements and mostly provide a paved roadway with gravel shoulders. Strauss Avenue provides a curb extension and marked crosswalk on the south leg of the Strauss Avenue/Pioneer Boulevard intersection. Photos of the study roadways are shown in Figures 2 through 5.

TABLE 1: EXISTING ROADWAY CHARACTERISTICS

FACILITY	PAVEMENT WIDTH (FEET)	EXISTING ROW (FEET)	TRAVEL LANES	SIDEWALKS	ON-STREET PARKING	LANDSCAPE STRIP
BRUNS AVENUE	35	50	2	Yes Both sides	Yes Both sides	No
STRAUSS AVENUE	25	50	1	Yes (Partial)	No	No
JUNKER STREET (EAST-WEST)	20	20	1	No	No	No
JUNKER STREET (NORTH-SOUTH)	20	20	2	No	No	No

FIGURE 2: STRAUSS AVENUE LOOKING SOUTH FROM PIONEER BOULEVARD

FIGURE 3: JUNKER STREET LOOKING EAST FROM STRAUSS AVENUE

FIGURE 4: JUNKER STREET LOOKING SOUTH FROM PIONEER BOULEVARD

FIGURE 5: JUNKER STREET "DRIVEWAY" LOOKING WEST FROM STRAUSS AVENUE

FIGURE 6: BRUNS AVENUE LOOKING NORTH FROM PIONEER PARKING LOT

The current traffic circulation in the study area is shown with green arrows on Figure 7.

- Strauss Avenue operates with one-way traffic in the southbound direction.
- Bruns Avenue operates with two-way traffic.
- On the east-west segment, Junker Street operates with one-way traffic in the eastbound direction.
- On the north-south segment, Junker Street operates with two-way traffic.
- Junker Street has right-of-way between Bruns Avenue and Strauss Avenue but the roadway has not been constructed. There is a gravel driveway in the right of way connecting several parcels to the Strauss Avenue/Junker Street intersection.

FIGURE 7: EXISTING CIRCULATION AND DRIVEWAYS

The current driveway locations along the roadway segments are also shown in Figure 7. In general, each developed parcel has one driveway on the fronting local street. It is expected that future development on vacant parcels will be granted a single driveway.

TRAFFIC VOLUMES

Traffic volumes were recently collected in October 2020 for the Sandy Transportation System Plan Update. Data collected at the nearby Pioneer Boulevard/OR 211 intersection showed Pioneer Boulevard carries approximately 2,900 vehicles during the evening peak hour. Count data is not available for the local streets in the study area. It is assumed they serve low traffic volumes due to the adjacent developments and observed traffic operations.

CIRCULATION ASSESSMENT

The existing local street circulation patterns were reviewed to determine if any changes would be beneficial. The circulation assessment considered the existing roadway network, traffic flow, pavement and right-of-way widths, fronting land uses, potential development/redevelopment, out of direction travel, driver expectations/consistency, and safety for all users. The recommended circulation plan is shown in Figure 8.

Access to all the parcels on Strauss Avenue and Junker Street could be provided by one-way or two-way traffic flow. One-way traffic would require out of direction travel for some trips. The study roadway segments are short (less than 300 feet) and out of direction travel would be an acceptable trade-off for other multimodal benefits.

The circulation assessment determined the constrained 20-foot right-of-way on Junker Street significantly limits the opportunity to provide sidewalks in the study area. Due to the downtown location of the study area, it is important to accommodate walking trips. If the circulation on the north-south segment of Junker Street was modified to one-way traffic with a single vehicle travel lane, the remaining right-of-way could provide continuous sidewalks. With two-way traffic circulation on Junker Street, the right-of-way could only serve vehicles with two 10-foot lanes and no sidewalks.

Junker Street between Bruns Avenue and Strauss Avenue has the same constrained 20-foot right-of-way. When this roadway is constructed, it would benefit from one-way traffic circulation to provide right-of-way for sidewalks. As shown in Figure 8, the recommended circulation is one-way eastbound on Junker Street and a counter-clockwise loop on Strauss Avenue and Junker Street.

The option to provide one-way circulation on Junker Street in the westbound direction and a clockwise loop on Junker Street and Strauss Avenue would have several challenges. The existing signal at the Strauss Avenue/Pioneer Boulevard intersection currently does not accommodate the northbound approach because traffic flows southbound only on Strauss Avenue. Clockwise circulation would require a modification to the existing signal, adding a pole, mast arm and signal heads to northbound approach. The available sight distance from the Strauss Avenue/Pioneer

Boulevard intersection northbound approach is limited by the building on the southwest corner and could create safety issues for drivers and crossing pedestrians.

With Junker Street operating with one-way traffic, it is recommended to also modify Strauss Avenue to create a one-way loop for consistency and clarity to drivers. This would create an additional benefit by providing right-of-way for potential on-street parking and wider sidewalks.

Bruns Avenue currently operates as a dead-end street and requires two-way traffic. Since Bruns Avenue provides a direct connection between Pioneer Boulevard and a large public parking lot, retaining two-way traffic is recommended after construction of Junker Street between Bruns Avenue and Strauss Avenue.

FIGURE 8: RECOMMENDED CIRCULATION PLAN

CROSS-SECTION CONCEPT ANALYSIS

Roadway cross-section concepts were developed for the unimproved segments of Strauss Avenue and Junker Street. Cross-section options were evaluated for each street segment to support the recommended one-way circulation and determine how best to use the remaining right-of-way.

Both of these roadways are classified as Local Streets. The Local Street cross-section standard is shown in Figure 9. It requires a 50-foot right-of-way to provide a 14-foot drive lane for two-way traffic, 7-foot on-street parking lanes, 5.5-foot planter strips (includes 0.5-foot curb), 5-foot sidewalks and 0.5-foot signage/monumentation strips on the outside edges. The section does not include designated bike facilities. Cyclists can safely share the vehicle lanes due to low vehicle speeds and volumes.

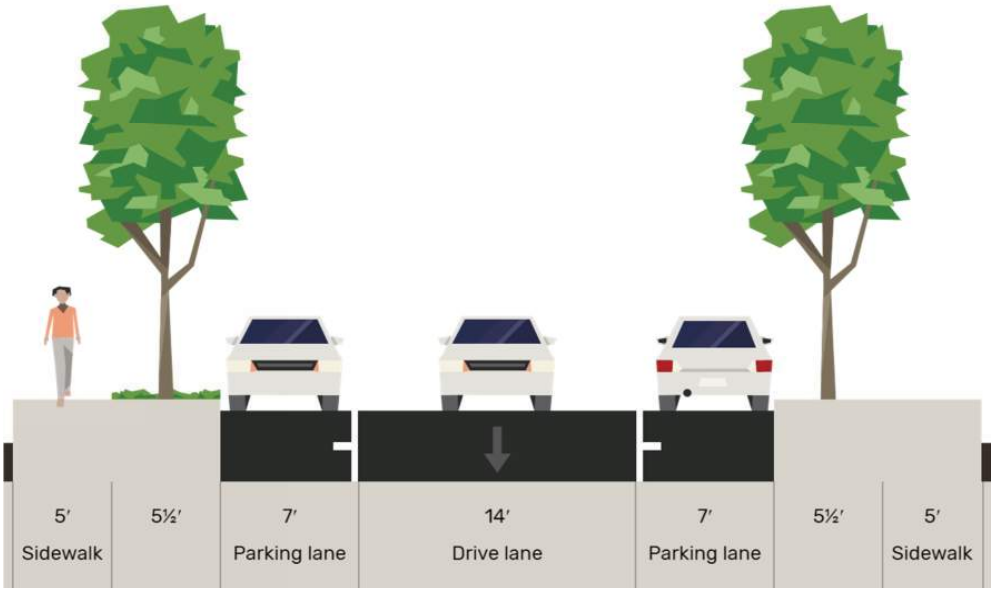

FIGURE 9: LOCAL STANDARD CROSS-SECTION

STRAUSS AVENUE

Strass Avenue has a 50-foot right-of-way and could accommodate the Local Street standard for most of the roadway. The cross-section is limited just south of Pioneer Boulevard by an existing curb extension that provides approximately 25-feet of pavement width. With the recommendation to retain the existing one-way circulation, Strauss Avenue would only need to accommodate a single southbound vehicle lane. The standard cross-section could be applied with a 14-foot travel lane designated as a single lane only. A 14-foot travel lane is wider than typical but would provide flexibility in the future if the need for two-way traffic on Strauss Avenue was triggered.

The recommended cross-section for Strauss Avenue (shown in Figure 10) would provide one 14-foot travel lane, 7-foot on-street parking lanes, 5.5-foot planter strips (includes 0.5-foot curb), 5-foot sidewalks and 0.5-foot signage/monumentation strips on the outside edge. The sidewalk and planer strip could be combined to provide a 10.5-foot sidewalk with tree wells which is preferred in urban areas to accommodate a higher volume of pedestrian trips.

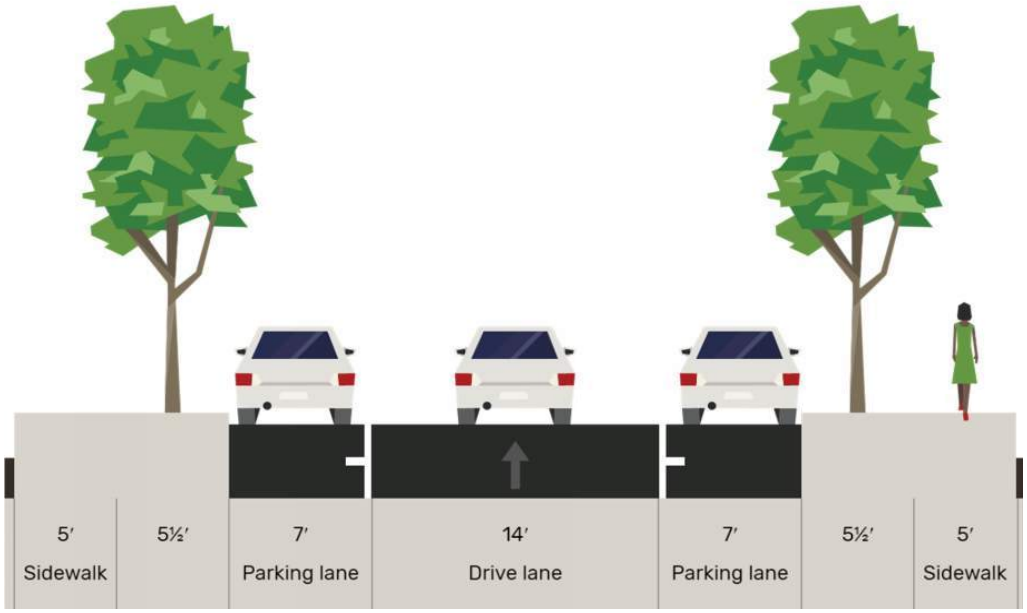

FIGURE 10: STRAUSS AVENUE CROSS-SECTION

On-street parking on the east side of the roadway would compliment the existing curb extension at Pioneer Boulevard. Providing parking on both sides of Strauss Avenue will be important to accommodate overall downtown parking demands and the needs of nearby residents and businesses.

JUNKER STREET

Junker Street has an existing 20-foot right-of-way and can only accommodate a portion of the local street standard cross-section (Figure 9). With the recommended one-way traffic, Junker Street would only need to accommodate a single vehicle lane. Two cross-section alternatives were developed, Alternative A which would fit within the existing right-of-way and Alternative B which would require additional right-of-way or an easement to provide on-street parking. The alternatives are presented below.

Alternative A - The 20-foot cross-section using the existing right-of-way would provide one 13-foot travel lane, 5.5-foot sidewalk (includes 0.5-foot curb), 0.5-foot curb and two 0.5-foot signage/monumentation strips on the outside edges. The sidewalk could be constructed on the north and west sides of Junker Street to create a continuous sidewalk loop with sidewalks on Strauss Avenue and connecting to Bruns Avenue to the west. Currently, there is not existing right-of-way to provide on-street parking or landscaping. Figure 10 shows the cross-section for Junker Street without additional right-of-way or easement.

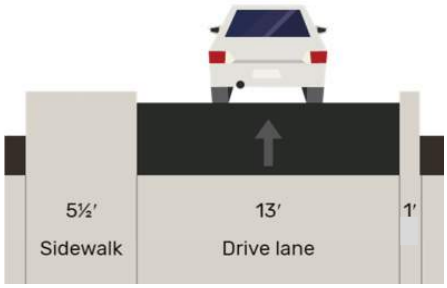

FIGURE 10: JUNKER STREET CROSS-SECTION WITH EXISTING RIGHT-OF-WAY

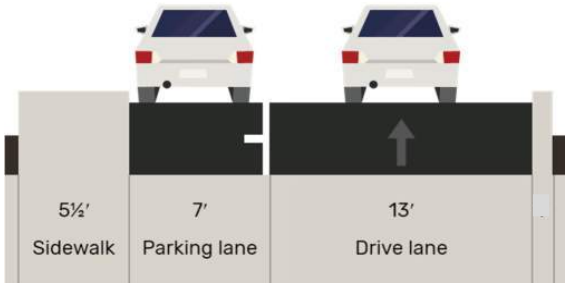

FIGURE 11: JUNKER STREET CROSS-SECTION WITH PARKING

Alternative B – If a 7-foot right-of-way dedication or easement could be obtained, on-street parking could be added to Alternative A. The 27-foot Alternative B section would provide one 13-foot travel lane, 5.5-foot sidewalk (includes 0.5-foot curb), 7-foot on-street parking lane adjacent to the sidewalk, 0.5-foot curb and two 0.5-foot signage/monumentation strips on the outside edges.

The recommended characteristics of the study area streets are shown in Table 2, including pavement width, existing right-of-way, and cross-section elements.

TABLE 2: RECOMMENDED ROADWAY CHARACTERISTICS

FACILITY	ROW (FEET)	TRAVEL LANES	SIDEWALKS	ON-STREET PARKING	LANDSCAPE STRIP
BRUNS AVENUE	50	2	Yes Both sides	Yes Both sides	No
STRAUSS AVENUE	50	1	Yes Both sides	Yes Both sides	Yes Both sides
JUNKER STREET ALTERNATIVE A	20	1	Yes One side	No	No
JUNKER STREET ALTERNATIVE B	27	1	Yes One side	Yes One Side	No

Dubarko Road & Hwy 211 Proportional Share ..... Section L

appendix

TECHNICAL MEMORANDUM

DATE: October 27, 2022

TO: Kelly O'Neill | City of Sandy

FROM: Reah Flisakowski | DKS

SUBJECT: Highway 211/Dubarko Road Proportionate Share Funding Plan

TABLE 1: PROPORTIONATE SHARE FEE ANALYSIS RESULTS

PROPORTIONATE SHARE METHOD	SHORT-TERM (5 YEARS)
PROPOSED IMPROVEMENT	Traffic signal + turn lanes
PROJECT COST	$12,383,000
YEAR 2020 ENTERING VOLUME	907
YEAR 2040 ENTERING VOLUME	1,665
NET GROWTH IN TRIPS ACCOMMODATED	758
COST FOR DEVELOPMENT	$16,336 per PM peak hour trip

NOTE: VOLUMES REPRESENT PM PEAK HOUR

EXHIBIT C

Ordinance No. 2023-24
2023 Sandy Transportation System Plan Adoption

FINDINGS OF COMPLIANCE

The City is proposing to adopt an update of the Sandy Transportation System Plan (TSP) and associated policies and development requirements. The following findings demonstrate that the adoption of the 2023 Sandy TSP is consistent with relevant Statewide Land Use Planning Goals, Oregon Transportation Plan policies, Oregon Highway Plan policies, Oregon Administrative Rules, Sandy Comprehensive Plan policies, and Sandy Development Code regulations.

I. Consistency with Statewide Planning Goals

Goal 1: Citizen Involvement

Goal 1 requires the development of a citizen involvement program that is widespread, allows two-way communication, provides for citizen involvement through all planning phases, and is understandable, responsive, and funded.

Findings: The TSP development process included robust community engagement to ensure the transportation needs and desires of the community are reflected in the TSP update. TSP engagement included the following activities:

- The TSP project team worked closely with a Community Advisory Committee (CAC), which included representatives from the Sandy City Council and Planning Commission, Oregon Department of Transportation (ODOT), Clackamas County, Sandy Area Metro (SAM), Sandy Fire District, Sandy Chamber of Commerce and neighborhoods. The CAC met a total of three times at key points in the process and provided input on current transportation needs and proposed recommendations and system updates.
- Three public open house events were held (two online, one in-person) to gather community input regarding transportation goals, concerns, and needs related to multimodal transportation options and community priorities for future investments. The events were held in September and October of 2021, and September 2022.
- The City's acknowledged land use regulations implement Goal 1 by providing for a community participation process to inform land use decisions. The City requires Comprehensive Plan amendments to be reviewed first through a public hearing process before the Planning Commission. The Planning Commission makes a recommendation to the City Council on the proposal, followed by a public hearing before the City Council. The City Council makes the final decision regarding the

Comprehensive Plan amendment. This legislative process requires public notice and public hearings with the opportunity for written and oral testimony.

In addition to the extensive community engagement activities that guided TSP development, Draft TSP Policy 8.3 requires the City to "(p)rovide multi-faceted and inclusive public engagement process that provides all community members an opportunity to provide input on transportation system decisions."

Based on the findings discussed above, Goal 1 is satisfied.

Goal 2: Land Use Planning
This goal requires that a land use planning process and policy framework be established as a basis for all decisions and actions relating to the use of land. All local governments and state agencies involved in the land use action must coordinate with each other. City, county, state and federal agency and special districts plans and actions related to land use must be consistent with the comprehensive plans of cities and counties and regional plans adopted under Oregon Revised Statues (ORS) Chapter 268.

Findings: The City has an established land use planning process and a policy framework that serves as a basis for the decision on this request. The policy framework is found in the City's acknowledged Comprehensive Plan, which includes policies and goals relevant to the decision. An analysis of how the Draft 2023 TSP is consistent with this policy framework is presented below, as required for the requested Comprehensive Plan amendments.

- Amendments to the City's Comprehensive Plan become part of the policy framework that serves as the basis for decisions and actions related to the use of land. The proposal is to replace the currently adopted 2011 TSP with the Draft 2023 TSP, to be adopted and incorporated by reference as an element of the Comprehensive Plan.
- Existing state, regional, and local plans, policies, and regulations relevant to the Draft 2023 TSP were reviewed and summarized in order to guide the development of the TSP. See Section A of the TSP Appendix (TM #1 Policy Framework and Code Review).
- Coordination between state, regional, and local agencies was accomplished through both the Project Management Team (PMT), which included key City staff members, and the CAC. Members of the CAC that provided guidance on the development of the TSP included representatives from multiple agencies and organizations, including those listed below.
    - Sandy Area Metro
    - ODOT
    - Department of Land Conservation and Development (DLCD)
    - City of Sandy
    - Sandy Fire District

- Sandy Chamber of Commerce
- Sandy Planning Commission
- Sandy City Council
- Sandy residents

Based on the findings discussed above, Goal 2 is satisfied.

Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces
To protect natural resources and conserve scenic and historic areas and open spaces. Local governments shall adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations. These resources promote a healthy environment and natural landscape that contributes to Oregon's livability.

Findings: Goal 5 of the Draft 2023 TSP is to "(m)inimize environmental impacts on natural resources and encourage carbon-neutral or efficient transportation alternatives." This Goal includes three policies that support Statewide Planning Goal 5:

- Policy 5.1: *Avoid or mitigate transportation project impacts to environmental resources including creeks and wetlands, cultural resources, and wildlife corridors.*
- Policy 5.3: *Encourage transportation facility construction methods that reduce environmental impacts.*
- Policy 5.4: *Minimize street cross-sections to protect and preserve open space and reduce impervious surface.*

Goal 3 of the Draft 2023 TSP includes the following policies to protect scenic and historic resources as they relate to the City's transportation system:

- Policy 3.1: *Protect the scenic resources in Sandy.*
- Policy 3.2: *Preserve the historic character of Sandy.*
- Policy 3.3: *Identify gateway and beautification treatments for Hwy 211.*
- Policy 3.4: *Support Mt. Hood Scenic Byway Enhancements.*

Based on the findings discussed above, Goal 5 is satisfied.

Goal 6: Air, Water and Land Resources Quality
To maintain and improve the quality of the air, water and land resources of the state. All waste and process discharges from future development, when combined with such discharges from existing developments shall not threaten to violate, or violate applicable state or federal environmental quality statutes, rules and standards.

Findings: Goal 5 of the Draft 2023 TSP is to "(m)inimize environmental impacts on natural resources and encourage carbon-neutral or efficient transportation alternatives." This Goal includes three policies that support Statewide Planning Goal 6:

- Policy 5.1: *Avoid or mitigate transportation project impacts to environmental resources including creeks and wetlands, cultural resources, and wildlife corridors.*
- Policy 5.2: *Support energy conservation by supporting public transit, transportation demand management, transportation system management and a multi-modal transportation system.*
- Policy 5.4: *Minimize street cross-sections to protect and preserve open space and reduce impervious surface.*

The Draft 2023 TSP also includes goals, policies, and projects that promote pedestrian, bicycle, and transit mobility, which will help mitigate transportation-related impacts and emissions in the community. Proposed goals and policies include:

- Policy 3.6: *Identify walking and biking needs in the urban growth boundary expansion area.*
- Goal 6: *Provide safe, efficient, high-quality transit service that gives Sandy residents, employees, employers, and visitors more freedom to meet their needs within the city, region and state. Create a transit system that offers an alternative to private automobile use, supports efficient use of roadways and reduces air pollution and energy use.*
- Policy 7.3: *Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities.*
- Policy 7.5: *Provide enhanced pedestrians and bicyclists crossings where needed.*
- Policy 9.1: *Develop recreational walking and biking routes to access employment, schools, shopping, and transit routes.*

The Draft 2023 TSP identifies 91 pedestrian and bicycle projects, which will help improve the City's multimodal network, providing more travel options, and reducing vehicular transportation-related impacts on air resources. The Draft TSP also includes eight transit projects. These projects are identified in Draft TSP Table 2 and Figures 12 and 13. The projects include the following categories:

- Infill sidewalk gaps and construct new sidewalks (Draft TSP projects P1 – P27)
- Pedestrian crossings, crosswalk installations, and traffic calming improvements (Draft TSP projects C1 – C24)
- ADA improvements (Draft TSP project C23)
- Shoulder widening for bike access and bike lane improvements (Draft TSP projects B1 – B15)
- Trail construction projects (Draft TSP projects T03 – T54)
- Transit service and facility improvements (no project numbers assigned)

Based on the findings discussed above, Goal 6 is satisfied.

Goal 7: Areas Subject to Natural Hazards
To protect people and property from natural hazards. Local governments shall adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards.

Findings: Planning for Sandy's transportation needs included a solid knowledge of existing environmental constraints (See Appendix Section D – TM #4 Existing Conditions) and estimating project costs to account for avoidance and mitigation. Proposed TSP improvements and projects respect the natural environment, avoiding impacts where possible and providing project solutions where necessary. The Draft TSP supports a multimodal system that is more resilient to natural disasters or disruptive events and plans for connectivity, providing multiple ways to move people away from hazardous areas. See the findings for Goal 5 for more details.

Based on the findings discussed above, Goal 7 is satisfied.

Goal 9: Economic Development
This goal requires that local comprehensive plans and policies contribute to a stable and healthy economy in all regions of the state.

Findings: Draft TSP Policies 4.2 and 9.1 promote a transportation system that serves the employment needs of the community, stating the following:

- Policy 4.2: *Plan for a transportation system that supports projected population and employment growth and maximize travel options by providing efficient routes for all modes of transportation.*
- Policy 9.1: *Develop recreational walking and biking routes to access employment, schools, shopping, and transit routes.*

The Draft TSP also includes policies that support freight movement by ensuring the function and efficiency of US 26, which is the City's primary freight route. This includes the following policies:

- Policy 1.5: *Emphasize local street connections, in an effort to reduce reliance on US 26 and Hwy 211 for local trips.*
- Policy 4.1: *Balance local access to US 26 with the need to serve regional and statewide traffic, while supporting adjacent land uses.*

Most projects recommended in the TSP support economic development in the city directly or indirectly given that they more efficiently use existing facilities and make transportation options more viable. Key examples from the Financially Constrained Project List ("project list") include the following:

- New collector streets (Draft TSP projects D21E and D22).

- Several road extensions (Draft TSP projects D20, D21B, D21F, and D23, among others).
- 27 sidewalk infill, improvement, or construction projects (Draft TSP Table 2 and Figure 12).
- Bike facility improvements/construction and trails (Draft TSP projects B1-B15 and T03-T54, and Draft TSP Figures 12 and 13).
- Several transit projects, including adding Saturday service and extending service hours on fixed routes, adding a new bus and driver, new service to Clackamas County and Boring, and other transit facility improvements.

Based on the findings discussed above, Goal 9 is satisfied.

Goal 10: Housing
This goal requires the City plans provide for the appropriate type, location and phasing of public facilities and services sufficient to support housing development in areas presently developed or undergoing development or redevelopment.

Findings: Several Draft TSP policies and projects promote a transportation system that can adequately support housing development and future travel demand. Draft TSP policies that address appropriate service for residential areas, population growth and travel demand needs include:

- Policy 1.4: *Ensure sufficient capacity to accommodate future travel demand (transit, bicycle, pedestrian, etc.) to, within, and through the City of Sandy.*
- Policy 4.2: *Plan for a transportation system that supports projected population and employment growth and maximize travel options by providing efficient routes for all modes of transportation.*
- Policy 7.3: *Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities.*

Travel demand analysis conducted through the TSP process estimates total traffic will increase by over 30 percent by 2040. Many of the identified Draft TSP projects are intended to increase travel capacity among various modes to accommodate future demand. Transportation improvements that accommodate traffic increases over the next 20 years will also help the City meet future housing needs. Many other projects are intended to complete the transportation network and options within existing residential areas. Examples of projects that support increased housing capacity and other transportation improvements that serve existing residential areas include:

- Cascadia Village Drive Extensions 1-3 (Draft TSP projects D21C, D21B, and D32)
- Village Boulevard Extensions 1 and 2 (Draft TSP projects D21F and D21G)
- Agnes Street Extension (Draft TSP project D19)
- Olson Street Extensions 1 and 2 (Draft TSP projects D18 and D33)

- Several sidewalk infill or construction projects in residential areas (TSP projects P1-P24)
- Several bicycle improvements and trail projects (Draft TSP projects B1-B15 and T03-T54)

Based on the findings discussed above, Goal 10 is satisfied.

Goal 11: Public Facilities and Services
Goal 11 requires cities and counties to plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development. The goal requires that urban and rural development be "guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to, the needs and requirements of the urban, urbanizable and rural areas to be served."

Findings: Transportation facilities, including roadways, bikeways, sidewalks, and multi-use paths are a primary type of public facility and, in Sandy, are managed by public agencies including the City, Clackamas County, and ODOT. The Draft 2023 TSP documents existing conditions and future needs for Sandy's transportation system based on the existing and planned land uses – see TM #4 and TM #5 in Draft TSP Appendix Sections D and F, respectively. The Draft TSP projects (listed in Draft TSP Tables 1 and 2) and the Financially Constrained Projects (Draft TSP Table 3) are tailored to meet identified existing and future needs and address project goals and objectives. In addition, changes to the City's Typical Street Cross-Section Standards are intended to support future transportation needs by updating the dimension and modal standards for these transportation facilities (Draft TSP Figures 18-24 and Table 4).

Based on the findings discussed above, Goal 11 is satisfied.

Goal 12: Transportation
Goal 12 requires cities, counties, metropolitan planning organizations, and ODOT to provide and encourage a "safe, convenient and economic transportation system." This is accomplished through development of Transportation System Plans based on inventories of local, regional and state transportation needs. Goal 12 is implemented through OAR 660, Division 12, also known as the Transportation Planning Rule ("TPR"). The TPR contains numerous requirements governing transportation planning and project development. (See the "OAR 660, Division 12" section of this document for findings of compliance with the TPR.)

Findings: Project goals and priorities that address mobility and connectivity, capital investments/funding, community needs, system management, environment, transit, safety, equity, and health guided the development of the Draft 2023 TSP. Existing conditions and future transportation needs were analyzed with respect to these goals and objectives. Elements of the Draft 2023 TSP – including existing conditions and

future needs, as well as transportation system standards, implementation strategies, and recommended transportation system improvements – are consistent with TPR Section -0020 requirements.

The inventory and analysis of existing and future conditions identified opportunities, by mode, to improve the transportation system. See Section D and E (Existing Conditions and Needs Analysis) in the Draft 2023 TSP Appendix. These needs were identified in the existing conditions and needs analysis; by project team members, advisory committee members, and other community members; and through analysis using projected future traffic volumes and patterns, consistent with TPR Section -0030 requirements.

Evaluation criteria, developed in accordance with TPR Section -0035 and based on the TSP goals and objectives, were used to evaluate improvement alternatives that would address identified needs. Evaluation criteria is detailed in the Draft TSP Appendix Section B (TM #2 Goals Objectives and Evaluation Criteria). The criteria were presented to and refined during discussions with the CAC during their scheduled meetings and with community members at public meetings.

The regulatory basis for proposed transportation policies and development code amendments – in particular, TPR requirements – is outlined in the Draft TSP Appendix Sections A and F (TM #1 Policy Framework and Code Review, and TM #6 Regulatory Solutions). This coordination of land use and transportation planning is consistent with both the general purpose and specific requirements in the TPR, including Section -0045 (Implementation of the Transportation System Plan).

The Draft 2023 TSP will be adopted as the Transportation Element of the City's Comprehensive Plan. TSP adoption will be accomplished through a legislative amendment process consistent with City procedures and requirements.

Based on the findings discussed above, Goal 12 is satisfied.

Goal 13: Energy Conservation
To conserve energy. Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles.

Findings: Draft 2023 TSP Policy 5.3 is to "Support energy conservation by supporting public transit, transportation demand management, transportation system management, and multi-modal transportation system." In addition, Draft TSP Goal 6 is Transit. Draft Goal 6 calls for the City to "(s)upport efficient use of roadways and reduces air pollution and energy use." The Draft TSP also identifies 8 transit projects.

The Draft 2023 TSP includes policies and projects that are intended to promote pedestrian and bicycle mobility, which supports energy conservation for the City's transportation system. The following Draft TSP policies support the City's pedestrian and bicycle mobility goals:

- Policy 1.3: Improve vehicular/pedestrian interface along all arterial and collector streets.
- Policy 1.4: Ensure sufficient capacity to accommodate future travel demand (transit, bicycle, pedestrian, etc.) to, within, and through the City of Sandy.
- Policy 3.6: Identify walking and biking needs in the urban growth boundary expansion area.
- Policy 6.3: Improve accessibility to transit services for people arriving by foot, by bicycle, or with a mobility device.
- Policy 7.3: Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities.
- Policy 7.5: Provide enhanced pedestrian and bicycle crossings where needed.
- Policy 8.2: Ensure the pedestrian and bike facilities are designed clear of obstacles and obstructions (e.g., utility poles, grates) and meet ADA requirements.
- Policy 9.1: Develop recreational walking and biking routes to access employment, schools, shopping, and transit routes.
- Policy 9.2: Provide walking facilities that are physically separated from auto traffic on all arterials and collectors.

The Draft TSP also identifies 91 pedestrian and bicycle projects, which are detailed in Draft TSP Table 2 and illustrated in Draft TSP Figures 12 and 13.

Based on the findings discussed above, Goal 13 is satisfied.

Goal 14: Urbanization
To provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

Findings: The Draft 2023 TSP includes a number of policies and projects that are intended to accommodate future housing and employment growth forecasted out to 2040, as described in findings for Statewide Planning Goals 9 (Economy) and 10 (Housing). Specifically Draft TSP Policy 4.3 calls for the City to "Plan for a transportation system that supports projected population and employment growth and maximize travel options by providing efficient routes for all modes of transportation." See findings to Goal 9 and 10 for more details on how specific Draft TSP policies and projects are intended to respond to a growing community.

Based on the findings discussed above, Goal 14 is satisfied.

II. Consistency with Oregon Transportation Plan

The Oregon Transportation Plan (OTP) is the state's long-range, multimodal transportation plan. The OTP is the overarching policy document for a series of modal and topic plans that together form the state's TSP. A local TSP must be consistent with applicable OTP goals and policies. Findings of compatibility will be part of the basis for TSP approval. While the Draft TSP meets all OTP goals and policies, the following policy list details how the Draft TSP meets the most notable policies. The following demonstrates how the Draft 2023 Sandy TSP complies with state transportation policy:

Policy 1.1 – Development of an Integrated Multimodal System
It is the policy of the State of Oregon to plan and develop a balanced, integrated transportation system with modal choices for the movement of people and goods.

Findings: The Draft 2023 TSP includes a number of policies and projects that are intended to support a multimodal transportation system. Some of the policies that promote a multimodal system include:

- Policy 3.6: Identify walking and biking needs in the urban growth boundary expansion area.
- Policy 5.2: Support energy conservation by supporting public transit, transportation demand management, transportation system management and a multi-modal transportation system.
- Policy 6.3: Improve accessibility to transit services for people arriving by foot, by bicycle or with a mobility device.
- Policy 7.3: Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities.
- Policy 7.5: Provide enhanced pedestrians and bicyclists crossings where needed.
- Policy 9.1: Develop recreational walking and biking routes to access employment, schools, shopping, and transit routes.
- Policy 9.2: Provide walking facilities that are physically separated from auto traffic on all arterials and collectors.

The TSP process identified numerous projects that cover a range of mobility options, including:

- 39 projects to improve motor vehicle mobility (Draft TSP Table 1 and Figure 11)
- 91 pedestrian and bicycle projects (Draft TSP Table 2 and Figures 12 and 13)
- 8 transit projects (Page 41 of the Draft TSP)

The Draft TSP divides the projects into "improvement packages" based on community priority and funding availability. Proposed Package 1 "financially constrained" projects are more likely to secure funding within the planning horizon (by 2040). Package 2

includes “aspirational” projects that are unlikely to secure funding before 2040. Most of the projects identified in the Draft TSP are in Package 2. The following Motor Vehicle projects are in Package 1:

- Project D3: US 26 and 362nd Drive Intersection Improvement
- Project D6: OR 211 & Proctor Boulevard Intersection Improvement
- Project D9: Highway 211 & Dubarko Road Multimodal Improvement
- Project D14A: Bell Street Extension 1A
- Project D15A: 362nd Drive Extension 1A
- Project D20: Dubarko Road Extension
- Project D21B: Gunderson Road Extension
- Project D21D: Cascadia Village Extension 2
- Project D21F : Village Boulevard Extension 1
- Project D24: Highway 211 & Gunderson Road Intersection Improvement
- Project D27: Highway 211 & Dubarko Road Intersection Control Evaluation
- Project D31: Sandy Bypass Planning

Bicycle and Pedestrian projects in Package 1, including the following:

- Project P1: 362nd Drive – West sidewalk of Chinook Street to Industrial Way.
- Project P3: Bluff Road - West sidewalk gap infill from Bell Street to 15931 Bluff Road
- Projects C5 to C15: Pedestrian crossing improvements along Bluff Road, US 26, Hood Street, and Pleasant Avenue.
- Project C23: ADA improvements along Highway 211.

The Draft TSP includes updates to the City’s roadway functional classifications that are designed to accommodate anticipated level of access for all travel modes. This includes bike lane requirements and design standards for arterials and collectors and sidewalk standards for each functional classification. The TSP also includes new standards for shared-use paths, as shown in TSP Figure 25. The functional classifications include principal arterials, minor arterials, collectors, and local streets, which are depicted in TSP Figures 18-24 and TSP Table 4.

Based on the findings discussed above, OTP Policy 1.1 is satisfied.

Policy 1.2 – Equity, Efficiency and Travel Choices
It is the policy of the State of Oregon to promote a transportation system with multiple travel choices that are easy to use, reliable, cost-effective and accessible to all potential users, including the transportation disadvantaged.

Findings: Draft TSP Goal 8 is Equity, which establishes the goal for Sandy to “Support an equitable transportation system and provide transportation choices to all users.” Goal 8 includes the following three policies:

- Policy 8.1: Ensure the transportation system provides equitable access to underserved, disadvantaged, and vulnerable populations and is easy to use and accommodating to travelers of all ages.
- Policy 8.2: Ensure the pedestrian and bike facilities are designed clear of obstacles and obstructions (e.g., utility poles, grates) and meet ADA requirements.
- Policy 8.3: Provide multi-faceted and inclusive public engagement process that provides all community members an opportunity to provide input on transportation system decisions.

Multiple Draft TSP goals and policies address efficiency, cost effectiveness, accessibility, travel choices, and reliability, including the following:

- Policy 1.1: Maintain the livability of Sandy through well-connected transportation facilities.
- Policy 1.2: Improve the safety and accessibility of transit facilities.
- Policy 1.4: Ensure sufficient capacity to accommodate future travel demand (transit, bicycle, pedestrian, etc.) to, within, and through the City of Sandy.
- Policy 2.1: Optimize the use, performance, and value of existing facilities while planning for future infrastructure.
- Policy 3.6: Identify walking and biking needs in the urban growth boundary expansion area.
- Policy 6.3: Improve accessibility to transit services for people arriving by foot, by bicycle or with a mobility device.
- Policy 7.3: Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities.

The Draft TSP also includes 91 pedestrian and bicycle projects (Draft TSP Table 2, Figure 12, and Figure 13), and 8 transit projects. Fourteen of the projects are in Package 1, meaning funding priority is high and they will likely be constructed before 2040. This includes a project to construct ADA improvements along Highway 211 (Project C23).

The Draft TSP includes updates to the City's roadway functional classifications, which are designed to accommodate anticipated level of access for all travel modes. The functional classifications include principal arterials, minor arterials, collectors, and local streets, which are depicted in TSP Figures 18-24 and TSP Table 4.

Based on the findings discussed above, OTP Policy 1.2 is satisfied.

Policy 2.1 – Capacity and Operational Efficiency
It is the policy of the State of Oregon to manage the transportation system to improve its capacity and operational efficiency for the long term benefit of people and goods movement.

Policy 2.2 – Management of Assets
It is the policy of the State of Oregon to manage transportation assets to extend their life and reduce maintenance costs.

Findings: Draft TSP Policy 1.4 is to "Ensure sufficient capacity to accommodate future travel demand (transit, bicycle, pedestrian, etc.) to, within, and through the City of Sandy." In addition, Draft TSP Policy 2.1 is to "Optimize the use, performance, and value of existing facilities while planning for existing infrastructure." Likewise, Draft TSP Goal 4 – System Management – is to "Promote traffic management to achieve the efficient use of transportation infrastructure." Goal 4 includes Policy 4.2, which is for the City to "Plan for transportation system that supports projected population and employment growth and maximize travel options by providing efficient routes for all modes of transportation."

The TSP process included a mobility target analysis to provide a metric for assessing the impact of new development on the existing transportation system and for identifying needed capacity improvements. The Alternative Mobility Standards analysis is included in the TSP Appendix Section I. The analysis found that existing mobility targets are unlikely to be met due to funding constraints for capital projects, however the City will continue working with ODOT to establish an alternative mobility target specifically for US 26. Draft TSP Policy 4.3 is to "Support Oregon Transportation Commission adoption of an alternate mobility target for US 26 that allows for increased congestion on the highway corridor, especially during peak seasonal and continued planned growth travel periods."

The TSP process included an Existing Conditions and Needs Analysis which are included in the TSP Appendix Sections D and E. These analyses evaluated system capacity and identified needs based on current and future conditions. The identified needs informed many of the proposed projects identified in TSP Table 1. Many of the projects include intersection improvements intended to improve capacity at signalized intersections along US 26, including Project D3 – US 26 & 362nd intersection improvements. Project 23 is intended to reduce congestion by adding turn lanes and providing minor widening. Projects D1 to D11 are all intended to reduce intersection congestion, three of which are Package 1 projects with project D3 having already secured funding.

The Draft TSP includes updates to the City's roadway functional classifications. The classification system determines the level of mobility for all travel modes for anticipated level of access and usage. Each functional classification is also designed to meet the City's roadway capacity needs. The functional classifications include principal arterials, minor arterials, collectors, and local streets, which are depicted in TSP Figures 18-24 and TSP Table 4.

The Draft TSP updated the street and access spacing standards, which require a minimum distance between public streets and minimum driveway spacing distances. The updated access spacing standards are intended to help reduce congestion and accident risk on the city's roadways. Appropriate access spacing will also help reduce the need for construction of additional roadway capacity. The updated access spacing standards are shown in Draft TSP Table 5.

The TSP process also identified updates to the City's Transportation Impact Analysis (TIA) guidelines, which are intended to apply conditions to land use development to minimize impacts on transportation facilities. TIA requirements apply to developments that are anticipated to have moderate to significant affects on the transportation system. They are intended to protect and extend the longevity of transportation facilities. The TIA guidelines are included in Appendix Section F of the Draft TSP.

Based on the findings discussed above, OTP Policy 2.1 and 2.2 are satisfied.

Policy 3.1 – An Integrated and Efficient Freight System
It is the policy of the State of Oregon to promote an integrated, efficient and reliable freight system involving air, barges, pipelines, rail, ships and trucks to provide Oregon a competitive advantage by moving goods faster and more reliably to regional, national and international markets.

Findings: Policy 4.1 of the Draft TSP is to "Balance local access to US 26 with the need to serve regional and statewide traffic, while supporting adjacent land uses." This goal recognizes the importance of US 26 as a regional and statewide transportation route, including for freight moving between the Greater Portland Metropolitan Area and Central Oregon. US 26 Bypass Planning (Project D28) and US Adaptive Signal System (Project S1) would create a more efficient freight system.

Based on the findings discussed above, OTP Policy 3.1 is satisfied.

Policy 3.2 – Moving People to Support Economic Vitality
It is the policy of the State of Oregon to develop an integrated system of transportation facilities, services and information so that intrastate, interstate and international travelers can travel easily for business and recreation.

Findings: US 26 serves as the primary arterial and connector between Sandy and the rest of the state. Several policies and projects are intended to improve mobility and maintain functional operations of the arterial/highway in Sandy, including the following:

- Policy 1.5: Emphasize local street connections, in an effort to reduce reliance on US 26 and Hwy 211 for local trips.
- Major Arterial – Commercial Corridor Cross-Section Standards (TSP Table 4)
- US 26 Access Spacing Standards (TSP Table 6)
- Intersection improvements along US 26 (Project D3, D4, and D8)

- US 26 Bypass Planning (Project D28)
- US 26 Safety Projects (Projects S1-S3)

Other policies and projects support the City's recreational travel needs, including:

- Policy 2.1: Protect the scenic resources in Sandy.
- Policy 2.2: Preserve the historic character of Sandy.
- Policy 2.3: Identify gateway and beautification treatments for Hwy 211.
- Policy 2.4: Support Mt. Hood Scenic Byway Enhancements.
- Policy 6.4: Increase public awareness of Sandy Transit (SAM) and its connectivity to other transit systems and transportation modes.

Based on the findings discussed above, OTP Policy 3.2 is satisfied.

Policy 4.1 – Environmentally Responsible Transportation System
It is the policy of the State of Oregon to provide a transportation system that is environmentally responsible and encourages conservation and protection of natural resources.

Findings: Draft TSP Goal 5 is Environmental, which calls for the City to "Minimize environmental impacts on natural resources and encourage carbon-neutral or efficient transportation alternatives." This goal includes the following four policies:

- Policy 5.1: Avoid or mitigate transportation project impacts to environmental resources including creeks and wetlands, cultural resources, and wildlife corridors.
- Policy 5.2: Support energy conservation by supporting public transit, transportation demand management, transportation system management and a multi-modal transportation system.
- Policy 5.3: Encourage transportation facility construction methods that reduce environmental impacts.
- Policy 5.4: Minimize street cross-sections to protect and preserve open space and reduce impervious surface.

The updated functional classification cross-section standards in the Draft TSP are intended to minimize right-of-way and pavement width, which will help minimize impervious surfaces and pavement and reduce impacts on adjacent natural areas. Further, the cross-section standards include requirements for planter strips, bike lanes, and sidewalks, all of which will help support lower-impact, environmentally sensitive travel transportation facilities, and mobility options. The cross-sections are shown in TSP Figures 18-24 and summarized in TSP Table 4.

In addition to the Environmental Goal, Draft TSP Goal 6 – Transit – includes four policies that are intended to promote transit service in the City and coordination with

other regional services. Several other policies and projects promote pedestrian and bike travel, as discussed in findings for other OTP policies and Statewide Planning Goals.

Based on the findings discussed above, OTP Policy 4.1 is satisfied.

Policy 5.1 – Safety
It is the policy of the State of Oregon to continually improve the safety and security of all modes and transportation facilities for system users including operators, passengers, pedestrians, recipients of goods and services, and property owners.

Findings: Draft TSP Goal 7 is to "Promote a safe transportation system for all users." This Goal includes the following policies:

- Policy 7.1: Encourage traffic safety through education, enforcement, and engineering.
- Policy 7.2: Identify high accident locations and implement specific counter measures to reduce their occurrence.
- Policy 7.3: Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities.
- Policy 7.4: Provide transportation design standards that encourage appropriate traffic volumes, speeds, and pedestrian safety.
- Policy 7.5: Provide enhanced pedestrians and bicyclists crossings where needed.
- Policy 7.6: Improve emergency service response time and evacuation routes through connectivity.
- Policy 7.7: Develop street design standards that support emergency service vehicle needs.

Several proposed policies promote a safe transportation system, such as Draft TSP Policy 1.2, which calls for the City to "Improve the safety and accessibility of transit facilities." And Draft Policy 6.1 to "Provide service that is safe, comfortable, and useful to many different kinds of people."

Several Draft TSP projects are intended to improve pedestrian safety, including several Package 1 projects (priority funding that will likely be complete by 2040). Package 1 pedestrian safety Projects C5-C15 include crosswalk, signal, curb ramp, curb extensions, and mark stop bars to improve safety conditions at intersections. In addition, the following projects are specifically intended to improve safety on US 26:

- Project S1: US 26 Adaptive Signal System.
- Project S2: US 26 at Ten Eyck Road Study – Study improvements to business access at Ten Eyck Road and US 26.
- Project S3: US 26 Speed Zone Study.

Based on the findings discussed above, OTP Policy 5.1 is satisfied.

Policy 7.1 – A Coordinated Transportation System
It is the policy of the State of Oregon to work collaboratively with other jurisdictions and agencies with the objective of removing barriers so the transportation system can function as one system.

Findings: Multiple Draft TSP policies promote collaboration with other jurisdictions and the state to support an integrated and coordinated local, regional, and statewide transportation system. TSP policies and projects that support interjurisdictional coordination include:

- Policy 2.3: Maximize the use of state and federal funds for transportation capital, operating, service, and demand improvements.
- Policy 6.2: Collaborate with other transportation agencies and support user-friendly connections between transit system.
- Policy 6.4: Increase public awareness of Sandy Transit (SAM) and its connectivity to other transit systems and transportation modes.
- Several ODOT led projects for intersection and sidewalk improvements on US 26 – TSP Tables 1 and 2.
- Sandy Transit Center – Projects C3 and C4 (ODOT led).
- Several transit projects to add or improve service with neighboring jurisdictions and transit agencies, including Boring, Clackamas County, TriMet, and Gresham. See the Draft Transit Projects Table (TSP page 39) for more details.

Based on the findings discussed above, OTP Policy 7.1 is satisfied.

Policy 7.3 – Public Involvement and Consultation
It is the policy of the State of Oregon to involve Oregonians to the fullest practical extent in transportation planning and implementation in order to deliver a transportation system that meets the diverse needs of the state.

Findings: As discussed in the findings for Statewide Planning Goal 1, the TSP development process included work and coordination with the CAC, three public open house events, and public noticing for meetings, events, and public adoption hearings. All of these activities are intended to solicit feedback on transportation needs and proposed improvements from the community as well as inform residents about the project and the City's planning process. In addition, Draft TSP Policy 8.3 calls for the City to "Provide multi-faceted and inclusive public engagement process that provides all community members an opportunity to provide input on transportation system decisions." See findings for Statewide Planning Goal 1 for more details on the TSP's engagement process and policies.

Based on the findings discussed above, OTP Policy 7.3 is satisfied.

Policy 7.4 – Environmental Justice
It is the policy of the State of Oregon to provide all Oregonians, regardless of race, culture or income, equal access to transportation decision-making so all Oregonians may fairly share in benefits and burdens and enjoy the same degree of protection from disproportionate adverse impacts.

Findings: Several Draft TSP policies and projects will help minimize environmental impacts on the community while supporting equitable transportation solutions. The following policies and projects are aligned with the OTP Environmental Justice policy:

- Policy 1.2: Improve the safety and accessibility of transit facilities.
- Policy 5.1: Avoid or mitigate transportation project impacts to environmental resources including creeks and wetlands, cultural resources, and wildlife corridors.
- Policy 6.1: Provide transit service that is safe, comfortable, and useful to many different kinds of people.
- Policy 6.3: Improve accessibility to transit services for people arriving by foot, by bicycle or with a mobility device.
- Policy 7.3: Provide safe pedestrian and bicycle routes between residential areas, schools, and public facilities.
- Policy 8.2: Ensure the pedestrian and bike facilities are designed clear of obstacles and obstructions (e.g., utility poles, grates) and meet ADA requirements.
- Policy 9.1: Develop recreational walking and biking routes to access employment, schools, shopping, and transit routes.
- Project C23: ADA improvements along Highway 211.

Based on the findings discussed above, OTP Policy 7.4 is satisfied.

III. Consistency with Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP – updated through January 2023) establishes policies and investment strategies for Oregon's Statewide Highway System over a 20-year period and refines the goals and policies found in the OTP. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems. While the Draft TSP meets all OHP policies, the following policy list details how the Draft TSP meets the most notable policies. The Draft 2023 Sandy TSP meets the state's policies as follows:

Policy 1A – Highway Classification
Defines the function of state highways to serve different types of traffic that should be incorporated into and specified through IAMPs.

Policy 1C – State Highway Freight System
States the need to balance the movement of goods and services with other uses.

Findings: OHP Policy 1A classifies US 26 as a Statewide Highway. Policy 1A further designates the segment of US 26 between Powell Valley Road in Gresham to Orient Drive in Sandy as an expressway. In addition, US 26 has been designated as a Freight Route through the entire city of Sandy by ODOT.

As discussed in the findings for OTP Policy 3.2, several policies and projects are intended to maintain the function and capacity of US 26 to facilitate efficient and functional movement through the City by reducing congestion and improving capacity. See OTP Policy 3.2 findings for more details.

Based on the findings discussed above, OHP Policies 1A and 1C are satisfied.

Policy 1B – Land Use and Transportation
Recognizes the need for coordination between state and local jurisdictions.

Findings: Policy 1B recognizes that state highways serve as main streets in many communities. Several policies and projects support coordination with ODOT for operations and land use coordination along US 26. Several intersection and sidewalk improvement projects on US 26 include coordination with ODOT which are summarized in TSP Tables 1 and 2. Findings for OTP Policy 7.1 detail other Draft TSP policies and projects that support coordination with the state.

Based on the findings discussed above, OHP Policy 1B is satisfied.

Policy 1D – Scenic Byways
Preserve and enhance designated Scenic Byways, and consider aesthetic and design elements along with safety and performance considerations on designated Byways.

Findings: US 26 is designated as a National Scenic Byway from Bluff Road to the junction with OR 35 – this portion of US 26 is known as the “Mt. Hood Scenic Byway.” Draft TSP Policy 3.4 calls for the City to “Support Mt. Hood Scenic Byway Enhancements.” The findings for OTP Policies 2.1, 2.2, and 3.2 discuss several projects and policies that will help manage congestion and improve capacity along US 26, which will help US 26 maintain its scenic qualities.

Based on the findings discussed above, OHP Policy 1D is satisfied.

Policy 1F – Highway Mobility Standards
Sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system by identifying necessary improvements that would allow the highway to function in a manner consistent with OHP mobility standards.

Findings: The City will continue working with ODOT to establish an alternative mobility target specifically for US 26. Draft TSP Policy 4.3 is to "Support Oregon Transportation Commission adoption of an alternate mobility target for US 26 that allows for increased congestion on the highway corridor, especially during peak seasonal and continued planned growth travel periods."

Based on the findings discussed above, OHP Policy 1F is satisfied.

Policy 1G – Major Improvements
Requires maintaining performance and improving safety by improving efficiency and management before adding capacity. ODOT works with regional and local governments to address highway performance and safety.

Findings: The City will coordinate with ODOT on projects, many of which are Package 1 (priority funding) projects for intersection and sidewalk improvements along US 26 (see TSP Tables 1 and 2). ODOT was actively involved in creation of the Draft TSP and has worked closely with the City on projects that will benefit the City and also US 26.

Based on the findings discussed above, OHP Policy 1G is satisfied.

Policy 1H – Bypass Policy
Effectively serve state and regional traffic trips and to build bypasses to provide safe, efficient passage for through travelers and commerce.

Findings: The City has been exploring the feasibility of a bypass to US 26. The Draft TSP identifies a long term project (Project C23) to construct a bypass from east of Orient Drive to Shorty's Corner (Firwood Road), which is a Package 2 project. Draft TSP projects D28 and D31 include planning and feasibility studies for the US 26 Sandy Bypass.

Based on the findings discussed above, OHP Policy 1H is satisfied.

Policy 2B – Off-System Improvements
Helps local jurisdictions adopt land use and access management policies.

Findings: As mentioned in findings for OTP Policy 2.2, the Draft TSP proposes updates to the City's street and access spacing standards, which require a minimum distance between public streets and minimum driveway spacing distances. The updated access spacing standards are intended to help reduce congestion and accident risk on the city's roadways. Appropriate access spacing will also help reduce the need for construction of additional roadway capacity. The updated access spacing standards for US 26 are shown in Draft TSP Table 6.

The access management standards will be coordinated with land use regulations in the SMC. Code amendments were drafted to incorporate the new access spacing standards – see Draft TSP Appendix Section F. The drafted SMC amendments will be adopted separately from the TSP at a later date, most likely in 2023.

Based on the findings discussed above, OHP Policy 2B is satisfied.

Policy 2F – Traffic Safety
Improves the safety of the highway system.

Findings: Several Draft TSP projects are intended to improve pedestrian safety, including several Package 1 projects (priority funding that will likely be complete by 2040). In addition, the following projects are specifically intended to improve safety on US 26:

- Project S1: US 26 Adaptive Signal System.
- Project S2: US 26 at Ten Eyck Road Study – Study improvements to business access at Ten Eyck Road and US 26.
- Project S3: US 26 Speed Zone Study.

Access management updates and other intersection improvement projects along US 26 (see findings for OHP Policy 1G) will also improve the highway by improving traffic and congestion management along the corridor. In addition, Draft TSP Policy 1.6 is to "Minimize access along the City's arterials and consolidate or relocate access points when possible."

Based on the findings discussed above, OHP Policy 2F is satisfied.

Policy 3A - Classification and Spacing Standards
Sets access spacing standards for driveways and approaches to the state highway system.

Findings: As mentioned in findings for OTP Policy 2.2 and OHP Policy 2B, the Draft TSP proposes updates to the City's street and access spacing standards. Draft Street and Access Spacing standards will be consistent with ODOT spacing standards for US

26, as shown in Draft TSP Table 6. See findings for OTP Policy 2.2 and OHP Policy 2B for more information.

Based on the findings discussed above, OHP Policy 3A is satisfied.

Policy 4A – Efficiency of Freight Movement
It is the policy of the State of Oregon to maintain and improve the efficiency of freight movement on the state highway system and access to intermodal connections. The State shall seek to balance the needs of long distance and through freight movements with local transportation needs on highway facilities in both urban areas and rural communities.

Findings: US 26 has been designated as a Freight Route through the entire city of Sandy by ODOT. As discussed in the findings for OTP Policy 3.2, several policies and projects are intended to maintain the function and capacity of US 26 to facilitate efficient and functional movement through the City by reducing congestion and improving capacity. See OTP Policy 3.2 and OHP Policy 1.3 findings for more details.

Based on the findings discussed above, OHP Policy 4A is satisfied.

Policy 4B – Alternative Passenger Modes
It is the policy of the State of Oregon to advance and support alternative passenger transportation systems where travel demand, land use, and other factors indicate the potential for successful and effective development of alternative passenger modes.

Findings: Several Draft TSP policies and projects support multimodal transportation options (i.e., alternative modes), many of which apply to US 26. TSP projects include re-striping or widening to accommodate bike lanes and sidewalks along US 26 and Highway 211. See Draft TSP Table 2 for a complete list of alternative transportation projects along US 26 and Highway 211 and see findings for OTP Policies 1.1 and 1.2 for more information on policies that promote alternative transportation modes.

Based on the findings discussed above, OHP Policy 4B is satisfied.

Policy 4D – Transportation Demand Management
Support the efficient use of the state transportation system through investment in transportation demand management strategies.

Findings: The following Draft TSP policies promote transportation demand management strategies:

- Policy 5.2: Support energy conservation by supporting public transit, transportation demand management, transportation system management and a multi-modal transportation system.

- Policy 6.3: Improve accessibility to transit services for people arriving by foot, by bicycle or with a mobility device.
- Policy 6.4: Increase public awareness of Sandy Transit (SAM) and its connectivity to other transit systems and transportation modes.

Based on the findings discussed above, OHP Policy 4D is satisfied.

IV. Consistency with OAR 660 Division 12 Transportation Planning Rule (TPR)

The Transportation Planning Rule (TPR) "(i)mplements Statewide Planning Goal 12 (Transportation) to provide and encourage a safe, convenient, and economic transportation system. This division also implements provisions of other statewide planning goals related to transportation planning in order to plan and develop transportation facilities and services in close coordination with urban and rural development." A major purpose of the TPR is to promote more careful coordination of land use and transportation planning, and to ensure that planned land uses are supported by and consistent with planned transportation facilities and improvements.

The TPR contains policies for preparing and implementing a transportation system plan.

Findings: The TSP Planning process included an evaluation of the City's compliance with the TPR. The project team drafted amendments for the Sandy Development Code (SDC) to ensure the City's land use requirements and standards comply with the TPR and are consistent with the Draft TSP. The draft amendments are summarized in TSP Appendix Section F – Regulatory Solutions. The proposed SDC amendments will be considered subsequent to TSP adoption, as part of a more comprehensive package of code amendments.

The City is currently engaged in the Sandy Clear and Objective Code Audit (Code Audit) project, which is focused on ensuring the City has clear and objective requirements for housing development. The TSP project team has been coordinating with the Code Audit project team to ensure that recommended modifications are consistent and not conflicting. Several SDC sections that have transportation-related recommendations also include clear and objective updates. For efficiency and to avoid confusion later, the City intends on adopting the updated transportation-related Code sections along with the clear and objective modifications as one package and through the same hearings and adoption process. The complete Code update adoption is tentatively scheduled for later in 2023.

Based on the findings discussed above, OAR 660-012 (TPR) is satisfied.

V. Consistency with OAR 734, Division 51

OAR 734-051 governs the permitting, management, and standards of approaches to state highways to ensure safe and efficient operation of state highways. OAR 734-051 policies address the following:

A. How to bring existing and future approaches into compliance with access spacing standards, and ensure the safe and efficient operation of the highway;
B. The purpose and components of an access management plan; and
C. Requirements regarding mitigation, modification, and closure of existing approaches as part of project development.

Findings: The Draft TSP includes access management standards for US 26, as shown in TSP Table 6. The access spacing standards for US 26 are consistent with rules for state highways (OAR 734-051 – Oregon Access Management Rule).

VI. Consistency with the Sandy Comprehensive Plan

The City's Comprehensive Plan is designed to guide land development within the city limits. The plan also establishes the goals, policies, and strategies to guide the city's future growth. Plan goals and policies are implemented through subsequent measures, such as zoning and development ordinances, that provide decision-making criteria and standards by which proposals can be evaluated.

The Comprehensive Plan goals reflect the first 14 Statewide Planning Goals.

Findings: The City of Sandy is currently undergoing a Comprehensive Plan update.[1] The Draft TSP will serve as the transportation element of the Comprehensive Plan. The Draft TSP is consistent with the current Comprehensive Plan, which is consistent with the Statewide Planning Goals. Relevant findings are found in the Consistency with Statewide Planning Goals section of this document.

VII. Consistency with the Sandy Municipal Code

Findings: The Sandy Development Code (SDC) is Title 17 of the Sandy Municipal Code. The SDC implements the land use goals and policies of the Sandy Comprehensive Plan, and therefore the SDC must be consistent with the Comprehensive Plan. Upon adoption, the Draft 2023 TSP will be the transportation element of the Comprehensive Plan. The TSP update process included draft amendments to the SDC to implement the transportation element of the Comprehensive Plan (i.e., the TSP), as well as to ensure consistency with OAR 660-012 (TPR). The draft transportation-related amendments (TSP Appendix Section F – Regulatory Solutions) will be considered for adoption as part of a larger package of code amendments to be considered later in 2023.

[1] https://www.ci.sandy.or.us/development-services/page/city-sandy-comprehensive-plan-update

VIII. Consistency with Sandy Municipal Code 17.12.40 Type IV Actions

Type IV (Legislative) procedures apply to legislative matters. Legislative matters involve the creation, revision, or large-scale implementation of public policy (e.g., adoption of land use regulations, zone changes, and comprehensive plan amendments that apply to entire districts, not just one property). Type IV matters are considered first by the Planning Commission with final decisions made by the City Council.

Applications processed under a Type IV procedure involve a public hearing pursuant to the requirements of Chapter 17.20. Notification of this public hearing shall be noticed according to the requirements of Chapter 17.22 with appeal of a Type IV decision made to the state Land Use Board of Appeals according to the provisions of Chapter 17.28.

D. Types of Applications:
2.Comprehensive Plan text or map amendment.

Findings: The Draft TSP is the transportation element of the Comprehensive Plan, and therefore the TSP update is considered a Comprehensive Plan amendment. The adoption procedures for the TSP update were followed for the Planning Commission public hearing that was held on May 22, 2023, and the City Council public hearing on June 20, 2023.

Oregon
Tina Kotek, Governor

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June 8, 2023

Mayor Stan Pulliam and Sandy City Council
39250 Pioneer Boulevard
Sandy, OR 97055

RE: City of Sandy's Transportation System Plan 2023 Update

Mayor Pulliam and City Councilors,

ODOT has worked in collaboration with the City of Sandy and the consultant, DKS Associates, throughout the 2023 Transportation System Plan Update (TSP) process. The City of Sandy's 2023 TSP Update is managed through the Transportation and Growth Management Program (TGM), which is jointly overseen by the Department of Transportation (ODOT) and the Department of Land Conservation and Development (DLCD). TGM is primarily funded by Federal transportation funds, with additional staff support and funding provided by the State of Oregon. ODOT finds that the City of Sandy's draft 2023 TSP is consistent with the Oregon Transportation Plan and Statewide Modal and Topic Plans with the following caveats:

Design

As identified in the draft TSP, any project along a State facility will require review and approval by ODOT, and may require Region or State Traffic Engineer approval. Final design of any project on a State facility is subject to ODOT design and operational standards and engineering approval.

Project Cost Estimates

ODOT is currently seeing significant costs increases on projects on State facilities across the region. The planning level estimates detailed in the project list tables appear to be low based on current inflation costs. These estimates may present issues during TSP implementation, such as when establishing proportional share costs to private developers abutting or impacting State facilities. This could limit the City's ability to carry out its established land use and transportation vision.

Funding

The Statewide Transportation Improvement Project (STIP) is ODOT's capital improvement program and funding mechanism for state and federally-funded projects. The Oregon Transportation Commission and ODOT develop the STIP in coordination with the Area Commissions on Transportation, with the involvement of a wide range of stakeholders and the public. The STIP is typically funded on a four-year cycle and updated every three years. The STIP funds are distributed, statewide, over five categories: Fix-It, Enhance, Safety, Non-highway, and Local Government. Each program area has its own criteria and process for prioritizing projects. The Commission typically allocates most funds to the Fix-It program, leaving very limited funds for Enhance or Modernization projects. In previous STIP cycles, revenues

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have been insufficient to address all identified needs. It is not possible for ODOT to forecast if or when federal or state funds may become available for projects that are identified in the TSP.

Therefore, the City of Sandy is advised that ODOT's participation in the development of the TSP does not constitute a commitment to fund projects on State facilities. Understandably, this caveat does not apply to funds currently allocated to projects in the adopted STIP program.

OAR 660-012-0060: Plan and Land Use Regulation Amendments

The Transportation Planning Rule (TPR), OAR 660-012-0060 establishes procedures for amendments to a comprehensive plan or land use regulation (including a zoning map). OAR660-012-0060(4) identifies which planned improvements local agencies can rely on or assume to be in place when an amendment significantly affects transportation facilities. The key point of this section of the Transportation Planning Rule is that projects must be funded, or reasonably likely to be funded in the adopted State STIP, City Capital Improvement Plan, Systems Development Charges, Local Improvement District, Development Agreement, or Condition of Approval. While the TPR does not require the TSP itself to be financially constrained, it does require that, for the City to rely on projects to be in place for purposes of compliance with OAR 660-012-0060, funding for those projects must be "reasonably likely."

ODOT's recognition of any project on State Highways in the TSP does not constitute a "reasonably likely" determination of funding from the State for purposes of compliance with the Transportation Planning Rule (TPR), OAR 660-012-0060. Explicitly, this is applicable for any future amendments to the comprehensive plan or land use regulations, such as the zoning map.

Alternative Mobility Targets

Alternative Mobility Targets were determined through the TSP and will be adopted with the TSP by the City. The targets will not be final until adopted by the Oregon Transportation Commission (OTC) following City adoption with the TSP.

Conclusion

In summation, the Oregon Department of Transportation finds that the City of Sandy's draft 2023 TSP is consistent with the Oregon Transportation Plan and Statewide Modal and Topic Plans with the with the following caveats:

1. All improvements on a State facility and/or on State right-of-way are subject to ODOT standards and require Region or State Engineer approvals.
2. The draft TSP project estimates on State facilities are low compared to current inflation costs.
3. Participation in the TSP development process does not ensure that STIP funds will be allocated to projects – either in general or in a specific time period – on State facilities identified in the draft TSP.
4. None of the projects in the draft TSP are "reasonably likely" for purposes of TPR -0060 compliance, given the anticipated funding shortfall to project costs.
5. Alternative Mobility Targets are not considered final until adoption by the OTC.

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ODOT appreciates the opportunity to comment and continue working towards the City of Sandy's envisioned transportation network.

Sincerely,

Rian Windsheimer
Region 1 Manager
Oregon Department of Transportation
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Portland, OR 97209

cc: Neelam Dorman, PE, Planning Manager, ODOT
Seth Brumley, Senior Planner, ODOT
Kelly O'Neill Jr., Development Services Director, City of Sandy
Reah Flisakowski, PE, Senior Project Manager, DKS Associates
Dock Rosenthal, PE, Transportation Engineer/Planner, DKS Associates

SANDY TRANSPORTATION SYSTEM PLAN

CITY COUNCIL HEARING

JUNE 20, 2023

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PROJECT MANAGER
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AGENDA

1 TSP PROCESS OVERVIEW

2 TSP PRIORITY PROJECTS

DKS

TSP PROCESS OVERVIEW

WHY UPDATE THE TSP?

Current TSP adopted in 2009 (14 years ago), extend planning horizon year to 2043

Incorporate recent plans:

- Sandy Transit Master Plan
- Sandy Parks and Trails Master Plan
- Downtown Walkability Assessment
- Junker Street Circulation Plan
- US 26 Bypass Feasibility Study

Incorporate current community input to prioritize future investments. Coordinate with Envision Sandy 2050 Comprehensive Plan Update.

WHY UPDATE THE TSP?

Address increased US 26 congestion, evaluate need for alternative mobility targets for US 26 intersections

Provide a strategic investment plan with reasonably funded priority improvements and programs, account for rising infrastructure costs

Support future grant funding opportunities

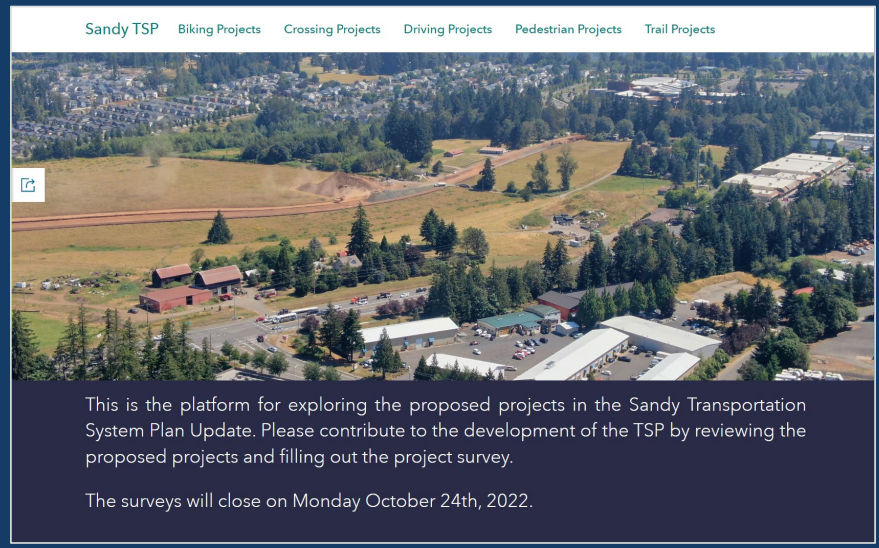
Implement Sandy Development Code consistent with TSP findings

PROJECT SCHEDULE

TSP PUBLIC OUTREACH

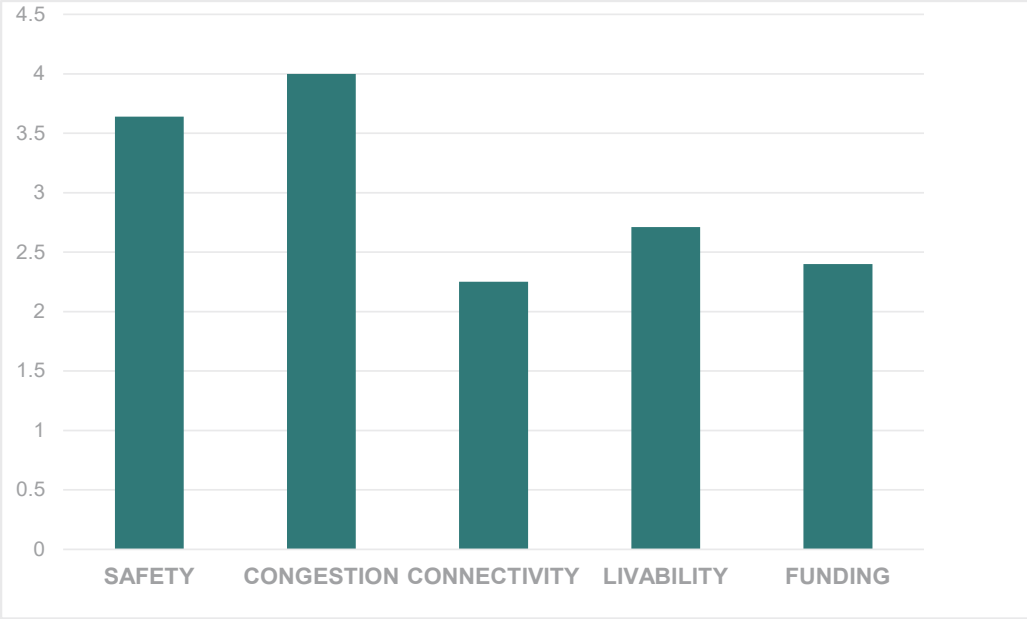
Focused on gathering input on local transportation needs and potential solutions from residents and business owners.

- Community Survey #1 September 2021, 400+ responses
- Community Survey #2 October 2022, 22 responses
- Future Fest September 28, 2022, 100+ attended

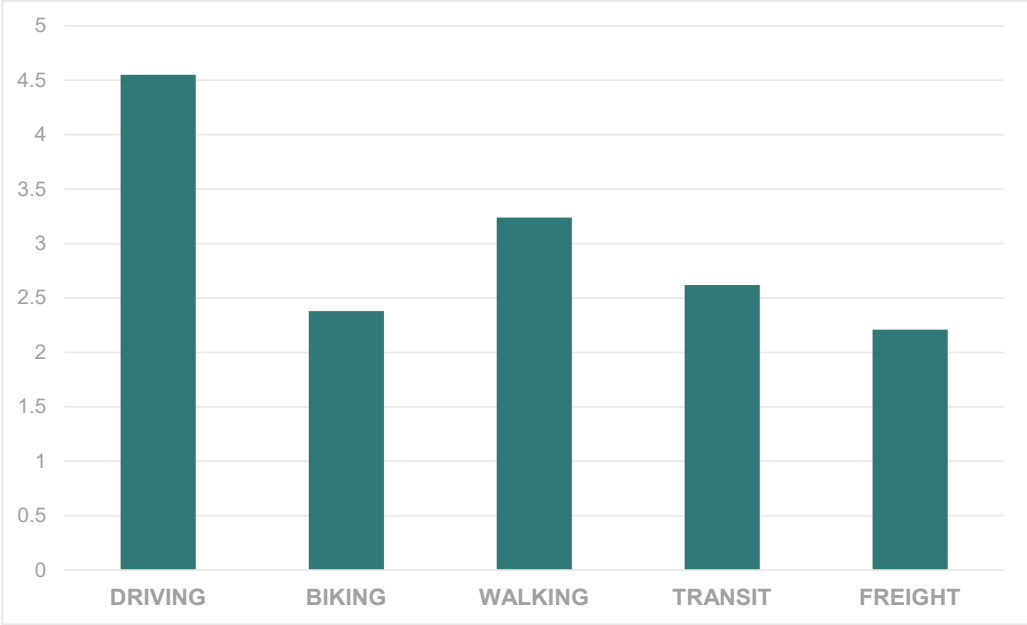


COMMUNITY SURVEY #1

Q5: What type of issue is most important to address in the TSP? (Rank 1 to 5)



Q6: What modes of travel are most important to address in the TSP? (Rank 1 to 5)



COMMUNITY SURVEY #2

Highest priority projects from draft TSP lists and maps:

Top #1 priority projects:

- US 26 Bypass (Project D23)
- Dubarko Road/Highway 211 Crossing Improvement (Project C2)

Top #2 priority projects:

- Southwestern connectivity improvements (Project D21)
- Highway 211 minor arterial cross section improvements (Project D25)

Top #3 priority projects:

- US 26 Bypass (Project D23)

TSP PRIORITY PROJECTS

TSP GOALS

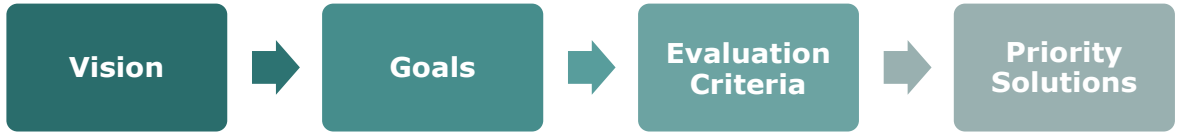
The nine transportation goals set priorities for transportation solutions and plan implementation.

PROJECT EVALUATION PROCESS

Step 1: Inventory of existing and future system needs for all modes, identify gaps and deficiencies

Step 2: Review 2011 TSP projects, remove completed projects, confirm, revise previous projects or add new projects

Step 3: Apply evaluation criteria to determine priorities that will advance goals



FUNDING SHORTFALL

Total cost of all TSP projects = $710 M (includes $390 M for US 26 Bypass)

Total cost of high priority TSP projects = $57 M

Total funding available next 20 years = $10.8 M

TSP Funding Package #1 - Financially Constrained project list, anticipated to be funded and constructed within the next 20 years

TSP Funding Package #2 – Aspirational project list, remaining likely unfunded projects

FINANCIALLY CONSTRAINED PROJECTS

2 PEDESTRIAN PROJECTS, $1.875 M

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
PEDESTRIAN IMPROVEMENTS (2 PROJECTS)			
P1	362nd Drive	This project constructs sidewalk to fill in existing gaps along the west side of 362nd Drive from Chinook Street to Industrial Way. By filling in sidewalk gaps along 362nd Drive this project improves the low-stress pedestrian network and access to the shopping center at 362nd Drive and US 26.	The $1,000,000 cost is expected to be primarily funded by developers as undeveloped parcels adjacent to 362nd Drive are developed, any remaining funds would come from System Development Charges (SDC).
P3	Bluff Rd	This project constructs sidewalk to fill in existing gaps along the west side of Bluff Road from Bell Street to the parcel at 15931 SE Bluff Road. This project improves the low-stress pedestrian network in the vicinity of Sandy High School, Jonsrud Viewpoint, and the residential area to the west of Bluff Road.	The $875,000 cost is expected to be primarily funded through the road fund and System Development Charges (SDC).

FINANCIALLY CONSTRAINED PROJECTS

11 ROADWAY CROSSING PROJECTS, $1.3 M

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
CROSSING IMPROVEMENTS (12 PROJECTS)			
C5	CRMS - Bluff Road at Marcy	This project improves the intersection crossing by constructing a Rectangular Rapid Flashing Beacon (RRFB) with School Crossing Assembly, and high visibility crosswalks across the north and east sides of the intersection.	The $125,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C6	CRMS - Bluff Road at Hood	This project improves the intersection by modernizing the crossing, particularly with curb extensions.	The $125,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C7	CRMS – Bluff Road at US 26	This project improves the intersection modernizing the crossing by reducing the curb radius at all corners, adding pedestrian-scale lighting and improvement of the bicycle network by providing buffered or separated bicycle facilities at the intersection crossing. Pending coordination with ODOT, the pedestrian signal crossing time may be increased, based on a slower walking speed.	The $125,000 cost, which does not assume a fully separated bike facility, is expected to be primarily funded by ODOT with additional funding expected from a Safe Routes to School grant and local funding from the road fund and urban renewal fund.
C8	CRMS – Hood Street at Beers	This project improves the intersection by repainting stop bars on Beers Avenue and improving the intersection control by installing stop signs for the Hood Street approaches, creating a 4-way stop intersection.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C9	CRMS – Hood Street at Scales	This project improves the intersection by installing perpendicular curb ramps with tactile domes at the intersection of Hood St and Scales Ave and repainting stop bars.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C10	CRMS – Hood Street at Bruns	This project improves the intersection by installing a tactile dome at the southwest corner of Bruns Ave and Hood St.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.

FINANCIALLY CONSTRAINED PROJECTS

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
C11	SGS – Hood/Strauss	This project improves the intersection by: • Relocating the southbound school advance crossing sign and school speed limit sign north of intersection. • Repairing sidewalk along the east side of Strauss Avenue and mitigating the narrowing caused by a utility pole. • Installing a curb ramp at the southeast corner of the intersection and adding tactile domes and a stop bar on the west leg of the intersection.	The $350,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C12	SGS – Pleasant/Strauss	Pleasant Street at Strauss Avenue: This project improves the intersection by marking stop bars in advance of crosswalks and potentially revising the control of the intersection to be all-way stop control.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C13	SGS – Pleasant/Alt	This project improves the intersection by marking stop bars in advance of crosswalks, replace existing diagonal curb ramps with perpendicular curb ramps and tactile domes, and constructing a raised intersection.	The $350,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C14	SGS – Smith/Pleasant	This project improves the intersection by marking stop bars in advance of crosswalks, relocating the southbound school advance crossing sign and school speed limit sign north of the intersection.	The $25,000 cost is expected to be primarily funded through the road fund and urban renewal funds. Additional funding is expected to be available through a Safe Routes to School grant.
C15	SGS – Alt/US 26	This project improves the intersection by increasing the pedestrian crossing time based on a walking rate of 3.0 feet per second, upgrading the pedestrian pushbuttons to meet current standards with audible indications, and consolidating the two existing crosswalks with one high visibility continental crosswalk on the east side of the intersection including an advance stop bar, bulb outs, curb ramps, and pedestrian scale lighting.	The $125,000 cost is expected to be primarily funded through an ODOT grant. Additional funding is expected from the road fund, urban renewal fund, and potential grant funding.

FINANCIALLY CONSTRAINED PROJECTS

10 DRIVING PROJECTS: $7 M

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
D3	US 26 & 362nd Drive Intersection Improvement	This project is expected to reduce congestion for the westbound left turn and accommodate the 362nd Drive Extension 1 (D15a). The project includes minor widening on the south leg to accommodate a northbound through lane, construction of a three-lane southbound approach with a right turn lane, through lane, and left turn lane, and an eastbound left turn lane.	This project is currently funded with local funds without an additional westbound left turning movement. The additional westbound left turn lane is dependent on the 362nd Drive and Industrial Way improvements (D1) that would extend the second southbound lane from the Fred Meyer driveway to the Industrial Way intersection. The second westbound left turn lane should be coordinated with project D1.
D6	Highway 211 & Proctor Boulevard Northbound Approach Modification	This project restripes the northbound approach to clearly indicate the set back stop bar and associated keep clear distance.	The $15,000 cost is expected to be funded through the road fund.
D9	Highway 211 & Dubarko Road Multimodal Intersection Improvement	This project improves safety and multimodal connectivity and should be coordinated with the recommendations in project D27 Highway 211 & Dubarko Road Intersection Control Evaluation and C23 ADA improvements along Highway 211.	The $500,000 cost is expected to be funded through the road fund and system development charges.
D14A	Bell Street Extension to 362nd Drive Extension	This project extends Bell Street to 362nd Drive extension (D15a) at Minor Arterial cross section standards. It improves connectivity by providing a parallel route to US 26 from 362nd Drive to Bluff Road.	This project is currently funded with local funds.
D15A	362nd Drive Extension to Bell Street Extension	This project extends 362nd Drive to Bell Street extension (D14a) at Minor Arterial cross section standards. It improves connectivity by providing a parallel route to US 26 from 362nd Drive to Bluff Road.	This project is currently funded with local funds.

FINANCIALLY CONSTRAINED PROJECTS

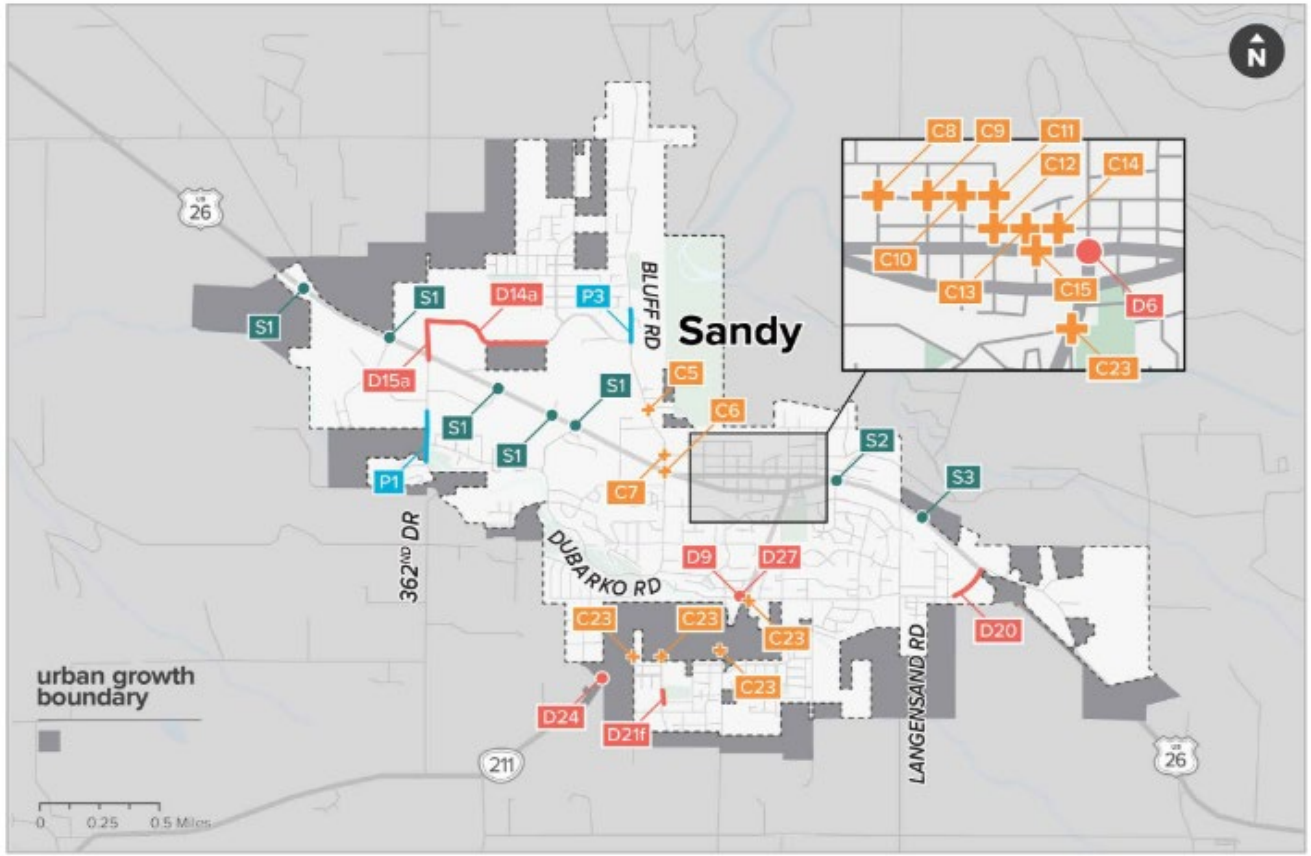
PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
DRIVING IMPROVEMENTS (10 PROJECTS)			
D20	Dubarko Road to US 26 Opposite Vista Loop Drive (West)	This project extends Dubarko Road to US 26/Vista Loop Road (west) at Minor Arterial cross section standards. It should be coordinated with D9 (US 26 Dubarko Road intersection improvement) and C17 (US 26 Dubarko Road pedestrian crossing improvement).	This project is expected to be constructed by development, with partial SDC credits, with an expected cost of $3,900,000.
D21F	Village Blvd Extension 1	This project connects Village Boulevard between Cascadia Village Drive and Juniper Street at Collector standards providing additional north-south connectivity for the neighborhood south of Highway 211.	The $875,000 cost is expected to be funded by the City through system development charges and partially by development.
D24	Highway 211 Roundabout at Gunderson	This project improves the intersection of Highway 211 at Gunderson Road by constructing a roundabout.	The $1,000,000 cost is partially funded by development with the remaining amount provided by the road fund and system development charges.
D27	Highway 211 & Dubarko Road Intersection Control Evaluation	This project studies the intersection control options for Highway 211 and Dubarko road given the strain of high traffic volumes and difficult topography. The resulting solutions should improve safety and capacity. While the specific intersection improvement is unknown, for financial planning purposes the improvement from the 2011 TSP is used. This includes construction of a traffic signal with widening for a northbound left and right turn lane and a southbound left turn lane. The inflated project cost (to 2021 dollars) is reflected in the proportional share fee calculation included in Appendix Section L. After completion of this intersection control evaluation the proportional share fee will be updated to reflected the cost of the expected improvement.	The $50,000 cost is expected to be funded through the road fund and system development charges.
D31	US 26 Sandy Bypass Planning	This project includes preparation of planning documents to evaluate alternatives and the environmental impact of a potential US 26 bypass. This project consists of planning work only, not directly resulting in any capital improvement, and is not included in the map.	The $1,000,000 is expected to be funded by the City.

FINANCIALLY CONSTRAINED PROJECTS

3 SAFETY PROJECTS: $325,000

PROJECT ID	LOCATION	PROJECT ELEMENTS[A]	FUNDING PLAN
SAFETY IMPROVEMENTS (3 PROJECTS)			
S1	US 26 Adaptive Signal System	This project extends the adaptive signal system from Orient Drive to Ruben Lane. An adaptive signal system improves performance and monitoring of traffic signals by providing real-time adjustments and improved data collection.	The $200,000 cost is expected to be funded by ODOT.
S2	US 26 at Ten Eyck Road Study	This project studies improvements or mitigations related to traffic impacts from access for business adjacent to the Ten Eyck Road and US 26 intersection.	The $50,000 cost is expected to be funded by ODOT and the road fund.
S3	US 26 Speed Zone Study	This project studies speeds east of Ten Eyck Road/Wolf Drive along US 26 for consideration of a potential reduction. It should be coordinated with C17 (Dubarko pedestrian crossing improvements) and D20 (Dubarko Road extension) to consider if an intersection control modification is necessary.	The $75,000 cost is expected to be primarily funded by ODOT.

FC PROJECTS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urban growth boundary
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crossings
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city limits

TRANSIT PROJECTS

TRANSIT PROJECTS	
LOCAL SERVICE IMPROVEMENTS – FIXED ROUTES	Add Saturday service, lengthening the service hours, adding an additional shuttle route that reaches the Vista Apartments.
LOCAL SERVICE IMPROVEMENTS – FLEXIBLE SERVICES	Add a bus and driver.
LOCAL SERVICE IMPROVEMENTS – ELECTRIC BUSES	Purchase one or more electric buses, a charging station, and the required maintenance equipment.
ADDITIONS TO REGIONAL SERVICE – GRESHAM EXPRESS	Higher frequencies on Saturdays or Sundays, more night and morning service on Saturdays or Sundays, Occasional additional trips that go directly to important destinations.
ADDITIONS TO REGIONAL SERVICE – NEW CLACKAMAS EXPRESS	Coordinate with Clackamas County, the City of Boring and TriMet to plan and fund a route connecting these communities.
ADDITIONS TO REGIONAL SERVICE – IMPROVED BUS STOPS	Coordinate with the City of Gresham and TriMet to invest in better stop amenities at the Gresham Transit Center.
PEDESTRIAN IMPROVEMENTS – TRANSIT CENTER	Improve access to the transit center by providing crossing treatments from every direction specifically at Proctor and Pioneer Blvd at Hoffman Ave. TSP projects include C3 & C4 – Hoffman Ave at Proctor and at Pioneer Crossing Improvement, these projects require coordination with ODOT.
PEDESTRIAN IMPROVEMENTS – EVANS ST CROSSING	Construct a crosswalk or traffic calming treatment on Evans St. TSP projects include C1 – Van Fleet Ave/Evans St Crossing Improvement, this project would be lead by SAM.

EDITS TO DRAFT TSP

Changes to TSP in City Council hearing packet

- Page 43: added reference to Highway 211/Dubarko proportionate share fee, added Appendix L with fee methodology summary
- Page 47: revised D9 (Highway 211/Dubarko improvements) description and cost estimate
- Page 48: revised D27 (Highway 211/Dubarko evaluation) description

SANDY DEVELOPMENT CODE MODIFICATIONS

Amendments to the Sandy Development Code (SDC) are proposed to improve and strengthen the city's development requirements by:

- Eliminating discrepancies between the SDC and the updated TSP
- Implementing multi-modal objectives and recommendations
- Eliminating vague and subjective language
- Ensuring future development is supported by the planned transportation system

Transportation-related SDC amendments will be further coordinated and combined with proposed housing-related modifications.

A complete package of code amendments will be presented for Planning Commission and City Council review and noticed for adoption in Fall 2023.

THANK YOU

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