City of Sandy

Agenda

City Council Meeting

Meeting Date: Tuesday, February 22, 2022

Meeting Time: 7:00 PM

1. CITY COUNCIL EXECUTIVE SESSION - 6:00 PM

The City Council will meet in executive session pursuant to ORS 192.660(2)(e).

2. CITY COUNCIL REGULAR MEETING - 7:00 PM

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/87641807188
Or by phone: (253) 215-8782; Meeting ID: 876 4180 7188

Please also note the public comment signup process below.

3. PLEDGE OF ALLEGIANCE

4. ROLL CALL

5. CHANGES TO THE AGENDA

6. PUBLIC COMMENT

Please note: there will be an opportunity to provide testimony for the Deer Meadows Subdivision Appeal later in the agenda.

The Council welcomes your comments on other topics at this time.

If you are attending the meeting in-person

Please hand 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.

7. RESPONSE TO PREVIOUS PUBLIC COMMENTS

8. CONSENT AGENDA

8.1. **City Council Minutes** 4 - 9
City Council - 07 Feb 2022 - Minutes - Pdf

8.2. **Granting of Pedestrian Easement to ODOT for ADA Ramp Project** 10 - 21
Grant Pedestrian Easement to ODOT for ADA ramp project - Pdf

8.3. **Noise Variance for US 26 Ten Eyck/Vista Loop Pedestrian Improvements Project** 22 - 24
Noise Variance for US 26 Ten Eyck/Vista Loop Pedestrian Improvements Project - Pdf

9. OLD BUSINESS

9.1. **PUBLIC HEARING: Deer Meadows Subdivision Appeal** 25 - 1007
Staff Report
Application, Plans, and Studies
Letters, Comments, and Correspondence

9.2. **Hoodview Disposal & Recycling Rate Increase Request** 1008 - 1019
Hoodview Disposal & Recycling Rate Increase Request - Pdf

10. NEW BUSINESS

10.1. **Contract for Design Services: Basin 6 & 7 Collection System Rehabilitation Project** 1020 - 1047
Award Contract for Design Services for Basins 6&7 Collection System Rehabilitation Project - Pdf

11. REPORT FROM THE CITY MANAGER

12. COMMITTEE /COUNCIL REPORTS

13. STAFF UPDATES

13.1. Monthly Reports

14. ADJOURN

MINUTES
City Council Meeting
Monday, February 7, 2022 6:00 PM

COUNCIL PRESENT: Stan Pulliam, Mayor; Jeremy Pietzold, Council President; Laurie Smallwood, Councilor; Richard Sheldon, Councilor; Kathleen Walker, Councilor; Carl Exner, Councilor; and Don Hokanson, Councilor

COUNCIL ABSENT:

STAFF PRESENT: Jordan Wheeler, City Manager; Jeff Aprati, City Recorder; Tyler Deems, Deputy City Manager / Finance Director; Ernie Roberts, Police Chief; Kelly O'Neill Jr., Development Services Director; Jenny Coker, Public Works Director; Chris Crean, City Attorney; and Greg Brewster, IT/SandyNet Director

MEDIA PRESENT: Sandy Post

1. CITY COUNCIL WORK SESSION - 6:00 PM

1.1. Tents and Unauthorized Structures in Commercial Zones

Staff Report - 0533

The **Development Services Director** summarized the staff report, which was included in the agenda packet. He also provided a contextual overview of the City's code enforcement approach and practices. A discussion was held regarding the particular history of the temporary structures at the Sandlandia property, and on current code language pertaining to food cart parking and restrooms.

Further Council discussion ensued on the following topics:

- The importance of improving the condition of the downtown corridor, and the importance of contributing funds to achieve this end
- The approach of removing code language the City does not intend to enforce
- History of the City's approach to code enforcement
- Importance of equity and fairness
- Balancing carrots and sticks, and ensuring the City communicates all programs and resources available to assist property owners with achieving compliance

- Consistency of temporary structures with Sandy Style
    - Whether off the shelf temporary structures exist that would be compatible with Sandy Style
        - Whether the code should be amended to allow such structures
- The availability of funds to assist property owners with achieving compliance
- The particular importance of the appearance of structures that are visible from Highway 26
- The importance of safety considerations
- Differences pertaining to noncompliant structures that are clearly intended to have a short duration

The consensus of the Council was to establish April 1, 2022 as the deadline for the properties in question to come into compliance. The Council also expressed interest in a future work session dedicated to possible code changes that could relax requirements on temporary structures that are not visible from a right-of-way.

2. CITY COUNCIL REGULAR MEETING - 7:00 PM

3. Pledge of Allegiance

4. Roll Call

5. Changes to the Agenda
(none)

6. Public Comment
(none)

7. Response to Previous Public Comments

8. Presentation

8.1. **Police Officer Oath of Office**

Chief Roberts delivered introductory remarks. **Mayor Pulliam** administered the oath to **Officer Carter**. Following the oath, photos were taken.

8.2. **Introduction of Public Works Director Jenny Coker**

The **City Manager** introduced the new **Public Works Director** to the Council, who subsequently delivered additional introductory remarks. The Council welcomed the new director and expressed its confidence and best wishes.

9. Consent Agenda

9.1. **City Council Minutes**
January 3, 2022

Moved by Kathleen Walker, seconded by Jeremy Pietzold

Approve the Consent Agenda.

CARRIED. 7-0

Ayes: Stan Pulliam, Jeremy Pietzold, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Carl Exner, and Don Hokanson

10. New Business

10.1. **Hoodview Disposal & Recycling Rate Increase Request**

Staff Report - 0530

The **Deputy City Manager** summarized the staff report, which was included in the agenda packet.

Council discussion ensued on the following topics:

- The particulars of the franchise agreement, including whether approval of annual rate increases is required
- History of Hoodview's rate increase requests, including distinctions between special and annual increases, interruptions experienced during the franchise transfer process, and possible changes in the City's obligations based on these schedule irregularities
- The need to consult the City Attorney regarding the City's approval obligations
- Business impacts of changes in the recycling market
- Whether Hoodview would be interested in performing recycling services that are offered by Ridwell Inc. Hoodview responded that they would want to have a formal conversation with the City should such a course be pursued.
- The importance of Hoodview's proactive and accurate communication with the public should the rate request be approved

- Dissatisfaction regarding Hoodview's collection performance during recent winter weather events, particularly with respect to the lack of supplemental pickups
- The impact of COVID-19 on the company's operations
- Request for more information on the history of the franchise agreement and possible options for improving its terms
- Reasons for the Council's limited decision-making options in this process
- Whether this franchise agreement is typical

Formal consideration of the rate increase request is anticipated for the February 22nd agenda.

10.2. **Resolution 2021-36**
SandyNet Construction RFP Alternative Procurement Method

Staff Report - 0534

The **SandyNet Director** summarized the staff report, which was included in the agenda packet.

Council discussion ensued on the following topics:

- Cost concerns regarding design-build, relative to standard contracting practices
- Considerations regarding staff capacity, and staff's rationale for recommending design-build
- The possibility of incorporating a no build option into a contract in the event the cost of the design is unacceptably high
- Possible future reimbursement mechanisms
- Importance of robust and reliable service at the treatment plant
- The consistency of design-build with past practice
- The importance of exploring provider options other than SandyNet, given the high projected costs of the extension project

Moved by Laurie Smallwood, seconded by Richard Sheldon

Adopt Resolution 2021-36.

CARRIED. 7-0

Ayes: Stan Pulliam, Jeremy Pietzold, Laurie Smallwood, Richard Sheldon, Kathleen Walker, Carl Exner, and Don Hokanson

11. Report from the City Manager

- A decision was needed regarding plans for a firework display later in 2022. After discussing tradition, fire concerns, rain concerns, safety considerations, and possible alternative events, the consensus of the Council was to proceed with a traditional fireworks display on July 4th.
- Initial results regarding subsurface infiltration options for wastewater effluent have been received. Additional study is needed. The Council discussed the extent to which these studies fall within the Council's previous work authorization.
- GMP 3 for the Wastewater Treatment Plant is expected to be on the March 7 agenda
- The next Council meeting will be on February 22nd

12. Committee /Council Reports

Councilor Hokanson

- Wastewater effluent alternative options are encouraging
- Future options for the pool can be discussed at the upcoming goal setting
- Thanks to staff for following up on the temporary structure issues

Councilor Exner

(none)

Councilor Walker

- Praise for the Library of Things; it should be given more publicity
- A Technical Advisory Committee for the Community Campus is being developed
- Welcome to the new Public Works Director

Councilor Sheldon

(none)

Councilor Smallwood

- Parks and Trails Advisory Board orientation has been occurring; goal suggestions may be forthcoming for the Council
- Praise for staff

Council President Pietzold

- Importance of buying now given future inflation pressures and supply constraints

- Acknowledgement of the property owners involved with the 362nd / Bell project; encouragement for Councilors to visit and tour the site

Mayor Pulliam

- The new employees choosing to join the City and serve the public are exciting an encouraging
- The Mountain Festival is expected to proceed as normal this year
- Thanks to all who have expressed personal support in recent days

13. Staff updates

13.1. Monthly Reports

14. Adjourn

_____
Mayor, Stan Pulliam

_____
City Recorder, Jeff Aprati

Staff Report

Meeting Date:	February 22, 2022
From	Mike Walker, Public Works Director
SUBJECT:	Grant Pedestrian Easement to ODOT for ADA ramp project

DECISION TO BE MADE:
Whether to grant a Pedestrian Easement to Oregon Department of Transportation for ADA ramp improvements at the NE corner of Hoffman Ave. and Pioneer Blvd. (Centennial Plaza site).

PURPOSE / OBJECTIVE:
An easement is necessary over approximately 310 sq. ft. of City property to accommodate improvements to the ADA ramp at the NE corner of Hoffman Ave. and Pioneer Blvd. (Centennial Plaza site).

BACKGROUND / CONTEXT:
As the Council is aware ODOT has a project underway to replace approximately 16 ADA ramps at various intersections in the Hwy 26 couplet (Proctor and Pioneer Boulevards). Work was scheduled to wrap up in October of 2021 but delays in quantifying the amount of right-of-way required and negotiations with property owners delayed completion of the project at several sites, including the NE corner of Pioneer and Hoffman at the Centennial Plaza site. Approximately 310 sq. ft. of property owned by the City is involved (see attached plan sheet).

KEY CONSIDERATIONS / ANALYSIS:
When the City improved the Centennial Plaza site wider sidewalks were constructed on Pioneer Blvd. and Hoffman Ave. Portions of these sidewalks are outside the exiting right-of-way and encroach onto the Plaza site. In order to save the expense of writing up legal descriptions for the encroachments and dedicating these areas as right-of-way a decision was made to allow the sidewalks to encroach onto the property owned by the City. Since the Centennial Plaza site is owned by the City and Pioneer Blvd. and Hoffman Ave. are City rights-of-way the reasoning was that there was little risk with this approach.

RECOMMENDATION:
Authorize the City Manager to sign a Pedestrian Easement benefitting the Oregon Department of Transportation to address the existing encroachment and permit improvements to the ADA ramp at the NE corner of Pioneer and Hoffman to be made.

BUDGETARY IMPACT:

None - The City agreed to waive any compensation for the easement since the value would be minimal.

SUGGESTED MOTION LANGUAGE:
"I move to authorize the City Manager to sign a pedestrian easement benefitting the Oregon Department of Transportation as shown in the attachment."

LIST OF ATTACHMENTS/EXHIBITS:

- Easement document
- Plan sheet

FILE #: 9655-034

TERMS OF STATE'S OFFER

THE STATE'S OFFER IS AS DESCRIBED IN THE ENCLOSED ACQUISITION SUMMARY STATEMENT AND ACQUISITION DOCUMENT(S) AND INCLUDES THE FOLLOWING ADDITIONAL TERMS:

1. The State will pay recording costs, title insurance premiums, and all other normal costs of sale.

2. Outstanding encumbrances, including taxes and other interests, may need to be paid out of the just compensation in order to provide sufficient title to the State.

3. Pursuant to ORS 311.412-311.414, the State will pay the taxes proportional to the part of the property acquired and prorated as of the date of the acquisition.

4. As part of this acquisition for this Project, the State will require the following actions:

   A. **Bonds.** The State and all subcontractors shall maintain a public works bond in full force and effect, as required by Oregon statutes, and shall obtain the mandatory insurance coverage required by the construction contract. The contractor shall verify subcontractors have filed a public works bond and required insurance certificates before the subcontractor begins work. All construction shall be completed in conformance with standard engineering and construction practices.

   B. **Utilities.** (Check appropriate box)
   ☒There will be no changes to public utilities to the property.
   ☐Public utilities will be reconnected to improvements on the remainder property, except for the following: **NA.**
   ☐Public utilities will be made available within the right-of-way adjacent to the remainder property, except for the following: **NA.**
   ☐Public utilities will not be available to the remainder property in the after.

   If a public utility on the property is not reconnected, just compensation (payment) is provided.

   C. **Access.** (Check appropriate box)
   ☒Access to the remainder property will remain the same.
   ☐There will be no access to the remainder property.
   ☐Access to the remainder property will remain the same, except for the following access:
   Access #1 located at: NA , is modified, relocated or closed as a result of:
   ☐the access modification letter dated: **NA**(attached)
   ☐this Project as follows: **NA**.
   Access #2 located at: NA, is modified, relocated or closed as a result of:
   ☐the access modification letter dated: **NA**(attached)

☐this Project as follows: **NA**.

Access #3 located at: **NA**, is modified, relocated or closed as a result of:

☐the access modification letter dated: **NA**(attached)

☐this Project as follows: **NA**.

After construction of the project, if any access to the property has been modified, relocated or closed, other than a reservation(s) of access noted in the acquisition document(s), the altered access shall be public access; said access before and after the Project is subject to the government's police powers.

The following access, **NA**, to be removed or modified as part of the project, shall remain open for access to the remainder property until the Project has completed construction of the new access as described above.

Access to the property shall remain open during construction with at least one lane for vehicle traffic, except for minimal closures (up to 2 hours) that are reasonably necessary pursuant to the Oregon Standard Specifications for Construction, Volume 2, Chapter 00220.02.

D. **Improvements.**

Private improvements in any easement areas shall be protected in place, or returned to a same or similar condition, except for the following: **NA**.

Any sidewalks in the acquisition area, that are impacted by the Project, will be reconnected to preexisting sidewalks, except at the following locations: **NA**.

E. **Fencing on the Property.**

☒Will not be affected.

☐Will be replaced as follows: **NA**.

☐Will not be replaced.

F. Other terms of offer:

NA.

5. To accept this offer, each of the persons listed on the attached signature page must (i) sign and return this document; and (ii) sign, notarize and deliver to ODOT all of the necessary acquisition document(s), in an original and unaltered form sufficient for transferring title and recording in the appropriate county recorder's office.

6. If this offer is addressed to multiple persons, it is a joint offer to all of those persons and must be accepted by all of the persons listed (or provide evidence showing any non-accepting persons do not have an interest in the property). If accepted, the just compensation in a joint offer may be apportioned among the persons listed in any mutually agreed upon manner.

7. The persons executing this offer each warrant and represent that they have authority to act for and bind their respective party with respect to the transfer of the real property interests that are the subject of this offer.

8. The "Terms of State's Offer" may be signed in counterparts. Once the signature of each person as set forth on the attached signature page has been affixed to one or more counterparts and returned to ODOT, this document shall be deemed fully executed as if all of the signatures were contained in a single document.

9. The Terms of State's Offer does not apply to any uneconomic remainder as identified in the appraisal.

[*See attached Signature page*]

SIGNATURE PAGE FOR TERMS OF STATE'S OFFER

STATE OF OREGON,by and through its
DEPARTMENT OF TRANSPORTATION

02/03/2022

Grant Casebeer — Date

City of Sandy, a municipal corporation of the State of Oregon — Date

LastOfferLTR_HWO.doc

File 9655034
Map RW9655M

PERMANENT EASEMENT

CITY OF SANDY, a municipal corporation of the State of Oregon, Grantor, for no monetary consideration, does grant unto the **STATE OF OREGON, by and through its DEPARTMENT OF TRANSPORTATION,** Grantee, its successors and assigns, a permanent easement to construct a public sidewalk upon the property described on **Exhibit "A" dated 1/24/2022**, attached hereto and by this reference made a part hereof.

IT IS UNDERSTOOD that the easement herein granted does not convey any right or interest in the above-described property, except for the purposes stated herein, nor prevent Grantor from the use of said property; provided, however, that such use does not interfere with the rights herein granted.

In construing this document, where the context so requires, the singular includes the plural and all grammatical changes shall be made so that this document shall apply equally to corporations and to individuals.

AFTER RECORDING RETURN TO:
OREGON DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY SECTION
4040 FAIRVIEW INDUSTRIAL DRIVE SE MS#2
SALEM OR 97302-1142

Map and Tax Lot #: 2S4E13DB-800

Property Address: 39295 Pioneer Boulevard
Sandy, OR 97055

File 9655034
Map RW9655M

It is understood and agreed that the delivery of this document is hereby tendered and that terms and obligations hereof shall not become binding upon the State of Oregon Department of Transportation, unless and until accepted and approved by the recording of this document.

Dated this _____ day of _____, 20____.

CITY OF SANDY, a municipal corporation of the State of Oregon

By_____
Jordan Wheeler, City Manager

STATE OF OREGON, County of _____

Dated _____, 20___. Personally appeared Jordan Wheeler, who, being sworn, stated that he is the City Manager of the City of Sandy, and that this instrument was voluntarily signed on behalf of said municipal corporation by authority of its City Council motion approved at their February 22nd, 2022 regular meeting.

_____
Notary Public for Oregon
My Commission expires_____

Accepted on behalf of the Oregon Department of Transportation

_____

File 9655034
Drawing RW9655M
Marcus Reedy, PLS, 1 Alliance Geomatics - 1/24/2022

Permanent Easement for Sidewalk

A parcel of land lying in the SE¼ of Section 13, Township 2 South, Range 4 East, W.M., Clackamas County, Oregon; the said parcel being a portion of that property described in that Statutory Warranty Deed to City of Sandy, recorded September 5, 2006 as Recorders Fee No. 2006-081987, Film Records of Clackamas County; the said parcel being that portion of said property lying Westerly and Southerly of the following described line:

Beginning at a point opposite and 55.00 feet Northerly of the relocated Mt. Hood Highway at Engineer's Station "EB" 796+00.00; thence Easterly in a straight line to a point opposite and 52.00 feet Northerly of Engineer's Station "EB" 796+09.50 on said center line; thence Southerly in a straight line to a point opposite and 39.50 feet Northerly of Engineer's Station "EB" 796+06.00 on said center line; thence Easterly in a straight line to a point opposite and 39.50 feet Northerly of Engineer's Station "EB" 796+35.00 on said center line thence Southerly in a straight line to Engineer's Station "EB" 796+35.00 on said center line.

The center line of the relocated Mt. Hood Highway is described as follows:

Beginning at Engineer's center line Station "EB" 760+00.00, said Station being 432.90 feet North and 439.87 feet West of the West quarter corner of Section 13, Township 2 South, Range 4 East, W.M.; thence South 61°34'57" East 153.78 feet; thence on a spiral curve left (the long chord of which bears South 62°54'56" East 199.96 feet) 200.00 feet; thence on a 1432.39 foot radius curve to the left (the long chord of which bears South 68°31'12" East 146.81 feet) 146.88 feet; thence on a spiral curve left (the long chord of which bears South 74°07'27" East 199.96 feet) 200.00 feet; thence South 75°27'27" East 32.39 feet; thence on a 11,459.42 foot radius curve to the right (the long chord of which bears South 74°36'12" East 341.66 feet) 341.67 feet; to Engineer's center line Station "EB" 770+74.72 Back equals "EB" 770+70.85 Ahead; thence South 73°44'57" East 671.78 feet; thence on a 954.93 foot radius curve to the left (the long chord of which bears South 80°06'42" East 211.64 feet) 212.08 feet; thence South 86°28'27" East 485.64 feet; thence South 87°28'27" East 652.76 feet; thence on a 716.20 foot radius curve to the left (the long chord of which bears North 84°08'03" East 209.04 feet) 209.79 feet; thence North 75°44'33" East 756.12 feet to Engineer's center line Station "EB" 800+59.02 Back equals "EB" 800+60.15 Ahead; thence on a spiral curve right (the long chord of which bears North 78°04'32" East 199.87 feet) 200.00 feet; thence on a 818.51 foot radius curve to the right (the long chord of which bears North 89°08'03" East 182.24 feet) 182.62 feet; thence on a spiral curve right (the long chord of which bears South 79°48'26" East 199.87 feet) 200.00 feet to Engineer's center line Station "EB" 806+42.77.

File 9655034
Drawing RW9655M
Marcus Reedy, PLS, 1 Alliance Geomatics - 1/24/2022

Bearings are based on the Oregon Coordinate Reference System, Gresham-Warm Springs Zone, NAD 83 (2011) epoch 2010.00.

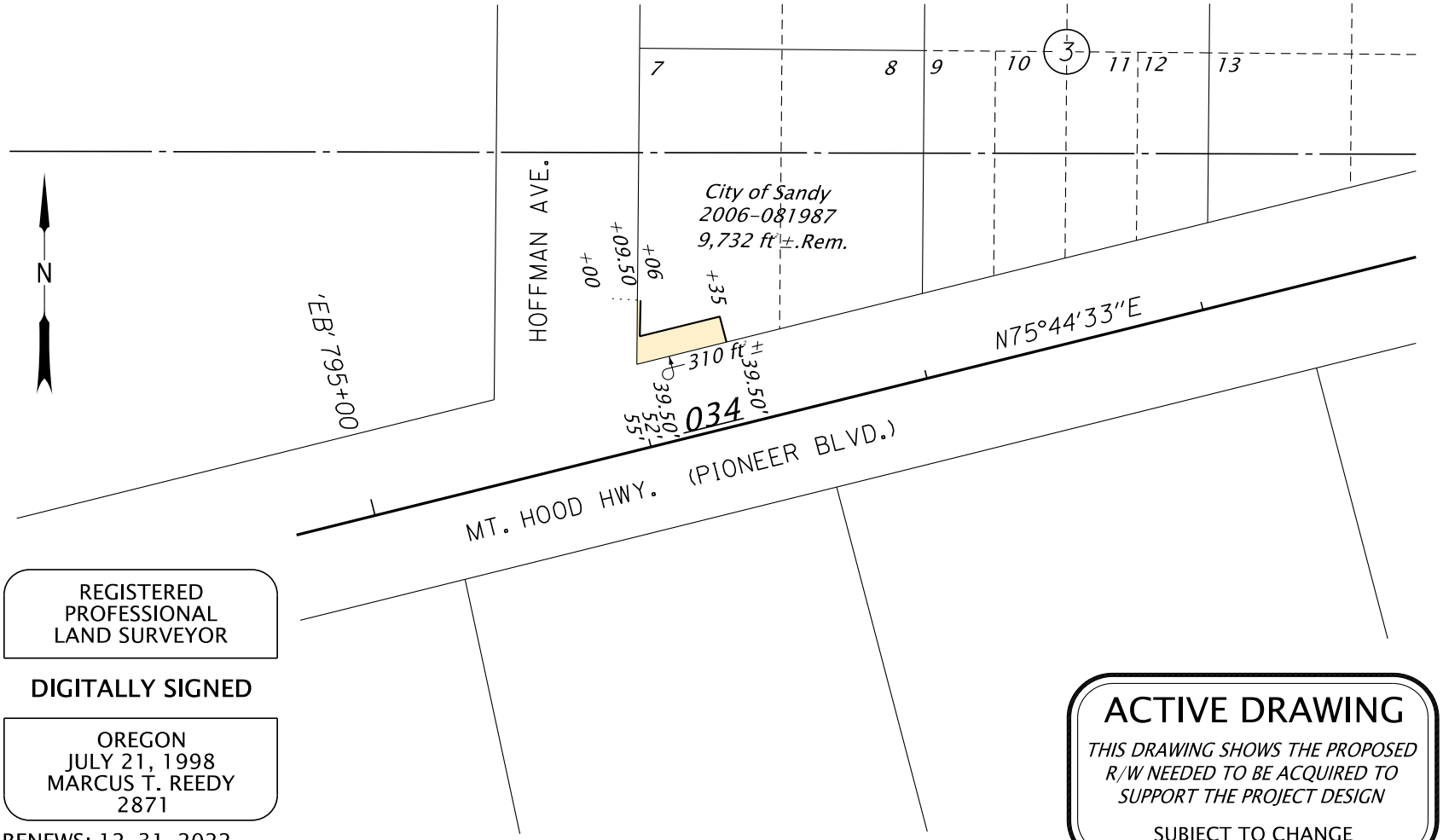
This parcel of land contains 310 square feet, more or less.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 21, 1998
MARCUS T. REEDY
2871

RENEWS: 12-31-2022

SEC. 13, T. 2S, R. 4E, W.M.



REGISTERED
PROFESSIONAL
LAND SURVEYOR

DIGITALLY SIGNED

OREGON
JULY 21, 1998
MARCUS T. REEDY
2871

RENEWS: 12-31-2022

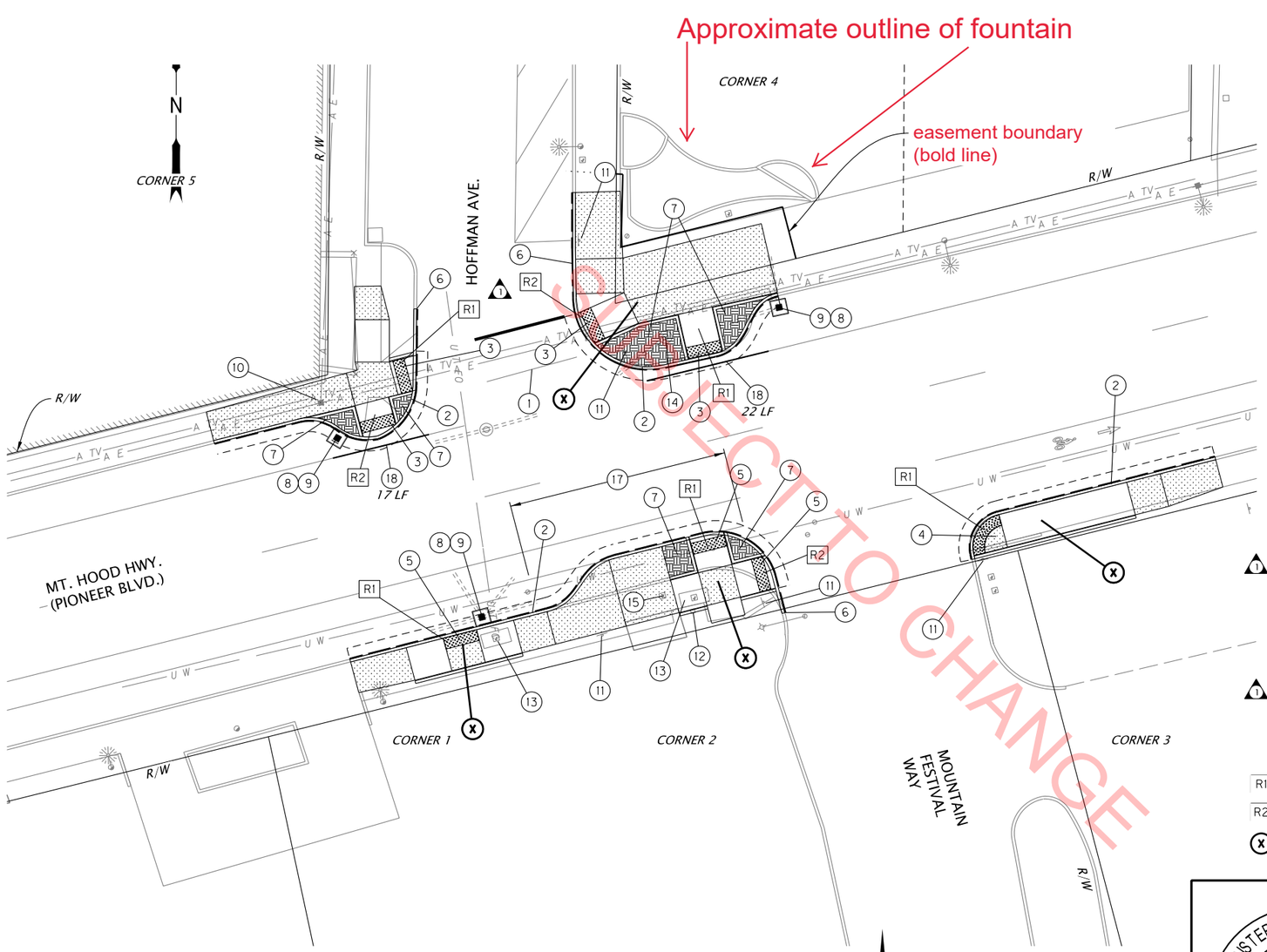
ACTIVE DRAWING

THIS DRAWING SHOWS THE PROPOSED R/W NEEDED TO BE ACQUIRED TO SUPPORT THE PROJECT DESIGN

SUBJECT TO CHANGE

OREGON DEPARTMENT OF TRANSPORTATION	SECTION	*US 26 CURB RAMPS (SANDY) PROJECT*	SCALE	*1" = 50'*
1 ALLIANCE GEOMATICS SURVEYING & MAPPING	HIGHWAY	*MT. HOOD HIGHWAY*	DATE	*JANUARY, 2021*
	COUNTY	*CLACKAMAS*	FILE	*9655034*
SKETCH MAP	PURPOSE	*R/W ACQUISITION*	*SEE DRAWING RW9655M*	

S_K22112_rw_base_01.dgn :: Sketches 3/30/2021



1. *Remove stop bar*
2. *Remove curb*
   Const. curb and gutter with pvmt. repair
   (For details, see sht. BA01)
3. *Remove sidewalk*
   Const. curb ramps - 4
   Insta. safety yellow truncated domes on new surface - 48 sqft
   PCC surfacing
   (See Standard Drawings)
4. *Remove sidewalk*
   Const. curb ramp
   Insta. safety yellow truncated domes on new surface - 16 sqft
   PCC surfacing
   (For details, see sht. BA10)
5. *Remove sidewalk*
   Const. curb ramps - 3
   Insta. safety yellow truncated domes on new surface - 36 sqft
   PCC surfacing
   (For details, see sht. BB11)
6. *Const. std. curb - 3*
7. *Const. landscaping - 6*
   (For details, see sht. BA09)
8. *Adjust inlet - 3*
   (For details, see sht. BA08)
9. *Inst. inlet protection, Type 3 - 3*
10. *Maintain and protect extg. utility pole*
11. *Maintain and protect extg. sign - 5*
12. *Remove and reinstall mailbox (by others)*
13. *Relocate utility vault (By others) - 2*
14. *Maintain and protect MH*
15. *Adjust junction box*
16. *N/A*
17. *Remove extg. 4" white line*
18. *Inst. 4" yellow line - 2*

R1 *Ramp 1*

R2 *Ramp 2*

(X) *Right-of-Way delays or access delays - 4 See 00180.65.*

NOTES:

1. *Signs not called out are extg. and shall remain in place.*
2. *Striping not called out are extg. and shall remain in place.*
3. *Longitudinal striping called out for removal shall not be replaced.*
4. *Striping repair quantities shown are approx. Contractor shall repair any pvmt. marking damaged by construction, per applicable std. dwg. unless otherwise noted.*
5. *Longitudinal pvmt. markings shall be Method A thermoplastic, extruded, surface, profile per Section 00865. Bars and legends shall be Type B-HS preformed, fused, thermoplastic, High-skid film per Section 00867. RPMs are Mono-Directional Type 1AR and Bi-Directional Yellow Type 1AR per Section 00855.*

No.	DATE	REVISIONS	BY
1	06-02-21	Revised notes	S.P.G.W.

SANDY SITE 16

REGISTERED PROFESSIONAL ENGINEER
82399PE
OREGON
JANUARY 14, 2020
ERIC MICHAEL WILDER
RENEWS: 06-30-2022

DAVID EVANS AND ASSOCIATES INC.
530 Center Street N.E. Suite 605
Salem Oregon 97301
Phone: 503.361.8655

US26 CURB RAMPS (SANDY) PROJECT
MT HOOD HIGHWAY
CLACKAMAS COUNTY

Designer: Shaun-Garey Wilder | Reviewer: Jon Heacock
Drafter: Alan Mitchell | Checker: Paul Tappana

GENERAL CONSTRUCTION | SHEET NO. C15

Staff Report

Meeting Date:	February 22, 2022
From	Mike Walker, Public Works Director
SUBJECT:	Noise Variance for US 26 Ten Eyck/Vista Loop Pedestrian Improvements Project

DECISION TO BE MADE:
Whether to grant a noise variance request under Section 8.20.020(B)7 of the Municipal Code

PURPOSE / OBJECTIVE:
Work on the Ten Eyck-Vista Loop Pedestrian Improvements Project will begin at the end of February. Some of this work will need to be performed at night to avoid or minimize impacts to traffic.

BACKGROUND / CONTEXT:
The City does not have objective criteria for noise impacts. Construction activity is presumed to be a source of noise impacts. Section 8.20.020(B)7 of the Municipal Code prohibits construction activity between the hours of 6:00 PM and 7:00 AM M-F. The City Council may grant an exception *"upon a determination by the council that the public health, safety and welfare will not be impaired and that loss or inconvenience would result to any person unless such exception were granted."*

KEY CONSIDERATIONS / ANALYSIS:
ODOT and their contractor will conduct outreach with the neighboring residents to inform them of the night work, the schedule and the anticipated noise levels that might be experienced during the work. The City also sent a notice to all residents in the project area on the north side of US 26 informing them that the Council would consider an exception to Section 8.20.020(B)7 of the Municipal Code at this meeting and posted the same information to the City's Facebook page.

RECOMMENDATION:
Authorize the City Manager to grant an exception to the construction noise prohibition between 6:00 PM and 7:00 AM M-F in section 8.20.020(B)7 of the Municipal Code for the night work associated with the Ten Eyck-Vista Loop Pedestrian Improvements Project. The City Manager will set the dates and times when this exemption will be effective based on the schedule submitted by the ODOT's construction contractor.

BUDGETARY IMPACT:
None

SUGGESTED MOTION LANGUAGE:
"I move to authorize the City Manager to grant an exception to the construction noise prohibition between 6:00 PM and 7:00 AM M-F in section 8.20.020(B)7 of the Municipal Code for the night work associated with the Ten Eyck-Vista Loop Pedestrian Improvements Project."

LIST OF ATTACHMENTS/EXHIBITS:
Project area sketch


K18823: US26: TEN EYCK RD/WOLF DR – VISTA LOOP (SANDY)
Pleasant St
Relocate Extg Utility Pole
Proposed TCE (Typ)
Relocate Extg Sign
Wall 1 Retained Height: 0'
Existing ROW Line
Relocate Extg Sign
6' Wide Sidewalk
Wall 2 Retained Height: 8'
Relocate Extg Utility Pole
Driveway (Typical)
Wall 3 Retained Height: 8'
Relocate Extg Utility Pole
Wall 4 Retained Height: 0'
Protect Extg Water Service
Adjust Extg Watermeter
Adjust Extg Watermeter
Relocate Extg Utility Pole
Proposed TCE (Typ)
Proposed Pee Take (Typ)
Wall 5 Retained Height: 6'
Existing ROW Line
Driveway (Typical)
Wall 6 Retained Height: 13'
6' Wide Sidewalk
Relocate Extg Utility Pole
Relocate Extg Utility Pole
Relocate Extg Utility Pole
McCormick Dr
McCormick Ct
MT. HOOD HIGHWAY (US26)
U.S. Hwy 26
26

Staff Report

Meeting Date:	February 22, 2022
From	Kelly O'Neill Jr., Development Services Director
SUBJECT:	Deer Meadows Subdivision Appeal

DECISION TO BE MADE:
Deny or Approve a subdivision request.

BACKGROUND / CONTEXT:
The Planning Commission denied the Deer Meadows subdivision proposal with a vote of 5:0 on November 8, 2021. The final order (i.e., written decision) was signed by Chairman Crosby and issued on November 18, 2021. The applicant filed an appeal of the Planning Commission decision on November 30, 2021 within 12 days of the Planning Commission decision as required by Section 17.28.10.

The appeal hearing was originally scheduled for January 18, 2022, but after publication of the staff report on January 11, the applicant asked to move the hearing date. The City of Sandy granted this request and postponed the hearing to February 22, 2022. With postponement of the hearing, staff sent a revised neighborhood notice on January 12, 2022 and completed a revised legal notice in the Sandy Post for February 9, 2022. Since publication of the staff report on January 11, 2022, staff has received additional exhibits beginning at Exhibit ZZ.

APPLICANT'S PROPOSAL:
The applicant, Roll Tide Properties Corp., seeks approval for a 32-lot subdivision at 40808 and 41010 Highway 26. The development proposal includes two partial street extensions and the creation of two new streets. The applicant proposes 30 lots of Low Density Residential (R-1) that would contain single family homes or duplexes, one small lot (9,023 square feet) of Medium Density Residential (R-2) that would like contain multi-family, and one large lot (7.35 acres) with a combination of Medium Density Residential (R-2) and Village Commercial (C-3) that would likely contain multi-family. The proposed 30 lots with R-1 zoning range in size from 5,500 square feet to 32,189 square feet. The applicant proposes to retain 48 existing trees and proposes to remove the remainder of the trees from the site.

The exact number of multifamily units was not determined at the time of the subdivision request as the applicant wants to process the multi-family development in a subsequent design review application. However, the applicant claims the number of multifamily dwelling units on the R-2 zoned land will be between 38 dwelling units and 66 dwelling units. The C-3 zoned land would likely contain a mix of commercial and residential

development, and the exact number of multifamily dwelling units is unknown at this time.

REASONS FOR DENIAL:
The Planning Commission denied the subdivision request due to the following issues:

1. The application does not meet subdivision criteria 17.100.60(E)(1).
2. The application does not meet subdivision criteria 17.100.60(E)(3).
3. The application does not meet the parkland dedication requirements in Chapter 17.86.

In addition, staff recommends the City Council deny the subdivision request due to the following issues:

1. The subdivision proposal does not meet subdivision Criteria 17.100.60 (E)(1), (2), (3), (4), (5), and (6).
2. The applicant's statement indicating that "Both of the proposed cul-de-sacs have less than 50% of their circumference covered by driveway drops" is not sufficient as there were no dimensional specifications submitted by the applicant to support this statement.
3. The applicant proposes two cul-de-sacs but does not propose a pedestrian connection to streets beyond the cul-de-sacs as required by Section 17.84.30.
4. The applicant proposes Lot 12 with less than the minimum 20 feet of street frontage as required by Section 17.36.30(C).
5. The distance between the two nearest edges of the right-of-way between Dubarko Road (an arterial) and Street C (a local street) is less than the minimum 150 ft. dimension in Sections 17.84.50(E)(2) and 17.84.50(J)(3).
6. The minimum 100 feet of tangent alignment required in Section 17.84.50(J)5(a) is not provided at the intersection of Street "B" (a collector) and Dubarko Road (an arterial) or at the intersection of Dubarko Road and Street "B".
7. The applicant does not propose to extend Dubarko Road to intersect with Highway 26 consistent with the requirements of the Sandy Development Code or the 2011 Transportation System Plan.
8. The applicant does not include highway frontage improvements along Highway 26 consistent with the Sandy Development Code.
9. The applicant's proposal does not clearly define if they propose to replace the 8-inch diameter water line and/or install an 18-inch water line in conformance with the Water Master Plan.
10. The applicant does not propose to extend the existing 12-inch water main in Highway 26 east from the required intersection of Dubarko Road and Highway 26 to the east boundary of the site consistent with the Sandy Development Code.
11. The proposed 10-foot-wide public storm drainage easements depicted between Lots 27 and 28 and at the rear of Lots 9-13 do not meet the minimum dimensional requirement for public facility easements in Section 17.84.90(A)(2).
12. This subdivision proposal does not propose to dedicate 0.96 acres of parkland as required by Chapter 17.86. The additional 0.96 acres could expand Deer Pointe Park consistent with the Parks and Trails Master Plan that was adopted in 1997.

RECOMMENDATION:
Pursuant to the subdivision criteria in Section 17.100.60 (E) and all other applicable criteria and requirements in the Sandy Development Code as outlined in the attached staff report, the Planning Commission and staff recommend that the City Council **deny** the subdivision request.

BUDGETARY IMPACT:
If the subdivision is approved as proposed by the applicant the City of Sandy will bear the full financial burden for the following:

- Connecting a future street to Highway 26 to accommodate the planned transportation route of Dubarko Road;
- Highway 26 frontage improvements (i.e., sidewalk, curb, lighting, street trees, etc.) along the site frontage of Highway 26;
- Extension of a 12-inch water main in Highway 26 east from the required intersection of Dubarko Road and Highway 26 to the east boundary of the site; and,
- The replacement costs for an 8-inch diameter water line and/or installation of an 18-inch water line through the site.

SUGGESTED MOTION LANGUAGE:
I move that the City Council deny the Deer Meadows Subdivision for the reasons outlined in the staff report.

LIST OF ATTACHMENTS/EXHIBITS:
Attachment 1: Staff Report
Attachment 2: Exhibits A. and B. Land Use Application and Narrative
Attachment 3: Exhibit C. Civil Plan Set
Attachment 4: Exhibits D. and E. Stormwater Report and Traffic Study
Attachment 5: Exhibits F. - J. Additional Studies
Attachment 6: Exhibits K. and L. Letters from Michael Robinson
Attachment 7: Exhibits M. - R. Agency Comments
Attachment 8: Exhibits S. - W. Public Comments
Attachment 9: Exhibits X. - Z. Letters from the Applicant
Attachment 10: Exhibits AA. - GG. Additional Documents
Attachment 11: Exhibits HH. - NN. Items from Open Record Period #1
Attachment 12: Exhibits OO. - PP. Items from Open Record Period #2
Attachment 13: Exhibits QQ. - RR. Items from Open Record Period #3
Attachment 14: Exhibits SS. - UU. Staff Documents Reviewed by the Planning Commission
Attachment 15: Exhibits VV. - WW. Appeal Documents from the Applicant
Attachment 16: Exhibits XX. - YY. Scope of Review Letters
Attachment 17: Exhibit ZZ. 120-day Extension Request from the Applicant
Attachment 18: Exhibits AAA. - DDD. New Public Comments

39250 Pioneer Blvd
Sandy, OR 97055
503-668-5533

WHERE INNOVATION MEETS ELEVATION

CITY COUNCIL STAFF REPORT
TYPE IV APPEAL

This proposal was originally reviewed concurrently as a Type III subdivision with tree removal. The Planning Commission denied the request. This review before the City Council is an appeal filed by the applicant. The following exhibits and findings of fact explain the proposal and support the Planning Commission decision and the staff recommendation.

DATE: January 11, 2022

FILE NO.: 21-061 AP (appeal to File No. 21-014 SUB/TREE)

PROJECT NAME: Deer Meadows Subdivision

APPLICANT/OWNER: Roll Tide Properties, Corp.

PHYSICAL ADDRESS: 40808 and 41010 Highway 26

LEGAL DESCRIPTION: T2 R5E Section 18CD, Tax Lots 900 and 1000

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EXHIBITS

Applicant's Original Submittals:

A. Land Use Application
B. Project Narrative (dated June 17, 2021)
C. Civil Plan Set
   - Sheet C1 - Cover Sheet and Future Street Plan
   - Sheet C2 - Preliminary Plat Map
   - Sheet C3 - Existing Conditions and Tree Retention Plan
   - Sheet C4 - Tree Tables
   - Sheet C5 - Master Street and Utility Plan
   - Sheet C6 - Preliminary Street Tree and Parking Plan
   - Sheet C7 - Preliminary Grading and Erosion Control Plan
   - Sheet C8 - Slope Analysis
D. Preliminary Stormwater Report
E. Traffic Impact Study (dated June 14, 2021)
F. Arborist Report
G. Wetland Determination
H. DSL Offsite Determination
I. Geotechnical and Slope Stability Investigation
J. Geotechnical Supplemental Review Letter
K. Letter from Michael Robinson (dated March 31, 2021)
L. Letter from Michael Robinson (dated June 11, 2021)

Agency Comments:

M. Fire Marshal (dated August 10, 2021)
N. ODOT (dated September 1, 2021)
O. Parks and Trails Advisory Board (dated September 1, 2021)
P. City Transportation Engineer (dated August 30, 2021)
Q. City Transit Director (dated August 30, 2021)
R. City Public Works Director (dated September 2, 2021)

Public Comments:

S. Gary and Val Roche (received August 16, 2021)
T. Dave and Nancy Allan (received August 23, 2021)
U. Ashley Yukich (received August 23, 2021)
V. Marilyn Euteneier (September 8, 2021)
W. Scott Ruehrdanz (September 13, 2021)

Documents Received after publication of the Planning Commission Staff Report:

X. Letter from Michael Robinson (September 23, 2021)
Y. Letter from Michael Robinson (September 24, 2021)
Z. Letter from All County Surveyors and Planners (dated September 16, 2021)
AA. Parks and Trails Advisory Board Minutes
BB. Letter from Dave Carter (received September 27, 2021)

CC. Revised TIS from Ard Engineering (September 27, 2021)
DD. Letter from Vincent and Lynn Mandina (received September 27, 2021)
EE. Ard Engineering Response Memo (September 27, 2021)
FF. Presentation from Development Services Director
GG. Presentation from Tracy Brown Consulting

Materials received during Open Record Period #1:
HH. Email from Michael Robinson (October 6, 2021)
II. 120-day extension letter from Michael Robinson (October 6, 2021)
JJ. Revised memo from the City Transportation Engineer (October 6, 2021)
KK. Staff email exchange with DLCD (October 7, 2021)
LL. Letter from Michael Robinson (October 11, 2021)
MM. Home Builders Association Letter (October 11, 2021)
NN. Letter from Michael Robinson (October 11, 2021)

Materials received during Open Record Period #2:
OO. Email from Christy Veselik (October 16, 2021)
PP. Letter from Michael Robinson (October 18, 2021)

Materials received during Open Record Period #3:
QQ. Letter from Michael Robinson (October 25, 2021)
RR. Letter from City Attorney David Doughman (November 1, 2021)

Staff Documents Reviewed by the Planning Commission:
SS. September 27, 2021 Staff Report
TT. November 8, 2021 Staff Report
UU. November 18, 2021 Final Order for File No. 21-014 SUB/TREE

Appeal Documents:
VV. 120-day extension email from Michael Robinson (November 24, 2021)
WW. Appeal documents from the applicant (received November 30, 2021)
XX. Letter from City Attorney regarding scope of work (December 21, 2021)
YY. Letter form Michael Robinson regarding scope of work (January 3, 2022)

FINDINGS OF FACT

GENERAL FINDINGS

1. The Planning Commission denied the Deer Meadows subdivision proposal with a vote of 5:0 on November 8, 2021. The final order (i.e., written decision) was signed by Chairman Crosby and issued on November 18, 2021.

2. The applicant filed an appeal of the Planning Commission decision on November 30, 2021 within 12 days of the Planning Commission decision as required by Section 17.28.10.

3. These findings are based on the applicant's submittals and other evidence and testimony presented to the Planning Commission. In a letter dated June 11, 2021, the applicant agreed to toll the 120-day clock until July 27, 2021. The original 120-day clock deadline was November 24, 2021.

4. On September 27, 2021 the Planning Commission held a public hearing on the Deer Meadows Subdivision and decided to create an open record period prior to deliberating on the subdivision request at a special meeting scheduled for November 8, 2021. The first open record period closed on Monday, October 11 at 4 pm. During the first open record period, anyone could submit additional written information for the Planning Commission to consider. The second open record period closed on Monday, October 18 at 4 pm. During the second open record period, parties could only submit information that rebutted or responded to information that was submitted during the first open record period. The third open record period closed on Monday, October 25 at 4 pm. This third open record period was reserved solely for the applicant to submit their final written argument.

5. With the creation of the open record period the applicant agreed to extend the 120-day clock by an additional 42 days. The 120-day clock deadline was then extended to January 5, 2022.

6. On November 24, 2021 the applicant requested to extend the 120-day clock deadline by an additional 27 days to February 1, 2022.

7. The subject site is approximately 15.91 acres. The site is located at 40808 and 41010 Highway 26.

8. The parcel has a Comprehensive Plan Map designation of Village and a Zoning Map designation of R-1, Low Density Residential; R-2, Medium Density Residential; and C-3, Village Commercial.

9. The applicant, Roll Tide Properties Corp., seeks approval for a 32-lot subdivision at 40808 and 41010 Highway 26. The development proposal includes two partial street extensions and the creation of two new streets. The applicant proposes 30 lots of Low Density Residential (R-1) that would contain single family homes or duplexes, one small lot (9,023 square feet) of Medium Density Residential (R-2) that would like contain multi-family, and one large lot (7.35 acres) with a combination of Medium Density Residential (R-2) and Village

Commercial (C-3) that would likely contain multi-family. The proposed 30 lots with R-1 zoning range in size from 5,500 square feet to 32,189 square feet. The applicant proposes to retain 48 existing trees and proposes to remove the remainder of the trees from the site.

10. The exact number of multifamily units was not determined at the time of the subdivision request as the applicant wants to process the multi-family development in a subsequent design review application. However, the applicant claims the number of multifamily dwelling units on the R-2 zoned land will be between 38 dwelling units and 66 dwelling units. The C-3 zoned land would likely contain a mix of commercial and residential development, and the exact number of multifamily dwelling units is unknown at this time.

11. Due to the interest in the previous proposal at the subject site, the Development Services Director elevated the Deer Meadows subdivision application to a Type III decision to be heard and considered by the Planning Commission.

12. Throughout the project narrative (Exhibit B) the applicant failed to submit required information. Instead, on 14 occasions in the narrative the applicant stated that the development code is subjective (i.e., not clear and objective) and because the subdivision is a housing application the alleged subjective development code language is not applicable. Staff explained at the Planning Commission meetings that they did not agree with the applicant's interpretation of what constitutes and does not constitute subjectivity.

13. The applicant previously proposed a development at the site that was denied by the City Council (File No. 19-050 CPA/ZC/SUB/SAP/TREE Bull Run Terrace). This application (File 21-014 SUB/TREE) was substantively different from that prior proposal. The applicant did not propose a Comprehensive Plan amendment or Zone Change amendment with this application. The applicant chose not to expand Deer Pointe Park or connect Dubarko Road to Highway 26. The existing parks master plan details the Deer Pointe neighborhood to have a Community Park. The existing transportation system plan classifies Dubarko Road as a minor arterial and shows it extending through the subject property and connecting to Highway 26.

14. The City of Sandy provided the following notices for this appeal:
    A. Notification of the appeal was mailed to affected property owners within 500 feet of the subject property on December 30, 2021.
    B. A legal notice was published in the Sandy Post on January 5, 2022.

15. The City of Sandy provided the following notices with File No. 21-014 SUB/TREE:
    A. A transmittal was sent to agencies asking for comment on August 2, 2021.
    B. Notification of the proposed application was mailed to affected property owners within 300 feet of the subject property on August 10, 2021.
    C. A supplemental notice regarding the Planning Commission meeting was mailed to affected property owners within 300 feet of the subject property on August 24, 2021.
    D. A legal notice was published in the Sandy Post on September 15, 2021.

PLANNING COMMISSION BASIS FOR DENIAL

BASIS FOR DENIAL 1: The application does not meet subdivision criteria 17.100.60(E)(1)

16. Section 17.100.60(E)(1) requires subdivisions to be consistent with the density, setback, and dimensional standards of the base zoning district, unless modified by a Planned Development approval as this particular application was submitted prior to the repeal of Planned Developments. Each base zoning district requires that residential development comply with Chapter 17.82. First, the Preliminary Plat Map (Exhibit C, Sheet C2) details setbacks for Lots 2, and 27-31 showing the front setback facing the local street or public access lane, instead of the Transit Street as required by Chapter 17.82. Second, Sheet C2 does not identify that lots abutting Highway 26 shall face Highway 26 as required by Chapter 17.82, nor does the plan set detail frontage improvements along Highway 26 as required by Chapter 17.86. Third, by not proposing the extension of Dubarko Road to connect with Highway 26, the lots that would otherwise abut Dubarko Road do not have the required frontage to Dubarko Road as required by Chapter 17.82. Fourth, by not proposing Dubarko Road or parkland dedication, some of the proposed lots are in the required right-of-way for Dubarko Road and also located across required parkland. Therefore, this proposal does not meet approval criteria 17.100.60 (E)(1).

BASIS FOR DENIAL 2: The application does not meet subdivision criteria 17.100.60(E)(3)

17. Section 17.100.60(E)(3) requires the proposed street pattern to be connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy. The proposed street pattern is not consistent with the Comprehensive Plan and the city's standards, including connecting Dubarko Road to Highway 26.

18. The 2011 Sandy Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan. Exhibit A of Ordinance 2011-12 is the TSP. The TSP is referenced by ordinance as 'the transportation element of the City of Sandy Comprehensive Land Use Plan.' The 2011 TSP includes the official street plan for the City of Sandy. Project M20 in the TSP is the connection of Dubarko Road to Highway 26.

19. On pages 9, 10, and 14 of the project narrative (Exhibit B) the applicant references the City's TSP and states that the TSP identifies Dubarko Road as a minor arterial. On page 32 of the project narrative (Exhibit B) the applicant claims that subdivision approval criteria 17.100.60 (E)(3) is not clear and objective and therefore the subdivision does not need to meet the Comprehensive Plan or official street plan for the City of Sandy. The applicant also asserts that if the official street plan is in the TSP, it is not sufficiently incorporated into the development code for the purposes of limited land use decisions. However, in the narrative for Bull Run Terrace (File No. 19-050) for the same subject site the same applicant stated, "*As illustrated on the submitted Future Street Plan (Sheet C1), the proposed street system is consistent with the City's Transportation System Plan and Comprehensive Plan*." So, with the Bull Run Terrace land use application the applicant conceded that the street system had to be consistent with the City's Transportation System Plan and Comprehensive Plan to meet criteria 17.100.60 (E)(3). The applicant's inconsistent understanding of what is the official

street plan (i.e., the City's TSP) is illogical and conflicting even in the applicant's project narrative. Additionally, in a previous TIS from Ard Engineering (dated September 28, 2020) on page 24 the applicant's traffic engineer referenced the requirement for the Dubarko Road connection by stating, "it is the completion of the city's planned connection of Dubarko Road to Highway 26." Furthermore, the proposal is not consistent with OAR 660-012-0045, which requires that local governments implement their TSP. By not providing the connection of Dubarko Road to Highway 26 in the proposal the subdivision request does not meet approval criteria 17.100.60 (E)(3).

BASIS FOR DENIAL 3: The application does not meet the parkland dedication requirements in Chapter 17.86

20. The applicant did not propose any parkland dedication as required by Chapter 17.86 of the Sandy Development Code. Directly west of the subject property is undeveloped land owned by the City of Sandy that has long been reserved for the eventual development of Deer Pointe Park. The Parks and Trails Advisory Board (Board) met on August 11, 2021. The Board recommended that conditions of approval were included that required dedication of land for expansion of Deer Pointe Park. The 1997 Parks Master Plan designated Deer Pointe Park as a community park, and in the Location and Development Polices section of the Plan states that community parks should be 20 acres or more. Because the Deer Meadows subdivision did not propose parkland dedication abutting Deer Pointe Park, the proposed subdivision is inconsistent with the 1997 Parks Master Plan.

21. Section 17.86.10 contains a clear and objective formula for determining the amount of land required to be dedicated. The formula is acres = proposed units x (persons/unit) x 0.0043. For the 30 single family homes, acres = 30 x 3 x 0.0043 = 0.39 acres. For the maximum development of 66 multifamily units, acres = 66 x 2 x 0.0043 = 0.57 acres. Combined, this totals 0.96 acres. The dedication of 0.96 acres was required to meet the clear and objective criteria in Chapter 17.86. NOTE: The number of dwelling units on the subject site does not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the calculations related to parkland dedication are based on unreliable assumptions.

LAND DIVISION CRITERIA – Chapter 17.100

22. This land use application is for the subdivision of land and therefore is reviewed in compliance with Chapter 17.100.

23. Submittal of preliminary utility plans and street plans is solely to satisfy the requirements of Section 17.100.60. **Preliminary plat approval does not connote utility or public improvement plan approval which will be reviewed and approved separately upon submittal of public improvement construction plans.**

24. On page 1 of the project narrative (Exhibit B) the applicant states that in accordance with ORS 197.307 (4) a local government may apply only clear and objective standards, conditions, and procedures regulating the creation of needed housing. The analysis of land division criteria as follows has been conducted through review of clear and objective standards. Staff's assessment of this subdivision proposal meets ORS 197.307 (4).

25. Section 17.100.60(E)(1) requires subdivisions to be consistent with the density, setback, and dimensional standards of the base zoning district, unless modified by a Planned Development approval. Each base zoning district requires that residential development comply with Chapter 17.82. First, Preliminary Plat Map (Exhibit C, Sheet C2) details setbacks for Lots 2, and 27-31 showing the front setback facing the local street or public access lane, instead of the Transit Street as required by Chapter 17.82. Second, Sheet C2 does not identify that lots abutting Highway 26 shall face Highway 26 as required by Chapter 17.82, nor does the plan set detail frontage improvements along Highway 26 as required by Chapter 17.86. Third, by not proposing the extension of Dubarko Road to connect with Highway 26 the lots that would otherwise abut Dubarko Road do not have the required frontage to Dubarko Road as required by Chapter 17.82. In addition, Lot 12 does not have the minimum 20 feet of street frontage required by Section 17.36.30(C). Fourth, by not proposing Dubarko Road or parkland dedication, some of the proposed lots are in the required right-of-way for Dubarko Road and also located across required parkland. Therefore, this proposal does not meet approval criteria 17.100.60 (E)(1).

26. Section 17.100.60(E)(2) requires subdivisions to be consistent with the design standards set forth in this chapter. The proposal is not consistent with Section 17.100.70, Section 17.100.100 (A)(E) or (F). The proposal does not meet approval criteria 17.100.60 (E)(2) as explained in A. through E., below:

    A. In accordance with Section 17.100.70 the design standards in Chapter 17.100 are not met as the proposed subdivision does not follow the City of Sandy Transportation System Plan by providing the connection of Dubarko Road to Highway 26.

    B. In accordance with Section 17.100.100 (A) the proposed subdivision does not meet the Street Connectivity Principle. By not connecting Dubarko Road to Highway 26 the subdivision does not provide safe and convenient options for cars, bikes, and pedestrians; does not create a logical, recognizable pattern of circulation; and does not spread traffic over many streets so that key streets such as Langensand Road and Highway 211 are not overburdened.

C. In accordance with Section 17.100.100 (E), by not connecting Dubarko Road to Highway 26 the proposed subdivision does not provide a future street plan that promotes a logical, connected pattern of streets.

D. In accordance with Section 17.100.100 (F) the proposed subdivision does not include the continuation of Dubarko Road and proposes two cul-de-sacs and one dead-end public access lane, all of which do not provide connectivity to other streets within the development and to existing and planned streets outside the development.

E. The applicant did not submit any information on block lengths or information regarding single tier vs double tier blocks. Instead, the applicant stated the block length standards in Section 17.100.120 are subjective (i.e., not clear and objective) and because the subdivision constitutes a needed housing application the block length standards are not applicable. The applicant failed to submit information into the record regarding block lengths and therefore staff does not have enough information to determine block lengths.

27. Section 17.100.60(E)(3) requires the proposed street pattern to be connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy. The proposed street pattern is not consistent with the Comprehensive Plan and the city's standards, including connecting Dubarko Road to Highway 26. The 2011 Sandy Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan. Exhibit A of Ordinance 2011-12 is the TSP. The TSP is referenced by ordinance as 'the transportation element of the City of Sandy Comprehensive Land Use Plan'. The 2011 TSP includes the official street plan for the City of Sandy. Project M20 in the TSP is the connection of Dubarko Road to Highway 26. On pages 9, 10, and 14 of the project narrative (Exhibit B) the applicant references the City's TSP and states that the TSP identifies Dubarko Road as a minor arterial. On page 32 of the project narrative (Exhibit B) the applicant claims that subdivision approval criteria 17.100.60 (E)(3) is not clear and objective and therefore the subdivision does not need to meet the Comprehensive Plan or official street plan for the City of Sandy. The applicant also asserts that if the official street plan is in the TSP, it is not sufficiently incorporated into the development code for the purposes of limited land use decisions. However, in the narrative for Bull Run Terrace (File No. 19-050) for the same subject site the same applicant stated, "*As illustrated on the submitted Future Street Plan (Sheet C1), the proposed street system is consistent with the City's Transportation System Plan and Comprehensive Plan*." So, with the Bull Run Terrace land use application the applicant conceded that the street system had to be consistent with the City's Transportation System Plan and Comprehensive Plan to meet criteria 17.100.60 (E)(3). The applicant's inconsistent understanding of what is the official street plan (i.e., the City's TSP) is illogical and inconsistent even in the applicant's project narrative. Additionally, in a previous TIS from Ard Engineering (dated September 28, 2020) on page 24 the applicant's traffic engineer references the requirement for the Dubarko Road connection by stating, "it is the completion of the city's planned connection of Dubarko Road to Highway 26." Furthermore, the proposal is not consistent with OAR 660-012-0045, which requires that local governments

implement their TSP. By not providing the connection of Dubarko Road to Highway 26 in the proposal the subdivision request does not meet approval criteria 17.100.60 (E)(3).

28. Section 17.100.60(E)(4) requires that traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions. The applicant's project narrative (Exhibit B) and the applicant's Traffic Impact Study (Exhibit E) do not evaluate ADT on local streets. The applicant's project narrative on page 32 states, "As detailed in the submitted Traffic Study traffic volumes on local streets are not projected to exceed ADT standards. This criterion is met." Staff cannot find an evaluation of ADT standards in the submitted TIS. Based on incomplete ADT analysis of the surrounding local streets the subdivision request does not meet approval criteria 17.100.60 (E)(4).

29. Section 17.100.60(E)(5) requires that adequate public facilities are available or can be provided to serve the proposed subdivision. City water, sewer and stormwater are available or will be constructed by the applicant to serve the subdivision. However, the proposal does not meet approval criteria 17.100.60 (E)(5) as explained in A through C, below:

    A. Dubarko Road. As thoroughly explained in this staff report the proposal does not propose the continuation of Dubarko Road to connect with Highway 26. This is inconsistent with the 2011 TSP and will create a safety concern by increasing trips to other streets in Sandy that are not designed to accommodate additional traffic without the connection of Dubarko Road to Highway 26. As stated by the City of Sandy Transportation Engineer (Exhibit P), the Deer Meadows subdivision application should be denied based on the inadequacy of the TIS and because the applicant does not propose the connection of Dubarko Road to Highway 26. By not providing the Dubarko Road connection to Highway 26 the subdivision fails to incorporate a key project from the 2011 TSP and therefore fails to provide adequate public facilities for transportation. Furthermore, the proposal is not consistent with OAR 660-012-0045, which requires that local governments implement their TSP.

    B. Parkland Dedication. Pursuant to 17.86.10 of the Development Code, new residential subdivisions "shall be required to provide parkland to serve existing and future residents of those developments." As thoroughly explained in this staff report the proposal does not include dedication of 0.96 acres of parkland as the Code requires. Directly west of the subject property is undeveloped land owned by the City of Sandy that has long been reserved for the eventual development of Deer Pointe Park. The 1997 Parks Master Plan designated Deer Pointe Park as a community park, and the Location and Development Polices section of the Plan states that community parks should be 20 acres or more. Because the Deer Meadows subdivision does not propose parkland dedication abutting Deer Pointe Park the proposed subdivision is inconsistent with the 1997 Parks Master Plan. Staff recognizes that outside of the City of Sandy purchasing land, there are practical and legal impediments to requiring an applicant to dedicate enough acreage to accommodate a 20-acre community park. Staff finds that a neighborhood park would be a more reasonable solution. Based on the 1997 Parks Master Plan, a neighborhood park is two to seven acres. The existing land the City

owns for Deer Point Park is 1.40 acres. When coupled with the 0.96 acres required by this application, the result would be an approximately 2.4 acre neighborhood park.

C. Highway 26 frontage improvements. As explained by the Public Works Director (Exhibit R) the site plan does not depict frontage improvements (curbs, sidewalks, street lighting, street trees, storm drainage, etc.) on the Highway 26 frontage of the site. Frontage improvements along Highway 26 are required by Section 17.84.50(F)(1) and Section 17.84.30(A). Section 17.84.50(F)(1) states, "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."

30. Section 17.100.60(E)(6) requires all proposed improvements to meet City standards. A detailed review of proposed improvements is contained throughout this staff report. Staff has identified a few aspects of the proposed subdivision improvements requiring additional information or modification by the applicant. Some of the required improvements could be satisfied with conditions of approval, but several of the required improvements can only be satisfied by a substantial modification to the subdivision proposal. The proposed subdivision lacks the following substantial improvements: 1) Dubarko Road connecting to Highway 26; 2) Highway 26 frontage improvements; and 3) Parkland dedication. The proposal does not meet approval criteria 17.100.60 (E)(6).

31. Section 17.100.60(E)(7) strives to ensure that a phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops. The applicant is not requesting a phased development. That said, the applicant is proposing that the design of the multifamily dwellings and commercial land occurs at a future date. The proposal meets approval criteria 17.100.60 (E)(7).

DENSITY CALCULATIONS – Chapter 17.30

32. The total gross acreage for the entire property is 15.91 acres. After removal of the proposed right-of-way and proposed stormwater tract, the net site area (NSA) for the subject property is reduced to 13.22 net acres with three zoning districts. The area zoned as R-1 is 5.64 net acres, the area zoned as R-2 is 4.74 net acres, and the area zoned as C-3 is 2.84 net acres.

    NOTE: The density calculations on the subject site do not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the calculations related to density are based on unreliable assumptions.

33. For the area zoned R-1, a minimum of 5 and a maximum of 8 units per acre are allowed. The minimum density for the subject area is 5.64 net acres x 5 units/net acre = 28.2 rounded down to 28 units. The maximum density for the subject area is 5.64 net acres x 8 units/net acre = 45.12 rounded down to 45 units. The applicant identifies 30 lots, within the density range.

34. For the area zoned R-2, a minimum of 8 and a maximum of 14 units per acre are allowed. The minimum density for the subject area is 4.74 net acres x 8 units/net acre = 37.92 rounded up to 38 units. The maximum density for the subject area is 4.74 net acres x 14 units/net acre = 66.36 rounded down to 66 units. The applicant has not identified the exact number of units which will be built in the subject area. In the project narrative (Exhibit B) on page 5 the applicant states that the exact number of multi-family dwelling units will be determined with a future land use application. **Multi-family housing development on this site shall be reviewed in a future design review process.**

35. For the area zoned C-3, the Sandy Development Code does not define a minimum or maximum density, but does prescribe use requirements, height requirements, minimum setbacks, landscaping percentage requirements, and parking requirements. The combination of these requirements will dictate the maximum number of residential multi-family housing units. The property zoned C-3 will also need to contain a commercial use. **This will be reviewed in a future design review process.**

ZONING DISTRICTS – Chapters 17.36, 17.38, and 17.46

Chapter 17.36 – Low Density Residential (R-1)

36. The applicant proposes constructing 30 single-family dwellings or duplexes as permitted in this zoning district. Section 17.36.30 contains the design standards for this zone. As shown on Sheet C2 of the plan set (Exhibit C), all lots in the proposed subdivision contain at least 5,500 square feet and contain an average lot width of at least 50 feet as required. All lots have at least 20 feet of street frontage with the exception of Lot 12, which does not have any street frontage as proposed.

37. Section 17.36.40(A) requires that water service be connected to all dwellings in the proposed subdivision. Section 17.36.40(B) requires that all proposed dwelling units be connected to sanitary service if currently within 200 feet from the site, which it is. Section 17.36.40(C) requires that the location of any real improvements to the property must provide for a future street network to be developed. Section 17.36.40(D) requires that all dwelling units must have frontage or approved access to public streets. The applicant proposes to meet all these requirements.

38. Section 17.36.50(B) requires that lots with 40 feet or less of street frontage shall be accessed by a rear alley or shared private driveway. Lots 9-16 proposed to access the cul-de-sac at the east terminus of Fawn Street all have less than 40 feet of lot frontage along Fawn Street, therefore, all 8 of these lots shall include shared driveways. Lots 20 and 21 share a private drive, Tract A, that accesses Street A, therefore these two lots shall include a shared driveway. **Lots 9-16, 20, and 21 shall have shared driveways.**

Chapter 17.38 – Medium Density Residential (R-2)

39. The R-2 zoning district allows for all residential use types, including but not limited to single family dwellings, duplexes, row houses, and multifamily dwelling units. The applicant is proposing three lots, Lots 27, 31, and 32, to include R-2 zoned land. Both lots 27 and 32 are proposed as split zoned lots. Lot 27 is split zoned between R-1 and R-2 zoned land, while Lot 32 is split zoned between R-2 and C-3 zoned land. Lot 31 is proposed to be entirely zoned R-2. Staff anticipates that Lot 31 will likely contain a single-family home or duplex, and Lot 32 will likely contain multi-family dwellings. As noted above, the applicant will be allowed to develop between 38 and 66 dwelling units on the R-2 zoned land, unless additional public land dedications are required. The R-2 zone does not include a minimum lot area. **The future design review application will include a review of development standards and requirements.**

Chapter 17.46 – Village Commercial (C-3)

40. While the C-3 zoning district will have to contain some commercial development there is a decent chance the C-3 land will also contain residential dwelling units. The exact number of potential residential units is not known at this time. If residential units are proposed on the C-3 land the dwelling units will be assessed in a future design review. **Any future development on the land zoned C-3 will require a design review in accordance with the development standards found in Section 17.46.30 and the Sandy Municipal Code.**

ADDITIONAL SETBACKS AND SPECIAL SETBACKS – Chapters 17.80 and 17.82

41. Chapter 17.80 requires all residential structures to be setback at least 20 feet to collector and arterial streets. Highway 26 is classified as an arterial, Dubarko Road is classified as a minor arterial, and Street B is classified as a collector. **All structures on lots abutting Highway 26, Dubarko Road, and Street B shall be setback at least 20 feet.**

42. Section 17.82.20(A) requires that all residential dwellings shall have their primary entrances 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. Highway 26, Dubarko Road, and Street B are all transit streets. **All residential structures on lots abutting Highway 26, Dubarko Road, and Street B shall have their primary entrances oriented to Highway 26, Dubarko Road, or Street B. If a lot abuts two or more of these streets the residential structure shall be oriented to the highest classification of street. This means for example that Lot 30 shall be oriented to Dubarko Road.**

43. The applicant references ORS to claim that Chapter 17.82 is not clear and objective and therefore the design standards in Chapter 17.82 do not have to be followed, but the project narrative goes on to state that Lots 2, and 27-31 can be designed in compliance with the standards of Chapter 17.82. Section 17.82.20(B) requires that dwellings shall have a primary entrance connecting directly between the street and building interior and outlines requirements for the pedestrian route. Section 17.82.20(C) requires that primary dwelling entrances shall be architecturally emphasized and visible from the street and shall include a covered porch at least 5 feet in depth. **The adherence to Chapter 17.82 for residential design standards shall be required.**

44. Section 17.82.20(D) requires that if the site has frontage on more than one transit street, the dwelling shall provide one main entrance oriented to a transit street or to a corner where two transit streets intersect. **If a lot abuts two or more of these streets the residential structure shall be oriented to the highest classification of street. This means for example that Lot 30 shall be oriented to Dubarko Road. The orientation of the future multi-family units that have frontage on both Highway 26 and Dubarko Road will be determined in a future design review process.**

TRANSPORTATION – Chapters 17.84 and 17.100

45. This finding analyzes the Traffic Impact Study (Exhibit E).
    A. The applicant submitted a Traffic Impact Study (Exhibit E) from Ard Engineering, dated June 14, 2021. The study did identify some required mitigation. According to the Traffic Impact Study (TIS), the proposed residential development (not including the commercial lot) would generate up to 79 site trips during the morning peak hour, 99 trips during the evening peak hour, and 1,180 daily site trips.
    B. The TSP states that Highway 211 at Dubarko Road has a high historical crash rate. Ard Engineering also states that no operational mitigations are necessary or recommended in conjunction with the proposed subdivision.
    C. The City Transportation Engineer (Exhibit P) states that the development plan ignores the TSP and does not propose extending Dubarko Road, currently a stub street, to connect with Highway 26 opposite SE Vista Loop (West) as specified in the TSP. The City Transportation Engineer also includes the following concerns:
        i. The TIS addresses some of the city's requirements but does not provide an adequate basis to evaluate impacts of the proposed development. Key deficiencies include a failure to provide for the extension of Dubarko Road to connect with Highway 26 as specified in the TSP and a failure to account for development of or access to the commercially zone land (approximately 3 acres) that comprises a portion of Lot 32 in the proposed development.
        ii. The engineer's use of pre-COVID-19 counts is understandable, but new analyses needed to address the full impact of the development should be based on new traffic counts.
        iii. The applicant appears to be assuming that the commercially zoned portion of Lot 32 would have direct driveway access to Highway 26, though this appears to conflict with ODOT access control policies. Alternatively, the applicant may be assuming some type of cross-easements or shared driveway connections involving the residentially zoned portion of Lot 32 would be acceptable. Neither option appears viable.
        iv. Since the TIS did not examine the impact of development of the commercially zoned portion of the site, it is not clear that LOS D would be achieved with full development of the subject property. It appears that only a little more development in Sandy would push the Dubarko Road and Highway 211 intersection to LOS E and cause the need for mitigation.
        v. The proposed elimination of Dubarko Road results in localized impacts in the immediate vicinity that will result in different travel patterns than anticipated in the TSP.
        vi. The applicant's traffic engineer failed to explain how the site would be developed to serve all uses in the absence of the Dubarko Road extension identified in the TSP. The City Traffic Engineer recommends delaying any approvals until access issues are resolved and street connectivity meets the TSP.

46. The City Transportation Engineer (John Replinger) recommends denial of the application based on the inadequacy of the TIS. Mr. Replinger states that the applicant has two paths to approval. The first involves submitting a new application that provides for the extension of Dubarko Road to Highway 26 as specified in the TSP. The second involves seeking a TSP

amendment with an alternative arterial and collector street network that allows the regional needs to be met without the section of Dubarko Road that is proposed to be eliminated.

47. This finding analyzes the necessity for Dubarko Road to intersect with Highway 26.
    A. The proposed street pattern in Deer Meadows is not consistent with the Comprehensive Plan and the city's street plan, including connecting Dubarko Road to Highway 26. The 2011 Sandy Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan. Exhibit A of Ordinance 2011-12 is the TSP. The TSP is referenced by ordinance as 'the transportation element of the City of Sandy Comprehensive Land Use Plan'. The 2011 TSP includes the official street plan for the City of Sandy. Project M20 in the TSP is the connection of Dubarko Road to Highway 26.
    B. The proposal is not consistent with OAR 660-012-0045, which requires that local governments implement their TSP.
    C. ODOT (Exhibit N) recommends that the City require the applicant to construct Dubarko Road as shown in the adopted Transportation System Plan (TSP). Consistent with OAR 660-012-0045, completing this connection would implement the adopted road network in the TSP. The extension of this arterial would provide increased connectivity for the proposed development as well as for other residents of the City. This would help reduce motor vehicle congestion and provide more options for those walking, biking, and using transit. Planning within the City of Sandy has assumed the Dubarko Road connection for over a decade. For example, the Sandy Area Metro Transit Master Plan identifies this connection as a way to provide increased service on the east side of Sandy and to more efficiently serve residents along Vista Loop Road.
    D. Dubarko Road shall continue in a northeast direction to connect with Highway 26. Dubarko Road shall include features consistent with the minor arterial street section in the 2011 Sandy TSP. The widening of Dubarko Road to accommodate the street section in the TSP is eligible for Transportation System Development Charge credits. The difference in cost between the required minor arterial improvements and a standard local street section is eligible for credits.
    E. The extension of Dubarko Road is classified as a minor arterial street and shall meet the standards of Section 17.84.50(B) which states that arterial streets should generally be spaced in one-mile intervals and traffic signals should generally not be spaced closer than 1,500 ft for reasonable traffic progression.
    F. Per the 2020 Transit Master Plan, the extension of Dubarko Road to intersect with Highway 26 is a future transit route.

48. Street B (defined as 'New Road' in the TSP) is classified as a collector street and does not need to adhere to the standards in Section 17.84.50(B).

49. The applicant's project narrative (Exhibit B) and the applicant's Traffic Impact Study (Exhibit E) do not evaluate ADT on local streets. The applicant's project narrative on page 32 states, "As detailed in the submitted Traffic Study traffic volumes on local streets are not projects to exceed ADT standards. This criterion is met." Staff cannot find an evaluation of ADT standards in the submitted TIS. As explained earlier in this staff report, based on

incomplete ADT analysis of the surrounding local streets the subdivision request does not meet approval criteria 17.100.60 (E)(4).

50. Section 17.84.50(E) requires that public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property. The proposed street layout results in one temporary dead-end street (Street B) that will be stubbed to the southern property line of the subject property. The proposal also includes two cul-de-sacs and one public access lane. The proposed subdivision does not propose the extension of Dubarko Road which is inconsistent with the City of Sandy 2011 TSP and thus fails to install the public street extension of Dubarko Road concurrent with development of the site. The proposed subdivision does not meet the standards of Section 17.84.50 (E).

51. The proposed development includes the need to name Street A, Street B, and Street C. Street A and Street B are one continuous street running north to south and therefore should be one street name. **The street shall be related to the deer theme in the development to the west and shall be an 'avenue' as it runs north/south. Staff recommends the name Velvet Avenue. The public access lane, Street C shall be related to the deer theme in the development to the west and shall be a 'street' as it runs east/west.**

52. Proposed streets do not meet the requirements of 17.84.50(H) as public street improvements (i.e., Dubarko Road) do not provide for the logical extension of an existing street network. The proposed streets also do not meet Section 17.100.100(E) as the subdivision proposal does not promote a logical, connected pattern of streets. The future street plan (Exhibit C, Sheet C1) does not adhere to the adopted 2011 TSP. Both Dubarko Road and Street B are identified in the TSP; however, the applicant is not proposing the connection of Dubarko Road to Highway 26. Therefore, the future street plan is incomplete and inconsistent with the TSP which is adopted by the City of Sandy and recognized by the State of Oregon as the official street plan for the city of Sandy.

53. Dubarko Road and Street "C" create "T" intersections at their connection to Street "A" and Street "B" respectively. The Code at 17.84.50(E)(2) states that adjacent "T" intersections "shall maintain a minimum of 150 feet between the nearest edges of the two rights-of-way." The distance between the two nearest edges of the right-of-way between Dubarko Road (an arterial) and Street C (a local street) is less than the minimum 150 ft. dimension in Sections 17.84.50(E)(2) and 17.84.50(J)(3).

54. Based on the submitted site plan it does not appear that that the minimum 100 feet of tangent alignment required in Section 17.84.50(J)(5)(a) is provided at the intersection of Street "B" (a collector) and Dubarko Road (an arterial) or at the intersection of Dubarko Road and Street "B".

55. While Section 17.100.100(C) calls for a rectangular grid pattern the proposed street layout is not a rectangular grid pattern as it incorporates cul-de-sacs and does not include the required extension of Dubarko Road to Highway 26. Staff finds that the proposed street layout does not represent a logical street pattern.

56. The applicant did not submit any information on block lengths or information regarding single tier vs double tier blocks. Instead, the applicant stated the block length standards in Section 17.100.120 are subjective (i.e., not clear and objective) and because the subdivision constitutes a needed housing application the block length standards are not applicable. The applicant failed to submit information into the record regarding block lengths and therefore staff does not have enough information to determine block lengths.

PEDESTRIAN IMPROVEMENTS – Chapters 17.84 and 17.100

57. Section 17.84.20(A)(1) requires that all improvements shall be installed concurrently with development or be financially guaranteed. **All lots in the proposed subdivision will be required to install public and franchise utility improvements or financially guarantee these improvements prior to final plat approval.**

58. Section 17.84.30(A)(1) requires that all proposed sidewalks on the local streets will be five feet wide as required by the development code and separated from curbs by a tree planting area that is a minimum of five feet in width.

59. As required by Section 17.84.30(A)(2), six-foot sidewalks shall be constructed along Highway 26, Dubarko Road, and Street B. These frontages shall include planter strips as required. ODOT (Exhibit N) recommends that the City require frontage improvements consistent with City, ODOT, and ADA standards. The applicant does not propose to install frontage improvements along Highway 26 and therefore does not meet the requirements of Section 17.84.30(A)(4).

60. As required by Section 17.84.30(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. Subsection 17.84.30(B)(2) goes on to elaborate that right-of-way connecting cul-de-sacs passing through unusually long or oddly shaped blocks shall be a minimum of 15 feet wide with eight (8) feet of pavement. The applicant proposes two cul-de-sacs but does not propose a pedestrian connection to streets beyond the cul-de-sacs as required by Section 17.84.30. Furthermore, the Street A cul-de-sac is in the parkland expansion area for Deer Pointe Park.

61. In relation to Sections 17.84.30(B), 17.84.30(C), 17.84.30(D), and 17.84.30(E), no pedestrian or bicycle facilities other than sidewalks have been identified or proposed in the subdivision. The plan set (Exhibit C, Sheet C5) does not identify bicycle lanes on Dubarko Road or Street B. **The applicant shall revise the plan set to include bicycle lanes on Dubarko Road and Street B.**

62. Section 17.84.40(A) requires the developer to construct adequate public transit facilities. Per the 2020 Transit Master Plan, the extension of Dubarko Road to intersect with Highway 26 is a future transit route. With extension of Dubarko Road to intersect with Highway 26 two transit amenities are required along the completed extension of Dubarko Road. **The applicant shall install two concrete bus shelter pads and green benches (Fairweather model PL-3, powder coated RAL6028). The required pad size is 7 feet by 9 feet 6 inches and the amenities should be located adjacent to Lot 1 and Lot 5.**

PARKING, LOADING, AND ACCESS REQUIREMENTS – Chapter 17.98

63. Section 17.98.10(M) requires that the developer provide a Residential Parking Analysis Plan. This plan identifying the location of parking for the 30 R-1 zoned lots is included in Exhibit C, Sheet C6.

64. Section 17.98.20(A) requires that each single-family dwelling unit or duplex is required to provide at least two off-street parking spaces. **Compliance with this requirement will be evaluated during building plan review. Parking for the proposed multi-family units will be evaluated as part of a future design review application.**

65. Section 17.98.60 has specifications for parking lot design and size of parking spaces. Lot 32 is proposed to gain access from an arterial or collector street and therefore is required to comply with Section 17.98.80.

66. Section 17.98.100 has specifications for driveways. The minimum driveway width for a single-family dwelling is 10 feet. The Public Works driveway approach standard detail specifies a maximum of 24 feet wide for a residential driveway approach. Additionally, all driveways shall meet vertical clearance, slope, and vision clearance requirements. Staff has concerns with the following lots:

    A. The driveway on Lot 3 and its proximity to the intersection of Dubarko Road as it's within 150 feet of the intersection of Dubarko Road and Highway 26. **Driveway access for Lot 3 shall be reviewed and approved by the City Public Works Director and City Engineer prior to issuance of a building permit.**
    B. There is no driveway identified for Lot 32. **Driveway access for Lot 32 shall be reviewed and approved by the City Public Works Director and City Engineer concurrently with land use review of Lot 32.**

67. The Public Works Director (Exhibit R) stated that no dimensional information is detailed in the plan set about driveway widths. **The location, number, and width of all driveway approaches in cul-de-sacs shall not exceed the dimensional standards in Section 17.98.100.** The applicant's statement indicating that "Both of the proposed cul-de-sacs have less than 50% of their circumference covered by driveway drops" is not sufficient.

68. Section 17.98.110 outlines the requirements for vision clearance. **The requirements of this section will be considered in placing landscaping in these areas with construction of homes and will be evaluated with a future design review application for the multi-family units.**

69. Section 17.98.130 requires that all parking and vehicular maneuvering areas shall be paved with asphalt or concrete. As required by Section 17.98.130, **all parking, driveway, and maneuvering areas shall be constructed of asphalt, concrete, or other approved material.**

70. Section 17.98.200 contains requirements for providing on-street parking spaces for new residential development. Per 17.98.200, one on-street parking space at least 22 feet in length

has been identified within 300 feet of each of the 30 lots zoned as R-1 as required. Exhibit C, Sheet C6 shows that 47 on-street parking spaces have been identified in compliance with this standard. No parking courts are proposed by the applicant.

NOTE: The locations of the lots on the subject site do not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the distances and locations of on-street parking spaces is based on unreliable assumptions.

UTILITIES – Chapters 17.84 and 17.100

71. Section 17.84.60 outlines the requirements of public facility extensions. The applicant submitted a utility plan (Exhibit C, Sheet C5) which shows the location of proposed public water, sanitary sewer, and stormwater drainage facilities. **Broadband fiber service shall be detailed with construction plans.**

72. Franchise utilities will be provided to all lots within the proposed subdivision as required in Section 17.84.80. The location of these utilities will be identified on construction plans and installed or guaranteed prior to final plat approval. The applicant does not anticipate extending franchise utilities beyond the site. All franchise utilities other than streetlights will be installed underground. The developer will make all necessary arrangements with franchise utility providers. **The developer shall install underground conduit for street lighting.**

73. Section 17.84.90 outlines requirements for land for public purposes. The application includes dedication of right-of-way and land for a stormwater detention pond. The proposal does not include land dedicated for parkland as required by the Sandy Development Code nor does the proposal include land dedicated for the continuation of Dubarko Road to intersect with Highway 26. Eight-foot-wide public utility easements will be required along all lots adjacent to street rights-of-way, including Highway 26, for future franchise utility installations. **All easements and dedications shall be identified on the final plat.**

74. As required by 17.100.130, eight-foot-wide public utility easements (PUE) are required along all property lines abutting a public right-of-way. The applicant did not propose a PUE along Highway 26. **The applicant shall add a PUE along all lots abutting Highway 26.**

75. Chapter 15.30 contains the City of Sandy's Dark Sky Ordinance. A lighting plan will be coordinated with PGE and the City as part of the construction plan process and prior to installation of any fixtures as required by Section 17.100.210. The applicant will need to install street lights along all street frontages wherever street lighting is determined necessary. **The locations of these fixtures shall be reviewed in detail with construction plans. Full cut-off lighting shall be required. Lights shall not exceed 4,125 Kelvins or 591 nanometers to minimize negative impacts on wildlife and human health.**

76. Section 17.84.100 outlines the requirements for mail delivery facilities. **The location and type of mail delivery facilities shall be coordinated with the City Engineer and the Post Office as part of the construction plan process.**

77. The applicant shall install all water lines and fire hydrants in compliance with the applicable standards in Section 17.100.230, which lists requirements for water facilities. According to the Public Works Director the existing 8-inch diameter water line resides in an easement granted to the City of Sandy recorded at 2004-110340. **The applicant shall replace the existing waterline with an 8-inch diameter water line at a depth approved by the City Engineer.** There will be no compensation or credits for replacement of the existing water line. This pipe is a standard pressure line and will be used to provide domestic water service to the development. The City's water master plan shows an 18-inch diameter water line in Dubarko Road south of Highway 26. **The applicant shall install an 18-inch water line in**

Dubarko Rd. connected to the existing 18-inch water line at the west end of the site and the existing 12-inch line on Highway 26. Due to the elevation of the site relative to the existing water reservoirs on Vista Loop Drive this line will be a low-pressure, high-volume line and will be used for fire protection. The cost difference between a standard diameter water line and the required 18-inch water line is eligible for Water System Development Charge (SDC) credits. The amount of the credit provided will be based on the Water System Construction Cost Credit table in the Water System Development Charge Methodology adopted by City Council motion on September 5, 2017. The applicant's proposal does not clearly define if they propose to replace the 8-inch diameter water line and/or install an 18-inch water line in conformance with the Water Master Plan.

78. Section 17.84.60D states, "As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies)." The applicant does not propose to extend the existing 12-inch water main in Highway 26 east from the required intersection of Dubarko Road and Highway 26 to the east boundary of the site. **The existing 12-inch water line in Highway 26 shall be extended to the eastern boundary of the site per the requirements of Sections 17.84.60 (C) and (D).** The extension of the waterline is eligible for SDC credits for the difference in cost between the minimum required 8-inch diameter line and a 12-inch diameter line.

79. The applicant intends to install sanitary sewer lines in compliance with applicable standards in Section 17.100.240. The sanitary sewer plans will be reviewed by the City Engineer and Public Works Director. **Preliminary plat approval does not connote utility or public improvement plan approval which will be reviewed and approved separately upon submittal of public improvement construction plans.**

80. Section 17.100.250(A) details requirements for stormwater detention and treatment. A public stormwater quality and detention facility is proposed as Tract C to be located at the northwest corner of the proposed development. The proposed 10-foot-wide public storm drainage easements depicted between Lots 27 and 28 and at the rear of Lots 9-13 do not meet the minimum dimensional requirement for public facility easements in Section 17.84.90(A)(2). **All site runoff shall be detained such that post-development runoff does not exceed the predevelopment runoff rate for the 2, 5, 10 and 25 year storm events. Stormwater quality treatment shall be provided for all site drainage per the standards in the City of Portland Stormwater Management Manual (COP SWMM).**

81. Section 17.100.260 states that all subdivisions shall be required to install underground utilities. **The applicant shall install utilities underground with individual service to each lot.**

PARKLAND DEDICATION – Chapter 17.86

82. The applicant is not proposing any parkland dedication as required by Chapter 17.86. Directly west of the subject property is undeveloped land owned by the City of Sandy that has long been reserved for the eventual development of Deer Pointe Park. The 1997 Parks Master Plan designated Deer Pointe Park as a community park, and in the Location and Development Polices section of the Plan states that community parks should be 20 acres or more. Because the Deer Meadows subdivision does not propose parkland dedication abutting Deer Pointe Park the proposed subdivision is inconsistent with the 1997 Parks Master Plan.

83. Section 17.86.10 contains a clear and objective formula for determining the amount of land required to be dedicated. The formula is acres = proposed units x (persons/unit) x 0.0043. For the 30 single family homes, acres = 30 x 3 x 0.0043 = 0.39 acres. For the maximum development of 66 multifamily units, acres = 66 x 2 x 0.0043 = 0.57 acres. Combined, this totals 0.96 acres. The dedication of 0.96 acres could expand the Deer Pointe Park to 2.36 acres if the parkland dedication abuts Deer Pointe Park. However, if the applicant does not propose abutting parkland, then the additional 0.96 acres would not be contiguous to the existing parkland.

    NOTE: The number of dwelling units on the subject site does not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the calculations related to parkland dedication are based on unreliable assumptions.

84. The Parks and Trails Advisory Board (Board) met on August 11, 2021. The Board recommended that conditions of approval include the dedication of land for expansion of Deer Pointe Park (Exhibit O). The vision for this currently undeveloped park parcel has always included adjacent parkland dedication from the subject property. Additionally, a conceptual design has been prepared and has been through an initial public comment period as part of the updated Parks and Trails Master Plan.

85. The parks dedication requirement, and therefore any fee in-lieu payment under Section 17.86.40, is based on the impact from the number of people anticipated to live in the units in the subdivision, and a duplex includes two dwelling units, each of which can be occupied by a family (or a number of unrelated persons). Accordingly, each unit of a duplex is treated the same as a separate single-family dwelling for purposes of calculating the amount of land dedicated under Section 17.86.10 or a fee in-lieu payment under Section 17.86.40. However, the City of Sandy is not aware of any duplexes being proposed at this time. Also, the City is not aware of how many multifamily units will be proposed on the land zoned as C-3. **If any lot includes a duplex or additional multifamily dwelling units are proposed on the C-3 zoned land the applicant shall be required to pay a fee in-lieu of parkland dedication in accordance with Section 17.86.40.**

86. Section 17.86.20 has a requirement that all homes must front on the parkland. The purpose of having homes front the parkland is to provide eyes on the park and increase safety for park users. Since the applicant is not proposing parkland dedication there is nothing in the applicant's submission detailing that any houses will face Deer Pointe Park.

87. Section 17.86.30 lists the requirements of the developer prior to acceptance of required parkland dedications. Since the applicant is not proposing parkland dedication this section was not reviewed for compliance.

URBAN FORESTRY – 17.102

88. Section 17.102.20 contains information on the applicability of Urban Forestry regulations. An Arborist Report is included as Exhibit F. The arborist inventoried all trees eleven inches and greater diameter at breast height (DBH) as required in 17.102.50. The inventory of trees proposed to be retained is included in Exhibit C, Sheet C3 and the proposed retention trees are shown in Exhibit C, Sheet C4.

89. The property contains 15.91 acres requiring retention of 48 trees, 11 inches and greater DBH (15.91 x 3 = 47.73). The applicant is proposing to retain all 48 trees on Lots 13, 14, and 21. One tree proposed for retention is a Grand fir and the other 47 trees are all Douglas fir. The trees range in size from 11 inches DBH to 30 inches DBH, and are in good condition as identified by the arborist.

90. Most of the proposed retention trees are located along Highway 26 on Lot 13, which is proposed to be zoned R-1, Low Density Residential. As indicated on the Preliminary Plat (Exhibit C, Sheet C2), the applicant is proposing to place a conservation easement over an area that encompasses the retention trees on Lots 13, 14, and 21 totaling 21,939 square feet. Staff believes there could be a future conflict between retention trees in this conservation easement and development of Lot 13.

91. The Arborist Report (Exhibit F) provides recommendations for protection of retained trees including identification of the recommended tree protection zone for these trees. The requirements of 17.102.50(B) shall be complied with prior to any grading or tree removal on the site. **The applicant shall install tree protection fencing at the critical root zone of 1 foot per 1-inch DBH to protect the 48 retention trees on the subject property as well as all trees on adjacent properties and shall not relocate or remove the fencing prior to certificates of occupancy. The tree protection fencing shall be 6-foot-tall chain link or no-jump horse fencing and the applicant shall affix a laminated sign (minimum 8.5 inches by 11 inches) to the tree protection fencing indicating that the area behind the fence is a tree retention area and that the fence shall not be removed or relocated. 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. The applicant shall request an inspection of tree protection measures prior to any tree removal, grading, or other construction activity on the site. Up to 25 percent of the area between the minimum root protection zone of 0.5 feet per 1-inch DBH and the critical root zone of 1 foot per 1-inch DBH may be able to be impacted without compromising the tree, provided the work is monitored by a qualified arborist. The applicant shall retain an arborist on site to monitor any construction activity within the critical root protection zones of the retention trees or trees on adjacent properties that have critical root protection zones that would be impacted by development activity on the subject property.**

92. The Tree Preservation Plan (Exhibit C, Sheet C3) details several trees being removed right next to the trees proposed for retention. **The trees proposed for removal that are adjacent to retention trees shall be removed in in a way that does not harm or damage adjacent trees.** The Arborist Report (Exhibit F) from Teragan and Associates, Inc. includes

recommendations for tree removal. The arborist also identifies options for stumps, including retention or careful surface grinding. Staff recommends that the applicant not fully remove all the trees adjacent to the retention trees but rather leave snags. **Tree removal and/or snag creation shall be completed without the use of heavy equipment in the tree protection zone; trunks and branches of adjacent trees shall not be contacted during tree removal or snag creation. The applicant shall submit a post-construction report prepared by the project arborist or other TRAQ qualified arborist to ensure none of the retention trees were damaged during construction.**

93. **To ensure protection of the required retention trees, the applicant shall record a tree protection covenant specifying protection of trees on the subject property and limiting removal without submittal of an Arborist's Report and City approval.**

LANDSCAPING AND SCREENING – Chapter 17.92

94. Section 17.92.10 contains general provisions for landscaping. As required by Section 17.92.10 (C), trees over 25-inches circumference measured at a height of 4.5 feet above grade are considered significant and should be preserved to the greatest extent practicable and integrated into the design of a development. A 25-inch circumference tree measured at 4.5 feet above grade has roughly an eight-inch diameter at breast height (DBH). Based on the Planning Commission interpretation from May 15, 2019, Subsection 17.92.10(C) does not apply to residential subdivisions. Tree protection fencing and tree retention is discussed in more detail in the Urban Forestry, Chapter 17.102 section of this document. **Per Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.**

95. Section 17.92.20 lists the requirements for minimum landscaping improvements. **The details of this section will be considered with submittal of a design review application for the proposed multi-family units and commercial property.**

96. Section 17.92.30 specifies that street trees shall be chosen from the City-approved list. As required by Section 17.92.30, the development of the subdivision requires medium trees spaced 30 feet on center along all street frontages. Planter strips will be provided along all frontages as required in Section 17.100.290. The current street tree plan (Exhibit C, Sheet C6) does not show the distance between trees, but most trees measure approximately 30 feet on center. The applicant does not detail street trees along Street C, nor along Highway 26. **The applicant shall update the Street Tree Plan to detail trees at 30 feet on center along Street C and Highway 26. The trees along street C can be behind back of sidewalk, but the street trees along Highway 26 shall be in a planter strip per Section 17.100.290.**

    The applicant is proposing to mass grade the buildable portion of the site. This will remove topsoil and heavily compact the soil. To maximize the success of the required street trees, **the applicant shall aerate and amend the soil in the planter strips to a depth of 3 feet prior to planting street trees. The applicant shall either amend and aerate the planter strip soil at the subdivision stage and install fencing around the planter strips to protect the soil from compaction or shall aerate and amend the soil at the individual home construction phase. The applicant shall submit a letter from the project landscaper confirming that the soil in the planter strips has been aerated and amended prior to planting the trees.**

    If the plans change in a way that affects the number of street trees (e.g., driveway locations), the applicant shall submit an updated street tree plan for staff review and approval. Street trees are required to be a minimum caliper of 1.5-inches measured 6 inches from grade and shall be planted per the City of Sandy standard planting detail. Trees shall be planted, staked, and the planter strip shall be graded and backfilled as necessary, and bark mulch, vegetation, or other approved material installed prior to occupancy. Tree ties shall be loosely tied twine or other soft material and shall be removed after one growing season (or a maximum of 1 year).

97. Section 17.92.40 requires that all landscaping shall be irrigated, either with a manual or automatic system. **As required by Section 17.92.140, the developer and lot owners shall be required to maintain all vegetation planted in the development for two (2) years from the date of completion, and shall replace any dead or dying plants during that period.**

98. Section 17.92.50 specifies the types and sizes of plant materials that are required when planting new landscaping. Street trees are typically required to be a minimum caliper of 1.5-inches measured 6 inches from grade. **All street trees shall be a minimum of 1.5-inches in caliper measured 6 inches above the ground and shall be planted per the City of Sandy standard planting detail. The applicant shall submit proposed trees specifies to City staff for review and approval concurrent with construction plan review.**

99. Section 17.92.60 requires revegetation in all areas that are not landscaped or remain as natural areas. The applicant did not submit any plans for re-vegetation of areas damaged through grading/construction, although most of the areas affected by grading will be improved. **Exposed soils shall be covered by mulch, sheeting, temporary seeding or other suitable material following grading or construction to maintain erosion control for a period of two (2) years following the date of recording of the final plat associated with those improvements.**

100. Section 17.92.90 has details on screening of unsightly views or visual conflicts. While the proposed lots are not unsightly, they are a large contrast from the existing view of the existing forest. This contrast was identified at a Planning Commission hearing for Bull Run Terrace in August of 2020 and the applicant was asked to look at some additional screening measures to protect existing trees or add additional landscaping. The applicant took the comments seriously and proposed additional landscaping along the common property line with the Deer Pointe subdivision. However, in this proposed subdivision for Deer Meadows the applicant is not proposing any tree retention nor is the applicant proposing any additional landscaping along the common property line with the Deer Pointe subdivision.

101. Section 17.92.130 contains standards for a performance bond. The applicant has the option to defer the installation of street trees and/or landscaping for weather-related reasons. Staff recommends the applicant utilize this option rather than install trees and landscaping during the dry summer months. Consistent with the warranty period in Section 17.92.140, staff recommends a two-year maintenance and warranty period for street trees based on the standard establishment period of a tree. **If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the street trees/landscaping, assuring installation within 6 months. The cost of the street trees shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a two-year maintenance and warranty period.**

HILLSIDE DEVELOPMENT AND EROSION CONTROL – Chapters 17.56, 15.44, and 17.74

102. The applicant submitted a Geotechnical and Slope Stability Investigation (Exhibit I) showing that the subject site contains a small area of slope exceeding 25 percent. The geotechnical investigation was completed by Redmond Geotechnical Services on November 23, 2020. **All recommendations in the Geotechnical and Slope Stability Investigation (Exhibit I) shall be conditions for development.**

103. Grass seeding shall be completed as required by Section 17.100.300. The submitted preliminary Grading and Erosion Control Plan (Exhibit C, Sheet C7) provides additional details to address erosion control concerns. A separate Grading and Erosion Control Permit will be required prior to any site grading. Erosion control requirements are defined in greater detail in Chapter 15.44 of this document. Section 15.44.50 contains requirements for maintenance of a site including re-vegetation of all graded areas. **The applicant's Erosion Control Plan shall be designed in accordance with the standards of Section 15.44.50.**

104. **All the work within the public right-of-way and within the paved area should comply with American Public Works Association (APWA) and City requirements as amended. The applicant shall submit a grading and erosion control permit and request an inspection of installed devices prior to any additional grading onsite.** The grading and erosion control plan shall include a re-vegetation plan for all areas disturbed during construction of the subdivision. **All erosion control and grading shall comply with Section 15.44 of the Municipal Code. The proposed subdivision is greater than one acre which typically requires approval of a DEQ 1200-C Permit.**

105. Recent development has sparked unintended rodent issues in surrounding neighborhoods. Prior to development of the site, **the applicant shall have a licensed pest control agent evaluate the site to determine if pest eradication is needed.**

106. Section 17.74.40 specifies, among other things, retaining wall and fence height in front, side, and rear yards. Retaining walls in residential zones shall not exceed 4 feet in height in the front yard, 8 feet in height in rear and side yards abutting other lots, and 6 feet inside and rear yards abutting a street. The submitted plan set (Exhibit C, Sheet C5) details a 3-foot retaining wall at the west terminus of Street C, a 4-foot retaining wall between Tract C and Lot 26, and an 8-foot retaining wall to the west of Street A and north of Fawn Street. These three retaining walls are proposed as Keystone block and Ultra-block, and all three include notes that the heights are plus/minus the stated height on the plan set. The plan set does not detail the height of the retaining wall in Tract C for the stormwater facility. **The applicant shall submit additional details on the proposed retaining walls, including height, material, and information on the architectural finish, for staff review and approval.**

RECOMMENDATION

The Planning Commission **denied** the subdivision request due to the following issues:

1) The application does not meet subdivision criteria 17.100.60(E)(1).
2) The application does not meet subdivision criteria 17.100.60(E)(3).
3) The application does not meet the parkland dedication requirements in Chapter 17.86.

In addition, staff recommends the City Council **deny** the subdivision request due to the following issues:

1) The subdivision proposal does not meet subdivision Criteria 17.100.60 (E)(1), (2), (3), (4), (5), and (6).
2) The applicant's statement indicating that "Both of the proposed cul-de-sacs have less than 50% of their circumference covered by driveway drops" is not sufficient as there were no dimensional specifications submitted by the applicant to support this statement.
3) The applicant proposes two cul-de-sacs but does not propose a pedestrian connection to streets beyond the cul-de-sacs as required by Section 17.84.30.
4) The applicant proposes Lot 12 with less than the minimum 20 feet of street frontage as required by Section 17.36.30(C).
5) The distance between the two nearest edges of the right-of-way between Dubarko Road (an arterial) and Street C (a local street) is less than the minimum 150 ft. dimension in Sections 17.84.50(E)(2) and 17.84.50(J)(3).
6) The minimum 100 feet of tangent alignment required in Section 17.84.50(J)5(a) is not provided at the intersection of Street "B" (a collector) and Dubarko Road (an arterial) or at the intersection of Dubarko Road and Street "B".
7) The applicant does not propose to extend Dubarko Road to intersect with Highway 26 consistent with the requirements of the Sandy Development Code or the 2011 Transportation System Plan.
8) The applicant does not include highway frontage improvements along Highway 26 consistent with the Sandy Development Code.
9) The applicant's proposal does not clearly define if they propose to replace the 8-inch diameter water line and/or install an 18-inch water line in conformance with the Water Master Plan.
10) The applicant does not propose to extend the existing 12-inch water main in Highway 26 east from the required intersection of Dubarko Road and Highway 26 to the east boundary of the site consistent with the Sandy Development Code.
11) The proposed 10-foot-wide public storm drainage easements depicted between Lots 27 and 28 and at the rear of Lots 9-13 do not meet the minimum dimensional requirement for public facility easements in Section 17.84.90(A)(2).
12) This subdivision proposal does not propose to dedicate 0.96 acres of parkland as required by Chapter 17.86. The additional 0.96 acres could expand Deer Pointe Park consistent with the Parks and Trails Master Plan that was adopted in 1997.

EXHIBIT A

SANDY

General Land Use Application

1 page

Name of Project:	Deer Meadows Subdivision
Location or Address:	40808 and 41010 Highway 26, Sandy, Oregon (south side of Highway 26)

Map & Tax Lot #	**T:** 2S	**R:** 5E	**Section:** 18CD	**Tax Lot (s):** 900 and 1000

Request: Construct a Type II 32 lot residential subdivision in accordance with existing zoning.

I am the (check one) ☑ owner ☐ lessee of the property listed above, and the statements and information contained herein are in all respects true, complete and correct to the best of my knowledge and belief.

Applicant (if different than owner)	Owner Roll Tide Properties, Corp.
Address	Address P.O. Box 703
City/State/Zip	City/State/Zip Cornelius, OR 97113
Email	Email dave.vandehey@accessmax.com
Phone	Phone 503-327-6084
Signature	Signature

Staff Use Only

File #:	Date:	Fee$:	Planner:
Type of review: Type I ☐	Type II ☐	Type III ☐	Type IV ☐
Has applicant attended a pre-app? Yes ☐	No ☐	If yes, date of pre-app meeting:	

Development Services Department, 39250 Pioneer Blvd, Sandy, OR 97055, 503.489.2160

EXHIBIT B

Project Details

Project Location:	South side of Highway 26, east of Langensand Road 40808 and 41010 Highway 26, Sandy, OR
Legal Description:	Map 25E 18CD, Tax Lots 900 and 1000
Zoning District	R-1, Low Density Residential R-2, Medium Density Residential C-3, Village Commercial
Site Size	Total Site 15.91 acres (693,057 sq. ft.)

Applicant
Dave Vandehey
Roll Tide Properties, Corp.
P.O. Box 703
Cornelius, OR 97113
Phone: 503-327-6084
Email: Dave.vandehey@accessmax.com

Representative:
Civil Engineer / Surveyor
Ray Moore, P.E., P.L.S.
All County Surveyors & Planners, Inc.
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Wetland Consultant
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Arborist
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Teragan & Associates
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Lake Oswego, OR. 97034
Phone: 971-295-4835
Email: todd@teragan.com

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I. Introduction

The Applicant submitted this application on March 31, 2021 and the City deemed the application incomplete on April 13, 2021 (Exhibit A). The City was required to notify the Applicant of "exactly what information was missing" in its incompleteness determination.

This submittal provides all of the missing information as provided for in ORS 227.178(2)(a) and the date of receipt of the missing information starts the 120-day period in ORS 227.178(1). The applicable approval standards are those in effect on the date of the Application submittal because the application was made complete within 180 days of submittal as required by ORS 227.178(3)(a).

The applicant is submitting this application requesting land use approval to construct a Type II subdivision in compliance with existing zoning to include the following:

- 32 lots
- On-street parking
- Installation of public and franchise utilities
- Tree removal
- Fee-in-lieu payment for parkland dedication

The proposed subdivision is part of the planned progression of land use planning for this area of Sandy and involves the creation of "Needed Housing" under ORS 197.303(1) and 197.307(4) on land zoned for residential uses within the city limits of Sandy and is also a Limited Land Use Application under ORS 197.015(12)(a)(A). The Applicant is not waiving any rights under ORS 197.015(12), 197.195(1), 197.303(1), 197.307(4) and (6), 197.522, 227.173(2) and 227.175(4).

ORS 197.307(4) states, a local government may apply only clear and objective standards, conditions, and procedures regulating the creation of Need Housing, and such standards, conditions, and procedures cannot have the effect, either in themselves or cumulatively, of discouraging Needed Housing through unreasonable cost or delay.

Oregon Courts and the Land Use Board of Appeals (LUBA) have held that an approval standard is not clear and objective if it imposes on an applicant "subjective, value-laden analyses that are designed to balance or mitigate impacts of the development." *Rogue Valley Association of Realtors v. City of Ashland,* 35 Or LUBA 139, 158 (1998) aff'd, 158 Or App 1 (1999). ORS 197.831 places the burden on local governments to demonstrate that the standards and conditions placed on Needed Housing applications can be imposed only in a clear and objective manner. While this application addresses all standards and conditions, the Applicant reserves the right to object to the application of standards and conditions that are

not clear and objective and does not waive its right to assert that the Needed Housing statues apply to this application. The exceptions in ORS 197.307(4)(a) and 197.307(5) do not apply to this application. ORS 197.307(7)(a) is controlled by ORS 197.307(4). The City has not taken an exception for Needed Housing under ORS 197.303(3).

II. General Project Description

The project site consists of two parcels located at Township 2 South, Range 5 East, Section 18CD, tax lots 900 and 1000. The property contains 15.91 acres and is vacant. The property contains a mix of R-1, Low Density Residential (5.512 acres), R-2, Medium Density Residential (4.739 acres), and C-3, Village Commercial (2.841 acres) zoning designations. In compliance with existing zoning, 30 lots (Lots 1 - 30) will be zoned R-1, one lot (Lot 31) R-2, and one lot (Lot 32) will contain both R-2 zoning (61%) and C-3 zoning (39%). Development on these lots will include construction of permitted outright use in these zones.

The property is gently sloping from the Southeast corner to the Northwest corner at Highway 26. The primary access to the development will be from an extension of Dubarko Road and Fawn Street to be extended onto the property. The applicant attended pre-application conferences with the City on March 17, 2021.

III. Application Approval Requests

The applicant requests the following approvals with this application:

- Type II Subdivision;
- Type II Tree Removal

IV. Items Submitted With This Application

- Land Use Application
- Preliminary Title Report
- Notification Mailing Labels
- Exhibit A - April 13, 2021 Incompleteness Letter
- Exhibit B - Project Narrative
- Exhibit C - Civil Plans
  - Sheet C1 - Cover Sheet and Future Street Plan
  - Sheet C2 - Preliminary Plat Map
  - Sheet C3 - Existing Conditions and Tree Retention Plan
  - Sheet C4 - Tree Tables
  - Sheet C5 - Master Street and Utility Plan
  - Sheet C6 - Preliminary Street Tree and Parking Plan
  - Sheet C7 - Preliminary. Grading and Erosion Control Plan
  - Sheet C8 - Slope Analysis
- Exhibit D - Preliminary Stormwater Report
- Exhibit E - Traffic Impact Study
- Exhibit F - Arborist Report
- Exhibit G - Wetland Determination

- Exhibit H - DSL Offsite Determination
- Exhibit I - Geotechnical and Slope Stability Investigation
- Exhibit J - Geotechnical Supplemental Review Letter

V. Review of Applicable Approval Criteria

Development applications are required to meet development standards set forth in the City of Sandy Development Code. This section addresses all applicable review criteria. Pertinent code provisions are cited below in regular text followed by a response describing how the proposal complies with this standard in *italics*. The following code chapters have been reviewed in this narrative:

Chapter		Title
17.18	-	Processing Applications
17.30	-	Zoning District
17.36	-	Low Density Residential (R-1)
17.38	-	Medium Density Residential (R-2
17.46	-	Village Commercial (C-3)
17.60	-	Flood and Slope Hazard Overlay
17.80	-	Additional Setbacks on Collector and Arterial Streets
17.82	-	Special Setbacks on Transit Streets
17.84	-	Improvements Required with Development
17.86	-	Parkland and Open Space
17.90	-	Design Standards
17.92	-	Landscaping and Screening
17.98	-	Parking, Loading, and Access Requirements
17.100	-	Land Division
17.102	-	Urban Forestry
15.30	-	Dark Sky Ordinance

CHAPTER 17.18 - PROCESSING APPLICATIONS

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 generally 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.

***Response**: The applicant has submitted a Type II Needed Housing application in compliance with the clear and objective standards contained in the Sandy Development Code.*

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.

***Response**: A pre-application conference was held with the City to review the project on March 17, 2021. Based on input received at this meeting, modifications were made to the project layout.*

CHAPTER 17.30 – ZONING DISTRICTS

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 transfers are permitted from restricted development areas to unrestricted areas consistent with the provisions of the Flood and Slope Hazard Area Overlay District, Chapter 17.60.

***Response**: The applicant proposes developing a 32 lot subdivision in conformance with the existing zoning on the property. Thirty lots will be zoned R-1, Low Density Residential, one lot zoned R-2, Medium Residential, and one lot (lot will contain a combination of R-2 and C-3, Village Commercial zoning.*

The subject property contains a gross site area of 15.910 acres. After deducting dedicated rights-of-way and a public stormwater tract, the portion of the property zoned R-1 contains a net site area (NSA) of 5.64 acres, the R-2 zoned portion 4.74 acres, and the C-3 zoned portion 2.84 acres. The subject property also does not contain any restricted development areas (RDA) as defined by Chapter 17.60

*The R-1 zone allows a minimum of 5 and a maximum of 8 units per net acre. The minimum density is calculated by multiplying the NSA x the required minimum density (5.64 acres x 5 = 28.2 units, rounded to 28 **units**)*

*The maximum density is determined by multiplying the NSA x the maximum allowed density (5.64 x 8 = 45.12, rounded to 45 **units**).*

As a result of these calculations the density range for the subject property is a minimum of 28 units and a maximum of 45 dwelling units. The proposal includes 30 units in conformance with this section.

*The R-2 zone allows a minimum of 8 and a maximum of 14 units per net acre. The minimum density is calculated by multiplying the NSA x the required minimum density (4.74 acres x 8 = 37.92 units, rounded to 38 **units**)*

*The maximum density is determined by multiplying the NSA x the maximum allowed density (4.74 x 14 = 66.36, rounded to 66 **units**).*

As a result of these calculations the density range for the subject property is a minimum of 38 units and a maximum of 66 dwelling units. The exact number of dwelling units on the lots zoned R-2 will be determine with a future design review application.

The applicant has not determined the uses proposed for the C-3 zoned portion of the property at this time.

CHAPTER 17.36 - LOW DENSITY RESIDENTIAL (R-1)

17.36.00 - INTENT

This district is intended to implement the Low Density Residential Comprehensive Plan designation by providing for an urban level of low-density residential development. It is to be used as a transition between the Single Family Residential zone and the higher densities of a village. 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 included in a village area and is designed as a mixed-use neighborhood with a range of housing types and accessible commercial areas. Density shall not be less than 5 or more than 8 units per net acre.

Response: *As detailed in Chapter 17.30 above, the proposed 30 lots (Lots 1 - 30) complies with the density range in the R-1 zoning district.*

17.36.10 - PERMITTED USES

A. Primary Uses Permitted Outright:

1. Single detached dwelling subject to design standards in Chapter 17.90;
   Response: *The applicant proposes constructing uses permitted in this zoning district.*

17.36.30 - DEVELOPMENT STANDARDS

Type	Standard	Proposed
A. Minimum Lot Area - Single detached dwelling	5,500 square ft.	All lots comply
B. Minimum Average Lot Width - Single detached dwelling	50 ft	All lots comply
C. Minimum Lot Frontage	20 ft. except as allowed by Section 17.100.160	All lots comply
D. Minimum Average Lot Depth	No minimum	Complies
E. Setbacks (Main Building) Front yard Rear yard Side yard (interior) Corner Lot Garage	10 ft. minimum 15 ft. minimum 5 ft. minimum 10 ft. minimum on side abutting the street 22 ft. minimum for front vehicle access 15 ft. minimum if entrance is perpendicular to the street (subject to Section 17.90.220)	All lots are capable of complying with setbacks. Setbacks will be confirmed with submittal of building permits.

F. Projections into Required Setbacks	See Chapter 17.74	No projections are proposed at this time.
G. Accessory Structures in Required Setbacks	See Chapter 17.74	No accessory structures are proposed at this time.
H. Structure Height	35 ft. maximum	To be determined.
I. Building Site Coverage	No minimum	Complies
J. Off-Street Parking	See Chapter 17.98	See Chapter 17.98.

Response: *As shown on the plan set, all lots in the proposed subdivision contain at least 5,500 square feet, have at least 20 feet of street frontage, contain an average lot width of at least 50 feet as required. The details of development standards will be reviewed with submittal of building permits. Compliance with off-street parking requirements is reviewed in Chapter 17.98 below.*

17.36.40 - MINIMUM REQUIREMENTS

A. Must connect to municipal water.
Response: The applicant proposes extending water service to serve all dwellings in the new subdivision.

B. Must connect to municipal sewer if service is currently within 200 feet of the site. 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 which directly benefit the property;
3. The minimum size of the property is one acre or is a pre-existing buildable lot, as determined by the city;
4. Site consists of a buildable parcel(s) created through dividing property in the city, which is less than five acres in size.
Response: *All proposed units will be connected to sanitary sewer service.*

C. The location of any real improvements to the property must provide for a future street network to be developed.
Response: *A new street network will be constructed to serve each dwelling as required.*

D. Must have frontage or approved access to public streets.

Response: *All lots contain frontage on a public street and all lots will gain access from this street. No lots are proposed to gain access from Dubarko Drive or Street B.*

17.36.50 - ADDITIONAL REQUIREMENTS

A. Design review as specified in Chapter 17.90 is required for all uses.
Response: *Only Section 17.90.150, Residential Design Standards of Chapter 17.90 is applicable to residential developments. This section is reviewed below.*

B. Lots with 40 feet or less of street frontage shall be accessed by a rear alley or a shared private driveway.
Response: *All lots contain at least 40 feet of street frontage or will gain access by a shared private drive.*

C. Lots with alley access may be up to 10 percent smaller than the minimum lot size of the zone.
Response: *No lots will be accessed by an alley.*

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 5 feet in width.
Response: *No zero lot line dwellings are proposed.*

CHAPTER 17.38 - MEDIUM DENSITY RESIDENTIAL (R-2)

17.38.00 - This district intended to implement the Medium Density Residential Comprehensive Plan designation by providing for medium density single-family and multiple-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 8 or more than 14 units per net acre.
Response: *The applicant is not proposing to construct any dwellings at this time. As discussed in Chapter 17.30 above, the density range for this property is 38 - 66 units as allowed in the R-2 zoning district. The exact number of units proposed within the allowed density range will be determine with a future design review application.*

17.38.10 - PERMITTED USES

A. Primary Uses Permitted Outright:
Response: *The applicant proposes constructing uses permitted outright in this zone.*

17.38.30 - DEVELOPMENT STANDARDS

Response: *As shown on the plan set, all lots are at least 50 feet wide and can provide minimum setbacks required by this section. Required off-street parking is shown on the plan set and is reviewed in more detail in Chapter 17.98 below.*

17.38.40 - MINIMUM REQUIREMENTS

A. Must connect to municipal water.
Response: The applicant proposes extending water service to serve all dwellings in the development.

B. Must connect to municipal sewer if service is currently within 200 feet of the site. 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 which directly benefit the property;
3. The minimum size of the property is one acre or is a pre-existing buildable lot, as determined by the city;
4. Site consists of a buildable parcel(s) created through dividing property in the city, which is less than five acres in size.
Response: *There is no existing septic system needing decommissioning. All dwellings will be connected to the city's sanitary sewer system as required.*

C. The location of any real improvements to the property must provide for a future street network to be developed.
Response: *A future street plan is included with the application materials.*

D. Must have frontage or approved access to public streets.
Response: *Each new residence constructed in the subdivision will gain access from a public street.*

17.38.50 - ADDITIONAL REQUIREMENTS

A. Design review as specified in Chapter 17.90 is required for all uses.
Response: *The Residential Design Standard of Section 17.90.150, are applicable to residential development.*

B. Lots with 40 feet or less of street frontage shall be accessed by a rear alley or a shared private driveway.
Response: *All proposed lots contain greater than 40 feet of street frontage or will be accessed by a shared drive.*

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 5 feet in width.
***Response**: No zero lot line dwellings are proposed.*

CHAPTER 17.46 - VILLAGE COMMERCIAL (C-3)

17.46.10 PERMITTED USES

***Response**: The C-3 zone allows single family dwellings and multi-family dwellings units above, beside, or behind a commercial business, and a variety of commercial uses. At this time the applicant does not have a plan for developing this portion of the property. Development of this property will be reviewed with submittal of a future design review application.*

CHAPTER 17.56 - HILLSIDE DEVELOPMENT

17.56.10 APPLICABILITY

These regulations shall apply to any parcel with slopes greater than twenty-five percent (25%) 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.
***Response**: As shown on the slope analysis submitted with the plan set, the site contains a small area of slopes exceeding 25%. As such, a Geotechnical Report is and a supplemental review letter are included with the submittal.*

CHAPTER 17.80 - ADDITIONAL SETBACKS ON COLLECTOR AND ARTERIAL STREETS

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.

17.80.10 - APPLICABLITY

These regulations apply to all collector and arterial streets as identified in the latest adopted Sandy Transportation System Plan (TSP). The Central Business District (C-1) is exempt from Chapter 17.80 regulations.

17.80.20 - SPECIFIC SETBACKS

Any structure located on streets listed above or identified in the 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.
***Response**: The City's Transportation System Plan identifies Dubarko Road as a "Minor Arterial" street, Highway 26 a "Major Arterial", and Street B terminating to tax lot 900 as a "Collector Street". The Preliminary Plat shows a 20 foot setback for all lots adjacent to these roads. The requirements of this section will be confirmed with construction of dwellings on the adjacent lots.*

CHAPTER 17.82 - SPECIAL SETBACKS ON TRANSIT STREETS

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 Transit System Plan.

***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "adjacent","to a transit street", "unless otherwise designated in the Transit System Plan" as used in this section are subjective words or not properly incorporated into the Development Code. The proposed subdivision is located adjacent to Highway 26, a major arterial, Dubarko Road, a Minor Arterial and Street B, a designated Collector in the City's Transportation System Plan.*

17.82.20 BUILDING ORIENTATION

A. All residential dwellings shall have their primary entrances 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.

   ***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "primary entrances" and "oriented toward" as used in this section are subjective words. Lot 2 will be accessed from Street A and Lots 27 - 30 will be accessed from Street C, an access drive constructed for this purpose. Lot 31 also with frontage on Street B will be accessed from Street C. All dwellings constructed on these lots can be designed in compliance with this standard as required.*

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 pedestrian route shall consist of materials such as concrete, asphalt, stone, brick, permeable pavers, or other materials 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.

   ***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "primary entrances" and "clearly marked, convenient, and safe", and "comparable subsurface as approved" as used in this section are subjective words. All dwellings constructed on Lots 2 and 27 - 31 can be designed in compliance with this standard as required.*

C. Primary dwelling entrances shall be architecturally emphasized and visible from the street and shall include a covered porch at least 5 feet in depth.

Response: *All dwellings constructed on Lots 2 and 27 - 31 can be designed in compliance with this standard as required.*

D. If the site has frontage on more than one transit street, the dwelling shall provide one main entrance oriented to a transit street or to a corner where two transit streets intersect.
Response: *Only Lot 30 contains frontage on more than one transit street (Dubarko Drive and Street B). The details of this design will be determined during review of a building permit application for this lot.*

CHAPTER 17.84 - IMPROVEMENTS REQUIRED WITH DEVELOPMENT

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.
   Response: *All lots in the proposed subdivision will be required to install public and franchise utility improvements or financially guarantee these improvements prior to final plat approval.*

   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.
   Response: *This section is not applicable because a land division is proposed.*

B. Where specific approval for a phasing plan has been granted for a planned development and/or subdivision, improvements may similarly be phased in accordance with that plan.
Response: *The applicant proposes constructing the subdivision in a single phase.*

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 5 ft. wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, unless modified in accordance with Subsection 3 below.
   Response: *All proposed sidewalks on the internal (local) streets will be five feet wide as required and separated from curbs by a tree planting area.*

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. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of 6 ft. wide.
Response: *As shown on Sheet C5, six-foot sidewalks are proposed to be constructed along Dubarko Road, a minor arterial and on Street B, a collector street. The cross-section for these street improvements includes a planter strip as required.*

3. Sidewalk improvements shall be made according to city standards, unless the 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, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.
   a) Narrow landscape strips
   b) Narrow sidewalk or portion of sidewalk to no less than 4 feet in width
   c) Eliminate landscape strips
   d) Narrow on-street improvements by eliminating on-street parking
   e) Eliminate sidewalks

   Response: *No exceptions or modifications to the sidewalk standards of this section are requested with this application.*

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, drainageways, or other publicly owned or semi-publicly owned areas, the sidewalks and planted areas shall be installed with street improvements.
   Response: *The applicant intends to construct sidewalks along Dubarko Road and Street B prior to final plat approval, or at the time of home construction whichever the city prefers. All other sidewalks are proposed to be constructed at the time of home construction.*

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, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks, as follows:
   1. For the purposes of this section, “safe and convenient” means pedestrian and bicyclist facilities that: are reasonably free from hazards which 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.
Response: *No pedestrian or bicycle facilities other than sidewalks and on-street bicycle lanes have been identified or are any proposed.*

2. To meet the intent of "B" above, right-of-ways connecting cul-de-sacs or passing through unusually long or oddly shaped blocks shall be a minimum of 15 ft. wide with 8 feet of pavement.
Response: *As noted above, no off-street facilities are proposed.*

3. 12 feet wide pathways shall be provided in areas with high bicycle volumes or multiple use by bicyclists, pedestrians, and joggers.
Response: *No facilities of this type are proposed with the subdivision.*

4. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:
   a) The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.
   b) Walkways at least five feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities which abut the site but are not adjacent to the streets abutting the site.
   c) Walkways shall be as direct as possible and avoid unnecessary meandering.
   Response: *No pedestrian pathways are proposed at this time, only sidewalks adjacent to public streets.*

   d) Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.
   e) With the exception of walkway/driveway crossings, 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 standards adopted by the City. (This provision does not require a separated walkway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).
   f) Pedestrians amenities such as covered walk-ways, awnings, visual corridors and benches will be encouraged. For every two benches provided, the minimum parking requirements will be reduced by one, up to a maximum of four benches per site. Benches shall have direct access to the circulation system.

***Response**: The requirements of these sections are not applicable to the proposed subdivision.*

C. Where a development site is traversed by or adjacent to a future trail linkage identified within the Transportation System Plan, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with 17.84.80.
***Response**: No trails are identified in the City's Transportation System Plan or Parks Master Plan on the subject property.*

D. To provide for orderly development of an effective pedestrian network, pedestrian facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).
***Response**: No pedestrian facilities, except sidewalks are proposed.*

E. To ensure improved access between a development site and an existing developed facility such as a commercial center, school, park, or trail system, the Planning Commission or Director may require off-site pedestrian facility improvements concurrent with development.
***Response**: No off-site pedestrian improvements have been identified.*

17.84.40 - TRANSIT AND SCHOOL BUS TRANSIT REQUIREMENTS

A. Development sites located along existing or planned transit routes shall, where appropriate, incorporate bus pull-outs and/or shelters into the site design. These improvements shall be installed in accordance with the guidelines and standards 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.
***Response**: A small portion of the subject property is located along Dubarko Road, a minor arterial. No required transit improvements were identified during the pre-application conference for this development.*

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, 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 shall provide safe, convenient pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of 17.84.30 B.
   ***Response**: The proposed subdivision complies with the requirements of this section.*

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 conditions less than the minimum standard established in the development code or the 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.
   Response: *At this time the proposal only includes dwellings and this section is not applicable. Future development of Lot 32 with commercial uses may trigger compliance with this section.*

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 subsection (B)(6), 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:
   Response: *A traffic impact study is included with this application.*

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. 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 5 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 a.m. and 9 a.m.) and p.m. peak hour (one hour between 4 p.m. and 6 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 and average daily traffic standards and the Oregon Department of Transportation's mobility standard.
5. If the study identifies level-of-service conditions less than the minimum standard established in the development code or the 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 or fails to meet the Oregon Department of Transportation's mobility standard, the applicant shall propose improvements and funding strategies for mitigating identified problems or deficiencies that will be implemented concurrent with the proposed development.
   Response: *A traffic impact study developed in compliance with the requirements of this section is included with the application.*

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 5 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; or
   b) The proposed development completed a transportation impact study at the time of annexation within the past 5 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.
      Response: *This section is not applicable as a traffic impact study is included.*

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).
   Response: *This section is not applicable.*

D. Location of new arterial streets shall conform to the Transportation System Plan in accordance with the following:
   1. Arterial streets should generally be spaced in one-mile intervals.

2. Traffic signals should generally not be spaced closer than 1500 ft. for reasonable traffic progression.
   Response: *No new arterial streets are required as part of this application.*

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:
   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.
   2. Local streets should typically intersect in "T" configurations rather than 4-way intersections to minimize conflicts and discourage through traffic. Adjacent "T" intersections shall maintain a minimum of 150 ft. between the nearest edges of the 2 rights-of-way.
      Response: *The proposed subdivision does not include any long straight street segments. All streets have been designed in accordance with the requirements of these sections.*

   3. Cul-de-sacs should generally not exceed 400 ft. in length nor serve more than 20 dwelling units, except in cases where existing topography, wetlands, or drainage systems or other existing features necessitate a longer cul-de-sac in order to provide adequate access to an area. 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.
      Response: *Two cul-de-sac streets are proposed (the extension of Fawn Street and Street A north of Fawn Street). The Fawn Street extension is 194 feet long and will serve 12 lots. The Street A cul-de-sac north of Fawn Street is 389 feet long and will serve 10 lots. Both of these streets are less than 400 feet long and will serve fewer than 20 dwelling units in compliance with this standard.*

F. Development sites shall be provided with access from a public street improved to City standards in accordance with the following:
   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.
      Response: *All lots will gain access from an abutting street improved to city standards.*

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.
Response: *All new streets are proposed as full street improvements.*

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.
Response: *No off-site improvements have been identified or are warranted with construction of this subdivision.*

4. Reimbursement agreements for 3/4 street improvements (i.e., curb face to curb face) may be requested by the developer per Chapter 12 of the SMC.
Response: *All streets are proposed as full streets. No 3/4 streets are proposed.*

5. A ½ street improvement includes curb and pavement 2 feet beyond the center line of the right-of-way. A ¾ street improvement includes curbs on both sides of the side and full pavement between curb faces.
Response: *No 1/2 street improvements are proposed.*

G. As necessary to provide for orderly development of adjacent properties, 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:
1. Temporary dead-ends created by this requirement to extend street improvements to the edge of adjacent properties may be installed without turn-arounds, subject to the approval of the Fire Marshal.
2. In order to assure the eventual continuation or completion of the street, reserve strips may be required.
Response: *The proposed street layout results in one temporary dead-end street (Street B, "New Street") that will be stubbed to the southern property line of the subject property. The applicant is aware the Fire Marshal will need to review the proposal. In addition, the applicant is aware that reserve strips will likely be required at the end of this street.*

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.

Response: *The applicant does not anticipate that any public street improvements will be required to be extended beyond the site boundaries. No such improvements were identified at the pre-application conference.*

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.
Response: *The proposal contains five street segments: Dubarko Road, an extension of Fawn Street, and Streets A, B, and C. The City will need to determine if the street extension of Fawn Street will carry the Fawn Street name or a different name.*

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 is not adversely affected. The following standards shall apply:
   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.
   Response: *A future street plan is submitted with this application on Sheet C1. This plan shows that the proposal will facilitate and not preclude development on adjacent properties.*

   2. Grades shall not exceed 6 percent on arterial streets, 10 percent on collector streets, and 15 percent on local streets.
   Response: *Dubarko, a minor arterial is proposed to have a grade of 6%, the extension of Fawn Street, a local street will have a grade of 4%, Street A, a local street, will have a grade south of Fawn Street of 3% and a grade north of Fawn Street of 2% to 11%, Street B ("New Street") will have a grade of 4% to 6%, and Street C will have a grade of 7%. All streets comply with these standards.*

   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 ft. between the nearest edges of the two rights-of-way.
   Response: *Dubarko Road, a minor arterial will be extended by a continuation of the centerline of this existing street. Street B ("New Road") is not an extension of an existing street. The proposal complies with this standard.*

4. Centerline radii of curves shall not be less than 500 ft. on arterial streets, 300 ft. on collector streets, and 100 ft. on local streets.
Response: *As shown on Sheet 2, Dubarko Road, a minor arterial is designed with a centerline radii of 500 feet, Street B, a collector, will have a centerline radii of 300 feet, and the extension of Fawn Street, a local street, will have a centerline radii of 100 feet. All of these streets comply with this standard.*

5. Streets shall be designed to intersect at angles as near as practicable to right angles and shall comply with the following:
   a) The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 ft. of straight (tangent) alignment perpendicular to the intersection.
   Response: *The intersection of Street B with Dubarko Drive is designed in compliance with this standard.*

   b) The intersection of a local street with another street shall have a minimum of 50 ft. of straight (tangent) alignment perpendicular to the intersection.
   Response: *All local streets intersect in compliance with this standard.*

   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 ft. along the right-of-way lines of the acute angle.
   Response: *All intersections are designed to intersect at a right angle or very close to a right angle.*

   d) Intersections with arterial streets shall have a minimum curb corner radius of 20 ft. All other intersections shall have a minimum curb corner radius of 10 ft.
   Response: *As shown on submitted plans, all street intersections comply with this standard.*

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.
   Response: *The proposed right-of-way width of Dubarko Road and Street B are proposed at 64 feet and Street A and the Fawn Street extension are proposed at 50 feet. Street C is proposed as an Access Drive to have a 40 foot right-of-way in compliance this standard.*

K. Private streets may be considered within a development site provided all the following conditions are met:
Response: *No private streets are proposed.*

17.84.60 - PUBLIC FACILITY EXTENSIONS

A. All development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage.
Response: *The submitted Utility Plan (Sheet C5) shows the location of proposed public water, sanitary sewer, and stormwater drainage facilities. Broadband fiber service will be detailed with construction plans.*

B. Where necessary to serve property as specified in "A" above, required public facility installations shall be constructed concurrent with development.
Response: *All of the utilities identified above will be constructed concurrent with the development.*

C. Off-site public facility extensions necessary to fully serve a development site and adjacent properties shall be constructed concurrent with development.
Response: *The applicant will extend all utilities as necessary to serve the development as required by this section.*

D. As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).
Response: *As shown on the submitted Sheet C5, Master Street and Utility Plan, all public facilities are proposed to be extended through the site to the edge of adjacent properties.*

E. Private on-site sanitary sewer and storm drainage facilities may be considered provided all the following conditions exist:
Response: *No private sanitary sewer or storm drainage facilities are proposed.*

17.84.70 - PUBLIC IMPROVEMENT PROCEDURES

Response: *The applicant is aware of and intends to comply with the requirements of this section.*

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.
Response: *Franchise utilities will be provided to all lots within the proposed subdivision as required. The location of these utilities will be identified on construction plans and installed or guaranteed prior to final plat approval.*

B. Where necessary, in the judgment of the Director, to provide for orderly development of adjacent properties, franchise utilities shall be extended through the site to the edge of adjacent property(ies), whether or not the development involves a land division.
***Response**: The applicant does not anticipate extending franchise utilities beyond the site.*

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.
   ***Response**: The applicant anticipates installing natural gas and will determine if the installation of cable television service is required.*

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.
***Response**: A land division is proposed, as such this section is not applicable. With the future review of the proposed multi-family units, this section will be applicable.*

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 aboveground:
   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.
   ***Response**: All franchise utilities will be installed underground with the exception of street lights as allowed by this section.*

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.

Response: *The developer will make all necessary arrangements with franchise utility providers as required by this section.*

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 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.
      Response: *The developer will install underground conduit for street lighting in accordance with the requirements of this section.*

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 ft. The minimum easement width for two adjacent utilities is 20 ft. The easement width shall be centered on the utility to the greatest extent practicable. Wider easements may be required for unusually deep facilities.
      Response: *There is an existing 15-foot wide water easement bisecting the site along the western line of Lot 32. A new 10-foot public storm easement is proposed along the back of Lots 3 and Lots 9 - 12 and between Lots 27 and 28. The rest of public facilities will be located within the public right-of-way.*

B. Public utility easements with a minimum width of 5 feet shall be provided adjacent to all street rights-of-way for franchise utility installations.
   Response: *Despite the language in this section, eight foot wide public utility easements will be provided along all lots adjacent to street rights-of-way for future franchise utility installations.*

C. Where a development site is traversed by a drainageway or water course, a drainage way dedication shall be provided to the City.
   Response: *The site is not traversed by a drainage way or water course and this section is not applicable.*

D. Where a development is traversed by, or adjacent to, a future trail linkage identified within the Transportation System Plan, dedications of suitable width to accommodate the trail linkage shall be provided. This width shall be determined by the City Engineer, considering the type of trail facility involved.

Response: *No future trail is identified in the TSP on the subject property and no trails are proposed.*

E. Where existing rights-of-way and/or easements within or adjacent to development sites are nonexistent or of insufficient width, dedications may be required. The need for and widths of those dedications shall be determined by the City Engineer.
Response: *The only existing right-of-way adjacent to the development is Highway 26. No additional right-of-way dedication along this facility has been identified.*

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 on standard document forms provided by the City Engineer.
Response: *All easements and dedications will be identified on the plat as required.*

17.84.100 - MAIL DELIVERY FACILITIES
Response: *The location and type of mail delivery facilities will be coordinated with the City Engineer and the Post Office as part of the construction plan process.*

CHAPTER 17.86 - PARKLAND and OPEN SPACE

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 the population of Sandy. This chapter implements policies of Goal 8 of the Comprehensive Plan and the Parks Master Plan by outlining provisions for parks and open space in the City of Sandy.
Response: *The city's adopted Parks Master Plan and Comprehensive Plan map shows a conceptual neighborhood park located in the vicinity of the subject property and the property directly west. The subdivision approval criteria in Sandy Development Code Section 17.100.60 do not incorporate the 1997 Parks Master Plan. As such, the sections in this chapter do not apply to this application. The applicant will pay a fee in lieu of parkland dedication in accordance with Subsection 2 of this Section. A one acre park tract dedicated as part of the Deer Pointe 2 Subdivision in 2007 appears to have satisfied this plan.*

17.86.10 - MINIMUM PARKLAND DEDICATION REQUIREMENTS
Parkland Dedication: New residential subdivisions, planned developments, multifamily or manufactured home park developments shall be required to provide parkland to serve existing and future residents of those developments.

Response: *The proposed residential subdivision is subject to the provisions of this chapter.*

1. The required parkland shall be dedicated as a condition of approval for the following:
   a. Tentative plat for a subdivision or partition;
   b. Planned Development conceptual or detailed development plan;
   c. Design review for a multi-family development or manufactured home park; and
   d. 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.
   Response: *No public parkland has been identified on the tentative plat.*

2. Calculation of Required Dedication: The required parkland acreage to be dedicated is based on a calculation of the following formula rounded to the nearest 1/100 (0.00) of an acre:
   Required parkland dedication (acres) = (proposed units) x (persons/unit) x 0.0043 (per person park land dedication factor)
   Response: *Of the proposed 32 lots, 30 are zoned R-1, one is zoned R-2, and one is proposed to contain both R-2 and C-3 zoning. The exact unit count is not known at this time. The applicant is aware that payment of a fee in lieu of parkland dedication will be based on the proposed unit count.*

17.86.20 - MINIMUM PARKLAND STANDARDS

Land required or proposed for parkland dedication shall be contained within a continuous unit and must be suitable for active use as a neighborhood or mini-park, based on the following criteria:

1. Homes must front on the parkland as shown in the example below:
2. The required dedication shall be contained as a contiguous unit and not separated into pieces or divided by roadways.
3. The parkland must be able to accommodate play structures, play fields, picnic areas, or other active park use facilities. The average slope of the active use parkland shall not exceed 15%.

Response: *The applicant does not propose dedicating any parkland with this development. The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The minimum parkland standards listed in this section contain subjective language. The words "continuous unit", "suitable", "contiguous", and "accommodate" are subjective words as used in this section. No parkland dedication is proposed with this application.*

17.86.40 - CASH IN LIEU OF DEDICATION

At the city's discretion only, the city may accept payment of a fee in lieu of land dedication. The city may require payment in lieu of land when the park land to be

dedicated is less than 3 acres. A payment in lieu of land dedication is separate from Park Systems Development Charges, and is not eligible for a credit of Park Systems Development Charges. The amount of the fee in lieu of land dedication (in dollars per acre) shall be set by City Council Resolution, and it shall be based on the typical market value of developed property (finished lots) in Sandy net of related development costs.

1. The following factors shall be used in the choice of whether to accept land or cash in lieu:
   a. The topography, geology, access to, parcel size, and location of land in the development available for dedication;
   b. Potential adverse/beneficial effects on environmentally sensitive areas;
   c. Compatibility with the Parks Master Plan, Public Facilities element of the Comprehensive Plan, and the City of Sandy Capital Improvements Program in effect at the time of dedication;
   d. Availability of previously acquired property; and
   e. The feasibility of dedication.
2. Cash in lieu of parkland dedication shall be paid prior to approval of the final plat or as specified below:
   a. 50 percent of the payment shall be paid prior to final plat approval, and
   b. The remaining 50 percent of the payment pro-rated equally among the lots, plus an administrative surcharge as determined by the City Council through a resolution, will constitute a lien against the property payable at the time of sale.

***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The choice between dedication and payment of a fee in lieu of land dedication is subjective, as is the procedure to make the recommendation on the choice. The words "topography, geology, access to, parcel size, and location of land in the development available for dedication" and "potential adverse/beneficial effects on environmentally sensitive areas", "compatibility with", "availability" and "feasibility" as used in this section are subjective. The subdivision approval criteria in Sandy Development Code Section 17.100.60 do not incorporate the 1997 Parks Master Plan. As such, the sections above do not apply to this application. The applicant will pay a fee in lieu of parkland dedication in accordance with Subsection 2 of this Section.*

17.86.50 - MINIMUM STANDARDS FOR OPEN SPACE DEDICATION

The applicant through a subdivision or design review process may propose the designation and protection of open space areas as part of that process. This open space will not, however, be counted toward the parkland dedication requirement of Sections 17.86.10 through 17.86.40.

1. The types of open space that may be provided are as follows:
   a. Natural Areas: areas of undisturbed vegetation, steep slopes, stream corridors, wetlands, wildlife habitat areas or areas replanted with native vegetation after construction.

b. Greenways: linear green belts linking residential areas with other open space areas. These greenways may contain bicycle paths or footpaths. Connecting greenways between residences and recreational areas are encouraged.
***Response**: The applicant does not proposed dedicating open space and this section is not applicable.*

2. A subdivision or design review application proposing designation of open space shall include the following information as part of this application:
   a. Designate the boundaries of all open space areas; and
   b. Specify the manner in which the open space shall be perpetuated, maintained, and administered; and
   c. Provide for public access to trails included in the Park Master Plan, including but not limited to the Tickle Creek Path.
   ***Response**: This section is not applicable as no open space is proposed or required.*

CHAPTER 17.92 - LANDSCAPING AND SCREENING GENERAL STANDARDS - ALL ZONES

***Response**: This chapter has limited applicability to subdivisions so only those applicable sections are reviewed in this submittal.*

17.92.10 - GENERAL PROVISIONS

A. Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications. 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 onsite 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 6 months.

C. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-1/2 ft. 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 be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline.
***Response**: As previously determined by the Planning Commission, the City's tree protection standards in this section do not apply to residential subdivi-*

sions. The regulations of Chapter 17.102, Urban Forestry relevant to this proposal are reviewed below. Landscaping is primarily confined to the proposed stormwater facility and street side landscape planters.

17.92.20 - MINIMUM IMPROVEMENTS - LANDSCAPING AND SCREENING

Response: *The Single Family Residential zone is not listed in this section requiring compliance with minimum landscaping requirements. Future development of Lot 32 will trigger compliance with the requirements depending on the proposed use. Compliance will be reviewed as part of a future design review application.*

CHAPTER 17.98 - PARKING, LOADING, AND ACCESS REQUIREMENTS

17.98.10 - GENERAL PROVISIONS

M. Residential Parking Analysis Plan. A Residential Parking Analysis Plan shall be required for all new residential planned developments, subdivisions, and partitions to include a site plan depicting all of the following:
   a. Location and dimension of required parking spaces as specified in Section 17.98.200.
   b. Location of areas where parking is not permitted as specified in Sections 17.98.200(A)(3) and (5).
   c. Location and design of parking courts (if applicable).

   Response: *A Residential Parking Analysis Plan identifying the location of parking for 31 lots as required by this section is included on sheet C7 of the plan set. Parking for Lot 32 will be accommodated onsite. The details of this analysis is discussed in Section 17.98.200 below.*

17.98.20 - OFF-STREET PARKING REQUIREMENTS

A. Off Street Parking Requirements. Off street parking shall conform to the following standards:
   2. All square footage measurements are gross square feet of total floor area.
   3. 18 lineal inches of bench shall be considered 1 seat.
   4. Except as otherwise specified, parking for employees shall be provided based on 1 space per 2 employees for the largest shift in addition to required parking specified in Sections A6-A9 below.
   5. Where less than 5 parking spaces are required, then only one bicycle space shall be required except as otherwise modified in Sections 5-9 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.

      Response: *Each single-family dwelling is required to provide at least two off-street parking spaces. Compliance with this requirement will be evaluated during building plan review. Parking for the development on Lot 32 will be evaluated as part of a future design review application.*

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.

Response: *The details of this section will be evaluated with submittal of the design review application for the multi-family/condominium units.*

17.98.80 - ACCESS TO ARTERIAL AND COLLECTOR STREETS
Response: *No lots are proposed to gain access from an arterial or collector street.*
17.98.90 - ACCESS TO UNIMPROVED STREETS
Response: *All streets proposed in the subdivision will be improved to city standards.*

17.98.100 - DRIVEWAYS

A. A driveway to an off-street parking area shall be improved from the public roadway 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.
Response: *All lots are designed in compliance with this standard.*

B. A driveway for a single-family dwelling shall have a minimum width of 10 feet.
Response: *All lots will have a curb cut and driveway approach in compliance with this standard.*

C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. A driveway approach must be constructed in accordance with applicable city standards and the entire driveway must be paved with asphalt or concrete.
Response: *Any of the lots constructed with two-family dwellings will be developed in compliance with this section.*

D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width but such clearance may be reduced in parking structures.
Response: *All driveways will be designed in compliance with this standard.*

E. No driveway shall traverse a slope in excess of 15 percent at any point along the driveway length.
Response: *All driveways will be designed in compliance with this standard.*

F. The location and design of the driveway shall provide for unobstructed sight per the vision clearance requirements. Requests for exceptions to these requirements will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.
Response: *All driveways will be designed in compliance with this standard.*

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 and taking into account functional classification of the streets involved, type of traffic control present at the intersection, and designated speed for the streets.
Response: *The subject property is located in the R-1, R-2, and C-3 zones requiring compliance with this section. The requirements of this section will be considered in placing landscaping in these areas with construction of homes and will be evaluated with a future design review application for the multi-family/condominium units.*

B. Traffic control devices, streetlights, and utility installations meeting approval by the City Engineer are permitted within vision clearance areas.
Response: *The exceptions contained in this section will be considered in the design and placement of these structures.*

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 planned developments, subdivisions and partitions shall provide one (1) on-street parking space within 200 feet of each dwelling except as provided in Section 17.98.200(A)(6) below.
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 22 feet minimum 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 must be set back a minimum of 15 feet from an intersection and may not be located within 10 feet of a fire hydrant.
Response: *This section is applicable to the 31 lots zoned R-1 and R-2. A Residential On-Street Parking Analysis designed in compliance with the requirements of this section is included on Sheet C6 of the application package. A shown on this plan, at least one on-street parking space at least 22 feet in length has been identified within 200 feet of each of these lots as required. This sheet shows that 47 on-street parking spaces have been identified in compliance with this standard.*

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:
Response: *No parking courts are proposed.*

CHAPTER 17.100 - LAND DIVISION

17.100.20 - LAND DIVISION CLASSIFICATION - TYPE I, II OR III PROCEDURES

C. Type II Land Division (Major Partition or Subdivision). A major partition or subdivision shall be a Type II procedure when a street is extended, satisfactory street conditions exist and the resulting parcels/lots comply with the standards of the zoning district and this chapter. Satisfactory street conditions exist when the Director determines one of the following:

1. Existing streets are stubbed to the property boundaries and are linked by the land division.
2. An existing street or a new proposed street need not continue beyond the land division in order to complete an appropriate street system or to provide access to adjacent property.
3. The proposed street layout is consistent with a street pattern adopted as part of the Comprehensive Plan or an officially adopted City street plan.

***Response**: The proposed subdivision complies with all applicable code requirements to be processed as a Type II application.*

CHAPTER 17.100 - LAND DIVISION

17.100.20 - LAND DIVISION CLASSIFICATION - TYPE I, II OR III PROCEDURES

C. Type II Land Division (Major Partition or Subdivision). A major partition or subdivision shall be a Type II procedure when a street is extended, satisfactory street conditions exist and the resulting parcels/lots comply with the standards of the zoning district and this chapter. Satisfactory street conditions exist when the Director determines one of the following:

1. Existing streets are stubbed to the property boundaries and are linked by the land division.
2. An existing street or a new proposed street need not continue beyond the land division in order to complete an appropriate street system or to provide access to adjacent property.
3. The proposed street layout is consistent with a street pattern adopted as part of the Comprehensive Plan or an officially adopted City street plan.

***Response**: The proposal is for a Type II "Needed Housing" residential subdivision designed in compliance with applicable standards.*

17.100.60 - SUBDIVISIONS

Approval of a subdivision is required for a land division of 4 or more 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.

***Response**: The proposal is a 90 lot subdivision.*

A. Preapplication Conference. The applicant for a subdivision 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.

***Response**: A pre-application conference was held with the city on February 26, 2020.*

B. Application Requirements for a Tentative Plat. Subdivision applications shall be made on forms provided by the planning department and shall be accompanied by:
***Response**: All of the items required by this section are included with the submittal.*

E. Approval Criteria. The Director or Planning Commission shall review the tentative plat for the subdivision based on the classification procedure (Type II or III) set forth in Section 17.12 and the following approval criteria:

1. The proposed subdivision is consistent with the density, setback and dimensional standards of the base zoning district, unless modified by a Planned Development approval.
***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "consistent with" as used in this section are subjective words. As reviewed in this narrative, the proposed subdivision is designed in compliance with density, setback, and dimensional standards in the R-1 and R-2 zoning districts. This criterion is met.*

2. The proposed subdivision is consistent with the design standards set forth in this chapter.
***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "consistent with" as used in this section are subjective words. As discussed in this narrative, the proposed subdivision is consistent with all required design standards in this chapter. This criterion is met.*

3. The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy.
***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "connected" and "consisted with" as used in this section are subjective words. Further, the City's Transportation System is not specifically incorporated into the Development and cannot be applied to this application. This criterion is met.*

4. Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.
***Response**: As detailed in the submitted Traffic Study traffic volumes on local streets are not projected to exceed ADT standards. This criterion is met.*

5. Adequate public facilities are available or can be provided to serve the proposed subdivision.
   Response: *The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "adequate" as used in this section are subjective words. There is no indication by City officials that public facilities are not adequate to serve the proposed subdivision.*

6. All proposed improvements meet City standards.
   Response: *As reviewed in this narrative, the proposed improvements in this application comply with City standards.*

7. The phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops.
   Response: *The applicant proposes developing the subdivision in a single phase.*

17.100.80 - CHARACTER OF THE LAND

Land which the Director or the Planning Commission finds to be unsuitable for development due to flooding, improper drainage, steep slopes, rock formations, adverse earth formations or topography, utility easements, or other features which will reasonably be harmful to the safety, health, and general welfare of the present or future inhabitants of the partition or subdivision and the surrounding areas, shall not be developed unless adequate methods are formulated by the subdivider and approved by the Director or the Planning Commission to solve the problems created by the unsuitable land conditions.

Response: *The subject property does not contain any of the items identified as "unsuitable" in this section. As demonstrated in this narrative, the subject property is suitable to construct the proposed subdivision.*

17.100.90 - ACCESS CONTROL GUIDELINES AND COORDINATION

A. Notice and coordination with ODOT required. The city will coordinate and notify ODOT regarding all proposals for new or modified public and private accesses on to Highways 26 and 211.
   Response: *The applicant's traffic consultant coordinated with ODOT and the City's traffic consultant prior to the preparation of the traffic impact study submitted with this application. The subject property abuts Highways 26 but no access to this road is proposed.*

17.100.100 - STREETS GENERALLY

A. Street Connectivity Principle. The pattern of streets established through land divisions should be connected to: (a) provide safe and convenient options for cars, bikes and pedestrians; (b) create a logical, recognizable pattern of circu-

lation; and (c) spread traffic over many streets so that key streets (particularly U.S. 26) are not overburdened.
Response: *Fawn Street and Dubarko Drive will be extended onto the subject property to provide access to lots in the subdivision. These streets are designed to create a logical street pattern and spread out traffic rather than concentrate it on a single street. No access is proposed to Highway 26. The submitted Future Street Plan identifies how the proposed street pattern can be extended to serve adjacent properties.*

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.
Response: *As reviewed above, the proposed development triggers preparation of a transportation impact study. A Traffic Impact Study is included with the application package.*

C. Topography and Arrangement. All streets shall be properly related to special traffic generators such as industries, business districts, schools, and shopping centers and to the pattern of existing and proposed land uses.
Response: *All proposed streets comply with the requirements of this section.*

D. Street Spacing. Street layout shall generally use a rectangular grid pattern with modifications as appropriate to adapt to topography or natural conditions.
Response: *As noted above, the location of Highway 26, Dubarko Road, and Street B control the street and lot layout of the subject property. With these conditions, a rectangular grid street pattern is not practical and the proposed street pattern represents a logical and efficient street system.*

E. Future Street Plan. Future street plans are conceptual plans, street extensions and connections on acreage adjacent to land divisions. They assure access for future development and promote a logical, connected pattern of streets. It is in the interest of the city to promote a logical, connected pattern of streets. All applications for land divisions shall provide a future street plan that shows the pattern of existing and proposed future streets within the boundaries of the proposed land divisions, proposed connections to abutting properties, and extension of streets to adjacent parcels within a 400 foot radius of the study area where development may practically occur.
Response: *A future street plan in compliance with this section is included with the plan set.*

F. Connections. Except as permitted under Exemptions, all streets, alleys and pedestrian walkways shall connect to other streets within the development and to existing and planned streets outside the development and to undeveloped properties which have no future street plan. Streets shall terminate at other streets or at parks, schools or other public land within a neighborhood.

Where practicable, local roads shall align and connect with other roads 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 neighborhood activity centers, such as schools, shopping areas and parks.
***Response**: As shown on submitted plans, Street A in the proposed subdivision connects Dubarko Road to Fawn Street extended onto the subject property. Street B is proposed to terminate at the southern property of the development so it can extended south with future development. All streets are designed as practical to provide a connection to abutting properties.*

17.100.120 - BLOCKS AND ACCESSWAYS

A. Blocks. Blocks shall have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.
***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "sufficient width" and "appropriate depths" as used in this section are subjective. The shape of the subject property and the alignment of Highway 26, Dubarko Drive and Fawn Street control the lot layout and design. Due to these physical constraints, the site does not lend itself to creating blocks with two tiers.*

B. Residential Blocks. Blocks fronting local streets shall not exceed 400 feet in length, unless topographic, natural resource, or other similar physical conditions justify longer blocks. Blocks may exceed 400 feet if approved as part of a Planned Development, Specific Area Plan, adjustment or variance.
***Response**: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "unless topographic, natural resource, or other similar physical conditions justify longer blocks" as used in this section are subjective. The location of Highway 26, Dubarko Road, and topographic constraints in the eastern portion of the property do not make it practical or reasonable to require typical 400 foot residential blocks.*

D. 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 10 feet within a 15-foot right-of-way or tract 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 or through greenway systems.

***Response**: No blocks are proposed greater than 600 feet in length to warrant construction of a pedestrian accessway as specified in this section.*

17.100.130 - EASEMENTS

A minimum eight (8) foot public utility easement shall be required along property lines abutting a right-of-way for all lots within a partition or subdivision. Where a partition or subdivision is traversed by a watercourse, drainage way, channel or stream, the land division shall provide a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse, and such further width as determined needed for water quality and quantity protection.
***Response**: Eight foot wide public utility easements will be platted along all property lines abutting a public right-of-way. As shown on submitted plans, a 10-foot wide public storm drainage easement is proposed to be platted along the back of Lots 3 and 9 - 12 and between Lots 27 and 28.*

17.100.140 - PUBLIC ALLEYS

***Response**: No alleys are proposed or required.*

17.100.150 - RESIDENTIAL SHARED PRIVATE DRIVES

A shared private drive is intended to provide access to a maximum of two (2) dwelling units.

A. Criteria for Approval

Shared private drives may be approved by the Director when one or more of the following conditions exist:

1. Direct access to a local street is not possible due to physical aspects of the site including size, shape, or natural features.
2. The construction of a local street is determined to be unnecessary.
   ***Response**: Two private drives (Tracts A and B) are proposed as shown on submitted plans.*

B. Design

1. A shared private drive constructed to city standards shall not serve more than two (2) dwelling units.
2. A shared access easement and maintenance agreement shall be established between the two units served by a shared private drive. The language of the easement and maintenance agreement shall be subject to approval by the Director.
3. Public utility easements shall be provided where necessary in accordance with Section 17.100.130.
4. Shared private drives shall be fully improved with an all weather surface (e.g. concrete, asphalt, permeable pavers) in conformance with city standards. The pavement width shall be 20 feet.
5. Parking shall not be permitted along shared private drives at any time and shall be signed and identified accordingly.

Response: *Each private drive is proposed to serve only two lots as allowed. Each private drive will be constructed in accordance with the requirements of this section.*

17.100.160 – PUBLIC ACCESS LANES

Public access lanes are designed to provide primary access to a limited number of dwellings where the construction of a local street is not necessary. Public access lanes are intended to serve a maximum of six dwelling units.

A. Criteria for Approval. Public access lanes may be approved by the Director when certain conditions exist which make the construction of a standard local street unnecessary. Approval of public access lanes shall be based on one or more of the following:
   1. Physical conditions such as natural features, unusual lot size, shape, or other unique features prevent the construction of a local street.
   2. It is determined that construction of a local street is not necessary to facilitate orderly development of a future street system.
   3. It is determined that there are no logical extensions of an existing local street to serve the site.

      Response: *Due to the configuration of the subject property and the location and access limitations to Dubarko Drive and Street B, Street C is proposed as a Public Access Lane as detailed below.*

B. General Provisions.
   1. A public access lane may serve a maximum of six dwelling units.
   2. Public access lanes are subject to spacing requirements of Section 17.100.120.
   3. Public utility easements shall be provided where necessary in accordance with Section 17.100.130.
   4. If a public access lane is designed as a dead end, a turnaround shall be provided at the point where the lane terminates. The design of the turnaround shall be subject to approval by the Director and the Fire Department.
   5. Parking shall be prohibited in public access lane turnarounds.
   6. Street lighting may be required in public access lanes for traffic and pedestrian safety.

      Response: *The applicant is aware of these general provisions.*

C. Public Access Lane Design

2. Public Access Lane Option "B" (Figure 17.100-B).
   a. Public access lane "B" is designed to be double loaded and provide access to lots located on both sides of the lane.
   b. Public access lanes shall be constructed to city standards and must meet the required dimension as specified in this section.
   c. Curbside sidewalks are required along both sides of the access lane to achieve specified dimensions.

d. Planter strips are not required along public access lanes dues to the minimal lots served. Lots abutting a public access land are required to have street trees in accordance with Section 17.100.290.
e. Parking is permitted on both sides of a public access lane "B" as shown in Figure 17.100-B. Signage shall be display to indicate the parking regulations along the lane and in the turnaround.
Response: *Street C is designed in compliance with the standards in this section. As shown on Sheet C5 (Section C), this street is designed to include a 40-foot right-of-way with 28-feet of paving and sidewalks on both sides.*

17.100.170 - FLAG LOTS

Flag lots can be created where it can be shown that no other street access is possible to achieve the requested land division. The flag lot shall have a minimum street frontage of 15 feet for its accessway. The following dimensional 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) may not be counted toward the lot size requirements.
Response: *Lot 11 of the proposed subdivision could be considered a flag lot as defined by code. This lot conforms with all applicable standards.*

17.100.180 - INTERSECTIONS

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 elements justified by a traffic study or necessary to comply with the Development Code.
Response: *All streets are designed to intersect an abutting street at a right angle in compliance with the requirements of this section.*

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.
Response: *All proposed streets comply with the standards of this section.*

17.100.190 - STREET SIGNS

The subdivider shall pay the cost of street signs prior to the issuance of a Certificate of Substantial Completion. The City shall install all street signs and upon completion will bill the developer for costs associated with installation. In addition, the subdivider may be required to pay for any traffic safety devices related

to the development. The City Engineer shall specify the type and location of the street signs and/or traffic safety devices.
Response: *The applicant understands it will be his responsibility to pay the cost of street signs and the city will install these signs.*

17.100.200 - STREET SURFACING
Public streets, including alleys, within the development shall be improved in accordance with the requirements of the City or the standards of the Oregon State Highway Department. An overlay of asphalt concrete, or material approved by the City Engineer, shall be placed on all streets within the development. Where required, speed humps shall be constructed in conformance with the City's standards and specifications.
Response: *All streets will be improved in accordance with City standards.*

17.100.210 - STREET LIGHTING
A complete lighting system (including, but not limited to: conduits, wiring, bases, poles, arms, and fixtures) shall be the financial responsibility of the subdivider on all cul-de-sacs, local streets, and neighborhood collector streets. The subdivider will be responsible for providing the arterial street lighting system in those cases where the subdivider is required to improve an arterial street. Standards and specifications for street lighting shall be coordinated with the utility and any lighting district, as appropriate.
Response: *The applicant is aware of the requirements of this section. A lighting plan will be coordinated with PGE and the city prior to installation of these fixtures.*

17.100.220 - LOT DESIGN
A. The lot arrangement shall be such that there will be no foreseeable difficulties, for reason of topography or other conditions, in securing building permits to build on all lots in compliance with the Development Code.
Response: *The proposed subdivision contains a logical lot layout and no difficulties are anticipated in securing building permits to build on any of these lots. Development on Lot 32 will require design review approval prior to development.*

B. The lot dimensions shall comply with the minimum standards of the Development Code. When lots are more than double the minimum lot size required for the zoning district, the subdivider may be required to arrange such lots to allow further subdivision and the opening of future streets to serve such potential lots.
Response: *As discussed above, all lots comply with the lot dimension and minimum standards as specified for lots platted within the R-1, R-2, and C-3 zoning districts.*

C. 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. A street frontage of not less than 15 feet is acceptable in the case of a flag lot division resulting from the division of an unusually deep land parcel which is of a size to warrant division into not more than two parcels.
Response: *All lots in the proposed subdivision contain at least 20 feet of frontage along a public street with the exception of four lots (Lots 12, 13, 21 and 22) which are proposed to be accessed by private drives. The proposal complies with this section.*

D. Double frontage lots shall be avoided except where necessary to provide separation of residential developments from arterial streets or to overcome specific disadvantages of topography or orientation.
Response: *None of the lots contain double frontage as defined by code except Lots 25, 26 that have frontage on both Street A and Highway 26 and Lots 27 - 30 with frontage on both Dubarko Road and Street C. Because direct access from Highway 26 and Dubarko Road is not permitted, a double frontage lot configuration is unavoidable.*

E. Lots shall avoid deriving access from major or minor arterials. When driveway access from major or minor arterials may be necessary for several adjoining lots, the Director or the Planning Commission may require that such lots be served by a common access drive in order to limit possible traffic hazards on such streets. Where possible, driveways should be designed and arranged to avoid requiring vehicles to back into traffic on minor or major arterials.
Response: *All lots are proposed to gain access from a new local street. No direct access to Dubarko Road, a minor arterial or Street B, a collector are proposed.*

17.100.230 - WATER FACILITIES

Water lines and fire hydrants serving the subdivision or partition, and connecting the development to City mains, shall be installed to provide adequate water pressure to serve present and future consumer demand. The materials, sizes, and locations of water mains, valves, service laterals, meter boxes and other required appurtenances shall be in accordance with the standards of the Fire District, the City, and the State.

If the city requires the subdivider 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 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 subdivider setting forth methods for reimbursement for the proportionate share of the cost.
Response: *The applicant intends to install all water lines and fire hydrants in compliance with applicable standards.*

17.100.240 - SANITARY SEWERS

Sanitary sewers shall be installed to serve the subdivision and to connect the subdivision to existing mains. Design of sanitary sewers shall take into account the capacity and grade to allow for desirable extension beyond the subdivision.

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.

***Response: Response**: The applicant intends to install sanitary sewer lines in compliance with applicable standards. All lots can be served by a gravity sewer line.*

17.100.250 - SURFACE DRAINAGE AND STORM SEWER SYSTEM

A. Drainage facilities shall be provided within the subdivision and to connect with off-site drainage ways or storm sewers. Capacity, grade and materials shall be by a design approved by the city engineer. Design of drainage within the subdivision 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.
   ***Response**: A single stormwater water quality and detention facility (Tract A) is proposed. This facility has been sized and located to accommodate public stormwater generated by the subdivision. A preliminary stormwater report is included with this application as required.*

B. In addition to normal drainage design and construction, provisions shall be taken to handle any drainage from preexisting subsurface drain tile. It shall be the design engineer's duty to investigate the location of drain tile and its relation to public improvements and building construction.
   ***Response**: No subsurface drain tiles are known to exist on the site.*

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.
   ***Response**: All roof and site drainage will be discharged to curb face outlets or another approved system as required.*

17.100.260 - UNDERGROUND UTILITIES

All subdivisions or major partitions shall be required to install underground utilities (including, but not limited to, electrical and telephone wiring). The utilities shall be installed pursuant to the requirements of the utility company.

***Response**: As shown on improvement plans the applicant intends to install all utilities underground as required.*

17.100.270 - SIDEWALKS

Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision.
***Response**: As shown on submitted plans, sidewalks will be constructed along both sides of all new streets as required.*

17.100.280 - BICYCLE ROUTES
If appropriate to the extension of a system of bicycle routes, existing or planned, the Director or the Planning Commission may require the installation of bicycle lanes within streets. Separate bicycle access ways may be required to reduce walking or cycling distance when no feasible street connection is available.
***Response**: No bicycle routes are existing, planned, or proposed on the subject property.*

17.100.290 - STREET TREES
Where planting strips are provided in the public right-of-way, a master street tree plan shall be submitted and approved by the Director. The street tree plan shall provide street trees approximately every 30' on center for all lots.
***Response**: Planter strips will be provided along all new street frontages as required. Street trees in accordance with City standards will be provided in these areas. The proposed tree species will be selected from the City's approved tree list.*

17.100.300 - EROSION CONTROL
Grass seed planting shall take place prior to September 30th 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 1000 square feet of land area.
***Response**: Grass seeding will be completed as required by this section. The submitted erosion control plan provides additional details to address erosion control concerns.*

17.100.310 - REQUIRED IMPROVEMENTS
The following improvements shall be installed at no expense to the city, consistent with the design standards of Chapter 17.84, except as otherwise provided in relation to oversizing.
A. Drainage facilities
B. Lot, street and perimeter monumentation
C. Mailbox delivery units
D. Sanitary sewers
E. Sidewalks
F. Street lights
G. Street name signs
H. Street trees
I. Streets
J. Traffic signs

K. Underground communication lines, including broadband (fiber), telephone, and cable. Franchise agreements will dictate whether telephone and cable lines are required.
L. Underground power lines
M. Water distribution lines and fire hydrants

Response: *All improvements specified in this section will be installed by the developer at no expense to the City of Sandy consistent with the design standards of Chapter 17.84 and applicable standards.*

CHAPTER 17.102 - URBAN FORESTRY

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.

   Response: *The subject property contains 15.91 acres and the standards of this chapter are applicable to the proposed application. As shown on submitted plans and detailed in the Arborist Report, development of the site requires removal of the majority of the trees on the site. The proposed tree removal and protection plan has been designed in accordance with the standards of this chapter and the provisions in Chapters 15.44, 17.56, and 17.60 as applicable.*

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.
   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.
   4. If possible, at least two of the required trees per acre must be of conifer species.
   5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.

***Response**: The subject property contains 15.91 acres requiring retention of 48 trees, 11 inches and greater DBH (15.91 x 3 = 47.73 rounded up to 48 trees). As stated in this section trees proposed for retention shall be "healthy and likely to grow to maturity". This section also has a preference for retaining conifer trees over deciduous. Submitted plans show that 48 trees are proposed to be retained in a grove along the northern boundary of the site. The submitted Arborist Report provides a description and quality assessment of each of the trees on the site. Most of the trees are in "good" condition but some have structural defects.*

B. Tree Protection Area: Except as otherwise determined by the Planning Director, 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. 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 10 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.
   ***Response**: As shown on the submitted Tree Retention and Protection plan the majority of trees proposed to be retained are located on Lot 13 with several trees also located on Lots 14, and 21. This entire group of trees is proposed to be retained and protected by a conservation easement platted for this purpose. The submitted Arborist report also contains additional recommendations for protection of these trees during construction.*

17.102.60 - TREE REPLANTING REQUIREMENTS

1. All areas with exposed soils resulting from tree removal shall be replanted with a ground cover of native species within 30 days of harvest during the active growing season, or by June 1st of the following spring.
2. 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.
3. Removal of hazard trees as defined shall be replanted with two native trees of quality nursery stock for every tree removed.
4. Tree Removal allowed within the FSH Overlay District shall be replanted with two native trees of quality nursery stock for every tree removed.

5. Tree Removal not associated with a development plan must be replanted following the provisions of OAR Chapter 629, Division 610, Section 020-060
***Response**: The requirements of this section as applicable will be completed with construction of subdivision improvements.*

17.102.70 - VARIANCES

Under a Type III review process, the Planning Commission may allow newly-planted trees to substitute for retained trees if:

1. 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
2. The substitution more nearly meets the intent of this ordinance due to:
   a. The location of the existing and proposed new trees, or
   b. The physical condition of the existing trees or their compatibility with the existing soil and climate conditions; or
   c. An undue hardship is caused by the requirement for retention of existing trees.
   d. Tree removal is necessary to protect a scenic view corridor.

   ***Response**: As noted above, the proposed tree retention plan complies with the tree retention requirements of Section 17.102.50 above. A variance to this section has not been requested or is one required.*

CHAPTER 15.30 - DARK SKY ORDINANCE

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. 2002-11)

15.30.030 - EXEMPTIONS AND EXCEPTIONS

D. Full cutoff street lighting, which is part of a federal, state, or municipal installation.

15.30.060 - GENERAL STANDARDS

D. All outdoor lighting systems shall be designed and operated so that the area 10 feet beyond the property line of the premises receives no more than .25 (one quarter) of a foot-candle of light from the premises lighting system.

***Response**: The applicant understands the requirements of this chapter. A detailed lighting plan will be submitted with construction plans following land use approval.*

V. Conclusion

The proposed subdivision is part of the planned progression of land use planning for this area of Sandy and involves the creation of "Needed Housing" under ORS 197.303(1) and 197.307(4) on land zoned for residential uses within the city limits of Sandy. The applicant has submitted this application requesting land use ap-

proval to construct a Type II residential subdivision on the 15.91 acre site to include the following:

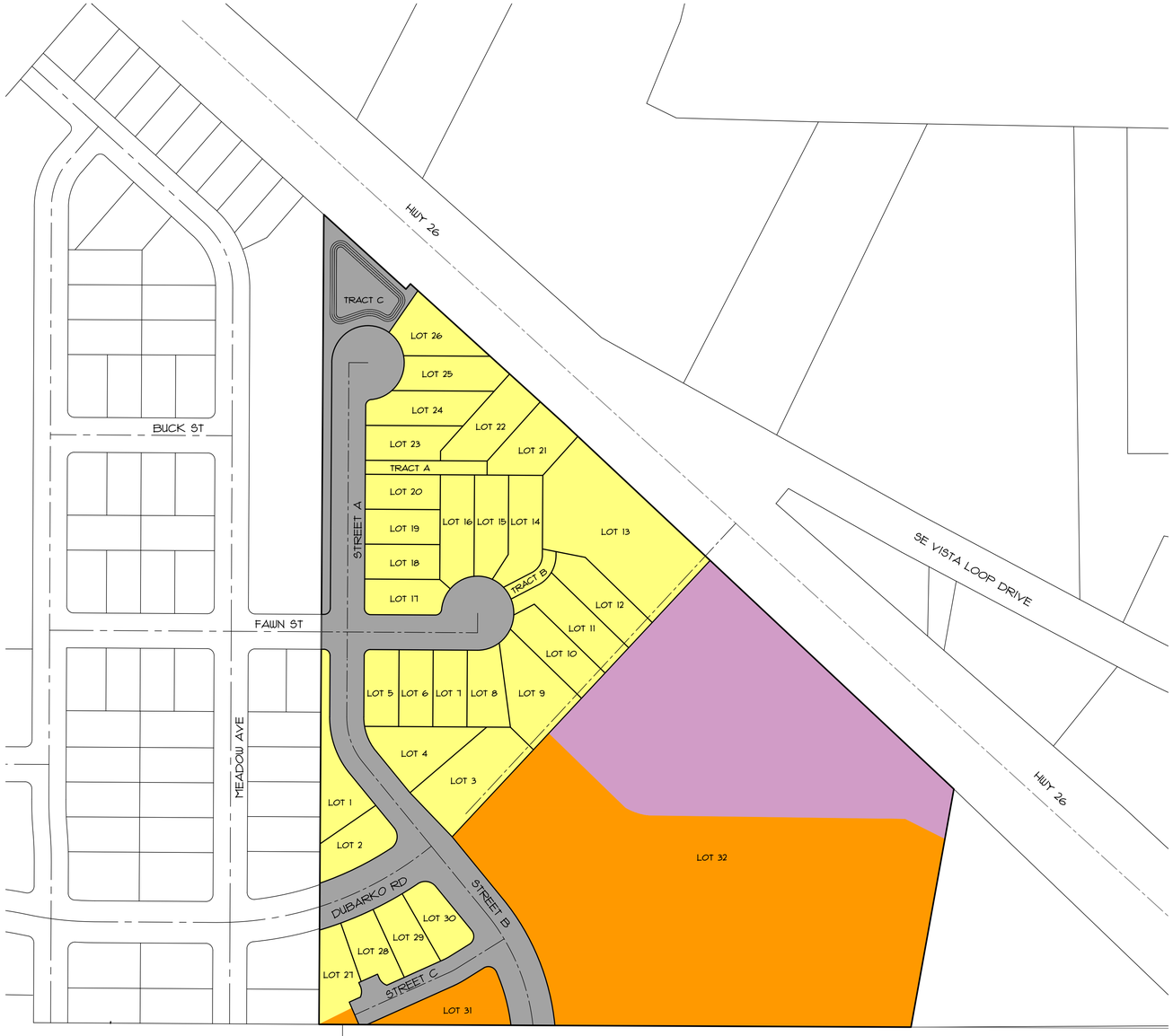
- 32 lots
- On-street parking
- Installation of public and franchise utilities
- Tree removal
- Fee-in-lieu payment for parkland dedication

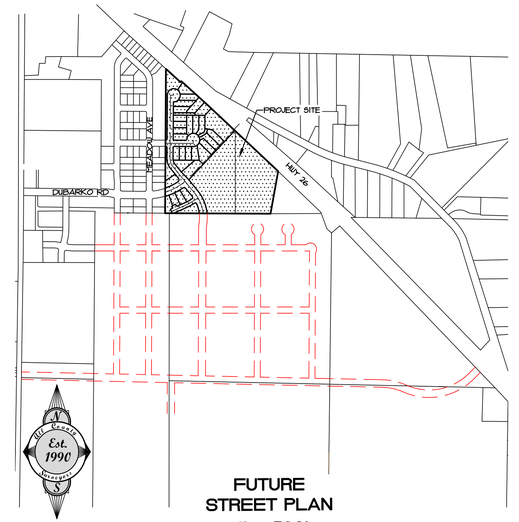
As reviewed in this narrative and shown on submitted plans and studies including the submitted Arborist Report and Geotechnical Report, the proposed subdivision complies with all applicable standards. Given these facts the applicant respectfully requests this application be approved as submitted.

EXHIBIT C

DEER MEADOWS

32-LOT SUBDIVISION





FUTURE STREET PLAN
1" = 500'

SCALE : 1" = 80'
0' 40' 80' 160'

CLIENT
ROLL TIDE PROPERTIES CORPORATION
PO BOX 103
CORNELIUS, OR 97113

SURVEYOR/ENGINEER
ALL COUNTY SURVEYORS & PLANNERS, INC.
PO BOX 955
SANDY, OR 97055

PLANNER
TRACY BROWN PLANNING CONSULTANTS, LLC
17075 FIR DR.
SANDY, OR 97055

LEGEND

- R-2 ZONE
- R-1 ZONE
- C-3 ZONE
- PUBLIC ROW, PUBLIC & PRIVATE TRACTS

SHEET INDEX

1. COVER SHEET & FUTURE STREET PLAN
2. PRELIMINARY PLAT MAP
3. EXISTING CONDITIONS AND TREE RETENTION PLAN
4. TREE TABLES
5. MASTER STREET & UTILITY PLAN
6. PRELIMINARY STREET TREE & PARKING PLAN
7. PRELIMINARY GRADING & EROSION CONTROL PLAN
8. SLOPE ANALYSIS

SHEET C1 OF 8

BY	DATE	NO.	REVISION
-	-	-	-

DESIGNED: CTH
DRAWN: CTH
CHECKED: RLH
APPROVED: RLH

REGISTERED PROFESSIONAL LAND SURVEYOR — OREGON — JULY 13, 2007 — RAY L. MOORE — RENEWAL DATE: 12/31/2022

SCALE — VERT: N/A — HORIZ: 1"=80'
DATE: 01/26/2018
FILE:19-035-Planning-Pl.dwg
LEGAL — SECTION: 18 — TWP: 2S — RANGE: 5E

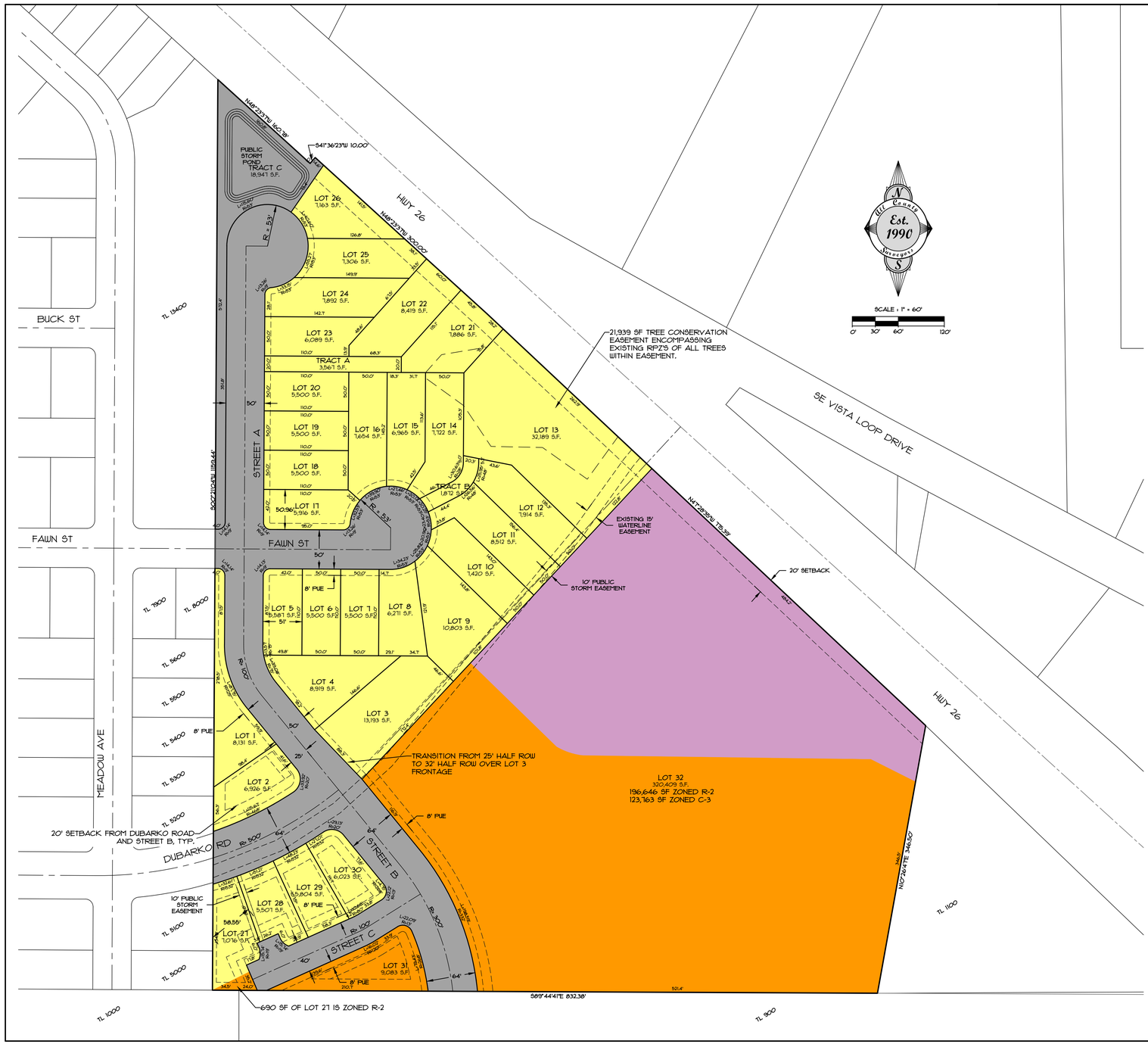
PROJECT: **DEER MEADOWS SUBDIVISION**
COVER SHEET AND FUTURE STREET PLAN

LOCATION: **40808 & 41010 HWY 26, SANDY, OR 97055**

Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT: 05/28/2021

CLIENT: ROLL TIDE PROPERTIES CORPORATION PO BOX 103 CORNELIUS, OR 97113



AREA TOTALS

TOTAL SITE AREA	= 693,056 SF = 15.910 ACRES
TRACT C (PUBLIC STORM POND)	= 18,947 SF = 0.435 ACRES
R-1 SINGLE FAMILY	= 245,536 SF = 5.631 ACRES
R-2 MULTI-FAMILY	= 206,419 SF = 4.739 ACRES
C-3 COMMERCIAL	= 123,763 SF = 2.841 ACRES
PUBLIC ROW	= 98,391 SF = 2.259 ACRES

DENSITY CALCULATIONS

R-1 SINGLE FAMILY MIN DENSITY
5.64 AC*5 UNITS/AC) = 28 UNITS

R-1 SINGLE FAMILY MAX DENSITY
5.64 AC*8 UNITS/AC) = 45 UNITS

R-1 SINGLE FAMILY PROPOSED DENSITY
30 UNITS

R-2 MULTI-FAMILY MIN DENSITY
4.74 AC*8 UNITS/AC) = 38 UNITS

R-2 MULTI-FAMILY MAX DENSITY
4.74 AC*14 UNITS/AC) = 66 UNITS

LEGEND

- R-1 ZONE
- R-2 ZONE
- C-3 ZONE
- PUBLIC ROW, PUBLIC TRACTS

NOTES

1. THIS IS NOT A BOUNDARY SURVEY. NO LIABILITY IS ASSUMED BY ALL COUNTY SURVEYORS AND PLANNERS FOR THE EXISTENCE OF ANY EASEMENTS, ENCUMBRANCES AND DISCREPANCIES IN BOUNDARY OR TITLE DEFECTS.
2. LOT 32 TO BE DEVELOPED UNDER SEPARATE DESIGN REVIEW PROCESS AT FUTURE DATE.

SHEET C2 OF 8

BY	REVISION	NO.	DATE
-	-	-	-

DESIGNED: CTH
DRAWN: CTH
CHECKED: RLM
APPROVED: RLM

REGISTERED PROFESSIONAL LAND SURVEYOR — OREGON — MAY 2, 1978 — RAY L. MOSS
RENEWAL DATE: 12/31/2022

SCALE — VERT: N/A — HORIZ: 1"=60'
DATE: 01/26/2018
FILE: 19-035-Planning-B1.dwg
LEGAL — SECTION: 18 — TWP.: 2S — RANGE: 5E

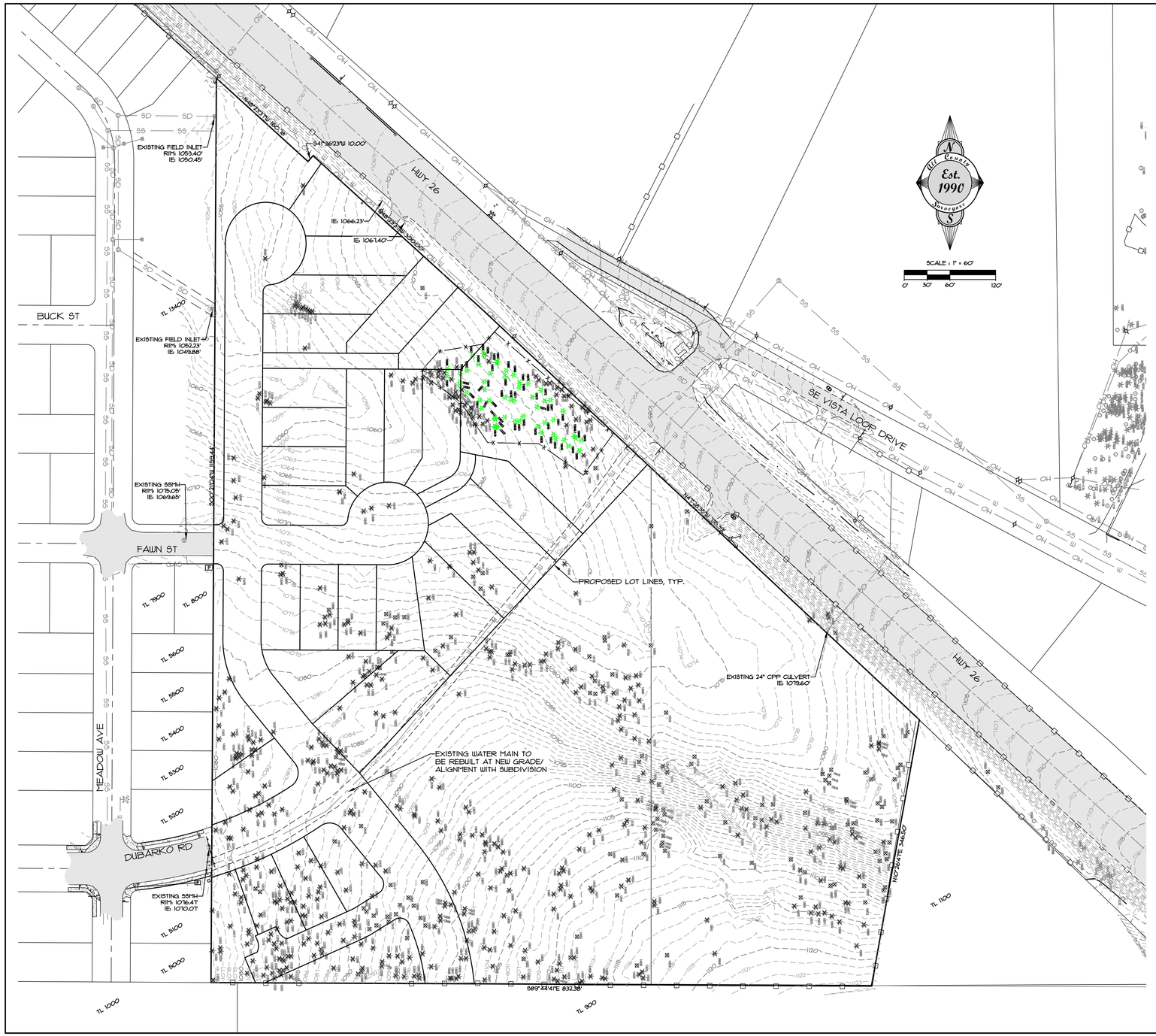
PROJECT:
DEER MEADOWS SUBDIVISION
PRELIMINARY PLAT MAP

LOCATION:
40808 & 41010 HWY 26, SANDY, OR 97055

Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT: 05/28/2021

CLIENT:
ROLL TIDE PROPERTIES CORPORATION
PO BOX 703
CORNELIUS, OR 97113



LEGEND

- PROPERTY LINE
- LOT LINE
- EXISTING BUILDING
- EXISTING EDGE OF PAVEMENT
- EXISTING SIDEWALK/CONCRETE
- EXISTING CURB
- EXISTING WATER LINE
- EXISTING STORM LINE
- EXISTING SANITARY LINE
- EXISTING GAS LINE
- EXISTING TELEPHONE LINE
- EXISTING UNDERGROUND POWER
- EXISTING STORM MANHOLE
- EXISTING CATCH BASIN
- EXISTING SANITARY MANHOLE
- EXISTING UTILITY POLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING SIGN
- EXISTING GROUND CONTOUR
- EXISTING LIGHT POLE
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- NEW LOT LINE
- NEW EASEMENT LINE
- NEW CURB
- NEW SIDEWALK/CONCRETE
- NEW AC
- NEW WATER LINE
- NEW SANITARY LINE
- NEW STORM LINE
- SAWCUT LINE
- NEW FINISH GRADE CONTOUR
- NEW WATER METER
- NEW STORM MANHOLE
- NEW CATCH BASIN
- NEW SANITARY MANHOLE
- NEW CLEANOUT
- NEW FIRE HYDRANT
- NEW WATER VALVE
- NEW STREET LIGHT
- NEW SIGN
- NEW MAILBOX UNIT

LEGEND

- EXISTING CONIFEROUS TREE TO BE PRESERVED
- EXISTING DECIDUOUS TREE TO BE REMOVED
- EXISTING CONIFEROUS TREE TO BE REMOVED

INSTALL PROTECTIVE BARRIER FENCING TO PROTECT TREES DURING EXCAVATION FOR THE UTILITIES. REQUEST AN INSPECTION OF EROSION CONTROL MEASURES AND TREE PROTECTION MEASURES AS SPECIFIED IN SECTION 11.102.5.0(C) PRIOR TO CONSTRUCTION ACTIVITIES OR GRADING. REFER TO ARBORIST REPORT FOR DETAIL ON FENCING LOCATION.

TREE RETENTION NOTES

TREES REQUIRED TO BE RETAINED:

3 TREES/ACRE X 15.91 ACRES = **48 TREES**

NUMBER OF TREES PROPOSED FOR RETENTION:

48 TREES

NOTES

1. THIS IS NOT A BOUNDARY SURVEY. NO LIABILITY IS ASSUMED BY ALL COUNTY SURVEYORS AND PLANNERS FOR THE EXISTENCE OF ANY EASEMENTS, ENCUMBRANCES AND DISCREPANCIES IN BOUNDARY OR TITLE DEFECTS.
2. UNDERGROUND UTILITIES SHOWN ON THIS SURVEY ARE LIMITED TO THOSE ITEMS VISIBLE BY SURFACE INSPECTION AND LOCATES PAINTED ON THE GROUND AS OF THE DATE OF THIS SURVEY. SUBSURFACE STRUCTURES, IF ANY, ARE NOT SHOWN.
3. UNDERGROUND UTILITY LOCATIONS MUST BE POTHOLED AND VERIFIED PRIOR TO CONSTRUCTION.
4. THE ELEVATION DATUM IS BASED ON THE CITY OF SANDY BENCHMARK #33. THE BENCHMARK IS LOCATED AT THE INTERSECTION OF MCCORMICK AND LANGENSEND. THE PUBLISHED ELEVATION IS 1021.57'

NO.	DATE	REVISION	BY
–	–	–	–

SHEET C3 OF 8

DESIGNED: CTH
DRAWN: CTH
CHECKED: RLM
APPROVED: RLM

REGISTERED PROFESSIONAL LAND SURVEYOR — OREGON — JULY 13, 2004 — RAY L. MOSS — RENEWAL DATE: 12/31/2022

SCALE — VERT: N/A, HORIZ: 1"=60'
DATE: 01/26/2018
FILE: 19-035-Planning-B.dwg
LEGAL — SECTION: 18, TWP: 2S, RANGE: 5E

PROJECT:
DEER MEADOWS SUBDIVISION
EXISTING CONDITIONS AND TREE RETENTION PLAN

LOCATION:
40808 & 4010 HWY 26, SANDY, OR 97055

CLIENT:
ROLL TIDE PROPERTIES CORPORATION
PO BOX 1503
CORNELIUS, OR 97113

Surveyors & Planners, Inc.
Surveying, Planning and Engineering
P.O. Box 955, Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT: 05/28/2021

TREE PRESERVATION INVENTORY

TREE NO.	SPECIES (COMMON NAME)	DBH (INCHES)	CONDITION	COMMENTS	TREATMENT
13653	DOUGLAS-FIR	11	FAIR	THIN CROWN, LARGE WOUND AT LOWER TRUNK	REMOVE
15546	DOUGLAS-FIR	15	GOOD	25% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15550	DOUGLAS-FIR	6	VERY POOR	DEAD	RETAIN
15551	DOUGLAS-FIR	30	GOOD	CODOMINANT AT 1', WEST STEM HAS 33% LIVE CROWN RATIO	RETAIN
15552	N/A	N/A	N/A	SAME AS TREE 15551	N/A
15553	DOUGLAS-FIR	13	GOOD	25% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15554	DOUGLAS-FIR	11	FAIR	POOR TRUNK TAPER, SUPPRESSED	REMOVE
15555	DOUGLAS-FIR	30	GOOD	MODERATELY ONE SIDED	RETAIN
15556	DOUGLAS-FIR	12	POOR	OVERTOPPED BY ADJACENT TREES, SUPPRESSED	RETAIN
15557	GRAND FIR	22	GOOD	ONE SIDED, CODOMINANT AT 30' WITH INCLUDED BARK	RETAIN
15558	DOUGLAS-FIR	12	GOOD	33% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15562	DOUGLAS-FIR	20	GOOD	40% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15564	DOUGLAS-FIR	14	GOOD	MARGINAL TRUNK TAPER, 33% LIVE CROWN RATIO	RETAIN
15565	DOUGLAS-FIR	11	FAIR	ONE SIDED, MARGINAL TRUNK TAPER, 33% LIVE CROWN RATIO	REMOVE
15566	DOUGLAS-FIR	23	GOOD	ONE SIDED	RETAIN
15567	DOUGLAS-FIR	17	GOOD	MARGINAL TRUNK TAPER, 40% LIVE CROWN RATIO	RETAIN
15568	DOUGLAS FIR	7	VERY POOR	DEAD	REMOVE
15569	DOUGLAS-FIR	11	FAIR	POOR TRUNK TAPER	REMOVE
15570	DOUGLAS-FIR	14	FAIR	ONE SIDED, OVERTOPPED BY ADJACENT TREES	REMOVE
15571	DOUGLAS-FIR	9	FAIR	POOR TRUNK TAPER, SUPPRESSED	REMOVE
15582	DOUGLAS-FIR	10	FAIR	POOR TRUNK TAPER, SUPPRESSED	REMOVE
15583	DOUGLAS-FIR	13	GOOD	POOR TRUNK TAPER, 25% LIVE CROWN RATIO	RETAIN
15584	DOUGLAS-FIR	14	GOOD	MARGINAL TRUNK TAPER, 40% LIVE CROWN RATIO	RETAIN
15584.1	DOUGLAS-FIR	8	VERY POOR	DEAD	REMOVE
15585	DOUGLAS-FIR	15	GOOD	35% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15589	DOUGLAS-FIR	18	GOOD	33% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15590	DOUGLAS-FIR	13	GOOD	35% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15612	DOUGLAS-FIR	9	VERY POOR	DEAD	RETAIN
15614	DOUGLAS-FIR	9	FAIR	25% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15615	DOUGLAS-FIR	14	GOOD	25% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15619	DOUGLAS-FIR	20, 16	GOOD	CODOMINANT AT GROUND LEVEL WITH INCLUDED BARK, MARGINAL TRUNK TAPER	RETAIN
15620	N/A	N/A	N/A	SAME AS TREE 15619	N/A
15621	N/A	N/A	N/A	DUPLICATE TREE POINT	N/A
15622	DOUGLAS-FIR	19	GOOD	ONE SIDED, BOWED TRUNK, MARGINAL TRUNK TAPER	RETAIN
15623	DOUGLAS-FIR	8	GOOD	ONE SIDED, POOR TRUNK TAPER	RETAIN
15624	DOUGLAS-FIR	9	VERY POOR	DEAD	RETAIN

TREE PRESERVATION INVENTORY

TREE NO.	SPECIES (COMMON NAME)	DBH (INCHES)	CONDITION	COMMENTS	TREATMENT
15630	DOUGLAS-FIR	18	GOOD	ONE SIDED	RETAIN
15631	DOUGLAS-FIR	24	GOOD	ONE SIDED	RETAIN
15632	DOUGLAS-FIR	13	GOOD	40% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15638	DOUGLAS-FIR	21	GOOD	ONE SIDED	RETAIN
15639	DOUGLAS-FIR	14	GOOD	ONE SIDED, MARGINAL TRUNK TAPER, BOWED TRUNK	RETAIN
15640	DOUGLAS-FIR	15	GOOD	ONE SIDED, 70% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15641	DOUGLAS-FIR	19	GOOD	40% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15642	DOUGLAS-FIR	19	GOOD	MODERATELY ONE SIDED, MARGINAL TRUNK TAPER, 50% LIVE CROWN RATIO	RETAIN
15643	DOUGLAS-FIR	16	GOOD	ONE SIDED	RETAIN
15644	DOUGLAS-FIR	17	GOOD	33% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	REMOVE
15645	DOUGLAS-FIR	24	GOOD	ONE SIDED	RETAIN
15646	DOUGLAS-FIR	16	GOOD	ONE SIDED	RETAIN
15648	DOUGLAS-FIR	17	GOOD	ONE SIDED, 60% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15649	DOUGLAS-FIR	16	GOOD	ONE SIDED, MARGINAL TRUNK TAPER	RETAIN
15649.1	DOUGLAS-FIR	17	GOOD	MODERATELY ONE SIDED, MARGINAL TRUNK TAPER	RETAIN
15650	DOUGLAS-FIR	23, 16	GOOD	CODOMINANT AT GROUND LEVEL, NORTH STEM HAS POOR TRUNK TAPER	RETAIN
15651	N/A	N/A	N/A	SAME AS TREE 15650	N/A
15654	DOUGLAS-FIR	21	GOOD	ONE SIDED, CODOMINANT AT 12' WITH INCLUDED BARK	REMOVE
15655	DOUGLAS-FIR	24	GOOD	ONE SIDED	REMOVE
15656	DOUGLAS-FIR	16	GOOD	MARGINAL TRUNK TAPER, 40% LIVE CROWN RATIO	REMOVE
15659	DOUGLAS-FIR	21	GOOD	MODERATELY ONE SIDED, 6" DEAD CODOMINANT STEM AT BASE OF TRUNK	REMOVE
15660	DOUGLAS-FIR	19	GOOD	35% LIVE CROWN RATIO, MARGINAL TRUNK TAPER, DEAD 8" CODOMINANT STEM AT 15'	RETAIN
15662	DOUGLAS-FIR	8	VERY POOR	DEAD	REMOVE
15666	DOUGLAS-FIR	13	GOOD	MARGINAL TRUNK TAPER, 35% LIVE CROWN RATIO	REMOVE
15667	DOUGLAS-FIR	16	GOOD	40% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15668	DOUGLAS-FIR	14	GOOD	40% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15669	DOUGLAS-FIR	15	GOOD	ONE SIDED, OVERTOPPED BY ADJACENT TREES	REMOVE
15670	DOUGLAS-FIR	23	GOOD	MODERATELY ONE SIDED	REMOVE
15671	DOUGLAS-FIR	10	GOOD	ONE SIDED, POOR TRUNK TAPER	REMOVE
15672	DOUGLAS-FIR	15	GOOD	33% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15673	DOUGLAS-FIR	15	GOOD	35% LIVE CROWN RATIO, MARGINAL TRUNK TAPER	RETAIN
15674	DOUGLAS-FIR	13	GOOD	25% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15677	DOUGLAS-FIR	13	GOOD	25% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15678	DOUGLAS-FIR	14	GOOD	33% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15679	DOUGLAS-FIR	16,12	GOOD	CODOMINANT AT GROUND LEVEL WITH INCLUDED BARK, SOUTH STEM HAS MARGINAL TRUNK TAPER WITH 25% LIVE CROWN RATIO	RETAIN
15680	DOUGLAS-FIR	11	GOOD	25% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN
15681	DOUGLAS-FIR	14	GOOD	POOR TRUNK TAPER, 20% LIVE CROWN RATIO	RETAIN
15682	DOUGLAS-FIR	26	GOOD	ONE SIDED	REMOVE
15685	DOUGLAS-FIR	22	GOOD	MODERATELY ONE SIDED	RETAIN
15686	DOUGLAS-FIR	25	GOOD	ONE SIDED	RETAIN
15688	DOUGLAS-FIR	20	GOOD	MARGINAL TRUNK TAPER, 50% LIVE CROWN RATIO	RETAIN
15690	DOUGLAS-FIR	16	GOOD	33% LIVE CROWN RATIO, POOR TRUNK TAPER	RETAIN

NOTE: [green box] INDICATES TREES 11" DBH AND GREATER DEEMED TO BE VIABLE BY ARBORIST INSPECTION, AND MEETING THE REQUIREMENTS OF THE SANDY DC FOR TREE RETENTION.

TOTAL NUMBER OF VIABLE, 11"+ DBH TREES TO BE PRESERVED: 48

DATE	NO.	REVISION	BY
-	-	-	-

SHEET C4 OF 8

DESIGNED: CTH
DRAWN: CTH
CHECKED: RLM
APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER 49710 OREGON JULY 21, 1998 RAY L. MOORE
RENEWAL DATE: 12/31/2022

SCALE VERT: N/A HORIZ: 1"=60'
DATE: 07/26/2018
FILE:19-035-Planning-B.dwg

LEGAL

SECTION	TWP.	RANGE
18	2S	5E

PROJECT: **DEER MEADOWS SUBDIVISION**

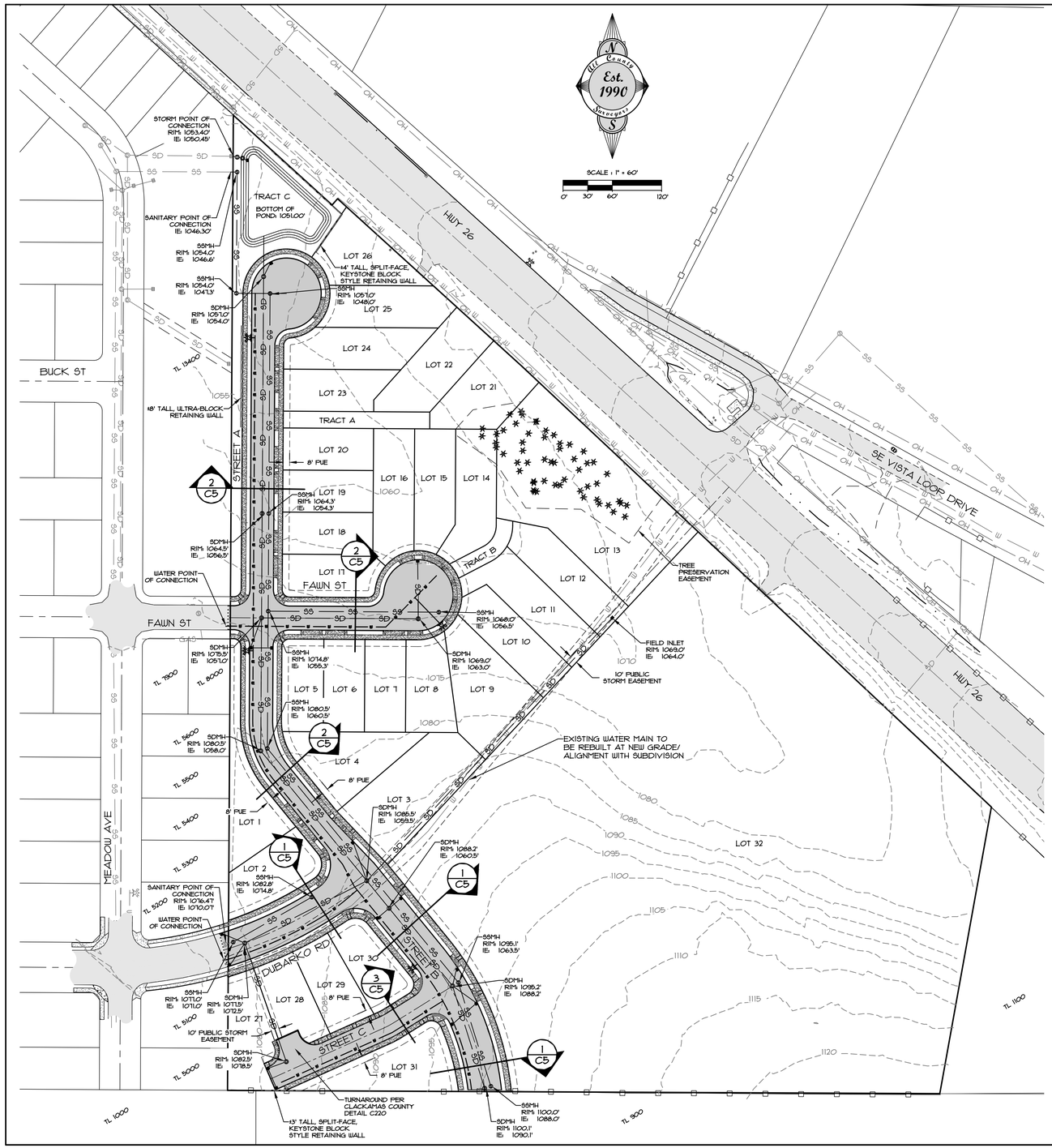
TREE TABLES

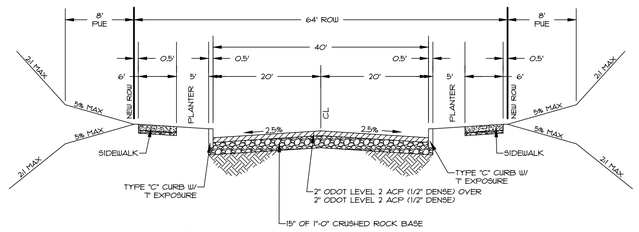
LOCATION: **40808 & 41010 HWY 26, SANDY, OR 97055**

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 05/28/2021

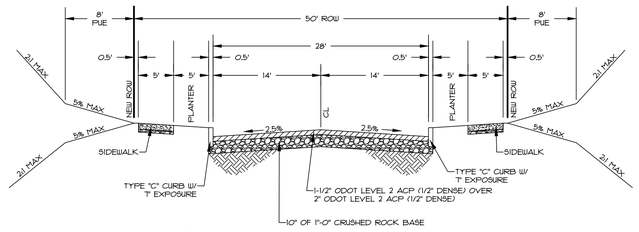
CLIENT: ROLL TIDE PROPERTIES CORPORATION
PO BOX 103
CORNELIUS, OR 97113





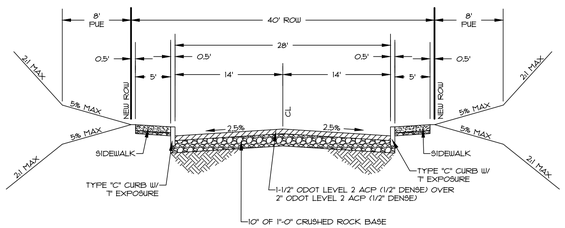
SECTION (1) (64' ROW - FULL STREET IMPROVEMENTS)

DUBARKO STREET, STREET B - ARTERIAL, COLLECTOR STREET
NTS



SECTION (2) (50' ROW - FULL STREET IMPROVEMENTS)

STREET A, FAWN STREET - LOCAL STREET
NTS



SECTION (3) (40' ROW - FULL STREET IMPROVEMENTS)

STREET C - ACCESS LANE
NTS

NOTES

1) BOTH OF THE PROPOSED CUL-DE-SACS HAVE LESS THAN 50% OF THEIR CIRCUMFERENCE COVERED BY DRIVEWAY DROPS.

SHEET C5 OF 8

NO.	DATE	REVISION	BY
-	-	-	-

DESIGNED: CTH
DRAWN: CTH
CHECKED: RLH
APPROVED: RLH

OREGON REGISTERED PROFESSIONAL ENGINEER 69774 RAY L. HOSKINS RENEWAL DATE: 12/31/2022

SCALE VERT: N/A HORIZ: 1"=60'
DATE: 01/26/2018
FILE:19-035-Planning-B1.dwg
LEGAL
SECTION 18 TWP: 2S RANGE: 5E

DEER MEADOWS SUBDIVISION

MASTER STREET AND UTILITY PLAN

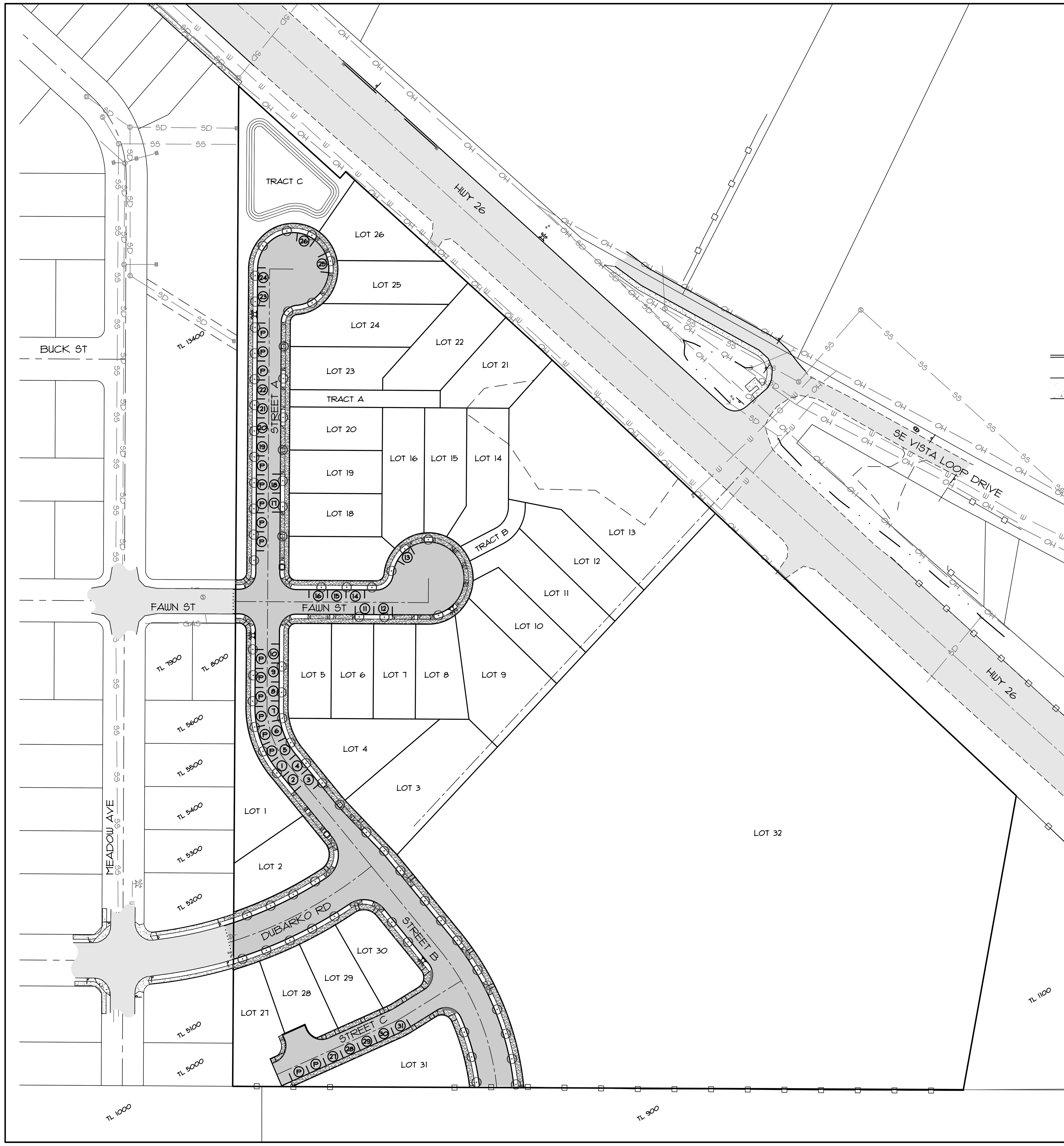
PROJECT:

LOCATION: **40808 & 41010 HWY 26, SANDY, OR 97055**

Surveyors & Planners, Inc.
Surveying, Planning and Engineering
P.O. Box 955, Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT: 05/28/2021

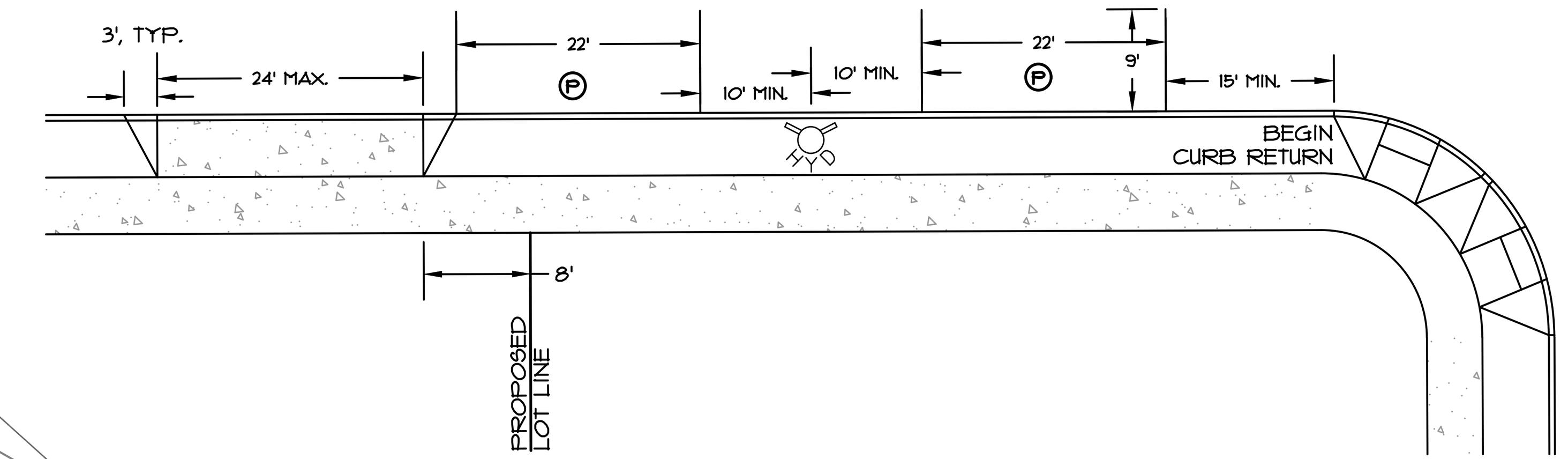
CLIENT:
ROLL TIDE PROPERTIES CORPORATION
PO BOX 1703
CORNELIUS, OR 97113



SCALE : 1" = 60'

0' 30' 60' 120'

TYPICAL ON-STREET PARKING REQUIREMENT DIMENSIONS



ON-STREET PARKING REQUIREMENTS
17.98.200 SDC

REQUIREMENT: 1 ON-STREET PARKING SPACE WITHIN 300 FEET OF EACH DWELLING

REQUIREMENT IS FULFILLED.

TOTAL NUMBER OF LOTS*: 31

TOTAL NUMBER OF ON-STREET PARKING SPACES: 47

* NOTE: LOT 32 IS NOT SUBJECT TO THE ON-STREET PARKING REQUIREMENTS OF 17.98.200 SDC, AND PARKING WILL BE PROVIDED ONSITE AT THE TIME OF FUTURE DEVELOPMENT.

NOTES

1) STREET TREE SPECIES TO BE DICTATED BY CITY PLANNING STAFF AT THE TIME OF PLANTING.

2) LOCATION OF STREET TREES MAY VARY BASED ON FINAL LOCATION OF FUTURE UTILITIES AND DRIVEWAY CUTS.

3) FINAL LOCATION OF MBU'S TO BE DETERMINED BY SANDY POSTMASTER AT THE TIME OF FINAL ENGINEERING.

PARKING LEGEND

- SUBJECT PROPERTY BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED CURB AND PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED UNSTRIPED 22' x 9' ON-STREET PARKING SPACE
- PARKING SPACE NUMBER CORRESPONDING TO LOT NUMBER
- PARKING SPACE THAT EXCEEDS THE REQUIREMENT
- PROPOSED FIRE HYDRANT
- PROPOSED MBU

DATE	NO.	REVISION	BY
-	-	-	-

DESIGNED: CTH
DRAWN: CTH
CHECKED: RLM
APPROVED: RLM

SHEET C6 OF 8

REGISTERED PROFESSIONAL ENGINEER 49710 OREGON JULY 21, 1998 RAY L. MOORE
RENEWAL DATE: 12/31/2022

SCALE: VERT: N/A HORIZ: 1"=60'
DATE: 01/26/2018
FILE: 19-035-Planning-B.dwg

LEGAL		
SECTION	TWP.	RANGE
18	2S	5E

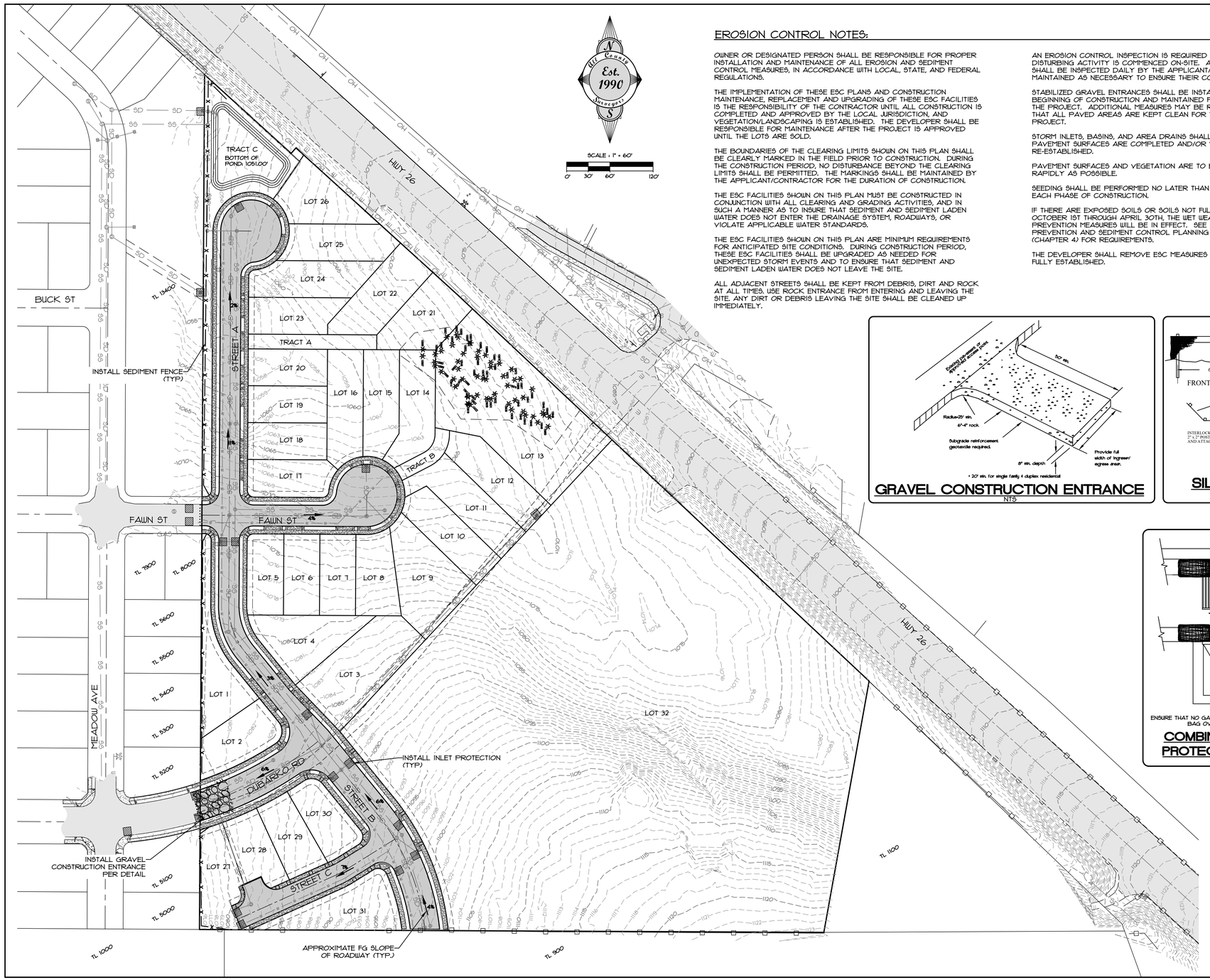
PROJECT:
DEER MEADOWS SUBDIVISION
STREET TREE PLAN & PARKING ANALYSIS

LOCATION: **40808 & 41010 HWY 26, SANDY, OR 97055**

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 05/28/2021

CLIENT:
ROLL TIDE PROPERTIES CORPORATION
PO BOX 703
CORNELIUS, OR 97113



EROSION CONTROL NOTES:

OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED. THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTENANCE AFTER THE PROJECT IS APPROVED UNTIL THE LOTS ARE SOLD.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.

ALL ADJACENT STREETS SHALL BE KEPT FROM DEBRIS, DIRT AND ROCK AT ALL TIMES. USE ROCK ENTRANCE FROM ENTERING AND LEAVING THE SITE. ANY DIRT OR DEBRIS LEAVING THE SITE SHALL BE CLEANED UP IMMEDIATELY.

AN EROSION CONTROL INSPECTION IS REQUIRED BEFORE ANY GROUND DISTURBING ACTIVITY IS COMMENCED ON-SITE. ALSO, THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

STORM INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED.

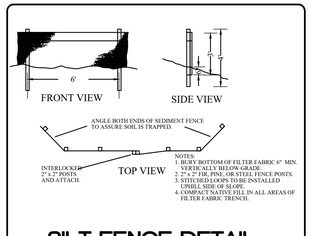
PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.

SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION.

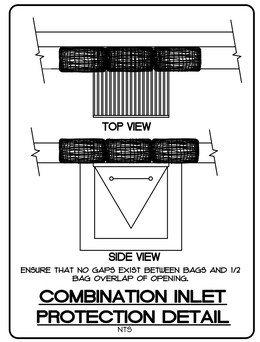
IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE WET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (CHAPTER 4) FOR REQUIREMENTS.

THE DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.

GRAVEL CONSTRUCTION ENTRANCE
NTS



SILT FENCE DETAIL
NTS



COMBINATION INLET PROTECTION DETAIL
NTS

SHEET C7 OF 8

NO.	DATE	REVISION	BY
–	–	–	–

DESIGNED: CTH
DRAWN: CTH
CHECKED: RLM
APPROVED: RLM

OREGON REGISTERED PROFESSIONAL ENGINEER — JULY 14, 2009 — RAY L. MOORE — RENEWAL DATE: 12/31/2022

SCALE — VERT: N/A — HORIZ: 1"=60'
DATE: 01/26/2018
FILE:19-035-Planning-B.dwg
LEGAL — SECTION: 18 — TWP: 2S — RANGE: 5E

PROJECT: **DEER MEADOWS SUBDIVISION**

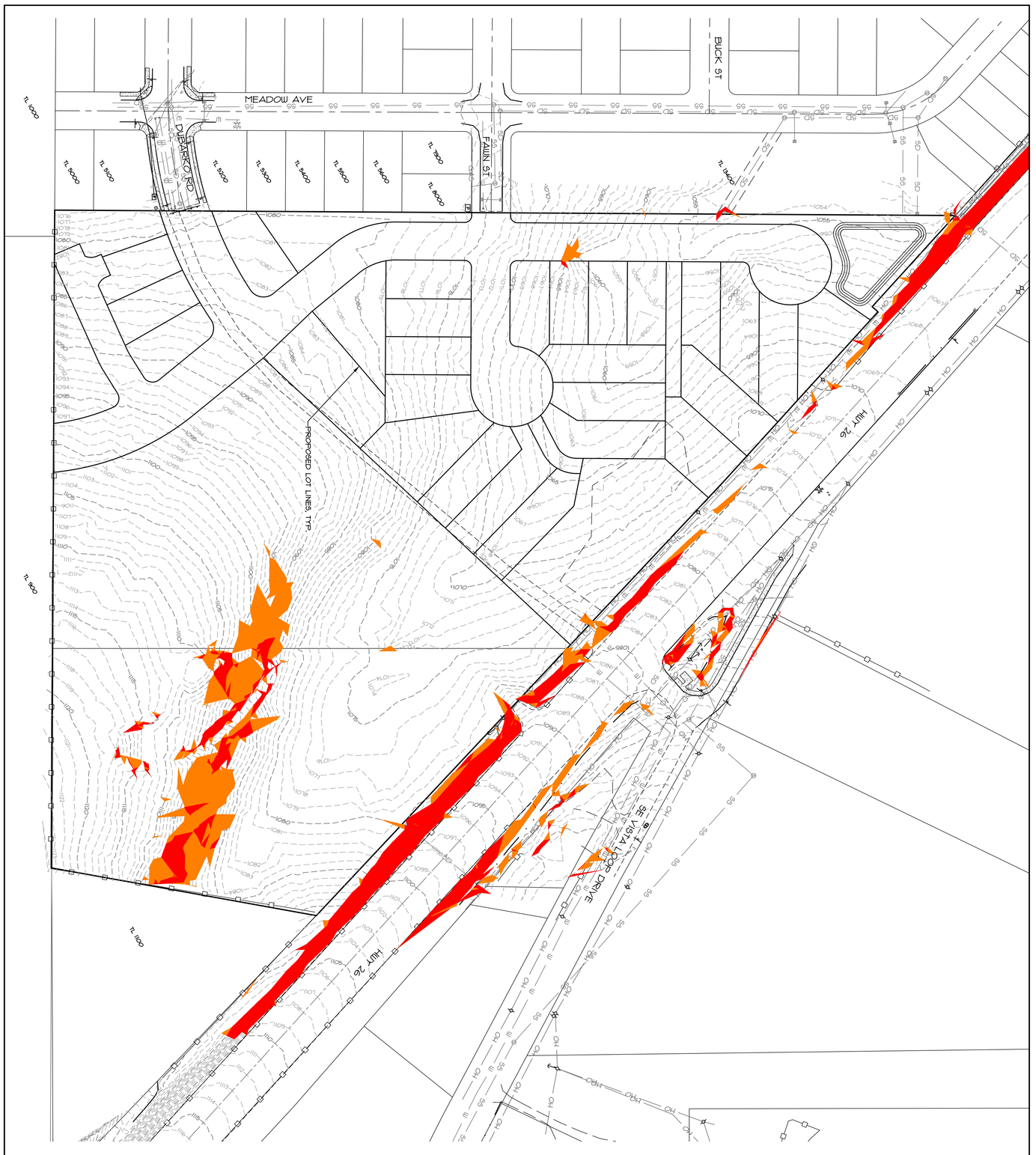
PRELIMINARY GRADING & EROSION CONTROL PLAN

LOCATION: **40808 & 41010 HWY 26, SANDY, OR 97055**

CLIENT:
ROLL TIDE
PROPERTIES CORPORATION
PO BOX 103
CORNELIUS, OR 97113

Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT: 05/28/2021



CLIENT:
ROLL TIDE PROPERTIES CORPORATION
PO BOX 103
CORNELIUS, OR 97113

All County
Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
DATE OF PLOT: 05/28/2021

PROJECT:
DEER MEADOWS SUBDIVISION
SLOPE ANALYSIS

LOCATION:
40808 & 41010 HWY 26, SANDY, OR 97055

SCALE	VERT: N/A HORIZ: 1"=60'
DATE:	07/26/2018
FILE:	19-035-Planning-B.dwg

LEGAL		
SECTION	TWP.	RANGE
18	2S	5E

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 29, 1994
RAY L. MOORE
RENEWAL DATE: 12/31/2022

DATE	NO.	REVISION	BY
–	–	–	–

DESIGNED: CTH
DRAWN: CTH
CHECKED: RLM
APPROVED: RLM

SHEET C8 OF 8

EXHIBIT D

Preliminary Storm Drainage Design and Calculations For the Deer Meadows Subdivision

May, 2021

Prepared By:
All County Surveyors and Planners, Inc.
Tyler Henderson, P.E.
Ray L. Moore, P.E., P.L.S.
P.O. Box 955
Sandy, Oregon 97055
Phone: (503) 668-3151
Job #19-035

Prepared For:
Roll Tide Properties Corporation
Alex Reverman
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Phone: (503) 327-6084

RENEWAL DATE: 12/31/2022

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Project Location and Description..... 2
Proposed Improvements..... 2
Hydrograph Parameters..... 3-4
Detention Sizing Results..... 5
Water Quality Design..... 6
Conclusions..... 6

Appendices:

Appendix A
-Pre-Developed Plan
-Developed Plan

Appendix B
-Standard Formulas
-Coefficients
-Hydrograph Analysis Summary
-Detention System Summary
-Stage Storage Summary
-Rectangular, Sharp Crested Weir Calculations

PURPOSE:

The purpose of this analysis is to:

- Describe existing and proposed site conditions.
- Provide detention calculations for the 2-yr, 5-yr, 10-yr, and 25-yr storm events.
- Provide water quality calculations.

PROJECT LOCATION AND DESCRIPTION:

The project site is located on the south side of the Mount Hood Highway in Sandy, Oregon. The site includes tax lots 900 and 1000. The +/- 15.91-acre site consists of grassy fields, and plentiful tree cover. The land is generally sloped to the north and west with an average slope of about 8%. A Vicinity Map and Site Layout (with proposed storm sewer layout) can be found in Appendix A.

PROPOSED IMPROVEMENTS

The proposed 32-lot Deer Meadows Subdivision project will consist of 29 single-family residential lots ranging from 5,500 SF to 32,189 SF. The project also includes a single split-zoned R-1/R-2 lot 7,076 SF in size, and a single R-2 lot 9,083 SF in size. The final lot is split zoned R-2/C-3 and is 320,409 SF in size. The split-zoned R-2/C-3 lot will be developed in the future under a design review process and will provide it's own stormwater detention/water quality system onsite. The site improvements will include streets, curbs, sidewalks, utilities, etc.

New storm sewer pipes, manholes, and catch basins will be installed to convey storm water to a public detention pond located in Tract C. A new water quality manhole will be installed downstream of the detention pond (See Site Layout – Appendix A).

The pond will be sized to detain the new public streets and the new homes to be built on lots 1 through 31. Lot 32 will provide lot-level detention and water quality systems at the time of future development. Lot 32 will drain through the detention pond, and the pond will be sized to accommodate these anticipated flows. The existing upland drainage on the site will be intercepted and flow through the new storm detention pond.

Upstream and downstream analyses will be performed as needed at the time of final engineering.

HYDROGRAPH PARAMETERS:

Rainfall

The rainfall distribution numbers below were taken from the City of Sandy Stormwater Website: https://www.ci.sandy.or.us/publicworks/page/stormwater

2 year, 24 hr. rainfall = 3.5"
5 year, 24 hr. rainfall = 4.5"
10 year, 24 hr. rainfall = 4.8"
25 year, 24 hr. rainfall = 5.5"

Soils

The soil data for this site is from *Soil Survey of Clackamas County, Oregon* published by the United Stated Department of Agriculture (USDA). The post-development soil is assumed to be the same as pre-development.

Soil Type: 15B, Cazadero silty clay loam. Hydrologic Group "C"
15C, Cazadero silty clay loam. Hydrologic Group "C"
24B, Cottrell silty clay loam. Hydrologic Group "C"

(See next section and Portland SWMM/Sewer and Drainage Facilities Design Manual for CN's)

Areas and Curve Numbers
Drainage basin areas were determined using a topographic map drafted in AutoCAD. See the Pre-Developed Plan and Developed Plan in Appendix A.

The impervious area for these post-developed basins includes the proposed roofs from lots 1 through 31, streets, sidewalks, driveways, and curbs and planters, as well as the un-developed condition of lot 32. See the following tables for a specific breakdown of these areas.

Pre-Development		
Areas	**CN**	**Reference**
Pervious (15.91 acres)	79	Portland SWMM Table A-8. Curve Numbers Type "C" Soils
Impervious (0.00 acres)	98	N/A
Post-Development		
Areas	**CN**	**Land Use Description**
Pervious (11.52 acres)*	76	Portland SDFDM Table 6-5 Non-composite Curve Numbers Lawns with Type "C" Soils, and Table A-8 as above.
Impervious (4.39 acres)**	98	Buildings, AC, Sidewalks, etc.

*Post-Developed Pervious CN: Weighted CN
Undeveloped Type C Soil 7.36 AC: CN = 79
Lawns Type C Soil 4.16 AC: CN = 70
[(7.36AC x 79) + (4.16AC x 70)] / (7.36 + 4.16) = 75.75 = **76.0**

**Refer to Water Quality Design Section for detailed area breakdown.

Time of Concentration
The times of concentrations (Tc), were assumed as follows.

Pre-development T_c= 30.0 minutes
Post-development T_c= 5.0 minutes

Hydrograph Modeling Results
Hydrographs for the site were determined using a spreadsheet based on the King County, Washington Hydrograph Program, version 4.21B, which uses the Santa Barbara Urban Hydrograph (SBUH) method.

DETENTION SIZING RESULTS:

The Post-Development flows were routed through a proposed 3-foot-deep detention pond. The 3-foot-deep detention pond has been designed so that the Post-Developed release rates for the entire site do not exceed the Pre-Developed rates for the 2-year, 5-year, 10-year, and 25-year storm events per the City of Sandy public Works Design Standards. See the Detention System Summary in Appendix B.

Hydrology Table			
Recurrence Interval (years)	**Pre-developed Flows (cfs)**	**Developed Flows (cfs)**	**Proposed Release Rates (cfs)**
2	3.84	7.46	3.73
5	6.37	11.21	6.09
10	7.17	12.39	7.17
25	9.09	15.21	9.09

The required storage volume is 20,016-cubic feet. This can be contained in a 3-foot-deep pond with a bottom area of 5,472 square feet.

Flow Control:

The flow control orifices were designed to release the Post-development Peak-Q's at or below the Pre-developed Peak-Q's.
(See the Detention System Summary - Appendix B)

Orifice Table		
Orifice	**Dia. (inches)**	**Height (feet)**
Bottom	10.72	0.00
Top	weir	weir

WATER QUALITY DESIGN:

CDS Storm Water Treatment Device
A CDS manhole by Contech Stormwater Solutions was designed for water quality for the site - see detail in Appendix B. The impervious area for the site includes AC pavement, sidewalks, and roofs. The impervious area is 4.39-acres.

Proposed asphalt, walks, etc.:	2.26 acres
Roof, Patio, Driveway*:	2.13 acres
Total Impervious Area:	4.39 acres

*40'x60' Building footprint:	2400SF
20'x20' Driveway:	400SF
2-10'x10' Patio:	200SF
Total:	3,000SF X 31 lots = 93,000SF

The flow (Q) from this runoff was calculated using the rational method (Q = CIA)

Where Q = flow (cfs)
C = runoff coefficient = 0.90 pavement and Roofs
I = Intensity = 0.2 inches per hour (Water Quality Design Storm)
A = Impervious Area = 4.39 Acres

Q = 0.90 X 0.2 X 4.39
Q = 0.79 cfs

A Contech Storm Water Treatment Device from the CDS line will be sized to treat the flow from impervious area at the time of final engineering.

CONCLUSIONS:

- The conveyance system for the proposed Deer Meadows Subdivision site has been sized to handle the peak 25-year, 24-hour storm.
- On-site detention has been designed to maintain existing downstream storm water runoff characteristics in accordance with the City of Sandy requirements.
- A CDS Storm Water Treatment Device will be used for water quality.

Appendix A

-Pre-Developed Plan
-Developed Plan

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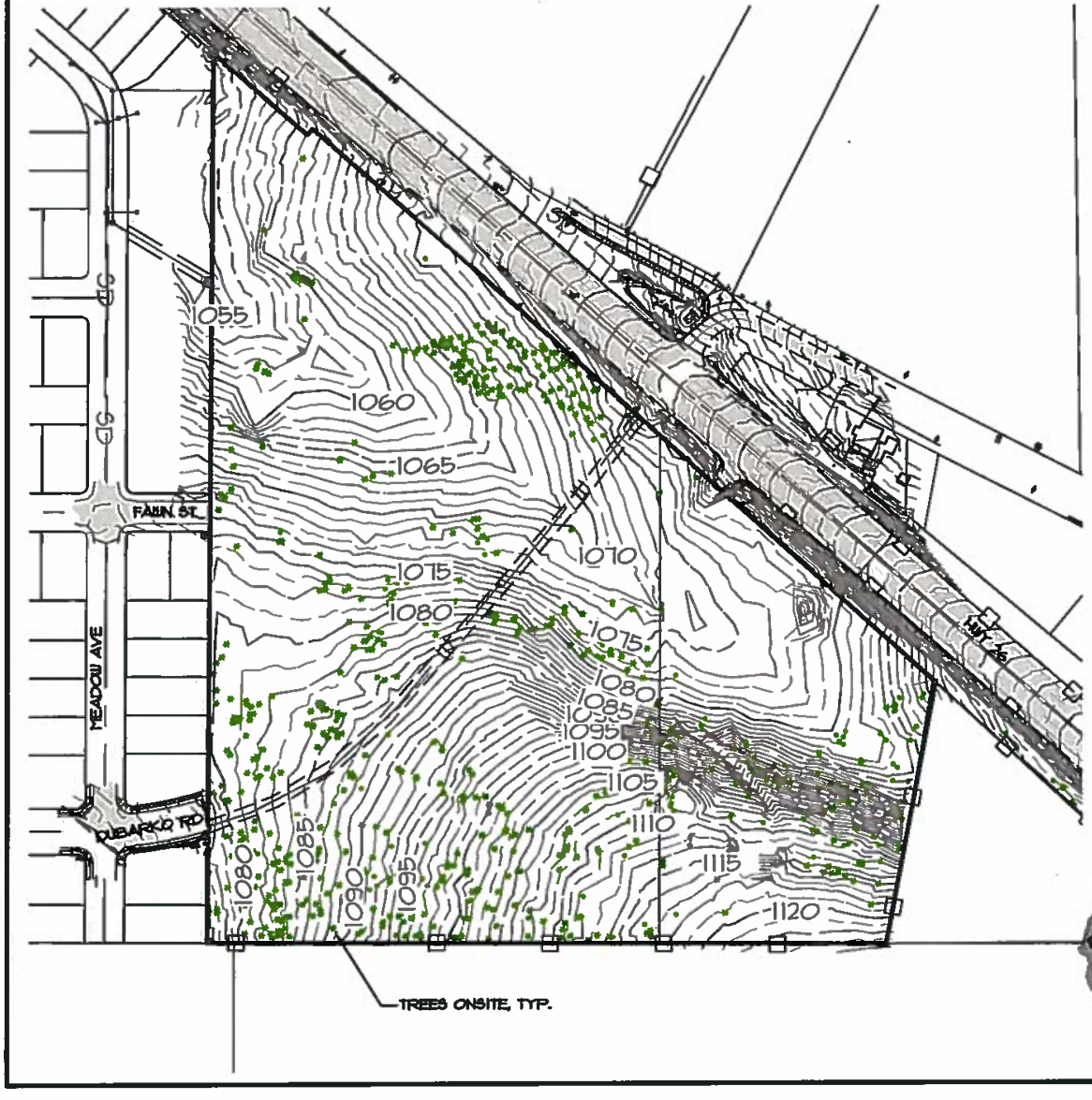
EXISTING CONDITIONS MAP



All County Surveyors Est. 1990

SCALE : 1" = 200'

0' 100' 200' 400'

REGISTERED PROFESSIONAL ENGINEER
49710
OREGON
JULY 21, 1998
RAY L. MOORE

RENEWAL DATE: 12/31/2022

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
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19-035-Planning-B.dwg
DATE OF PLOT: 5/21/21

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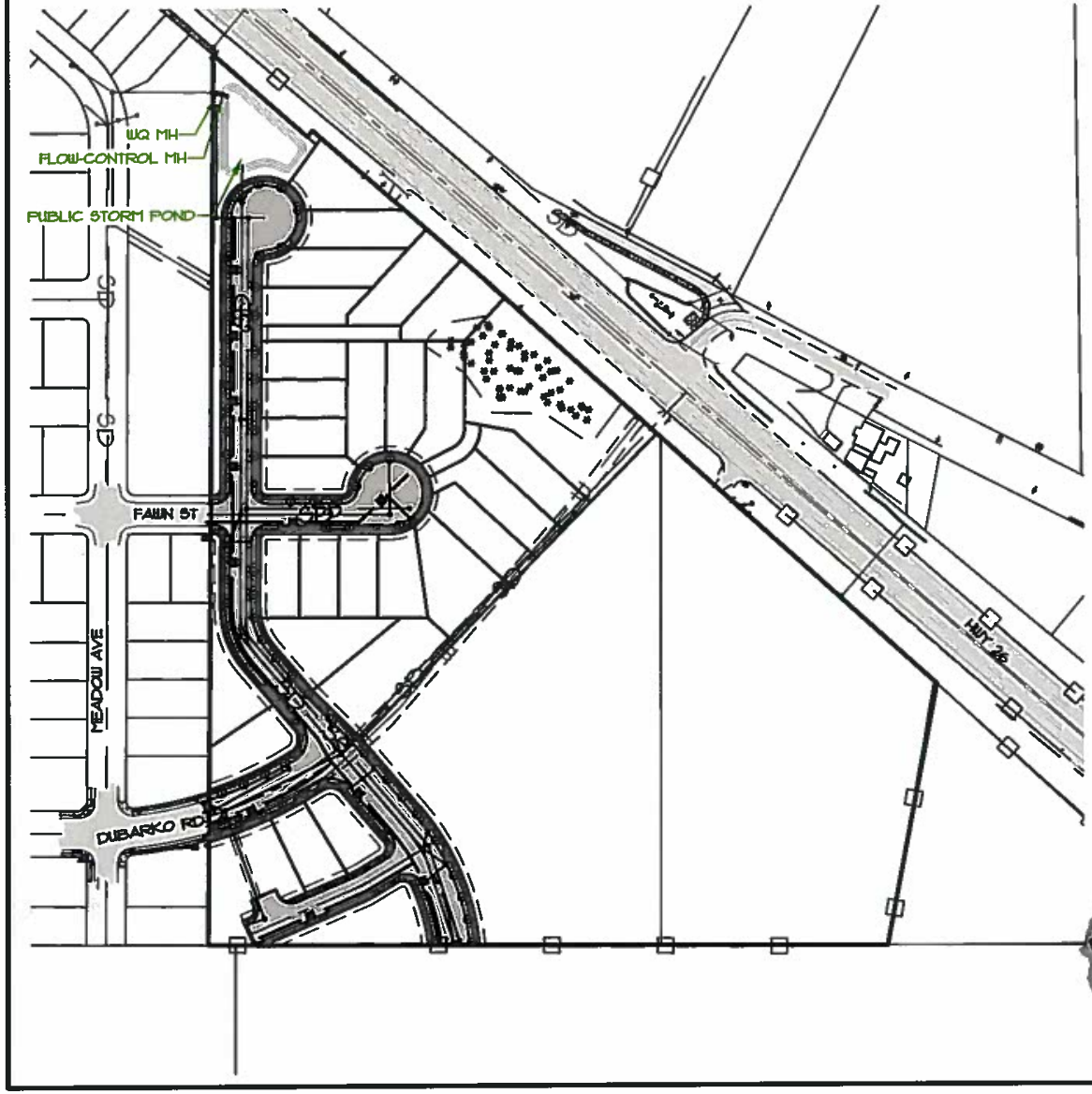
DEVELOPED CONDITIONS MAP



SCALE : 1" = 200'

0' 100' 200' 400'

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19-035-Planning-B.dwg
DATE OF PLOT: 5/21/21

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Appendix B

-Standard Formulas
-Coefficients
-Hydrograph Analysis Summary
-Detention System Summary
-Stage Storage Summary
-Rectangular, Sharp Crested Weir Calculations

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Standard formulas used for the Time of Concentration Calculations

Overland Flow (max 300' total)

$$\frac{(0.42)[(Ns)(L)]^{0.8}}{(P_2)^{0.5}(S_0)^{0.4}}$$

Tc	= time of concentration for less than 300' of travel (minutes)
Ns	= sheet flow Manning's effective roughness coefficient
L	= flow length (ft)
P2	= 2-year, 24 hour rainfall (in)
So	= slope of hydraulic grade line (land slope, ft/ft)

Shallow Concentrated Flow (after initial 300')

$$T = \frac{L}{(60)(k\sqrt{S_0})}$$

T	= travel time for sheet flow (min)
L	= flow length (ft)
So	= slope of hydraulic grade line (land slope, ft/ft)
k	= time of concentration velocity factor (ft/s)

Flow in Swales

Q = (1.486/n) x A x R^2/3 x S^1/2 (Manning's Equation)

Tc	= time of concentration for gutter flow (minutes)
A	= area of flow (sf)
R	= hydraulic radius (ft)
Ls	= side slope
Q	= quantity of flow (ft^3/sec)
V	= average velocity of flow (ft/sec)
L	= length of flow
Ve	= vertical length of side slope
Ho	= horizontal length of side slope
Bw	= base width (in)
D	= depth (in)
S	= slope (ft/ft)
n	= Manning's n

Flow in gutters

$$V = \frac{1.12}{n}(S)^{0.5}(Sx)^{.67}(T)^{0.67}$$

Tc	= time of concentration for gutter flow (minutes)
V	= average velocity of flow (ft/sec)
Q	= quantity of flow (ft^3/sec)
S	= street longitudinal slope (ft/ft)
Sx	= street cross slope (ft/ft)
T	= total width of flow in the gutter (ft)
n	= sheet flow Manning's (pavement = 0.018)
L	= Length of flow (ft)

Flow in pipes

Mannings Equation

Tc	= time of concentration in pipe (minutes)
V	= calculated velocity pipe full (ft/sec)
Q	= quantity of flow (ft^3/sec)
n	= Manning's n
D	= pipe Diameter (in)
S	= slope (ft/ft)
L	= length of pipe

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COEFFICIENTS

Ns = = Manning's coefficient (sheet flow)
n values are for sheet flow only

Design Value	
0.011	Concrete or asphalt
0.010	Bare soil
0.020	Graveled surface
0.020	Bare clay - loam (eroded)
0.150	Grass (short prairie)
0.240	Grass (dense lawn)
0.410	Grass (bermuda)
0.400	Woods (light underbrush)
0.800	Woods (dense underbrush)

k = = time of concentration velocity factor (ft/s)

Design Value	
3	Forest with heavy ground cover and meadows (n=0.10)
5	Brushy ground with some trees (n=0.060)
8	Fallow or cultivation (n=0.040)
9	High grass (n=0.035)
11	Short grass, pasture or lawns (n=0.030)
13	Nearly bare ground (n=0.025)
27	Paved and gravel areas (n=0.012)

n = = Manning's coefficient (channel)

Design Value	
	CONSTRUCTED CHANNELS
	A. Earth, straight and uniform
0.018	Earth (straight and uniform)
0.025	Gravel (straight and uniform)
0.027	Grass (with weeds)
	B. Earth, winding and sluggish
0.025	Earth (no vegetation)
0.030	Grass (some weeds)
0.035	Dense weeds (deep channel)
0.030	Earth (rubble bottom and sides)
0.035	Stony bottom and weedy banks
0.040	Cobble bottom with clean sides
	C. Rock lined
0.035	Smooth and uniform
0.040	Jagged and irregular
	D. Channels not maintained (weeds and brush uncut)
0.050	Dense weeds (high as flow depth)
0.050	Clean bottom (brush on sides)
0.100	Dense brush (high stage)
0.200	Water quality swales (mowed regulary)
	NATURAL STREAMS
0.029	Clean (straight no pools)
0.035	Clean (straight no pools with weeds and stones)
0.039	Clean (winding pools)
0.042	Clean (winding pools weeds and stones)
0.052	Clean (winding pools weeds and large stones)
0.065	Weedy (sluggish with deep pools)
0.112	Very weedy (sluggish with deep pools)

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Project Name: Deer Meadows
Hydrograph Analysis Summary

Job # 19-035
Date: 5/28/2021

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50
100	0.00

Pre-Developed

Pervious		
Area =	15.91	acres
CN =	79	na
Impervious		
Area =	0	acres
CN =	98	na
Tc =	30	min
Total A =	15.91	acres

Developed

Pervious		
Area =	11.52	acres
CN =	76	na
Impervious		
Area =	4.39	acres
CN =	98	na
Tc =	5	min
Total A =	15.91	acres

Note: The hydrographs shown are based on the S.C.S. Type - 1A, 24 hour storm using the SBUH method based on the King County Model.

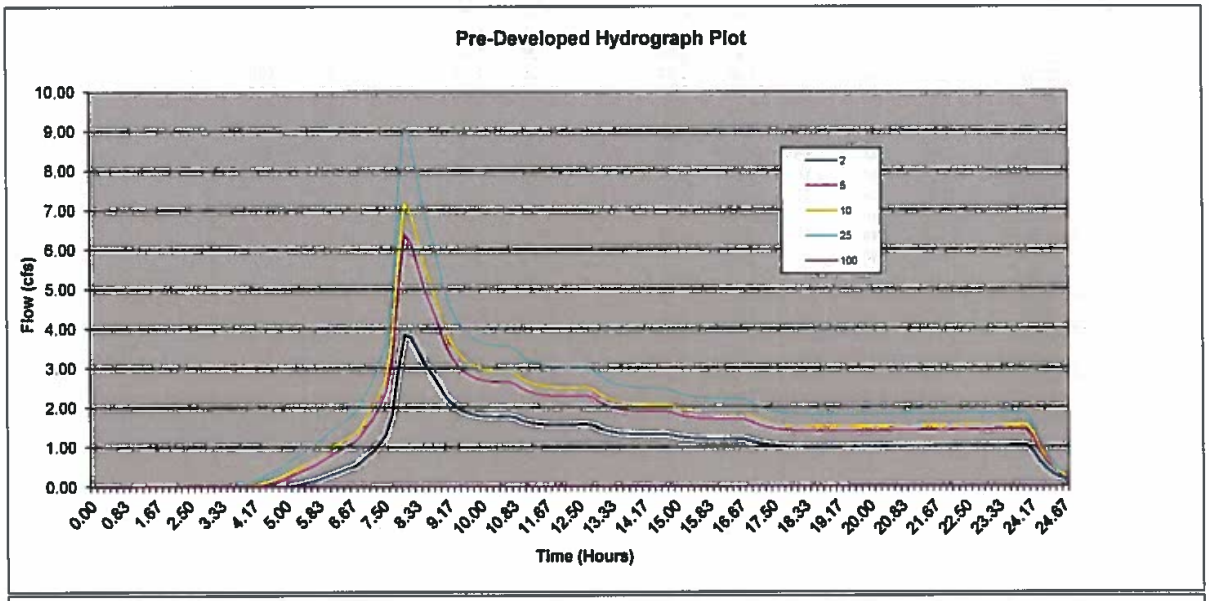
		Pre-Developed Hydrographs					Developed Hydrographs				
Year ========>		2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	3.84	6.37	7.17	9.09	0.00	7.46	11.21	12.39	15.21	0.00
Volume	cf =>	90,144	136,837	151,461	186,400	-	109,099	156,947	171,829	207,283	-
Tpeak	min =>	480	480	480	480	10	470	470	470	470	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.04	0.00
40	0.67	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.07	0.12	0.00
50	0.83	0.00	0.00	0.00	0.00	0.00	0.05	0.12	0.14	0.20	0.00
60	1.00	0.00	0.00	0.00	0.00	0.00	0.09	0.17	0.19	0.26	0.00
70	1.17	0.00	0.00	0.00	0.00	0.00	0.12	0.21	0.23	0.30	0.00
80	1.33	0.00	0.00	0.00	0.00	0.00	0.14	0.24	0.27	0.34	0.00
90	1.50	0.00	0.00	0.00	0.00	0.00	0.17	0.27	0.30	0.37	0.00
100	1.67	0.00	0.00	0.00	0.00	0.00	0.19	0.29	0.32	0.40	0.00
110	1.83	0.00	0.00	0.00	0.00	0.00	0.23	0.35	0.39	0.47	0.00
120	2.00	0.00	0.00	0.00	0.00	0.00	0.28	0.41	0.45	0.55	0.00
130	2.17	0.00	0.00	0.00	0.00	0.00	0.30	0.43	0.47	0.57	0.00
140	2.33	0.00	0.00	0.00	0.00	0.00	0.31	0.45	0.49	0.59	0.00
150	2.50	0.00	0.00	0.00	0.00	0.00	0.33	0.46	0.51	0.60	0.00
160	2.67	0.00	0.00	0.00	0.00	0.00	0.34	0.48	0.52	0.62	0.00
170	2.83	0.00	0.00	0.00	0.00	0.00	0.36	0.54	0.58	0.69	0.00
180	3.00	0.00	0.00	0.00	0.00	0.00	0.43	0.60	0.65	0.77	0.00
190	3.17	0.00	0.00	0.00	0.00	0.00	0.44	0.61	0.66	0.78	0.00
200	3.33	0.00	0.00	0.00	0.00	0.00	0.45	0.62	0.67	0.79	0.00
210	3.50	0.00	0.00	0.00	0.00	0.00	0.46	0.63	0.68	0.80	0.00
220	3.67	0.00	0.00	0.00	0.01	0.00	0.47	0.64	0.69	0.80	0.00
230	3.83	0.00	0.00	0.00	0.05	0.00	0.52	0.70	0.75	0.88	0.00
240	4.00	0.00	0.00	0.01	0.10	0.00	0.56	0.76	0.82	0.96	0.00
250	4.17	0.00	0.01	0.04	0.17	0.00	0.57	0.77	0.82	1.01	0.00
260	4.33	0.00	0.03	0.08	0.24	0.00	0.58	0.77	0.83	1.07	0.00
270	4.50	0.00	0.07	0.13	0.32	0.00	0.58	0.78	0.86	1.14	0.00
280	4.67	0.00	0.11	0.19	0.40	0.00	0.59	0.79	0.91	1.20	0.00
290	4.83	0.00	0.17	0.26	0.50	0.00	0.64	0.91	1.04	1.38	0.00
300	5.00	0.01	0.24	0.34	0.61	0.00	0.70	1.04	1.19	1.56	0.00
310	5.17	0.03	0.31	0.43	0.72	0.00	0.70	1.10	1.25	1.63	0.00
320	5.33	0.06	0.39	0.51	0.83	0.00	0.71	1.15	1.31	1.71	0.00
330	5.50	0.10	0.46	0.59	0.93	0.00	0.72	1.21	1.37	1.77	0.00
340	5.67	0.15	0.54	0.68	1.03	0.00	0.75	1.26	1.43	1.84	0.00
350	5.83	0.20	0.63	0.78	1.16	0.00	0.86	1.42	1.61	2.08	0.00
360	6.00	0.26	0.73	0.90	1.31	0.00	0.97	1.59	1.79	2.29	0.00
370	6.17	0.32	0.84	1.01	1.45	0.00	1.01	1.65	1.86	2.37	0.00
380	6.33	0.39	0.93	1.12	1.58	0.00	1.06	1.71	1.92	2.44	0.00
390	6.50	0.45	1.02	1.21	1.70	0.00	1.10	1.77	1.99	2.51	0.00
400	6.67	0.51	1.11	1.31	1.81	0.00	1.15	1.83	2.05	2.58	0.00
410	6.83	0.61	1.27	1.50	2.04	0.00	1.43	2.27	2.54	3.19	0.00
420	7.00	0.75	1.51	1.76	2.37	0.00	1.74	2.73	3.05	3.83	0.00
430	7.17	0.88	1.71	1.98	2.65	0.00	1.81	2.83	3.16	3.94	0.00
440	7.33	1.07	2.02	2.32	3.07	0.00	2.23	3.46	3.85	4.79	0.00
450	7.50	1.32	2.40	2.76	3.61	0.00	2.67	4.11	4.57	5.67	0.00
460	7.67	1.83	3.22	3.67	4.76	0.00	4.10	6.25	6.93	8.55	0.00
470	7.83	3.00	5.09	5.76	7.38	0.00	7.46	11.21	12.39	15.21	0.00
480	8.00	3.84	6.37	7.17	9.09	0.00	7.23	10.78	11.88	14.53	0.00
490	8.17	3.77	6.17	6.93	8.74	0.00	4.24	6.26	6.89	8.38	0.00
500	8.33	3.44	5.57	6.24	7.84	0.00	3.04	4.46	4.91	5.95	0.00
510	8.50	3.12	5.00	5.58	6.99	0.00	2.65	3.87	4.25	5.15	0.00
520	8.67	2.90	4.60	5.13	6.41	0.00	2.69	3.92	4.30	5.20	0.00

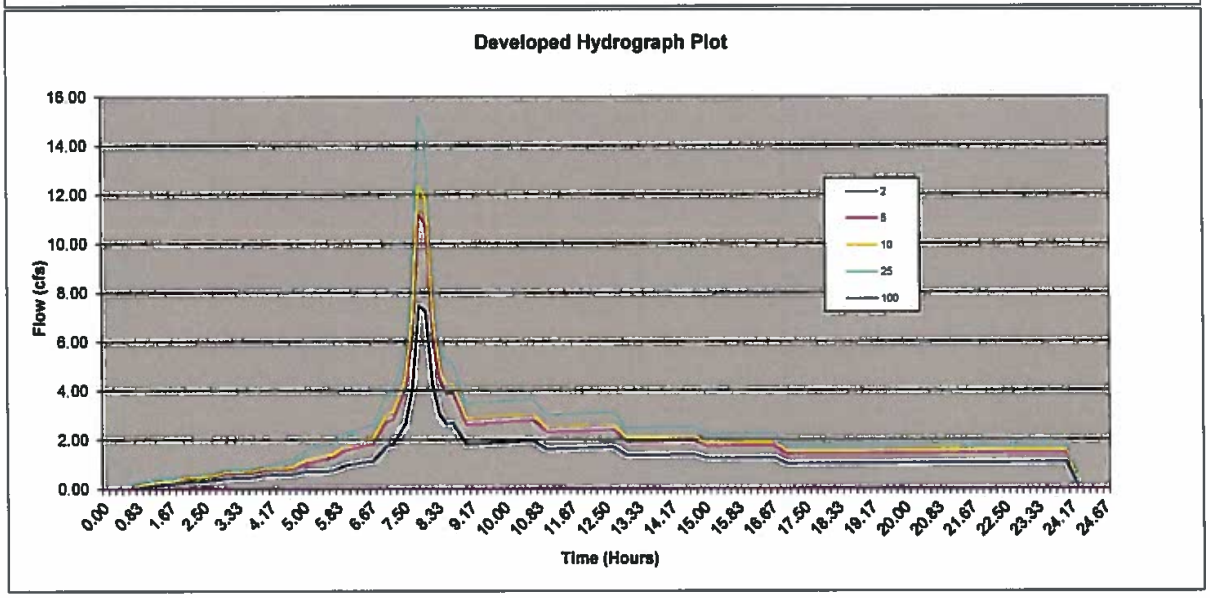
		Pre-Developed Hydrographs					Developed Hydrographs				
Year	==========>	2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	3.84	6.37	7.17	9.09	0.00	7.46	11.21	12.39	15.21	0.00
Volume	cf =>	90,144	136,837	151,481	186,400	-	109,099	158,947	171,629	207,283	-
Tpeak	min =>	480	480	480	480	10	470	470	470	470	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
530	8.83	2.64	4.15	4.63	5.76	0.00	2.25	3.28	3.60	4.35	0.00
540	9.00	2.34	3.66	4.08	5.06	0.00	1.81	2.63	2.88	3.47	0.00
550	9.17	2.14	3.32	3.69	4.57	0.00	1.82	2.64	2.90	3.50	0.00
560	9.33	1.99	3.08	3.42	4.22	0.00	1.84	2.66	2.92	3.52	0.00
570	9.50	1.90	2.92	3.24	3.98	0.00	1.86	2.68	2.94	3.54	0.00
580	9.67	1.84	2.81	3.11	3.82	0.00	1.87	2.70	2.95	3.56	0.00
590	9.83	1.80	2.74	3.03	3.71	0.00	1.89	2.72	2.97	3.58	0.00
600	10.00	1.78	2.69	2.97	3.64	0.00	1.90	2.73	2.99	3.59	0.00
610	10.17	1.77	2.66	2.94	3.59	0.00	1.92	2.75	3.01	3.61	0.00
620	10.33	1.76	2.65	2.92	3.57	0.00	1.93	2.77	3.02	3.63	0.00
630	10.50	1.77	2.65	2.92	3.55	0.00	1.94	2.78	3.04	3.65	0.00
640	10.67	1.77	2.65	2.92	3.55	0.00	1.96	2.80	3.06	3.66	0.00
650	10.83	1.74	2.59	2.85	3.46	0.00	1.79	2.56	2.79	3.34	0.00
660	11.00	1.67	2.48	2.72	3.31	0.00	1.62	2.31	2.52	3.02	0.00
670	11.17	1.62	2.40	2.64	3.20	0.00	1.63	2.32	2.53	3.03	0.00
680	11.33	1.59	2.35	2.58	3.13	0.00	1.64	2.33	2.54	3.04	0.00
690	11.50	1.57	2.32	2.55	3.08	0.00	1.65	2.34	2.55	3.05	0.00
700	11.67	1.56	2.30	2.52	3.05	0.00	1.66	2.35	2.56	3.06	0.00
710	11.83	1.56	2.29	2.51	3.03	0.00	1.66	2.36	2.57	3.07	0.00
720	12.00	1.55	2.28	2.50	3.02	0.00	1.67	2.37	2.58	3.08	0.00
730	12.17	1.56	2.28	2.50	3.02	0.00	1.68	2.38	2.59	3.09	0.00
740	12.33	1.56	2.28	2.50	3.02	0.00	1.69	2.39	2.60	3.10	0.00
750	12.50	1.57	2.29	2.51	3.02	0.00	1.69	2.39	2.61	3.11	0.00
760	12.67	1.57	2.29	2.51	3.03	0.00	1.70	2.40	2.62	3.12	0.00
770	12.83	1.53	2.23	2.45	2.94	0.00	1.53	2.16	2.35	2.80	0.00
780	13.00	1.46	2.12	2.32	2.79	0.00	1.36	1.91	2.08	2.48	0.00
790	13.17	1.41	2.04	2.24	2.69	0.00	1.36	1.92	2.09	2.49	0.00
800	13.33	1.37	1.99	2.18	2.62	0.00	1.37	1.92	2.09	2.49	0.00
810	13.50	1.35	1.95	2.14	2.57	0.00	1.37	1.93	2.10	2.50	0.00
820	13.67	1.33	1.93	2.11	2.53	0.00	1.38	1.93	2.10	2.50	0.00
830	13.83	1.32	1.91	2.09	2.51	0.00	1.38	1.94	2.11	2.51	0.00
840	14.00	1.32	1.90	2.08	2.49	0.00	1.38	1.94	2.11	2.51	0.00
850	14.17	1.32	1.90	2.07	2.49	0.00	1.39	1.95	2.12	2.52	0.00
860	14.33	1.32	1.90	2.07	2.48	0.00	1.39	1.95	2.12	2.52	0.00
870	14.50	1.32	1.89	2.07	2.48	0.00	1.40	1.96	2.13	2.53	0.00
880	14.67	1.32	1.90	2.07	2.48	0.00	1.40	1.96	2.13	2.53	0.00
890	14.83	1.30	1.87	2.04	2.44	0.00	1.32	1.84	2.00	2.38	0.00
900	15.00	1.26	1.81	1.98	2.36	0.00	1.24	1.73	1.88	2.23	0.00
910	15.17	1.24	1.77	1.94	2.31	0.00	1.24	1.73	1.88	2.23	0.00
920	15.33	1.22	1.75	1.91	2.28	0.00	1.24	1.73	1.88	2.23	0.00
930	15.50	1.21	1.73	1.89	2.26	0.00	1.24	1.74	1.89	2.24	0.00
940	15.67	1.20	1.72	1.87	2.24	0.00	1.25	1.74	1.89	2.24	0.00
950	15.83	1.20	1.71	1.87	2.23	0.00	1.25	1.74	1.89	2.24	0.00
960	16.00	1.20	1.71	1.86	2.22	0.00	1.25	1.75	1.90	2.25	0.00
970	16.17	1.20	1.71	1.86	2.22	0.00	1.26	1.75	1.90	2.25	0.00
980	16.33	1.20	1.71	1.86	2.22	0.00	1.26	1.75	1.90	2.25	0.00
990	16.50	1.20	1.71	1.86	2.22	0.00	1.26	1.76	1.91	2.26	0.00
1000	16.67	1.20	1.71	1.86	2.22	0.00	1.26	1.76	1.91	2.26	0.00
1010	16.83	1.17	1.66	1.81	2.16	0.00	1.14	1.59	1.72	2.04	0.00
1020	17.00	1.11	1.58	1.72	2.05	0.00	1.02	1.41	1.53	1.81	0.00
1030	17.17	1.07	1.52	1.66	1.97	0.00	1.02	1.41	1.53	1.81	0.00
1040	17.33	1.04	1.48	1.61	1.92	0.00	1.02	1.41	1.53	1.82	0.00
1050	17.50	1.03	1.45	1.58	1.88	0.00	1.02	1.42	1.54	1.82	0.00
1060	17.67	1.01	1.43	1.56	1.86	0.00	1.02	1.42	1.54	1.82	0.00
1070	17.83	1.00	1.42	1.55	1.84	0.00	1.02	1.42	1.54	1.82	0.00
1080	18.00	1.00	1.41	1.54	1.83	0.00	1.03	1.42	1.54	1.82	0.00
1090	18.17	0.99	1.40	1.53	1.82	0.00	1.03	1.42	1.54	1.82	0.00
1100	18.33	0.99	1.40	1.52	1.81	0.00	1.03	1.43	1.55	1.83	0.00
1110	18.50	0.99	1.40	1.52	1.81	0.00	1.03	1.43	1.55	1.83	0.00
1120	18.67	0.99	1.40	1.52	1.81	0.00	1.03	1.43	1.55	1.83	0.00
1130	18.83	0.99	1.40	1.52	1.81	0.00	1.03	1.43	1.55	1.83	0.00
1140	19.00	0.99	1.40	1.52	1.81	0.00	1.03	1.43	1.55	1.83	0.00
1150	19.17	0.99	1.40	1.52	1.81	0.00	1.04	1.43	1.55	1.83	0.00
1160	19.33	0.99	1.40	1.52	1.81	0.00	1.04	1.44	1.56	1.84	0.00
1170	19.50	1.00	1.40	1.52	1.81	0.00	1.04	1.44	1.56	1.84	0.00
1180	19.67	1.00	1.40	1.53	1.81	0.00	1.04	1.44	1.56	1.84	0.00
1190	19.83	1.00	1.41	1.53	1.81	0.00	1.04	1.44	1.56	1.84	0.00
1200	20.00	1.00	1.41	1.53	1.81	0.00	1.04	1.44	1.56	1.84	0.00
1210	20.17	1.00	1.41	1.53	1.82	0.00	1.05	1.44	1.56	1.84	0.00
1220	20.33	1.00	1.41	1.53	1.82	0.00	1.05	1.45	1.57	1.85	0.00
1230	20.50	1.01	1.41	1.53	1.82	0.00	1.05	1.45	1.57	1.85	0.00

		Pre-Developed Hydrographs					Developed Hydrographs				
Year ==========>		2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	3.84	6.37	7.17	9.09	0.00	7.46	11.21	12.39	15.21	0.00
Volume	cf =>	90,144	138,837	151,461	188,400	-	109,099	156,947	171,629	207,263	-
Tpeak	min =>	480	480	480	480	10	470	470	470	470	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
1240	20.67	1.01	1.41	1.54	1.82	0.00	1.05	1.45	1.57	1.85	0.00
1250	20.83	1.01	1.42	1.54	1.82	0.00	1.05	1.45	1.57	1.85	0.00
1260	21.00	1.01	1.42	1.54	1.83	0.00	1.05	1.45	1.57	1.85	0.00
1270	21.17	1.01	1.42	1.54	1.83	0.00	1.05	1.45	1.57	1.85	0.00
1280	21.33	1.02	1.42	1.54	1.83	0.00	1.06	1.45	1.57	1.86	0.00
1290	21.50	1.02	1.42	1.55	1.83	0.00	1.06	1.46	1.58	1.86	0.00
1300	21.67	1.02	1.43	1.55	1.83	0.00	1.06	1.46	1.58	1.86	0.00
1310	21.83	1.02	1.43	1.55	1.83	0.00	1.06	1.46	1.58	1.86	0.00
1320	22.00	1.02	1.43	1.55	1.84	0.00	1.06	1.46	1.58	1.86	0.00
1330	22.17	1.02	1.43	1.55	1.84	0.00	1.06	1.46	1.58	1.86	0.00
1340	22.33	1.03	1.43	1.55	1.84	0.00	1.06	1.46	1.58	1.86	0.00
1350	22.50	1.03	1.43	1.56	1.84	0.00	1.07	1.46	1.58	1.87	0.00
1360	22.67	1.03	1.44	1.56	1.84	0.00	1.07	1.47	1.59	1.87	0.00
1370	22.83	1.03	1.44	1.56	1.84	0.00	1.07	1.47	1.59	1.87	0.00
1380	23.00	1.03	1.44	1.56	1.85	0.00	1.07	1.47	1.59	1.87	0.00
1390	23.17	1.03	1.44	1.56	1.85	0.00	1.07	1.47	1.59	1.87	0.00
1400	23.33	1.04	1.44	1.56	1.85	0.00	1.07	1.47	1.59	1.87	0.00
1410	23.50	1.04	1.44	1.57	1.85	0.00	1.07	1.47	1.59	1.87	0.00
1420	23.67	1.04	1.45	1.57	1.85	0.00	1.07	1.47	1.59	1.88	0.00
1430	23.83	1.04	1.45	1.57	1.85	0.00	1.08	1.48	1.60	1.88	0.00
1440	24.00	1.04	1.45	1.57	1.85	0.00	1.08	1.48	1.60	1.88	0.00
1450	24.17	0.89	1.24	1.35	1.59	0.00	0.54	0.74	0.80	0.94	0.00
1460	24.33	0.64	0.89	0.96	1.14	0.00	0.00	0.00	0.00	0.00	0.00
1470	24.50	0.46	0.63	0.69	0.81	0.00	0.00	0.00	0.00	0.00	0.00
1480	24.67	0.33	0.45	0.49	0.58	0.00	0.00	0.00	0.00	0.00	0.00
1490	24.67	0.23	0.32	0.35	0.41	0.00	0.00	0.00	0.00	0.00	0.00
1500	24.67	0.17	0.23	0.25	0.30	0.00	0.00	0.00	0.00	0.00	0.00

Pre-Developed Hydrographs						
Year	==========>	2	5	10	25	100
Qpeak	cfs =>	3.84	6.37	7.17	9.09	0.00
Volume	cf =>	90,144	136,837	151,461	186,400	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)

Developed Hydrographs				
2	5	10	25	100
7.45	11.21	12.39	15.21	0.00
109,099	158,947	171,829	207,283	-
470	470	470	470	10
7.83	7.83	7.83	7.83	0.17
2	5	10	25	100
Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)



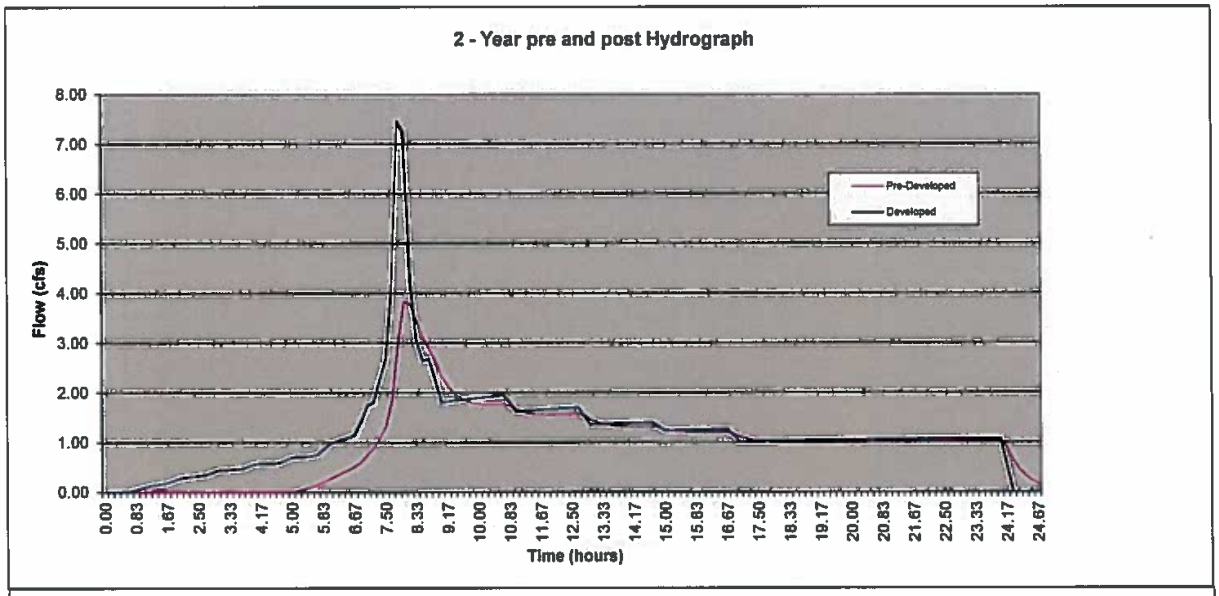


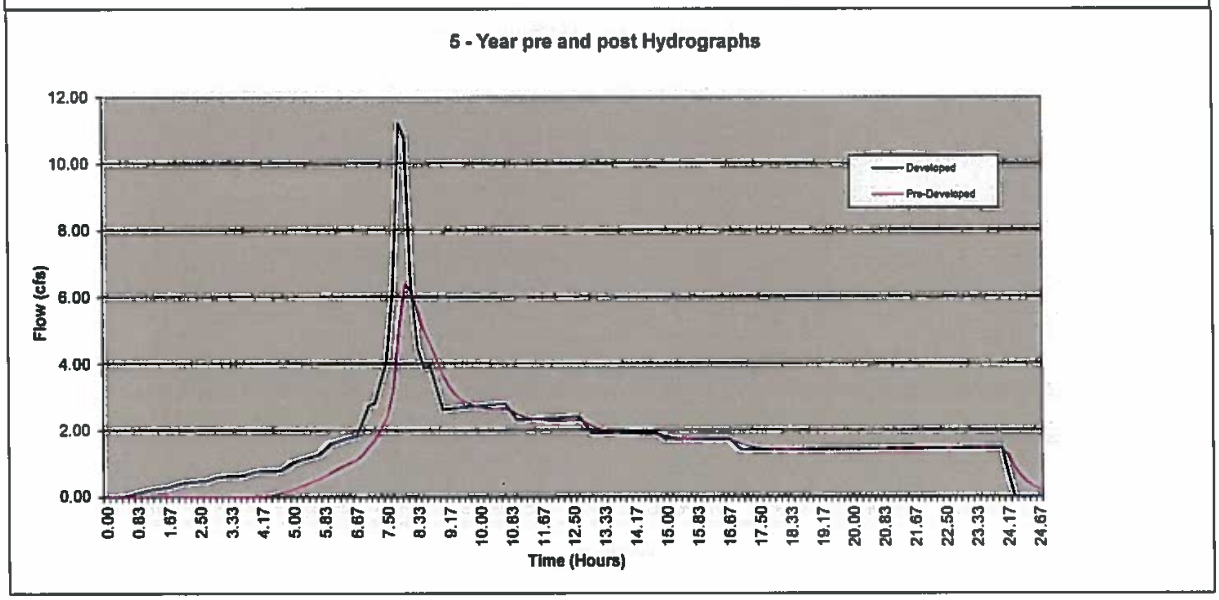
Pre-Developed Hydrographs

Year ==========>		2	5	10	25	100
Qpeak	cfs =>	3.84	6.37	7.17	9.09	0.00
Volume	cf =>	90,144	136,837	151,461	188,400	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)

Developed Hydrographs

2	5	10	25	100
7.46	11.21	12.39	15.21	0.00
109,099	156,947	171,829	207,263	-
470	470	470	470	10
7.83	7.83	7.83	7.83	0.17
2	5	10	25	100
Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)



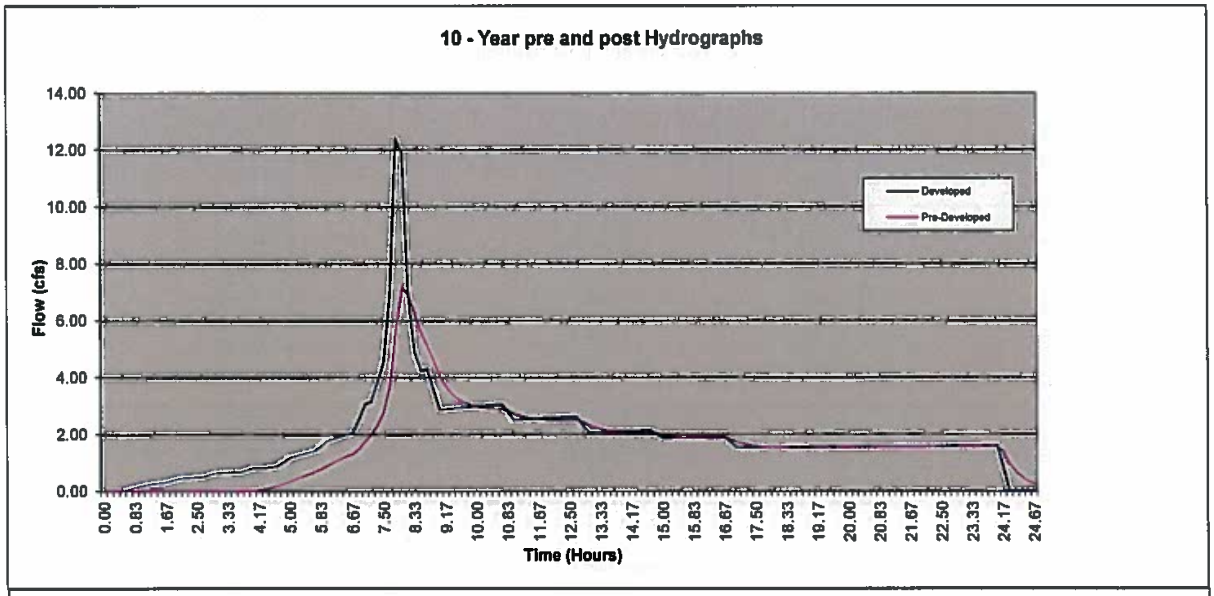


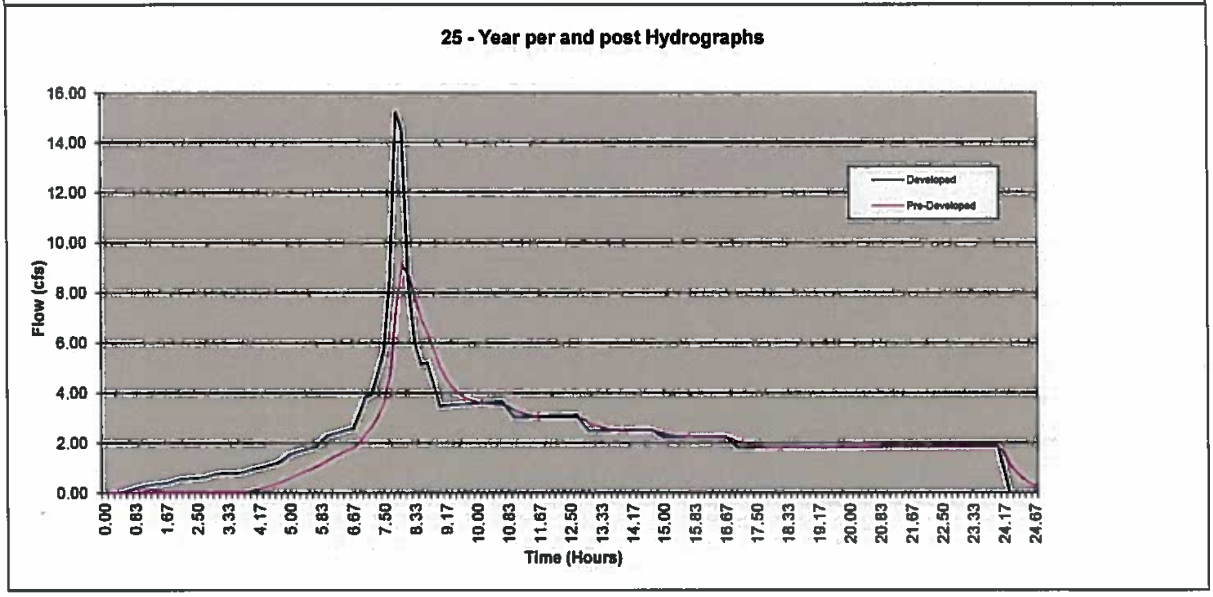
Pre-Developed Hydrographs

Year ==========>		2	5	10	25	100
Qpeak	cfs =>	3.84	5.37	7.17	9.09	0.00
Volume	cf =>	90,144	138,837	151,461	188,400	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)

Developed Hydrographs

2	5	10	25	100
7.46	11.21	12.39	15.21	0.00
109,099	156,947	171,629	207,263	-
470	470	470	470	10
7.83	7.83	7.83	7.83	0.17
2	5	10	25	100
Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)



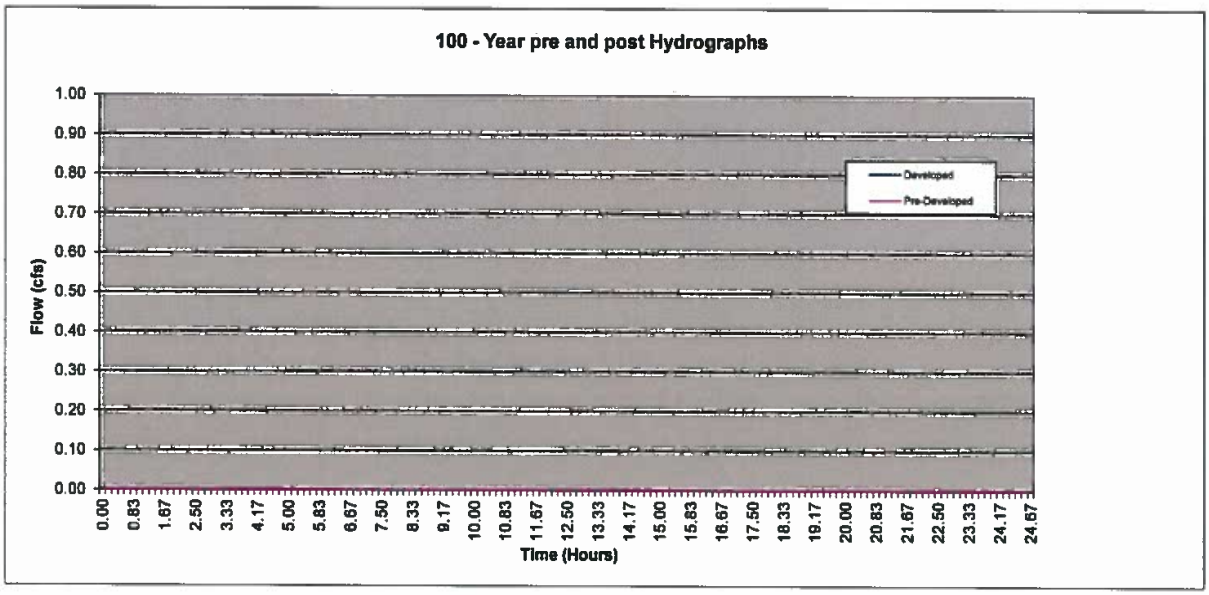


Pre-Developed Hydrographs

Year ========>		2	5	10	25	100
Qpeak	cfs =>	3.84	6.37	7.17	9.09	0.00
Volume	cf =>	90,144	138,837	151,461	186,400	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)

Developed Hydrographs

2	5	10	25	100
7.46	11.21	12.39	15.21	0.00
109,099	156,947	171,829	207,263	-
470	470	470	470	10
7.83	7.83	7.83	7.83	0.17
2	5	10	25	100
Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)



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Project Name:	Deer Meadows
Detention System Summary	
Job #	19-035
Date:	5/28/2021

Note: The detention system design is based on the King County Model "Facility Design Routine".

1) Detention Facility Design Input:

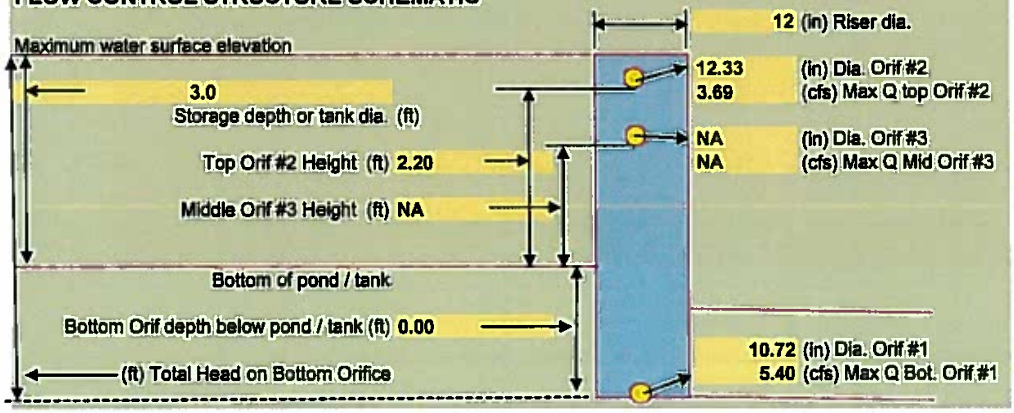
2) Type of facility:	DETENTION POND		
3) Pond side slopes:	3	to 1	
4) Pond storage depth:	3	ft (from bottom of pond to overflow)	
5) Vertical permeability	0	min/in	
6) Number of orifices:	2		
7) Riser dia. =>	12	in	
8) Orifice coefficient	0.62	(typically 0.62)	
9) IE - bottom orifice:	0	ft (distance below bottom of pond - Negative #)	
10) Max Q Bottom Orif. #1	5.40	cfs	
11) Top Orif #2 Height =	2.2	ft	
12) Max Q Mid Orif. #3	0.00	cfs	Orifice not being used
13) Mid Orif #3 Height =	0.00	ft	Orifice not being used

Detention Facility Design Results:

Performance year	Developed Inflow cfs	Pre-Developed Outflow cfs	Actual Outflow cfs	Peak Stage ft	Storage cf
100	0	0	0	0	-
25	15.21	9.09	9.09	3.00	20,016
10	12.39	7.17	7.17	2.50	16,021
5	11.21	6.37	6.09	2.31	14,602
2	7.46	3.84	3.73	1.43	8,474
			Required Storage ====		20,016

	Bottom Orif.	Middle Orif.	Top Orif.	Optional Weir Design (for top orifice)
Total Q =	5.40	0.00	3.69	
Head (ft) =	3.00	0.00	0.80	1.83 La (ft)
Dist. from bottom of pond (ft) =	0.00	NA	2.20	209.85 < deg.
Orif. Dia. (in) =	10.72	0.00	12.33	Must Use Weir

FLOW CONTROL STRUCTURE SCHEMATIC



Project Name:	Deer Meadows

Detention Facility Type

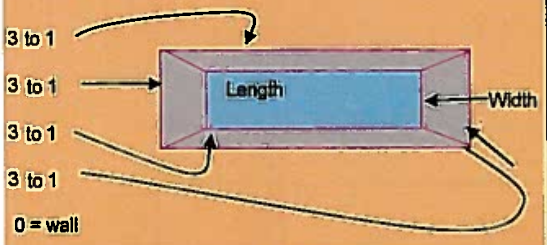
Job # 19-035
Date: 5/28/2021

Detention Facility Type:

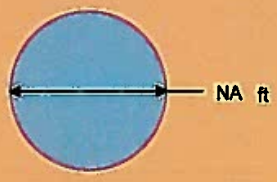
DETENTION POND

L =	72.5 ft
W =	72.5 ft
D =	3.0 ft
Pond Area =	5,259 sf

DETENTION POND



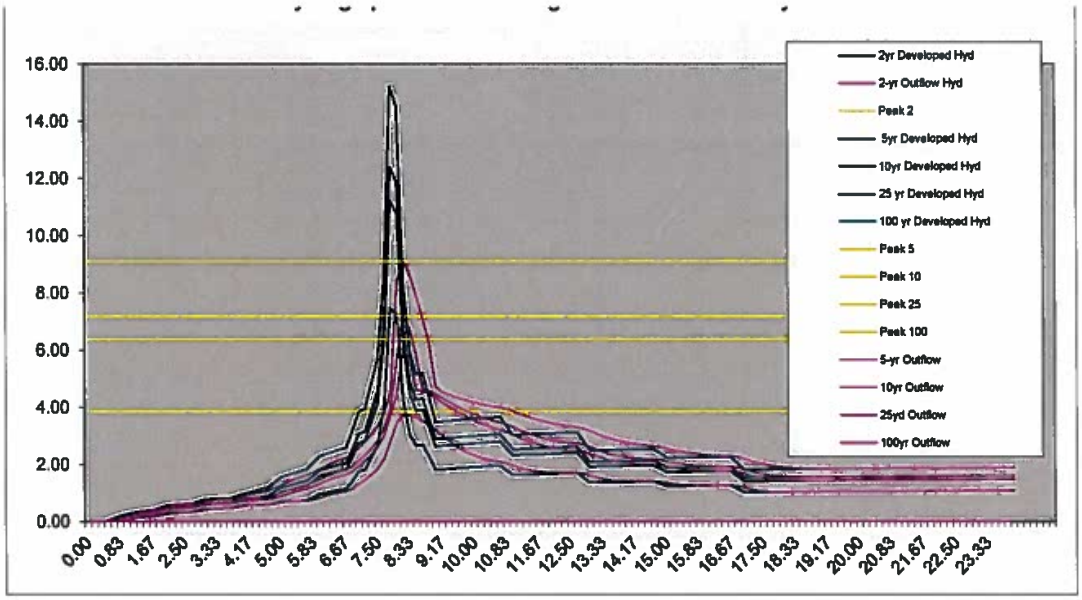
DETENTION TANK
NA

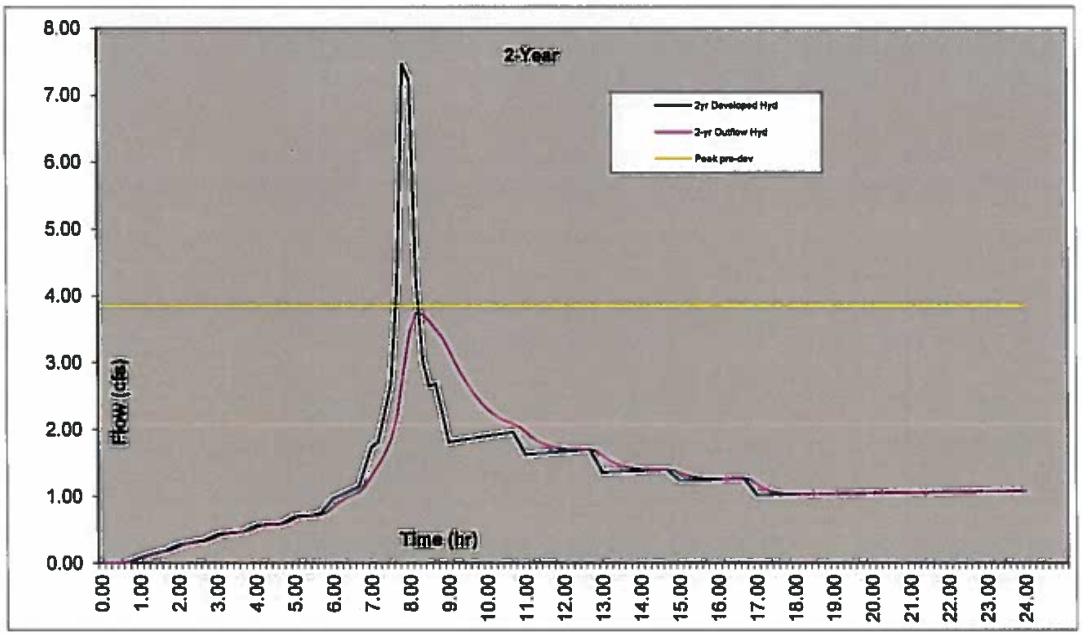


USER DEFINED POND
NA
Pond Geometry

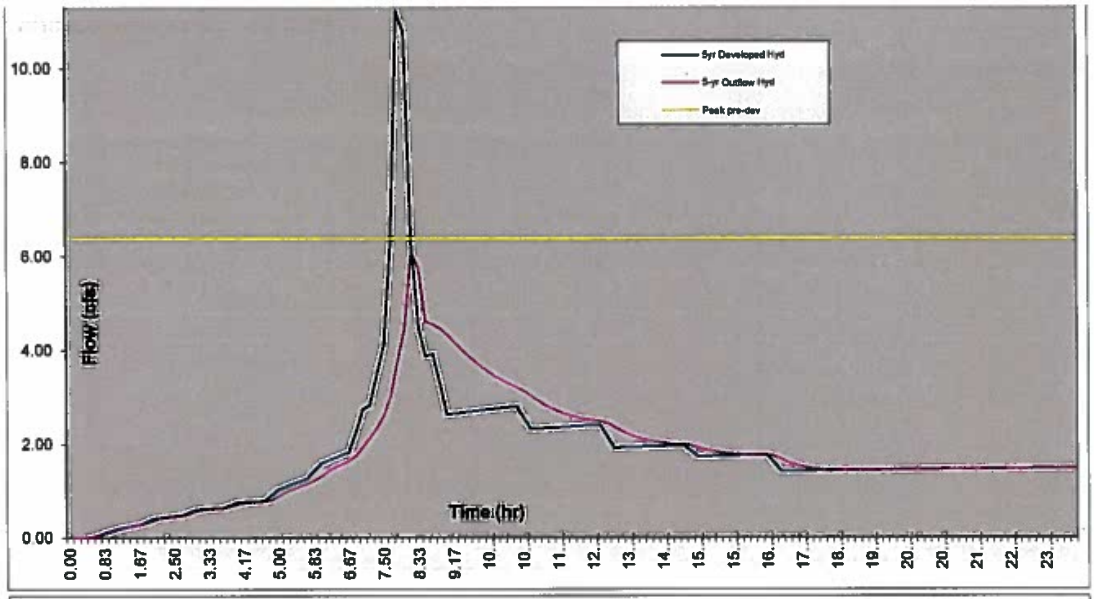
Stage (ft)	Area (sf)
0	NA
1	NA
2	NA
3	NA
4	NA
5	NA
6	NA
7	NA
8	NA
9	NA
10	NA
11	NA
12	NA
13	NA
14	NA
15	NA

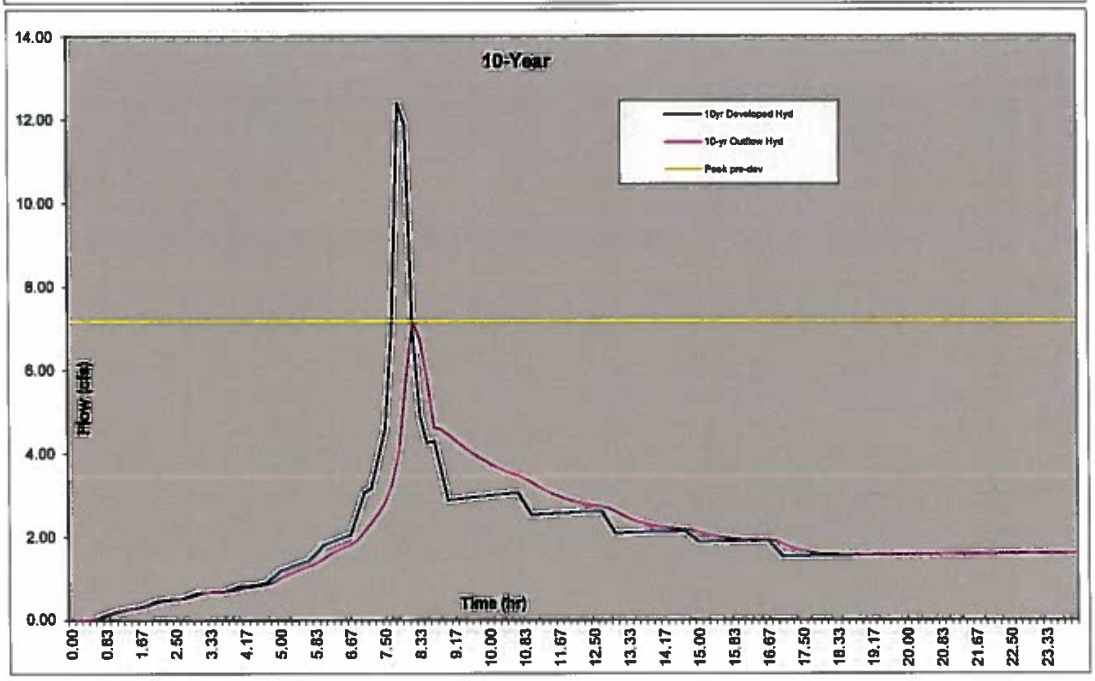
All Storm Hydrographs Routed Through The Detention Facility


16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.00 0.83 1.67 2.50 3.33 4.17 5.00 5.83 6.67 7.50 8.33 9.17 10.00 10.83 11.67 12.50 13.33 14.17 15.00 15.83 16.67 17.50 18.33 19.17 20.00 20.83 21.67 22.50 23.33
2yr Developed Hyd
2-yr Outflow Hyd
Peak 2
5yr Developed Hyd
10yr Developed Hyd
25 yr Developed Hyd
100 yr Developed Hyd
Peak 5
Peak 10
Peak 25
Peak 100
5-yr Outflow
10yr Outflow
25yd Outflow
100yr Outflow

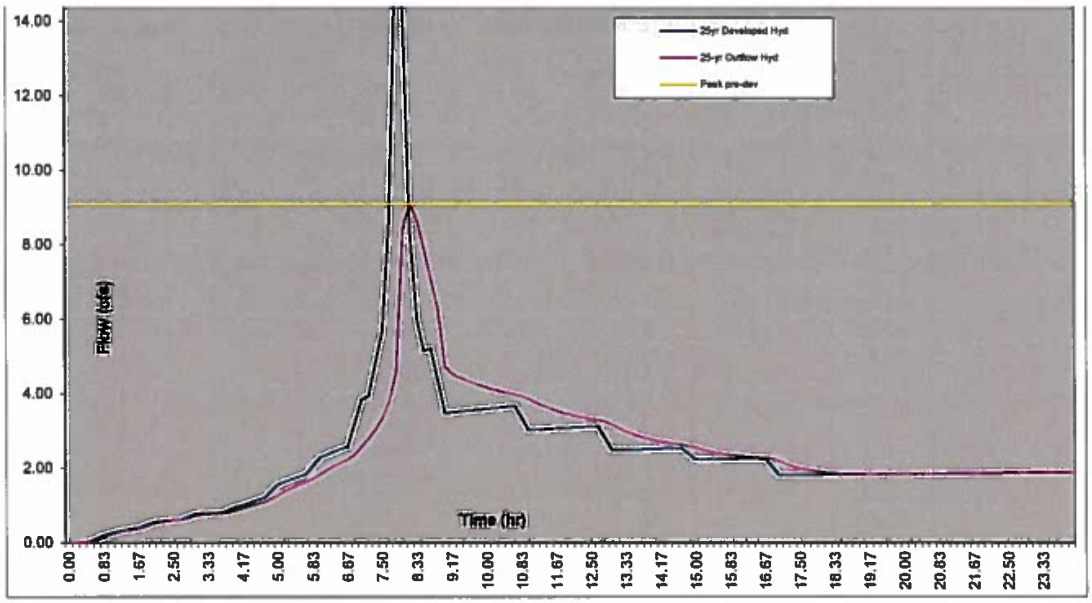

2-Year
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Flow (cfs)
Time (hr)
0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00 21.00 22.00 23.00 24.00
2yr Developed Hyd
2-yr Outflow Hyd
Peak pre-dev


12.00
5-Year


5yr Developed Hyd
5-yr Outflow Hyd
Peak pre-dev
Flow (cfs)
Time (hr)


10-Year
10yr Developed Hyd
10-yr Outflow Hyd
Peak pre-dev
Flow (cfs)
Time (hr)


25-Year


25yr Developed Hyd
25-yr Outflow Hyd
Peak pre-dev
Flow (cfs)
Time (hr)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.00
0.83
1.67
2.50
3.33
4.17
5.00
5.83
6.67
7.50
8.33
9.17
10.00
10.83
11.67
12.50
13.33
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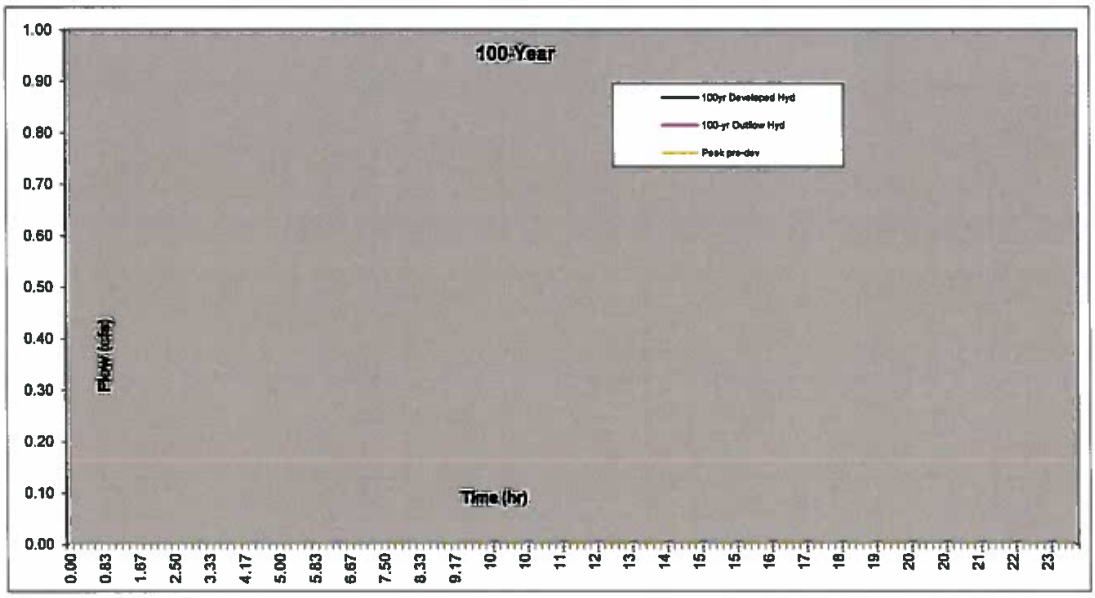
19.17
20.00
20.83
21.67
22.50
23.33


100-Year
100yr Developed Hyd
100-yr Outflow Hyd
Peak pre-dev
Flow (cfs)
Time (hr)
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00

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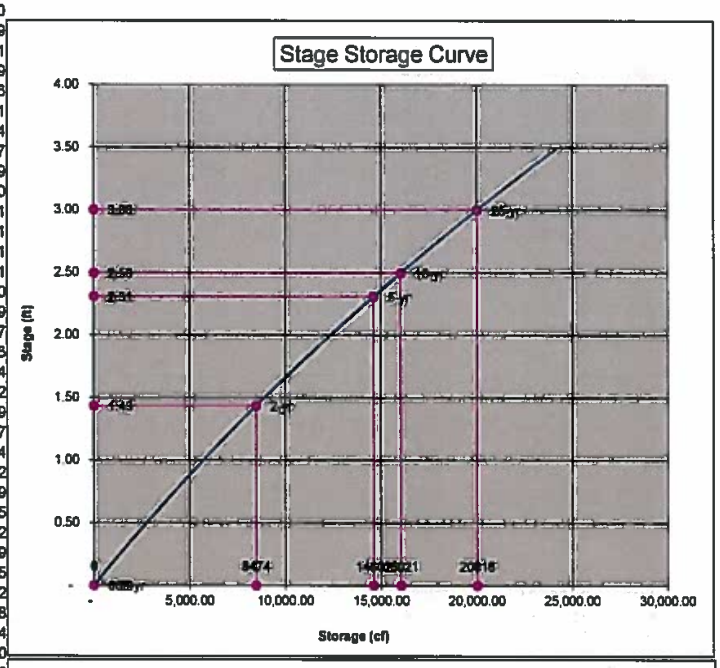
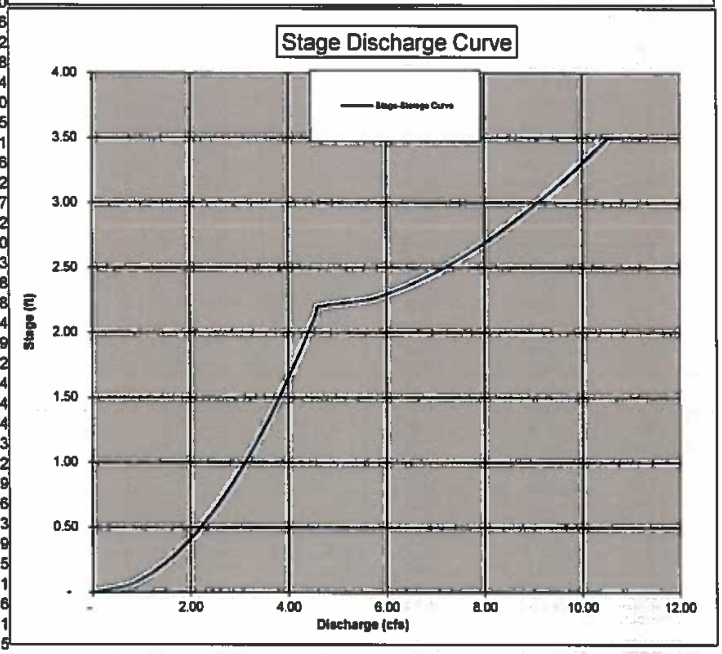
Project Name: Deer Meadows
Stage Storage Summary
Job # 19-035
Date: 5/28/2021

Stage ft	Storage cf	Discharge cfs
-	-	-
0.05	264.02	0.70
0.10	530.23	0.99
0.15	798.64	1.21
0.20	1,069.24	1.39
0.25	1,342.06	1.56
0.30	1,617.09	1.71
0.35	1,894.36	1.84
0.40	2,173.86	1.97
0.45	2,455.62	2.09
0.50	2,739.63	2.20
0.55	3,025.90	2.31
0.60	3,314.45	2.41
0.65	3,605.28	2.51
0.70	3,898.41	2.61
0.75	4,193.83	2.70
0.80	4,491.57	2.79
0.85	4,791.62	2.87
0.90	5,094.01	2.96
0.95	5,398.73	3.04
1.00	5,705.80	3.12
1.05	6,015.23	3.19
1.10	6,327.01	3.27
1.15	6,641.18	3.34
1.20	6,957.72	3.42
1.25	7,276.66	3.49
1.30	7,597.99	3.55
1.35	7,921.74	3.62
1.40	8,247.91	3.69
1.45	8,576.50	3.75
1.50	8,907.53	3.82
1.55	9,241.00	3.88
1.60	9,576.93	3.94
1.65	9,915.32	4.00
1.70	10,256.19	4.06
1.75	10,599.53	4.12
1.80	10,945.37	4.18
1.85	11,293.71	4.24
1.90	11,644.55	4.30
1.95	11,997.92	4.35
2.00	12,353.80	4.41
2.05	12,712.23	4.46
2.10	13,073.20	4.52
2.15	13,436.72	4.57
2.20	13,802.81	4.62
2.25	14,171.46	5.60
2.30	14,542.70	6.03
2.35	14,916.53	6.38
2.40	15,292.95	6.68
2.45	15,671.98	6.94
2.50	16,053.63	7.19
2.55	16,437.91	7.42
2.60	16,824.82	7.64
2.65	17,214.37	7.84
2.70	17,606.57	8.04
2.75	18,001.44	8.23
2.80	18,398.98	8.42
2.85	18,799.19	8.59
2.90	19,202.10	8.76
2.95	19,607.70	8.93
3.00	20,016.01	9.09
3.05	20,427.03	9.25
3.10	20,840.78	9.41
3.15	21,257.27	9.56
3.20	21,676.49	9.71
3.25	22,098.47	9.85





Stage ft	Storage cf	Discharge cfs
3.30	22,523.21	9.99
3.35	22,950.71	10.13
3.40	23,381.00	10.27
3.45	23,814.07	10.41
3.50	24,249.94	10.54
3.50	24,249.94	10.54
3.50	24,249.94	10.54
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Stage ft	Storage cf	Discharge cfs
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Stage ft	Storage cf	Discharge cfs
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3.50	24,249.94	10.54
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3.50	24,249.94	10.54
3.50	24,249.94	10.54
3.50	24,249.94	10.54
3.50	24,249.94	10.54
3.50	24,249.94	10.54

Project Name: Deer Meadows
Rectangular, Sharp Crested Weir Calculations

Job # 19-035
Date: 5/28/2021

Weir Equation: $Q = C(L-0.2H)H^{3/2}$

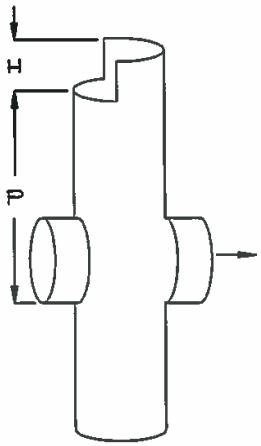
Q = Flow over weir (cfs)
C = 3.27 + 0.40 H/P (ft)
L = Adjusted length of weir (La - 0.1H x 2) this is to account for side constraints
La = Actual length of weir along pipes interior circumference (ft)
H = Distance from bottom of weir to maximum head (ft)
P = Distance from bottom of weir to outfall invert elevation (ft)
D = Inside riser pipe diameter (in)
< = Angle of opening for weir

Given:

Q	3.69	cfs
H	0.80	ft
P	2.20	ft
D	12	in

Find:

C	3.42	ft
L	1.67	ft
La	**1.83**	**ft**
<	**210**	**degrees**



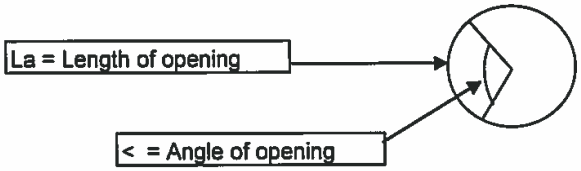


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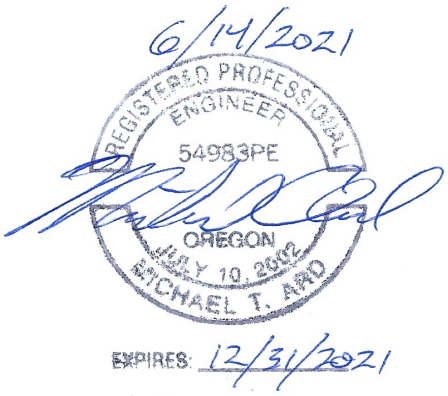
Exhibit E

DEER MEADOWS SUBDIVISION
TRAFFIC IMPACT STUDY

SANDY, OREGON



PREPARED FOR:
Alex Reverman

PREPARED BY:
Michael Ard, PE
Ard Engineering

DATE:
June 14, 2021

21370 SW Langer Farms Parkway, Suite 142, Sherwood, OR 97140 - (503)862-6960

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EXECUTIVE SUMMARY

1. A property located on the south side of US Highway 26 opposite SE Vista Loop Drive in Sandy, Oregon is proposed for a 32-lot subdivision which will support up to 32 single-family homes and 120 apartment units. The site will take access via extensions of Dubarko Road and Fawn Street into the site.

2. Upon completion of residential development within the R-1, R-2, and C-3 zones, the subject property is projected to generate up to 79 site trips during the morning peak hour, 99 trips during the evening peak hour, and 1,180 daily site trips.

3. With conversion to all-way stop control, the intersection of Highway 211 at Dubarko Road is projected to operate acceptably under year 2023 traffic conditions. All other study intersections are projected to operate acceptably through year 2023 either with or without the addition of site trips from the proposed development. No other operational mitigations are necessary or recommended in conjunction with the proposed subdivision.

4. Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. This intersection meets all-way stop control warrants based on crash history, and conversion to all-way stop control would be expected to reduce the frequency and severity of right-angle and turning-movement collisions. It is therefore recommended that all-way stop control be installed at the intersection of Highway 211 and Dubarko Road. No other safety improvements are recommended.

5. Based on the warrant analysis, no new turn lanes or traffic signals are recommended in conjunction with the proposed subdivision.

PROJECT DESCRIPTION & LOCATION

INTRODUCTION

A property located on the south side of US Highway 26 opposite SE Vista Loop Drive is proposed for development with 32 lots across R-1, R-2, and C-3 zoning. The site can support up to 30 single-family homes, 2 duplex units, and 120 apartment units. The portion of the site zoned C-3 is expected to ultimately include some form of commercial development; however, the nature of this future use has not yet been determined. Accordingly, a future traffic study will be required as part of the design review application for the future commercial site use. The site will take access via extensions of Dubarko Road and Fawn Street into the site. Dubarko Road will be extended to intersect a new north/south collector street within the site, which will stub to the south side of the property.

This report addresses the impacts of the proposed development on the surrounding street system. An operational and safety analysis was conducted for the proposed site access as well as the intersections of:

- Highway 26 at SE Ten Eyck Road;
- Highway 26 at SE Langensand Road;
- Highway 211 at Dubarko Road; and
- Dubarko Road at SE Langensand Road.

The purpose of this analysis is to determine whether the surrounding transportation system is capable of safely and efficiently supporting the proposed use and to identify any necessary improvements and mitigations.

SITE LOCATION AND STUDY AREA DESCRIPTION

The project site has an area of approximately 16 acres, which is currently undeveloped. The property is surrounded by a mixture of residential development, agricultural uses and undeveloped forested land.

The proposed development will include an extension of Dubarko Road into the site to intersect a new north/south collector roadway. The proposed development will connect to the existing street system via extensions of Dubarko Road and Fawn Street into the project site.

US Highway 26 (Mt. Hood Highway) is classified by the Oregon Department of Transportation as a Statewide Highway and a Freight Route. It has two through lanes in each direction and added turn lanes at intersections. Between SE Langensand Road and SE Vista Loop Drive it has a center two-way left-turn lane. It has a posted speed limit of 25 mph at SE Ten Eyck Road, 40 mph at SE Langensand Road, and 55 mph at SE Vista Loop Drive. West of SE Ten Eyck Road the highway divides into a couplet, with westbound traffic traveling on Proctor Boulevard and eastbound traffic traveling on Pioneer Boulevard.

SE Ten Eyck Road has one through lane in each direction and is striped to prohibit passing in the site vicinity. It has a basic rule speed limit of 55 mph and is classified by the City of Sandy as a Minor Arterial.

SE Langensand Road is also classified by the City of Sandy as a Minor Arterial. It has a two-lane cross-section with one through lane in each direction and a posted speed limit of 25 mph. Partial sidewalks are in place on both sides of the roadway, and on-street parking is available where sufficient paved width is provided.

Oregon Highway 211 (Eagle Creek Sandy Highway) is classified by the Oregon Department of Transportation as a District Highway. It has a two-lane cross-section with one through lane in each direction and added turn lanes at major intersections. It has a posted speed limit of 45 mph in the vicinity of Dubarko Road.

Dubarko Road is classified by the City of Sandy as a Minor Arterial. It generally has a two-lane cross-section with some added turn lanes at major intersections and bike lanes on each side of the roadway. Partial sidewalks are in place on each side of the roadway adjacent to developed properties. It has a posted residential speed limit of 25 mph.

EXISTING CONDITIONS

The intersection of US Highway 26 at SE Ten Eyck Road/Wolf Drive is controlled by a traffic signal. The northbound and southbound approaches each have a single, shared lane for all turning movements. The westbound approach has a left-turn lane, two through lanes, and a short right-turn pocket. The eastbound approach has a left-turn lane, a dedicated through lane and a shared through/right lane. The northbound and southbound approaches operate with concurrent signal phasing. Protected phasing is provided for the eastbound and westbound left-turn movements. Bike lanes are provided along Highway 26 to the right of the through lanes.

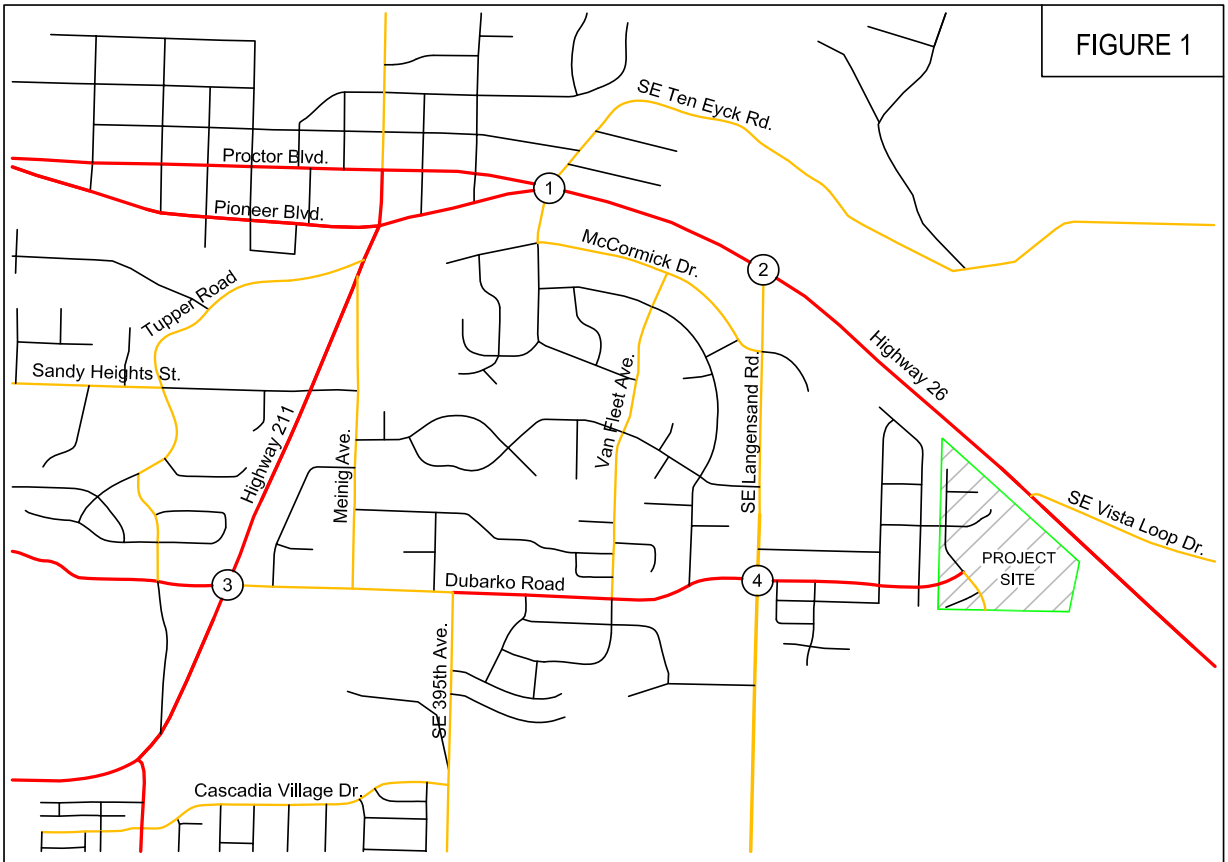
The intersection of US Highway 26 at SE Langensand Road is a T- intersection controlled by a stop sign on the northbound Langensand Road approach. Through traffic traveling along Highway 26 does not stop. The northbound approach has a left-turn lane and a right-turn lane. The eastbound approach has two through lanes and a right-turn lane. The westbound approach has a left-turn lane and two through lanes. Bike lanes are provided along Highway 26 to the right of the through lanes.

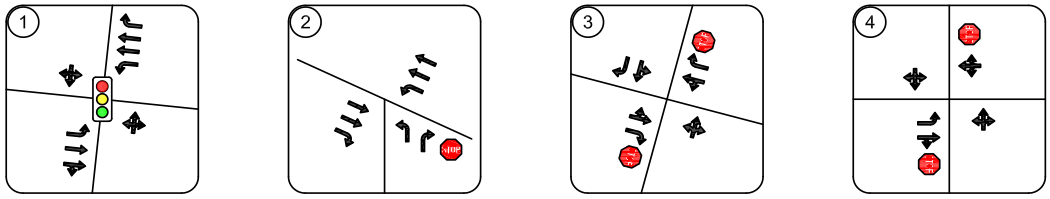
The intersection of Oregon Highway 211 at Dubarko Road is a four-way intersection controlled by stop signs on the eastbound and westbound Dubarko Road approaches. The southbound, eastbound and westbound approaches each have a shared through/left lane, a bike lane, and a dedicated right-turn lane. The northbound approach has a single, shared lane for all motorized turning movements and a bike lane.

The intersection of Dubarko Road at SE Langensand Road is a four-way intersection currently controlled by stop signs on the eastbound and westbound Dubarko Road approaches. Through traffic traveling along SE Langensand Road does not stop. The northbound and southbound approaches each have a single, shared lane for all turning movements. The westbound approach has a single, shared lane for all motor vehicle turning movements and a bike lane. The eastbound approach has a left-turn lane, a shared through/right lane and a bike lane.

A vicinity map displaying the project site, vicinity streets, and the study intersections including lane configurations is provided in Figure 1 on page 7.

FIGURE 1





LEGEND

- Study Intersection
- Traffic Signal
- Stop Sign

VICINITY MAP
Study Intersections
Lane Configurations and Traffic Control

PAGE 7

TRAFFIC COUNT DATA

Traffic counts were conducted at the study intersections on Tuesday March 19th, 2019 from 4:00 to 6:00 PM and on Wednesday March 20th, 2019 from 7:00 to 9:00 AM. Data was used from the highest-volume hour during each analysis period. This historical data was used since it predates the impacts of the current COVID-19 pandemic, allowing conservative projections of future peak-hour traffic conditions once conditions return to normal.

Since the count data was collected during a non-peak period of the year, the observed traffic volumes were adjusted to account for seasonal traffic variations to represent the 30th-highest hour design volumes.

US Highway 26 serves local and commuter traffic as well as trips to and from Mt. Hood and beyond. These trip types would be expected to exhibit very different seasonal variations in travel demands over the course of the year, since local and commuter traffic volumes are relatively stable regardless of season, while travel volumes to and from Mt. Hood vary significantly based on the season.

To determine the portion of traffic attributable to each of the two primary travel types, data from ODOT's 2017 Highway Volume Tables was utilized. Specifically, the data used was collected at ODOT's Automatic Count Data station 03-006, located 0.30 miles east of Camp Creek Road in Rhododendron, Oregon. This site is located on Highway 26 approximately 21 miles east of SE Vista Loop Drive. Although the distance to the ATR station means the data cannot be used directly, the ATR data provides useful information regarding the variation in traffic volumes traveling to Mt. Hood and beyond during the time of the count data collection as well as during the peak season of the year. Accordingly, this data allows determination of the likely portion of highway traffic that falls into each of the two seasonal variation categories ("commuter" and "recreational summer/winter"), as well as providing information regarding the most appropriate seasonal adjustment factor for the recreational summer/winter traffic.

Based on the data, 6,763 vehicles per day (approximately 676 per hour during the peak hour) travel along Highway 26 to and from Mt. Hood at the Rhododendron permanent count station location during the month of March. This volume represents 45.3 percent of the through traffic volumes measured on Highway 26 east of SE Vista Loop Drive. Accordingly, it is expected that no more than 45.3 percent of the trips traveling along Highway 26 in the project vicinity are traveling to and from destinations beyond the Rhododendron count station. Since the remaining 54.7 percent of through traffic volumes on the Highway 26 at the study intersections never reach Mt. Hood, it was assumed that these traffic volumes represent more typical commuter and local trips.

The ODOT data also showed that 11,738 vehicles were measured per day (approximately 1174 per hour during the peak hour) during the peak-season month of August at the ATR station near Rhododendron. This indicates that the seasonal recreational traffic volumes along the Highway 26 corridor increased by no more than 4,975 vehicles per day (11,738 vehicles per day in August - 6,763 vehicles per day in March). This equates to roughly 498 additional vehicles per hour during the peak hour of the peak recreational season. It is expected that the increased recreational traffic flows will be somewhat directional, with approximately 55% traveling westbound during the evening peak hour.

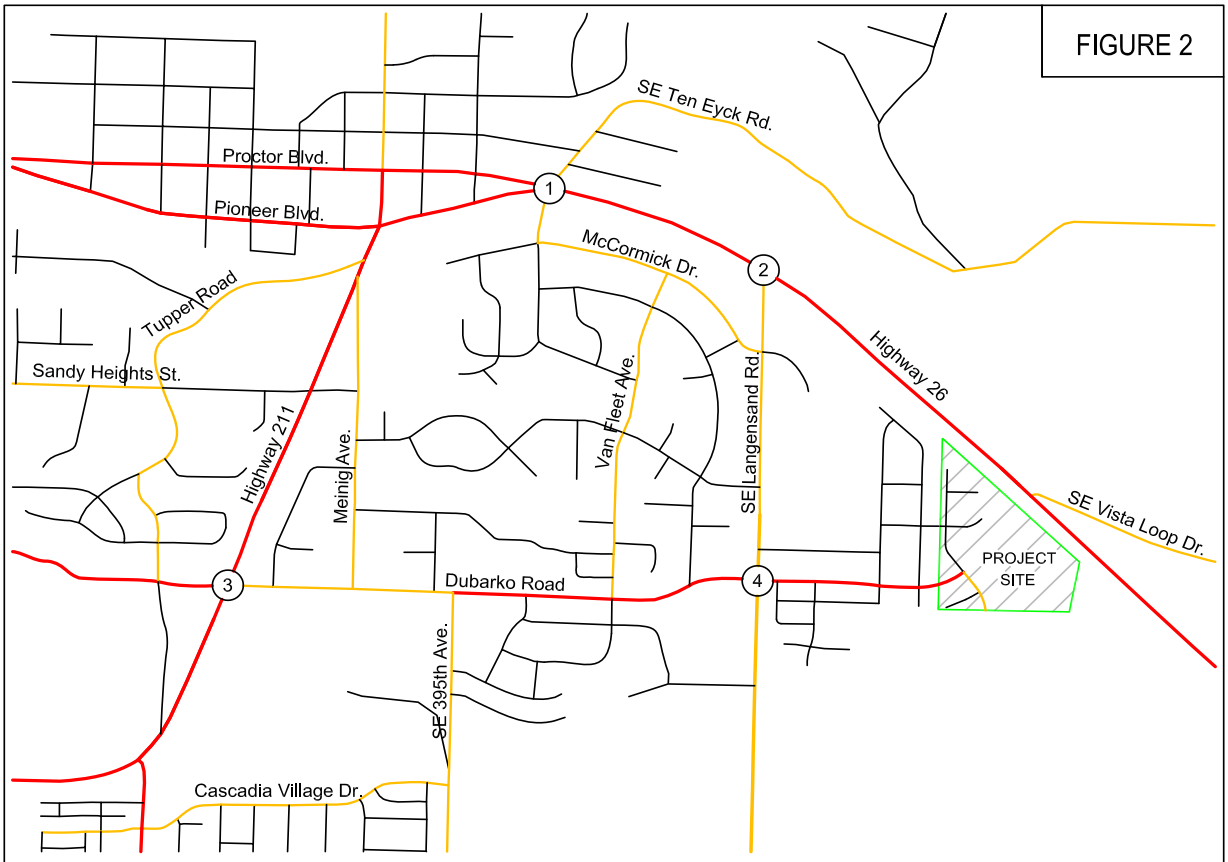
In order to seasonally adjust the local and commuter traffic volumes, the through traffic volumes were reduced by the amount of the assumed seasonal traffic (676 vehicles per hour during the evening peak hour), and a seasonal adjustment of 1.08 was applied to the remaining local and commuter traffic volumes. Following this adjustment, the 676 March recreational trips and the 498 peak-season through trips were added to determine the total peak-season traffic volumes. These calculated through traffic volumes represent the anticipated traffic levels for the intersections along Highway 26 during the 30th-highest hour in August. The morning peak hour traffic volumes along the highway were then increased by the same overall percentage as the evening peak hour volumes.

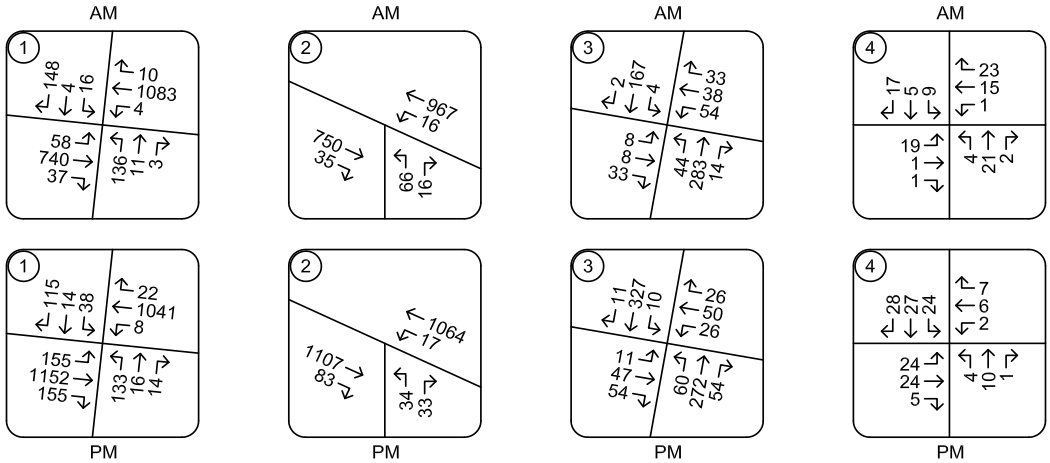
The observed traffic volumes along Highway 211 also had a seasonal adjustment of 1.08 applied to represent peak-season traffic volumes.

Following application of the seasonal adjustments, two years of growth was added to the year 2019 traffic count data to represent the expected year 2021 seasonal peak traffic conditions absent the impacts of the current COVID-19 pandemic. Based on data from ODOT's Future Volume Tables, the growth rate for traffic volumes on Highway 26 in the site vicinity was calculated to be 1.96 percent per year. The growth rate for traffic volumes on Highway 211 was calculated to be 3.13 percent per year. These growth rates were applied to the through traffic volumes on the highways. All other turning movements had a growth factor of 2 percent per year applied. The respective growth rates were applied over a period of two years to generate the year 2021 seasonal peak traffic volumes.

Figure 2 on page 10 shows the existing year 2021 30th-highest hour traffic volumes for the morning and evening peak hours at the study intersections.

FIGURE 2





TRAFFIC VOLUMES
2021 Existing 30th-Highest Hour (August) Conditions
Morning and Evening Peak Hours

PAGE 10

OPERATIONAL ANALYSIS

An operational analysis was conducted for the study intersections using Synchro 10 software, with outputs calculated based on the *HIGHWAY CAPACITY MANUAL, 6th Edition.* The analysis was conducted for the weekday morning and evening peak hours.

The purpose of the existing conditions analysis is to establish how the study area intersections operate currently and allow for calibration of the operational analysis if required.

The results of the operational analysis are reported based on delay, Level of Service (LOS), and volume-to-capacity ratio (v/c). Delays are reported in seconds. Level of service is reported as a letter grade and can range from A to F, with level of service A representing nearly free-flow conditions and level of service F representing high delays and severe congestion. A report of level of service D generally indicates moderately high but tolerable delays, and typically occurs prior to reaching intersection capacity. For unsignalized intersections, the v/c represents the portion of the available intersection capacity that is being utilized on the worst intersection approach. For signalized intersections, it indicates the portion of the overall intersection's capacity that is being used. A v/c ratio of 1.0 would indicate that the intersection is operating at capacity.

The Oregon Department of Transportation requires that the signalized intersection of Highway 26 at SE Ten Eyck Road operate with a v/c ratio of 0.85 or less during the peak hours. The intersection of Highway 26 at SE Langensand Road is required to operate with a v/c ratio of 0.80 or less on the major-street approaches and a v/c ratio of 0.90 or less on the minor-street approaches.

Intersections operating under the jurisdiction of the City of Sandy are required to operate at level of service D or better. This operational standard applies to the intersections of Dubarko Road at Langensand Road and Highway 211 at Dubarko Road.

A summary of the existing conditions operational analysis is provided in Table 1 on the following page. For the unsignalized intersections the reported delays and levels-of-service represent the approach lane which experiences the highest delays. The reported v/c ratios represent the highest ratio for the major-street and minor-street movements. For the signalized intersection of Highway 26 at SE Ten Eyck Road, the reported delays, levels-of-service and v/c ratios represent the operation of the overall intersection.

Based on the analysis, the study intersections are currently operating acceptably per the respective ODOT and City of Sandy standards. Detailed capacity analysis worksheets are provided in the technical appendix.

Table 1 - Operational Analysis Summary: Year 2021 30th-Highest Hour Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c*	Delay	LOS	v/c*
Highway 26 at Ten Eyck Road	24.0	C	0.66	27.3	C	0.71
Highway 26 at Langensand Road	56.1	F	0.29 / 0.51	96.7	F	0.36 / 0.50
Highway 211 at Dubarko Road	18.9	C	0.22 / 0.28	27.0	D	0.23 / 0.33
Dubarko Road at Langensand Road	9.4	A	0.05	9.8	A	0.04

*(major street v/c) / (minor-street v/c) is shown for unsignalized ODOT intersections.

SITE TRIPS

Proposed Development

The proposed subdivision will support development of 32 single-family homes as well as up to 120 apartment units. Although some commercial development is expected to occur within the C-3 zoned portion of the property in the longer-range future, a separate design review application and analysis will be required for future commercial development. To estimate the number of trips that will be generated by the potential residential development within the proposed subdivision, trip rates from the *TRIP GENERATION MANUAL, 10th EDITION* were used. Data from land-use code 210, *Single-Family Detached* Housing, and 220, *Multi-Family Housing*, were used. The trip estimates are based on the number of dwelling units.

A summary of the trip generation calculations is provided in Table 2 below. Detailed trip generation worksheets are also included in the technical appendix.

Table 2 - Proposed Development Trip Generation Summary

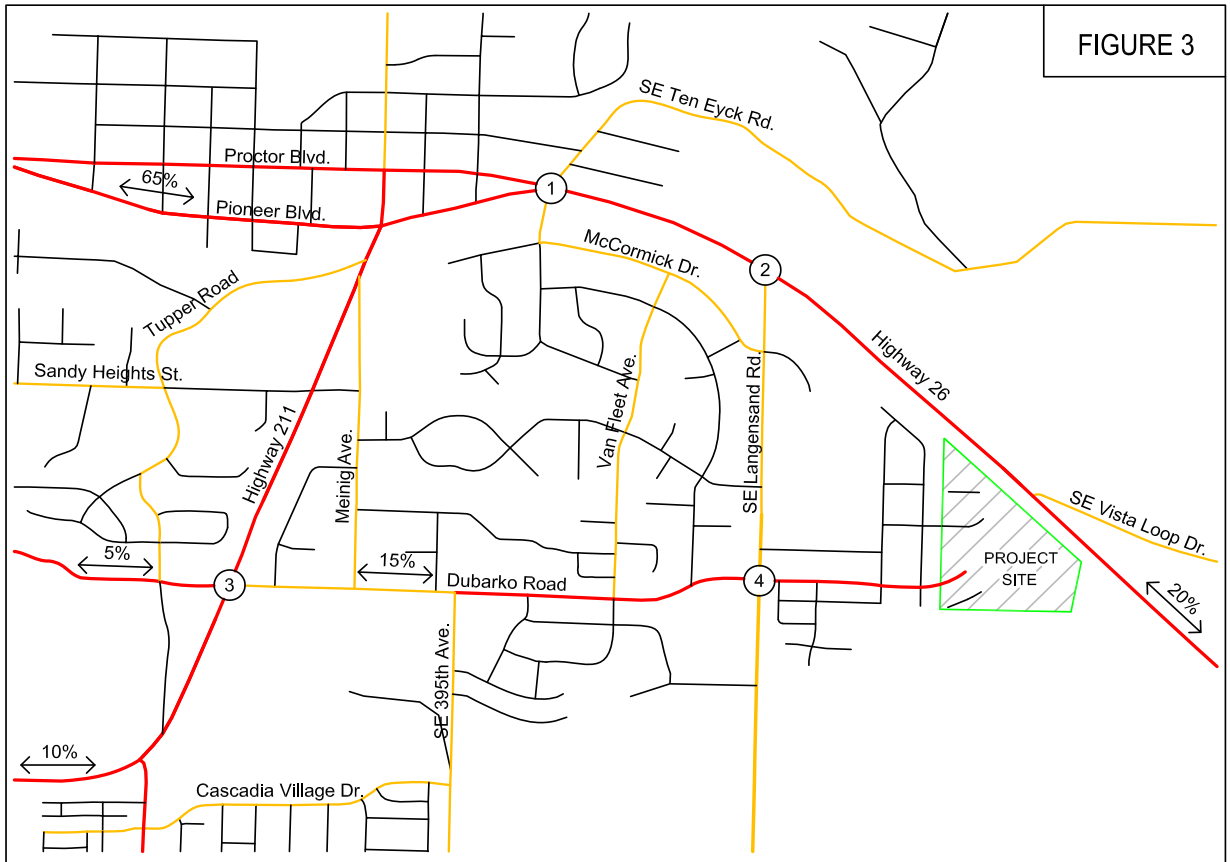
	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
32 Single-Family Homes	6	18	24	20	12	32	302
120 Multi-Family Dwelling Units	13	42	55	42	25	67	878
Total Site Trips	19	60	79	62	37	99	1,180

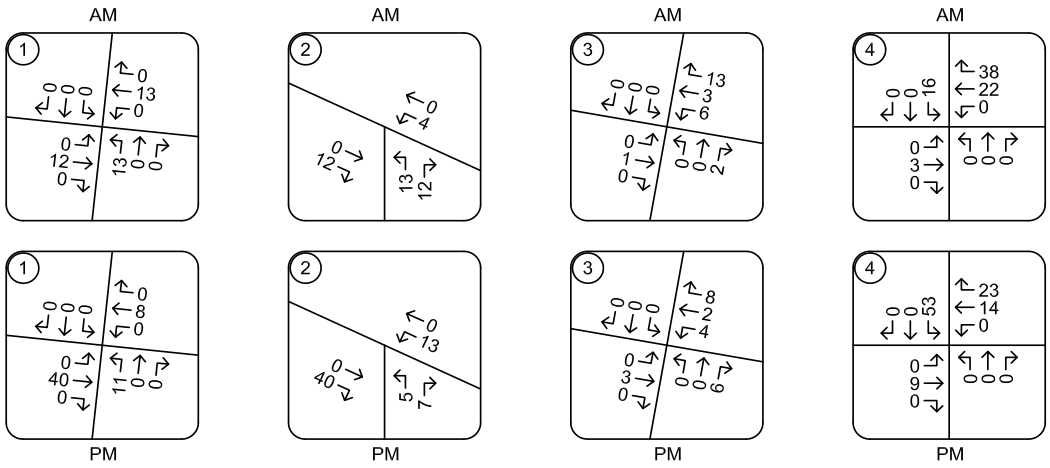
TRIP DISTRIBUTION

The directional distribution of site trips to and from the project site was estimated based the existing travel patterns in the site vicinity, as well as the locations of likely trip destinations and major transportation routes. Overall, 65 percent of the anticipated site trips are projected to travel to and from the northwest on Highway 26, 20 percent are projected to travel to and from the southeast on Highway 26, and the remaining 15 percent of site trips are projected to travel to and from the west on Dubarko Road.

The trip distribution percentages and trip assignment for residential development within the proposed subdivision are shown in Figure 3 on page 14.

FIGURE 3





TRAFFIC VOLUMES
Proposed Development - Primary Site Trips
Morning and Evening Peak Hours

PAGE 14

FUTURE CONDITIONS ANALYSIS

BACKGROUND VOLUMES

In order to determine the expected impact of site trips on the study area intersections, it is necessary to compare traffic conditions both with and without the addition of the projected traffic from the proposed development. This comparison is made for future traffic conditions at the time of project completion. It is anticipated that the proposed use will be completed and occupied within two years. Accordingly, the analysis was conducted for year 2023 traffic conditions.

Prior to adding the projected site trips to the study intersections, the existing traffic volumes were adjusted to account for background traffic growth over time. Based on data from ODOT's Future Volume Tables, the growth rate for traffic volumes on Highway 26 in the site vicinity was calculated to be 1.96 percent per year (linear). The growth rate for traffic volumes on Highway 211 was calculated to be 3.13 percent per year (linear). These growth rates were applied to the through traffic volumes on the highways. All other turning movements had a growth factor of 2 percent per year (exponential) applied.

In addition to the background growth, future site trips associated with other anticipated developments within the City of Sandy were added to the background traffic volumes. These projects included the Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and Bornstedt Views. The projected site trips for these residential developments are shown in Figure 6 in the attached technical appendix.

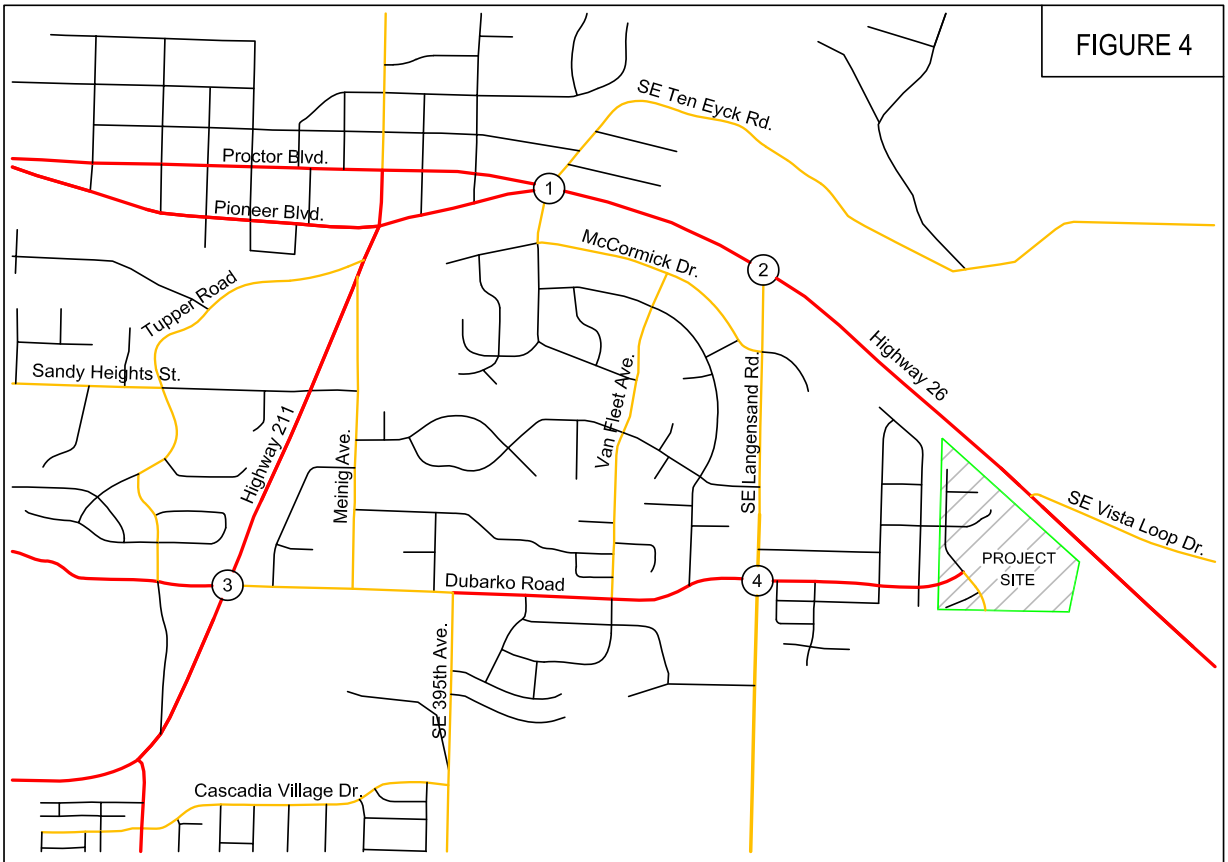
Figure 4 on page 16 shows the projected year 2023 background traffic volumes at the study intersections during the morning and evening peak hours.

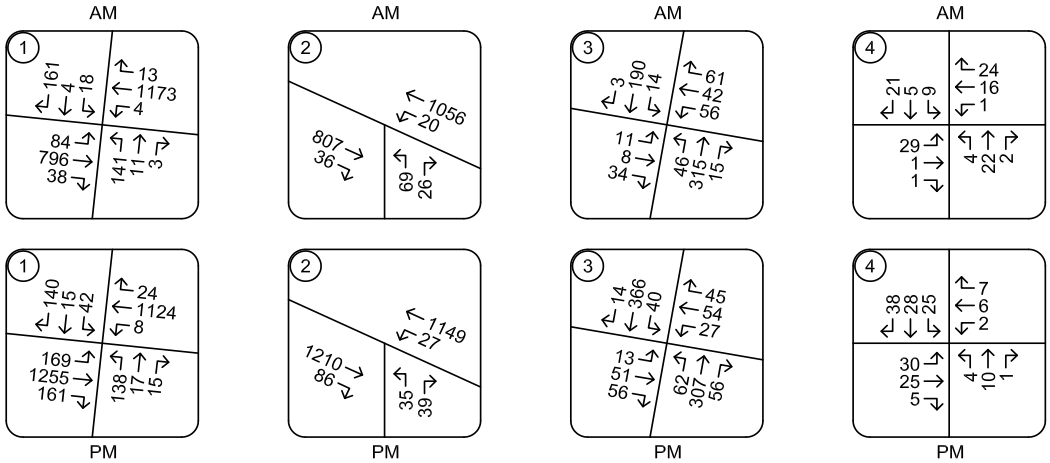
BACKGROUND VOLUMES PLUS SITE TRIPS

Peak hour trips calculated to be generated by the proposed development were added to the projected year 2023 background traffic volumes to obtain the year 2023 total traffic volumes following completion of the proposed residential development.

Figure 5 on page 17 shows the projected year 2023 peak hour volumes including background growth, and site trips from the proposed development for the morning and evening peak hours.

FIGURE 4

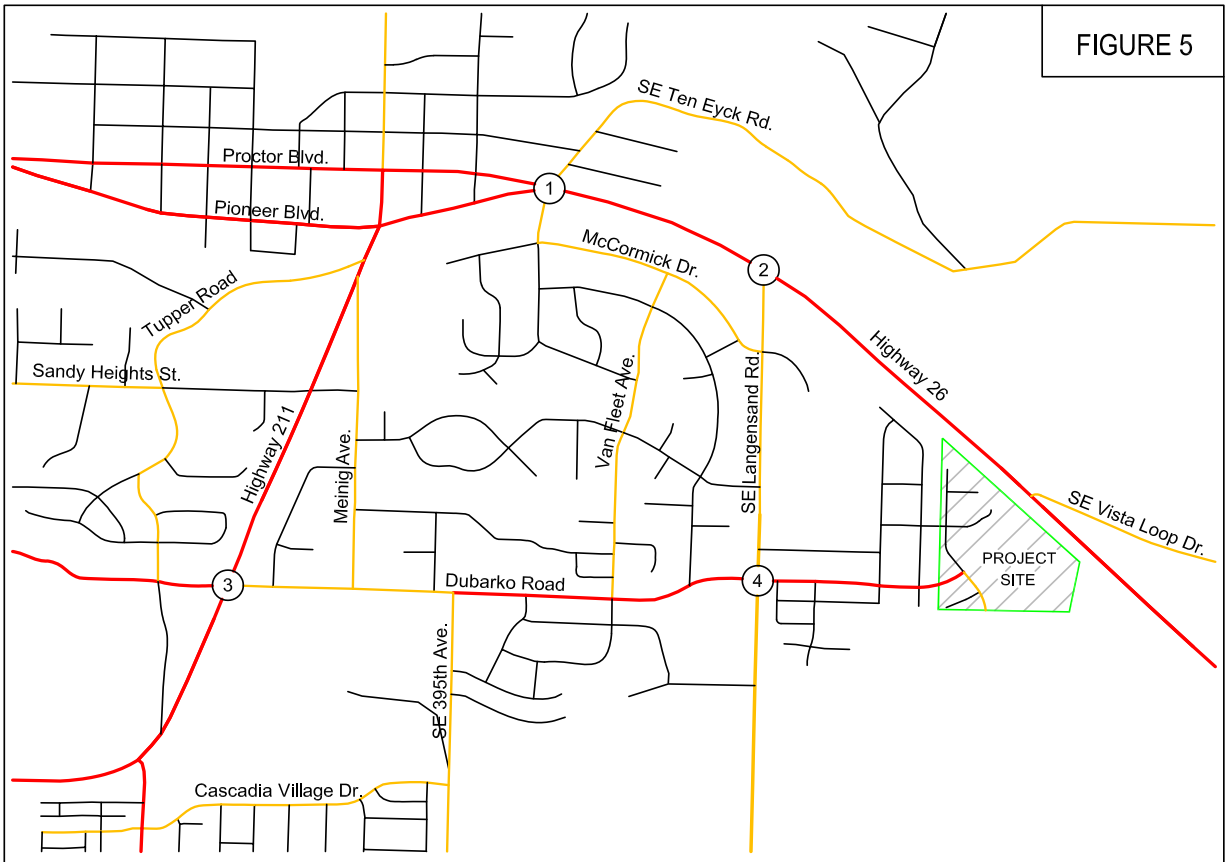


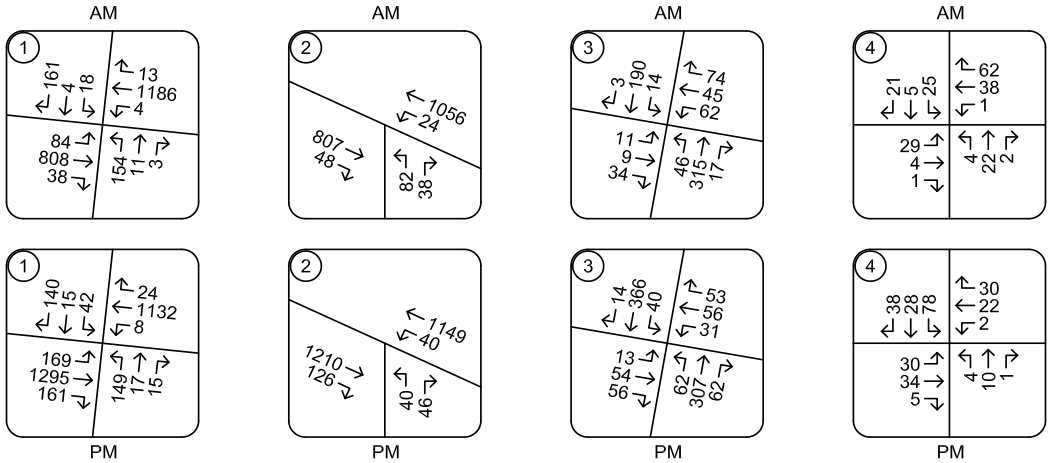


TRAFFIC VOLUMES
2023 Background Conditions
Morning and Evening Peak Hours

PAGE 16

FIGURE 5





TRAFFIC VOLUMES
2023 Background Plus Site Trips
Morning and Evening Peak Hours

PAGE 17

OPERATIONAL ANALYSIS

The operational analysis for future traffic conditions was again conducted using Synchro analysis software, with outputs based on the analysis methodologies contained in the *HIGHWAY CAPACITY MANUAL*. The analysis was prepared for the intersections' morning and evening peak hours.

The results of the operational analysis are summarized in Table 4 below. Detailed analysis worksheets are also included in the technical appendix.

Table 4 - Operational Analysis Summary: Year 2023 Future Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c*	Delay	LOS	v/c*
Highway 26 at Ten Eyck Road						
2023 Background Conditions	25.5	C	0.72	29.2	C	0.78
2023 Background plus Site	25.8	C	0.75	29.8	C	0.81
Highway 26 at Langensand Road						
2023 Background Conditions	76.4	F	0.32 / 0.62	160.1	F	0.39 / 0.68
2023 Background plus Site	97.3	F	0.32 / 0.75	210.4	F	0.40 / 0.84
Highway 211 at Dubarko Road						
2023 Background Conditions	22.8	C	0.35	39.4	E	0.46
2023 Background plus Site	23.9	C	0.39	43.3	E	0.50
2023 Background plus Site AWSC	19.5	C	0.67	29.6	D	0.79
Dubarko Road at Langensand Road						
2023 Background Conditions	9.5	A	0.05	9.9	A	0.04
2023 Background plus Site	10.5	B	0.13	11.3	B	0.08

*(major street v/c) / (minor-street v/c) is shown for the unsignalized ODOT intersection.
AWSC = Mitigated conditions analysis with conversion to all-way stop control

The intersection of Oregon Highway 211 at Dubarko Road was previously under the jurisdiction of the Oregon Department of Transportation and subject to a volume-to-capacity ratio standard rather than level of service. The intersection would have met ODOT standards for operation, but with conversion to a city intersection it is projected to operate at level of service "E" either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control (as recommended in the safety analysis section of this report on page 20), the intersection is projected to operate at level of service D, thereby meeting the city's operational standard.

All other intersections are projected to operate acceptably per the appropriate jurisdictional standards. No other operational mitigations are recommended in conjunction with the proposed development.

SAFETY ANALYSIS

CRASH DATA ANALYSIS

Using data obtained from the Oregon Department of Transportation, a review of the five most recent years of available crash history (from January 2015 through December 2019) was performed for the study intersections. The crash data was evaluated based on the number, type, and severity of collisions, as well as the intersection crash rate. Crash rates allow comparison of relative safety risks at intersections with different lane configurations, volumes, and traffic control devices by accounting for both the number of crashes that occur during the study period and the number of vehicles that traveled through the intersection during that period. Crash rates are calculated using the standard assumption that evening peak hour volumes are approximately 10 percent of the average daily traffic volume at an intersection. The crash rates were compared to statewide crash rates for similar intersection types to identify any locations with crash rates in excess of the 90th percentile.

The intersection of Highway 26 at SE Ten Eyck Road had eight reported collisions during the five-year analysis period. These included four rear-end collisions, three turning movement collisions, and one angle collision. The crashes resulted in no serious injuries or fatalities and six reports of a "possible injury/complaint of pain". The crash rate for the intersection was calculated to be 0.15 crashes per million entering vehicles. This is well below the 90th percentile crash rate of 0.86 crashes per million entering vehicles for signalized, four-way urban intersections in Oregon.

The intersection of Highway 26 at SE Langensand Road had seven reported collisions during the five-year analysis period. These included five turning-movement collisions, one backing collision and one pedestrian collision. The pedestrian collision occurred when a pedestrian walking along the south side of Highway 26 crossing Langensand Road was struck by a driver making an eastbound right turn from the highway onto Langensand Road. The collision resulted in a report of a "possible injury/complaint of pain" by the pedestrian. Overall, the crashes resulted in one non-incapacitating injury and five reports of a "possible injury/complaint of pain". The crash rate for the intersection was calculated to be 0.16 crashes per million entering vehicles. This is well below the 90th percentile crash rate of 0.29 crashes per million entering vehicles for stop-controlled, three-way urban intersections in Oregon.

The intersection of Highway 211 at Dubarko Road had 27 reported crashes during the five-year analysis period. These included 16 angle collisions, 4 turning-movement collisions, 4 rear-end collisions, 1 backing collision, 1 sideswipe-overtaking collision, and 1 pedestrian collision. The crashes resulted in one incapacitating injury and no fatalities. There were 10 "non-incapacitating" injuries reported and 19 reports of a "possible injury/complaint of pain". The incapacitating injury occurred when a westbound driver failed to yield to a southbound vehicle and was struck in the intersection. The pedestrian collision occurred when a southbound pedestrian was struck by a westbound driver that failed to yield right-of-way to the pedestrian crossing, resulting in a report of a possible injury/complaint of pain by the pedestrian. The crash rate for the intersection was calculated to be 1.56 crashes per million entering vehicles. This is above the 90th percentile crash rate of 1.08 crashes per million entering vehicles for rural unsignalized four-way intersections in the state of Oregon.

The Oregon Department of Transportation recently undertook safety improvements at this intersection, including re-alignment of the minor-street approaches to intersect at a 90-degree angle and the addition

of some striping and speed feedback signs along the major-street to increase driver awareness of speed. However, the crash data for subsequent years has shown no significant improvement in the crash frequency at this intersection. An examination of the current intersection configuration revealed no significant apparent hazards and adequate sight distance from the minor-street approaches, allowing drivers approaching the highway to select safe gaps when turning onto or crossing the highway.

As described in the Warrant Analysis section of this report below, the intersection currently meets all-way stop control warrants based on crash history. Accordingly, it is recommended that all-way stop control be installed at this intersection. No other safety mitigations are recommended at this time.

The intersection of Dubarko Road at SE Langensand Road had one reported collision during the five-year analysis period. It was an angle collision that resulted in property damage only. The crash rate for the intersection was calculated to be 0.34 crashes per million entering vehicles. This is well below the 90th percentile crash rate of 0.408 crashes per million entering vehicles for stop-controlled, four-way urban intersections in Oregon.

Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. It is recommended that consideration be given to installing all-way stop control at this intersection. No other safety improvements are recommended for the study area intersections at this time.

TRAFFIC SIGNAL AND ALL-WAY STOP CONTROL WARRANT ANALYSIS

Traffic signal warrants were examined for the unsignalized study intersections. Based on the projected traffic volumes, traffic signal warrants are not projected to be met for any of the unsignalized study intersections under any of the analysis scenarios.

All-way stop control can be installed where there are “Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.” Examination of the crash data shows that there were six angle collisions at the intersection in the most recent year for which complete data is available (2019). Accordingly, installation of all-way stop control is warranted based on crash history.

Consideration was also given to installing a roundabout at the intersection of Highway 211 and Dubarko Road. Installation of a roundabout would result in operation well within capacity and at level of service A. However, according to *Roundabouts: An Informational Guide*, published by the Federal Highway Administration, “It is generally not desirable to locate roundabouts in locations where grades through the intersection are greater than four percent. The installation of roundabouts on roadways with grades lower than three percent is generally not problematic.” In this instance, Highway 211 has a constant grade of approximately 6 percent through its intersection with Dubarko Road. Accordingly, installation of a roundabout would not be recommended absent significant re-grading of the approach roadways. The potential for snow and ice at the intersection compound this concern.

TURN LANE WARRANT ANALYSIS

Turn lane warrants were also examined for the major-street approaches to the unsignalized study intersections. Left-turn lane warrants are intended to evaluate whether a meaningful safety benefit may be expected if the turning vehicles are provided with turn lane within the street, allowing left-turning drivers to move out of the through travel lane so that following vehicles may pass without conflicts.

The intersection of Highway 26 at Langensand Road already has left and right turn lanes in place.

The intersection of Highway 211 at Dubarko Road currently meets ODOT warrants for a northbound left-turn lane and a northbound right-turn lane. However, the need for these turn lanes is not meaningfully related to the proposed development. Further, if all-way stop control is installed at the intersection as recommended based on the safety analysis, additional turn lanes will not be required for either safety or operations.

The intersection of Dubarko Road at Langensand Road is not projected to meet turn lane warrants under any analysis scenarios.

CONCLUSIONS

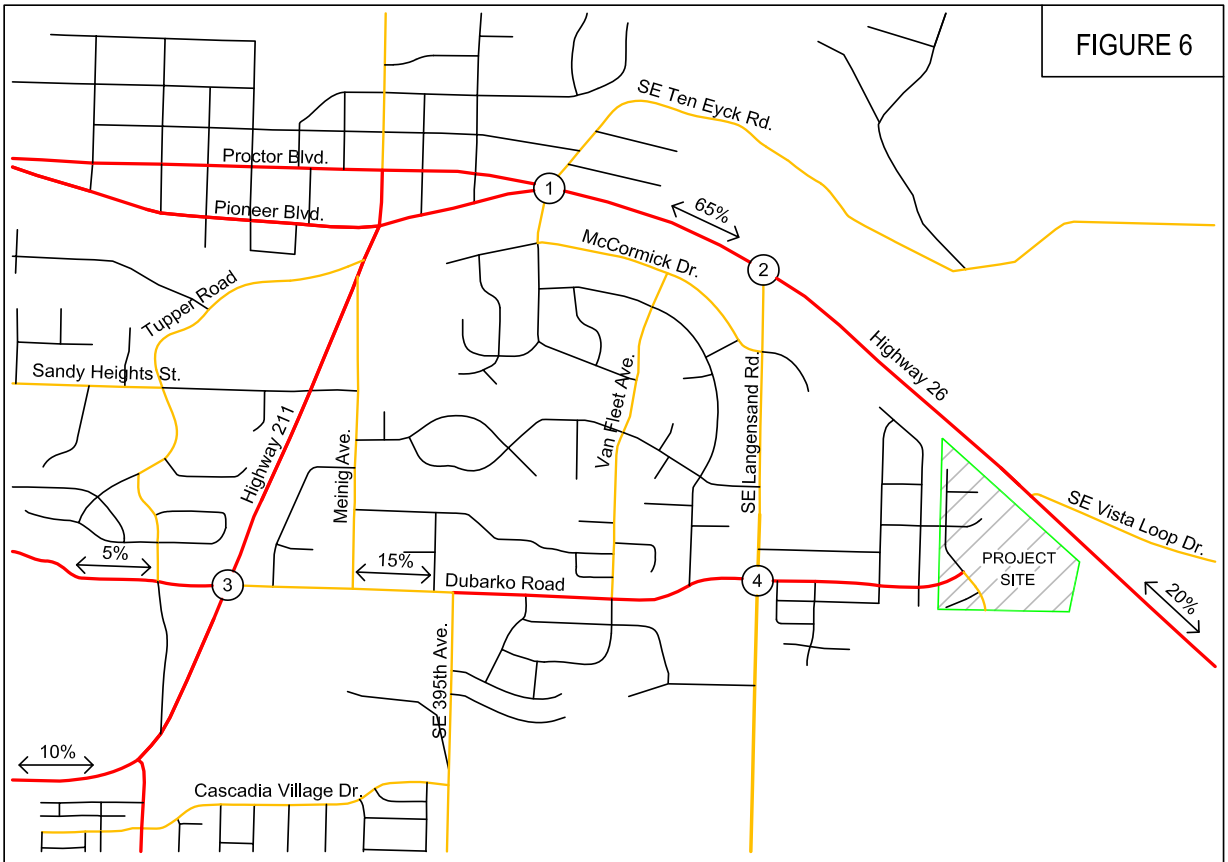
With conversion to all-way stop control, the intersection of Highway 211 at Dubarko Road is projected to operate acceptably under year 2023 traffic conditions. All other study intersections are projected to operate acceptably through year 2023 either with or without the addition of site trips from the proposed development. No other operational mitigations are necessary or recommended in conjunction with the proposed subdivision.

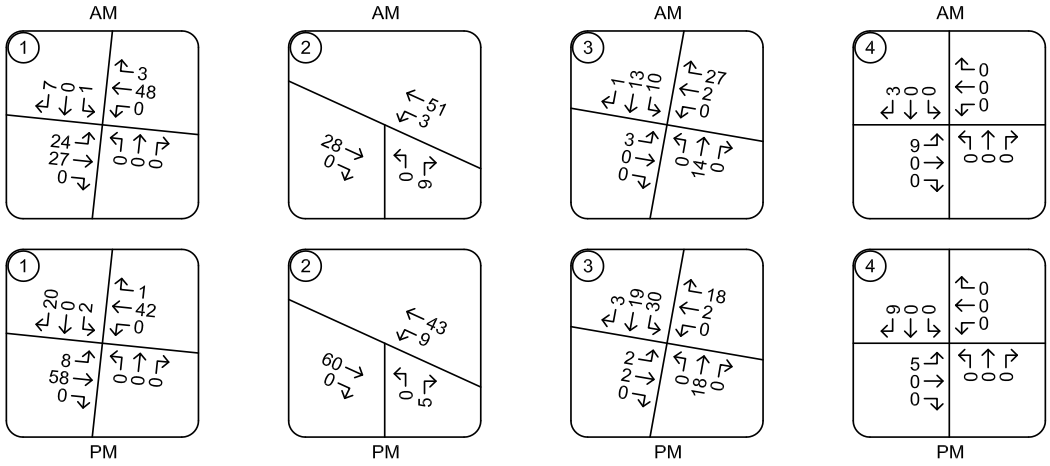
Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. This intersection meets all-way stop control warrants based on crash history, and conversion to all-way stop control would be expected to reduce the frequency and severity of right-angle and turning-movement collisions. It is therefore recommended that all-way stop control be installed at the intersection of Highway 211 and Dubarko Road. No other safety improvements are recommended.

Based on the warrant analysis, no new turn lanes or traffic signals are recommended in conjunction with the proposed subdivision.

APPENDIX

FIGURE 6



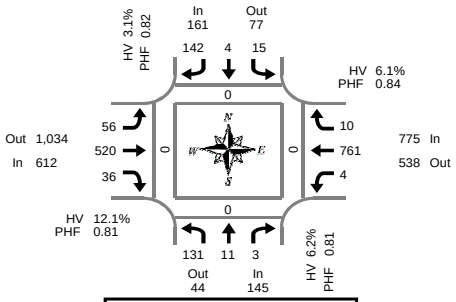


TRAFFIC VOLUMES
In-Process Development - Site Trips
Morning and Evening Peak Hours

PAGE
APP1

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:00 AM to 8:00 AM

SE Ten Eyck Rd & Hwy 26

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	16	0	0	0	0	0	17	0	5	26	2	0	0	74	0	0	140	0	0	0	0
7:05 AM	10	0	1	0	1	0	10	0	2	18	3	0	1	65	2	0	113	0	0	0	0
7:10 AM	17	1	0	0	2	0	11	0	7	36	2	0	2	74	1	0	153	0	0	0	0
7:15 AM	12	0	0	0	1	2	9	0	9	40	2	0	1	84	1	0	161	0	0	0	0
7:20 AM	15	0	0	0	3	0	11	0	3	40	1	0	0	68	0	0	141	0	0	0	0
7:25 AM	14	1	0	0	1	1	16	0	2	40	4	0	0	70	1	0	150	0	0	0	0
7:30 AM	7	1	1	0	0	0	16	0	8	43	2	0	0	67	0	0	145	0	0	0	0
7:35 AM	12	2	0	0	3	0	12	0	0	56	5	0	0	57	1	0	148	0	0	0	0
7:40 AM	8	2	0	0	0	0	11	0	4	59	3	0	0	53	0	0	140	0	0	0	0
7:45 AM	12	1	1	0	2	0	11	0	4	53	3	0	0	45	2	0	134	0	0	0	0
7:50 AM	4	2	0	0	1	0	10	0	9	47	4	0	0	62	0	0	139	0	0	0	0
7:55 AM	4	1	0	0	1	1	8	0	3	62	5	0	0	42	2	0	129	0	0	0	0
8:00 AM	5	0	1	0	2	1	13	0	2	46	2	0	0	41	0	0	113	0	0	0	0
8:05 AM	6	0	0	0	1	1	5	0	8	50	2	0	0	42	2	0	117	0	0	0	0
8:10 AM	3	0	0	0	2	1	10	0	5	45	4	0	0	53	1	0	124	0	0	0	1
8:15 AM	12	0	0	0	2	0	7	0	3	38	1	0	0	34	1	0	98	0	0	0	0
8:20 AM	6	2	0	0	2	0	9	0	5	38	1	0	1	49	0	0	113	0	0	0	0
8:25 AM	8	0	0	0	1	0	11	0	4	44	3	0	0	39	2	0	112	0	0	0	1
8:30 AM	5	0	0	0	2	1	10	0	4	66	2	0	0	47	0	0	137	1	0	0	0
8:35 AM	10	0	0	0	3	0	13	0	6	59	5	0	0	45	1	0	142	0	0	0	0
8:40 AM	7	0	0	0	5	1	15	0	10	62	3	0	1	43	1	0	148	0	0	0	0
8:45 AM	5	0	0	0	1	0	12	0	5	69	5	0	0	63	0	0	160	0	0	0	0
8:50 AM	9	2	0	0	3	0	12	0	7	56	8	0	1	46	1	0	145	0	0	0	0
8:55 AM	8	1	0	0	2	0	13	0	6	51	8	0	2	44	1	0	136	0	0	0	0
Total Survey	215	16	4	0	41	9	272	0	121	1,144	80	0	9	1,307	20	0	3,238	1	0	0	2

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	43	1	1	0	3	0	38	0	14	80	7	0	3	213	3	0	406	0	0	0	0
7:15 AM	41	1	0	0	5	3	36	0	14	120	7	0	1	222	2	0	452	0	0	0	0
7:30 AM	27	5	1	0	3	0	39	0	12	158	10	0	0	177	1	0	433	0	0	0	0
7:45 AM	20	4	1	0	4	1	29	0	16	162	12	0	0	149	4	0	402	0	0	0	0
8:00 AM	14	0	1	0	5	3	28	0	15	141	8	0	0	136	3	0	354	0	0	0	1
8:15 AM	26	2	0	0	5	0	27	0	12	120	5	0	1	122	3	0	323	0	0	0	1
8:30 AM	22	0	0	0	10	2	38	0	20	187	10	0	1	135	2	0	427	1	0	0	0
8:45 AM	22	3	0	0	6	0	37	0	18	176	21	0	3	153	2	0	441	0	0	0	0
Total Survey	215	16	4	0	41	9	272	0	121	1,144	80	0	9	1,307	20	0	3,238	1	0	0	2

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	145	44	189	0	161	77	238	0	612	1,034	1,646	0	775	538	1,313	0	1,693	0	0	0	0
%HV	6.2%				3.1%				12.1%				6.1%				8.0%				
PHF	0.81				0.82				0.81				0.84				0.93				

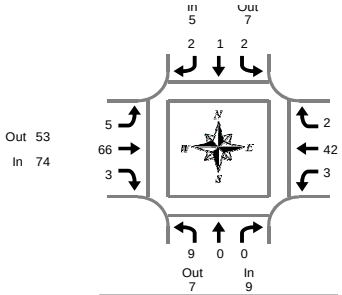
By Movement	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	131	11	3	145	15	4	142	161	56	520	36	612	4	761	10	775	1,693
%HV	6.9%	0.0%	0.0%	6.2%	13.3%	25.0%	1.4%	3.1%	8.9%	12.7%	8.3%	12.1%	75.0%	5.5%	20.0%	6.1%	8.0%
PHF	0.74	0.55	0.75	0.81	0.63	0.33	0.81	0.82	0.74	0.77	0.75	0.81	0.25	0.84	0.63	0.84	0.93

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	131	11	3	0	15	4	142	0	56	520	36	0	4	761	10	0	1,693	0	0	0	0
7:15 AM	102	10	3	0	17	7	132	0	57	581	37	0	1	684	10	0	1,641	0	0	0	1
7:30 AM	87	11	3	0	17	4	123	0	55	581	35	0	1	584	11	0	1,512	0	0	0	2
7:45 AM	82	6	2	0	24	6	122	0	63	610	35	0	2	542	12	0	1,506	1	0	0	2
8:00 AM	84	5	1	0	26	5	130	0	65	624	44	0	5	546	10	0	1,545	1	0	0	2

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE Ten Eyck Rd & Hwy 26

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	0	0	1	0	0	0	0	1	6	1	8	0	6	0	6	15
7:05 AM	0	0	0	0	0	0	0	0	0	5	0	5	0	5	0	5	10
7:10 AM	3	0	0	3	0	0	0	0	0	3	0	3	2	2	1	5	11
7:15 AM	1	0	0	1	0	1	0	1	2	6	0	8	1	1	0	2	12
7:20 AM	2	0	0	2	1	0	0	1	0	5	0	5	0	1	0	1	9
7:25 AM	0	0	0	0	0	0	0	0	0	6	1	7	0	1	0	1	8
7:30 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	7	0	7	14
7:35 AM	0	0	0	0	1	0	0	1	0	7	0	7	0	6	0	6	14
7:40 AM	0	0	0	0	0	0	0	0	1	8	0	9	0	1	0	1	10
7:45 AM	0	0	0	0	0	0	1	1	0	6	0	6	0	4	0	4	11
7:50 AM	0	0	0	0	0	0	1	1	0	3	0	3	0	7	0	7	11
7:55 AM	2	0	0	2	0	0	0	0	1	4	1	6	0	1	1	2	10
8:00 AM	1	0	0	1	0	0	1	1	0	10	1	11	0	2	0	2	15
8:05 AM	0	0	0	0	1	0	1	2	0	9	0	9	0	7	1	8	19
8:10 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	6	0	6	8
8:15 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	3	0	3	7
8:20 AM	0	0	0	0	0	0	1	1	0	5	0	5	1	2	0	3	9
8:25 AM	0	0	0	0	0	0	0	0	0	6	1	7	0	3	0	3	10
8:30 AM	0	0	0	0	1	0	0	1	2	6	0	8	0	3	0	3	12
8:35 AM	0	0	0	0	0	0	0	0	1	5	0	6	0	8	0	8	14
8:40 AM	0	0	0	0	0	0	1	1	0	5	0	5	0	1	0	1	7
8:45 AM	0	0	0	0	0	0	0	0	0	9	0	9	0	3	0	3	12
8:50 AM	0	0	0	0	0	0	0	0	1	4	0	5	1	8	0	9	14
8:55 AM	0	0	0	0	0	0	3	3	0	0	2	2	0	3	0	3	8
Total Survey	10	0	0	10	4	1	9	14	9	131	7	147	5	91	3	99	270

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	4	0	0	4	0	0	0	0	1	14	1	16	2	13	1	16	36
7:15 AM	3	0	0	3	1	1	0	2	2	17	1	20	1	3	0	4	29
7:30 AM	0	0	0	0	1	0	0	1	1	22	0	23	0	14	0	14	38
7:45 AM	2	0	0	2	0	0	2	2	1	13	1	15	0	12	1	13	32
8:00 AM	1	0	0	1	1	0	2	3	0	21	1	22	0	15	1	16	42
8:15 AM	0	0	0	0	0	0	1	1	0	15	1	16	1	8	0	9	26
8:30 AM	0	0	0	0	1	0	1	2	3	16	0	19	0	12	0	12	33
8:45 AM	0	0	0	0	0	0	3	3	1	13	2	16	1	14	0	15	34
Total Survey	10	0	0	10	4	1	9	14	9	131	7	147	5	91	3	99	270

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound SE Ten Eyck Rd			Southbound SE Ten Eyck Rd			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	9	7	16	5	7	12	74	53	127	47	68	115	135
PHF	0.38			0.63			0.80			0.73			0.89

By Movement	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	9	0	0	9	2	1	2	5	5	66	3	74	3	42	2	47	135
PHF	0.38	0.00	0.00	0.38	0.50	0.25	0.25	0.63	0.63	0.75	0.75	0.80	0.25	0.75	0.50	0.73	0.89

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

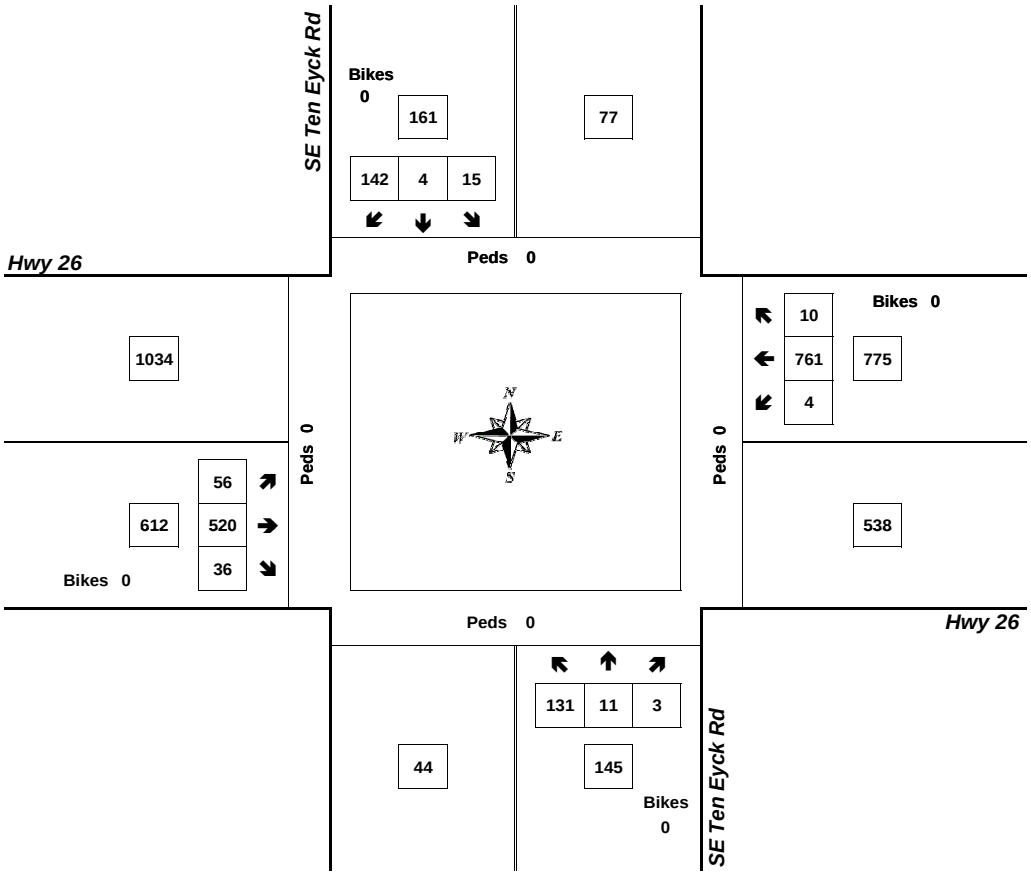
Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	9	0	0	9	2	1	2	5	5	66	3	74	3	42	2	47	135
7:15 AM	6	0	0	6	3	1	4	8	4	73	3	80	1	44	2	47	141
7:30 AM	3	0	0	3	2	0	5	7	2	71	3	76	1	49	2	52	138
7:45 AM	3	0	0	3	2	0	6	8	4	65	3	72	1	47	2	50	133
8:00 AM	1	0	0	1	2	0	7	9	4	65	4	73	2	49	1	52	135

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE Ten Eyck Rd & Hwy 26

7:00 AM to 8:00 AM
Wednesday, March 20, 2019

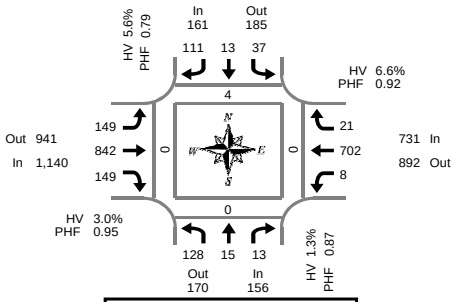


Approach	PHF	HV%	Volume
EB	0.81	12.1%	612
WB	0.84	6.1%	775
NB	0.81	6.2%	145
SB	0.82	3.1%	161
Intersection	0.93	8.0%	1,693

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SE Ten Eyck Rd & Hwy 26

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Peak Hour Summary
4:10 PM to 5:10 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	4	0	2	0	4	3	11	0	8	58	12	0	1	49	2	0	154	0	1	0	0
4:05 PM	10	1	0	0	7	1	5	0	12	63	8	0	1	53	3	0	164	0	0	0	0
4:10 PM	7	2	3	0	1	0	17	0	12	76	11	0	0	65	1	0	195	0	0	0	0
4:15 PM	14	0	1	0	7	1	9	0	18	71	15	0	0	62	1	0	199	0	0	0	0
4:20 PM	9	0	1	0	4	1	11	0	9	75	10	0	0	62	7	0	189	0	0	0	0
4:25 PM	12	2	0	0	5	0	10	0	12	61	14	0	0	52	0	0	168	0	0	0	0
4:30 PM	11	1	4	0	3	2	12	0	17	87	16	1	1	58	1	0	213	0	0	0	0
4:35 PM	15	0	0	0	2	2	6	0	6	59	14	0	0	65	3	0	172	0	0	0	0
4:40 PM	7	1	1	0	3	0	7	0	7	54	9	0	1	57	0	0	147	1	0	0	0
4:45 PM	8	1	0	0	4	1	3	0	13	71	15	1	3	51	3	0	173	0	0	0	0
4:50 PM	13	2	1	0	1	1	6	0	19	74	8	0	0	56	0	0	181	0	0	0	0
4:55 PM	7	1	0	0	1	0	12	0	10	67	14	0	3	57	1	0	173	1	0	0	0
5:00 PM	13	3	1	0	2	2	14	0	12	81	12	0	0	49	1	0	190	2	0	0	0
5:05 PM	12	2	1	0	4	3	4	0	14	66	11	0	0	68	3	1	188	0	0	0	0
5:10 PM	8	0	0	0	6	2	10	0	13	60	12	0	0	68	2	0	181	2	0	0	0
5:15 PM	8	2	1	0	6	2	8	0	9	70	11	0	0	57	1	0	175	0	0	0	0
5:20 PM	8	1	1	1	1	4	10	0	15	73	10	0	0	43	1	0	167	0	1	0	0
5:25 PM	9	1	0	0	4	2	8	0	14	74	11	0	0	43	0	0	166	0	0	0	0
5:30 PM	5	0	1	0	4	0	5	0	15	64	10	0	0	44	0	0	148	1	0	0	0
5:35 PM	5	1	0	0	7	0	9	0	17	50	4	1	0	39	0	0	132	0	0	0	0
5:40 PM	4	0	0	0	2	1	5	0	11	56	7	0	0	30	1	0	117	2	0	0	2
5:45 PM	4	1	0	0	3	2	8	0	14	76	6	0	3	41	1	0	159	0	0	0	0
5:50 PM	7	1	0	0	0	1	6	0	14	69	8	0	0	42	0	0	148	0	0	0	0
5:55 PM	10	1	0	0	0	2	3	0	16	65	10	0	0	51	1	0	159	0	0	0	0
Total Survey	210	24	18	1	81	33	199	0	307	1,620	258	3	13	1,262	33	1	4,058	9	2	0	2

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	21	3	5	0	12	4	33	0	32	197	31	0	2	167	6	0	513	0	1	0	0
4:15 PM	35	2	2	0	16	2	30	0	39	207	39	0	0	176	8	0	556	0	0	0	0
4:30 PM	33	2	5	0	8	4	25	0	30	200	39	1	2	180	4	0	532	1	0	0	0
4:45 PM	28	4	1	0	6	2	21	0	42	212	37	1	6	164	4	0	527	1	0	0	0
5:00 PM	33	5	2	0	12	7	28	0	39	207	35	0	0	185	6	1	559	4	0	0	0
5:15 PM	25	4	2	1	11	8	26	0	38	217	32	0	0	143	2	0	508	0	1	0	0
5:30 PM	14	1	1	0	13	1	19	0	43	170	21	1	0	113	1	0	397	3	0	0	2
5:45 PM	21	3	0	0	3	5	17	0	44	210	24	0	3	134	2	0	466	0	0	0	0
Total Survey	210	24	18	1	81	33	199	0	307	1,620	258	3	13	1,262	33	1	4,058	9	2	0	2

Peak Hour Summary
4:10 PM to 5:10 PM

By Approach	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	156	170	326	0	161	185	346	0	1,140	941	2,081	2	731	892	1,623	1	2,188	4	0	0	0
%HV	1.3%				5.6%				3.0%				6.6%				4.3%				
PHF	0.87				0.79				0.95				0.92				0.94				

By Movement	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	128	15	13	156	37	13	111	161	149	842	149	1,140	8	702	21	731	2,188
%HV	1.6%	0.0%	0.0%	1.3%	0.0%	0.0%	8.1%	5.6%	4.0%	3.0%	2.0%	3.0%	0.0%	6.7%	4.8%	6.6%	4.3%
PHF	0.84	0.63	0.65	0.87	0.58	0.65	0.75	0.79	0.89	0.94	0.85	0.95	0.33	0.93	0.58	0.92	0.94

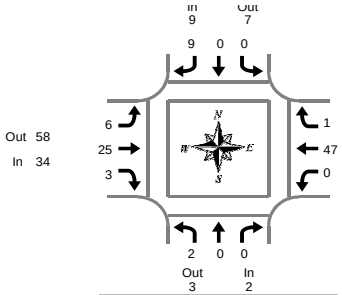
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	117	11	13	0	42	12	109	0	143	816	146	2	10	687	22	0	2,128	2	1	0	0
4:15 PM	129	13	10	0	42	15	104	0	150	826	150	2	8	705	22	1	2,174	6	0	0	0
4:30 PM	119	15	10	1	37	21	100	0	149	836	143	2	8	672	16	1	2,126	6	1	0	0
4:45 PM	100	14	6	1	42	18	94	0	162	806	125	2	6	605	13	1	1,991	8	1	0	2
5:00 PM	93	13	5	1	39	21	90	0	164	804	112	1	3	575	11	1	1,930	7	1	0	2

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:10 PM to 5:10 PM

SE Ten Eyck Rd & Hwy 26

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	4	0	4	0	10	1	11	15
4:05 PM	0	0	0	0	1	0	0	1	0	6	0	6	0	3	1	4	11
4:10 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	8	0	8	10
4:15 PM	2	0	0	2	0	0	2	2	2	3	0	5	0	3	0	3	12
4:20 PM	0	0	0	0	0	0	2	2	1	3	0	4	0	5	1	6	12
4:25 PM	0	0	0	0	0	0	1	1	0	5	1	6	0	4	0	4	11
4:30 PM	0	0	0	0	0	0	2	2	1	0	0	1	0	3	0	3	6
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	5
4:40 PM	0	0	0	0	0	0	1	1	0	3	0	3	0	2	0	2	6
4:45 PM	0	0	0	0	0	0	0	0	1	1	0	2	0	4	0	4	6
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	7
4:55 PM	0	0	0	0	0	0	1	1	1	2	1	4	0	0	0	0	5
5:00 PM	0	0	0	0	0	0	0	0	0	4	1	5	0	1	0	1	6
5:05 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	5	0	5	7
5:10 PM	0	0	0	0	0	0	0	0	1	3	0	4	0	4	0	4	8
5:15 PM	0	0	0	0	0	0	0	0	1	1	0	2	0	2	0	2	4
5:20 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	5	0	5	6
5:25 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3
5:30 PM	0	0	0	0	0	0	0	0	0	3	1	4	0	3	0	3	7
5:35 PM	0	0	0	0	0	0	0	0	1	1	0	2	0	4	0	4	6
5:40 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
5:45 PM	1	0	0	1	0	0	0	0	0	2	0	2	0	3	0	3	6
5:50 PM	1	0	0	1	0	0	0	0	0	1	1	2	0	4	0	4	7
5:55 PM	0	0	0	0	0	0	0	0	1	2	0	3	0	5	0	5	8
Total Survey	4	0	0	4	1	0	9	10	10	53	5	68	0	91	3	94	176

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	1	0	0	1	0	12	0	12	0	21	2	23	36
4:15 PM	2	0	0	2	0	0	5	5	3	11	1	15	0	12	1	13	35
4:30 PM	0	0	0	0	0	0	3	3	1	3	0	4	0	10	0	10	17
4:45 PM	0	0	0	0	0	0	1	1	2	3	1	6	0	11	0	11	18
5:00 PM	0	0	0	0	0	0	0	0	1	9	1	11	0	10	0	10	21
5:15 PM	0	0	0	0	0	0	0	0	1	4	0	5	0	8	0	8	13
5:30 PM	0	0	0	0	0	0	0	0	1	6	1	8	0	7	0	7	15
5:45 PM	2	0	0	2	0	0	0	0	1	5	1	7	0	12	0	12	21
Total Survey	4	0	0	4	1	0	9	10	10	53	5	68	0	91	3	94	176

Heavy Vehicle Peak Hour Summary
4:10 PM to 5:10 PM

By Approach	Northbound SE Ten Eyck Rd			Southbound SE Ten Eyck Rd			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	3	5	9	7	16	34	58	92	48	25	73	93
PHF	0.25			0.45			0.57			0.71			0.66

By Movement	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	0	0	2	0	0	9	9	6	25	3	34	0	47	1	48	93
PHF	0.25	0.00	0.00	0.25	0.00	0.00	0.45	0.45	0.50	0.57	0.38	0.57	0.00	0.73	0.25	0.71	0.66

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

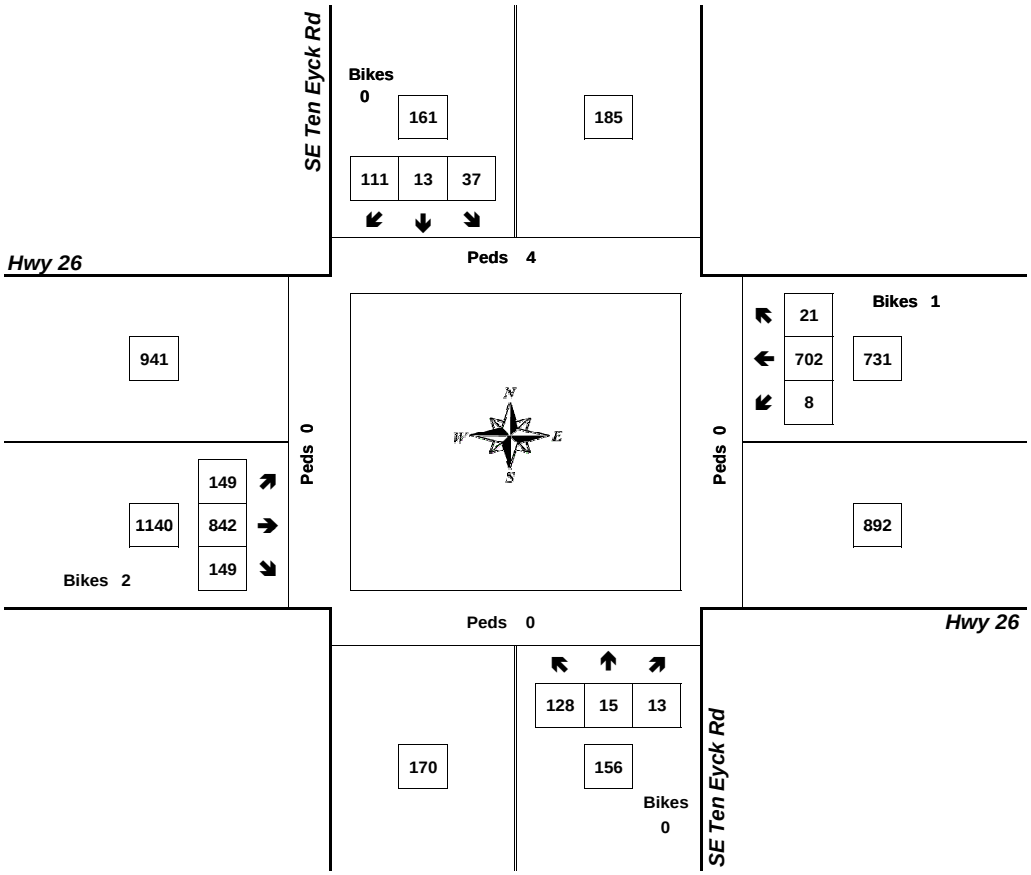
Interval Start Time	Northbound SE Ten Eyck Rd				Southbound SE Ten Eyck Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	0	0	2	1	0	9	10	6	29	2	37	0	54	3	57	106
4:15 PM	2	0	0	2	0	0	9	9	7	26	3	36	0	43	1	44	91
4:30 PM	0	0	0	0	0	0	4	4	5	19	2	26	0	39	0	39	69
4:45 PM	0	0	0	0	0	0	1	1	5	22	3	30	0	36	0	36	67
5:00 PM	2	0	0	2	0	0	0	0	4	24	3	31	0	37	0	37	70

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE Ten Eyck Rd & Hwy 26

4:10 PM to 5:10 PM
Tuesday, March 19, 2019

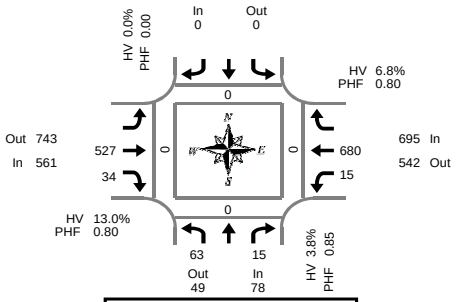


Approach	PHF	HV%	Volume
EB	0.95	3.0%	1,140
WB	0.92	6.6%	731
NB	0.87	1.3%	156
SB	0.79	5.6%	161
Intersection	0.94	4.3%	2,188

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

SE Langensand Rd & Hwy 26

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
7:00 AM	4		0	0				0	25	1	0	2	62		0	94	0	0	0	0
7:05 AM	9		0	0				0	24	2	0	2	65		0	102	0	0	0	0
7:10 AM	3		0	0				0	22	2	0	0	74		0	101	0	0	0	0
7:15 AM	4		2	0				0	33	3	0	1	71		0	114	0	0	0	0
7:20 AM	9		2	0				0	52	1	0	0	71		0	135	0	0	0	0
7:25 AM	4		1	0				0	31	3	0	4	67		0	110	0	0	0	0
7:30 AM	5		2	0				0	39	5	0	0	60		0	111	0	0	0	0
7:35 AM	4		1	0				0	52	1	0	2	54		0	114	0	0	0	0
7:40 AM	8		0	0				0	56	3	0	2	41		0	110	0	0	0	0
7:45 AM	1		2	0				0	49	8	0	3	42		0	105	0	0	0	0
7:50 AM	4		2	0				0	56	2	0	1	52		0	117	0	0	0	0
7:55 AM	7		1	0				0	59	2	0	0	45		0	114	0	0	0	0
8:00 AM	5		2	0				0	54	2	0	0	38		0	101	0	0	0	0
8:05 AM	2		2	0				0	44	3	0	1	41		0	93	0	0	0	0
8:10 AM	2		2	0				0	41	1	0	0	49		0	95	0	0	0	0
8:15 AM	4		1	0				0	46	0	0	2	34		0	87	0	0	0	0
8:20 AM	2		1	0				0	40	3	0	0	42		0	88	0	0	0	0
8:25 AM	4		2	0				0	39	2	0	1	43		0	91	0	0	0	0
8:30 AM	5		4	0				0	53	1	0	2	37		0	102	0	0	0	0
8:35 AM	2		3	0				0	56	1	0	0	53		0	115	0	0	0	0
8:40 AM	1		2	0				0	53	8	0	1	47		0	112	0	0	0	0
8:45 AM	6		2	0				0	77	5	0	0	53		0	143	0	0	0	0
8:50 AM	4		4	0				0	52	2	0	5	60		0	127	0	0	0	0
8:55 AM	5		0	0				0	60	0	0	1	42		0	108	0	0	0	0
Total Survey	104		38	0				0	1,113	61	0	30	1,243		0	2,589	0	0	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
7:00 AM	16		0	0				0	71	5	0	4	201		0	297	0	0	0	0
7:15 AM	17		5	0				0	116	7	0	5	209		0	359	0	0	0	0
7:30 AM	17		3	0				0	147	9	0	4	155		0	335	0	0	0	0
7:45 AM	12		5	0				0	164	12	0	4	139		0	336	0	0	0	0
8:00 AM	9		6	0				0	139	6	0	1	128		0	289	0	0	0	0
8:15 AM	10		4	0				0	125	5	0	3	119		0	266	0	0	0	0
8:30 AM	8		9	0				0	162	10	0	3	137		0	329	0	0	0	0
8:45 AM	15		6	0				0	189	7	0	6	155		0	378	0	0	0	0
Total Survey	104		38	0				0	1,113	61	0	30	1,243		0	2,589	0	0	0	0

Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	78	49	127	0	0	0	0	0	561	743	1,304	0	695	542	1,237	0	1,334	0	0	0	0
%HV	3.8%				0.0%				13.0%				6.8%				9.2%				
PHF	0.85				0.00				0.80				0.80				0.93				

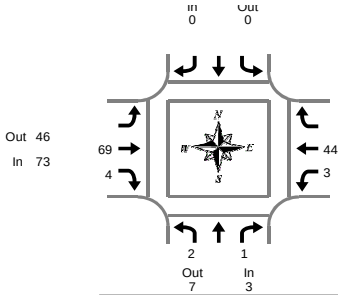
By Movement	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Total
	L		R	Total				Total	T	R	Total		L	T		Total	
Volume	63		15	78				0	527	34	561		15	680		695	1,334
%HV	3.2%	NA	6.7%	3.8%	NA	NA	NA	0.0%	NA	13.1%	11.8%	13.0%	20.0%	6.5%	NA	6.8%	9.2%
PHF	0.88		0.75	0.85				0.00		0.78	0.65	0.80	0.54	0.79		0.80	0.93

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
7:00 AM	62		13	0				0	498	33	0	17	704		0	1,327	0	0	0	0
7:15 AM	55		19	0				0	566	34	0	14	631		0	1,319	0	0	0	0
7:30 AM	48		18	0				0	575	32	0	12	541		0	1,226	0	0	0	0
7:45 AM	39		24	0				0	590	33	0	11	523		0	1,220	0	0	0	0
8:00 AM	42		25	0				0	615	28	0	13	539		0	1,262	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SE Langensand Rd & Hwy 26

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

Peak Hour Summary
7:05 AM to 8:05 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
7:00 AM	0		0	0				0	6	1	7	0	6		6	13
7:05 AM	0		0	0				0	4	1	5	0	6		6	11
7:10 AM	0		0	0				0	2	0	2	0	3		3	5
7:15 AM	0		0	0				0	6	0	6	0	3		3	9
7:20 AM	0		0	0				0	7	0	7	0	0		0	7
7:25 AM	0		0	0				0	5	1	6	1	2		3	9
7:30 AM	0		0	0				0	6	0	6	0	6		6	12
7:35 AM	0		0	0				0	5	0	5	1	7		8	13
7:40 AM	1		0	1				0	7	0	7	0	2		2	10
7:45 AM	0		0	0				0	11	1	12	1	3		4	16
7:50 AM	0		1	1				0	4	1	5	0	5		5	11
7:55 AM	1		0	1				0	3	0	3	0	5		5	9
8:00 AM	0		0	0				0	9	0	9	0	2		2	11
8:05 AM	1		0	1				0	11	1	12	0	7		7	20
8:10 AM	0		0	0				0	2	0	2	0	5		5	7
8:15 AM	0		0	0				0	3	0	3	0	4		4	7
8:20 AM	0		0	0				0	4	1	5	0	2		2	7
8:25 AM	0		1	1				0	4	1	5	0	3		3	9
8:30 AM	0		2	2				0	9	0	9	1	3		4	15
8:35 AM	1		1	2				0	5	0	5	0	6		6	13
8:40 AM	0		0	0				0	5	0	5	0	3		3	8
8:45 AM	0		0	0				0	7	0	7	0	1		1	8
8:50 AM	0		0	0				0	3	0	3	0	9		9	12
8:55 AM	0		0	0				0	4	0	4	0	4		4	8
Total Survey	4		5	9				0	132	8	140	4	97		101	250

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
7:00 AM	0		0	0				0	12	2	14	0	15		15	29
7:15 AM	0		0	0				0	18	1	19	1	5		6	25
7:30 AM	1		0	1				0	18	0	18	1	15		16	35
7:45 AM	1		1	2				0	18	2	20	1	13		14	36
8:00 AM	1		0	1				0	22	1	23	0	14		14	38
8:15 AM	0		1	1				0	11	2	13	0	9		9	23
8:30 AM	1		3	4				0	19	0	19	1	12		13	36
8:45 AM	0		0	0				0	14	0	14	0	14		14	28
Total Survey	4		5	9				0	132	8	140	4	97		101	250

Heavy Vehicle Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound SE Langensand Rd			Southbound SE Langensand Rd			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	7	10	0	0	0	73	46	119	47	70	117	123
PHF	0.38			0.00			0.76			0.69			0.79

By Movement	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Total
	L		R	Total				Total	T	R	Total	L	T		Total	
Volume	2		1	3				0	69	4	73	3	44		47	123
PHF	0.50		0.25	0.38				0.00	0.75	0.50	0.76	0.38	0.73		0.69	0.79

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

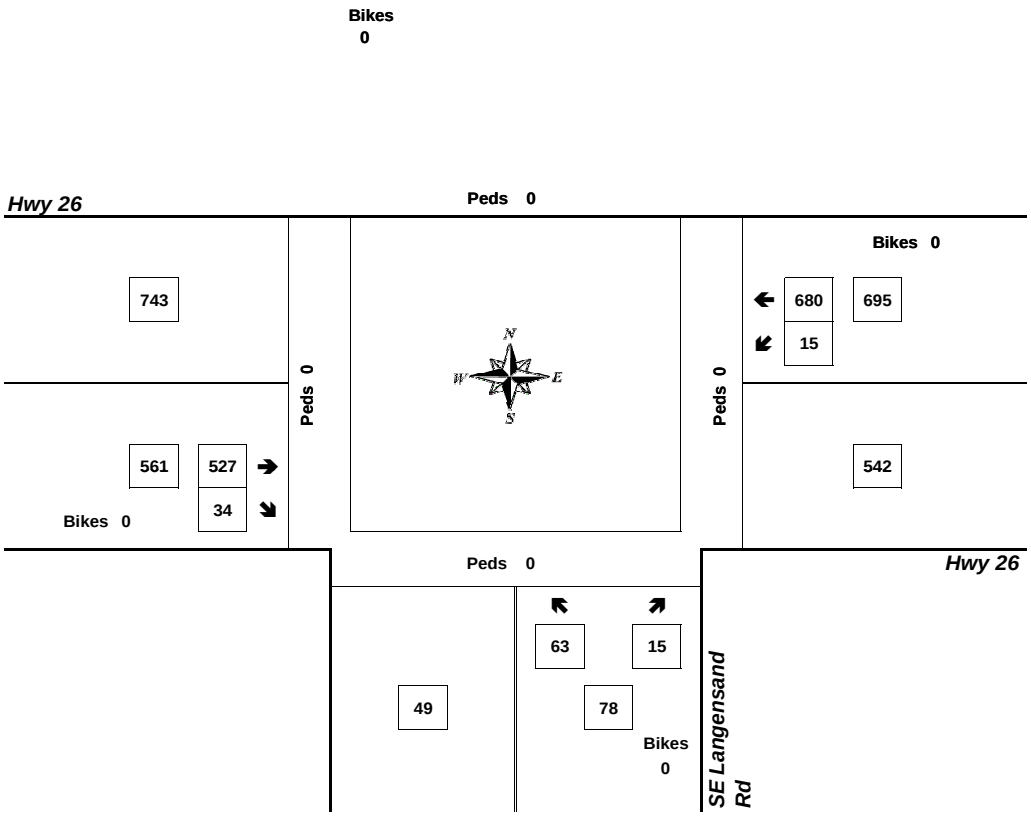
Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
7:00 AM	2		1	3				0	66	5	71	3	48		51	125
7:15 AM	3		1	4				0	76	4	80	3	47		50	134
7:30 AM	3		2	5				0	69	5	74	2	51		53	132
7:45 AM	3		5	8				0	70	5	75	2	48		50	133
8:00 AM	2		4	6				0	66	3	69	1	49		50	125

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE Langensand Rd & Hwy 26

7:05 AM to 8:05 AM
Wednesday, March 20, 2019

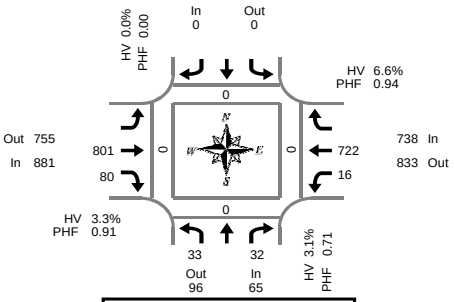


Approach	PHF	HV%	Volume
EB	0.80	13.0%	561
WB	0.80	6.8%	695
NB	0.85	3.8%	78
SB	0.00	0.0%	0
Intersection	0.93	9.2%	1,334

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:10 PM to 5:10 PM

SE Langensand Rd & Hwy 26

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	2		4	0				0	62	9	0	5	50		0	132	0	0	0	0
4:05 PM	1		2	0				0	69	6	0	3	52		0	133	0	0	0	0
4:10 PM	1		3	0				0	61	3	0	1	74		0	143	0	0	0	0
4:15 PM	6		1	0				0	76	5	0	1	50		0	139	0	0	0	0
4:20 PM	5		5	0				0	79	9	0	1	70		0	169	0	0	0	0
4:25 PM	6		0	1				0	58	8	0	1	49		0	122	0	0	0	0
4:30 PM	0		3	0				0	75	12	0	1	56		0	147	0	0	0	0
4:35 PM	2		5	0				0	61	7	0	1	64		0	140	0	0	0	0
4:40 PM	0		1	0				0	59	1	0	1	55		0	117	0	0	0	0
4:45 PM	1		1	0				0	64	3	0	2	63		0	134	0	0	0	0
4:50 PM	6		5	0				0	62	6	0	0	54		0	133	0	0	0	0
4:55 PM	3		0	0				0	72	5	0	2	56		0	138	0	0	0	0
5:00 PM	1		5	0				0	62	10	0	1	55		0	134	0	0	0	0
5:05 PM	2		3	0				0	72	11	0	4	76		0	168	0	0	0	0
5:10 PM	2		3	0				0	58	14	0	1	65		0	143	0	0	0	0
5:15 PM	1		2	0				0	51	8	0	2	59		0	123	0	0	0	0
5:20 PM	2		4	0				0	78	7	0	2	43		0	136	0	0	0	0
5:25 PM	3		1	0				0	71	5	0	1	42		0	123	0	0	0	0
5:30 PM	2		2	0				0	67	7	0	3	38		0	119	0	0	0	0
5:35 PM	1		1	0				0	60	5	0	1	38		0	106	0	0	0	0
5:40 PM	0		4	0				0	49	7	0	0	34		0	94	0	0	0	0
5:45 PM	2		1	0				0	69	7	0	1	45		0	125	0	0	0	0
5:50 PM	0		3	0				0	60	4	0	0	43		0	110	0	0	0	0
5:55 PM	4		1	0				0	65	8	0	3	52		0	133	0	0	0	0
Total Survey	53		60	1				0	1,560	167	0	38	1,283		0	3,161	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	4		9	0				0	192	18	0	9	176		0	408	0	0	0	0
4:15 PM	17		6	1				0	213	22	0	3	169		0	430	0	0	0	0
4:30 PM	2		9	0				0	195	20	0	3	175		0	404	0	0	0	0
4:45 PM	10		6	0				0	198	14	0	4	173		0	405	0	0	0	0
5:00 PM	5		11	0				0	192	35	0	6	196		0	445	0	0	0	0
5:15 PM	6		7	0				0	200	20	0	5	144		0	382	0	0	0	0
5:30 PM	3		7	0				0	176	19	0	4	110		0	319	0	0	0	0
5:45 PM	6		5	0				0	194	19	0	4	140		0	368	0	0	0	0
Total Survey	53		60	1				0	1,560	167	0	38	1,283		0	3,161	0	0	0	0

Peak Hour Summary
4:10 PM to 5:10 PM

By Approach	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	65	96	161	1	0	0	0	0	881	755	1,636	0	738	833	1,571	0	1,684	0	0	0	0
%HV	3.1%				0.0%				3.3%				6.6%				4.8%				
PHF	0.71				0.00				0.91				0.94				0.93				

By Movement	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Total
	L		R	Total				Total	T	R	Total		L	T		Total	
Volume	33		32	65				0	801	80	881		16	722		738	1,684
%HV	3.0%	NA	3.1%	3.1%	NA	NA	NA	0.0%	3.4%	2.5%	3.3%		0.0%	6.8%	NA	6.6%	4.8%
PHF	0.49		0.80	0.71				0.00	0.93	0.69	0.91		0.57	0.93		0.94	0.93

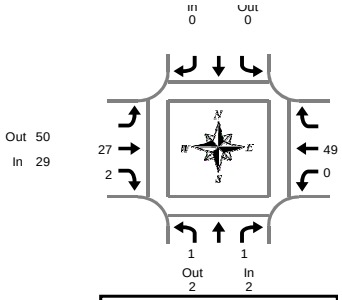
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	33		30	1				0	798	74	0	19	693		0	1,647	0	0	0	0
4:15 PM	34		32	1				0	798	91	0	16	713		0	1,684	0	0	0	0
4:30 PM	23		33	0				0	785	89	0	18	688		0	1,636	0	0	0	0
4:45 PM	24		31	0				0	766	88	0	19	623		0	1,551	0	0	0	0
5:00 PM	20		30	0				0	762	93	0	19	590		0	1,514	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



SE Langensand Rd & Hwy 26

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Peak Hour Summary
4:10 PM to 5:10 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	0		0	0				0	3	0	3	0	11		11	14
4:05 PM	0		0	0				0	8	0	8	0	5		5	13
4:10 PM	0		0	0				0	2	0	2	0	7		7	9
4:15 PM	0		0	0				0	5	0	5	0	4		4	9
4:20 PM	1		0	1				0	4	1	5	0	4		4	10
4:25 PM	0		0	0				0	3	0	3	0	5		5	8
4:30 PM	0		1	1				0	1	1	2	0	3		3	6
4:35 PM	0		0	0				0	1	0	1	0	4		4	5
4:40 PM	0		0	0				0	2	0	2	0	3		3	5
4:45 PM	0		0	0				0	1	0	1	0	4		4	5
4:50 PM	0		0	0				0	2	0	2	0	6		6	8
4:55 PM	0		0	0				0	1	0	1	0	2		2	3
5:00 PM	0		0	0				0	3	0	3	0	1		1	4
5:05 PM	0		0	0				0	2	0	2	0	6		6	8
5:10 PM	0		0	0				0	0	1	1	0	4		4	5
5:15 PM	0		0	0				0	2	0	2	0	3		3	5
5:20 PM	0		0	0				0	0	0	0	0	5		5	5
5:25 PM	0		0	0				0	1	0	1	0	1		1	2
5:30 PM	0		0	0				0	4	0	4	0	2		2	6
5:35 PM	0		0	0				0	0	0	0	1	2		3	3
5:40 PM	0		0	0				0	1	0	1	0	3		3	4
5:45 PM	0		0	0				0	4	0	4	0	3		3	7
5:50 PM	0		0	0				0	1	0	1	0	2		2	3
5:55 PM	0		0	0				0	2	0	2	0	7		7	9
Total Survey	1		1	2				0	53	3	56	1	97		98	156

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	0		0	0				0	13	0	13	0	23		23	36
4:15 PM	1		0	1				0	12	1	13	0	13		13	27
4:30 PM	0		1	1				0	4	1	5	0	10		10	16
4:45 PM	0		0	0				0	4	0	4	0	12		12	16
5:00 PM	0		0	0				0	5	1	6	0	11		11	17
5:15 PM	0		0	0				0	3	0	3	0	9		9	12
5:30 PM	0		0	0				0	5	0	5	1	7		8	13
5:45 PM	0		0	0				0	7	0	7	0	12		12	19
Total Survey	1		1	2				0	53	3	56	1	97		98	156

Heavy Vehicle Peak Hour Summary
4:10 PM to 5:10 PM

By Approach	Northbound SE Langensand Rd			Southbound SE Langensand Rd			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	2	4	0	0	0	29	50	79	49	28	77	80
PHF	0.25			0.00			0.56			0.82			0.71

By Movement	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Total
	L		R	Total				Total	T	R	Total	L	T		Total	
Volume	1		1	2				0	27	2	29	0	49		49	80
PHF	0.25		0.25	0.25				0.00	0.56	0.25	0.56	0.00	0.82		0.82	0.71

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

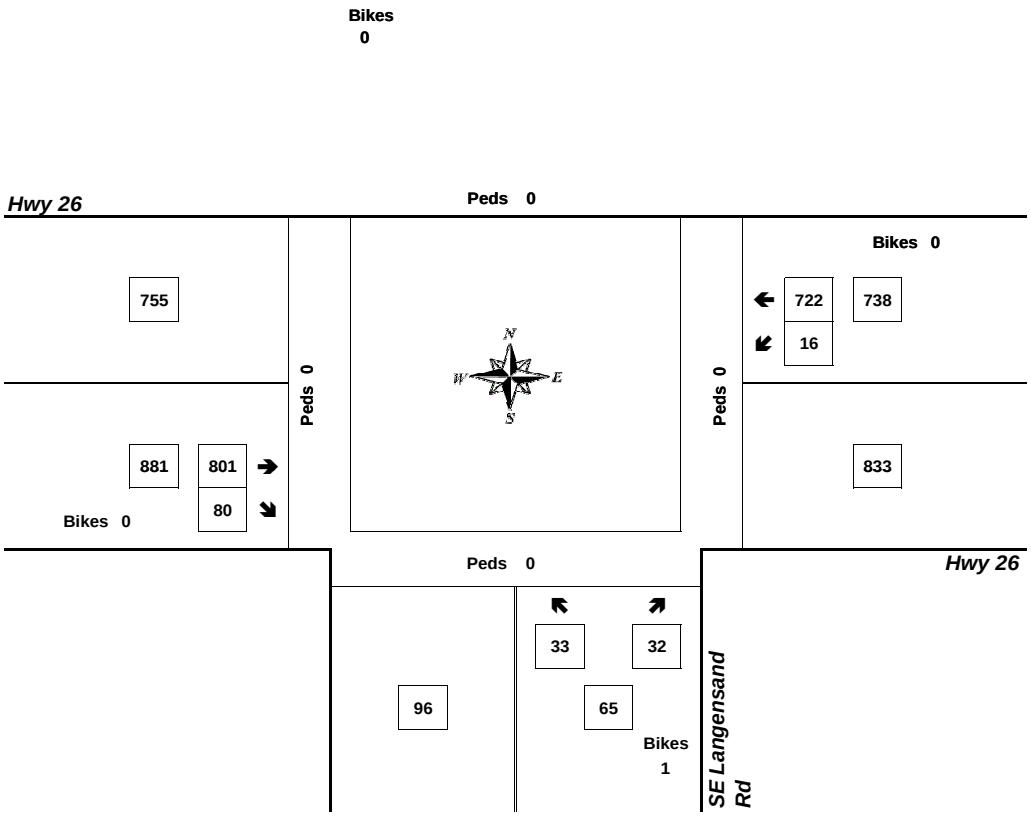
Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	1		1	2				0	33	2	35	0	58		58	95
4:15 PM	1		1	2				0	25	3	28	0	46		46	76
4:30 PM	0		1	1				0	16	2	18	0	42		42	61
4:45 PM	0		0	0				0	17	1	18	1	39		40	58
5:00 PM	0		0	0				0	20	1	21	1	39		40	61

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE Langensand Rd & Hwy 26

4:10 PM to 5:10 PM
Tuesday, March 19, 2019

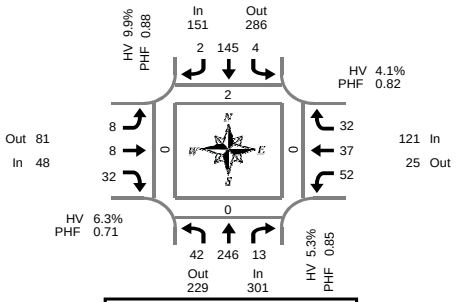


Approach	PHF	HV%	Volume
EB	0.91	3.3%	881
WB	0.94	6.6%	738
NB	0.71	3.1%	65
SB	0.00	0.0%	0
Intersection	0.93	4.8%	1,684

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

Hwy 211 & Dubarko Rd

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	2	18	1	0	0	8	0	0	0	0	0	0	4	5	0	0	38	0	1	0	0
7:05 AM	3	20	1	0	0	12	0	0	0	0	0	0	3	1	5	0	45	0	0	0	0
7:10 AM	5	23	0	0	0	12	0	0	2	2	4	0	4	3	9	0	64	0	0	0	0
7:15 AM	5	32	0	0	0	9	0	0	1	0	2	0	4	2	2	0	57	1	0	0	0
7:20 AM	8	13	0	0	2	13	1	0	0	0	2	0	5	3	5	0	52	0	0	0	0
7:25 AM	1	23	2	0	0	13	0	0	1	1	5	0	4	3	3	0	56	0	0	0	0
7:30 AM	3	17	0	0	1	12	0	0	0	0	3	0	4	9	1	0	50	1	0	0	0
7:35 AM	2	23	0	0	0	17	0	0	0	0	7	0	6	5	1	0	61	0	0	0	0
7:40 AM	2	23	1	0	0	6	1	0	1	2	4	0	6	4	1	0	51	0	0	0	0
7:45 AM	4	20	3	0	0	14	0	0	0	1	0	0	3	1	0	0	46	0	0	0	0
7:50 AM	5	15	3	0	0	10	0	0	1	1	1	0	5	4	2	0	47	0	0	0	0
7:55 AM	1	21	2	0	1	15	0	0	1	0	3	0	3	1	1	0	49	0	0	0	0
8:00 AM	3	16	1	0	0	12	0	0	1	1	1	0	5	1	2	0	43	0	0	0	0
8:05 AM	2	15	0	0	0	7	0	0	1	1	2	0	4	0	3	0	35	1	0	0	0
8:10 AM	2	19	1	0	1	8	0	0	3	1	2	0	3	4	1	0	45	0	0	0	0
8:15 AM	3	27	1	0	0	8	0	0	0	0	1	0	1	3	2	0	46	0	0	0	0
8:20 AM	0	19	0	0	0	10	0	0	0	1	0	0	1	3	0	0	34	0	0	0	0
8:25 AM	6	8	1	0	0	8	0	0	0	1	1	0	1	1	2	0	29	0	0	0	0
8:30 AM	3	27	2	0	0	10	0	0	0	1	1	0	2	2	5	0	53	0	0	0	0
8:35 AM	1	14	0	0	0	16	0	0	0	1	0	0	2	2	0	0	36	0	0	0	0
8:40 AM	0	19	1	0	0	15	0	0	0	1	1	0	1	3	1	0	42	0	0	0	0
8:45 AM	1	21	1	0	0	15	1	0	0	2	3	0	1	2	4	0	51	0	0	0	0
8:50 AM	0	21	0	0	0	9	0	0	0	2	0	0	3	3	2	0	40	0	0	0	0
8:55 AM	4	20	1	0	1	10	0	0	1	3	2	0	3	3	3	0	51	0	0	0	0
Total Survey	66	474	22	0	6	269	3	0	13	22	45	0	78	68	55	0	1,121	3	1	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	10	61	2	0	0	32	0	0	2	2	4	0	11	9	14	0	147	0	1	0	0
7:15 AM	14	68	2	0	2	35	1	0	2	1	9	0	13	8	10	0	165	1	0	0	0
7:30 AM	7	63	1	0	1	35	1	0	1	2	14	0	16	18	3	0	162	1	0	0	0
7:45 AM	10	56	8	0	1	39	0	0	2	2	4	0	11	6	3	0	142	0	0	0	0
8:00 AM	7	50	2	0	1	27	0	0	5	3	5	0	12	5	6	0	123	1	0	0	0
8:15 AM	9	54	2	0	0	26	0	0	0	2	2	0	3	7	4	0	109	0	0	0	0
8:30 AM	4	60	3	0	0	41	0	0	0	3	2	0	5	7	6	0	131	0	0	0	0
8:45 AM	5	62	2	0	1	34	1	0	1	7	5	0	7	8	9	0	142	0	0	0	0
Total Survey	66	474	22	0	6	269	3	0	13	22	45	0	78	68	55	0	1,121	3	1	0	0

Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	301	229	530	0	151	286	437	0	48	81	129	0	121	25	146	0	621	2	0	0	0
%HV	5.3%				9.9%				6.3%				4.1%				6.3%				
PHF	0.85				0.88				0.71				0.82				0.90				

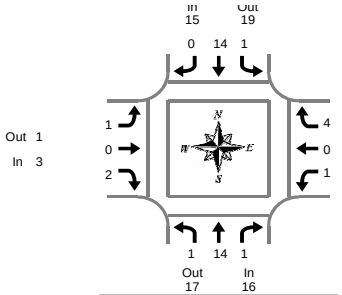
By Movement	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	42	246	13	301	4	145	2	151	8	8	32	48	52	37	32	121	621
%HV	2.4%	5.7%	7.7%	5.3%	25.0%	9.7%	0.0%	9.9%	12.5%	0.0%	6.3%	6.3%	1.9%	0.0%	12.5%	4.1%	6.3%
PHF	0.58	0.82	0.41	0.85	0.33	0.86	0.50	0.88	0.67	0.50	0.53	0.71	0.81	0.51	0.50	0.82	0.90

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	41	248	13	0	4	141	2	0	7	7	31	0	51	41	30	0	616	2	1	0	0
7:15 AM	38	237	13	0	5	136	2	0	10	8	32	0	52	37	22	0	592	3	0	0	0
7:30 AM	33	223	13	0	3	127	1	0	8	9	25	0	42	36	16	0	536	2	0	0	0
7:45 AM	30	220	15	0	2	133	0	0	7	10	13	0	31	25	19	0	505	1	0	0	0
8:00 AM	25	226	9	0	2	128	1	0	6	15	14	0	27	27	25	0	505	1	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

Hwy 211 & Dubarko Rd

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
7:05 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
7:10 AM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	1	1	3
7:15 AM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
7:20 AM	0	0	0	0	1	1	0	2	0	0	0	0	1	0	0	1	3
7:25 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	2	3
7:30 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
7:35 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
7:40 AM	0	3	1	4	0	0	0	0	0	0	0	0	0	0	1	1	5
7:45 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	1	0	0	1	0	3	0	3	0	0	0	0	0	0	0	0	4
8:00 AM	0	6	0	6	0	2	0	2	0	0	0	0	0	0	0	0	8
8:05 AM	0	0	0	0	0	3	0	3	0	0	0	0	1	0	0	1	4
8:10 AM	0	2	0	2	0	0	0	0	0	0	0	0	1	1	0	2	4
8:15 AM	1	2	0	3	0	1	0	1	0	0	0	0	0	0	0	0	4
8:20 AM	0	2	0	2	0	2	0	2	0	1	0	1	0	0	0	0	5
8:25 AM	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	3
8:30 AM	0	3	0	3	0	2	0	2	0	0	0	0	0	0	0	0	5
8:35 AM	0	3	0	3	0	4	0	4	0	0	0	0	0	0	0	0	7
8:40 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
8:45 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
8:50 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:55 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
Total Survey	2	31	1	34	1	31	0	32	1	1	2	4	3	3	4	10	80

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	2	0	2	0	1	0	1	0	0	1	1	0	1	1	2	6
7:15 AM	0	1	0	1	1	1	0	2	1	0	1	2	1	0	2	3	8
7:30 AM	0	5	1	6	0	4	0	4	0	0	0	0	0	0	1	1	11
7:45 AM	1	0	0	1	0	6	0	6	0	0	0	0	0	0	0	0	7
8:00 AM	0	8	0	8	0	5	0	5	0	0	0	0	2	1	0	3	16
8:15 AM	1	6	0	7	0	4	0	4	0	1	0	1	0	0	0	0	12
8:30 AM	0	7	0	7	0	7	0	7	0	0	0	0	0	0	0	0	14
8:45 AM	0	2	0	2	0	3	0	3	0	0	0	0	0	1	0	1	6
Total Survey	2	31	1	34	1	31	0	32	1	1	2	4	3	3	4	10	80

Heavy Vehicle Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound Hwy 211			Southbound Hwy 211			Eastbound Dubarko Rd			Westbound Dubarko Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	16	17	33	15	19	34	3	1	4	5	2	7	39
PHF	0.57			0.63			0.38			0.42			0.81

By Movement	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	14	1	16	1	14	0	15	1	0	2	3	1	0	4	5	39
PHF	0.25	0.58	0.25	0.57	0.25	0.58	0.00	0.63	0.25	0.00	0.25	0.38	0.25	0.00	0.50	0.42	0.81

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

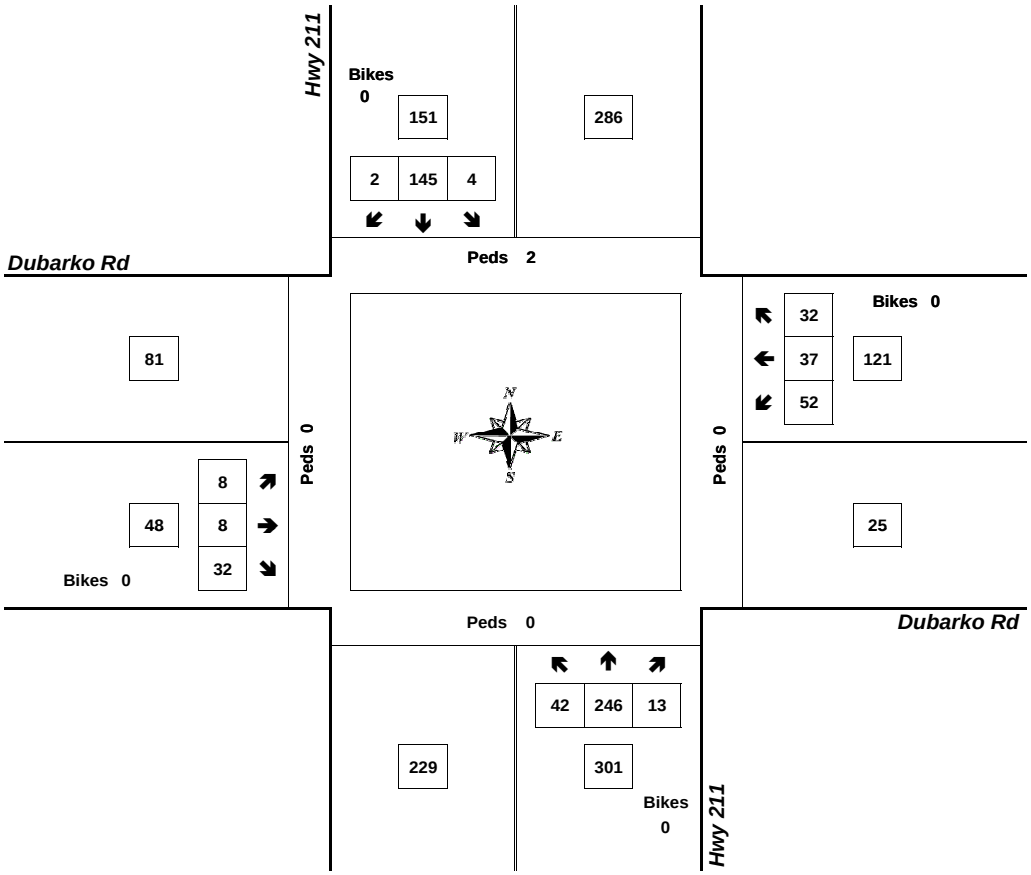
Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	8	1	10	1	12	0	13	1	0	2	3	1	1	4	6	32
7:15 AM	1	14	1	16	1	16	0	17	1	0	1	2	3	1	3	7	42
7:30 AM	2	19	1	22	0	19	0	19	0	1	0	1	2	1	1	4	46
7:45 AM	2	21	0	23	0	22	0	22	0	1	0	1	2	1	0	3	49
8:00 AM	1	23	0	24	0	19	0	19	0	1	0	1	2	2	0	4	48

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Hwy 211 & Dubarko Rd

7:05 AM to 8:05 AM
Wednesday, March 20, 2019

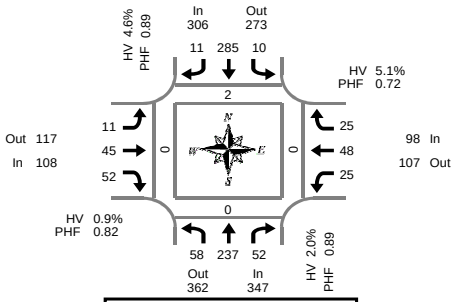


Approach	PHF	HV%	Volume
EB	0.71	6.3%	48
WB	0.82	4.1%	121
NB	0.85	5.3%	301
SB	0.88	9.9%	151
Intersection	0.90	6.3%	621

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Hwy 211 & Dubarko Rd

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Peak Hour Summary
4:05 PM to 5:05 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	4	14	0	0	2	25	1	0	0	3	3	0	2	3	3	0	60	0	0	1	0
4:05 PM	4	28	3	0	1	31	0	0	1	7	6	0	2	6	2	0	91	0	0	0	0
4:10 PM	10	17	2	0	1	19	0	0	0	4	3	0	3	4	3	0	66	0	0	0	0
4:15 PM	4	20	6	0	2	20	1	0	2	7	3	1	1	5	1	0	72	0	0	0	0
4:20 PM	6	12	1	0	1	14	1	0	2	3	4	0	5	7	4	0	60	1	0	0	0
4:25 PM	5	16	4	0	1	21	1	0	3	3	4	0	2	4	1	0	65	0	0	0	0
4:30 PM	4	22	3	0	0	19	3	0	1	2	2	0	5	5	1	0	67	1	0	0	0
4:35 PM	2	23	7	0	0	29	1	0	1	2	1	0	0	1	3	0	70	0	0	0	0
4:40 PM	2	17	4	0	0	22	0	0	0	2	1	0	1	3	3	0	55	0	0	0	0
4:45 PM	10	23	7	0	2	29	1	0	0	6	8	0	3	2	0	0	91	0	0	0	0
4:50 PM	3	22	6	0	1	19	1	0	1	0	4	0	1	1	2	0	61	0	0	0	0
4:55 PM	4	20	3	0	0	20	2	0	0	6	2	0	1	6	1	0	65	0	0	0	0
5:00 PM	4	17	6	0	1	42	0	0	0	3	14	0	1	4	4	0	96	0	0	0	0
5:05 PM	2	24	5	0	0	20	0	0	0	4	5	0	1	2	3	0	66	0	0	0	0
5:10 PM	8	24	4	0	1	13	1	0	1	8	2	0	2	1	3	0	68	0	0	0	0
5:15 PM	4	13	4	0	1	19	1	0	0	4	3	0	5	3	0	0	57	0	0	0	0
5:20 PM	1	19	6	0	1	29	1	0	1	2	2	0	1	4	0	0	67	0	0	0	0
5:25 PM	5	14	6	0	0	17	1	0	1	3	9	0	2	4	3	0	65	0	0	0	0
5:30 PM	5	19	6	0	0	19	1	0	1	5	5	0	0	2	3	0	66	0	0	0	0
5:35 PM	5	15	1	0	2	24	0	0	1	5	6	0	1	2	1	0	63	0	0	0	0
5:40 PM	5	19	7	0	0	29	1	0	0	8	3	0	1	2	0	1	75	0	0	0	0
5:45 PM	4	15	8	0	0	16	1	0	0	7	3	0	3	0	0	0	57	0	0	0	0
5:50 PM	4	13	2	0	0	20	3	0	2	5	3	0	0	5	3	0	60	0	0	0	0
5:55 PM	5	13	2	0	1	18	0	0	0	2	3	0	2	1	1	0	48	0	0	0	0
Total Survey	110	439	103	0	18	534	22	0	18	101	99	1	45	77	45	1	1,611	2	0	1	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	18	59	5	0	4	75	1	0	1	14	12	0	7	13	8	0	217	0	0	1	0
4:15 PM	15	48	11	0	4	55	3	0	7	13	11	1	8	16	6	0	197	1	0	0	0
4:30 PM	8	62	14	0	0	70	4	0	2	6	4	0	6	9	7	0	192	1	0	0	0
4:45 PM	17	65	16	0	3	68	4	0	1	12	14	0	5	9	3	0	217	0	0	0	0
5:00 PM	14	65	15	0	2	75	1	0	1	15	21	0	4	7	10	0	230	0	0	0	0
5:15 PM	10	46	16	0	2	65	3	0	2	9	14	0	8	11	3	0	189	0	0	0	0
5:30 PM	15	53	14	0	2	72	2	0	2	18	14	0	2	6	4	1	204	0	0	0	0
5:45 PM	13	41	12	0	1	54	4	0	2	14	9	0	5	6	4	0	165	0	0	0	0
Total Survey	110	439	103	0	18	534	22	0	18	101	99	1	45	77	45	1	1,611	2	0	1	0

Peak Hour Summary
4:05 PM to 5:05 PM

By Approach	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	347	362	709	0	306	273	579	0	108	117	225	1	98	107	205	0	859	2	0	0	0
%HV	2.0%				4.6%				0.9%				5.1%				3.1%				
PHF	0.89				0.89				0.82				0.72				0.94				

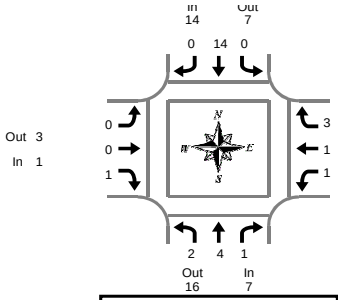
By Movement	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	58	237	52	347	10	285	11	306	11	45	52	108	25	48	25	98	859
%HV	3.4%	1.7%	1.9%	2.0%	0.0%	4.9%	0.0%	4.6%	0.0%	0.0%	1.9%	0.9%	4.0%	2.1%	12.0%	5.1%	3.1%
PHF	0.73	0.91	0.72	0.89	0.63	0.88	0.55	0.89	0.39	0.63	0.65	0.82	0.52	0.75	0.78	0.72	0.94

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	58	234	46	0	11	268	12	0	11	45	41	1	26	47	24	0	823	2	0	1	0
4:15 PM	54	240	56	0	9	268	12	0	11	46	50	1	23	41	26	0	836	2	0	0	0
4:30 PM	49	238	61	0	7	278	12	0	6	42	53	0	23	36	23	0	828	1	0	0	0
4:45 PM	56	229	61	0	9	280	10	0	6	54	63	0	19	33	20	1	840	0	0	0	0
5:00 PM	52	205	57	0	7	266	10	0	7	56	58	0	19	30	21	1	788	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:05 PM to 5:05 PM

Hwy 211 & Dubarko Rd

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	0	4	0	4	0	0	1	1	1	0	0	1	7
4:05 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:10 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	3
4:15 PM	0	1	0	1	0	4	0	4	0	0	0	0	0	0	0	0	5
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
4:25 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	1	1	3
4:35 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	3
4:40 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
4:50 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:55 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:00 PM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
5:05 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:10 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:20 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:25 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:40 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	2	0	2	0	0	1	1	1	0	0	1	4
Total Survey	3	9	2	14	0	23	0	23	0	0	3	3	3	1	3	7	47

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	1	0	3	0	5	0	5	0	0	1	1	1	0	1	2	11
4:15 PM	0	1	0	1	0	6	0	6	0	0	0	0	1	1	0	2	9
4:30 PM	0	1	0	1	0	4	0	4	0	0	0	0	0	0	2	2	7
4:45 PM	0	1	1	2	0	1	0	1	0	0	1	1	0	0	0	0	4
5:00 PM	0	2	0	2	0	3	0	3	0	0	0	0	0	0	0	0	5
5:15 PM	1	2	1	4	0	0	0	0	0	0	0	0	0	0	0	0	4
5:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	3	0	3	0	0	1	1	1	0	0	1	5
Total Survey	3	9	2	14	0	23	0	23	0	0	3	3	3	1	3	7	47

Heavy Vehicle Peak Hour Summary
4:05 PM to 5:05 PM

By Approach	Northbound Hwy 211			Southbound Hwy 211			Eastbound Dubarko Rd			Westbound Dubarko Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	16	23	14	7	21	1	3	4	5	1	6	27
PHF	0.58			0.58			0.25			0.42			0.68

By Movement	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	4	1	7	0	14	0	14	0	0	1	1	1	1	3	5	27
PHF	0.25	0.50	0.25	0.58	0.00	0.58	0.00	0.58	0.00	0.00	0.25	0.25	0.25	0.25	0.38	0.42	0.68

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

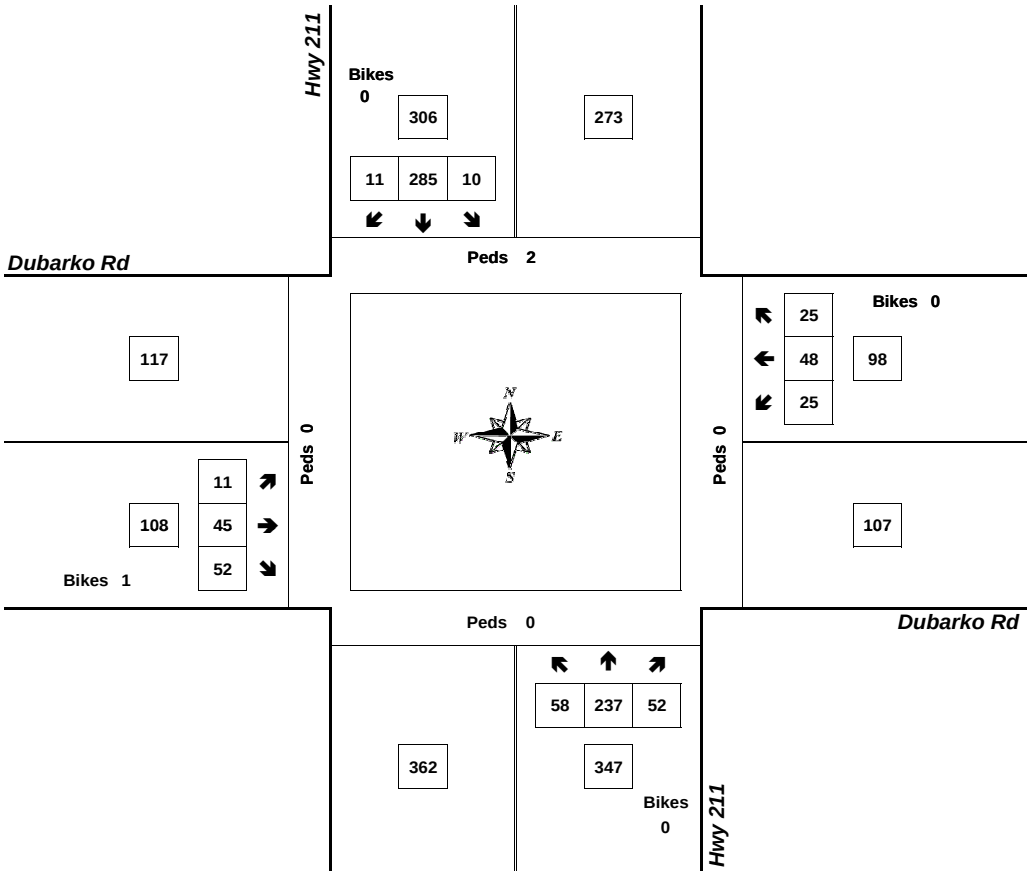
Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	4	1	7	0	16	0	16	0	0	2	2	2	1	3	6	31
4:15 PM	0	5	1	6	0	14	0	14	0	0	1	1	1	1	2	4	25
4:30 PM	1	6	2	9	0	8	0	8	0	0	1	1	0	0	2	2	20
4:45 PM	1	6	2	9	0	5	0	5	0	0	1	1	0	0	0	0	15
5:00 PM	1	5	1	7	0	7	0	7	0	0	1	1	1	0	0	1	16

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Hwy 211 & Dubarko Rd

4:05 PM to 5:05 PM
Tuesday, March 19, 2019

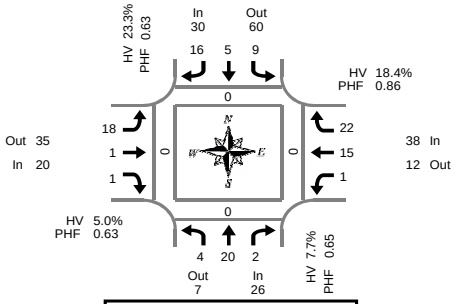


Approach	PHF	HV%	Volume
EB	0.82	0.9%	108
WB	0.72	5.1%	98
NB	0.89	2.0%	347
SB	0.89	4.6%	306
Intersection	0.94	3.1%	859

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

SE Langensand Rd & Dubarko Rd

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	1	1	0	0	0	1	1	0	0	0	0	0	0	2	0	0	6	0	0	0	0
7:05 AM	2	1	0	0	1	0	3	0	1	1	0	0	0	2	3	0	14	0	0	0	0
7:10 AM	0	0	0	0	1	0	0	0	1	0	0	0	0	1	2	0	5	0	0	0	0
7:15 AM	0	2	1	0	0	1	1	0	2	0	0	0	0	0	1	0	8	0	0	0	0
7:20 AM	0	0	0	0	0	0	0	0	3	0	0	0	1	3	2	0	9	0	0	0	0
7:25 AM	0	0	0	0	2	2	3	0	1	0	0	0	0	1	2	0	11	0	0	0	0
7:30 AM	0	6	0	0	0	0	3	0	0	0	0	0	0	1	1	0	11	0	0	0	0
7:35 AM	1	2	0	0	0	0	0	0	0	0	1	0	0	2	0	0	6	0	0	0	0
7:40 AM	0	0	1	0	2	1	3	0	0	0	0	0	0	2	2	0	11	0	0	0	0
7:45 AM	0	1	0	0	2	0	1	0	2	0	0	0	0	0	3	0	9	0	0	0	0
7:50 AM	1	1	0	0	1	0	2	0	3	0	0	0	0	1	3	0	12	0	0	0	0
7:55 AM	0	4	0	0	0	0	0	0	3	0	0	0	0	0	2	0	9	0	0	0	0
8:00 AM	0	3	0	0	0	1	0	0	2	0	0	0	0	2	1	0	9	0	0	0	0
8:05 AM	0	1	0	0	0	1	1	0	3	0	0	0	0	3	1	0	10	0	0	0	0
8:10 AM	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3	1	0	0	0
8:15 AM	0	2	0	0	0	0	1	0	3	0	0	0	0	1	1	0	8	0	0	0	0
8:20 AM	1	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	5	0	0	0	0
8:25 AM	1	0	0	0	0	1	1	0	3	0	1	0	0	0	1	0	8	0	0	1	0
8:30 AM	0	0	0	0	0	0	0	0	2	2	0	0	1	2	1	0	8	0	0	0	0
8:35 AM	1	0	0	0	1	0	0	0	1	1	1	0	1	2	0	0	8	0	0	0	0
8:40 AM	1	1	0	0	0	3	2	0	1	0	0	0	0	1	0	0	9	0	0	0	0
8:45 AM	1	3	0	0	0	1	2	0	3	0	2	0	1	2	1	0	16	0	0	0	0
8:50 AM	1	4	1	0	0	1	2	0	2	0	0	0	0	1	3	0	15	0	0	0	0
8:55 AM	1	2	1	0	0	0	1	0	1	0	0	0	0	2	1	0	9	0	0	0	0
Total Survey	12	35	4	0	11	14	29	0	38	5	5	0	4	31	31	0	219	1	0	1	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	3	2	0	0	2	1	4	0	2	1	0	0	0	5	5	0	25	0	0	0	0
7:15 AM	0	2	1	0	2	3	4	0	6	0	0	0	1	4	5	0	28	0	0	0	0
7:30 AM	1	8	1	0	2	1	6	0	0	0	1	0	0	5	3	0	28	0	0	0	0
7:45 AM	1	6	0	0	3	0	3	0	8	0	0	0	0	1	8	0	30	0	0	0	0
8:00 AM	0	5	0	0	1	2	2	0	5	0	0	0	0	5	2	0	22	1	0	0	0
8:15 AM	2	2	0	0	0	2	3	0	7	1	1	0	0	1	2	0	21	0	0	1	0
8:30 AM	2	1	0	0	1	3	2	0	4	3	1	0	2	5	1	0	25	0	0	0	0
8:45 AM	3	9	2	0	0	2	5	0	6	0	2	0	1	5	5	0	40	0	0	0	0
Total Survey	12	35	4	0	11	14	29	0	38	5	5	0	4	31	31	0	219	1	0	1	0

Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	26	7	33	0	30	60	90	0	20	35	55	0	38	12	50	0	114	0	0	0	0
%HV	7.7%				23.3%				5.0%				18.4%				14.9%				
PHF	0.65				0.63				0.63				0.86				0.89				

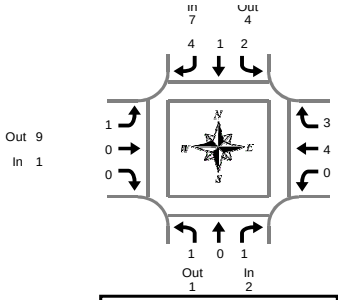
By Movement	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	4	20	2	26	9	5	16	30	18	1	1	20	1	15	22	38	114
%HV	25.0%	0.0%	50.0%	7.7%	22.2%	20.0%	25.0%	23.3%	5.6%	0.0%	0.0%	5.0%	0.0%	26.7%	13.6%	18.4%	14.9%
PHF	0.50	0.63	0.50	0.65	0.45	0.42	0.67	0.63	0.56	0.25	0.25	0.63	0.25	0.75	0.69	0.86	0.89

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	5	18	2	0	9	5	17	0	16	1	1	0	1	15	21	0	111	0	0	0	0
7:15 AM	2	21	2	0	8	6	15	0	19	0	1	0	1	15	18	0	108	1	0	0	0
7:30 AM	4	21	1	0	6	5	14	0	20	1	2	0	0	12	15	0	101	1	0	1	0
7:45 AM	5	14	0	0	5	7	10	0	24	4	2	0	2	12	13	0	98	1	0	1	0
8:00 AM	7	17	2	0	2	9	12	0	22	4	4	0	3	16	10	0	108	1	0	1	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE Langensand Rd & Dubarko Rd

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

Peak Hour Summary
7:05 AM to 8:05 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
7:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
7:25 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	2
7:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	2
7:50 AM	0	0	0	0	1	0	0	1	1	0	0	1	0	1	1	2	4
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
8:05 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:10 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
8:35 AM	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	1	3
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	1	1	4	2	1	5	8	3	0	0	3	2	4	3	9	24

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	0	0	1	0	0	1	1	0	0	0	0	0	0	1	1	3
7:15 AM	0	0	1	1	0	0	1	1	0	0	0	0	0	3	0	3	5
7:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	2	0	1	3	1	0	0	1	0	1	1	2	6
8:00 AM	0	1	0	1	0	1	1	2	0	0	0	0	0	0	1	1	4
8:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:30 AM	1	0	0	1	0	0	0	0	1	0	0	1	2	0	0	2	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	1	1	4	2	1	5	8	3	0	0	3	2	4	3	9	24

Heavy Vehicle Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound SE Langensand Rd			Southbound SE Langensand Rd			Eastbound Dubarko Rd			Westbound Dubarko Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	1	3	7	4	11	1	9	10	7	3	10	17
PHF	0.25			0.58			0.25			0.58			0.71

By Movement	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	1	2	2	1	4	7	1	0	0	1	0	4	3	7	17
PHF	0.25	0.00	0.25	0.25	0.25	0.25	0.50	0.58	0.25	0.00	0.00	0.25	0.00	0.33	0.38	0.58	0.71

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

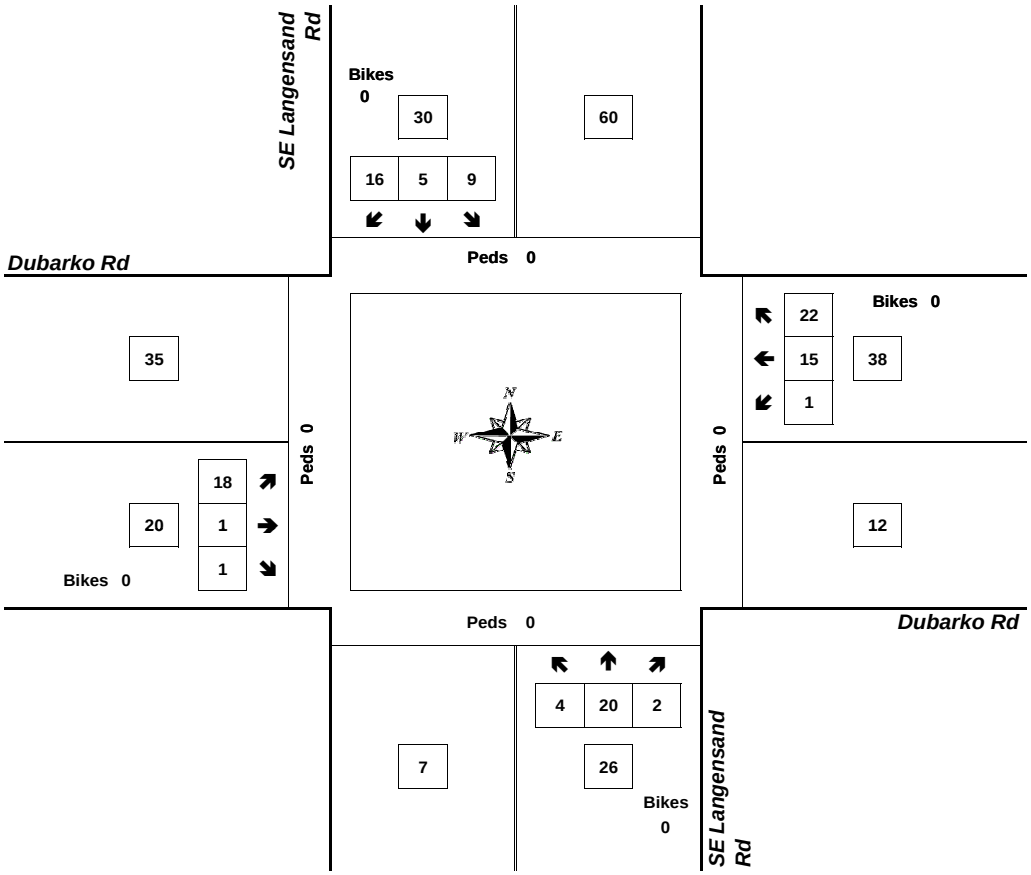
Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	0	1	2	2	0	4	6	1	0	0	1	0	4	2	6	15
7:15 AM	0	1	1	2	2	1	4	7	1	0	0	1	0	4	2	6	16
7:30 AM	0	1	0	1	2	1	3	6	2	0	0	2	0	1	2	3	12
7:45 AM	1	1	0	2	2	1	2	5	3	0	0	3	2	1	2	5	15
8:00 AM	1	1	0	2	0	1	1	2	2	0	0	2	2	0	1	3	9

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE Langensand Rd & Dubarko Rd

7:05 AM to 8:05 AM
Wednesday, March 20, 2019

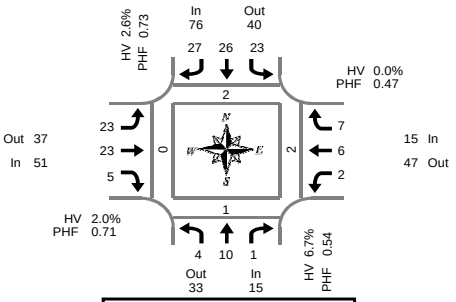


Approach	PHF	HV%	Volume
EB	0.63	5.0%	20
WB	0.86	18.4%	38
NB	0.65	7.7%	26
SB	0.63	23.3%	30
Intersection	0.89	14.9%	114

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SE Langensand Rd & Dubarko Rd

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Peak Hour Summary
4:55 PM to 5:55 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	2	1	0	1	0	5	0	3	2	0	0	0	0	0	0	15	0	0	0	0
4:05 PM	2	1	1	0	0	2	2	0	1	1	0	0	0	2	0	0	12	0	0	0	0
4:10 PM	2	0	0	0	2	0	0	0	1	1	2	0	0	0	1	0	9	0	0	1	0
4:15 PM	3	2	0	0	1	1	3	0	4	0	0	0	0	1	1	0	16	1	0	0	0
4:20 PM	0	0	0	0	1	3	2	0	3	2	0	0	0	2	1	0	14	0	0	1	0
4:25 PM	0	3	0	0	1	2	1	0	1	0	0	1	0	3	1	0	12	0	0	0	0
4:30 PM	0	2	0	0	0	1	3	2	4	0	0	0	0	2	0	0	12	2	0	3	0
4:35 PM	0	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	5	0	0	1	0
4:40 PM	0	2	0	0	0	2	1	0	1	0	1	0	0	1	1	0	9	0	0	0	0
4:45 PM	0	2	0	0	0	2	1	0	3	2	1	0	0	1	1	0	13	0	0	0	0
4:50 PM	0	0	0	0	2	4	0	0	1	2	0	0	0	1	2	0	12	0	0	0	0
4:55 PM	1	2	0	0	1	2	2	0	2	0	0	0	0	0	0	0	10	0	0	0	0
5:00 PM	1	3	0	0	3	3	1	0	1	2	0	0	0	0	0	0	14	0	0	0	0
5:05 PM	0	0	0	0	1	4	4	0	4	2	0	0	0	0	0	0	15	0	0	0	0
5:10 PM	0	0	0	0	2	2	4	0	1	2	0	0	0	0	0	0	11	0	1	0	0
5:15 PM	0	1	0	0	3	3	3	0	3	1	0	0	0	1	1	0	16	0	0	1	0
5:20 PM	1	1	0	0	1	1	4	0	0	1	1	0	0	0	2	0	12	0	0	0	0
5:25 PM	0	0	0	0	3	0	2	0	2	2	2	0	2	0	1	0	14	1	0	0	0
5:30 PM	0	0	0	0	1	2	3	0	0	3	0	0	0	3	0	0	12	0	0	0	0
5:35 PM	0	0	0	1	3	1	0	0	3	1	0	0	0	1	1	0	10	1	0	0	0
5:40 PM	0	1	1	0	1	1	1	1	2	4	0	0	0	1	0	0	12	0	0	1	0
5:45 PM	1	0	0	0	2	3	2	0	4	2	1	0	0	0	0	0	15	0	0	0	0
5:50 PM	0	2	0	0	2	4	1	0	1	3	1	0	0	0	2	0	16	0	0	0	0
5:55 PM	1	0	0	0	1	0	3	0	1	1	0	0	0	1	0	0	8	0	0	0	0
Total Survey	13	25	3	1	32	45	48	3	47	34	10	1	2	20	15	0	294	5	1	8	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	5	3	2	0	3	2	7	0	5	4	2	0	0	2	1	0	36	0	0	1	0
4:15 PM	3	5	0	0	3	6	6	0	8	2	0	1	0	6	3	0	42	1	0	1	0
4:30 PM	0	5	0	0	0	5	4	2	6	0	2	0	0	3	1	0	26	2	0	4	0
4:45 PM	1	4	0	0	3	8	3	0	6	4	1	0	0	2	3	0	35	0	0	0	0
5:00 PM	1	3	0	0	6	9	9	0	6	6	0	0	0	0	0	0	40	0	1	0	0
5:15 PM	1	2	0	0	7	4	9	0	5	4	3	0	2	1	4	0	42	1	0	1	0
5:30 PM	0	1	1	1	5	4	4	1	5	8	0	0	0	5	1	0	34	1	0	1	0
5:45 PM	2	2	0	0	5	7	6	0	6	6	2	0	0	1	2	0	39	0	0	0	0
Total Survey	13	25	3	1	32	45	48	3	47	34	10	1	2	20	15	0	294	5	1	8	0

Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	15	33	48	1	76	40	116	1	51	37	88	0	15	47	62	0	157	2	1	2	0
%HV	6.7%				2.6%				2.0%				0.0%				2.5%				
PHF	0.54				0.73				0.71				0.47				0.91				

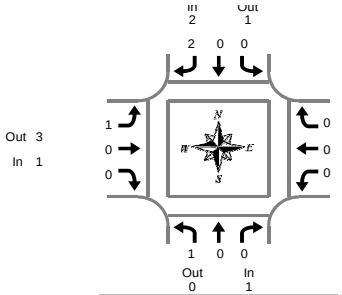
By Movement	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	4	10	1	15	23	26	27	76	23	23	5	51	2	6	7	15	157
%HV	25.0%	0.0%	0.0%	6.7%	0.0%	0.0%	7.4%	2.6%	4.3%	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	2.5%
PHF	0.50	0.50	0.25	0.54	0.82	0.72	0.61	0.73	0.64	0.64	0.42	0.71	0.25	0.30	0.44	0.47	0.91

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	9	17	2	0	9	21	20	2	25	10	5	1	0	13	8	0	139	3	0	6	0
4:15 PM	5	17	0	0	12	28	22	2	26	12	3	1	0	11	7	0	143	3	1	5	0
4:30 PM	3	14	0	0	16	26	25	2	23	14	6	0	2	6	8	0	143	3	1	5	0
4:45 PM	3	10	1	1	21	25	25	1	22	22	4	0	2	8	8	0	151	2	1	2	0
5:00 PM	4	8	1	1	23	24	28	1	22	24	5	0	2	7	7	0	155	2	1	2	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE Langensand Rd & Dubarko Rd

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Peak Hour Summary
4:55 PM to 5:55 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	2
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
4:20 PM	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	2
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	2
5:50 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	0	1	2	1	1	3	5	2	0	0	2	0	1	0	1	10

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	1	1	0	2	1	0	0	1	0	0	0	0	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	1	0	0	1	1	1	0	0	1	0	0	0	0	3
Total Survey	1	0	1	2	1	1	3	5	2	0	0	2	0	1	0	1	10

Heavy Vehicle Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound SE Langensand Rd			Southbound SE Langensand Rd			Eastbound Dubarko Rd			Westbound Dubarko Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	0	1	2	1	3	1	3	4	0	0	0	4
PHF	0.25			0.50			0.25			0.00			0.33

By Movement	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	0	1	0	0	2	2	1	0	0	1	0	0	0	0	4
PHF	0.25	0.00	0.00	0.25	0.00	0.00	0.50	0.50	0.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.33

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

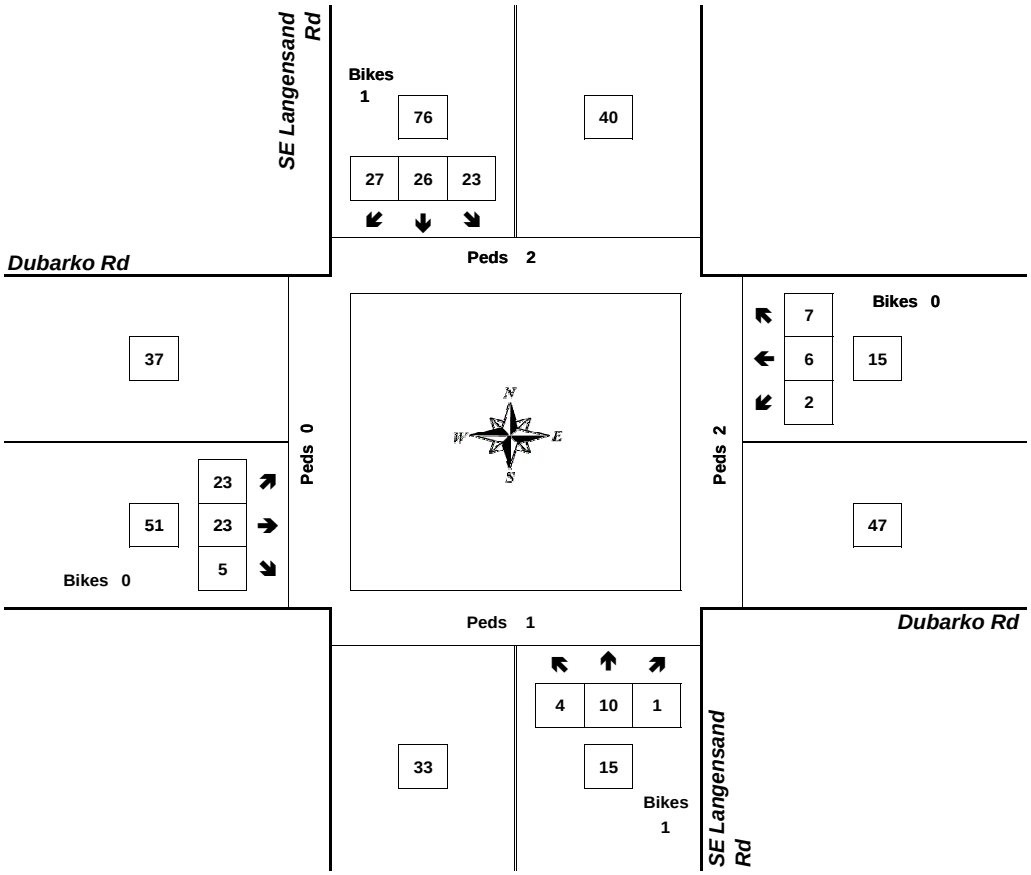
Interval Start Time	Northbound SE Langensand Rd				Southbound SE Langensand Rd				Eastbound Dubarko Rd				Westbound Dubarko Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	1	1	1	3	1	0	0	1	0	1	0	1	6
4:15 PM	0	0	0	0	1	1	1	3	1	0	0	1	0	1	0	1	5
4:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	2
4:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:00 PM	1	0	0	1	0	0	2	2	1	0	0	1	0	0	0	0	4

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE Langensand Rd & Dubarko Rd

4:55 PM to 5:55 PM
Tuesday, March 19, 2019



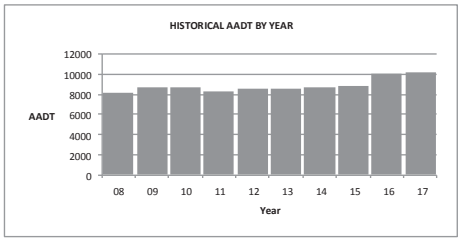
Approach	PHF	HV%	Volume
EB	0.71	2.0%	51
WB	0.47	0.0%	15
NB	0.54	6.7%	15
SB	0.73	2.6%	76
Intersection	0.91	2.5%	157

Count Period: 4:00 PM to 6:00 PM

Location:	US26; MP 46.38; MT. HOOD HIGHWAY NO. 26; 0.30 mile east of Camp Creek Rd (USFS 28)	Site Name:	Rhododendron (03-006)
		Installed:	August, 1995

HISTORICAL TRAFFIC DATA

		Percent of AADT				
Year	AADT	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2008	8162	233	22.9	20.1	19.1	18.2
2009	8737	197	22.3	19.6	18.4	17.8
2010	8714	207	21.6	19.8	18.9	18.5
2011	8330	214	24.7	20.0	18.6	18.1
2012	8480	227	24.0	21.0	20.2	19.4
2013	8527	213	23.4	21.1	20.3	19.1
2014	8652	216	23.2	21.1	20.3	19.2
2015	8861	242	21.4	20.3	19.4	18.7
2016	10071	208	22.9	19.6	18.8	17.9
2017	10223	200	19.9	19.1	18.1	17.5



2017 TRAFFIC DATA

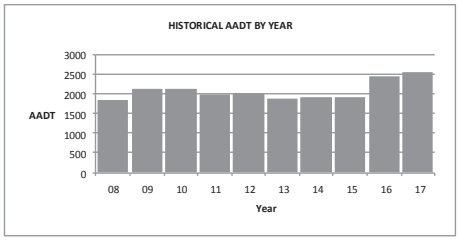
	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	6744	66	9080	89
February	6533	64	9496	93
March	6763	66	9337	91
April	6166	60	8675	85
May	7675	75	9598	94
June	8568	84	10695	105
July	11291	110	13874	136
August	11738	115	13623	133
September	11300	111	12734	125
October	6589	64	8087	79
November	5493	54	7313	72
December	8753	86	10161	99

For Vehicle Classification data near your project, please go to the following web page: https://www.oregon.gov/ODOT/Data/Documents/TVT_2017.xlsx

Location:	OR35; MP 57.79; MT. HOOD HIGHWAY NO. 26; 0.02 mile east of Warm Springs Highway No. 53 (US26)	Site Name:	Mt. Hood Meadows (03-007)
		Installed:	September, 1995

HISTORICAL TRAFFIC DATA

		Percent of AADT				
Year	AADT	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2008	1854	398	56.8	44.2	39.9	36.1
2009	2130	***	***	***	***	***
2010	2145	374	49.2	39.5	34.8	33.2
2011	1976	476	79.2	49.1	45.0	39.1
2012	2023	452	65.4	43.4	40.3	37.7
2013	1868	427	68.1	48.7	42.0	37.1
2014	1908	400	60.0	41.9	37.4	33.6
2015	1931	393	50.4	38.6	34.4	32.6
2016	2455	366	55.9	38.3	33.1	31.2
2017	2565	340	52.1	37.7	32.5	31.3



2017 TRAFFIC DATA

	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	2449	95	3616	141
February	1978	77	3362	131
March	1781	69	2833	110
April	1116	44	2050	80
May	1202	47	1609	63
June	1794	70	2070	81
July	2405	94	2837	111
August	2302	90	2614	102
September	3956	154	3993	156
October	1387	54	1614	63
November	768	30	1156	45
December	2499	97	2966	116

For Vehicle Classification data near your project, please go to the following web page: https://www.oregon.gov/ODOT/Data/Documents/TVT_2017.xlsx

Site id	HWY	MP	DIR	HS	Description	2017	2018	2019	2039	RSQ
1778	026	22.72	1		0.02 mile northwest of SE 362nd Drive, west city limits of Sandy		33700		47300	MODEL
1779	026	23.85	1		0.02 mile west of Bluff Road		33300		47100	MODEL
1780	026	23.89	1		0.02 mile east of Bluff Road		15700		22400	MODEL
1781	026	24.02	1		0.02 mile west of Beers Avenue		16200		23100	MODEL
1782	026	24.35	1		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		16000		23400	MODEL
1783	026	24.42	1		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		12400		17700	MODEL
1784	026	24.59	1		0.02 mile west of Ten Eyck Road		12500		17800	MODEL
1785	026	23.89	2		0.02 mile east of Bluff Road		16600		23300	MODEL
1786	026	24.04	2		0.02 mile west of Beers Avenue		18300		25600	MODEL
1787	026	24.36	2		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		15900		22700	MODEL
1788	026	24.40	2		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		13700		19200	MODEL
1789	026	24.61	2		0.02 mile west of Ten Eyck Road		12600		17600	MODEL
1790	026	25.10	1		0.02 mile west of Langensand Road		20700		29200	MODEL
1791	026	25.66	1		0.10 mile east of Vista Loop Drive		23500		32900	MODEL

Site id	HWY	MP	DIR	HS	Description	2017	2018	2019	2039	RSQ
3563	172	-0.13	1		0.10 mile east of Clackamas Highway (OR224)			6000	9400	MODEL
3564	172	1.45	1		0.10 mile southwest of Judd Road			7100	11200	MODEL
3565	172	1.65	1		0.10 mile northeast of Judd Road			7400	11400	MODEL
3566	172	3.65	1		0.05 mile west of 362nd Drive			8000	12200	MODEL
3567	172	3.75	1		0.05 mile east of 362nd Drive			5900	8800	MODEL
3568	172	5.07	1		0.10 mile west of Bornstedt Road			4600	7600	MODEL
3569	172	5.29	1		0.10 mile south of Dubarko Road			6300	10300	MODEL
3570	172	5.50	1		0.11 mile north of Dubarko Road			5700	9200	MODEL
3571	172	5.83	1		0.05 mile south of Mt. Hood Highway (US26-EB)			7500	12100	MODEL
3572	172	5.92	1		0.02 mile south of Mt. Hood Highway (US26-WB)			4400	7100	MODEL

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 05/31/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	740	37	4	1083	10	136	11	3	16	4	148
Future Volume (vph)	58	740	37	4	1083	10	136	11	3	16	4	148
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		1.00			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00			0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			1.00	
Satd. Flow (prot)	1484	2945		1568	3137	1356		1575			1464	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.55			0.97	
Satd. Flow (perm)	1484	2945		1568	3137	1356		902			1423	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	62	787	39	4	1152	11	145	12	3	17	4	157
RTOR Reduction (vph)	0	3	0	0	0	5	0	1	0	0	109	0
Lane Group Flow (vph)	62	823	0	4	1152	6	0	159	0	0	69	0
Confl. Peds. (#/hr)						4						4
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	12%	12%	12%	6%	6%	6%	6%	6%	6%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	8.4	68.9		1.1	61.6	61.6		36.5			36.5	
Effective Green, g (s)	8.4	68.9		1.1	61.6	61.6		36.5			36.5	
Actuated g/C Ratio	0.07	0.57		0.01	0.51	0.51		0.30			0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	103	1690		14	1610	696		274			432	
v/s Ratio Prot	c0.04	0.28		0.00	c0.37							
v/s Ratio Perm						0.00		c0.18			0.05	
v/c Ratio	0.60	0.49		0.29	0.72	0.01		0.58			0.16	
Uniform Delay, d1	54.2	15.1		59.1	22.5	14.3		35.3			30.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.5	1.0		10.9	2.8	0.0		8.7			0.2	
Delay (s)	63.7	16.1		70.0	25.2	14.3		44.0			30.7	
Level of Service	E	B		E	C	B		D			C	
Approach Delay (s)		19.4			25.3			44.0			30.7	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26 05/31/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	740	37	4	1083	10	136	11	3	16	4	148
Future Volume (veh/h)	58	740	37	4	1083	10	136	11	3	16	4	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586	1668	1668	1668	1668	1668	1668	1709	1709	1709
Adj Flow Rate, veh/h	62	787	39	4	1152	11	145	12	3	17	4	157
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	12	12	12	6	6	6	6	6	6	3	3	3
Cap, veh/h	76	1687	84	8	1689	735	323	25	6	57	29	396
Arrive On Green	0.05	0.58	0.58	0.01	0.53	0.53	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1511	2919	145	1589	3169	1379	874	82	18	80	94	1300
Grp Volume(v), veh/h	62	406	420	4	1152	11	160	0	0	178	0	0
Grp Sat Flow(s),veh/h/ln	1511	1507	1556	1589	1585	1379	974	0	0	1474	0	0
Q Serve(g_s), s	4.9	18.7	18.7	0.3	32.0	0.5	8.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.9	18.7	18.7	0.3	32.0	0.5	19.6	0.0	0.0	11.5	0.0	0.0
Prop In Lane	1.00		0.09	1.00		1.00	0.91		0.02	0.10		0.88
Lane Grp Cap(c), veh/h	76	871	900	8	1689	735	353	0	0	481	0	0
V/C Ratio(X)	0.82	0.47	0.47	0.48	0.68	0.01	0.45	0.00	0.00	0.37	0.00	0.00
Avail Cap(c_a), veh/h	145	871	900	73	1689	735	353	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	56.4	14.6	14.6	59.5	20.6	13.2	37.0	0.0	0.0	33.1	0.0	0.0
Incr Delay (d2), s/veh	18.5	1.8	1.7	38.0	2.2	0.0	4.1	0.0	0.0	0.5	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	2.3	6.8	7.0	0.2	12.2	0.2	4.5	0.0	0.0	4.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.9	16.4	16.4	97.5	22.8	13.2	41.1	0.0	0.0	33.5	0.0	0.0
LnGrp LOS	E	B	B	F	C	B	D	A	A	C	A	A
Approach Vol, veh/h		888			1167			160			178	
Approach Delay, s/veh		20.5			23.0			41.1			33.5	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	73.9		41.0	10.5	68.5		41.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	64.5		36.5	11.5	58.5		36.5				
Max Q Clear Time (g_c+I1), s	2.3	20.7		21.6	6.9	34.0		13.5				
Green Ext Time (p_c), s	0.0	6.8		0.8	0.0	10.0		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			24.0									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	750	35	16	967	66	16
Future Vol, veh/h	750	35	16	967	66	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	13	13	7	7	4	4
Mvmt Flow	798	37	17	1029	70	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	835	0	1347	399
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	-	-	4.24	-	6.88	6.98
Critical Hdwy Stg 1	-	-	-	-	5.88	-
Critical Hdwy Stg 2	-	-	-	-	5.88	-
Follow-up Hdwy	-	-	2.27	-	3.54	3.34
Pot Cap-1 Maneuver	-	-	763	-	140	595
Stage 1	-	-	-	-	399	-
Stage 2	-	-	-	-	537	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	763	-	137	595
Mov Cap-2 Maneuver	-	-	-	-	137	-
Stage 1	-	-	-	-	399	-
Stage 2	-	-	-	-	525	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	47.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	137	595	-	-	763	-
HCM Lane V/C Ratio	0.513	0.029	-	-	0.022	-
HCM Control Delay (s)	56.1	11.2	-	-	9.8	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	2.4	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱		↔			↰	↱
Traffic Vol, veh/h	8	8	33	54	38	33	44	283	14	4	167	2
Future Vol, veh/h	8	8	33	54	38	33	44	283	14	4	167	2
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	5	5	5	2	2	2	5	5	5
Mvmt Flow	9	9	37	60	42	37	49	314	16	4	186	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	658	626	188	640	620	326	190	0	0	332	0	0
Stage 1	196	196	-	422	422	-	-	-	-	-	-	-
Stage 2	462	430	-	218	198	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.15	6.55	6.25	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.545	4.045	3.345	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	379	402	857	384	400	708	1384	-	-	1211	-	-
Stage 1	808	740	-	604	583	-	-	-	-	-	-	-
Stage 2	582	585	-	778	732	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	316	381	855	347	379	705	1381	-	-	1209	-	-
Mov Cap-2 Maneuver	316	381	-	347	379	-	-	-	-	-	-	-
Stage 1	771	736	-	576	556	-	-	-	-	-	-	-
Stage 2	486	558	-	733	728	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.6	16.7	1	0.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1381	-	-	345	855	360	705	1209	-	-
HCM Lane V/C Ratio	0.035	-	-	0.052	0.043	0.284	0.052	0.004	-	-
HCM Control Delay (s)	7.7	0	-	16	9.4	18.9	10.4	8	0	-
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	1.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	1	1	1	15	23	4	21	2	9	5	17
Future Vol, veh/h	19	1	1	1	15	23	4	21	2	9	5	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	18	18	18	8	8	8	23	23	23
Mvmt Flow	21	1	1	1	17	26	4	24	2	10	6	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	91	70	16	70	78	25	25	0	0	26	0	0
Stage 1	36	36	-	33	33	-	-	-	-	-	-	-
Stage 2	55	34	-	37	45	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.28	6.68	6.38	4.18	-	-	4.33	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.28	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.28	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.662	4.162	3.462	2.272	-	-	2.407	-	-
Pot Cap-1 Maneuver	886	815	1055	884	783	1007	1551	-	-	1462	-	-
Stage 1	972	859	-	944	837	-	-	-	-	-	-	-
Stage 2	950	861	-	939	827	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	843	807	1055	875	775	1007	1551	-	-	1462	-	-
Mov Cap-2 Maneuver	843	807	-	875	775	-	-	-	-	-	-	-
Stage 1	969	853	-	941	834	-	-	-	-	-	-	-
Stage 2	904	858	-	930	821	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	9.2	1.1	2.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1551	-	-	843	914	900	1462	-	-
HCM Lane V/C Ratio	0.003	-	-	0.025	0.002	0.049	0.007	-	-
HCM Control Delay (s)	7.3	0	-	9.4	8.9	9.2	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.2	0	-	-

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 05/31/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	1152	155	8	1041	22	133	16	14	38	14	115
Future Volume (vph)	155	1152	155	8	1041	22	133	16	14	38	14	115
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.99			0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			0.99	
Satd. Flow (prot)	1614	3163		1554	3107	1343		1645			1461	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.57			0.91	
Satd. Flow (perm)	1614	3163		1554	3107	1343		983			1340	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	163	1213	163	8	1096	23	140	17	15	40	15	121
RTOR Reduction (vph)	0	8	0	0	0	12	0	3	0	0	66	0
Lane Group Flow (vph)	163	1368	0	8	1096	11	0	169	0	0	110	0
Confl. Peds. (#/hr)						4						4
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	3%	3%	3%	7%	7%	7%	1%	1%	1%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	16.3	73.0		1.0	57.7	57.7		32.5			32.5	
Effective Green, g (s)	16.3	73.0		1.0	57.7	57.7		32.5			32.5	
Actuated g/C Ratio	0.14	0.61		0.01	0.48	0.48		0.27			0.27	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	219	1924		12	1493	645		266			362	
v/s Ratio Prot	c0.10	c0.43		0.01	0.35							
v/s Ratio Perm						0.01		c0.17			0.08	
v/c Ratio	0.74	0.71		0.67	0.73	0.02		0.64			0.30	
Uniform Delay, d1	49.8	16.2		59.3	25.0	16.3		38.5			34.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.8	2.3		89.5	3.2	0.0		11.1			0.5	
Delay (s)	62.7	18.5		148.8	28.2	16.4		49.6			35.2	
Level of Service	E	B		F	C	B		D			D	
Approach Delay (s)		23.2			28.8			49.6			35.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26 05/31/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	1152	155	8	1041	22	133	16	14	38	14	115
Future Volume (veh/h)	155	1152	155	8	1041	22	133	16	14	38	14	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1709	1709	1654	1654	1654	1736	1736	1736	1668	1668	1668
Adj Flow Rate, veh/h	163	1213	163	8	1096	23	140	17	15	40	15	121
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	3	7	7	7	1	1	1	6	6	6
Cap, veh/h	189	1742	233	15	1573	684	290	35	26	109	53	275
Arrive On Green	0.12	0.61	0.61	0.01	0.50	0.50	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1628	2870	384	1576	3143	1368	869	128	95	266	195	1014
Grp Volume(v), veh/h	163	684	692	8	1096	23	172	0	0	176	0	0
Grp Sat Flow(s),veh/h/ln	1628	1624	1630	1576	1572	1368	1092	0	0	1475	0	0
Q Serve(g_s), s	11.8	34.3	34.8	0.6	32.1	1.0	7.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.8	34.3	34.8	0.6	32.1	1.0	18.4	0.0	0.0	11.4	0.0	0.0
Prop In Lane	1.00		0.24	1.00		1.00	0.81		0.09	0.23		0.69
Lane Grp Cap(c), veh/h	189	985	989	15	1573	684	350	0	0	436	0	0
V/C Ratio(X)	0.86	0.69	0.70	0.52	0.70	0.03	0.49	0.00	0.00	0.40	0.00	0.00
Avail Cap(c_a), veh/h	264	985	989	67	1573	684	350	0	0	436	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	52.1	16.0	16.1	59.1	23.0	15.2	39.2	0.0	0.0	36.1	0.0	0.0
Incr Delay (d2), s/veh	18.3	4.0	4.1	24.7	2.6	0.1	4.9	0.0	0.0	0.6	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	5.8	13.4	13.7	0.3	12.3	0.3	5.0	0.0	0.0	4.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	20.0	20.2	83.8	25.6	15.3	44.1	0.0	0.0	36.7	0.0	0.0
LnGrp LOS	E	C	C	F	C	B	D	A	A	D	A	A
Approach Vol, veh/h		1539			1127			172			176	
Approach Delay, s/veh		25.5			25.8			44.1			36.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	77.3		37.0	18.4	64.6		37.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	68.9		32.5	19.5	54.5		32.5				
Max Q Clear Time (g_c+I1), s	2.6	36.8		20.4	13.8	34.1		13.4				
Green Ext Time (p_c), s	0.0	13.3		0.8	0.2	8.7		1.0				

Intersection Summary			
HCM 6th Ctrl Delay		27.3	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1107	83	17	1064	34	33
Future Vol, veh/h	1107	83	17	1064	34	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	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	7	7	3	3
Mvmt Flow	1165	87	18	1120	36	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1252	0	1761	583
Stage 1	-	-	-	-	1165	-
Stage 2	-	-	-	-	596	-
Critical Hdwy	-	-	4.24	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.27	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	525	-	75	453
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	510	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	525	-	72	453
Mov Cap-2 Maneuver	-	-	-	-	72	-
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	493	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	55.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	72	453	-	-	525	-
HCM Lane V/C Ratio	0.497	0.077	-	-	0.034	-
HCM Control Delay (s)	96.7	13.6	-	-	12.1	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	2	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	47	54	26	50	26	60	272	54	10	327	11
Future Vol, veh/h	11	47	54	26	50	26	60	272	54	10	327	11
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	5	5	5	2	2	2	5	5	5
Mvmt Flow	12	50	57	28	53	28	64	289	57	11	348	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	860	848	350	878	832	322	362	0	0	348	0	0
Stage 1	372	372	-	448	448	-	-	-	-	-	-	-
Stage 2	488	476	-	430	384	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.15	6.55	6.25	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.545	4.045	3.345	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	277	299	696	265	301	712	1197	-	-	1194	-	-
Stage 1	651	621	-	584	568	-	-	-	-	-	-	-
Stage 2	563	558	-	598	606	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	213	274	695	197	276	709	1195	-	-	1192	-	-
Mov Cap-2 Maneuver	213	274	-	197	276	-	-	-	-	-	-	-
Stage 1	606	612	-	544	529	-	-	-	-	-	-	-
Stage 2	453	519	-	498	598	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.1	22.7	1.3	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1195	-	-	260	695	243	709	1192	-	-
HCM Lane V/C Ratio	0.053	-	-	0.237	0.083	0.333	0.039	0.009	-	-
HCM Control Delay (s)	8.2	0	-	23.1	10.6	27	10.3	8	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.9	0.3	1.4	0.1	0	-	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	24	5	2	6	7	4	10	1	24	27	28
Future Vol, veh/h	24	24	5	2	6	7	4	10	1	24	27	28
Conflicting Peds, #/hr	2	0	1	3	0	4	1	0	3	4	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	3	3	3
Mvmt Flow	26	26	5	2	7	8	4	11	1	26	30	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	131	124	51	140	139	20	63	0	0	16	0	0
Stage 1	100	100	-	24	24	-	-	-	-	-	-	-
Stage 2	31	24	-	116	115	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.17	-	-	4.13	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.263	-	-	2.227	-	-
Pot Cap-1 Maneuver	841	766	1017	830	752	1058	1508	-	-	1595	-	-
Stage 1	906	812	-	994	875	-	-	-	-	-	-	-
Stage 2	986	875	-	889	800	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	812	746	1012	786	732	1050	1505	-	-	1589	-	-
Mov Cap-2 Maneuver	812	746	-	786	732	-	-	-	-	-	-	-
Stage 1	901	797	-	987	869	-	-	-	-	-	-	-
Stage 2	965	869	-	838	785	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	9.3	2	2.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1505	-	-	812	781	862	1589	-	-
HCM Lane V/C Ratio	0.003	-	-	0.032	0.041	0.019	0.017	-	-
HCM Control Delay (s)	7.4	0	-	9.6	9.8	9.3	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	0.1	-	-

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 32 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

32 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	6	18	24
PM Peak Hour	20	12	32
Weekday	151	151	302

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet

Land Use Description: Multi-Family Housing (Low-Rise)
ITE Land Use Code: 220
Independent Variable: Dwelling Units
Quantity: 120 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.46 trips per dwelling unit
Directional Distribution: 23% Entering 77% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.56 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 7.32 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

120 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	13	42	55
PM Peak Hour	42	25	67
Weekday	439	439	878

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 06/01/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	796	38	4	1173	13	141	11	3	18	4	161
Future Volume (vph)	84	796	38	4	1173	13	141	11	3	18	4	161
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		1.00			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00			0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			1.00	
Satd. Flow (prot)	1484	2946		1568	3137	1356		1575			1464	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.52			0.96	
Satd. Flow (perm)	1484	2946		1568	3137	1356		854			1418	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	838	40	4	1235	14	148	12	3	19	4	169
RTOR Reduction (vph)	0	2	0	0	0	7	0	1	0	0	115	0
Lane Group Flow (vph)	88	876	0	4	1235	7	0	162	0	0	77	0
Confl. Peds. (#/hr)						4						4
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	12%	12%	12%	6%	6%	6%	6%	6%	6%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	11.0	71.0		1.0	61.0	61.0		34.5			34.5	
Effective Green, g (s)	11.0	71.0		1.0	61.0	61.0		34.5			34.5	
Actuated g/C Ratio	0.09	0.59		0.01	0.51	0.51		0.29			0.29	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	136	1743		13	1594	689		245			407	
v/s Ratio Prot	c0.06	0.30		0.00	c0.39							
v/s Ratio Perm						0.01		c0.19			0.05	
v/c Ratio	0.65	0.50		0.31	0.77	0.01		0.66			0.19	
Uniform Delay, d1	52.6	14.2		59.2	23.9	14.6		37.6			32.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	10.1	1.0		13.0	3.7	0.0		13.3			0.2	
Delay (s)	62.8	15.3		72.2	27.7	14.6		50.9			32.4	
Level of Service	E	B		E	C	B		D			C	
Approach Delay (s)		19.6			27.7			50.9			32.4	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26 06/01/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	796	38	4	1173	13	141	11	3	18	4	161
Future Volume (veh/h)	84	796	38	4	1173	13	141	11	3	18	4	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586	1668	1668	1668	1668	1668	1668	1709	1709	1709
Adj Flow Rate, veh/h	88	838	40	4	1235	14	148	12	3	19	4	169
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, %	12	12	12	6	6	6	6	6	6	3	3	3
Cap, veh/h	107	1740	83	8	1678	730	295	22	5	57	27	379
Arrive On Green	0.07	0.59	0.59	0.01	0.53	0.53	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1511	2925	140	1589	3169	1379	825	77	17	84	95	1318
Grp Volume(v), veh/h	88	432	446	4	1235	14	163	0	0	192	0	0
Grp Sat Flow(s),veh/h/ln	1511	1507	1557	1589	1585	1379	919	0	0	1497	0	0
Q Serve(g_s), s	6.9	19.5	19.5	0.3	36.1	0.6	8.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.9	19.5	19.5	0.3	36.1	0.6	21.7	0.0	0.0	12.8	0.0	0.0
Prop In Lane	1.00		0.09	1.00		1.00	0.91		0.02	0.10		0.88
Lane Grp Cap(c), veh/h	107	896	926	8	1678	730	321	0	0	463	0	0
V/C Ratio(X)	0.82	0.48	0.48	0.48	0.74	0.02	0.51	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	157	896	926	68	1678	730	321	0	0	463	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	55.0	13.8	13.8	59.5	21.8	13.4	39.7	0.0	0.0	35.0	0.0	0.0
Incr Delay (d2), s/veh	19.6	1.9	1.8	38.0	2.9	0.0	5.6	0.0	0.0	0.6	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	3.2	7.0	7.3	0.2	13.9	0.2	4.8	0.0	0.0	4.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.7	15.7	15.6	97.5	24.7	13.5	45.3	0.0	0.0	35.6	0.0	0.0
LnGrp LOS	E	B	B	F	C	B	D	A	A	D	A	A
Approach Vol, veh/h		966			1253			163			192	
Approach Delay, s/veh		21.0			24.8			45.3			35.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	75.9		39.0	13.0	68.0		39.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	66.9		34.5	12.5	59.5		34.5				
Max Q Clear Time (g_c+I1), s	2.3	21.5		23.7	8.9	38.1		14.8				
Green Ext Time (p_c), s	0.0	7.4		0.7	0.1	10.2		1.1				

Intersection Summary			
HCM 6th Ctrl Delay		25.5	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	807	36	20	1056	69	26
Future Vol, veh/h	807	36	20	1056	69	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	13	13	7	7	4	4
Mvmt Flow	849	38	21	1112	73	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	887	0	1447	425
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	598	-
Critical Hdwy	-	-	4.24	-	6.88	6.98
Critical Hdwy Stg 1	-	-	-	-	5.88	-
Critical Hdwy Stg 2	-	-	-	-	5.88	-
Follow-up Hdwy	-	-	2.27	-	3.54	3.34
Pot Cap-1 Maneuver	-	-	728	-	120	572
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	506	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	728	-	117	572
Mov Cap-2 Maneuver	-	-	-	-	117	-
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	491	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	58.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	117	572	-	-	728	-
HCM Lane V/C Ratio	0.621	0.048	-	-	0.029	-
HCM Control Delay (s)	76.4	11.6	-	-	10.1	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	3.1	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	8	34	56	42	61	46	315	15	14	190	3
Future Vol, veh/h	11	8	34	56	42	61	46	315	15	14	190	3
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	5	5	5	2	2	2	5	5	5
Mvmt Flow	12	9	38	62	47	68	51	350	17	16	211	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	765	716	213	731	711	363	216	0	0	369	0	0
Stage 1	245	245	-	463	463	-	-	-	-	-	-	-
Stage 2	520	471	-	268	248	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.15	6.55	6.25	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.545	4.045	3.345	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	321	357	830	334	354	675	1354	-	-	1173	-	-
Stage 1	761	705	-	573	559	-	-	-	-	-	-	-
Stage 2	541	561	-	731	696	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	244	333	828	297	330	672	1351	-	-	1171	-	-
Mov Cap-2 Maneuver	244	333	-	297	330	-	-	-	-	-	-	-
Stage 1	723	692	-	544	531	-	-	-	-	-	-	-
Stage 2	422	533	-	678	683	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	18.3	1	0.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1351	-	-	275	828	310	672	1171	-	-
HCM Lane V/C Ratio	0.038	-	-	0.077	0.046	0.351	0.101	0.013	-	-
HCM Control Delay (s)	7.8	0	-	19.2	9.6	22.8	11	8.1	0	-
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	1.5	0.3	0	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	1	1	1	16	24	4	22	2	9	5	21
Future Vol, veh/h	29	1	1	1	16	24	4	22	2	9	5	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	18	18	18	8	8	8	23	23	23
Mvmt Flow	33	1	1	1	18	27	4	25	2	10	6	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	95	73	18	73	84	26	30	0	0	27	0	0
Stage 1	38	38	-	34	34	-	-	-	-	-	-	-
Stage 2	57	35	-	39	50	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.28	6.68	6.38	4.18	-	-	4.33	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.28	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.28	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.662	4.162	3.462	2.272	-	-	2.407	-	-
Pot Cap-1 Maneuver	881	812	1052	880	777	1006	1545	-	-	1461	-	-
Stage 1	970	857	-	943	836	-	-	-	-	-	-	-
Stage 2	947	860	-	937	823	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	836	804	1052	871	769	1006	1545	-	-	1461	-	-
Mov Cap-2 Maneuver	836	804	-	871	769	-	-	-	-	-	-	-
Stage 1	967	851	-	940	833	-	-	-	-	-	-	-
Stage 2	899	857	-	928	817	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	9.2	1	1.9
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1545	-	-	836	911	895	1461	-	-
HCM Lane V/C Ratio	0.003	-	-	0.039	0.002	0.051	0.007	-	-
HCM Control Delay (s)	7.3	0	-	9.5	9	9.2	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.2	0	-	-

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 06/01/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	1255	161	8	1124	24	138	17	15	42	15	140
Future Volume (vph)	169	1255	161	8	1124	24	138	17	15	42	15	140
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.99			0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			0.99	
Satd. Flow (prot)	1614	3166		1554	3107	1343		1645			1456	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.53			0.91	
Satd. Flow (perm)	1614	3166		1554	3107	1343		906			1339	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	178	1321	169	8	1183	25	145	18	16	44	16	147
RTOR Reduction (vph)	0	8	0	0	0	13	0	3	0	0	74	0
Lane Group Flow (vph)	178	1482	0	8	1183	12	0	176	0	0	133	0
Confl. Peds. (#/hr)						4						4
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	3%	3%	3%	7%	7%	7%	1%	1%	1%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	16.7	74.0		1.0	58.3	58.3		31.5			31.5	
Effective Green, g (s)	16.7	74.0		1.0	58.3	58.3		31.5			31.5	
Actuated g/C Ratio	0.14	0.62		0.01	0.49	0.49		0.26			0.26	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	224	1952		12	1509	652		237			351	
v/s Ratio Prot	c0.11	c0.47		0.01	0.38							
v/s Ratio Perm						0.01		c0.19			0.10	
v/c Ratio	0.79	0.76		0.67	0.78	0.02		0.74			0.38	
Uniform Delay, d1	50.0	16.6		59.3	25.6	16.0		40.5			36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	17.4	2.8		89.5	4.2	0.1		18.9			0.7	
Delay (s)	67.4	19.4		148.8	29.8	16.1		59.4			36.9	
Level of Service	E	B		F	C	B		E			D	
Approach Delay (s)		24.5			30.3			59.4			36.9	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26 06/01/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	1255	161	8	1124	24	138	17	15	42	15	140
Future Volume (veh/h)	169	1255	161	8	1124	24	138	17	15	42	15	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1709	1709	1654	1654	1654	1736	1736	1736	1668	1668	1668
Adj Flow Rate, veh/h	178	1321	169	8	1183	25	145	18	16	44	16	147
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	3	7	7	7	1	1	1	6	6	6
Cap, veh/h	204	1778	226	15	1571	684	262	32	23	101	49	279
Arrive On Green	0.13	0.62	0.62	0.01	0.50	0.50	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1628	2890	367	1576	3143	1368	790	121	89	246	188	1064
Grp Volume(v), veh/h	178	738	752	8	1183	25	179	0	0	207	0	0
Grp Sat Flow(s),veh/h/ln	1628	1624	1634	1576	1572	1368	1001	0	0	1498	0	0
Q Serve(g_s), s	12.9	38.5	39.4	0.6	36.2	1.1	7.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.9	38.5	39.4	0.6	36.2	1.1	21.7	0.0	0.0	13.9	0.0	0.0
Prop In Lane	1.00		0.22	1.00		1.00	0.81		0.09	0.21		0.71
Lane Grp Cap(c), veh/h	204	999	1005	15	1571	684	317	0	0	430	0	0
V/C Ratio(X)	0.87	0.74	0.75	0.52	0.75	0.04	0.56	0.00	0.00	0.48	0.00	0.00
Avail Cap(c_a), veh/h	251	999	1005	66	1571	684	317	0	0	430	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	51.6	16.3	16.5	59.1	24.1	15.3	41.6	0.0	0.0	37.9	0.0	0.0
Incr Delay (d2), s/veh	23.6	4.9	5.1	24.7	3.4	0.1	7.1	0.0	0.0	0.8	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	6.6	15.1	15.6	0.3	14.0	0.4	5.5	0.0	0.0	5.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.2	21.2	21.5	83.8	27.4	15.4	48.7	0.0	0.0	38.7	0.0	0.0
LnGrp LOS	E	C	C	F	C	B	D	A	A	D	A	A
Approach Vol, veh/h		1668			1216			179			207	
Approach Delay, s/veh		27.1			27.6			48.7			38.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	78.3		36.0	19.5	64.5		36.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	70.0		31.5	18.5	56.5		31.5				
Max Q Clear Time (g_c+I1), s	2.6	41.4		23.7	14.9	38.2		15.9				
Green Ext Time (p_c), s	0.0	14.2		0.6	0.2	9.0		1.1				

Intersection Summary	
HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1210	86	27	1149	35	39
Future Vol, veh/h	1210	86	27	1149	35	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	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	7	7	3	3
Mvmt Flow	1274	91	28	1209	37	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1365	0	1935	637
Stage 1	-	-	-	-	1274	-
Stage 2	-	-	-	-	661	-
Critical Hdwy	-	-	4.24	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.27	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	474	-	57	418
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	473	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	474	-	54	418
Mov Cap-2 Maneuver	-	-	-	-	54	-
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	445	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	83.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	54	418	-	-	474	-
HCM Lane V/C Ratio	0.682	0.098	-	-	0.06	-
HCM Control Delay (s)	160.1	14.5	-	-	13.1	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	2.8	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	51	56	27	54	45	62	307	56	40	366	14
Future Vol, veh/h	13	51	56	27	54	45	62	307	56	40	366	14
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
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, %	1	1	1	5	5	5	2	2	2	5	5	5
Mvmt Flow	14	54	59	28	57	47	65	323	59	42	385	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1008	985	387	1018	971	357	402	0	0	384	0	0
Stage 1	471	471	-	485	485	-	-	-	-	-	-	-
Stage 2	537	514	-	533	486	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.15	6.55	6.25	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.545	4.045	3.345	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	220	249	663	213	250	680	1157	-	-	1158	-	-
Stage 1	575	561	-	558	547	-	-	-	-	-	-	-
Stage 2	530	537	-	525	546	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	149	219	662	144	220	677	1155	-	-	1156	-	-
Mov Cap-2 Maneuver	149	219	-	144	220	-	-	-	-	-	-	-
Stage 1	532	534	-	517	507	-	-	-	-	-	-	-
Stage 2	405	497	-	410	519	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.1	29.2	1.2	0.8
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1155	-	-	200	662	187	677	1156	-	-
HCM Lane V/C Ratio	0.057	-	-	0.337	0.089	0.456	0.07	0.036	-	-
HCM Control Delay (s)	8.3	0	-	31.9	11	39.4	10.7	8.2	0	-
HCM Lane LOS	A	A	-	D	B	E	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.4	0.3	2.2	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	25	5	2	6	7	4	10	1	25	28	38
Future Vol, veh/h	30	25	5	2	6	7	4	10	1	25	28	38
Conflicting Peds, #/hr	2	0	1	3	0	4	1	0	3	4	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	3	3	3
Mvmt Flow	33	27	5	2	7	8	4	11	1	27	31	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	139	132	57	149	153	20	75	0	0	16	0	0
Stage 1	108	108	-	24	24	-	-	-	-	-	-	-
Stage 2	31	24	-	125	129	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.17	-	-	4.13	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.263	-	-	2.227	-	-
Pot Cap-1 Maneuver	831	759	1009	819	739	1058	1493	-	-	1595	-	-
Stage 1	897	806	-	994	875	-	-	-	-	-	-	-
Stage 2	986	875	-	879	789	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	801	739	1004	774	719	1050	1490	-	-	1589	-	-
Mov Cap-2 Maneuver	801	739	-	774	719	-	-	-	-	-	-	-
Stage 1	893	790	-	987	869	-	-	-	-	-	-	-
Stage 2	965	869	-	826	773	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	9.3	2	2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1490	-	-	801	773	852	1589	-	-
HCM Lane V/C Ratio	0.003	-	-	0.041	0.043	0.019	0.017	-	-
HCM Control Delay (s)	7.4	0	-	9.7	9.9	9.3	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	0.1	-	-

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 06/01/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	808	38	4	1186	13	154	11	3	18	4	161
Future Volume (vph)	84	808	38	4	1186	13	154	11	3	18	4	161
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		1.00			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00			0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			1.00	
Satd. Flow (prot)	1484	2946		1568	3137	1356		1575			1464	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.52			0.96	
Satd. Flow (perm)	1484	2946		1568	3137	1356		852			1416	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	851	40	4	1248	14	162	12	3	19	4	169
RTOR Reduction (vph)	0	2	0	0	0	7	0	1	0	0	115	0
Lane Group Flow (vph)	88	889	0	4	1248	7	0	176	0	0	77	0
Confl. Peds. (#/hr)						4						4
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	12%	12%	12%	6%	6%	6%	6%	6%	6%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	11.0	71.0		1.0	61.0	61.0		34.5			34.5	
Effective Green, g (s)	11.0	71.0		1.0	61.0	61.0		34.5			34.5	
Actuated g/C Ratio	0.09	0.59		0.01	0.51	0.51		0.29			0.29	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	136	1743		13	1594	689		244			407	
v/s Ratio Prot	c0.06	0.30		0.00	c0.40							
v/s Ratio Perm						0.01		c0.21			0.05	
v/c Ratio	0.65	0.51		0.31	0.78	0.01		0.72			0.19	
Uniform Delay, d1	52.6	14.3		59.2	24.1	14.6		38.4			32.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	10.1	1.1		13.0	3.9	0.0		16.9			0.2	
Delay (s)	62.8	15.4		72.2	28.0	14.6		55.4			32.4	
Level of Service	E	B		E	C	B		E			C	
Approach Delay (s)		19.7			28.0			55.4			32.4	
Approach LOS		B			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26 06/01/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	808	38	4	1186	13	154	11	3	18	4	161
Future Volume (veh/h)	84	808	38	4	1186	13	154	11	3	18	4	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586	1668	1668	1668	1668	1668	1668	1709	1709	1709
Adj Flow Rate, veh/h	88	851	40	4	1248	14	162	12	3	19	4	169
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, %	12	12	12	6	6	6	6	6	6	3	3	3
Cap, veh/h	107	1741	82	8	1678	730	296	20	4	58	27	382
Arrive On Green	0.07	0.59	0.59	0.01	0.53	0.53	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1511	2927	138	1589	3169	1379	830	70	16	85	96	1329
Grp Volume(v), veh/h	88	438	453	4	1248	14	177	0	0	192	0	0
Grp Sat Flow(s),veh/h/ln	1511	1507	1558	1589	1585	1379	915	0	0	1510	0	0
Q Serve(g_s), s	6.9	19.9	19.9	0.3	36.7	0.6	10.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.9	19.9	19.9	0.3	36.7	0.6	23.4	0.0	0.0	12.8	0.0	0.0
Prop In Lane	1.00		0.09	1.00		1.00	0.92		0.02	0.10		0.88
Lane Grp Cap(c), veh/h	107	896	927	8	1678	730	321	0	0	467	0	0
V/C Ratio(X)	0.82	0.49	0.49	0.48	0.74	0.02	0.55	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	157	896	927	68	1678	730	321	0	0	467	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	55.0	13.9	13.9	59.5	21.9	13.4	40.4	0.0	0.0	35.0	0.0	0.0
Incr Delay (d2), s/veh	19.6	1.9	1.8	38.0	3.0	0.0	6.7	0.0	0.0	0.6	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	3.2	7.2	7.4	0.2	14.1	0.2	5.4	0.0	0.0	4.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.7	15.8	15.7	97.5	25.0	13.5	47.1	0.0	0.0	35.6	0.0	0.0
LnGrp LOS	E	B	B	F	C	B	D	A	A	D	A	A
Approach Vol, veh/h		979			1266			177			192	
Approach Delay, s/veh		21.1			25.1			47.1			35.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	75.9		39.0	13.0	68.0		39.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	66.9		34.5	12.5	59.5		34.5				
Max Q Clear Time (g_c+I1), s	2.3	21.9		25.4	8.9	38.7		14.8				
Green Ext Time (p_c), s	0.0	7.5		0.7	0.1	10.2		1.1				

Intersection Summary			
HCM 6th Ctrl Delay		25.8	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	807	48	24	1056	82	38
Future Vol, veh/h	807	48	24	1056	82	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	13	13	7	7	4	4
Mvmt Flow	849	51	25	1112	86	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	900	0	1455	425
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	606	-
Critical Hdwy	-	-	4.24	-	6.88	6.98
Critical Hdwy Stg 1	-	-	-	-	5.88	-
Critical Hdwy Stg 2	-	-	-	-	5.88	-
Follow-up Hdwy	-	-	2.27	-	3.54	3.34
Pot Cap-1 Maneuver	-	-	720	-	119	572
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	502	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	720	-	115	572
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	484	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	70.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	115	572	-	-	720	-
HCM Lane V/C Ratio	0.751	0.07	-	-	0.035	-
HCM Control Delay (s)	97.3	11.8	-	-	10.2	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	4.2	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	9	34	62	45	74	46	315	17	14	190	3
Future Vol, veh/h	11	9	34	62	45	74	46	315	17	14	190	3
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	5	5	5	2	2	2	5	5	5
Mvmt Flow	12	10	38	69	50	82	51	350	19	16	211	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	775	718	213	733	712	364	216	0	0	371	0	0
Stage 1	245	245	-	464	464	-	-	-	-	-	-	-
Stage 2	530	473	-	269	248	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.15	6.55	6.25	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.545	4.045	3.345	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	316	356	830	332	354	674	1354	-	-	1171	-	-
Stage 1	761	705	-	573	558	-	-	-	-	-	-	-
Stage 2	534	560	-	730	696	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	233	332	828	294	330	671	1351	-	-	1169	-	-
Mov Cap-2 Maneuver	233	332	-	294	330	-	-	-	-	-	-	-
Stage 1	723	692	-	544	530	-	-	-	-	-	-	-
Stage 2	403	532	-	676	683	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	18.7	0.9	0.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1351	-	-	269	828	308	671	1169	-	-
HCM Lane V/C Ratio	0.038	-	-	0.083	0.046	0.386	0.123	0.013	-	-
HCM Control Delay (s)	7.8	0	-	19.6	9.6	23.9	11.1	8.1	0	-
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	1.8	0.4	0	-	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	4	1	1	38	62	4	22	2	25	5	21
Future Vol, veh/h	29	4	1	1	38	62	4	22	2	25	5	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	18	18	18	8	8	8	23	23	23
Mvmt Flow	33	4	1	1	43	70	4	25	2	28	6	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	165	109	18	111	120	26	30	0	0	27	0	0
Stage 1	74	74	-	34	34	-	-	-	-	-	-	-
Stage 2	91	35	-	77	86	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.28	6.68	6.38	4.18	-	-	4.33	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.28	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.28	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.662	4.162	3.462	2.272	-	-	2.407	-	-
Pot Cap-1 Maneuver	793	775	1052	831	741	1006	1545	-	-	1461	-	-
Stage 1	928	828	-	943	836	-	-	-	-	-	-	-
Stage 2	909	860	-	894	793	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	692	757	1052	812	724	1006	1545	-	-	1461	-	-
Mov Cap-2 Maneuver	692	757	-	812	724	-	-	-	-	-	-	-
Stage 1	925	811	-	940	833	-	-	-	-	-	-	-
Stage 2	800	857	-	870	777	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	9.7	1	3.7
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1545	-	-	692	802	876	1461	-	-
HCM Lane V/C Ratio	0.003	-	-	0.047	0.007	0.13	0.019	-	-
HCM Control Delay (s)	7.3	0	-	10.5	9.5	9.7	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.4	0.1	-	-

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 06/01/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	1295	161	8	1132	24	149	17	15	42	15	140
Future Volume (vph)	169	1295	161	8	1132	24	149	17	15	42	15	140
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.99			0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			0.99	
Satd. Flow (prot)	1614	3167		1554	3107	1343		1645			1456	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.53			0.91	
Satd. Flow (perm)	1614	3167		1554	3107	1343		901			1338	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	178	1363	169	8	1192	25	157	18	16	44	16	147
RTOR Reduction (vph)	0	7	0	0	0	13	0	3	0	0	74	0
Lane Group Flow (vph)	178	1525	0	8	1192	12	0	188	0	0	133	0
Confl. Peds. (#/hr)						4						4
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	3%	3%	3%	7%	7%	7%	1%	1%	1%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	16.7	74.0		1.0	58.3	58.3		31.5			31.5	
Effective Green, g (s)	16.7	74.0		1.0	58.3	58.3		31.5			31.5	
Actuated g/C Ratio	0.14	0.62		0.01	0.49	0.49		0.26			0.26	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	224	1952		12	1509	652		236			351	
v/s Ratio Prot	c0.11	c0.48		0.01	0.38							
v/s Ratio Perm						0.01		c0.21			0.10	
v/c Ratio	0.79	0.78		0.67	0.79	0.02		0.80			0.38	
Uniform Delay, d1	50.0	17.0		59.3	25.7	16.0		41.3			36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	17.4	3.2		89.5	4.3	0.1		23.7			0.7	
Delay (s)	67.4	20.2		148.8	30.0	16.1		65.0			36.9	
Level of Service	E	C		F	C	B		E			D	
Approach Delay (s)		25.1			30.5			65.0			36.9	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26

06/01/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	1295	161	8	1132	24	149	17	15	42	15	140
Future Volume (veh/h)	169	1295	161	8	1132	24	149	17	15	42	15	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1709	1709	1654	1654	1654	1736	1736	1736	1668	1668	1668
Adj Flow Rate, veh/h	178	1363	169	8	1192	25	157	18	16	44	16	147
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	3	7	7	7	1	1	1	6	6	6
Cap, veh/h	204	1786	220	15	1571	684	264	30	22	102	50	282
Arrive On Green	0.13	0.62	0.62	0.01	0.50	0.50	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1628	2902	357	1576	3143	1368	799	113	83	249	189	1072
Grp Volume(v), veh/h	178	758	774	8	1192	25	191	0	0	207	0	0
Grp Sat Flow(s),veh/h/ln	1628	1624	1636	1576	1572	1368	995	0	0	1510	0	0
Q Serve(g_s), s	12.9	40.4	41.5	0.6	36.7	1.1	9.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.9	40.4	41.5	0.6	36.7	1.1	23.1	0.0	0.0	13.8	0.0	0.0
Prop In Lane	1.00		0.22	1.00		1.00	0.82		0.08	0.21		0.71
Lane Grp Cap(c), veh/h	204	999	1006	15	1571	684	316	0	0	433	0	0
V/C Ratio(X)	0.87	0.76	0.77	0.52	0.76	0.04	0.60	0.00	0.00	0.48	0.00	0.00
Avail Cap(c_a), veh/h	251	999	1006	66	1571	684	316	0	0	433	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	51.6	16.7	16.9	59.1	24.2	15.3	42.3	0.0	0.0	37.9	0.0	0.0
Incr Delay (d2), s/veh	23.6	5.4	5.7	24.7	3.5	0.1	8.3	0.0	0.0	0.8	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	6.6	15.9	16.5	0.3	14.2	0.4	6.0	0.0	0.0	5.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.2	22.0	22.5	83.8	27.7	15.4	50.6	0.0	0.0	38.7	0.0	0.0
LnGrp LOS	E	C	C	F	C	B	D	A	A	D	A	A
Approach Vol, veh/h		1710			1225			191			207	
Approach Delay, s/veh		27.8			27.8			50.6			38.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	78.3		36.0	19.5	64.5		36.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	70.0		31.5	18.5	56.5		31.5				
Max Q Clear Time (g_c+I1), s	2.6	43.5		25.1	14.9	38.7		15.8				
Green Ext Time (p_c), s	0.0	14.2		0.6	0.2	8.9		1.1				

Intersection Summary			
HCM 6th Ctrl Delay		29.8	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1210	126	40	1149	40	46
Future Vol, veh/h	1210	126	40	1149	40	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	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	7	7	3	3
Mvmt Flow	1274	133	42	1209	42	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1407	0	1963	637
Stage 1	-	-	-	-	1274	-
Stage 2	-	-	-	-	689	-
Critical Hdwy	-	-	4.24	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.27	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	456	-	55	418
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	457	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	456	-	50	418
Mov Cap-2 Maneuver	-	-	-	-	50	-
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	415	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	105.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	50	418	-	-	456	-
HCM Lane V/C Ratio	0.842	0.116	-	-	0.092	-
HCM Control Delay (s)	210.4	14.7	-	-	13.7	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	3.5	0.4	-	-	0.3	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	54	56	31	56	53	62	307	62	40	366	14
Future Vol, veh/h	13	54	56	31	56	53	62	307	62	40	366	14
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
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, %	1	1	1	5	5	5	2	2	2	5	5	5
Mvmt Flow	14	57	59	33	59	56	65	323	65	42	385	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1016	991	387	1023	974	360	402	0	0	390	0	0
Stage 1	471	471	-	488	488	-	-	-	-	-	-	-
Stage 2	545	520	-	535	486	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.15	6.55	6.25	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.545	4.045	3.345	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	217	247	663	211	249	678	1157	-	-	1152	-	-
Stage 1	575	561	-	556	545	-	-	-	-	-	-	-
Stage 2	524	534	-	524	546	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	144	218	662	140	219	675	1155	-	-	1150	-	-
Mov Cap-2 Maneuver	144	218	-	140	219	-	-	-	-	-	-	-
Stage 1	532	534	-	515	505	-	-	-	-	-	-	-
Stage 2	393	494	-	406	519	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.9	31	1.2	0.8
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1155	-	-	198	662	182	675	1150	-	-
HCM Lane V/C Ratio	0.057	-	-	0.356	0.089	0.503	0.083	0.037	-	-
HCM Control Delay (s)	8.3	0	-	32.9	11	43.3	10.8	8.2	0	-
HCM Lane LOS	A	A	-	D	B	E	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.5	0.3	2.5	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	34	5	2	22	30	4	10	1	78	28	38
Future Vol, veh/h	30	34	5	2	22	30	4	10	1	78	28	38
Conflicting Peds, #/hr	2	0	1	3	0	4	1	0	3	4	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	3	3	3
Mvmt Flow	33	37	5	2	24	33	4	11	1	86	31	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	278	250	57	272	271	20	75	0	0	16	0	0
Stage 1	226	226	-	24	24	-	-	-	-	-	-	-
Stage 2	52	24	-	248	247	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.17	-	-	4.13	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.263	-	-	2.227	-	-
Pot Cap-1 Maneuver	674	653	1009	680	636	1058	1493	-	-	1595	-	-
Stage 1	777	717	-	994	875	-	-	-	-	-	-	-
Stage 2	961	875	-	756	702	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	601	611	1004	611	595	1050	1490	-	-	1589	-	-
Mov Cap-2 Maneuver	601	611	-	611	595	-	-	-	-	-	-	-
Stage 1	773	675	-	987	869	-	-	-	-	-	-	-
Stage 2	899	869	-	668	661	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.1	10	2	4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1490	-	-	601	643	785	1589	-	-
HCM Lane V/C Ratio	0.003	-	-	0.055	0.067	0.076	0.054	-	-
HCM Control Delay (s)	7.4	0	-	11.3	11	10	7.4	0	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0.2	0.2	-	-

Intersection	
Intersection Delay, s/veh	15.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	9	34	62	45	74	46	315	17	14	190	3
Future Vol, veh/h	11	9	34	62	45	74	46	315	17	14	190	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	1	1	5	5	5	2	2	2	5	5	5
Mvmt Flow	12	10	38	69	50	82	51	350	19	16	211	3
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	9.6	10.7	19.5	12.2
HCM LOS	A	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	12%	55%	0%	58%	0%	7%	0%
Vol Thru, %	83%	45%	0%	42%	0%	93%	0%
Vol Right, %	4%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	378	20	34	107	74	204	3
LT Vol	46	11	0	62	0	14	0
Through Vol	315	9	0	45	0	190	0
RT Vol	17	0	34	0	74	0	3
Lane Flow Rate	420	22	38	119	82	227	3
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.667	0.044	0.064	0.227	0.134	0.377	0.005
Departure Headway (Hd)	5.72	7.087	6.09	6.862	5.854	5.992	5.248
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	630	504	586	523	612	601	681
Service Time	3.754	4.844	3.847	4.609	3.6	3.734	2.989
HCM Lane V/C Ratio	0.667	0.044	0.065	0.228	0.134	0.378	0.004
HCM Control Delay	19.5	10.2	9.3	11.6	9.5	12.3	8
HCM Lane LOS	C	B	A	B	A	B	A
HCM 95th-tile Q	5	0.1	0.2	0.9	0.5	1.7	0

Intersection	
Intersection Delay, s/veh	23.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	54	56	31	56	53	62	307	62	40	366	14
Future Vol, veh/h	13	54	56	31	56	53	62	307	62	40	366	14
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
Heavy Vehicles, %	1	1	1	5	5	5	2	2	2	5	5	5
Mvmt Flow	14	57	59	33	59	56	65	323	65	42	385	15
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	11.3	11.7	29.6	25.7
HCM LOS	B	B	D	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	14%	19%	0%	36%	0%	10%	0%
Vol Thru, %	71%	81%	0%	64%	0%	90%	0%
Vol Right, %	14%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	431	67	56	87	53	406	14
LT Vol	62	13	0	31	0	40	0
Through Vol	307	54	0	56	0	366	0
RT Vol	62	0	56	0	53	0	14
Lane Flow Rate	454	71	59	92	56	427	15
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.796	0.152	0.113	0.199	0.107	0.757	0.023
Departure Headway (Hd)	6.315	7.741	6.919	7.828	6.923	6.376	5.626
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	576	463	518	459	517	568	640
Service Time	4.329	5.491	4.668	5.577	4.671	4.088	3.326
HCM Lane V/C Ratio	0.788	0.153	0.114	0.2	0.108	0.752	0.023
HCM Control Delay	29.6	11.9	10.6	12.5	10.5	26.3	8.5
HCM Lane LOS	D	B	B	B	B	D	A
HCM 95th-tile Q	7.7	0.5	0.4	0.7	0.4	6.7	0.1

SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L G S	D M R U N V	J I H L	S C R K	W O H	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03911	N	N	N				10/27/2018	17	PROCTOR BLVD	INTER	5-LEG	N	N	UNK	S-1STOP	01	NONE 0	STRGHT									29
NONE							SA	0	SE TEN EYCK RD	NE		TRF SIGNAL	N	UNK	REAR		PRVTE	NE-SW								000	00
N							5P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y		026	000	29
N							45 23 49.25	-122 15 19.74																OR<25				
																02	NONE 0	STOP									00
																	PRVTE	NE-SW								011	00
																	PSNGR CAR		01	DRVR	INJC	55	F	OR-Y	000	000	00
																								OR<25			
03089	N	N	N				09/03/2018	14	PROCTOR BLVD	INTER	5-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									29
NONE							MO		SE TEN EYCK RD	SE		TRF SIGNAL	N	DRY	REAR		UNKN	SE-NW								000	00
N							3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK	026	000	29
N							45 23 49.25	-122 15 19.75	002600200S00															UNK			
																02	NONE 0	STOP									00
																	PRVTE	SE-NW								011	00
																	PSNGR CAR		01	DRVR	INJC	25	F	OR-Y	000	000	00
																								OR>25			
03213	N	N	N				09/17/2019	14	PROCTOR BLVD	INTER	5-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									29
NONE							TU		SE TEN EYCK RD	SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE-NW								000	00
N							3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	41	F	OTH-Y	026	000	29
N							45 23 49.26	-122 15 19.69	002600200S00															N-RES			
																02	NONE 0	STOP									00
																	PRVTE	SE-NW								011	00
																	PSNGR CAR		01	DRVR	INJC	48	F	OR-Y	000	000	00
																								OR<25			
																02	NONE 0	STOP									00
																	PRVTE	SE-NW								011	00
																	PSNGR CAR		02	PSNG	INJC	50	M		000	000	00
05173	N	N	N				11/08/2016	14	PROCTOR BLVD	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	U-TURN									06
NONE							TU		SE TEN EYCK RD	W		TRF SIGNAL	N	DRY	TURN		N/A	W -W								000	00
N							5P			05	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 49.25	-122 15 19.74	002600200S00		(02)													UNK			
																02	NONE 9	TURN-R									00
																	N/A	NE-W								000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
																								UNK			
04335	N	N	N				11/06/2018	14	PROCTOR BLVD	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT									02
NONE							TU		SE TEN EYCK RD	CN		TRF SIGNAL	N	DRY	TURN		N/A	SE-NW								000	00
N							2P			01	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 49.25	-122 15 19.72	002600200S00															UNK			

SER# / INVEST / RD DPT / UNLOC?	S P / E / D	A	R U / L / C	J / G / S	S / N / V	W / H / L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V# TYPE	MOVE / FROM / TO	P# TYPE	PRTC / INJ / SVRTY	A G E	S X	LICNS / RES / UNK	PED LOC	ERROR	ACT EVENT	CAUSE
																02 NONE 9	TURN-R									
																N/A	NE-NW								015	00
																PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
																						UNK				

CITY OF SANDY, CLACKAMAS COUNTY **TEN EYCK RD at PIONEER BLVD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019**

1 - 1 of 1 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L S	D R G N	M U I H	J N	S C R K	W O	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V# TYPE	MOVE / FROM / TO	P# TYPE	PRTC / INJ / SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03787	N	N	N		N	N		09/15/2015	14	PIONEER BLVD	INTER	5-LEG	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								29
NONE				TU						SE TEN EYCK RD	E		TRF SIGNAL	N	DRY	REAR	PRVTE	E -W							000	00
N				1P							06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	71 M	OR-Y	026	000	29
N				45 23 49.24				-122 15 19.74		002600100S00												OR<25			
																	02 NONE 0	STOP								
																	PRVTE	E -W							011	00
																	PSNGR CAR		01 DRVR	INJC	38 F	OTH-Y	000	000	00
																						N-RES			

SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L S	R U G N V	J I N L	S C H K	W O R	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
01741	N	N	N		N	N	05/09/2015	14	PIONEER BLVD	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
NONE							SA		WOLF DR	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	S -N								000	00
N							6A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	25	M	OTH-Y		020	026	04
N							45 23 49.25	-122 15 19.74	002600100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	W -E								000	00
																	PSNGR CAR		01	DRVR	NONE	51	F	OR-Y	000	000	00
																								OR<25			
00512	N	N	N		N	N	02/07/2017	14	PIONEER BLVD	INTER	5-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L										04
CITY							TU		WOLF DR	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S -W								000	00
N							4P			04	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJC	55	F	OR-Y	000	000	00
N							45 23 49.25	-122 15 19.74	002600100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	W -E								000	00
																	PSNGR CAR		01	DRVR	NONE	63	M	OR-Y	020	000	04
																								OR>25			

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V#	TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05355	N	N	N				11/18/2016	14	LANGENSAND RD	INTER	3-LEG	N	N	RAIN	PED	01	NONE 0	TURN-R									19,02
CITY							FR		MT HOOD HY	S		UNKNOWN	N	WET	PED		PRVTE	S -SE								015	00
N							6P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	59	M	OR-Y		029	000	02
N							45 23 44.19	-122 15 .03	002600100S00															OR>25				
																		- STRGHT	01	PED	INJC	34	M		I XWK?	000	034	19
																		SE NW										
05056	N	N	N				12/01/2017	14	LANGENSAND RD	INTER	3-LEG	N	N	RAIN	ANGL-STP	01	NONE 0	TURN-R									08
NONE							FR		MT HOOD HY	S		STOP SIGN	N	WET	TURN		PRVTE	NW-S								000	00
N							9P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		001	000	08
N							45 23 44.19	-122 15 .03	002600100S00															OR<25				
																02	NONE 0	STOP										
																	PRVTE	S -N								012	00
																	PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000	000	00
																								OR<25				
																02	NONE 0	STOP										
																	PRVTE	S -N								012	00
																	PSNGR CAR		02	PSNG	INJC	25	M			000	000	00
01431	N	N	N				04/14/2017	14	LANGENSAND RD	INTER	3-LEG	N	N	CLR	O-1STOP	01	NONE 9	BACK									10
NONE							FR		MT HOOD HY	S		STOP SIGN	N	DRY	BACK		N/A	N -S								000	00
N							3P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 44.19	-122 15 .03	002600100S00															UNK				
																02	NONE 9	STOP										
																	N/A	S -N								012	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
00297	N	N	N	N	N		01/24/2015	14	LANGENSAND RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT									02,08
CITY							SA		MT HOOD HY	CN		UNKNOWN	N	DRY	TURN		PRVTE	NW-SE								000	00
N							4P			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		000	000	00
N							45 23 44.19	-122 15 .03	002600100S00															OR<25				
																01	NONE 0	STRGHT										
																	PRVTE	NW-SE								000	00
																	PSNGR CAR		02	PSNG	NO<5	01	F			000	000	00
																02	NONE 0	TURN-L										
																	PRVTE	SE-S								000	00
																	PSNGR CAR		01	DRVR	INJC	78	F	OR-Y		028,004	000	02,08
																								OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	D A L C	M R G S	J U N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04571	N	N	N	N	Y	N	10/05/2016	14	LANGENSAND RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L									013	02,08
CITY							WE		MT HOOD HY	CN		STOP SIGN	N	WET	TURN		PRVTE	S -W								015		00
N							6P			04	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		028	000		02
N							45 23 44.19	-122 15 .03	002600100S00									OR<25										
																02	NONE 0	STRGHT										
																	PRVTE	W -E									000	013	00
																	PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		000	000		00
																		OR>25										
																03	NONE 0	STRGHT										
																	PRVTE	E -W									022		00
																	PSNGR CAR		01	DRVR	INJB	61	M	OR-Y		000	000		00
																		OR<25										
																03	NONE 0	STRGHT										
																	PRVTE	E -W									022		00
																	PSNGR CAR		02	PSNG	INJC	59	F			000	000		00
03612	N	N	N	N	N	N	10/16/2019	14	LANGENSAND RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 9	TURN-L										02
CITY							WE		MT HOOD HY	CN		STOP SIGN	N	WET	TURN		N/A	S -NW								015		00
N							2P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 44.19	-122 15 .03	002600100S00									UNK										
																02	NONE 9	STRGHT										
																	N/A	SE-NW									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																		UNK										
04040	N	N	N				11/14/2019	14	LANGENSAND RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
NONE							TH		MT HOOD HY	CN		STOP SIGN	N	DRY	TURN		N/A	E -W								000		00
N							8A			02	0		N	DAWN	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 44.2	-122 15 .04	002600100S00									UNK										
																02	NONE 9	TURN-L										
																	N/A	S -W									015		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																		UNK										

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
02296	N	N	N	N	N		07/06/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT									27,29,32
CITY							SA		EAGLE CRK-SANDY HY	N		NONE	N	DRY	REAR		N/A	NE-SW								000	00
N							11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 22.65	-122 15 48.74	017200100S00															UNK				
																02	NONE 9	STOP									
																	N/A	NE-SW								011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
01165	N	N	N				03/10/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	O-1STOP	01	NONE 0	BACK									10
NONE							TH		EAGLE CRK-SANDY HY	E		STOP SIGN	N	DRY	BACK		PRVTE	W -E								000	00
N							6P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y		011	000	10
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25				
																02	NONE 0	STOP									
																	PRVTE	E -W								012	00
																	PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000	00
																								OR<25				
04008	N	N	N	N	N		11/02/2018	16	DUBARKO RD	INTER	CROSS	N	N	CLD	PED	01	NONE 0	STRGHT									02
CITY							FR		EAGLE CRK-SANDY HY	E		STOP SIGN	N	WET	PED		PRVTE	E -W								000	00
N							7P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	74	M	OR-Y		029	000	02
N							45 23 22.54	-122 15 48.5	017200100S00															OR<25				
																		- STRGHT	01	PED	INJC	36	M		I XWK?	000	034	00
																		N S									
03026	N	N	N				07/27/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									07,29
CITY							MO		EAGLE CRK-SANDY HY	SW		NONE	N	DRY	REAR		PRVTE	SW-NE								000	00
N							8P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJC	19	M	OR-Y		043,026	000	07,29
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25				
																02	NONE 0	STOP									
																	PRVTE	SW-NE								012	00
																	PSNGR CAR		01	DRVR	INJC	36	M	OR-Y		000	000	00
																								OR<25				
01095	N	N	N	N	N		03/04/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT									27,07,32
CITY							FR		EAGLE CRK-SANDY HY	SW		STOP SIGN	N	DRY	SS-O		PRVTE	NE-SW								000	00
N							4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		016,043,052	010	27,07,32
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25				
																01	NONE 0	STRGHT									
																	PRVTE	NE-SW								000	00
																	PSNGR CAR		02	PSNG	NO<5	01	F			000	000	00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D A L C	M R G S	J U N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	NONE	18	F	OR-Y OR<25		000	012 000	00 00
																03	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	INJB	26	M	OR-Y OR<25		000	000 000	00 00
00763	N	N	N	N	N		02/17/2016 16	DUBARKO RD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										07
CITY						WE		EAGLE CRK-SANDY HY	SW		NONE	N	WET	REAR		N/A	S -N									000	00
N N						5P 45 23 22.76	-122 15 48.39	017200100S00	06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
																02	NONE 9 N/A PSNGR CAR	STOP S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	012 000	00 00
01324	N	N	N	N	N		04/19/2018 16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
CITY						TH		EAGLE CRK-SANDY HY	SW		UNKNOWN	N	DRY	REAR		PRVTE	SW-NE									000	00
N N						6P 45 23 22.55	-122 15 48.5	017200100S00	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		026	000	29
																02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	21	F	OR-Y OR<25		000	012 000	00 00
																02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	02	PSNG	INJC	18	M			000	012 000	00 00
04952	N	N	N	N	N		11/22/2015 16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L										03
CITY						SU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -NE									000	00
N N						4P 45 23 22.76	-122 15 48.39	017200100S00	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	53	F	OTH-Y OR<25		021	000	03
																02	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	19	F	OR-Y OR>25		000	000 000	00 00
																03	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	41	M	OR-Y OR<25		000	000 000	00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L G C	M R U S	J N H V	S I L K	W C O	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05614	N	N	N	N	N		12/25/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		PRVTE	N -S								000	00
N							6P			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y		000	000	00
N							45 23 22.76	-122 15 48.39	017200100S00															OR>25				
																02	NONE 0	STRGHT										
																	PRVTE	E -W								015	00
																	PSNGR CAR		01	DRVR	INJC	53	M	OR-Y	028	000	02
																								OR<25			
02172	N	N	N				06/05/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
NONE							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E								015	00
N							7A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25			
																02	NONE 0	TURN-L										
																	PRVTE	SW-W								000	00
																	PSNGR CAR		01	DRVR	NONE	29	M	OR-Y	000	000	00
																								OR<25			
03589	N	N	N	N	N		08/05/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	E -W								015	00
N							6P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	77	M	OTH-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															N-RES			
																02	NONE 0	STRGHT										
																	PRVTE	N -S								000	00
																	PSNGR CAR		01	DRVR	NONE	40	M	OR-Y	000	000	00
																								OR<25			
03967	N	N	N	N	N		08/30/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							TU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W -E								015	00
N							12P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	61	F	OTH-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															N-RES			
																01	NONE 0	STRGHT										
																	PRVTE	W -E								015	00
																	PSNGR CAR		02	PSNG	INJC	06	F		000	000	00
																02	NONE 0	STRGHT										
																	PRVTE	S -N								000	00
																	PSNGR CAR		01	DRVR	INJB	53	F	OR-Y	000	000	00
																								OR<25			
02427	N	N	N				05/31/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										03,32
CITY							TU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	UNK	ANGL		N/A	W -E								000	00
N							11A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 22.76	-122 15 48.39	017200100S00															UNK			

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	R G S	J N V	S H L	W R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 9 N/A PSNGR CAR	STRGHT N -S						UNK UNK			000 000		00 00
02031	N	N	N	N	N		05/06/2016 16		DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		N/A	N -S									000		00
N N							4P 45 23 22.76 -122 15 48.39		017200100S00	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STRGHT E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
00805	N	N	N	N	N		03/01/2017 16		DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										082,013	02
CITY							WE		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W -E								015		00
N N							3P 45 23 22.76 -122 15 48.39		017200100S00	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	17	F	OR-Y OR<25		028	000	082	02
																02	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	INJC	43	M	OR-Y OR<25		000	000 000	013	00 00
																03	NONE 0 PRVTE PSNGR CAR	STOP E -W	01	DRVR	INJB	27	F	OR-Y OR<25		000	022 000		00 00
00846	N	N	N	N	N		03/04/2017 16		DUBARKO RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT											02
CITY							SA		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		PRVTE	W -E								015		00
N N							6P 45 23 22.76 -122 15 48.39		017200100S00	04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y OR<25		028	000		02
																02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	INJC	21	F	OR-Y OR<25		000	000 000		00 00
02225	N	N	N				06/07/2017 16		DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
CITY							WE		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N N							4P 45 23 22.76 -122 15 48.39		017200100S00	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	40	M	OR-Y OR<25		000	000		00
																02	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	INJC	38	M	OR-Y OR<25		028	015 000		00 02

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W C R	O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02958	N	N	N	N	N			07/21/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										02
CITY					FR					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	S -W								000		00
N					8P						01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y		028	000		02
N					45 23 22.76			-122 15 48.39		017200100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	N -S									000		00
																		PSNGR CAR		01	DRVR	INJB	29	F	OR-Y		000	000		00
																									OR<25					
00647	N	N	N	N	N			02/18/2017	16	DUBARKO RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											03
CITY					SA					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		N/A	W -E								000		00
N					7P						03	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
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03467	N	N	N	N	N			08/23/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
CITY					WE					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		N/A	NE-SW								000		00
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03265	N	N	N					09/14/2018	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										082	02
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N					9P						03	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		028	000	082	02
N					45 23 22.52			-122 15 48.53		017200100S00															OR<25					
																	01	NONE 0	TURN-L											
																		PRVTE	W -N									015		00
																		PSNGR CAR		01	PSNG	INJC	35	F			000	000		00
																	01	NONE 0	TURN-L											
																		PRVTE	W -N									015		00
																		PSNGR CAR		02	PSNG	NONE	02	F			000	000		00
																	02	NONE 0	STRGHT											
																		PRVTE	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	62	M	OR-Y		000	000		00
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SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L G S	R J S V	W C O H L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
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CITY					MO		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	NE-SW								000		00
N					7A			02	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	31	M	OR-Y		000	000		00
N					45 23 22.59	-122 15 48.49	017200100S00															OR<25					
														02	NONE 0	STRGHT										
															PRVTE	E -W									015	00
															PSNGR CAR		01	DRVR	INJC	17	F	OR-Y		028	000		02
																						OR<25				
														02	NONE 0	STRGHT										
															PRVTE	E -W									015	00
															PSNGR CAR		02	PSNG	INJA	12	F			000	000		00
00075	N	N	N	N	01/08/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										013	27,02
CITY					TU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S								000		00
N					4P			03	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	52	M	OR-Y		000	000		00
N					45 23 22.54	-122 15 48.5	017200100S00															OR<25					
														02	NONE 0	STRGHT										
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															PSNGR CAR		01	DRVR	INJC	16	F	OR-Y		028	000		27,02
																						OR<25				
														03	NONE 0	STOP										
															PRVTE	W -E									022	00
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00908	N	N	N		03/14/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
NO RPT					TH		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N					2P			04	0		N	DAY	INJ		SEMI TOW		01	DRVR	INJC	58	M	OR-Y		000	000		00
N					45 23 22.76	-122 15 48.39	017200100S00															OR<25					
														02	NONE 0	STRGHT										
															PRVTE	W -E									015	00
															PSNGR CAR		01	DRVR	INJB	19	M	OR-Y		028	000		02
																						OR<25				
														02	NONE 0	STRGHT										
															PRVTE	W -E									015	00
															PSNGR CAR		02	PSNG	INJB	18	F			000	000		00
01291	N	N	N	N	04/22/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
CITY					MO		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N					5P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	36	M	OR-Y		000	000		00
N					45 23 22.54	-122 15 48.5	017200100S00															OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE / TO	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	37	M	OR-Y OR<25		028	015 000	00 02
03399	N	N	N	N	N		10/03/2019 TH 7P 45 23 22.78	16 -122 15 48.4	DUBARKO RD EAGLE CRK-SANDY HY 01720010OS00	INTER CN	CROSS 03	N STOP SIGN 2	N N N	RAIN WET DLIT	ANGL-OTH ANGL INJ	01	NONE PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	INJB	48	F	OR-Y OR<25		000	000 000	02 00 00
																02	NONE PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	19	M	OTH-Y N-RES		028	015 000	00 02
04270	N	N	N				11/29/2019 FR 5P 45 23 22.55	16 -122 15 48.51	DUBARKO RD EAGLE CRK-SANDY HY 01720010OS00	INTER CN	CROSS 01	N STOP SIGN 0	N N N	CLR DRY DLIT	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	NONE	49	F	OR-Y OR<25		000	000 000	02 00 00
																02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	INJC	59	F	OR-Y OR<25		028	015 000	00 02

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M U N V	J I H L	S C R K	W O	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03066	N	N	N					06/09/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										083	02
NONE								TU	0	LANGENSAND RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000	00
N								12P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		000	000		00
N								45 23 23.89	-122 14 59.94																OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	W -E									015	00
																		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y		028	000	083	02
																									OR<25					

Preliminary Traffic Signal Warrant Analysis

Project Name: Deer Meadows Development
Intersection: Highway 26 at Langensand Road
Scenario: 2023 Background Plus Site Trips
Number of Major Street Lanes: 2 PM Peak Hour Volume 2485 (sum of both approaches)
Number of Minor Street Lanes 1 PM Peak Hour Volume 40 (highest-volume approach)[a]
Posted or 85th percentile speed > 40 mph: Yes
Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Anaylsis Calculations	8th Highest Hour[b]	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	1404	420	
Minor Street Volume	23	105	**No**
Condition B - Interruption of Continuous Traffic			
Major Street Volume	1404	630	
Minor Street Volume	23	53	**No**
Combination Warrant[c]			
Major Street Volume	1404	504	
Minor Street Volume	23	84	**No**

[a] Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.
[b] Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.
[c] This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis

Project Name: Deer Meadows Development
Intersection: Highway 211 at Dubarko Road
Scenario: 2023 Background Plus Site Trips
Number of Major Street Lanes: 1 PM Peak Hour Volume 837 (sum of both approaches)
Number of Minor Street Lanes 1 PM Peak Hour Volume 87 (highest-volume approach)[a]
Posted or 85th percentile speed > 40 mph: Yes
Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Anaylsis Calculations	8th Highest Hour[b]	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	473	350	
Minor Street Volume	49	105	**No**
Condition B - Interruption of Continuous Traffic			
Major Street Volume	473	525	
Minor Street Volume	49	53	**No**
Combination Warrant[c]			
Major Street Volume	473	420	
Minor Street Volume	49	84	**No**

[a] Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.
[b] Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.
[c] This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis

Project Name: Deer Meadows Development
Intersection: Dubarko Road at Langensand Road
Scenario: 2023 Background Plus Site Trips
Number of Major Street Lanes: 1 PM Peak Hour Volume 159 (sum of both approaches)
Number of Minor Street Lanes 1 PM Peak Hour Volume 68 (highest-volume approach)[a]
Posted or 85th percentile speed > 40 mph: No
Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Anaylsis Calculations	8th Highest Hour[b]	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	90	500	
Minor Street Volume	38	150	**No**
Condition B - Interruption of Continuous Traffic			
Major Street Volume	90	750	
Minor Street Volume	38	75	**No**
Combination Warrant[c]			
Major Street Volume	90	600	
Minor Street Volume	38	120	**No**

[a] Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.
[b] Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.
[c] This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

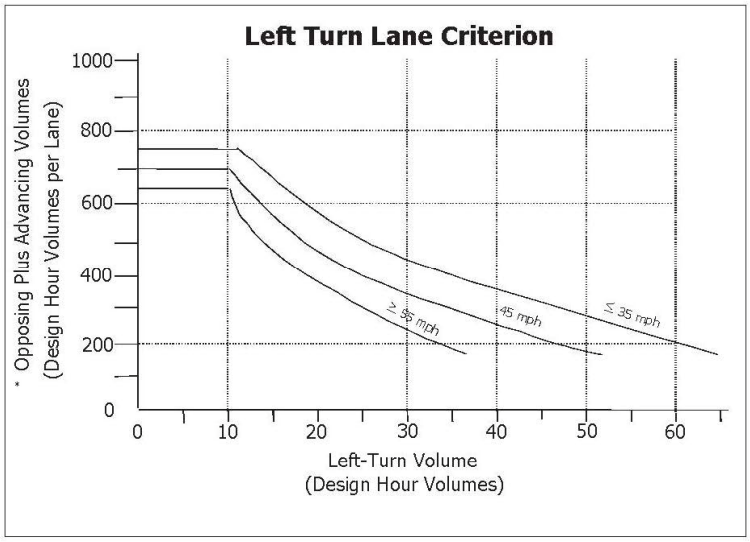
Left-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Deer Meadows Development
Approach: Highway 211 NB at Dubarko Road
Scenario: 2021 Existing Conditions

Number of Advancing Lanes: 1
Number of Opposing Lanes: 1
Major-Street Design Speed: 45 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	341	386
Opposing Volume for Design Hour:	271	337
Design Hour Volume Per Lane:	612	723
Number of Left Turns per Hour:	44	61
Left-turn lane warrants satisfied?	**YES**	**YES**

Exhibit 7-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Right-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Deer Meadows Development
Approach: Highway 211 Northbound at Dubarko Road
Scenario: 2021 Existing Conditions

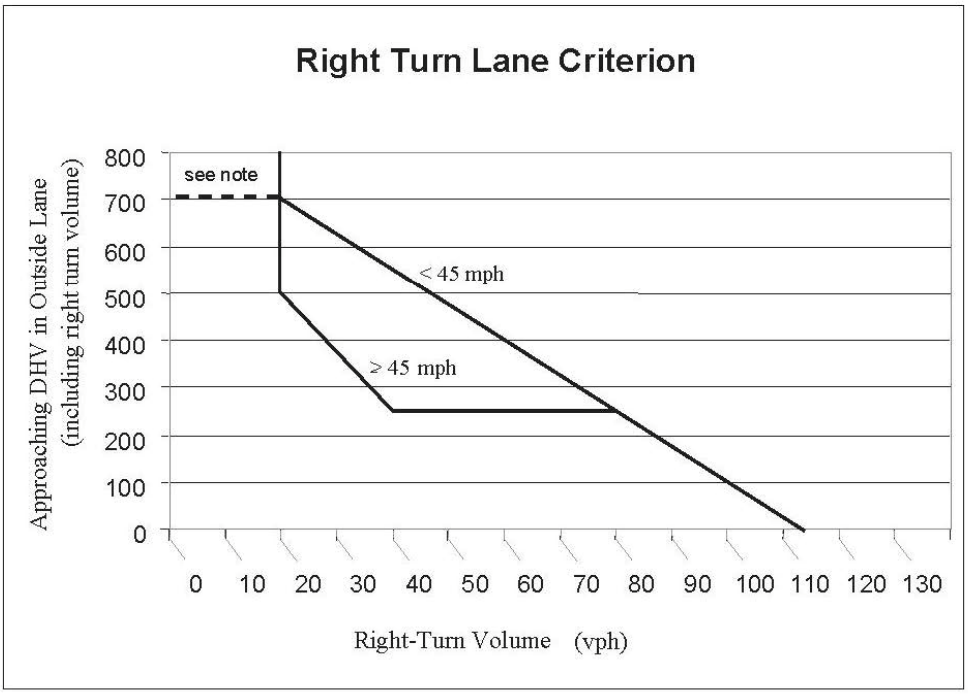
Major-Street Design Speed: 45 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	14	54
Approaching DVH in Outside Lane:	341	386
Calculated Turn Volume Threshold:	33	29
Right Turn Volume Exceeds Threshold?	**NO**	**YES**

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

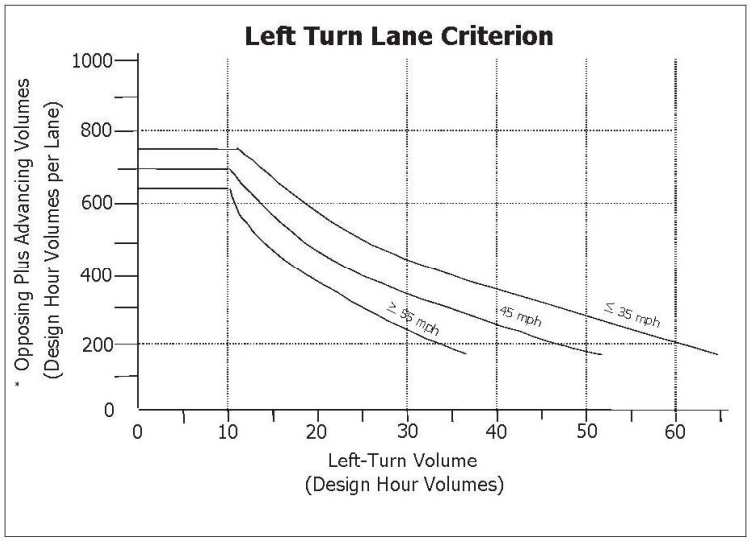
Left-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Deer Meadows Development
Approach: Dubarko Road westbound at Langensand Road
Scenario: 2023 Background plus Site Trips

Number of Advancing Lanes: 1
Number of Opposing Lanes: 1
Major-Street Design Speed: 25 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	101	54
Opposing Volume for Design Hour:	34	69
Design Hour Volume Per Lane:	135	123
Number of Left Turns per Hour:	1	2
Left-turn lane warrants satisfied?	**NO**	**NO**

Exhibit 7-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Right-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Deer Meadows Development
Approach: Dubarko Road Westbound at Langensand Road
Scenario: 2023 Background Plus Site Trips

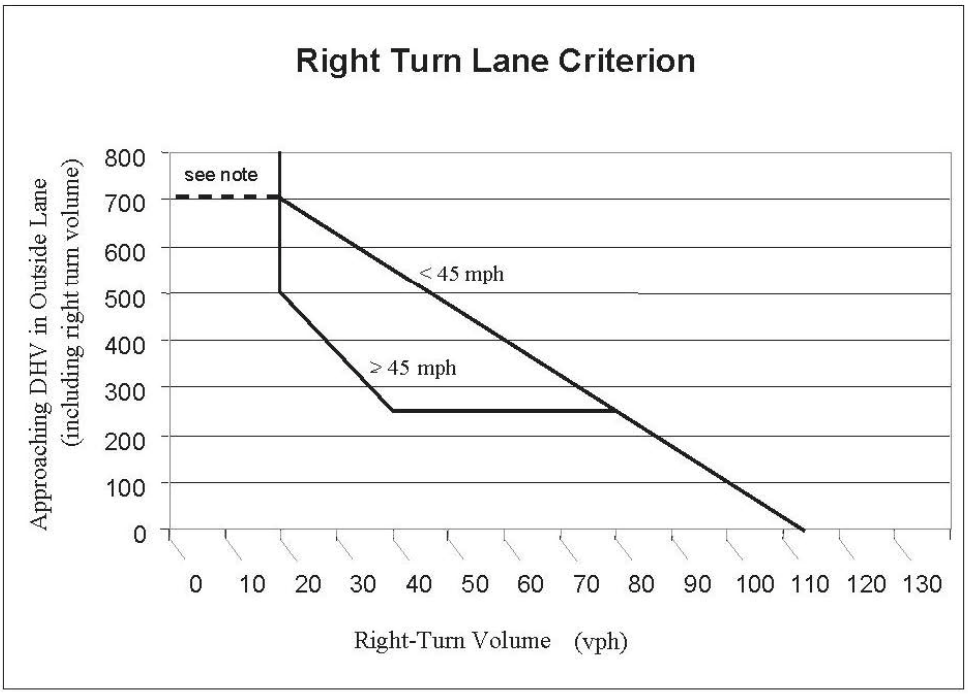
Major-Street Design Speed: 25 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	62	30
Approaching DVH in Outside Lane:	101	54
Calculated Turn Volume Threshold:	100	106
Right Turn Volume Exceeds Threshold?	**NO**	**NO**

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

EXHIBIT F

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

MEMORANDUM

DATE: April 23, 2021

TO: Alex Reverman (Roll Tide Corporation)

FROM: Todd Prager, RCA #597, ISA Board Certified Master Arborist

RE: Tree Plan for the Deer Meadows Subdivision

Summary

This report includes tree removal, preservation, and protection recommendations for the proposed Deer Meadows Subdivision in Sandy, Oregon.

Background

Roll Tide Corporation is proposing to construct a 30-lot subdivision at the east end of Dubarko Road in Sandy, Oregon. An existing conditions map of the site and trees is provided in Attachment 1. The schematic site plan with the proposed tree retention area is provided in Attachment 2. A detail of the grove of trees to be retained along Highway 26 is provided in Attachment 3.

The assignment requested of our firm for this project was to:

- Assess the existing grove of trees along Highway 26;
- Identify the trees to be removed and retained in the grove; and
- Provide tree protection recommendations for the trees to be retained in the grove.

Tree Assessment

On September 12 and December 11, 2019 I completed the inventory of existing trees in the grove.

The complete inventory data for each tree is provided in Attachment 4 and includes the tree number, common name, scientific name, trunk diameter (DBH), crown radius, health condition, structural condition, pertinent comments, and whether it is an onsite 11-inch DBH or greater tree in good condition to be retained.[1]

[1] Section 17.102.50 of the City of Sandy Code requires three onsite trees over 11-inch DBH that are in good condition to be retained.

Teragan & Associates, Inc.
3145 Westview Circle • Lake Oswego, OR 97034
Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

The tree numbers in the inventory in Attachment 4 correspond to the tree numbers on the plans in Attachments 1 and 3.

Note that since the site is 15.91 acres, Section 17.102.50 requires 48 trees over 11-inch DBH that are in good condition to be retained. My assignment was to identify at least 48 trees in the grove that meet these criteria.

Tree Removal and Retention

This section of the report includes tree removal and retention recommendations based on the proposed site plan.

Tree Removal

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH if no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

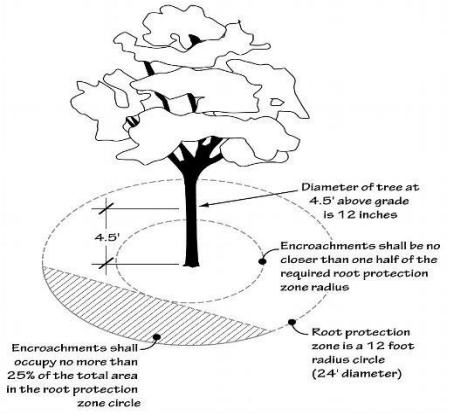


Figure 1: Alterative minimum protection zone

Using the criteria described above, while considering the tree locations relative to construction and other site improvements, 20 of the assessed trees are proposed for removal.

Tree Retention

Fifty-four (54) trees within the grove will be retained. Of the 54 trees to be retained, 48 are in good condition and over 11-inch DBH. Tree preservation has been maximized to the extent practicable with trees removed only as necessary for construction.

Section 17.102.50.A of the City of Sandy Code includes five criteria for tree retention with development. The five criteria followed by my findings in *italics* are listed below:

1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.

Finding: The site is 15.91 acres in size so 48 trees over 11-inch DBH in good condition are required to be retained. The proposed preservation includes 48 trees over 11-inch DBH in good condition within the grove along Highway 26 to be retained. This criterion is met.

2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.

Finding: The retained trees are clustered within the grove of trees along Highway 26. This criterion is met.

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.

Finding: All of the trees subject to this standard are in good health condition and likely to grow to maturity. Future selective thinning of the grove is recommended to improve the availability of space, water, nutrients, and light for the retained trees. Also, invasive understory and vine species such as Himalayan blackberry and English ivy should be removed to improve the condition of the understory and prevent vine growth on the retained trees.

Trees along portions of the southwest, east, and north sides of the grove are proposed for removal for construction. It will be important to reassess and monitor the trees along the newly exposed edges following site clearing and periodically during construction and after high wind events to ensure they do not pose a high risk. Since the bulk of the grove will be retained, I anticipate that the overall grove will remain viable. However, selective thinning of trees within the grove should be delayed until the changes in wind dynamics from edge tree removal is more thoroughly assessed. Retaining more of the interior trees will help to protect the overall integrity of grove from blow-down during the near term. It will also be very important to protect the root zones of the trees in the grove from construction impacts with tree protection fencing and other measures to further minimize the risk of blow-down. Tree protection measures are further described in the next section of this report.

Since the bulk of the grove will be retained and measures to monitor and protect the trees in the grove will be implemented, this criterion is met.

4. If possible, at least two of the required trees per acre must be of conifer species.

Finding: All 48 trees over 11-inch DBH and in good condition are conifer species. This criterion is met.

5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.

Finding: Any retained trees that are over 11-inch DBH and in good condition that are within protected setback areas will be counted towards the tree retention standards. This criterion is met.

Tree Protection Recommendations

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH if no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

The reason for using this alternative is because it allows the tree protection zone to better relate to the size of the tree and its root zone. For example, a 10-foot tree protection setback would not be adequate for a 36-inch DBH tree which should have a minimum setback of at least 18 feet. Also, driplines can be highly variable based on species growth habits and onsite conditions such as the presence of adjacent trees or past pruning.

The critical root zone radii of 1 foot per inch of DBH is shown for the trees to be retained on the plan sheet in Attachments 3. The trees to be retained can be adequately protected by placing tree protection fencing as shown in Attachment 3. The tree protection fencing will protect at least 75 percent of their critical roots zones and avoid any encroachments closer than a radius of .5 feet per inch of DBH to a tree to be retained. No grading, stockpiling, storage, disposal, or any other construction related activity shall occur in the tree protection zones unless specifically reviewed and approved by the project arborist.

The following additional protection measures shall apply to the trees at the site:

- *Tree Protection Fencing*: Establish tree protection fencing in the locations shown in Attachment 3. 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.
- *Directional Felling*: Fell the trees to be removed away from the trees to be retained so they do not contact or otherwise damage the trunks or branches of the trees to be retained. No vehicles or heavy equipment shall be permitted within the tree protection zones during tree removal operations.
- *Stump Removal*: The stumps of the trees to be removed from within the tree protection zones shall either be retained in place or stump ground to protect the root systems of the trees to be retained.
- *Protect Tree Crowns*: Care will need to be taken to not contact or otherwise damage the crowns of the trees that may extend into the construction area.
- *Monitoring of New Grove Edges*: Trees along portions of the southwest, east, and north sides of the grove are proposed for removal for construction. It will be important to reassess and monitor the trees along the newly exposed edges following site clearing and periodically during construction and after high

wind events to ensure they do not pose a high risk. This monitoring should occur for the next two to three storm seasons following site clearing.

- *Selective Thinning of Grove Trees*: Selective thinning of the grove is recommended to improve the availability of space, water, nutrients, and light for the retained trees. Also, invasive understory and vine species such as Himalayan blackberry and English ivy should be removed to improve the condition of the understory and prevent vine growth on the retained trees.

  Any thinning of trees within the grove should be delayed until the changes in wind dynamics from edge tree removal is more thoroughly assessed. Retaining more of the interior trees will help to protect the overall integrity of the grove from blow-down during the near term. After, site adaptations of the trees are better understood in the following two to three storm seasons following disturbance, the project arborist may prescribe a selective thinning treatment.

Additional tree protection recommendations for the trees to be retained are provided in Attachment 5.

Conclusion

Forty-eight (48) trees over 11-inch DBH in good condition are proposed to be retained within the grove of trees along Highway 26. The required tree retention for the 15.91 acre site is 48 trees.

While the grove of trees will have areas of disturbance along the edges, I anticipate that the overall grove will remain viable. It will be important to reassess and monitor the trees along the newly exposed edges following site clearing and periodically during construction and after high wind events to ensure they do not pose a high risk.

Once the grove is stabilized, I recommend selective thinning of trees to improve the availability of space, water, nutrients, and light for the retained trees. Also, invasive understory and vine species such as Himalayan blackberry and English ivy should be removed to improve the condition of the understory and prevent vine growth on the retained trees.

Please contact me if you have questions, concerns, or need any additional information.

Sincerely,

Todd Prager

Todd Prager
ASCA Registered Consulting Arborist #597
ISA Board Certified Master Arborist, WE-6723B
ISA Qualified Tree Risk Assessor
AICP, American Planning Association

Teragan & Associates, Inc.
3145 Westview Circle • Lake Oswego, OR 97034
Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

Attachments: Attachment 1 - Existing Site Conditions with Existing Trees
Attachment 2 - Conceptual Site Plan with Trees Retention Area
Attachment 3 - Grove Detail with Tree Protection
Attachment 4 - Tree Inventory
Attachment 5 - Tree Protection Recommendations
Attachment 6 - Assumptions and Limiting Conditions

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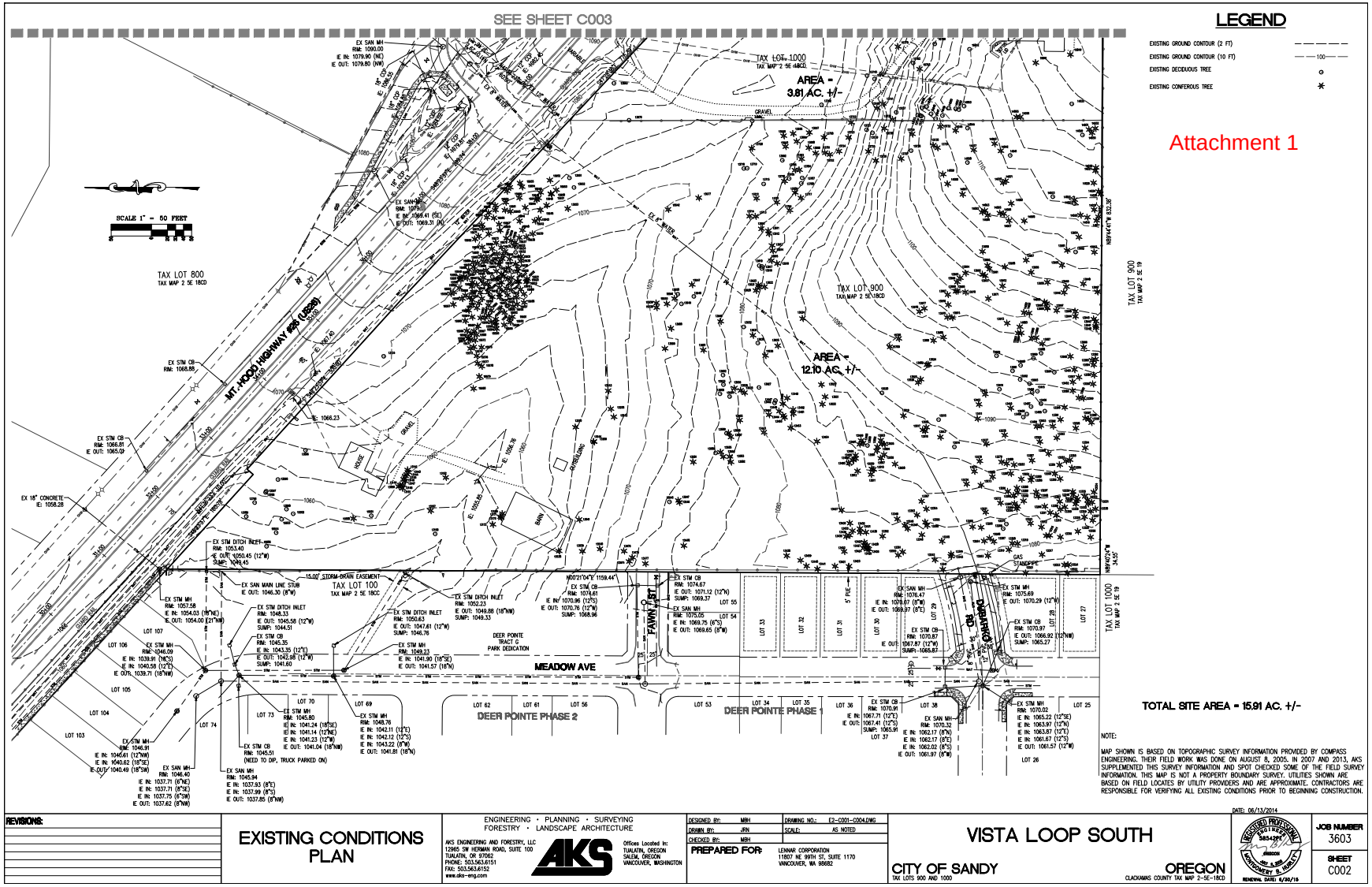
SEE SHEET C003
LEGEND
EXISTING GROUND CONTOUR (2 FT)
EXISTING GROUND CONTOUR (10 FT)
EXISTING DECIDUOUS TREE
EXISTING CONIFEROUS TREE
Attachment 1
SCALE 1" = 50 FEET
TAX LOT 800
TAX MAP 2 SE 18CD
TAX LOT 1000
TAX MAP 2 SE 18CD
AREA = 3.81 AC. +/-
TAX LOT 900
TAX MAP 2 SE 18CD
AREA = 12.10 AC. +/-
TAX LOT 900
TAX MAP 2 SE 19
TAX LOT 1000
TAX MAP 2 SE 19
MT. HOOD HIGHWAY #26 (US26)
MEADOW AVE
FAWN ST
DEER POINTE PHASE 2
DEER POINTE PHASE 1
DEER POINTE TRACT G PARK DEDICATION
15.00' STORM DRAIN EASEMENT
TOTAL SITE AREA = 15.91 AC. +/-
NOTE:
MAP SHOWN IS BASED ON TOPOGRAPHIC SURVEY INFORMATION PROVIDED BY COMPASS ENGINEERING. THEIR FIELD WORK WAS DONE ON AUGUST 8, 2005. IN 2007 AND 2013, AKS SUPPLEMENTED THIS SURVEY INFORMATION AND SPOT CHECKED SOME OF THE FIELD SURVEY INFORMATION. THIS MAP IS NOT A PROPERTY BOUNDARY SURVEY. UTILITIES SHOWN ARE BASED ON FIELD LOCATES BY UTILITY PROVIDERS AND ARE APPROXIMATE. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
REVISIONS:
EXISTING CONDITIONS PLAN
ENGINEERING • PLANNING • SURVEYING
FORESTRY • LANDSCAPE ARCHITECTURE
AKS ENGINEERING AND FORESTRY, LLC
12965 SW HERMAN ROAD, SUITE 100
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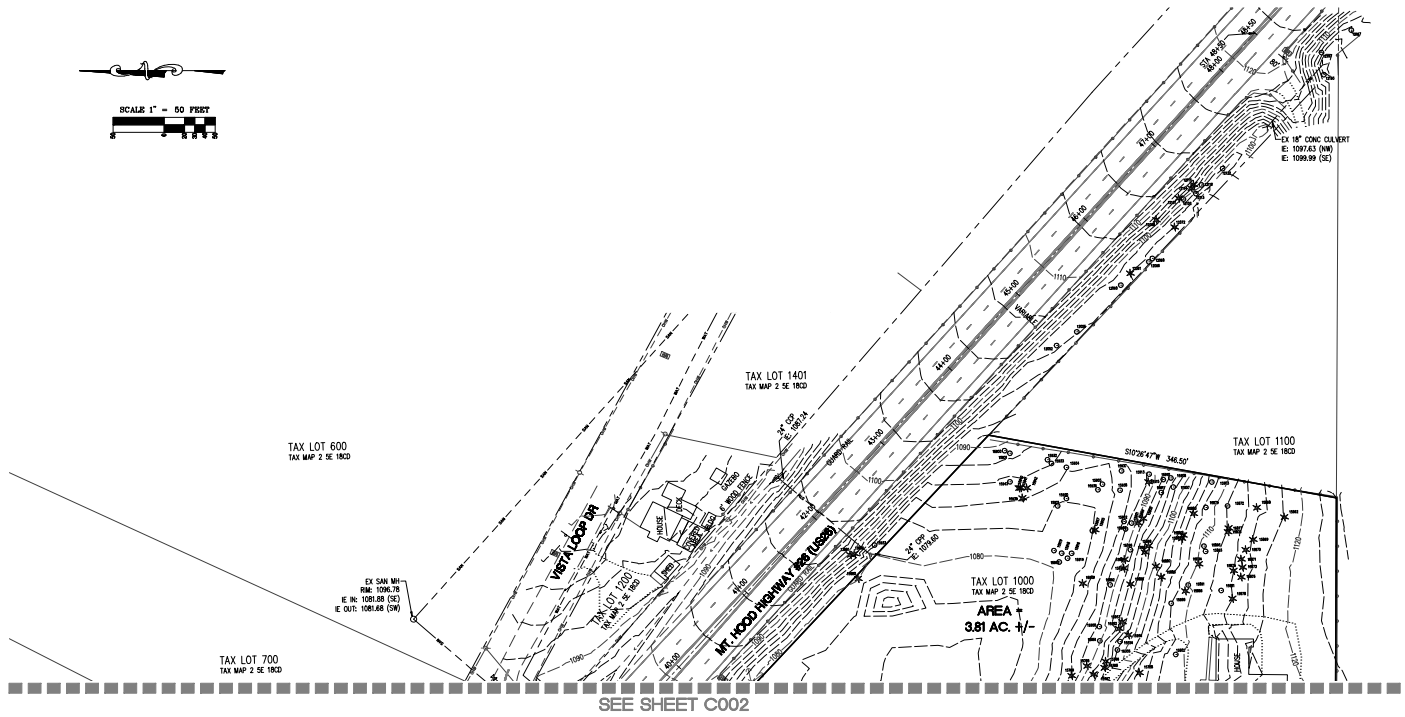
DESIGNED BY: MRH
DRAWN BY: JRN
CHECKED BY: MRH
DRAWING NO.: E2-C001-C004.DWG
SCALE: AS NOTED
PREPARED FOR:
LENNAR CORPORATION
11807 NE 99TH ST, SUITE 1170
VANCOUVER, WA 98682
VISTA LOOP SOUTH
CITY OF SANDY
TAX LOTS 900 AND 1000
OREGON
CLACKAMAS COUNTY: TAX MAP 2-5E-18CD
DATE: 06/13/2014
JOB NUMBER 3603
SHEET C002

Attachment 1



TOTAL SITE AREA = 15.91 AC. +/-

NOTE:

MAP SHOWN IS BASED ON TOPOGRAPHIC SURVEY INFORMATION PROVIDED BY COMPASS ENGINEERING. THEIR FIELD WORK WAS DONE ON AUGUST 8, 2005. IN 2007 AND 2013, AKS SUPPLEMENTED THIS SURVEY INFORMATION AND SPOT CHECKED SOME OF THE FIELD SURVEY INFORMATION. THIS MAP IS NOT A PROPERTY BOUNDARY SURVEY. UTILITIES SHOWN ARE BASED ON FIELD LOCATES BY UTILITY PROVIDERS AND ARE APPROXIMATE. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.

DATE: 06/13/2014

REVISIONS:

EXISTING CONDITIONS PLAN

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DESIGNED BY: MRH
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11807 NE 99TH ST, SUITE 1170
VANCOUVER, WA 98682

VISTA LOOP SOUTH

CITY OF SANDY
TAX LOTS 900 AND 1000

OREGON
CLACKAMAS COUNTY: TAX MAP 2-5E-18CD

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
JASON A. SALMI
RENEWAL DATE: 6/30/15

JOB NUMBER
3603

SHEET
C003

Attachment 1

TREE NUMBER	SPECIES	DBH (IN)
12052	MAPLE	17,18
12055	MAPLE	38
12060	MAPLE	29
12061	CEDAR	26
12066	UNKNOWN DECID.	5
12068	UNKNOWN DECID.	13
12069	DOUGLAS FIR	27
12072	CEDAR	17
12101	DOUGLAS FIR	19
12102	MAPLE	7
12113	MAPLE	14,21
12114	DOUGLAS FIR	22
12115	DOUGLAS FIR	25
12116	MAPLE	12
12122	MAPLE	7,3,15
12157	MAPLE	5,6
12193	UNKNOWN DECID.	12
12197	MAPLE	9
13095	BIG LEAF MAPLE	20
13096	PEAR	12
13097	PEAR	10
13098	FILBERT	8
13134	BIG LEAF MAPLE	52
13142	DOUGLAS FIR	19
13143	DOUGLAS FIR	10
13144	DOUGLAS FIR	36
13145	DOUGLAS FIR	12
13146	DOUGLAS FIR	21
13147	DOUGLAS FIR	13
13148	DOUGLAS FIR	21
13149	DOUGLAS FIR	15
13150	DOUGLAS FIR	19
13151	DOUGLAS FIR	23
13152	DOUGLAS FIR	35
13157	PINE	18
13158	APPLE	22
13159	DOUGLAS FIR	20
13170	DOUGLAS FIR	15
13171	CEDAR	20
13172	CEDAR	20,26
13208	DOUGLAS FIR	22
13209	DOUGLAS FIR	17
13210	DOUGLAS FIR	44
13253	CEDAR	24
13254	CEDAR	10
13255	CEDAR	15
13256	CEDAR	24
13257	DOUGLAS FIR	21
13258	DOUGLAS FIR	17
13259	ALDER	8
13270	ALDER	10
13271	CEDAR	12
13272	CEDAR	12
13273	CEDAR	19
13274	CEDAR	19
13275	DOUGLAS FIR	24
13276	CEDAR	11
13277	CEDAR	36
13278	CEDAR	48
13279	CEDAR	18
13280	DOUGLAS FIR	22
13281	DOUGLAS FIR	16
13282	DOUGLAS FIR	17
13283	CEDAR	32
13284	DOUGLAS FIR	15
13285	DOUGLAS FIR	20
13286	DOUGLAS FIR	20
13287	DOUGLAS FIR	17
13288	CEDAR	12
13289	CEDAR	12
13290	CEDAR	13
13291	CEDAR	40
13292	CEDAR	37
13293	CEDAR	9
13294	CEDAR	6
13295	CEDAR	13
13296	CEDAR	13
13297	CEDAR	13
13298	CEDAR	16
13299	CEDAR	57
13300	SPRUCE	12
13301	CEDAR	8
13302	CEDAR	8
13303	CEDAR	13
13304	DOUGLAS FIR	18
13305	DOUGLAS FIR	12
13306	CEDAR	17
13307	DOUGLAS FIR	27
13308	CEDAR	12
13309	CEDAR	8
13310	CEDAR	8
13311	CEDAR	31
13312	CEDAR	32
13313	CEDAR	13
13314	CEDAR	37
13315	DOUGLAS FIR	13
13316	DOUGLAS FIR	26
13317	DOUGLAS FIR	14
13318	DOUGLAS FIR	28
13319	DOUGLAS FIR	16
13320	CEDAR	13
13321	DOUGLAS FIR	15
13322	CEDAR	40
13323	CEDAR	30
13324	DOUGLAS FIR	16
13325	CEDAR	46
13326	DOUGLAS FIR	26
13327	DOUGLAS FIR	25
13328	CEDAR	11

TREE NUMBER	SPECIES	DBH (IN)
13329	CEDAR	16
13330	CEDAR	19
13331	CEDAR	12
13332	CEDAR	8
13333	DOUGLAS FIR	13
13334	CEDAR	10
13335	CEDAR	11
13336	CEDAR	10
13337	CEDAR	13
13338	CEDAR	11
13339	CEDAR	14
13340	DOUGLAS FIR	15
13341	DOUGLAS FIR	26
13342	DOUGLAS FIR	13
13343	DOUGLAS FIR	12
13344	DOUGLAS FIR	17
13345	DOUGLAS FIR	27
13346	DOUGLAS FIR	32
13347	DOUGLAS FIR	21
13348	DOUGLAS FIR	12
13349	DOUGLAS FIR	16
13350	DOUGLAS FIR	31
13351	DOUGLAS FIR	11
13352	DOUGLAS FIR	26
13353	DOUGLAS FIR	19
13354	DOUGLAS FIR	24
13355	DOUGLAS FIR	18
13356	DOUGLAS FIR	12
13357	DOUGLAS FIR	13
13382	DOUGLAS FIR	12
13383	DOUGLAS FIR	14
13384	DOUGLAS FIR	14
13385	DOUGLAS FIR	8
13386	DOUGLAS FIR	18
13387	DOUGLAS FIR	18
13388	DOUGLAS FIR	16
13390	DOUGLAS FIR	26
13391	DOUGLAS FIR	24
13392	DOUGLAS FIR	28
13393	DOUGLAS FIR	28
13394	DOUGLAS FIR	12
13395	DOUGLAS FIR	8
13396	DOUGLAS FIR	16
13397	DOUGLAS FIR	14
13398	DOUGLAS FIR	14
13399	DOUGLAS FIR	8
13400	DOUGLAS FIR	9
13401	CEDAR	19
13402	CEDAR	38
13403	CEDAR	12
13404	CEDAR	8
13405	ALDER	11
13406	ALDER	6
13407	ALDER	6
13408	ALDER	6
13409	ALDER	6
13410	DOUGLAS FIR	39
13411	CEDAR	26
13412	CEDAR	26
13413	DOUGLAS FIR	29
13414	ALDER	10
13415	ALDER	10
13416	ALDER	6
13421	DOUGLAS FIR	29
13422	DOUGLAS FIR	13
13423	DOUGLAS FIR	36
13424	DOUGLAS FIR	24
13425	DOUGLAS FIR	22
13426	DOUGLAS FIR	17
13427	DOUGLAS FIR	8
13428	DOUGLAS FIR	8
13429	DOUGLAS FIR	8
13430	DOUGLAS FIR	11
13431	DOUGLAS FIR	22
13432	DOUGLAS FIR	22
13433	DOUGLAS FIR	22
13434	CEDAR	14
13435	CEDAR	22
13436	DOUGLAS FIR	24
13437	DOUGLAS FIR	14
13438	DOUGLAS FIR	40
13439	DOUGLAS FIR	8
13440	DOUGLAS FIR	32
13441	DOUGLAS FIR	12
13442	CEDAR	52
13443	DOUGLAS FIR	29
13444	DOUGLAS FIR	17
13445	DOUGLAS FIR	8
13446	ALDER	6
13447	ALDER	8
13448	CEDAR	12
13449	DOUGLAS FIR	17
13450	CEDAR	9
13451	DOUGLAS FIR	29
13452	CEDAR	8
13453	DOUGLAS FIR	27
13454	DOUGLAS FIR	19
13455	DOUGLAS FIR	30
13474	DOUGLAS FIR	13
13475	DOUGLAS FIR	16
13476	DOUGLAS FIR	26
13477	DOUGLAS FIR	48
13478	DOUGLAS FIR	48
13493	DOUGLAS FIR	16
13494	DOUGLAS FIR	12
13495	BIG LEAF MAPLE	12
13496	DOUGLAS FIR	12
13497	DOUGLAS FIR	19
13498	DOUGLAS FIR	24

TREE NUMBER	SPECIES	DBH (IN)
13499	DOUGLAS FIR	15
13500	ALDER	9
13501	CEDAR	13
13502	DOUGLAS FIR	22
13503	CEDAR	9
13504	DOUGLAS FIR	13
13505	DOUGLAS FIR	10
13506	CEDAR	8
13507	CEDAR	16
13508	CEDAR	18
13509	CEDAR	17
13510	DOUGLAS FIR	10
13511	DOUGLAS FIR	20
13512	CEDAR	16
13513	CEDAR	27
13514	ALDER	14
13515	ALDER	8
13516	DOUGLAS FIR	22
13517	CEDAR	13
13518	CEDAR	25
13519	CEDAR	25
13520	ALDER	24
13521	DOUGLAS FIR	26
13522	DOUGLAS FIR	8
13523	DOUGLAS FIR	18
13524	DOUGLAS FIR	17
13525	CEDAR	9
13526	CEDAR	16
13538	CEDAR	27
13539	DOUGLAS FIR	31
13540	CEDAR	28,32
13541	CEDAR	17
13542	DOUGLAS FIR	15
13543	DOUGLAS FIR	25
13544	DOUGLAS FIR	18
13545	FRUIT	26
13546	DOUGLAS FIR	31
13547	DOUGLAS FIR	31
13581	DOUGLAS FIR	30
13582	DOUGLAS FIR	28
13583	DOUGLAS FIR	14
13584	DOUGLAS FIR	17
13585	DOUGLAS FIR	17
13586	HOLLY	10
13587	CEDAR	12
13588	CEDAR	12
13589	ALDER	12
13599	DOUGLAS FIR	14
13600	DOUGLAS FIR	25
13601	DOUGLAS FIR	25
13602	ALDER	15
13603	ALDER	13
13604	ALDER	12
13605	ALDER	12
13606	DOUGLAS FIR	23
13610	DOUGLAS FIR	17
13611	CEDAR	10
13612	CEDAR	10
13613	CEDAR	25
13614	CEDAR	25
13615	DOUGLAS FIR	29
13616	DOUGLAS FIR	19
13617	ALDER	6
13618	ALDER	6
13619	DOUGLAS FIR	14
13620	CEDAR	29
13621	DOUGLAS FIR	10
13622	DOUGLAS FIR	34
13623	DOUGLAS FIR	6
13624	DOUGLAS FIR	34
13625	DOUGLAS FIR	34
13626	DOUGLAS FIR	25
13627	ALDER	13
13628	DOUGLAS FIR	24
13629	DOUGLAS FIR	19
13630	HOLLY	8
13631	DOUGLAS FIR	30
13632	ALDER	11
13646	DOUGLAS FIR	32
13647	DOUGLAS FIR	32
13648	HOLLY	8
13649	HOLLY	9
13650	HOLLY	7
13651	ALDER	9
13652	HOLLY	10
13653	DOUGLAS FIR	6
13676	APPLE	17
13677	DOUGLAS FIR	20
13684	BIG LEAF MAPLE	12
13692	CHERRY	8
13693	CEDAR	40
13694	CEDAR	20
13695	DOUGLAS FIR	15
13696	DOUGLAS FIR	22
13697	CEDAR	16
13698	CEDAR	24
13699	CEDAR	16
13700	CEDAR	50
13701	CEDAR	14
13702	CEDAR	15
13703	CEDAR	17
13704	CEDAR	12
13705	CEDAR	15
13706	ALDER	14
13707	ALDER	6
13708	ALDER	6
13709	CEDAR	15
13710	CEDAR	24
13711	CEDAR	30

TREE NUMBER	SPECIES	DBH (IN)
13712	CEDAR	46
13713	CEDAR	25
13714	DOUGLAS FIR	17
13715	ALDER	24
13716	DOUGLAS FIR	36
13717	DOUGLAS FIR	12
13718	BIG LEAF MAPLE	42
13719	BIG LEAF MAPLE	6
13720	CEDAR	12
13721	BIG LEAF MAPLE	18
13722	DOUGLAS FIR	17
13723	CEDAR	15
13724	CEDAR	17
13725	DOUGLAS FIR	18
13726	DOUGLAS FIR	34
13727	DOUGLAS FIR	19
13728	FRUIT	36
13729	DOUGLAS FIR	36
13730	DOUGLAS FIR	22
13731	DOUGLAS FIR	34
13732	DOUGLAS FIR	22
13733	ALDER	13
13734	ALDER	14
13735	ALDER	10
13736	DOUGLAS FIR	15
13737	ALDER	12
13738	DOUGLAS FIR	12
13739	BIG LEAF MAPLE	20
13740	CEDAR	18
13741	DOUGLAS FIR	33
13742	BIG LEAF MAPLE	16
13743	ALDER	9
13744	ALDER	8
13786	PEAR	8
13788	PEAR	9
13789	PEAR	8
13843	BIG LEAF MAPLE	12
13880	DOUGLAS FIR	24,24
13881	DOUGLAS FIR	18
13882	DOUGLAS FIR	18,16
13933	BIG LEAF MAPLE	12,16
13940	DOUGLAS FIR	17
13941	DOUGLAS FIR	23
13942	DOUGLAS FIR	14
13943	DOUGLAS FIR	31
13944	DOUGLAS FIR	17
13945	DOUGLAS FIR	6
13946	DOUGLAS FIR	12
13947	DOUGLAS FIR	35
13948	DOUGLAS FIR	9
13949	DOUGLAS FIR	18
13950	DOUGLAS FIR	16
13951	DOUGLAS FIR	20
13952	BIG LEAF MAPLE	24
13953	DOUGLAS FIR	21
13954	DOUGLAS FIR	20
13955	DOUGLAS FIR	40
13956	DOUGLAS FIR	28
13957	DOUGLAS FIR	28
13958	DOUGLAS FIR	20
13959	DOUGLAS FIR	36
13960	CEDAR	6
13961	CEDAR	6
13962	DOUGLAS FIR	24
13963	DOUGLAS FIR	22
13964	DOUGLAS FIR	28
13965	DOUGLAS FIR	28
13966	DOUGLAS FIR	14
13967	DOUGLAS FIR	30
13968	DOUGLAS FIR	8
13969	DOUGLAS FIR	8
13970	DOUGLAS FIR	26
13971	DOUGLAS FIR	16
13972	DOUGLAS FIR	30
13973	DOUGLAS FIR	22
13974	DOUGLAS FIR	18
13975	DOUGLAS FIR	24
13976	CEDAR	10
13977	DOUGLAS FIR	30
13978	DOUGLAS FIR	24
13979	ALDER	12
13980	DOUGLAS FIR	24
13981	DOUGLAS FIR	18
13982	DOUGLAS FIR	18
13983	DOUGLAS FIR	24
13984	DOUGLAS FIR	32
13985	ALDER	16
13986	DOUGLAS FIR	28
13987	DOUGLAS FIR	20
13988	ALDER	8
13989	ALDER	6
13990	ALDER	8
13991	ALDER	8
13992	ALDER	8
13993	ALDER	8
13994	ALDER	8
13995	DOUGLAS FIR	30
13996	DOUGLAS FIR	6
13997	DOUGLAS FIR	28
13998	DOUGLAS FIR	18
13999	DOUGLAS FIR	18
14000	DOUGLAS FIR	16
14001	DOUGLAS FIR	28
14002	DOUGLAS FIR	28
14003	DOUGLAS FIR	6
14016	DOUGLAS FIR	6
14017	DOUGLAS FIR	24
14018	DOUGLAS FIR	26
14019	DOUGLAS FIR	28

TREE NUMBER	SPECIES	DBH(IN)
14020	CEDAR	8
14021	BIG LEAF MAPLE	25
14022	DOUGLAS FIR	6
14023	BIG LEAF MAPLE	8
14024	DOUGLAS FIR	14
14025	DOUGLAS FIR	32
14026	DOUGLAS FIR	42
14027	DOUGLAS FIR	24
14028	DOUGLAS FIR	32
14029	BIG LEAF MAPLE	24
14030	DOUGLAS FIR	26
14031	DOUGLAS FIR	18
14032	DOUGLAS FIR	24
14033	BIG LEAF MAPLE	16
14041	BIG LEAF MAPLE	28
14042	DOUGLAS FIR	6
14043	DOUGLAS FIR	32
14044	ALDER	8
14045	DOUGLAS FIR	28
14046	BIG LEAF MAPLE	16
14047	ALDER	14
14048	ALDER	8
14049	ALDER	12
14050	ALDER	6
14051	ALDER	8
14052	ALDER	8
14053	ALDER	8
14055	DOUGLAS FIR	18
14056	DOUGLAS FIR	20
14057	DOUGLAS FIR	12
14058	ALDER	14
14059	DOUGLAS FIR	18
14060	DOUGLAS FIR	39
14061	DOUGLAS FIR	39
14062	DOUGLAS FIR	24
14063	DOUGLAS FIR	20
14064	DOUGLAS FIR	16
14065	DOUGLAS FIR	20
14066	DOUGLAS FIR	22
14067	DOUGLAS FIR	12
14068	DOUGLAS FIR	24
14069	DOUGLAS FIR	14
14070	DOUGLAS FIR	22
14071	DOUGLAS FIR	36
15500	DOUGLAS FIR	28
15501	BIG LEAF MAPLE	18
15502	HAZELNUT	6
15503	HAZELNUT	6
15504	HAZELNUT	6
15505	HAZELNUT	6
15538	DOUGLAS FIR	6
15539	DOUGLAS FIR	15
15540	DOUGLAS FIR	24
15541	DOUGLAS FIR	20
15542	CEDAR	15
15543	DOUGLAS FIR	6
15544	DOUGLAS FIR	6
15545	DOUGLAS FIR	8
15546	DOUGLAS FIR	10
15547	DOUGLAS FIR	6
15548	DOUGLAS FIR	6
15549	DOUGLAS FIR	6
15550	DOUGLAS FIR	6
15551	DOUGLAS FIR	10
15552	DOUGLAS FIR	15
15553	DOUGLAS FIR	10
15554	DOUGLAS FIR	10
15555	DOUGLAS FIR	21
15556	DOUGLAS FIR	10
15557	DOUGLAS FIR	15
15558	DOUGLAS FIR	10
15559	DOUGLAS FIR	8
15560	DOUGLAS FIR	8
15561	DOUGLAS FIR	8
15562	DOUGLAS FIR	16
15563	DOUGLAS FIR	8
15564	DOUGLAS FIR	10
15565	DOUGLAS FIR	8
15566	DOUGLAS FIR	15
15567	DOUGLAS FIR	12
15568	DOUGLAS FIR	6
15569	DOUGLAS FIR	10
15570	DOUGLAS FIR	10
15571	DOUGLAS FIR	6
15572	DOUGLAS FIR	10
15573	DOUGLAS FIR	15
15574	DOUGLAS FIR	6
15575	DOUGLAS FIR	12
15576	DOUGLAS FIR	15
15577	DOUGLAS FIR	10
15578	DOUGLAS FIR	15
15579	DOUGLAS FIR	24
15580	DOUGLAS FIR	30
15581	DOUGLAS FIR	6
15582	DOUGLAS FIR	8
15583	DOUGLAS FIR	8
15584	DOUGLAS FIR	10
15585	DOUGLAS FIR	6
15586	DOUGLAS FIR	6
15587	DOUGLAS FIR	6
15588	DOUGLAS FIR	8
15589	DOUGLAS FIR	12
15590	DOUGLAS FIR	10
15591	DOUGLAS FIR	10
15592	DOUGLAS FIR	6
15593	DOUGLAS FIR	12
15594	DOUGLAS FIR	8
15595	DOUGLAS FIR	10
15596	DOUGLAS FIR	6

TREE NUMBER	SPECIES	DBH (IN)
15597	DOUGLAS FIR	6
15598	DOUGLAS FIR	12
15599	DOUGLAS FIR	12
15600	DOUGLAS FIR	6
15601	DOUGLAS FIR	14
15602	DOUGLAS FIR	6
15603	ALDER	6
15604	ALDER	8
15605	ALDER	8
15606	DOUGLAS FIR	12
15607	DOUGLAS FIR	10
15608	DOUGLAS FIR	18
15609	DOUGLAS FIR	17
15610	DOUGLAS FIR	12
15611	DOUGLAS FIR	8
15612	DOUGLAS FIR	8
15613	DOUGLAS FIR	10
15614	DOUGLAS FIR	6
15615	DOUGLAS FIR	10
15616	DOUGLAS FIR	6
15617	DOUGLAS FIR	6
15618	DOUGLAS FIR	8
15619	DOUGLAS FIR	12
15620	DOUGLAS FIR	15
15621	DOUGLAS FIR	12
15622	DOUGLAS FIR	6
15623	DOUGLAS FIR	6
15624	DOUGLAS FIR	6
15625	DOUGLAS FIR	8
15626	DOUGLAS FIR	10
15627	ALDER	6
15628	DOUGLAS FIR	8
15629	DOUGLAS FIR	8
15630	DOUGLAS FIR	12
15631	DOUGLAS FIR	13
15632	DOUGLAS FIR	10
15633	DOUGLAS FIR	8
15634	ALDER	8
15635	DOUGLAS FIR	6
15636	DOUGLAS FIR	8
15637	DOUGLAS FIR	10
15638	DOUGLAS FIR	15
15639	DOUGLAS FIR	10
15640	DOUGLAS FIR	10
15641	DOUGLAS FIR	12
15642	DOUGLAS FIR	12
15643	DOUGLAS FIR	10
15644	DOUGLAS FIR	12
15645	DOUGLAS FIR	12
15646	DOUGLAS FIR	10
15647	DOUGLAS FIR	10
15648	DOUGLAS FIR	10
15649	DOUGLAS FIR	12
15650	DOUGLAS FIR	12
15651	DOUGLAS FIR	18
15652	DOUGLAS FIR	24
15653	DOUGLAS FIR	12
15654	DOUGLAS FIR	15
15655	DOUGLAS FIR	16
15656	DOUGLAS FIR	14
15657	DOUGLAS FIR	18
15658	DOUGLAS FIR	15
15659	DOUGLAS FIR	18
15660	DOUGLAS FIR	15
15661	DOUGLAS FIR	8
15662	DOUGLAS FIR	6
15663	DOUGLAS FIR	12
15664	DOUGLAS FIR	12
15665	DOUGLAS FIR	15
15666	DOUGLAS FIR	10
15667	DOUGLAS FIR	10
15668	DOUGLAS FIR	10
15669	DOUGLAS FIR	10
15670	DOUGLAS FIR	12
15671	DOUGLAS FIR	8
15672	DOUGLAS FIR	10
15673	DOUGLAS FIR	10
15674	DOUGLAS FIR	10
15675	DOUGLAS FIR	8
15676	DOUGLAS FIR	6
15677	DOUGLAS FIR	8
15678	DOUGLAS FIR	8
15679	DOUGLAS FIR	10
15680	DOUGLAS FIR	8
15681	DOUGLAS FIR	11
15682	DOUGLAS FIR	12
15683	DOUGLAS FIR	6
15684	DOUGLAS FIR	6
15685	DOUGLAS FIR	6
15686	DOUGLAS FIR	17
15687	DOUGLAS FIR	11
15688	DOUGLAS FIR	15
15689	DOUGLAS FIR	8
15690	DOUGLAS FIR	12
15691	DOUGLAS FIR	6
15692	DOUGLAS FIR	8
15693	DOUGLAS FIR	6
15694	DOUGLAS FIR	6
15695	DOUGLAS FIR	6
15696	DOUGLAS FIR	6
15697	DOUGLAS FIR	6
15698	DOUGLAS FIR	6
15699	DOUGLAS FIR	6
15700	ALDER	6
15709	PINE	18
15710	DOUGLAS FIR	32
15740	ALDER	12
15758	UNKNOWN DECID.	9
15759	BIG LEAF MAPLE	12

TREE NUMBER	SPECIES	DBH (IN)
15762	ALDER	12
15763	UNKNOWN DECID.	10
15765	CEDAR	12
15766	UNKNOWN DECID.	8
15767	DOUGLAS FIR	17
15768	CEDAR	24
15769	DOUGLAS FIR	14
15770	DOUGLAS FIR	25
15802	ELM	8
15841	UNKNOWN DECID.	8
15842	BIG LEAF MAPLE	48
15849	CEDAR	17
15862	CEDAR	12
15868	CEDAR	16
15869	PINE	11
15870	PINE	23
15871	PINE	17
15872	BIG LEAF MAPLE	16
15873	DOUGLAS FIR	20
15874	PINE	12
15875	DOUGLAS FIR	22
15876	DOUGLAS FIR	24
15877	DOUGLAS FIR	16
15878	CEDAR	17
15879	ALDER	17
15880	DOUGLAS FIR	18
15881	BIRCH	15
15882	DOUGLAS FIR	20
15883	DOUGLAS FIR	24
15884	PINE	23
15885	DOUGLAS FIR	18
15886	UNKNOWN DECID.	13
15887	DOUGLAS FIR	25
15888	ALDER	13
15889	DOUGLAS FIR	16
15890	DOUGLAS FIR	36
15891	HOLLY	8
15892	ALDER	13
15893	ALDER	19
15894	DOUGLAS FIR	24
15895	ALDER	19
15896	BIG LEAF MAPLE	16
15897	DOUGLAS FIR	36
15898	DOUGLAS FIR	33
15899	DOUGLAS FIR	30
15900	DOUGLAS FIR	10
15901	BIG LEAF MAPLE	10
15902	BIG LEAF MAPLE	31
15903	BIG LEAF MAPLE	14
15904	BIG LEAF MAPLE	23
15905	CEDAR	10
15907	BIG LEAF MAPLE	17
15908	BIG LEAF MAPLE	20
15909	UNKNOWN DECID.	17
15910	BIG LEAF MAPLE	14,15
15911	ALDER	19
15912	ALDER	18
15913	BIG LEAF MAPLE	9,11,19,16
15914	ALDER	8
15915	CEDAR	17
15916	ALDER	16
15918	ALDER	22
15919	ALDER	36
15920	ALDER	10
15921	ALDER	11
15930	BIG LEAF MAPLE	22
15931	BIG LEAF MAPLE	24
15932	BIG LEAF MAPLE	27
15933	BIG LEAF MAPLE	24
15934	BIG LEAF MAPLE	19
15935	BIG LEAF MAPLE	30
15936	BIG LEAF MAPLE	19
15937	ALDER	17
15938	BIG LEAF MAPLE	19
15939	UNKNOWN DECID.	12
15940	UNKNOWN DECID.	12
15941	UNKNOWN DECID.	12
15942	UNKNOWN DECID.	12
15943	ALDER	14
15950	ALDER	16
15951	BIG LEAF MAPLE	20
15952	DOUGLAS FIR	12
15953	DOUGLAS FIR	18
15954	ALDER	10
15955	ALDER	11
15956	DOUGLAS FIR	17
15957	CHERRY	8

REVISIONS:

EXISTING CONDITIONS
TREE TABLE

ENGINEERING • PLANNING • SURVEYING
FORESTRY • LANDSCAPE ARCHITECTURE

AKS ENGINEERING AND FORESTRY, LLC
12965 SW HERMAN ROAD, SUITE 100
TUALATIN, OR 97062
PHONE: 503.563.6151
FAX: 503.563.6152
www.aks-eng.com

AKS

Offices Located In:
TUALATIN, OREGON
SALEM, OREGON
VANCOUVER, WASHINGTON

DESIGNED BY: MBH
DRAWN BY: JRN
CHECKED BY: MBH
DRAWING NO.: E2-C001-C004.DWG
SCALE: AS NOTED

PREPARED FOR: LENNAR CORPORATION
11807 NE 99TH ST, SUITE 1170
VANCOUVER, WA 98682

VISTA LOOP SOUTH

CITY OF SANDY
TAX LOTS 900 AND 1000

OREGON
CLACKAMAS COUNTY TAX MAP 2-5E-18CD

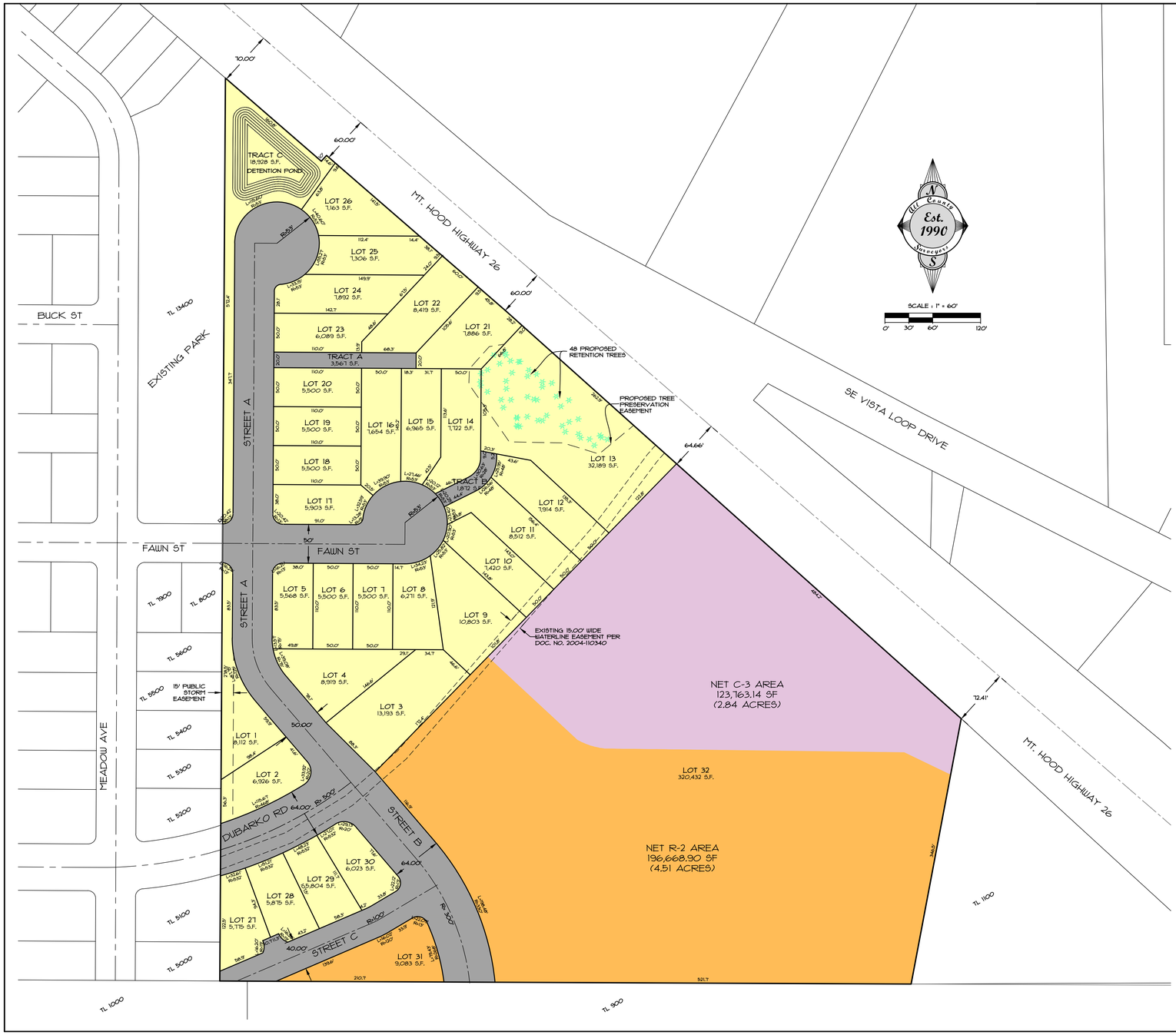
DATE: 06/13/2014

REGISTERED PROFESSIONAL ENGINEER
58542PE
OREGON
JULY 9, 2002
MONTGOMERY B. HURLEY
RENEWAL DATE: 6/30/15

JOB NUMBER
3603

SHEET
C004

Attachment 2



TREE RETENTION NOTES

TREES REQUIRED TO BE RETAINED:

3 TREES/ACRE X 15.91 ACRES = **48 TREES**

NUMBER OF TREES PROPOSED FOR RETENTION: **48 TREES**

LEGEND

- R-1 ZONE
- R-2 ZONE
- C-3 ZONE

SHEET 1 OF X

NO.	DATE	REVISION	BY
-	-	-	-

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLT

REGISTERED PROFESSIONAL LAND SURVEYOR — OREGON — JULY 13, 2005 — RAY L. MOORE — RENEWAL DATE: 12/31/2022

SCALE: VERT: N/A HORIZ: 1"=60'
DATE: 1-14-21
FILE: 19-035-Planning-04.dwg
LEGAL
SECTION 18 TWP. 2S RANGE 5E

PROJECT:
BULL RUN TERRACE PLAN B
SUBDIVISION
32 LOT SUBDIVISION

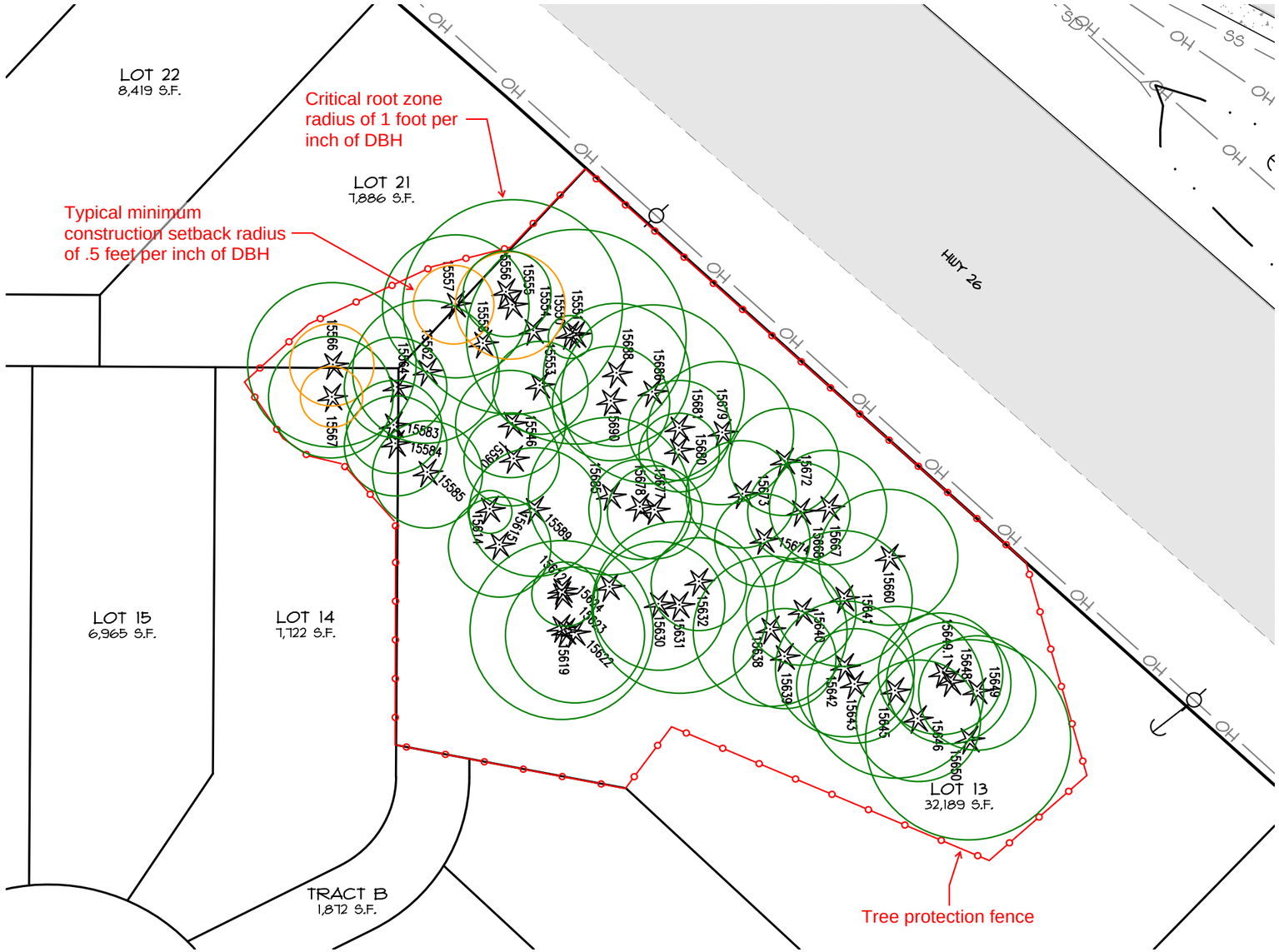
LOCATION:
40808 & 41010 HWY 26, SANDY, OR 97055

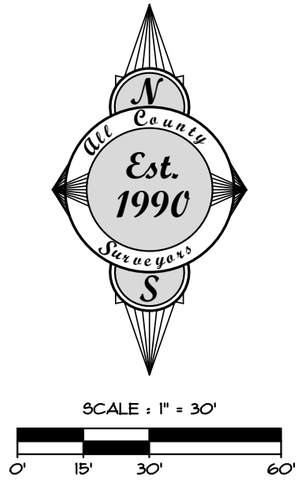
Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-7730

DATE OF PLOT: 1-14-21

CLIENT:
ROLL TIDE PROPERTIES CORPORATION
PO BOX 103
CORNELIUS, OR 97113

GROVE DETAIL





Attachment 3

All County
Surveyors & Planners, Inc.
Surveying, Planning
and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

19-035-Planning-04.dwg
DATE OF PLOT: 4/23/2021

Attachment 4

Tree No	Common Name	Scientific Name	DBH[1]	C-Rad[2]	Condition[3]	Structure[3]	Comments	Treatment	Onsite Trees >11" DBH in Good Cond. to be Retained
13653	Douglas-fir	*Pseudotsuga menziesii*	11	15	fair	fair	thin crown, large wound at lower trunk	remove	
15546	Douglas-fir	*Pseudotsuga menziesii*	15	15	good	poor	25% live crown ratio, poor trunk taper	retain	x
15550	Douglas-fir	*Pseudotsuga menziesii*	6	0	very poor	very poor	dead	retain	
15551	Douglas-fir	*Pseudotsuga menziesii*	30	15	good	fair	codominant at 1', west stem has 33% live crown ratio	retain	x
15552	n/a	n/a	n/a	n/a	n/a	n/a	same as tree 15551	n/a	n/a
15553	Douglas-fir	*Pseudotsuga menziesii*	13	15	good	poor	25% live crown ratio, poor trunk taper	retain	x
15554	Douglas-fir	*Pseudotsuga menziesii*	11	10	fair	poor	poor trunk taper, suppressed	remove	
15555	Douglas-fir	*Pseudotsuga menziesii*	30	25	good	fair	moderately one sided	retain	x
15556	Douglas-fir	*Pseudotsuga menziesii*	12	10	poor	poor	overtopped by adjacent trees, suppressed	retain	
15557	grand fir	*Abies grandis*	22	20	good	fair	one sided, codominant at 30' with included bark	retain	x
15558	Douglas-fir	*Pseudotsuga menziesii*	12	15	good	poor	33% live crown ratio, poor trunk taper	retain	x
15562	Douglas-fir	*Pseudotsuga menziesii*	20	15	good	fair	40% live crown ratio, marginal trunk taper	retain	x
15564	Douglas-fir	*Pseudotsuga menziesii*	14	15	good	poor	marginal trunk taper, 33% live crown ratio	retain	x
15565	Douglas-fir	*Pseudotsuga menziesii*	11	15	fair	fair	one sided, marginal trunk taper, 5" codominant dead stem at 3'	remove	
15566	Douglas-fir	*Pseudotsuga menziesii*	23	20	good	fair	one sided	retain	x
15567	Douglas-fir	*Pseudotsuga menziesii*	17	15	good	fair	marginal trunk taper, 40% live crown ratio	retain	x
15568	Douglas-fir	*Pseudotsuga menziesii*	7	0	very poor	very poor	dead	remove	
15569	Douglas-fir	*Pseudotsuga menziesii*	11	8	fair	poor	poor trunk taper	remove	
15570	Douglas-fir	*Pseudotsuga menziesii*	14	15	fair	fair	one sided, overtopped by adjacent trees	remove	
15571	Douglas-fir	*Pseudotsuga menziesii*	9	5	fair	poor	poor trunk taper, suppressed	remove	
15582	Douglas-fir	*Pseudotsuga menziesii*	10	5	fair	poor	poor trunk taper, suppressed	remove	
15583	Douglas-fir	*Pseudotsuga menziesii*	13	15	good	poor	poor trunk taper, 25% live crown ratio	retain	x
15584	Douglas-fir	*Pseudotsuga menziesii*	14	15	good	fair	marginal trunk taper, 40% live crown ratio	retain	x
15584.1	Douglas-fir	*Pseudotsuga menziesii*	8	0	very poor	very poor	dead	remove	
15585	Douglas-fir	*Pseudotsuga menziesii*	15	20	good	poor	35% live crown ratio, poor trunk taper	retain	x
15589	Douglas-fir	*Pseudotsuga menziesii*	18	20	good	poor	33% live crown ratio, marginal trunk taper	retain	x
15590	Douglas-fir	*Pseudotsuga menziesii*	13	15	good	poor	35% live crown ratio, poor trunk taper	retain	x
15612	Douglas-fir	*Pseudotsuga menziesii*	9	0	very poor	very poor	dead	retain	
15614	Douglas-fir	*Pseudotsuga menziesii*	9	10	fair	poor	25% live crown ratio, poor trunk taper	retain	
15615	Douglas-fir	*Pseudotsuga menziesii*	14	15	good	poor	25% live crown ratio, poor trunk taper	retain	x
15619	Douglas-fir	*Pseudotsuga menziesii*	20,16	20	good	fair	codominant at ground level with included bark, marginal trunk taper	retain	x
15620	n/a	n/a	n/a	n/a	n/a	n/a	same as tree 15619	n/a	n/a
15621	n/a	n/a	n/a	n/a	n/a	n/a	duplicate tree point?	n/a	n/a

Teragan Associates, Inc.
3145 Westview Circle • Lake Oswego, OR 97034
Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

Attachment 4

Tree No	Common Name	Scientific Name	DBH[1]	C-Rad[2]	Condition[3]	Structure[3]	Comments	Treatment	Onsite Trees >11" DBH in Good Cond. to be Retained
15622	Douglas-fir	*Pseudotsuga menziesii*	19	20	good	fair	one sided, bowed trunk, marginal trunk taper	retain	x
15623	Douglas-fir	*Pseudotsuga menziesii*	8	10	good	poor	one sided, poor trunk taper	retain	
15624	Douglas-fir	*Pseudotsuga menziesii*	9	0	very poor	very poor	dead	retain	
15630	Douglas-fir	*Pseudotsuga menziesii*	18	20	good	fair	one sided	retain	x
15631	Douglas-fir	*Pseudotsuga menziesii*	24	20	good	fair	one sided	retain	x
15632	Douglas-fir	*Pseudotsuga menziesii*	13	15	good	poor	40% live crown ratio, poor trunk taper	retain	x
15638	Douglas-fir	*Pseudotsuga menziesii*	21	20	good	fair	one sided	retain	x
15639	Douglas-fir	*Pseudotsuga menziesii*	14	15	good	fair	one sided, marginal trunk taper, bowed trunk	retain	x
15640	Douglas-fir	*Pseudotsuga menziesii*	15	15	good	fair	one sided, 70% live crown ratio, marginal trunk taper	retain	x
15641	Douglas-fir	*Pseudotsuga menziesii*	19	20	good	fair	40% live crown ratio, marginal trunk taper	retain	x
15642	Douglas-fir	*Pseudotsuga menziesii*	19	15	good	fair	moderately one sided, marginal trunk taper, 50% live crown ratio	retain	x
15643	Douglas-fir	*Pseudotsuga menziesii*	16	15	good	fair	one sided	retain	x
15644	Douglas-fir	*Pseudotsuga menziesii*	17	20	good	poor	33% live crown ratio, marginal trunk taper	remove	
15645	Douglas-fir	*Pseudotsuga menziesii*	24	25	good	fair	one sided	retain	x
15646	Douglas-fir	*Pseudotsuga menziesii*	16	15	good	fair	one sided	retain	x
15648	Douglas-fir	*Pseudotsuga menziesii*	17	15	good	fair	one sided, 60% live crown ratio, marginal trunk taper	retain	x
15649	Douglas-fir	*Pseudotsuga menziesii*	16	20	good	fair	one sided, marginal trunk taper	retain	x
15649.1	Douglas-fir	*Pseudotsuga menziesii*	17	20	good	fair	moderately one sided, marginal trunk taper	retain	x
15650	Douglas-fir	*Pseudotsuga menziesii*	23,16	25	good	fair	codominant at ground level, north stem has poor trunk taper	retain	x
15651	n/a	n/a	n/a	n/a	n/a	n/a	same as tree 15650	n/a	n/a
15654	Douglas-fir	*Pseudotsuga menziesii*	21	20	good	fair	one sided, codominant at 12' with included bark	remove	
15655	Douglas-fir	*Pseudotsuga menziesii*	24	25	good	fair	one sided	remove	
15656	Douglas-fir	*Pseudotsuga menziesii*	16	15	good	fair	marginal trunk taper, 40% live crown ratio	remove	
15659	Douglas-fir	*Pseudotsuga menziesii*	21	20	good	fair	moderately one sided, 6" dead codominant stem at base of trunk	remove	
15660	Douglas-fir	*Pseudotsuga menziesii*	19	20	good	fair	35% live crown ratio, marginal trunk taper, dead 8" codominant stem at 15'	retain	x
15662	Douglas-fir	*Pseudotsuga menziesii*	8	0	very poor	very poor	dead	remove	
15666	Douglas-fir	*Pseudotsuga menziesii*	13	15	good	fair	marginal trunk taper, 35% live crown ratio	remove	
15667	Douglas-fir	*Pseudotsuga menziesii*	16	15	good	fair	40% live crown ratio, marginal trunk taper	retain	x
15668	Douglas-fir	*Pseudotsuga menziesii*	14	15	good	fair	40% live crown ratio, marginal trunk taper	retain	x

Teragan Associates, Inc.
3145 Westview Circle • Lake Oswego, OR 97034
Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

Attachment 4

Tree No	Common Name	Scientific Name	DBH[1]	C-Rad[2]	Condition[3]	Structure[3]	Comments	Treatment	Onsite Trees >11" DBH in Good Cond. to be Retained
15669	Douglas-fir	*Pseudotsuga menziesii*	15	15	good	fair	one sided, overtopped by adjacent trees	remove	
15670	Douglas-fir	*Pseudotsuga menziesii*	23	20	good	fair	moderately one sided	remove	
15671	Douglas-fir	*Pseudotsuga menziesii*	10	10	good	poor	one sided, poor trunk taper	remove	
15672	Douglas-fir	*Pseudotsuga menziesii*	15	20	good	poor	33% live crown ratio, marginal trunk taper	retain	x
15673	Douglas-fir	*Pseudotsuga menziesii*	15	15	good	fair	35% live crown ration, marginal trunk taper	retain	x
15674	Douglas-fir	*Pseudotsuga menziesii*	13	10	good	poor	25% live crown ratio, poor trunk taper	retain	x
15677	Douglas-fir	*Pseudotsuga menziesii*	13	10	good	poor	25% live crown ratio, poor trunk taper	retain	x
15678	Douglas-fir	*Pseudotsuga menziesii*	14	10	good	poor	33% live crown ratio, poor trunk taper	retain	x
15679	Douglas-fir	*Pseudotsuga menziesii*	16,12	20	good	fair	codominant at ground level with included bark, south stem has marginal trunk taper with 25% live crown ratio	retain	x
15680	Douglas-fir	*Pseudotsuga menziesii*	11	10	good	poor	25% live crown ratio, poor trunk taper	retain	x
15681	Douglas-fir	*Pseudotsuga menziesii*	14	10	good	poor	poor trunk taper, 20% live crown ratio	retain	x
15682	Douglas-fir	*Pseudotsuga menziesii*	26	20	good	fair	one sided	remove	
15685	Douglas-fir	*Pseudotsuga menziesii*	22	20	good	fair	moderately one sided	retain	x
15686	Douglas-fir	*Pseudotsuga menziesii*	25	25	good	fair	one sided	retain	x
15688	Douglas-fir	*Pseudotsuga menziesii*	20	20	good	fair	marginal trunk taper, 50% live crown ratio	retain	x
15690	Douglas-fir	*Pseudotsuga menziesii*	16	20	good	poor	33% live crown ratio, poor trunk taper	retain	x

[1]**DBH** is the trunk diameter in inches measured in accordance with International Society of Arboriculture standards.

[2]**C-Rad** is the approximate crown radius in feet.

[2]**Condition** and **Structure** ratings range from very poor, poor, fair, to good.

Teragan Associates, Inc.
3145 Westview Circle • Lake Oswego, OR 97034
Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

Attachment 5
Additional Tree Protection Recommendations

The following recommendations meet or exceed City of Sandy Code requirements:

Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
    a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
    c. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outline in the current edition of the ***Guide for Plant Appraisal*** by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
    a. Trees to remain in the grove should be protected by installation of tree protection fencing as shown in Attachments 2 and 3.
    b. The fencing should be put in place before the ground is cleared in order to protect the trees and the soil around the trees from disturbances.
    c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
    d. Fencing should consist of 6-foot high steel fencing on concrete blocks or 6-foot metal fencing secured to the ground with 8-foot metal posts placed no farther than ten feet apart to prevent it from being moved by contractors, sagging, or falling down.
    e. Fencing should remain in the position that is established by the project arborist and not be moved without approval from the project arborist until final project approval.
3. Signage
    a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

> **TREE PROTECTION ZONE**
>
> **DO NOT REMOVE OR ADJUST THE APPROVED LOCATION OF THIS TREE PROTECTION FENCING.**
>
> Please contact the project arborist if alterations to the approved location of the tree protection fencing are necessary.
>
> Todd Prager, Project Arborist - 971-295-4835

    b. Signage should be placed every 75-feet or less.

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During Construction

1. Protection Guidelines Within the Tree Protection Zones:
    a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.
    b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, or even repeated foot traffic.
    c. No storage of materials including but not limiting to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
    d. Construction trailers should not to be parked/placed within the tree protection zones.
    e. No vehicles should be allowed to park within the tree protection zones.
    f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning or breaking of branches, trunks or woody roots.
3. The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
4. Trees that have roots cut should be provided supplemental water during the summer months.
5. Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

After Construction

1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained.
5. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. The retained trees may need to be fertilized if recommended by the project arborist.
7. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

Attachment 6
Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. The site plans and other information provided by Roll Tide Corporation and their consultants was the basis of the information provided in this report.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant s role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to:
   - Assess the existing grove of trees along Highway 26;
   - Identify the trees to be removed and retained in the grove; and
   - Provide tree protection recommendations for the trees to be retained in the grove.

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EXHIBIT G

May 3, 2019

Carey Sheldon
PO Box 883
Fairview, OR 97024

RE: Dubarko Road Subdivision – Wetland Determination

Carey:

This letter provides findings of a wetlands determination conducted by Environmental Science & Assessment, LLC (ES&A) at 40808 & 41010 Highway 26 in Sandy, Oregon (TL# 25E18CD00900 & TL#25E18CD01000) to evaluate the existing conditions. The 16.12-acre site is located directly east of a subdivision near Dubarko Road and Meadows Avenue and south of Highway 26 in the east end of Sandy, Oregon (Figure 1; Attachment A). The parcel boundaries and base topographic survey were provided by All County Surveyors and Planners, Inc.

A 6-lot subdivision and 216-unit condominium complex site is planned for the project. The project developer contracted ES&A to determine the presence of jurisdictional resources on site and determine the presence or absence of potential stream or wetland within the site.

METHODOLOGY

Potential wetland areas on the parcel were evaluated using the methodology provided in the Army Corps of Engineers *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*, (U.S. Army Corps of Engineers, 2010). This methodology defines criteria for hydrology, soils, and vegetation to identify wetland areas.

Two levels of investigation were used to evaluate the presence or absence of Sensitive Areas. The first level included a review of existing and available background data. The second level consisted of an on-site field investigation.

Reviewed background data included the following information:

- Aerial Photography (Google Earth, 2018)
- City of Sandy Local Wetland Inventory (Sri/Shapiro AGCO Inc., 1997)
- USFWS National Wetland Inventory (NWI) (USFWS, 2019)
- Natural Resource Conservation Service (NRCS) Soil Survey of Clackamas County, Oregon (Web Soil Survey, 2019)
- Topography (Metro Data Resource Center's MetroMap, 2018)

The lots within site are currently undeveloped, but a small structure was located on TL 1000 in 2012 based on the available 2012 aerial photos (Figure 2). The only evidence of water or wetland resources on site is an intermittent stream mapped on the City of Sandy Local Wetland Inventory (LWI) extending east to west through the site. The USFWS NWI does not map wetland or waters within the site (Figure 3) and the NRCS soil survey does not map hydric soils on site (Figure 4).

ES&A wetland scientist, Jack Dalton, conducted the site assessment on March 23, 2019, with a preliminary site visit on June 8, 2018. Three (3) wetland determination data plots were established to document existing conditions on-site (Figure 5). The data sheets are included in Appendix C of this report. Data plot locations were mapped in the field using a hand-held resource grade GPS unit and transferred to a base topographic survey provided by All County Surveyors and Planners, Inc. (Attachment A).

EXISTING CONDITIONS

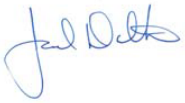
The 16.12-acre site located at 40808 & 41010 Highway 26, Sandy, Oregon (TL# 25E18CD00900 & TL#25E18CD01000) is bordered by Highway 26 to the north and a neighborhood to the west. Agricultural land is located east of the site and a single-family residence is located on the lot directly east (Figure 1). A stub for Dubarko Road and a second road stub for Fawn Street are located along the west site boundary (Figure 2).

The investigation found no water feature at the mapped location in the middle of the site. While there is a narrow linear depression extending roughly east to west through the site, no defined channel bed or bank is present, as documented by site data plot locations (Figure 5). No evidence of ponding was observed in the lowest points in the west end of the site and no evidence of seasonal surface water flow was observed in the area of the mapped stream. The plant community is primarily a weedy cleared field dominated by Himalayan blackberry (*Rubus armeniacus*, FAC) and pasture grasses. The tree groves on site are primarily Douglas fit (*Pseudotsuga menziesii*, FACU) with small clusters of western red-cedar (*Thuja plicata*, FAC). No wetland vegetation is present on site. Soils sampled at the three data plots all lacked hydric soil indicators and showed no evidence of sub-surface saturation, high seasonal groundwater, saturation or other hydrology indicators. Photos documenting the existing conditions and plant community are provided in Attachment B. Detailed plant and soil data is provided in Attachment C.

It is my conclusion that the intermittent stream feature mapped on the LWI mapping is not longer accurate and no stream feature or wetland is currently present on site. Any historic drainage that may have extended through the site has is no longer present and was altered by past land use or a change in the surrounding basin hydrology up slope of site. There is no evidence of any surface water entering the site from the east and no evidence of wetland or seasonal ponded water features was observed in the lowest topographic point of site where wetland or were most likely to be located.

If you have any questions about the findings presented in this letter, I would be happy to discuss the determination findings further.

Sincerely,

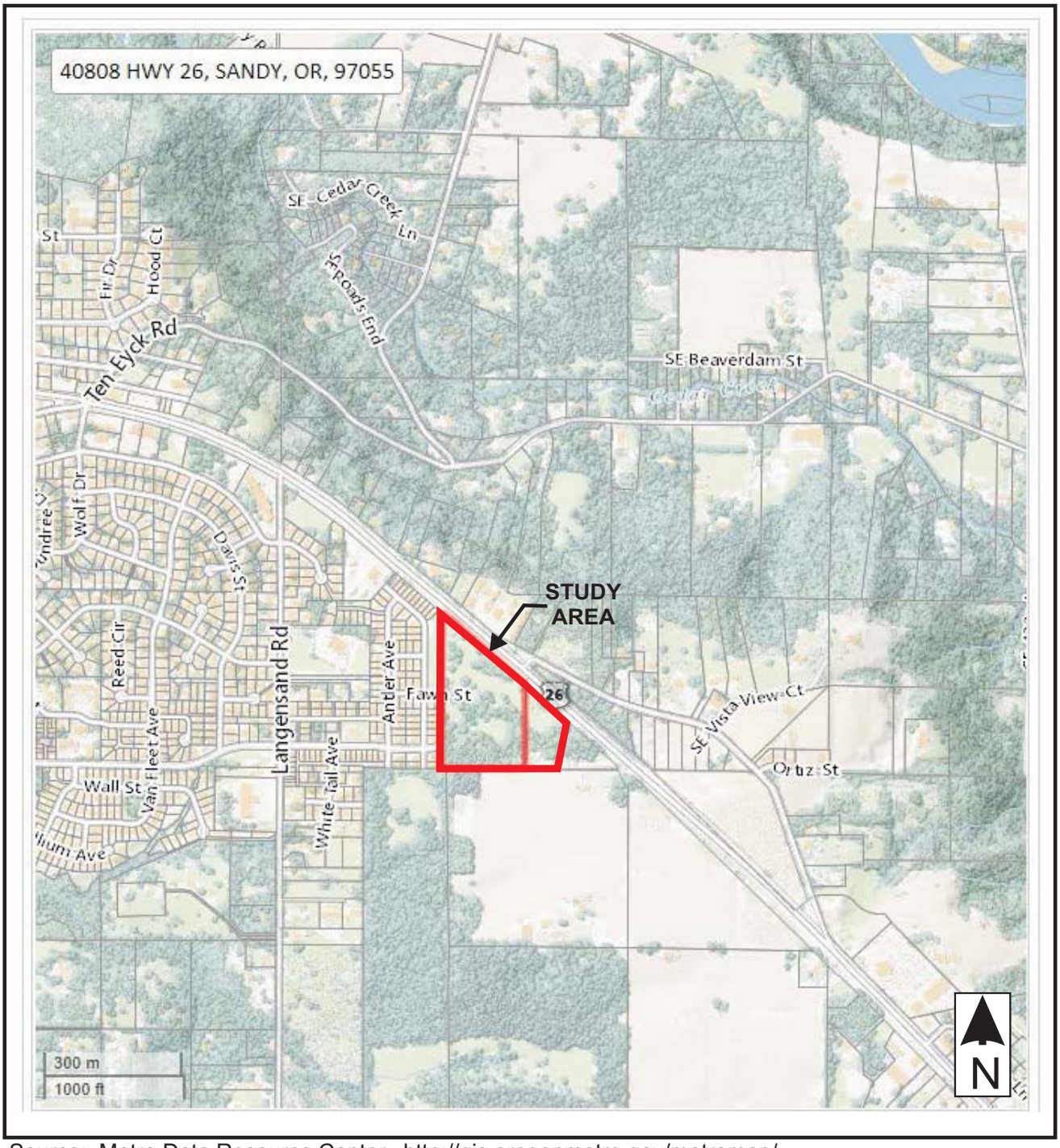


Jack Dalton
Environmental Science & Assessment, LLC

Cc: Alex Reverman (via email)
Ray Moore (via email)

Attachments
A – Figures
B – Site Photos
C - Wetland Determination Data

ATTACHMENT A: FIGURES



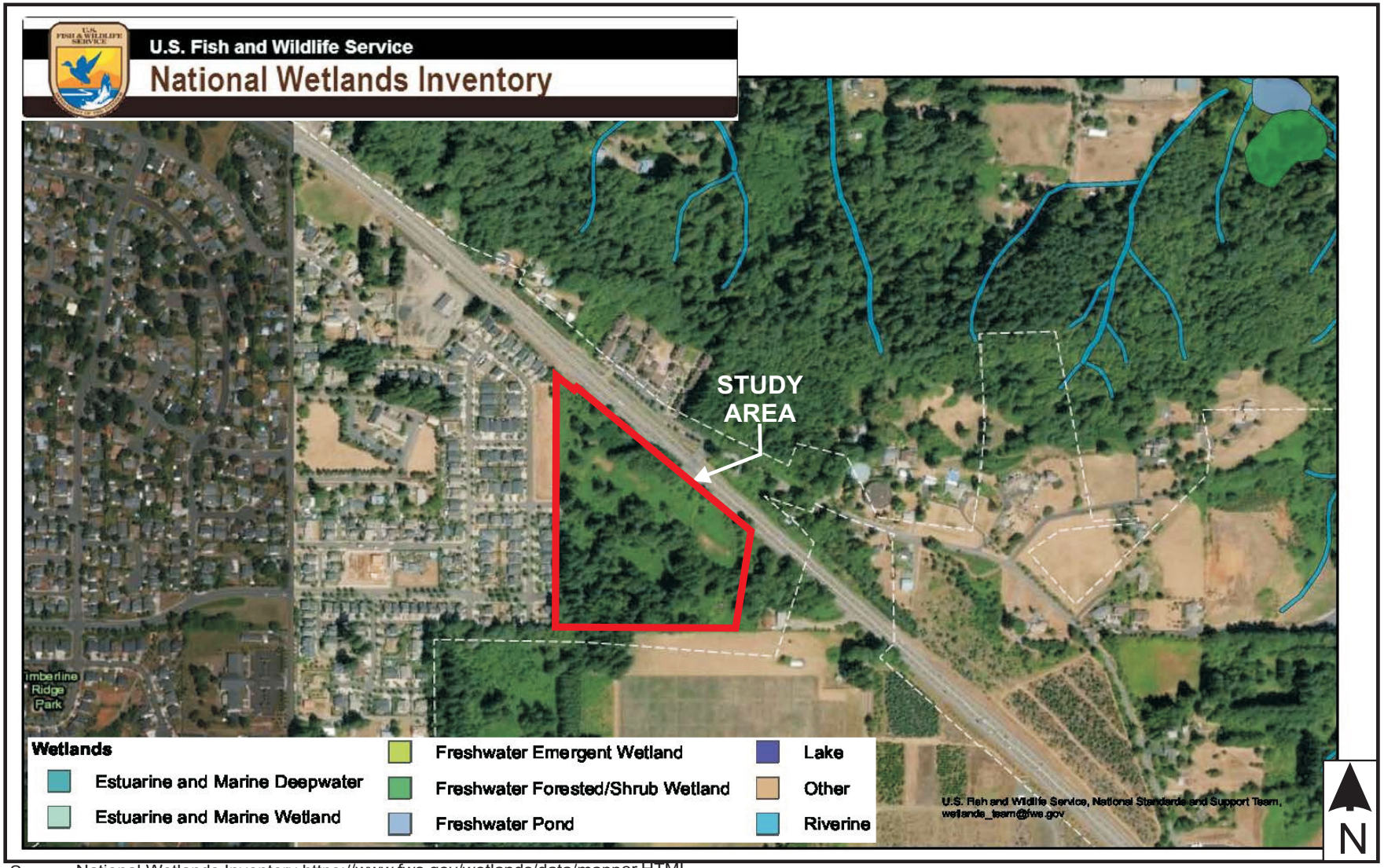
Source: Metro Data Resource Center. http://gis.oregonmetro.gov/metromap/

Environmental Science & Assessment, LLC	Vicinity Map Dubarko Road Subdivision Sandy, Oregon	Figure 1 Approx. Scale: 1in. = 100 ft.

Source: Google Earth

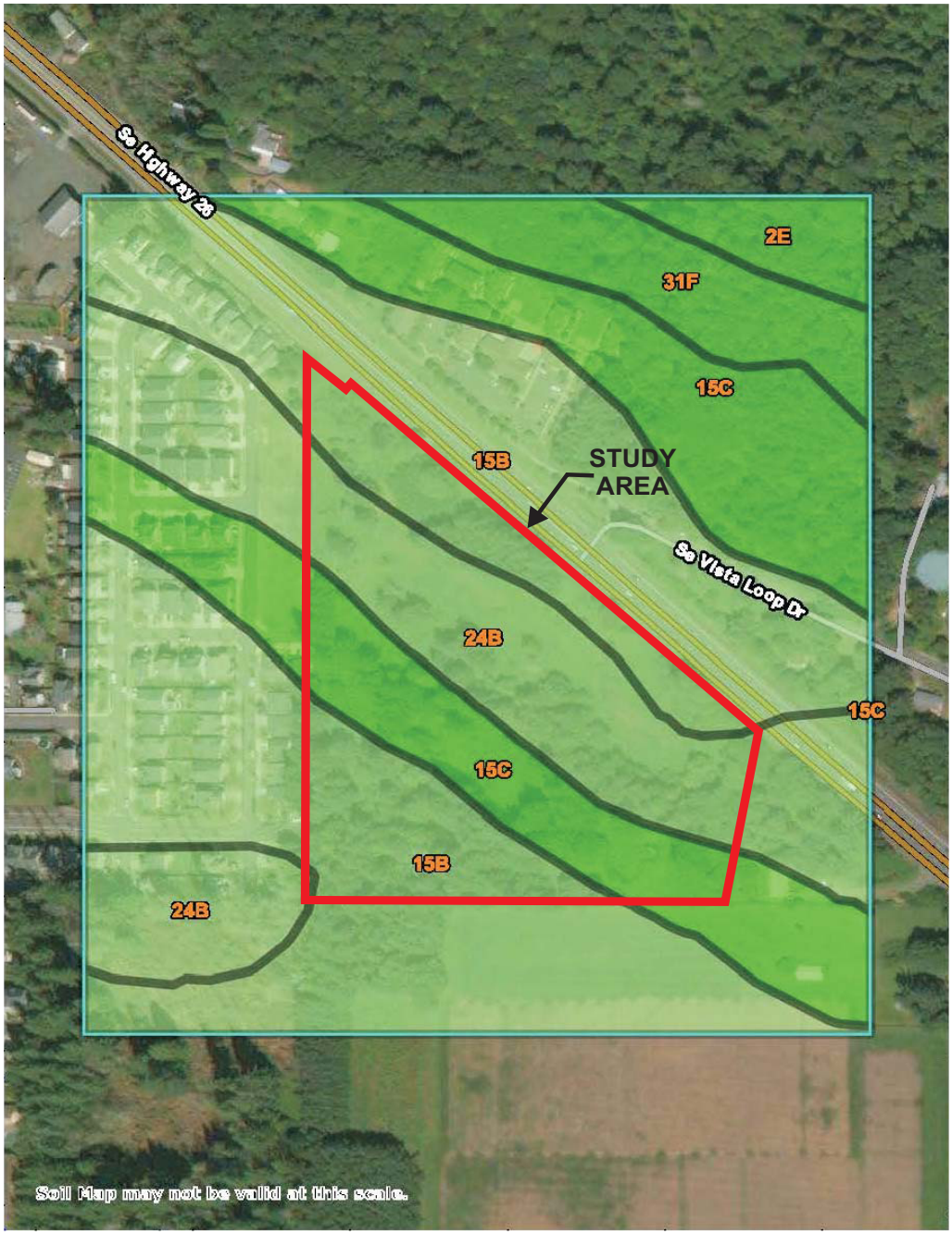
Image Date: 9/3/2018

Environmental Science & Assessment, LLC	Aerial Photograph Dubarko Road Subdivision Sandy, Oregon	Approx. Scale: 1in. = 345ft.	Figure 2



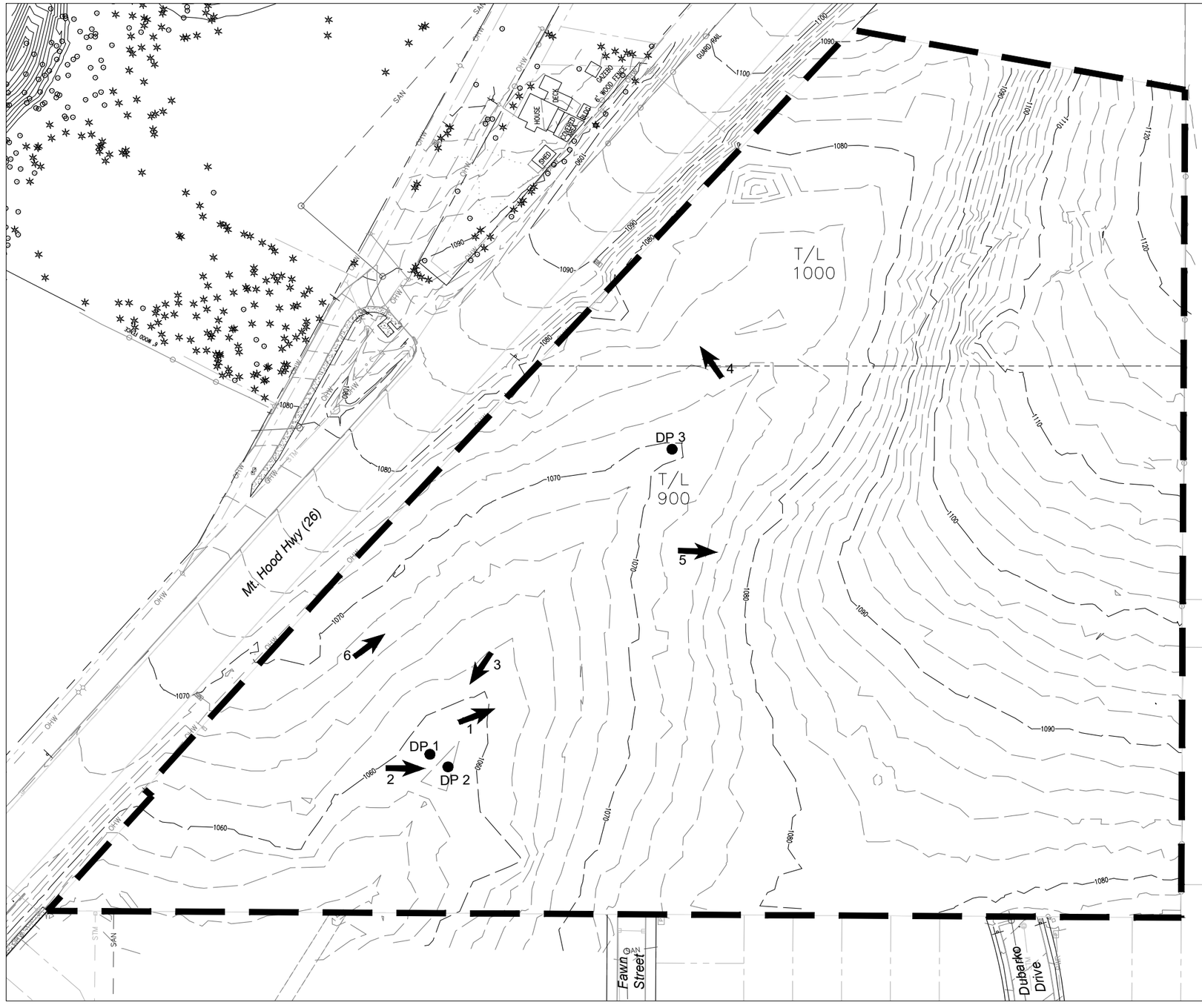
Source: National Wetlands Inventory https://www.fws.gov/wetlands/data/mapper.HTML

Environmental Science & Assessment, LLC	NWI Map Dubarko Road Subdivision Sandy, Oregon	Not to Scale	Figure 3



Source: NRCS Web Soil Survey https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Environmental Science & Assessment, LLC	NRCS Soil Map Dubarko Road Subdivision Sandy, Oregon	Figure 4 Not to Scale



Environmental Science & Assessment, LLC

107 SE Washington St.,
Suite 249
Portland, OR 97214
Phone: 503.478.0424
www.esapdx.com

Existing Conditions Map
Dubarko Road Subdivision
40808, 41010 HWY 26
Sandy, Oregon

Base Map Source:	All County Surveyors & Planners, Inc.
Modified By:	KR
Date:	4/19
Job:	18042
Rev:	00/00

Figure 5

ATTACHMENT B: SITE PHOTOS

Photo 1: View SE of low point in the middle of the site.

Photo 2: View S by DP-1 and DP-2. Shallow swale with no offsite connection.

Photo 3: View NW of the middle of the site.

Photo 4: View NE of overgrown blackberry area.

Photo 5: View S of Doug fir forest in SW corner.

Photo 6: View NE of doug fir grove at N end.

ATTACHMENT C: WETLAND DETERMINATION DATA SHEETS

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Dubarko Road Subdivision City/County: Sandy/Clackamas Sampling Date: 3/28/19

Applicant/Owner: Roll Tide Properties Corp State: OR Sampling Point: DP-1

Investigator(s): Jack Dalton Section, Township, Range: S18 T2S R5E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): _____

Subregion (LRR): A-Northwest Forests and Coasts Lat: 45.392061° Long: -122.244803° Datum: N/A

Soil Map Unit Name: Cottrell silty clay loam (24B) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: Data point taken at grassy, flat area in the lower topo in west end.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus armeniacus	25	yes	FAC
2.			
3.			
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Schedonorus arundinaceus	50	yes	FAC
2. Agrostis sp.	20	yes	UPL
3. Dactylis glomerata	20	yes	FACU
4. Poa sp.	10		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 60	x 3 =	180
FACU species 45	x 4 =	180
UPL species 20	x 5 =	100
Column Totals: 125 (A)		460 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5 YR 3/2	100			C	M	silt loam	no redox
12-16	7.5YR 4/4	99	7.5YR 4/6	1	C	M	silt loam	
16-20	7.5YR 3/4	99	7.5YR 4/6	1	C	M	silt clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No saturation/O.R. or evidence of surface flow.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Dubarko Road Subdivision City/County: Sandy/Clackamas Sampling Date: 3/28/19

Applicant/Owner: Roll Tide Properties Corp State: OR Sampling Point: DP-2

Investigator(s): Jack Dalton Section, Township, Range: S18 T2S R5E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): _____

Subregion (LRR): A-Northwest Forests and Coasts Lat: 45.392061° Long: -122.244803° Datum: N/A

Soil Map Unit Name: Cottrell silty clay loam (24B) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: Data point taken at low point in linear swale in the west end - no evidence of wetland hydrology.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus armeniacus	50	yes	FAC
2.			
3.			
4.			
5.			
	50 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Schedonorus arundinaceus	50	yes	FAC
2. Agrostis sp.	30	yes	UPL
3. Holcus lanatus	15		FAC
4. Galium aparine	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 115	x 3 = 345
FACU species 5	x 4 = 20
UPL species 30	x 5 = 150
Column Totals: 150 (A)	515 (B)

Prevalence Index = B/A = 3.43

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: Veg meets dominance test, but fails prevalence index test - marginal FAC dominated community that lacks FACW or OBL veg.

SOIL

Sampling Point: DP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5 YR 3/2	100			C	M	silt loam	no redox, 10% pebbles
9-12	7.5YR 3/2	99	7.5YR 3/4	1	C	M	silt loam	
12-16	7.5YR 4/4	80	7.5YR 3/2	18	C	M		
			7.5YR 3/4	2	C	M		
16-20	7.5YR 4/4	90	7.5YR 4/6	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No saturation, O.R. or evidence of surface flow.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Dubarko Road Subdivision City/County: Sandy/Clackamas Sampling Date: 3/28/19

Applicant/Owner: Roll Tide Properties Corp State: OR Sampling Point: DP-3

Investigator(s): Jack Dalton Section, Township, Range: S18 T2S R5E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A-Northwest Forests and Coasts Lat: 45.392061° Long: -122.244803° Datum: N/A

Soil Map Unit Name: Cottrell silty clay loam (24B) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: Data point taken up linear depression in middle of site - no wetland hydrology evident.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus armeniacus	50	yes	FAC
2.			
3.			
4.			
5.			
	50 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Holcus lanatus	35	yes	FAC
2. Anthoxanthum odoratum	30	yes	FACU
3. Agrostis sp.	30	yes	UPL
4. Schedonorus arundinaceus	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	40	x 3 =	120
FACU species	80	x 4 =	320
UPL species	30	x 5 =	150
Column Totals:	150 (A)		590 (B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: Marginal degraded plant community - lacks FACW or greater plants.

SOIL

Sampling Point: DP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 3/3	100			C	M	silt loam	no redox,
10-13	7.5YR 4/3	98	10YR 3/6	2	C	M		
13-15	10YR 4/4	95	7.5YR 4/6	5	C	M		
15-20	10YR 4/3	80	7.5YR 4/6	10	C	M		
			10YR 4/4	10				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

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- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
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Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
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- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
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- ___ Geomorphic Position (D2)
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- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: faint O.R. at 13"

EXHIBIT H

OFFSITE WETLAND DETERMINATION REPORT **BATCH**
OREGON DEPARTMENT OF STATE LANDS **WD#:** 2019-0386
775 Summer Street NE, Suite 100, Salem OR 97301-1279 Phone: (503) 986-5200

At your request, an offsite wetland determination has been conducted on the property described below.

County: Clackamas City: Sandy

Agent Name & Address: Tracy Brown, Tracy Brown Planning Consultants, LLC, 17075 Fir Dr., Sandy, OR 97055

Township: 2S Range: 5E Section: 18 Q/Q: CD Tax Lot(s): 900, 1000

Project Name: Site Evaluation

Site Address/Location: 40808 and 41010 Highway 26, Sandy, OR

☐ The National Wetlands Inventory or Local Wetlands Inventory shows a wetland on the property.

☐ The county soil survey shows hydric (wet) soils on the property. Hydric soils indicate that there may be wetlands.

☒ It is unlikely that there are jurisdictional wetlands or waterways on the property based upon a review of wetlands maps, the county soil survey and other information. An onsite investigation by a qualified professional is the only way to be certain that there are no wetlands.

☐ There may be wetlands/waterways on the property that are subject to the state Removal-Fill Law.

- ☒ A state permit is required for ≥ 50 cubic yards of fill, removal, or ground alteration in the wetlands or waterways.
- ☐ A state permit may be required for any amount of fill, removal, or other ground alteration in the Essential Salmonid Habitat and hydrologically associated wetlands.

☐ A state permit will be/will not be required for project because/if .

☐ The proposed parcel division may create a lot that is largely wetland and thus create future development problems.

☐ A wetland delineation by a qualified wetland consultant is recommended prior to site development. The wetland delineation report should be submitted to DSL for review and approval.

☐ A permit may be required by the Army Corps of Engineers: (503) 808-4373

Note: This report is for the state Removal-Fill Law only. City or County permits may be required for the proposed activity.

Comments: Based on a review of the available information, there are no jurisdictional wetlands or waters on the property.

Determination by: _____ Date: 7/03/19

☐ This jurisdictional determination is valid for five years from the above date, unless new information necessitates a revision. Circumstances under which the Department may change a determination and procedures for renewal of an expired determination are found in OAR 141-090-0045 (available on our web site or upon request). The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months from the above date.

☒ **This is a preliminary jurisdictional determination and is advisory only.**

Copy To: ☐ Other ☒ Enclosures: email: tbrownplan@gmail.com
☐ City of Sandy

FOR OFFICE USE ONLY

Entire Lot(s) Checked? ☒ Yes ☐ No **Waters Present** ☐ Yes ☒ No ☐ Maybe **Request Received:** 6/27/2019
LWI Area: Sandy **LWI Code:** N/A **Latitude:** 45.390763 **Longitude:** -122.244278 **Related DSL File #** N/A
Has Wetlands? ☐Y ☒N ☐Unk **ESH?** ☐Y ☒N **Wild & Scenic?** ☐Y ☒N **State Scenic?** ☐Y ☒N **Coast Zone?** ☐Y ☒N ☐Unk
Adjacent Waterbody: N/A **NWI Quad:** Sandy ☒ Scanned ☒ Mailings Completed ☒ Data Entry Completed

proj:# 78454

EXHIBIT I

REDMOND GEOTECHNICAL SERVICES

Geotechnical Investigation and Consultation Services

Proposed Vista Loop Apartments Site

Tax Lot No's. 900 and 1000

40808 and 41010 Highway 26

Sandy (Clackamas County), Oregon

for

Roll Tide Property Corporation

Project No. 1861.001.G
November 23, 2020

REDMOND GEOTECHNICAL SERVICES

November 23, 2020

Mr. Dave Vandehey
Roll Tide Property Corporation
P.O. Box 703
Cornelius, Oregon 97113

Dear Mr. Vandehey:

Re: Geotechnical Investigation and Consultation Services,
Proposed Vista Loop Apartments Development Site, Tax Lot No's. 900 and 1000,
40808 and 41010 Highway 26, Sandy (Clackamas County), Oregon

Submitted herewith is our report entitled "Geotechnical Investigation and Consultation Services, Proposed Vista Loop Apartments Development Site, Tax Lot No's. 900 and 1000, 40808 and 41010 Highway 26, Sandy (Clackamas County), Oregon". The scope of our services was outlined in our formal discussions with Mr. Carey Sheldon of Sheldon Development, Inc. October 12, 2020. Authorization of our services was provided by Mr. Dave Vandehey of Roll Tide Property Corporation on October 20, 2020.

During the course of our investigation, we have kept you and/or others advised of our schedule and preliminary findings. We appreciate the opportunity to assist you with this phase of the project. Should you have any questions regarding this report, please do not hesitate to call.

Sincerely,

Daniel M. Redmond, P.E., G.E.
President/Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
12309
OREGON
July 15, 1983
DANIEL M. REDMOND
Exp 12-31-20

Cc: Mr. Ray Moore
All County Surveyors & Planners, Inc.

PO Box 20547 • Portland, Oregon 97294 • Fax 503/286-7176 • Phone 503/285-0598

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Figure No. 1 - Site Vicinity Map
Figure No. 2 - Site Exploration Plan
Figure No. 3 - Typical Key and Bench Fill Slope Detail
Figure No. 4 - Perimeter Footing/Retaining Wall Drain Detail

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APPENDIX A

Test Pit Logs and Laboratory Data

APPENDIX B

Slope Stability Analysis

GEOTECHNICAL INVESTIGATION AND CONSULTATION SERVICES
PROPOSED VISTA LOOP APARTMENTS DEVELOPMENT SITE
TAX LOT NO'S. 900 AND 1000
40808 AND 41010 HIGHWAY 26
SANDY (CLACKAMAS COUNTY) OREGON

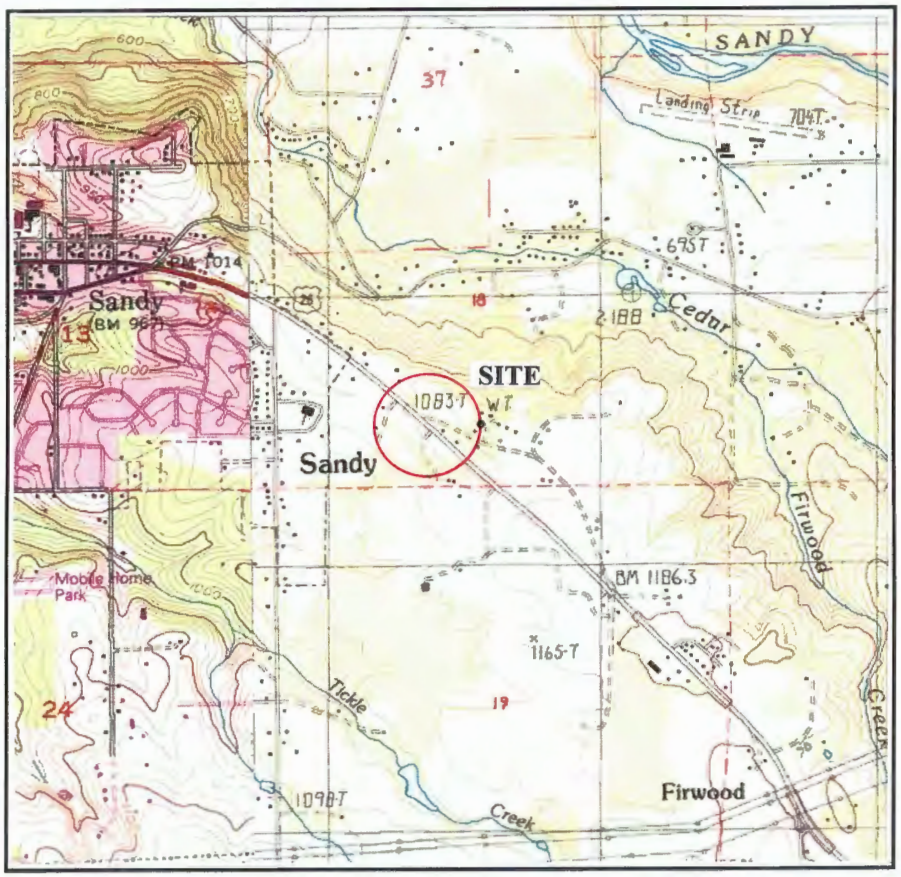
INTRODUCTION

Redmond Geotechnical Services, LLC is please to submit to you the results of our Geotechnical Investigation and Consultation Services at the site of the proposed new Vista Loop Apartments development project located to the southwest of Highway 26 and the intersection of SE Vista Loop Drive in Sandy (Clackamas County), Oregon. The general location of the subject site is shown on the Site Vicinity Map, Figure No. 1. The purpose of our geotechnical investigation and consultation services at this time was to explore the existing subsurface soils and/or groundwater conditions across the subject site and to evaluate any potential concerns with regard to development at the site as well as to develop and/or provide appropriate geotechnical design and construction recommendations for the proposed new Vista Loop Apartments development project.

PROJECT DESCRIPTION

Based on a review of the proposed site development plan(s), we understand that present plans for the project will consist primarily of the construction of new multi-family apartments. However, due to the current site zoning, the site development may also include the construction of new single-family residential homes as well as some mixed use and/or commercial structures. We understand that the multi-family apartments will likely be two- and/or three-story wood-frame structures with a concrete slab-on-grade floor system. However, the single-family lots will likely be developed with new single- and/or two-story wood-frame residential structures with raised wooden post and beam floors. Construction and/or development within the mixed use and/or commercial zoned portion of the property is unknown at this time but is anticipated to result in single- and/or two-story wood-frame structures with concrete slab-on-grade floors.

Support of the proposed new multi-family residential structures is anticipated to consist primarily of conventional shallow continuous (strip) footings although some individual (spread) column-type footings may also be required. Additionally, due to the existing sloping site grades and/or the finish slope grades following the site grading activities for the project, we anticipate that some of the proposed new residential homes and/or multi-family structures may be constructed with partial and/or below levels. As such, construction of some below grade retaining walls is also anticipated for the project.



BULL RUN QUADRANGLE
OREGON
7.5-MINUTE SERIES

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

SITE VICINITY MAP

Project No. 1861.001.G	**VISTA LOOP APARTMENTS** **Tax Lots 600, 700, 900 and 1000**	Figure No. 1

Structural loading information, although unavailable at this time, is anticipated to be fairly typical for this type of single- and/or three-story wood-frame structure and is expected to result in maximum dead plus live continuous (strip) and individual (column) footing loads on the order of about 1.5 to 4.0 kips per lineal foot (klf) and 10 to 50 kips, respectively.

Other associated site improvements for the project will include construction of new paved public streets and/or private access drives and parking areas. Additionally, the project will include the construction of new underground utility services as well as new concrete curbs and sidewalks. Further, we understand that development of the site will also include the collection of storm water from hard and/or impervious surfaces (i.e., roofs and pavements) for on-site treatment and disposal within various storm water detention facilities designed by the Civil Engineer.

Earthwork and grading operations for the project to bring the subject property to finish design grades and/or elevations are unknown at this time. However, based on our past experience with similar types of projects, we envision that the site grading and earthwork for the project will include cuts and/or fills of between five (5) and ten (10) feet.

SCOPE OF WORK

The purpose of our geotechnical studies was to evaluate the overall subsurface soil and/or groundwater conditions underlying the subject site with regard to the proposed new residential development and construction at the site and any associated impacts or concerns with respect to development at the site as well as provide appropriate geotechnical design and construction recommendations for the project. Specifically, our geotechnical investigation included the following scope of work items:

1. Review of available and relevant geologic and/or geotechnical investigation reports for the subject site and/or area including a Geotechnical and Slope Stability Investigation for the proposed Vista Loop North and Vista Loop South Subdivisions prepared by GeoPacific Engineering, Inc. dated August 16, 2005.

2. A detailed field reconnaissance and subsurface exploration program of the soil and ground water conditions underlying the site by means of eight (8) exploratory test pit excavations. The exploratory test pits were excavated to depths ranging from about six (6) to seven (7) feet beneath existing site grades at the approximate locations as shown on the Site Exploration Plan, Figure No. 2. Additionally, field infiltration testing was also performed within various test pits excavated across the subject site.

3. Laboratory testing to evaluate and identify pertinent physical and engineering properties of the subsurface soils encountered relative to the planned site development and construction at the site. The laboratory testing program included tests to help evaluate the natural (field) moisture content and dry density, maximum dry density and optimum moisture content, Atterberg Limits and gradational characteristics, as well as (remolded) direct shear strength and "R"-value tests.

4. A literature review and engineering evaluation and assessment of the regional seismicity to evaluate the potential ground motion hazard(s) at the subject site. The evaluation and assessment included a review of the regional earthquake history and sources such as potential seismic sources, maximum credible earthquakes, and reoccurrence intervals as well as a discussion of the possible ground response to the selected design earthquake(s), fault rupture, landsliding, liquefaction, and tsunami and seiche flooding.

5. Engineering analyses utilizing the field and laboratory data as a basis for furnishing recommendations for foundation support of the proposed new residential structures. Recommendations include maximum design allowable contact bearing pressure(s), depth of footing embedment, estimates of foundation settlement, lateral soil resistance, and foundation subgrade preparation. Additionally, construction and/or permanent subsurface water drainage considerations have also been prepared. Further, our report includes recommendations regarding site preparation, placement and compaction of structural fill materials, suitability of the on-site soils for use as structural fill, criteria for import fill materials, and preparation of foundation, pavement and/or floor slab subgrades.

6. Flexible pavement design and construction recommendations for the proposed new public streets and private access drives and parking area improvements.

7. A quantitative limit equilibrium slope stability analysis.

SITE CONDITIONS

Regional and Site Geology

The subject site and/or area is located on the eastern margin of the Portland Basin near where the basin meets the western edge of the Cascade Mountains physiographic province (Orr and Orr, 1999). Bedrock in this region consists of volcanic rocks emplaced tens of millions of years ago, associated with the Columbia River Basalt Group and with volcanics from the Western Cascades province (Gannet and Caldwell, 1998).

The volcanic basement is overlain by silts, sands and gravels of Miocene to Pleistocene age which form the majority of the basin fill in the area. The basin fill sediments generally are mapped as Sandy River Mudstone towards the lower portion of the assemblage inturn overlain by the Troutdale Formation, a series of gravels, sands and silts deposited by the ancestral Columbia River and smaller rivers flowing from the Cascade Mountains (Schlicker and Finlayson, 1979). In the vicinity of Sandy, the Troutdale Formation is overlain by the Springwater Formation, a conglomerate with some volcaniclastic sands, silts, and debris flows derived from the Cascade Range. The conglomerate consists of gravels, cobbles, and boulders of volcanic composition that are strongly and deeply weathered to completely decomposed residual soils often producing a red, fine-grained soil up to 75 feet deep.

Surface Conditions

The proposed new Vista Loop Apartments development property consists of two (2) generally irregular shaped tax lots (TL's 900 and 1000) which encompass a total plan area of approximately 15.04 acres. The proposed Vista Loop Apartments development property is roughly located to the southwest of Highway 26 and to the southwest of the intersection with SE Vista Loop Drive. The subject property is presently unimproved. However, we understand that the subject property was previously improved and contained two (2) single-family residential homes the northwesterly and southeasterly portions of the subject site. Surface vegetation across the site generally consists of a light to moderate growth of grass, weeds and brush as well as numerous small to large sized trees. Additionally, the northeasterly portion of the subject property contains an existing seasonal drainage basin.

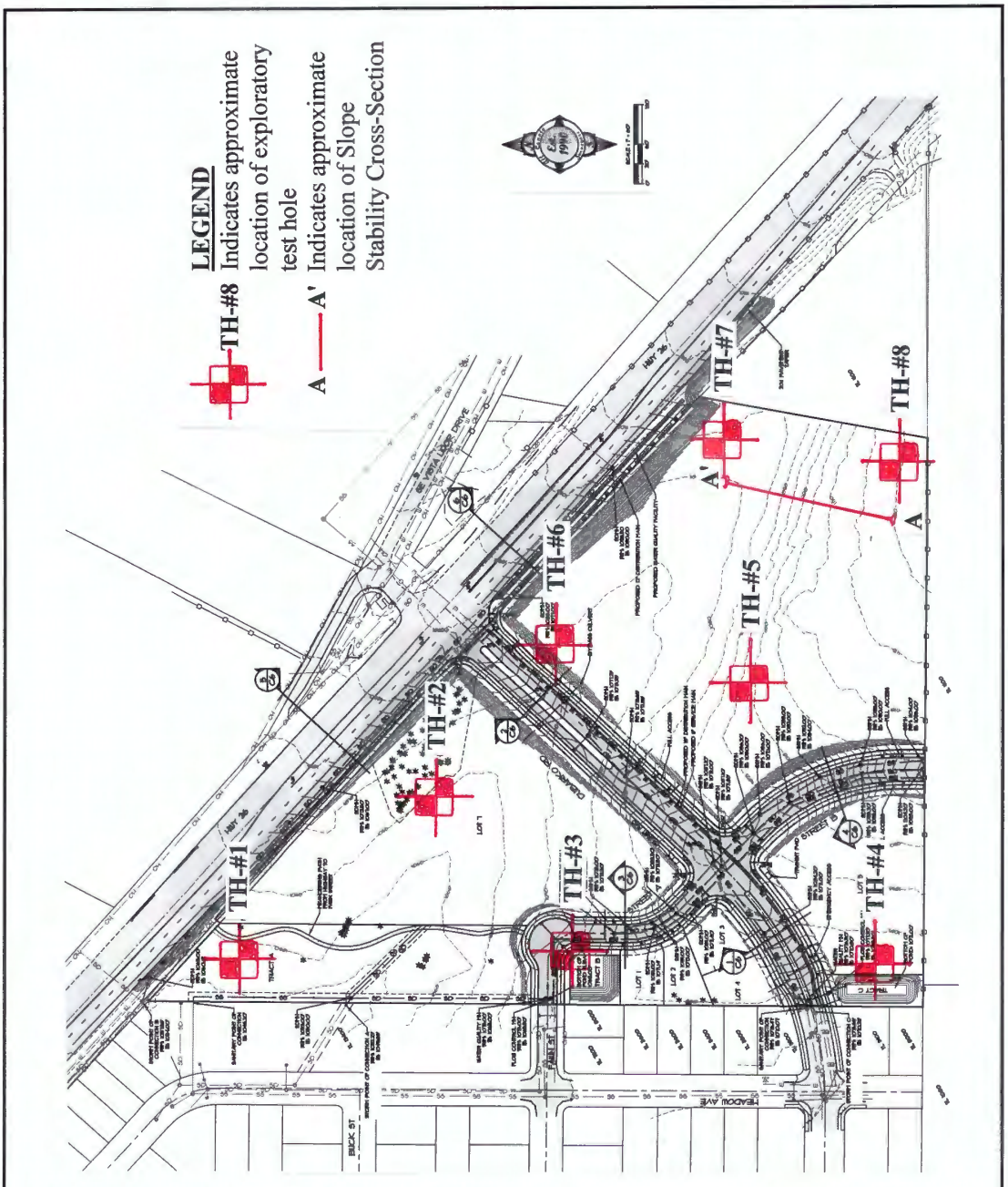
Topographically, the subject site is characterized as gently sloping terrain (i.e., 5 to 30 percent) descending downward towards the north and/or northwest with overall topographic relief estimated at about seventy (70) feet and ranges from a low about Elevation 1052 feet near the northwesterly corner of the subject site to a high of about Elevation 1123 near the southeasterly corner of the site.

Subsurface Soil Conditions

Our understanding of the subsurface soil conditions underlying the site was developed by means of eight (8) exploratory test pits excavated to depths ranging from about six (6) to seven (7) feet beneath existing site grades on October 20, 2020 with a John Deere 200C track-mounted excavator. The location of the exploratory test pits were located in the field by marking off distances from existing and/or known site features and are shown in relation to the existing site features and/or site improvements on the Site Exploration Plan, Figure No. 2. Detailed logs of the test pit explorations, presenting conditions encountered at each location explored, are presented in the Appendix, Figure No's. A-4 through A-7.

The exploratory test pit excavations were observed by staff from Redmond Geotechnical Services, LLC who logged each of the test pit explorations and obtained representative samples of the subsurface soils encountered across the site. Additionally, the elevation of the exploratory test pit excavations were referenced from a site topographic survey and should be considered as approximate. All subsurface soils encountered at the site and/or within the exploratory test pit excavations were logged and classified in general conformance with the Unified Soil Classification System (USCS) which is outlined on Figure No. A-3.

The test pit explorations revealed that the subject site is underlain by native soil deposits comprised of residual soils and/or highly weathered bedrock deposits composed of a surficial layer of dark brown, wet, soft , organic, sandy, clayey silt topsoil materials to depths of about 10 to 16 inches. These surficial topsoil materials were inturn underlain by medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey silt to the maximum depth explored of about seven (7) feet beneath the existing site and/or surface grades.



SITE EXPLORATION PLAN

Project No. 1861.001.G	**VISTA LOOP APARTMENTS** **Tax Lot's 600, 700, 900 and 1000**	Figure No. 2

These sandy, clayey silt subgrade soils and/or residual soils (highly weathered bedrock deposits) are best characterized by relatively moderate strength and low to moderate compressibility.

Groundwater

Groundwater was not encountered within any of the exploratory test pit explorations (TH-#1 through TH-#8) at the time of excavation to depths of at least 7.0 feet beneath existing surface grades except. However, the northerly portion of the subject property contain existing seasonal drainage basin. In this regard, groundwater elevations at the site may fluctuate seasonally in accordance with rainfall conditions and/or associated with runoff across the site as well as changes in site utilization. As such, we are generally of the opinion that the static water levels and/or surface water ponding observed and/or not observed during our recent field exploration work generally reflect the seasonal groundwater level(s) at and/or beneath the site.

INFILTRATION TESTING

We performed two (2) field infiltration tests at the site on October 20, 2020. The infiltration tests were performed in test holes TH-#3 and TH-#4 at depths of between four (4) and five (5) feet beneath the existing site and/or surface grades. The subgrade soils encountered in the infiltration test hole consisted of sandy, clayey silt. The infiltration testing was performed in general conformance with current EPA and/or the City of Sandy/Clackamas County Encased Falling Head test method which consisted of advancing a 6-inch diameter PVC pipe approximately 6 inches into the exposed soil horizon at each test location. Using a steady water flow, water was discharged into the pipe and allowed to penetrate and saturate the subgrade soils. The water level was adjusted over a two (2) hour period and allowed to achieve a saturated subgrade soil condition consistent with the bottom elevation of the surrounding test pit excavation. Following the required saturating period, water was again added into the PVC pipe and the time and/or rate at which the water level dropped was monitored and recorded. Each measurable drop in the water level was recorded until a consistent infiltration rate was observed and/or repeated.

Based on the results of the field infiltration testing at the site, we have found that the native sandy, clayey silt subgrade soil deposits posses an ultimate infiltration rate on the order of about 0.1 to 0.2 inches per hour (in/hr).

LABORATORY TESTING

Representative samples of the on-site subsurface soils were collected at selected depths and intervals from various test pit excavations and returned to our laboratory for further examination and testing and/or to aid in the classification of the subsurface soils as well as to help evaluate and identify their engineering strength and compressibility characteristics. The laboratory testing consisted of visual and textural sample inspection, moisture content and dry density determinations, maximum dry density and optimum moisture content, gradation analyses and Atterberg Limits as well as direct shear strength and "R"-value tests. Results of the various laboratory tests are presented in the Appendix, Figure No's. A-8 through A-12.

SEISMICITY AND EARTHQUAKE SOURCES

The seismicity of the southwest Washington and northwest Oregon area, and hence the potential for ground shaking, is controlled by three separate fault mechanisms. These include the Cascadia Subduction Zone (CSZ), the mid-depth intraplate zone, and the relatively shallow crustal zone. Descriptions of these potential earthquake sources are presented below.

The CSZ is located offshore and extends from northern California to British Columbia. Within this zone, the oceanic Juan de Fuca Plate is being subducted beneath the continental North American Plate to the east. The interface between these two plates is located at a depth of approximately 15 to 20 kilometers (km). The seismicity of the CSZ is subject to several uncertainties, including the maximum earthquake magnitude and the recurrence intervals associated with various magnitude earthquakes. Anecdotal evidence of previous CSZ earthquakes has been observed within coastal marshes along the Washington and Oregon coastlines. Sequences of interlayered peat and sands have been interpreted to be the result of large Subduction zone earthquakes occurring at intervals on the order of 300 to 500 years, with the most recent event taking place approximately 300 years ago. A study by Geomatrix (1995) and/or USGS (2008) suggests that the maximum earthquake associated with the CSZ is moment magnitude (Mw) 8 to 9. This is based on an empirical expression relating moment magnitude to the area of fault rupture derived from earthquakes that have occurred within Subduction zones in other parts of the world. An Mw 9 earthquake would involve a rupture of the entire CSZ. As discussed by Geomatrix (1995) this has not occurred in other subduction zones that have exhibited much higher levels of historical seismicity than the CSZ. However, the 2008 USGS report has assigned a probability of 0.67 for a Mw 9 earthquake and a probability of 0.33 for a Mw 8.3 earthquake. For the purpose of this study an earthquake of Mw 9.0 was assumed to occur within the CSZ.

The intraplate zone encompasses the portion of the subducting Juan de Fuca Plate located at a depth of approximately 30 to 50 km below western Washington and western Oregon. Very low levels of seismicity have been observed within the intraplate zone in western Oregon and western Washington. However, much higher levels of seismicity within this zone have been recorded in Washington and California. Several reasons for this seismic quiescence were suggested in the Geomatrix (1995) study and include changes in the direction of Subduction between Oregon, Washington, and British Columbia as well as the effects of volcanic activity along the Cascade Range. Historical activity associated with the intraplate zone includes the 1949 Olympia magnitude 7.1 and the 1965 Puget Sound magnitude 6.5 earthquakes. Based on the data presented within the Geomatrix (1995) report, an earthquake of magnitude 7.25 has been chosen to represent the seismic potential of the intraplate zone.

The third source of seismicity that can result in ground shaking within the Vancouver and southwest Washington area is near-surface crustal earthquakes occurring within the North American Plate. The historical seismicity of crustal earthquakes in this area is higher than the seismicity associated with the CSZ and the intraplate zone. The 1993 Scotts Mills (magnitude 5.6) and Klamath Falls (magnitude 6.0), Oregon earthquakes were crustal earthquakes.

Liquefaction

Seismic induced soil liquefaction is a phenomenon in which lose, granular soils and some silty soils, located below the water table, develop high pore water pressures and lose strength due to ground vibrations induced by earthquakes. Soil liquefaction can result in lateral flow of material into river channels, ground settlements and increased lateral and uplift pressures on underground structures. Buildings supported on soils that have liquefied often settle and tilt and may displace laterally. Soils located above the ground water table cannot liquefy, but granular soils located above the water table may settle during the earthquake shaking.

Our review of the subsurface soil test pit logs from our exploratory field explorations (TH-#1 through TH-#8) and laboratory test results indicate that the site is generally underlain by medium stiff to stiff, sandy, clayey silt residual soils and/or highly weathered bedrock deposits to depths of at least 7.0 feet beneath existing site grades. Additionally, groundwater was generally not encountered within any of the exploratory test pit excavations (TH-#1 through TH-#8) at the site during our field exploration work.

As such, due to the medium stiff to stiff and/or cohesive nature of the sandy, clayey silt subgrade soils and/or highly weathered bedrock deposits beneath the site, it is our opinion that the native clayey, sandy silt subgrade soil and/or highly weathered bedrock deposits located beneath the subject site have a very low potential for liquefaction during the design earthquake motions previously described.

Landslides

No ancient and/or active landslides were observed or are known to be present on the subject site. Additionally, the subject property does not contain any steep slopes (i.e., greater than 40 percent). As such, development of the subject site into the planned residential development does not appear to present a potential geologic and/or landslide hazard provided that the site grading and development activities conform with the recommendations presented within this report.

Surface Rupture

Although the site is generally located within a region of the country known for seismic activity, no known faults exist on and/or immediately adjacent to the subject site. As such, the risk of surface rupture due to faulting is considered negligible.

Tsunami and Seiche

A tsunami, or seismic sea wave, is produced when a major fault under the ocean floor moves vertically and shifts the water column above it. A seiche is a periodic oscillation of a body of water resulting in changing water levels, sometimes caused by an earthquake. Tsunami and seiche are not considered a potential hazard at this site because the site is not near to the coast and/or there are no adjacent significant bodies of water.

Flooding and Erosion

Stream flooding is a potential hazard that should be considered in lowland areas of Clackamas County and Sandy. The FEMA (Federal Emergency Management Agency) flood maps should be reviewed as part of the design for the proposed new residential structures and site improvements. Elevations of structures on the site should be designed based upon consultants reports, FEMA (Federal Emergency Management Agency), and Clackamas County requirements for the 100-year flood levels of any nearby creeks, streams and/or drainage basins.

SLOPE STABILITY ANALYSIS

For the purpose of evaluating slope stability at the subject site, we performed quantitative slope stability modeling and analyses based upon the existing site conditions and/or the proposed site development plan.

Quantitative slope stability modeling and analyses were performed to evaluate slope stability on the site under the existing and/or post construction in-situ conditions using Slide 7.0 computer program developed by Rocscience, Inc. of Toronto, Ontario, Canada. This numerical analysis program utilizes a two-dimensional limiting equilibrium method to calculate the factor of safety of a potential slip surface, and incorporates search routines to identify the most critical potential failure surfaces for the case(s) analyzed. Factors of safety were calculated using Bishop and Janbu method of slices.

Proposed residential development at the subject site is anticipated to be constructed at and/or above the existing in-situ soil conditions of the existing gently descending slope(s) at the site and were modeled as a two (2) layer system with the upper layer as native, stiff, sandy, clayey silt soil and the lower layer as the existing (native) very moist, very stiff, sandy, clayey silt and/or residual soils encountered in test holes TH-#1 through TH-#8. Site and slope topography, subsurface geometry, and other site conditions modeled in the analyses are based on a topographic map provided by the client and/or our field measurements. In our analysis, we considered potential groundwater levels to be located greater than 30 feet beneath the site.

For stability calculations, the potential failure model was considered primarily as circular sliding along a basal shear surface. Shear strength parameters used in the model were selected based on soil conditions encountered in the test pits, SPT N-value correlations, and our local experience with similar soil types and geologic conditions. The results of our slope stability analyses for the proposed single-family residential structures constructed above the in-situ subgrade soil conditions on structural fill soils are summarized in Table 2. The slope stability analyses cross-section is presented as an attachment to this report in Appendix B. The location of the cross-section used is indicated on the Site Exploration Plan, Figure No. 2.

Table 1 - Summary of Estimated In-Situ/Fill Soil Strength Parameters

Geologic Unit	Wet Unit Weight (pcf)	Friction Angle	Cohesion (psf)
Stiff, andy, clayey SILT (ML)	110	24	450
Very stiff, sandy, clayey SILT (ML)	110	26	350

Table 2 - Summary of Slope Stability Analyses for In-Situ/Fill Soil Conditions with Proposed Development

Pre-Construction	Factor of Safety (Static)	Factor of Safety (Seismic)
Cross-Section A-A'	4.626	1.857

The results of the quantitative slope stability modeling and analysis performed using Slide 7.0 computer program indicated an existing in-situ and/or post construction slope stability factor of safety (FS) under static and seismic loading greater than 1.5 and 1.2 (see Slope Stability Results in Appendix B). In our opinion, the calculated factor of safety is adequate for the proposed residential construction and development of the subject site as we understand it.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our field explorations, laboratory testing, and engineering analyses, it is our opinion that the site is presently stable and suitable for the proposed new Vista Loop Apartments development and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the Vista Loop Apartments development project.

The primary features of concern at the site are 1) the presence of highly moisture sensitive clayey and silty subgrade soils across the site, 2) the presence of gently steep sloping site conditions across the site and 3) the relatively low infiltration rates anticipated within the near surface clayey and silty subgrade soils.

With regard to the moisture sensitive clayey and silty subgrade soils, we are generally of the opinion that all site grading and earthwork activities be scheduled for the drier summer months which is typically June through September.

In regards to the gently sloping site conditions across the site, we are of the opinion that site grading and/or structural fill placement should be minimized where possible and should generally limit cuts and/or fills to about ten (10) feet unless approved by the Geotechnical Engineer. Additionally, where existing site slopes and/or surface grades exceed about 20 percent (1V:5H) and in order to construct the proposed new site improvements, benching and keying of all fills into the natural site slopes will be required. Further, due to the presence of the existing seasonal drainage basin across the northerly portion of the site, the use of subdrains may be required beneath all structural fills and/or within all fill slopes

With regard to the relatively low infiltration rates anticipated within the clayey and silty subgrade soils beneath the site, we generally do not recommend any storm water detention and/or infiltration within structural and/or embankment fills. However, storm water detention and some infiltration may be feasible within storm water detention basins excavated into the existing medium stiff to stiff, sandy, clayey silt residual soils across the lower westerly portion of the site. In this regard, we recommend that all proposed storm water detention and/or infiltration systems for the project be reviewed and approved by Redmond Geotechnical Services, LLC.

The following sections of this report provide specific recommendations regarding subgrade preparation and grading as well as foundation and floor slab design and construction for the new Vista Loop Apartments development project.

Site Preparation

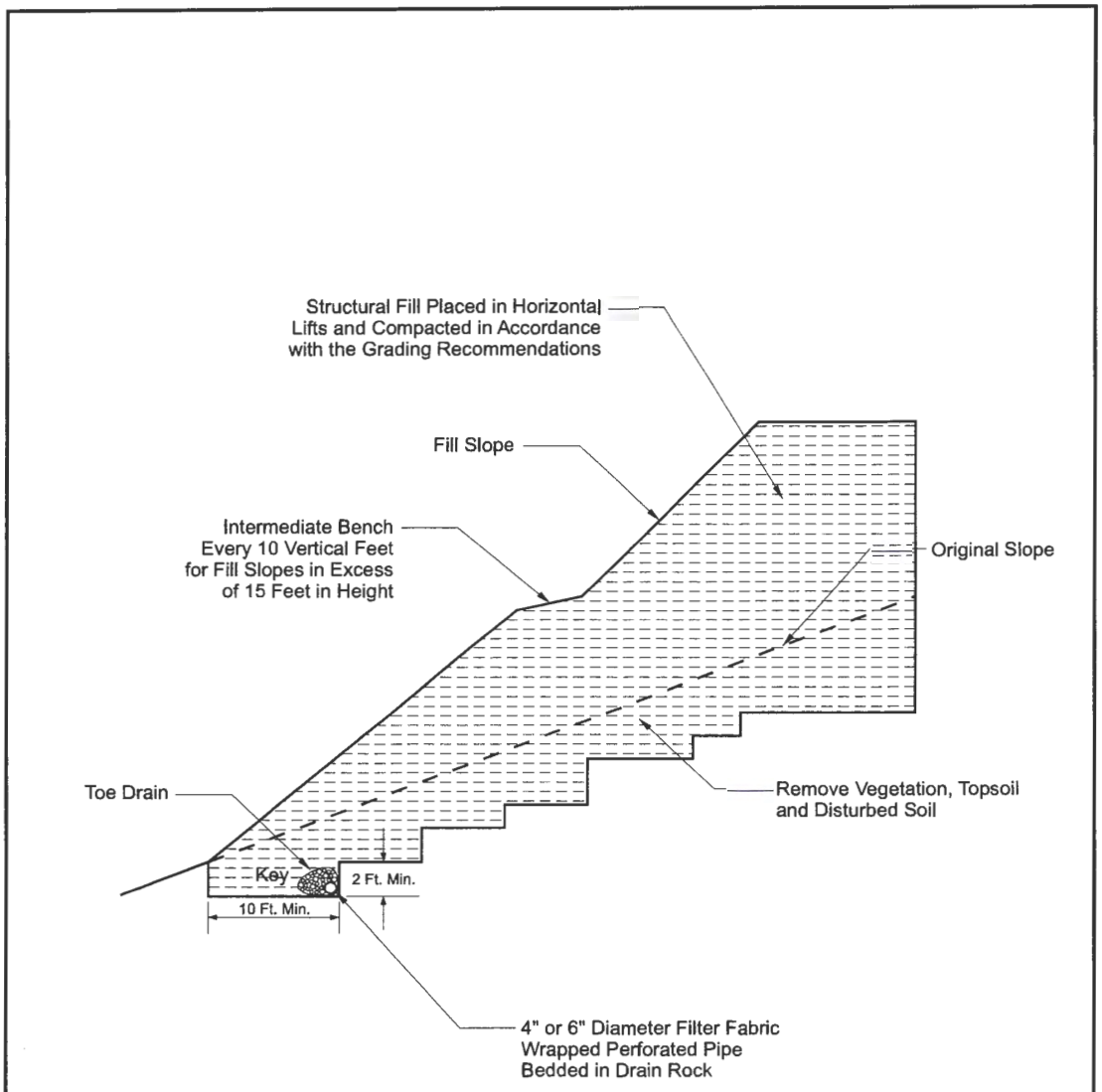
As an initial step in site preparation, we recommend that the proposed new Vista Loop Apartments development site as well as any associated structural and/or site improvement area(s) be stripped and cleared of all existing improvements, any existing unsuitable fill materials, surface debris, existing vegetation, topsoil materials, and/or any other deleterious materials present at the time of construction. In general, we envision that the site stripping to remove existing vegetation and topsoil materials will generally be about 10 to 14 inches. However, localized areas requiring deeper removals, such as any existing undocumented and/or unsuitable fill materials as well as old foundation remnants, will likely be encountered and should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally considered unsuitable for use/reuse as fill materials.

Following the completion of the site stripping and clearing work and prior to the placement of any required structural fill materials and/or structural improvements, the exposed subgrade soils within the planned structural improvement area(s) should be inspected and approved by the Geotechnical Engineer and possibly proof-rolled with a half and/or fully loaded dump truck. Areas found to be soft or otherwise unsuitable should be over-excavated and removed or scarified and recompacted as structural fill. During wet and/or inclement weather conditions, proof rolling and/or scarification and recompaction as noted above may not be appropriate.

The on-site native sandy, clayey silt subgrade soil materials are generally considered suitable for use/reuse as structural fill materials provided that they are free of organic materials, debris, and rock fragments in excess of about 6 inches in dimension. However, if site grading is performed during wet or inclement weather conditions, the use of some of the on-site native soil materials which contain significant silt and clay sized particles will be difficult at best. In this regard, during wet or inclement weather conditions, we recommend that an import structural fill material be utilized which should consist of a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines. Representative samples of the materials which are to be used as structural fill materials should be submitted to the Geotechnical Engineer and/or laboratory for approval and determination of the maximum dry density and optimum moisture content for compaction.

In general, all site earthwork and grading activities should be scheduled for the drier summer months (June through September) if possible. However, if wet weather site preparation and grading is required, it is generally recommended that the stripping of topsoil materials be accomplished with a tracked excavator utilizing a large smooth-toothed bucket working from areas yet to be excavated. Additionally, the loading of strippings into trucks and/or protection of moisture sensitive subgrade soils will also be required during wet weather grading and construction. In this regard, we recommend that areas in which construction equipment will be traveling be protected by covering the exposed subgrade soils with a geotextile fabric such as Mirafi FW404 followed by at least 12 inches or more of crushed aggregate base rock. Further, the geotextile fabric should have a minimum Mullen burst strength of at least 250 pounds per square inch for puncture resistance and an apparent opening size (AOS) between the U.S. Standard No. 70 and No. 100 sieves.

All structural fill materials placed within the new building and/or pavement areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Structural fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches. Additionally, all fill materials placed within five (5) lineal feet of the perimeter (limits) of the proposed single-family and/or multi-family structures and/or pavements should be considered structural fill. Additionally, due to the sloping site conditions, we recommend that all structural fill materials planned in areas where existing surface and/or slope gradients exceed about 20 percent (1V:5H) be properly benched and/or keyed into the native (natural) slope subgrade soils. In general, a bench width of about eight (8) to ten (10) feet and a keyway depth of about one (1) to one and one-half (1.5) feet is recommended (see Typical Key and Bench Fill Slope Detail, Figure No. 3). However, the actual bench width and keyway depth should be determined at the time of construction by the Geotechnical Engineer. Further, all fill slopes should be constructed with a finish slope surface gradient no steeper than about 2H:1V. All aspects of the site grading, including a review of the proposed site grading plan(s), should be approved and/or monitored by a representative of Redmond Geotechnical Services, LLC.



TYPICAL KEY AND BENCH FILL SLOPE DETAIL

Project No. 1861.001.G	**VISTA LOOP APARTMENTS** **Tax Lot's 600, 700, 900 and 1000**	Figure No. 3

Foundation Support

Based on the results of our investigation, it is our opinion that the site of the proposed new Vista Loop Apartments development is suitable for support of the planned single- and/or three-story wood-frame structures provided that the following foundation design recommendations are followed. The following sections of this report present specific foundation design and construction recommendations for the planned new single-family and/or multi-family structures.

Shallow Foundations

In general, conventional shallow continuous (strip) footings and individual (spread) column footings may be supported by approved native (untreated) subgrade soil materials and/or clayey silt structural fill soils based on an allowable contact bearing pressure of about 2,000 pounds per square foot (psf). This recommended allowable contact bearing pressure is intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads. In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (where required) should be embedded at least 18 inches below grade and have a minimum width of at least 24 inches. Additionally, if foundation excavation and construction work is planned to be performed during wet and/or inclement weather conditions, we recommend that a 2- to 4-inch layer of compacted crushed rock be used to help protect the exposed foundation bearing surfaces until the placement of concrete.

Total and differential settlements of foundations constructed as recommended above and supported by approved native subgrade soils or by properly compacted structural fill materials are expected to be well within the tolerable limits for this type of wood-frame structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footing element and the supporting subgrade bearing soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.30 and 0.45 for native silty subgrade soils and/or import gravel fill materials, respectively. In addition, lateral loads may be resisted by passive earth pressures on footings poured "neat" against in-situ (native) subgrade soils or properly backfilled with structural fill materials based on an equivalent fluid density of 300 pounds per cubic foot (pcf). This recommended value includes a factor of safety of approximately 1.5 which is appropriate due to the amount of movement required to develop full passive resistance.

Floor Slab Support

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slab area be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should help provide a capillary break to prevent migration of moisture through the slab.

However, additional moisture protection can be provided by using a 10-mil polyolefin geo-membrane sheet such as StegoWrap.

The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where floor slab subgrade materials are undisturbed, firm and stable and where the underslab aggregate base rock section has been prepared and compacted as recommended above, we recommend that a modulus of subgrade reaction of 150 pci be used for design.

Retaining/Below Grade Walls

Retaining and/or below grade walls should be designed to resist lateral earth pressures imposed by native soils or granular backfill materials as well as any adjacent surcharge loads. For walls which are unrestrained at the top and free to rotate about their base, we recommend that active earth pressures be computed on the basis of the following equivalent fluid densities:

Non-Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	35	30
3H:1V	60	50
2H:1V	90	80

For walls which are fully restrained at the top and prevented from rotation about their base, we recommend that at-rest earth pressures be computed on the basis of the following equivalent fluid densities:

Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	45	35
3H:1V	65	60
2H:1V	95	90

The above recommended values assume that the walls will be adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or if adjacent surcharge loading is present, the above recommended values will be significantly higher. For seismic loading, we recommend an additional uniform earth pressure of 8H where H is the height of the wall in feet.

Backfill materials behind walls should be compacted to 90 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Special care should be taken to avoid over-compaction near the walls which could result in higher lateral earth pressures than those indicated herein. In areas within three (3) to five (5) feet behind walls, we recommend the use of hand-operated compaction equipment.

Pavements

Flexible pavement design for the proposed new public street improvements as well as the proposed new private drives and parking area improvements for the Vista Loop Apartments development was determined in accordance with the City of Sandy and/or Clackamas County Department of Public Works standards.

The subgrade soil samples collected at the site were tested in the laboratory in accordance with the ASTM Vol. 4.08 Part D-2844-69 (AASHTO T-190-93) test method for the determination of the subgrade soil "R"-value and expansion pressure. The results of the "R"-value testing was then converted to an equivalent Resilient Modulus (M_{RSG}) in accordance with current AASHTO methodology. The results of the laboratory "R"-value tests revealed that the subgrade soils have an apparent "R"-value of between 29 and 31 with an average "R"-value of 30 (see Figure No. A-12). Using the current AASHTO methodology for converting "R"-value to Resilient Modulus (M_{RSG}), the subgrade soils have a Resilient Modulus (M_{RSG}) of about 6,070 psi which is classified a "Fair" (M_{RSG} = 5,000 psi to 10,000 psi). Based on the above, we recommend that the asphaltic concrete pavement section(s) for the new The Views planned development areas at the site consist of the following:

Collector Streets

The following documents and/or design input parameters were used to help determine the flexible pavement section design for improvements to new and/or existing Collector Streets:

- **Street Classification:** Collector Street
- **Design Life:** 20 years
- **Serviceability:** 4.2 initial, 2.5 terminal
- **Traffic Loading Data:** 1,000,000 18-kip EAL's
- **Reliability Level:** 90%
- **Drainage Coefficient:** 1.0 (asphalt), 0.8 (aggregate)
- **Asphalt Structural Coefficient:** 0.41
- **Aggregate Structural Coefficient:** 0.10

Based on the above design input parameters and using the design procedures contained within the AASHTO 1993 Design of Pavement Structures Manual, a Structural Number (SN) of 4.1 was determined. In this regard, we recommend the following flexible pavement section for the new improvements to new and/or existing Collector Streets:

Material Type	Pavement Section (inches)
Asphaltic Concrete	5.0
Aggregate Base Rock	14.0

Local Residential Streets

The following documents and/or design input parameters were used to help determine the flexible pavement section design for new local residential streets:

- **Street Classification:** Local Residential Street
- **Design Life:** 25 years
- **Serviceability:** 4.2 initial, 2.5 terminal
- **Traffic Loading Data:** 100,000 18-kip EAL's
- **Reliability Level:** 90%
- **Drainage Coefficient:** 1.0 (asphalt), 0.8 (aggregate)
- **Asphalt Structural Coefficient:** 0.41
- **Aggregate Structural Coefficient:** 0.10

Based on the above design input parameters and using the design procedures contained within the AASHTO 1993 Design of Pavement Structures Manual, a Structural Number (SN) of 2.6 was determined. In this regard, we recommend the following flexible pavement section for the construction of new Local Residential Streets:

Material Type	Pavement Section (inches)
Asphaltic Concrete	4.0
Aggregate Base Rock	10.0

Private Access Drives and Parking Areas

We recommend that the asphaltic concrete pavement section(s) for any private access drives and parking areas associated with The Views planned development areas consist of the following:

	Asphaltic Concrete Thickness (inches)	Crushed Base Rock Thickness (inches)
Automobile Parking Areas	3.0	8.0
Automobile Drive Areas	3.5	10.0

Note: Where heavy vehicle traffic is anticipated such as those required for fire and/or garbage trucks, we recommend that the automobile drive area pavement section be increased by adding 0.5 inches of asphaltic concrete and 2.0 inches of aggregate base rock. Additionally, the above recommended flexible pavement section(s) assumes a design life of 20 years.

Pavement Subgrade, Base Course & Asphalt Materials

The above recommended pavement section(s) were based on the design assumptions listed herein and on the assumption that construction of the pavement section(s) will be completed during an extended period of reasonably dry weather. All thicknesses given are intended to be the minimum acceptable. Increased base rock sections and the use of a woven geotextile fabric may be required during wet and/or inclement weather conditions and/or in order to adequately support construction traffic and protect the subgrade during construction. Additionally, the above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Further, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course.

Pavement base course materials should consist of well-graded 1-1/2 inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications for Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete paving materials should be compacted to at least 92 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

Wet Weather Grading and Soft Spot Mitigation

Construction of the proposed new paved site improvements is generally recommended during dry weather. However, during wet weather grading and construction, excavation to subgrade can proceed during periods of light to moderate rainfall provided that the subgrade remains covered with aggregate. A total aggregate thickness of 8- to 12-inches may be necessary to protect the subgrade soils from heavy construction traffic. Construction traffic should not be allowed directly on the exposed subgrade but only atop a sufficient compacted base rock thickness to help mitigate subgrade pumping. If the subgrade becomes wet and pumps, no construction traffic shall be allowed on the road alignment. Positive site drainage shall be maintained if site paving will not occur before the on-set of the wet season.

Depending on the timing for the project, any soft subgrade found during proof-rolling or by visual observations can either be removed and replaced with properly dried and compacted fill soils or removed and replaced with compacted crushed aggregate. However, and where approved by the Geotechnical Engineer, the soft area may be covered with a bi-axial geogrid and covered with compacted crushed aggregate.

Soil Shrink-Swell and Frost Heave

The results of the laboratory "R"-value tests indicate that the native subgrade soils possess a low to moderate expansion potential. As such, the exposed subgrade soils should not be allowed to completely dry and should be moistened to near optimum moisture content (plus or minus 3 percent) at the time of the placement of the crushed aggregate base rock materials. Additionally, exposure of the subgrade soils to freezing weather may result in frost heave and softening of the subgrade. As such, all subgrade soils exposed to freezing weather should be evaluated and approved by the Geotechnical Engineer prior to the placement of the crushed aggregate base rock materials.

Excavation/Slopes

Temporary excavations of up to about four (4) feet in depth may be constructed with near vertical inclinations. Temporary excavations greater than about four (4) feet but less than eight (8) feet should be excavated with inclinations of at least 1 to 1 (horizontal to vertical) or properly braced/shored. Where excavations are planned to exceed about eight (8) feet, this office should be consulted. All shoring systems and/or temporary excavation bracing for the project should be the responsibility of the excavation contractor. Permanent slopes should be constructed no steeper than about 2H to 1V unless approved by the Geotechnical Engineer.

Depending on the time of year in which trench excavations occur, trench dewatering may be required in order to maintain dry working conditions if the invert elevations of the proposed utilities are located at and/or below the groundwater level. If groundwater is encountered during utility excavation work, we recommend placing trench stabilization materials along the base of the excavation.

Trench stabilization materials should consist of 1-foot of well-graded gravel, crushed gravel, or crushed rock with a maximum particle size of 4 inches and less than 5 percent fines passing the No. 200 sieve. The material should be free of organic matter and other deleterious material and placed in a single lift and compacted until well keyed.

Surface Drainage/Groundwater

We recommend that positive measures be taken to properly finish grade the site so that drainage waters from the residential structures and landscaping areas as well as adjacent properties or buildings are directed away from the new single- and/or multi-family residential structures foundations and/or floor slabs. All roof drainage should be directed into conduits that carry runoff water away from the residential structures to a suitable outfall. Roof downspouts should not be connected to foundation drains. A minimum ground slope of about 2 percent is generally recommended in unpaved areas around the proposed new residential structures.

Groundwater was not encountered at the site within any of the exploratory test pits excavated at the site at the time of excavation to depths of up to 8.0 feet beneath existing site grades. However, the northerly, easterly and southerly portion(s) of the site contain existing seasonal drainage basins. Further, groundwater elevations in the area and/or across the subject property may fluctuate seasonally and may temporarily pond/perch near the ground surface during periods of prolonged rainfall.

As such, based on our current understand of the possible site grading required to bring the subject site to finish design grade(s), we are of the opinion that an underslab drainage system is generally not required for the proposed multi-family residential structures. However, a perimeter foundation drain is recommended for any perimeter footings and/or below grade retaining walls. A typical recommended perimeter footing/retaining wall drain detail is shown on Figure No. 4. Additionally, a subdrain is recommended beneath and/or within all structural fills which are constructed within and/or above the existing seasonal drainage basins. Further, due to our understanding that various storm water detention and/or infiltration basins will be utilized for the project as well as the relatively low infiltration rates of the near surface sandy, clayey silt subgrade soils and/or highly weathered bedrock deposits anticipated within and/or near to the foundation bearing level of the proposed residential structures, we are generally of the opinion that storm water detention basins and/or infiltration systems should not be utilized around and/or up-gradient of the proposed residential structures unless approved by the Geotechnical Engineer.

Design Infiltration Rates

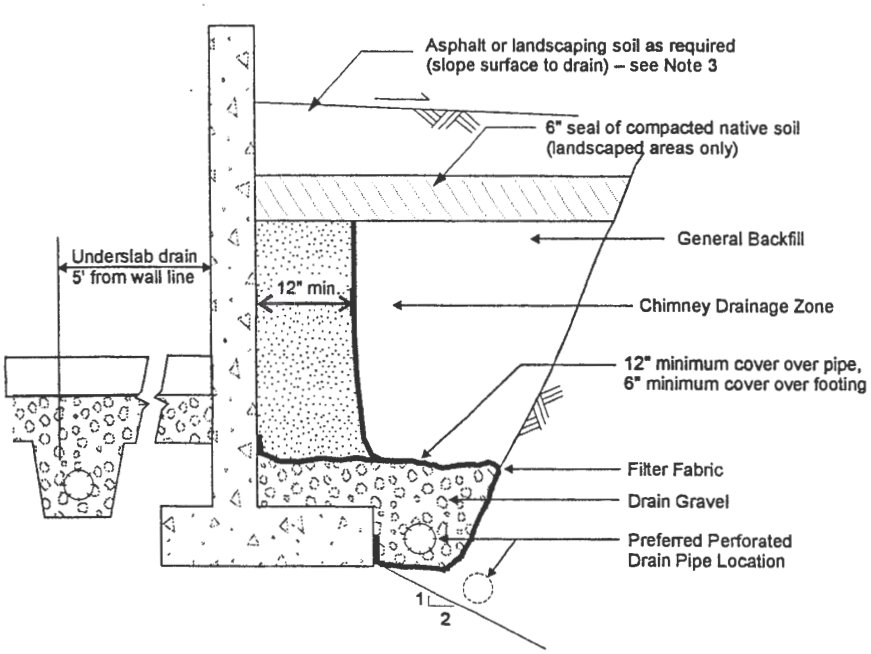
Based on the results of our field infiltration testing, we recommend using the following infiltration rate to design any on-site near surface storm water infiltration and/or disposal systems for the project:

Subgrade Soil Type	Recommended Infiltration Rate
sandy, clayey SILT (ML)	less than 0.1 inches per hour (in/hr)

Note: A safety factor of two (2) was used to calculate the above recommended design infiltration rate. Additionally, given the gradational variability of the on-site sandy, clayey sit subgrade soils beneath the site as well as the anticipation of some site grading for the project, it is generally recommended that field testing be performed during and/or following construction of any on-site storm water infiltration system(s) in order to confirm that the above recommended design infiltration rates are appropriate.

Seismic Design Considerations

Structures at the site should be designed to resist earthquake loading in accordance with the methodology described in the 2019 and/or latest edition of the State of Oregon Structural Specialty Code (OSSC), ASCE 7-16 and/or Amendments to the 2018 International Building Code (IBC).



SCHEMATIC - NOT TO SCALE

NOTES:

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾""-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

PERIMETER FOOTING/RETAINING WALL DRAIN DETAIL

Project No. 1861.001.G	**VISTA LOOP APARTMENTS** **Tax Lot's 600, 700, 900 and 1000**	Figure No. 4

The maximum considered earthquake ground motion for short period and 1.0 period spectral response may be determined from the Oregon Structural Specialty Code, ASCE 7-16 and/or from the 2015 National Earthquake Hazard Reduction Program (NEHRP) "Recommended Provisions for Seismic Regulations for New Buildings and Other Structures" published by the Building Seismic Safety Council. We recommend Site Class "D" be used for design. Using this information, the structural engineer can select the appropriate site coefficient values (F_a and F_v) from the 2018 IBC and/or ASCE 7-16 to determine the maximum considered earthquake spectral response acceleration for the project. However, we have assumed the following response spectrum for the project:

Table 1. ASCE 7-16 Seismic Design Parameters

Site Class	S_S	S_1	F_a	F_v	S_{MS}	S_{M1}	S_{DS}	S_{D1}
D	0.705	0.314	1.236	1.986	0.871	0.623	0.581	0.416

Notes: 1. S_S and S_1 were established based on the ASCE 7-16 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. Fa and Fv were established based on the ASCE 7-16 using the selected S_S and S_1 values.

CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond Geotechnical Services, LLC** be retained to provide construction monitoring and testing services during all earthwork operations for the proposed new Vista Loop Apartments development. The purpose of our monitoring services would be to confirm that the site conditions reported herein are as anticipated, provide field recommendations as required based on the actual conditions encountered, document the activities of the grading contractor and assess his/her compliance with the project specifications and recommendations. It is important that our representative meet with the contractor prior to any site grading to help establish a plan that will minimize costly over-excavation and site preparation work. Of primary importance will be observations made during site preparation and stripping, structural fill placement, footing excavations and construction as well as retaining wall backfill.

CLOSURE AND LIMITATIONS

This report is intended for the exclusive use of the addressee and/or their representative(s) to use to design and construct the proposed new single- and/or multi-family residential structures and their associated site improvements described herein as well as to prepare any related construction documents. The conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the explorations are representative of the subsurface conditions between the explorations and/or at other locations across the study area. The data, analyses, and recommendations herein may not be appropriate for other structures and/or purposes.

We recommend that parties contemplating other structures and/or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. Additionally, the above recommendations are contingent on Redmond Geotechnical Services, LLC being retained to provide all site inspections and constriction monitoring services for this project. Redmond Geotechnical Services, LLC will not assume any responsibility and/or liability for any engineering judgment, inspection and/or testing services performed by others.

It is the owners/developers responsibility for insuring that the project designers and/or contractors involved with this project implement our recommendations into the final design plans, specifications and/or construction activities for the project. Further, in order to avoid delays during construction, we recommend that the final design plans and specifications for the project be reviewed by our office to evaluate as to whether our recommendations have been properly interpreted and incorporated into the project.

If during any future site grading and construction, subsurface conditions different from those encountered in the explorations are observed or appear to be present beneath excavations, we should be advised immediately so that we may review these conditions and evaluate whether modifications of the design criteria are required. We also should be advised if significant modifications of the proposed site development are anticipated so that we may review our conclusions and recommendations.

LEVEL OF CARE

The services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty or other conditions, either expressed or implied, is made.

REFERENCES

Adams, John, 1984, Active Deformation of the Pacific Northwest Continental Margin: Tectonics, v.3, no. 4, p. 449-472.

Applied Technology Council, ATC-13, 1985, Earthquake Damage Evaluation Data for California.

Atwater, B.F., 1992, Geologic evidence for earthquakes during the past 2000 years along the Copalis River, southern coastal Washington: Journal of Geophysical Research, v. 97, p. 1901-1919.

Atwater, B.F., 1987a, A periodic Holocene recurrence of widespread, probably coseismic Subsidence in southwestern Washington: EOS, v. 68, no. 44.

Atwater, B.F., 1987b, Evidence for great Holocene earthquakes along the outer coast of Washington State: Science, v. 236, no. 4804, pp. 942-944.

Campbell, K.W., 1990, Empirical prediction of near-surface soil and soft-rock ground motion for the Diablo Canyon Power Plant site, San Luis Obispo County, California: Dames & Moore report to Lawrence Livermore National Laboratory.

Carver, G.A., and Burke, R.M., 1987, Late Holocene paleoseismicity of the southern end of the Cascadia Subduction zone [abs.]: EOS, v. 68, no. 44, p. 1240.

Chase, R.L., Tiffin, D.L., Murray, J.W., 1975, The western Canadian continental margin: In Yorath, C.J., Parker, E.R., Glass, D.J., editors, Canada's continental margins and offshore petroleum exploration: Canadian Society of Petroleum Geologists Memoir 4, p. 701-721.

Crouse, C.B., 1991a, Ground motion attenuation equations for earthquakes on the Cascadia Subduction Zone: Earthquake Spectra, v. 7, no. 2, pp. 201-236.

Crouse, C.B., 1991b, Errata to Crouse (1991a), Earthquake Spectra, v. 7, no. 3, p. 506.

Darienzo, M.E., and Peterson, C.D., 1987, Episodic tectonic subsidence recorded in late Holocene salt marshes, northern Oregon central Cascadia margin: Tectonics, v. 9, p. 1-22.

Darienzo, M.E., and Peterson, C.D., 1987, Episodic tectonic subsidence recorded in late Holocene salt marshes northwest Oregon [abs]: EOS, v. 68, no. 44, p. 1469.

EERI (Earthquake Engineering Research Institute), 1993, The March 25, 1993, Scotts Mill Earthquake, Western Oregon's Wake-Up Call: EERI Newsletter, Vol. 27, No. 5, May.

Geomatrix, 1995 Seismic Design Mapping, State of Oregon: Final Report to Oregon Department of Transportation, January.

Geologic Map Series (GMS-49), Map of Oregon Seismicity, 1841-1986 dated 1986.

Geologic Map Series (GMS-97), Geologic Map of the Damascus Quadrangle, Clackamas County, Oregon dated 1995.

Grant, W.C., and McLaren, D.D., 1987, Evidence for Holocene Subduction earthquakes along the northern Oregon coast [abs]: EOS v. 68, no. 44, p. 1239.

Grant, W.C., Atwater, B.F., Carver, G.A., Darienzo, M.E., Nelson, A.R., Peterson, C.D., and Vick, G.S., 1989, Radiocarbon dating of late Holocene coastal subsidence above the Cascadia Subduction zone-compilation for Washington, Oregon, and northern California, [abs]: EOS Transactions of the American Geophysical Union, v. 70, p. 1331.

International Conference of Building Officials (ICBO), 1994, Uniform Building Code: 1994 Edition, Whittier, CA. 1994.

Joyner, W.B., and Boore, D.M., 1998, Measurement, characterization and prediction of strong ground motion: Earthquake Engineering and Soil Dynamics II – Recent Advances in Ground Motion Evaluation, ASCE Geotech. Special Publ. No. 20, p. 43-102.

Riddihough, R.P., 1984, Recent movements of the Juan de Fuca plate system: Journal of Geophysical Research, v. 89, no. B8, p. 6980-6994.

Youngs, R.R., Day, S.M., and Stevens, J.L., 1998, Near field ground motions on rock for large Subduction earthquakes: Earthquake Engineering and Soil Dynamics II – Recent Advances in Ground Motion Evaluation, ASCE Geotech. Special Publ. No. 20, p. 445-462.

Appendix "A"

Test Pit Logs and Laboratory Test Data

APPENDIX

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION

Subsurface conditions at the site were explored by excavating eight (8) exploratory test pits (TH-#1 through TH-#8) on October 20, 2020. The approximate location of the test pit explorations are shown in relation to the existing site features and/or site improvements on the Site Exploration Plan, Figure No. 2.

The test pits were excavated using track-mounted excavating equipment in general conformance with ASTM Methods in Vol. 4.08, D-1586-94 and D-1587-83. The test pits were excavated to depths ranging from about 6.0 to 7.0 feet beneath existing site grades. Detailed logs of the test pits are presented on the Log of Test Pits, Figure No's. A-4 through A-7. The soils were classified in accordance with the Unified Soil Classification System (USCS), which is outlined on Figure No. A-3.

The exploration program was coordinated by a field engineer who monitored the excavating and exploration activity, obtained representative samples of the subsurface soils encountered, classified the soils by visual and textural examination, and maintained continuous logs of the subsurface conditions. Disturbed and/or undisturbed samples of the subsurface soils were obtained at appropriate depths and/or intervals and placed in plastic bags and/or with a thin walled ring sample.

Groundwater was not encountered within any of the exploratory test pits (TH-#1 through TH-#8) at the time of excavating to depths of up to 7.0 feet beneath existing surface grades.

LABORATORY TESTING

Pertinent physical and engineering characteristics of the soils encountered during our subsurface investigation were evaluated by a laboratory testing program to be used as a basis for selection of soil design parameters and for correlation purposes. Selected tests were conducted on representative soil samples. The program consisted of tests to evaluate the existing (in-situ) moisture-density, maximum dry density and optimum moisture content, Atterberg Limits and gradational characteristics as well as direct shear strength and "R"-value tests.

Dry Density and Moisture Content Determinations

Density and moisture content determinations were performed on both disturbed and relatively undisturbed samples from the test pit explorations in general conformance with ASTM Vol. 4.08 Part D-216. The results of these tests were used to calculate existing overburden pressures and to correlate strength and compressibility characteristics of the soils. Test results are shown on the test pit logs at the appropriate sample depths.

Maximum Dry Density

Two (2) Maximum Dry Density and Optimum Moisture Content tests were performed on representative samples of the on-site sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-1557. This test was conducted to help establish various engineering properties for use as structural fill. The test results are presented on Figure No. A-8.

Atterberg Limits

Two (2) Liquid Limit (LL) and Plastic Limit (PL) tests were performed on representative samples of the sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-4318-85. These tests were conducted to facilitate classification of the soils and for correlation purposes. The test results appear on Figure No. A-9.

Gradation Analysis

Two (2) Gradation analyses were performed on representative samples of the sandy, clayey silt subsurface soils in accordance with ASTM Vol. 4.08 Part D-422. The test results were used to classify the soil in accordance with the Unified Soil Classification System (USCS). The test results are shown graphically on Figure No. A-10.

Direct Shear Strength Test

One (1) Direct Shear Strength test was performed on an undisturbed and/or remolded sample of the sandy, clayey silt subgrade soils at a continuous rate of shearing deflection (0.02 inches per minute) in accordance with ASTM Vol. 4.08 Part D-3080-79. The test results were used to determine engineering strength properties and are shown graphically on Figure No. A-11.

"R"-Value Tests

Two (2) "R"-value tests were performed on remolded samples of the sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-2844. The test results were used to help evaluate the subgrade soils supporting and performance capabilities when subjected to traffic loading. The test results are shown on Figure No. A-12.

The following figures are attached and complete the Appendix:

Figure No. A-3	Key To Exploratory Test Pit Logs
Figure No's. A-4 through A-7	Log of Test Pits
Figure No. A-8	Maximum Dry Density
Figure No. A-9	Atterberg Limits Test Results
Figure No. A-10	Gradation Test Results
Figure No. A-11	Direct Shear Strength Test Results
Figure No. A-12	Results of "R"-Value Tests
Figure No's. A-13 and A-14	Field Infiltration Test Results

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

DEFINITION OF TERMS

U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENINGS			
200	40	10	4	3/4"	3"	12"	
SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT†
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

RELATIVE DENSITY

CLAYS AND PLASTIC SILTS	STRENGTH‡	BLOWS/FOOT†
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

CONSISTENCY

†Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

‡Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

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KEY TO EXPLORATORY TEST PIT LOGS
Unified Soil Classification System (ASTM D-2487)

VISTA LOOP APARTMENTS
40808 and 41010 Highway 26

PROJECT NO.	DATE	Figure
1861.001.G	11/23/20	A-3

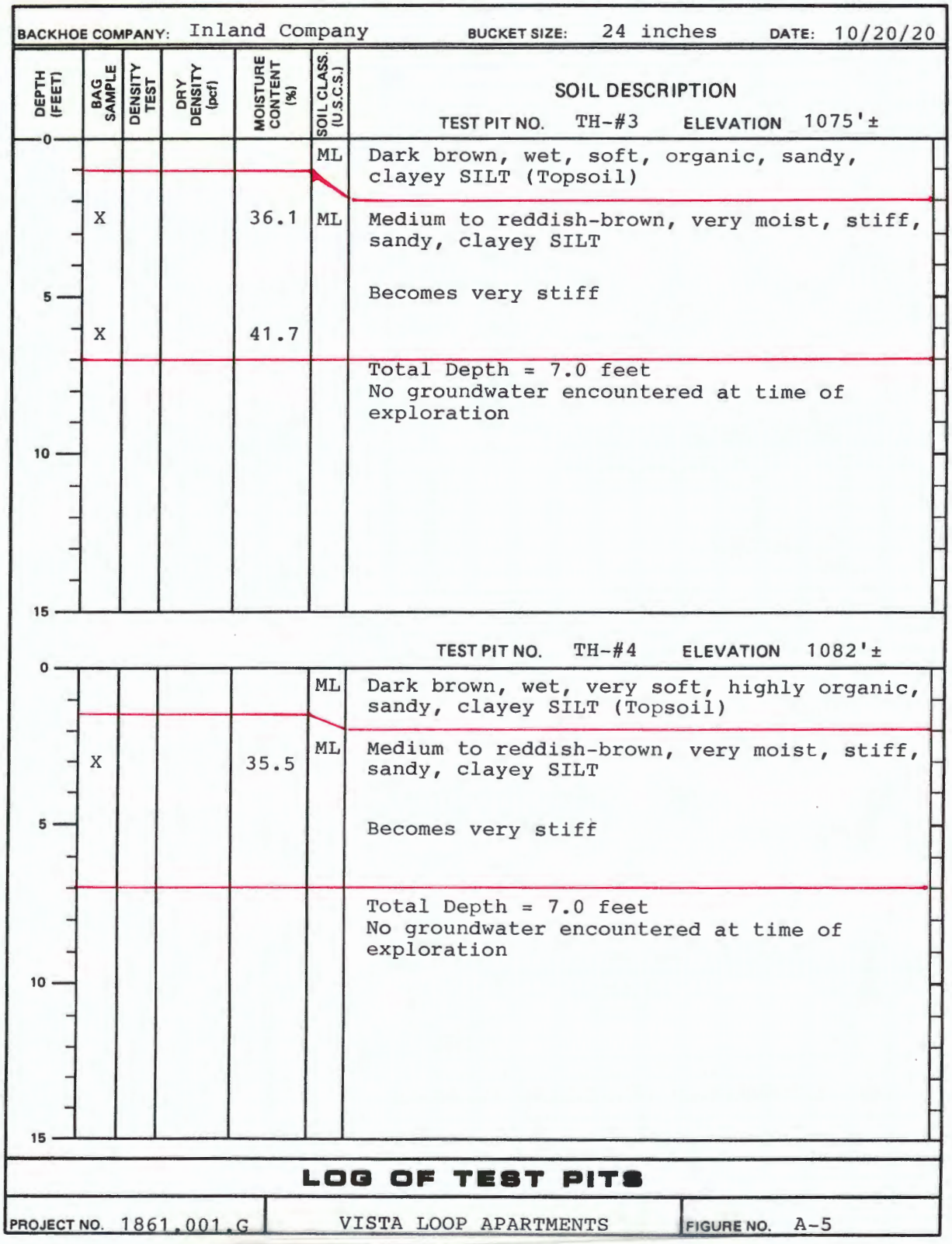
BACKHOE COMPANY: Inland Company BUCKET SIZE: 24 inches DATE: 10/20/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#1 ELEVATION 1058'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			35.5	ML	Medium to reddish-brown, very moist, stiff, sandy, clayey SILT
5	X			40.3		Becomes very stiff
						Total Depth = 7.0 feet No groundwater encountered at time of exploration
10						
15						
						TEST PIT NO. TH-#2 ELEVATION 1067'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
					ML	Medium to reddish-brown, very moist, stiff, sandy, clayey SILT
5						Becomes very stiff
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1861.001.G VISTA LOOP APARTMENTS FIGURE NO. A-4

REDMOND GEOTECHNICAL SERVICES



REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company BUCKET SIZE: 24 inches DATE: 10/20/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#5 ELEVATION 1095'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
					ML	Medium to reddish-brown, very moist, stiff, sandy, clayey SILT
5						Becomes very stiff
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						
						TEST PIT NO. TH-#6 ELEVATION 1075'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			34.9	ML	Medium to reddish-brown, very moist, stiff, sandy, clayey SILT
5	X			41.4		Becomes very stiff
						Total Depth = 7.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1861.001.G VISTA LOOP APARTMENTS FIGURE NO. A-6

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company BUCKET SIZE: 24 inches DATE: 10/20/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#7 ELEVATION 1085'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			35.7	ML	Medium to reddish-brown, very moist, stiff, sandy, clayey SILT
5						Becomes very stiff
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						
						TEST PIT NO. TH-#8 ELEVATION 1120'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			36.7	ML	Medium to reddish-brown, very moist, stiff, sandy, clayey SILT
5						Becomes very stiff
						Total Depth = 7.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1861.001.G VISTA LOOP APARTMENTS FIGURE NO. A-7

REDMOND GEOTECHNICAL SERVICES

MAXIMUM DENSITY TEST RESULTS

SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#3 @ 2.5'	Medium to reddish-brown, sandy, clayey, SILT (ML)	104.0	28.0

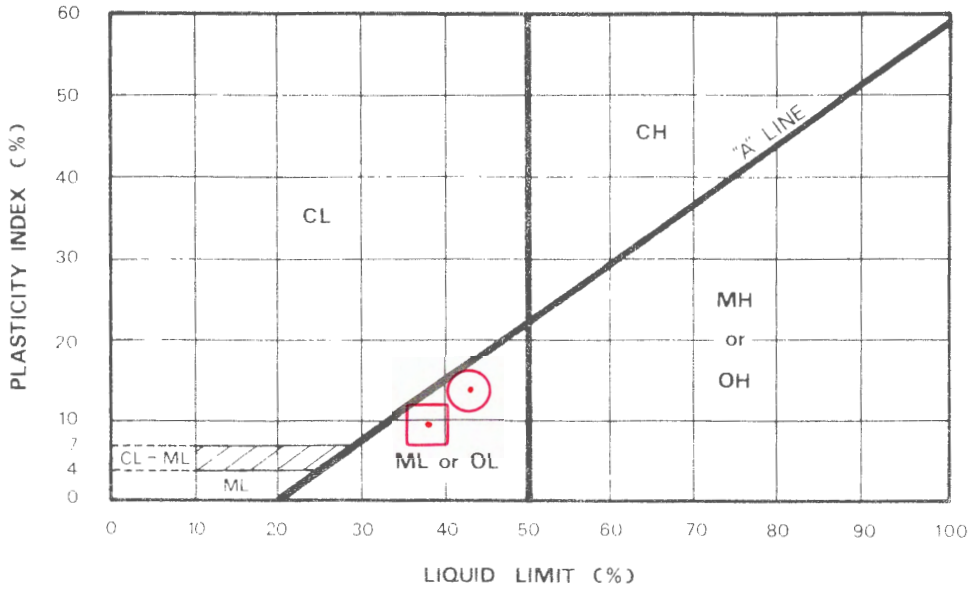
EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE CLASS.

MAXIMUM DENSITY & EXPANSION INDEX TEST RESULTS

PROJECT NO.: 1861.001.G | VISTA LOOP APARTMENTS | FIGURE NO.: A-8

REDMOND GEOTECHNICAL SERVICES



KEY SYMBOL	BORING NO	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
▫	TH-#1	2.0	35.5	38.2	9.9	77.3		ML
○	TH-#1	5.0	40.3	42.6	12.7	85.5		ML

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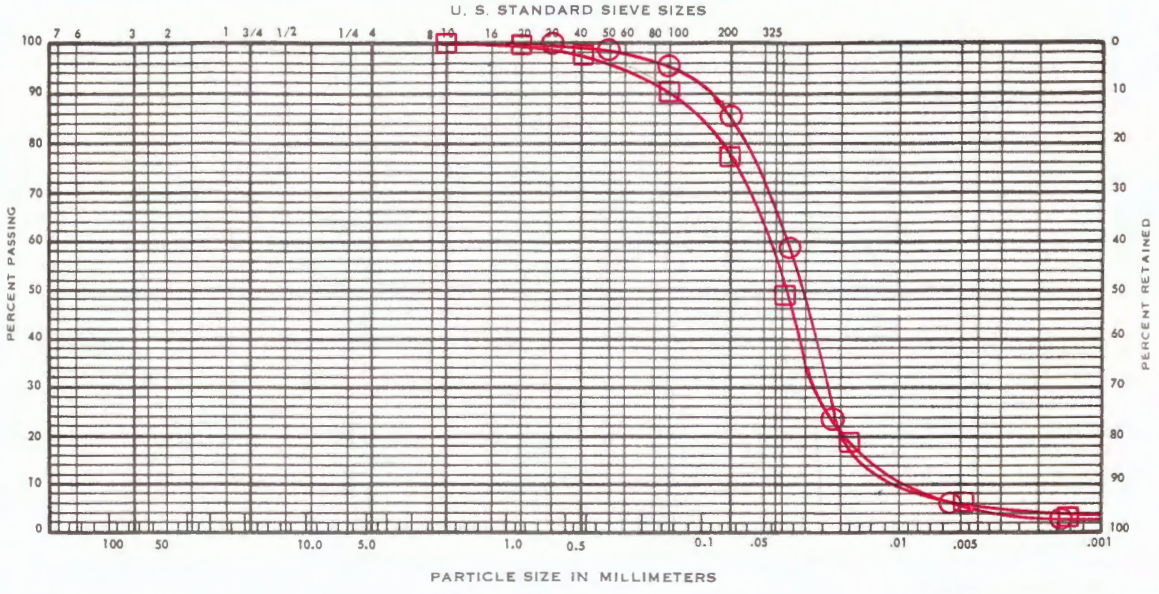
PLASTICITY CHART AND DATA

VISTA LOOP APARTMENTS
40808 and 41010 Highway 26

PROJECT NO	DATE	
1861.001.G	11/23/20	Figure A-9

UNIFIED SOIL CLASSIFICATION SYSTEM

(ASTM D 422-72)



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	ELEV. (feet)	UNIFIED SOIL CLASSIFICATION SYMBOL	SAMPLE DESCRIPTION
⊟	TH-#1	2.0		ML	Medium to reddish-brown, sandy, clayey SILT
⊖	TH-#1	5.0		ML	Medium to reddish-brown, sandy, clayey SILT

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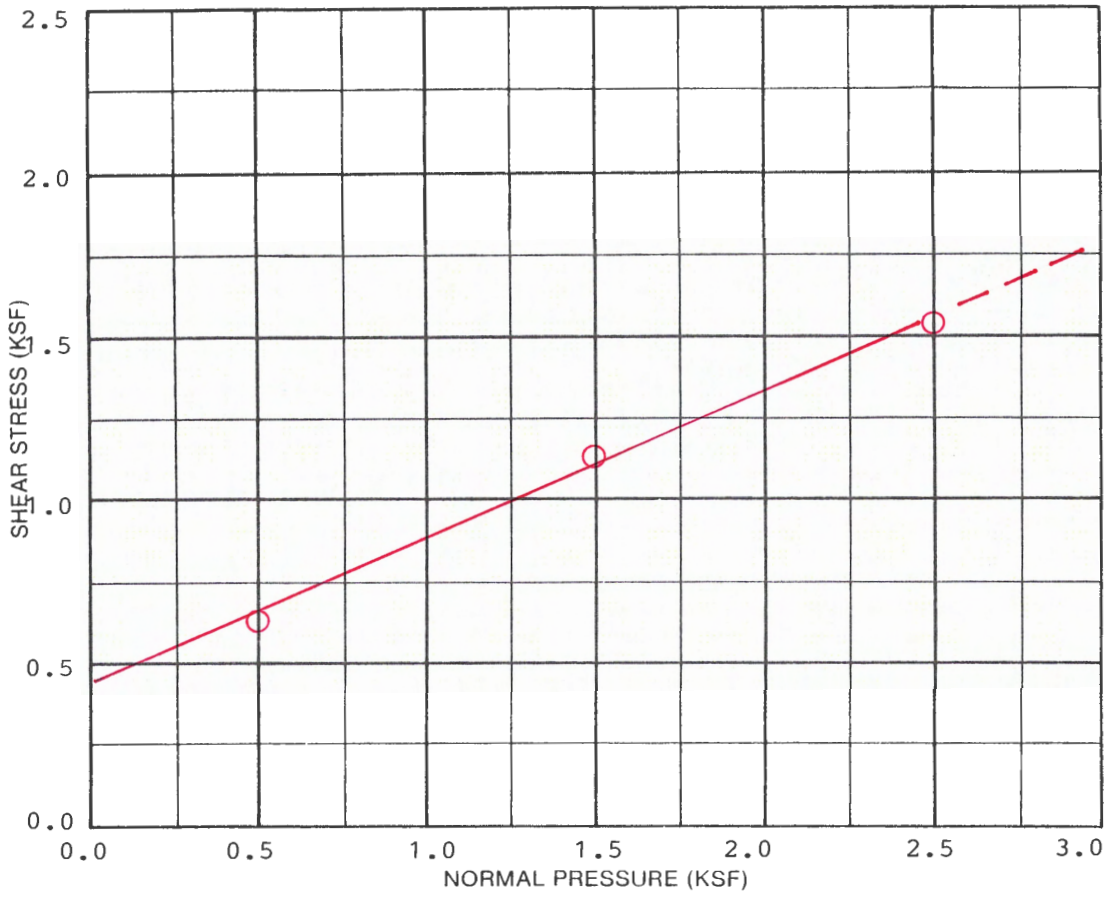
GRADATION TEST DATA

VISTA LOOP APARTMENTS
40808 and 41010 Highway 26

PROJECT NO.	DATE	FIGURE
1861.001.G	11/23/20	A-10



SAMPLE DATA	
DESCRIPTION: Medium to reddish-brown sandy, clayey SILT (ML) (Remolded)	
BORING NO.: TH-#3	
DEPTH (ft.): 2.5	ELEVATION (ft):
TEST RESULTS	
APPARENT COHESION (C): 450 psf	
APPARENT ANGLE OF INTERNAL FRICTION (Φ): 24°	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.6	1.1	1.5	
INITIAL H_2O CONTENT (%)	28.0	28.0	28.0	
FINAL H_2O CONTENT (%)	28.9	23.2	16.6	
INITIAL DRY DENSITY (PCF)	95.0	95.0	95.0	
FINAL DRY DENSITY (PCF)	95.7	98.9	103.3	
STRAIN RATE: 0.02 inches per minute				

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DIRECT SHEAR TEST DATA

VISTA LOOP APARTMENTS
40808 and 41010 Highway 26

PROJECT NO.	DATE	
1861.001.G	11/23/20	Figure A-11

RESULTS OF R (RESISTANCE) VALUE TESTS

SAMPLE LOCATION: TH-#3

SAMPLE DEPTH: 2.5 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	219	329	431
Expansion Dial (o.ooo1")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	17.6	14.4	11.1
Dry Density (pcf)	93.4	98.2	102.6
Resistance Value, "R"	17	30	41
"R"-Value at 300 psi Exudation Pressure = 29			

SAMPLE LOCATION: TH-#6

SAMPLE DEPTH: 2.0 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	208	326	439
Expansion Dial (0.0001")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	17.3	14.1	10.7
Dry Density (pcf)	94.9	99.1	103.7
Resistance Value "R"	19	32	43
"R"-Value at 300 psi Exudation Pressure = 31			

Division 004 Appendix C - Infiltration Testing

Location: Vista Loop Apartments	**Date:** October 20, 2020	**Test Hole:** TH-#3
Depth to Bottom of Hole: 4.0 feet	**Hole Diameter:** 6 inches	**Test Method:** Encased Falling Head
Tester's Name: Daniel M. Redmond, P.E., G.E. **Tester's Company:** Redmond Geotechnical Services, LLC		**Tester's Contact Number:** 503-285-0598

Depth (feet)	Soil Characteristics
0-1.0	Dark brown Topsoil
1.0-4.0	Medium to reddish-brown, sandy, clayey SILT (ML)

Time	Time Interval (Minutes)	Measurement (inches)	Drop in Water (inches)	Infiltration Rate (inches/hour)	Remarks
11:00	0	48.00	----		Filled w/12" water
11:20	20	48.20	0.20	0.60	
11:40	20	48.34	0.14	0.42	
12:00	20	48.45	0.11	0.33	
12:20	20	48.54	0.09	0.27	
12:40	20	48.62	0.08	0.24	
1:00	20	48.69	0.07	0.21	
1:20	20	48.76	0.07	0.21	
1:40	20	48.83	0.07	0.21	

Infiltration Test Data Table

Figure No. A-13

Division 004 Appendix C - Infiltration Testing

Location: Vista Loop Apartments	**Date:** October 20, 2020	**Test Hole:** TH-#4
Depth to Bottom of Hole: 5.0 feet	**Hole Diameter:** 6 inches	**Test Method:** Encased Falling Head
Tester's Name: Daniel M. Redmond, P.E., G.E. **Tester's Company:** Redmond Geotechnical Services, LLC		**Tester's Contact Number:** 503-285-0598

Depth (feet)	Soil Characteristics
0-1.0	Dark brown Topsoil
1.0-5.0	Medium to reddish-brown, sandy, clayey SILT (ML)

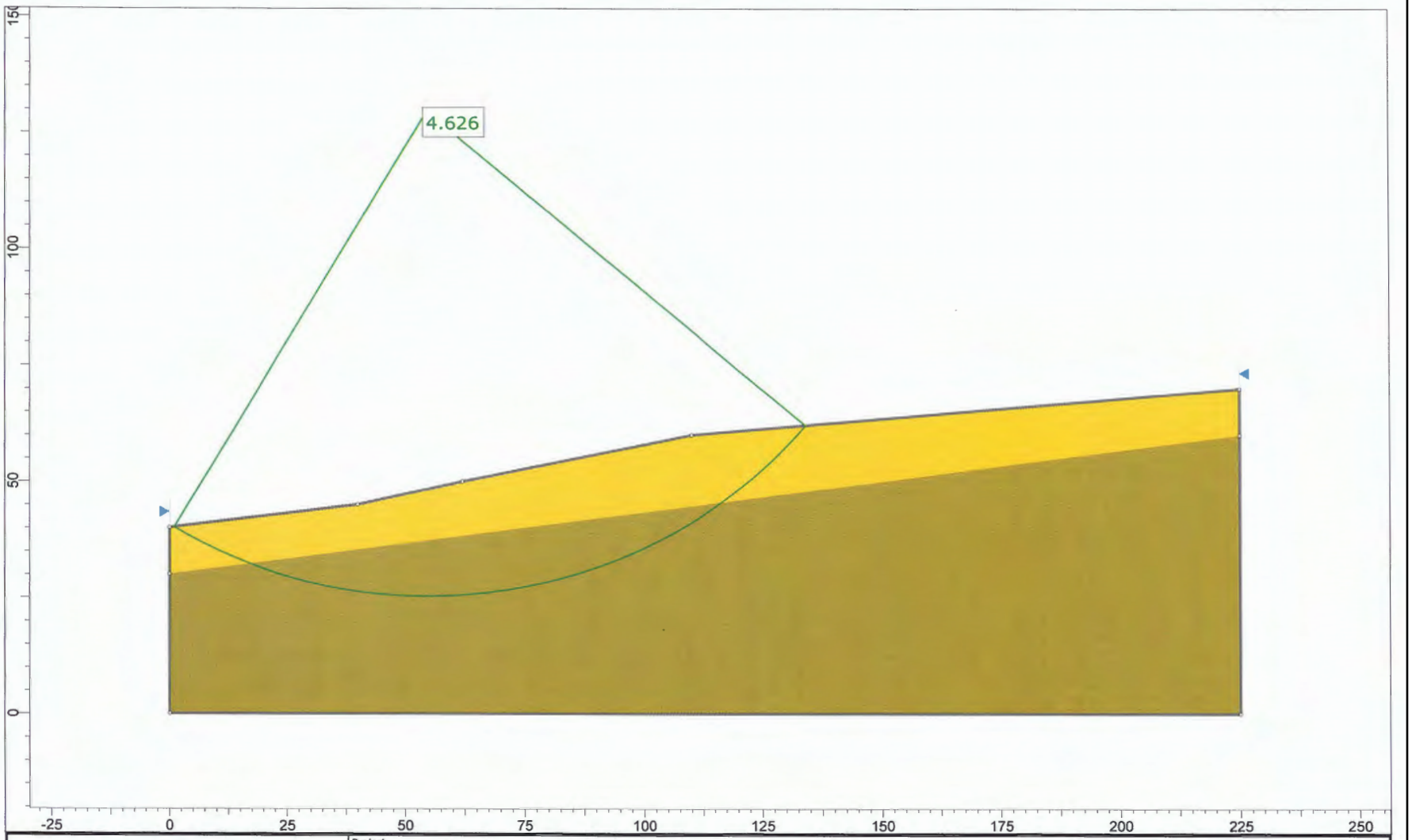
Time	Time Interval (Minutes)	Measurement (inches)	Drop in Water (inches)	Infiltration Rate (inches/hour)	Remarks
11:30	0	60.00	----		Filled w/12" water
11:50	20	60.15	0.15	0.45	
12:10	20	60.25	0.10	0.30	
12:30	20	60.32	0.07	0.21	
12:50	20	60.37	0.05	0.15	
1:10	20	60.41	0.04	0.12	
1:30	20	60.44	0.03	0.09	
1:50	20	60.47	0.03	0.09	
2:10	20	60.50	0.03	0.09	

Infiltration Test Data Table

Figure No. A-14

Appendix "B"

Slope Stability Analysis



rocscience

SLIDEINTERPRET 8.020

Project	Vista Loop Apartments				
Analysis Description					
Drawn By	Daniel M. Redmond, P.E., G.E.	Scale	1:333	Company	Redmond Geotechnical Services, LLC
Date	November 21, 2020			File Name	Vista Loop Apartments Static.slmd

Slide Analysis Information

Vista Loop Apartments Static

Project Summary

File Name:	Vista Loop Apartments Static.slmd
Slide Modeler Version:	8.02
Compute Time:	00h:00m:01.150s
Project Title:	Vista Loop Apartments
Author:	Daniel M. Redmond, P.E., G.E.
Company:	Redmond Geotechnical Services, LLC
Date Created:	November 21, 2020

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
	Janbu simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Property	Material 1	Material 5
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	110	110
Cohesion [psf]	450	350
Friction Angle [°]	24	26
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: bishop simplified

FS	4.626110
Center:	54.656, 129.596
Radius:	104.317
Left Slip Surface Endpoint:	1.015, 40.127
Right Slip Surface Endpoint:	134.197, 62.104
Resisting Moment:	1.90519e+07 lb-ft
Driving Moment:	4.11834e+06 lb-ft
Total Slice Area:	2301.38 ft2
Surface Horizontal Width:	133.182 ft
Surface Average Height:	17.28 ft

Method: janbu simplified

FS	4.243600
Center:	58.497, 104.803
Radius:	81.443
Left Slip Surface Endpoint:	7.895, 40.987
Right Slip Surface Endpoint:	127.487, 61.521
Resisting Horizontal Force:	162738 lb
Driving Horizontal Force:	38349 lb
Total Slice Area:	2275.47 ft2
Surface Horizontal Width:	119.591 ft
Surface Average Height:	19.027 ft

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces:	12126
Number of Invalid Surfaces:	44

Error Codes:

Error Code -112 reported for 44 surfaces

Method: janbu simplified

Number of Valid Surfaces:	11229
Number of Invalid Surfaces:	941

Error Codes:

Error Code -108 reported for 342 surfaces
Error Code -111 reported for 599 surfaces

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 4.62611**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	2.67883	278.075	-30.0942	Material 1	450	24	113.6	525.528	169.639	0	169.639
2	2.67883	818.959	-28.4075	Material 1	450	24	133.654	618.297	378.003	0	378.003
3	2.67883	1330.02	-26.7473	Material 1	450	24	152.452	705.26	573.323	0	573.323
4	2.67883	1812.58	-25.1109	Material 1	450	24	170.066	786.742	756.335	0	756.335
5	2.67883	2267.82	-23.4962	Material 1	450	24	186.555	863.025	927.668	0	927.668
6	2.67883	2696.74	-21.9011	Material 1	450	24	201.974	934.356	1087.88	0	1087.88
7	2.68435	3107.05	-20.322	Material 5	350	26	205.722	951.694	1233.66	0	1233.66
8	2.68435	3487.49	-18.7573	Material 5	350	26	220.528	1020.18	1374.08	0	1374.08
9	2.68435	3843.89	-17.207	Material 5	350	26	234.279	1083.8	1504.51	0	1504.51
10	2.68435	4176.87	-15.6696	Material 5	350	26	247.013	1142.71	1625.3	0	1625.3
11	2.68435	4486.99	-14.1437	Material 5	350	26	258.763	1197.07	1736.74	0	1736.74
12	2.68435	4774.73	-12.628	Material 5	350	26	269.557	1247	1839.12	0	1839.12
13	2.68435	5040.51	-11.1212	Material 5	350	26	279.419	1292.62	1932.66	0	1932.66
14	2.68435	5284.68	-9.62213	Material 5	350	26	288.373	1334.04	2017.59	0	2017.59
15	2.68435	5516.31	-8.12971	Material 5	350	26	296.785	1372.96	2097.39	0	2097.39
16	2.68435	5787.61	-6.64283	Material 5	350	26	306.737	1419	2191.78	0	2191.78
17	2.68435	6049.7	-5.16044	Material 5	350	26	316.277	1463.13	2282.25	0	2282.25
18	2.68435	6291.13	-3.6815	Material 5	350	26	324.951	1503.26	2364.54	0	2364.54
19	2.68435	6512.03	-2.20502	Material 5	350	26	332.774	1539.45	2438.74	0	2438.74
20	2.68435	6712.49	-0.729997	Material 5	350	26	339.754	1571.74	2504.93	0	2504.93
21	2.68435	6892.53	0.744538	Material 5	350	26	345.895	1600.15	2563.18	0	2563.18
22	2.68435	7052.16	2.21957	Material 5	350	26	351.202	1624.7	2613.53	0	2613.53
23	2.68435	7190.8	3.69607	Material 5	350	26	355.662	1645.33	2655.81	0	2655.81

24	2.68435	7298.45	5.17504	Material 5	350	26	358.885	1660.24	2686.39	0	2686.39
25	2.68435	7381.43	6.65747	Material 5	350	26	361.126	1670.61	2707.65	0	2707.65
26	2.68435	7443.58	8.1444	Material 5	350	26	362.542	1677.16	2721.07	0	2721.07
27	2.68435	7484.7	9.63688	Material 5	350	26	363.126	1679.86	2726.62	0	2726.62
28	2.68435	7504.53	11.136	Material 5	350	26	362.875	1678.7	2724.23	0	2724.23
29	2.68435	7502.75	12.6429	Material 5	350	26	361.779	1673.63	2713.85	0	2713.85
30	2.68435	7479	14.1587	Material 5	350	26	359.831	1664.62	2695.38	0	2695.38
31	2.68435	7432.87	15.6847	Material 5	350	26	357.021	1651.62	2668.72	0	2668.72
32	2.68435	7363.87	17.2223	Material 5	350	26	353.334	1634.56	2633.74	0	2633.74
33	2.68435	7271.44	18.7727	Material 5	350	26	348.753	1613.37	2590.29	0	2590.29
34	2.68435	7154.97	20.3376	Material 5	350	26	343.262	1587.97	2538.21	0	2538.21
35	2.68435	7013.74	21.9184	Material 5	350	26	336.84	1558.26	2477.3	0	2477.3
36	2.68435	6846.94	23.5171	Material 5	350	26	329.463	1524.13	2407.32	0	2407.32
37	2.68435	6653.67	25.1354	Material 5	350	26	321.103	1485.46	2328.04	0	2328.04
38	2.68435	6432.87	26.7754	Material 5	350	26	311.731	1442.1	2239.14	0	2239.14
39	2.68435	6183.38	28.4396	Material 5	350	26	301.311	1393.9	2140.31	0	2140.31
40	2.68435	5903.86	30.1304	Material 5	350	26	289.805	1340.67	2031.17	0	2031.17
41	2.68435	5585.54	31.8506	Material 5	350	26	276.899	1280.97	1908.76	0	1908.76
42	2.68435	5162.95	33.6037	Material 5	350	26	260.208	1203.75	1750.45	0	1750.45
43	2.68435	4686.95	35.3931	Material 5	350	26	241.642	1117.86	1574.35	0	1574.35
44	2.5412	3964.63	37.1733	Material 1	450	24	230.597	1066.77	1385.28	0	1385.28
45	2.5412	3470	38.9466	Material 1	450	24	212.188	981.604	1194	0	1194
46	2.5412	2938.5	40.7654	Material 1	450	24	192.584	890.917	990.316	0	990.316
47	2.5412	2367.06	42.6355	Material 1	450	24	171.707	794.335	773.39	0	773.39
48	2.5412	1752.02	44.5637	Material 1	450	24	149.461	691.424	542.247	0	542.247

49	2.5412	1088.94	46.5583	Material 1	450	24	125.738	581.676	295.749	0	295.749
50	2.5412	372.395	48.6292	Material 1	450	24	100.406	464.488	32.5414	0	32.5414

- **Global Minimum Query (janbu simplified) - Safety Factor: 4.2436**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	2.53101	312.373	-37.2927	Material 1	450	24	129.324	548.801	221.911	0	221.911
2	2.53101	916.276	-35.0855	Material 1	450	24	155.483	659.808	471.238	0	471.238
3	2.53101	1480.1	-32.9366	Material 1	450	24	179.604	762.168	701.141	0	701.141
4	2.53101	2006.79	-30.8388	Material 1	450	24	201.875	856.675	913.408	0	913.408
5	2.53101	2498.8	-28.786	Material 1	450	24	222.448	943.98	1109.5	0	1109.5
6	2.39611	2789.74	-26.8256	Material 5	350	26	229.639	974.496	1280.41	0	1280.41
7	2.39611	3175.29	-24.9514	Material 5	350	26	248.05	1052.63	1440.6	0	1440.6
8	2.39611	3535.88	-23.1054	Material 5	350	26	265.08	1124.89	1588.77	0	1588.77
9	2.39611	3872.56	-21.2844	Material 5	350	26	280.805	1191.62	1725.58	0	1725.58
10	2.39611	4186.26	-19.4858	Material 5	350	26	295.287	1253.08	1851.59	0	1851.59
11	2.39611	4477.75	-17.7069	Material 5	350	26	308.584	1309.51	1967.28	0	1967.28
12	2.39611	4747.73	-15.9455	Material 5	350	26	320.744	1361.11	2073.08	0	2073.08
13	2.39611	4996.8	-14.1995	Material 5	350	26	331.808	1408.06	2169.34	0	2169.34
14	2.39611	5250.62	-12.4668	Material 5	350	26	343.051	1455.77	2267.16	0	2267.16
15	2.39611	5523.46	-10.7457	Material 5	350	26	355.165	1507.18	2372.58	0	2372.58
16	2.39611	5777.12	-9.0343	Material 5	350	26	366.281	1554.35	2469.28	0	2469.28
17	2.39611	6011.49	-7.33102	Material 5	350	26	376.395	1597.27	2557.28	0	2557.28
18	2.39611	6226.8	-5.63424	Material 5	350	26	385.529	1636.03	2636.75	0	2636.75
19	2.39611	6423.25	-3.94241	Material 5	350	26	393.699	1670.7	2707.83	0	2707.83
20	2.39611	6600.97	-2.25402	Material 5	350	26	400.919	1701.34	2770.65	0	2770.65
21	2.39611	6760.06	-0.567591	Material 5	350	26	407.199	1727.99	2825.3	0	2825.3
22	2.39611	6900.56	1.11835	Material 5	350	26	412.548	1750.69	2871.85	0	2871.85
23	2.39611	7019.52	2.80526	Material 5	350	26	416.832	1768.87	2909.12	0	2909.12

24	2.39611	7111.33	4.49461	Material 5	350	26	419.792	1781.43	2934.87	0	2934.87
25	2.39611	7183.84	6.18789	Material 5	350	26	421.807	1789.98	2952.4	0	2952.4
26	2.39611	7237.43	7.88662	Material 5	350	26	422.9	1794.62	2961.92	0	2961.92
27	2.39611	7271.9	9.59236	Material 5	350	26	423.07	1795.34	2963.38	0	2963.38
28	2.39611	7286.97	11.3067	Material 5	350	26	422.304	1792.09	2956.73	0	2956.73
29	2.39611	7282.32	13.0314	Material 5	350	26	420.598	1784.85	2941.88	0	2941.88
30	2.39611	7257.56	14.7683	Material 5	350	26	417.938	1773.56	2918.72	0	2918.72
31	2.39611	7212.24	16.5191	Material 5	350	26	414.304	1758.14	2887.11	0	2887.11
32	2.39611	7145.82	18.2859	Material 5	350	26	409.68	1738.52	2846.88	0	2846.88
33	2.39611	7057.67	20.071	Material 5	350	26	404.044	1714.6	2797.84	0	2797.84
34	2.39611	6947.07	21.8767	Material 5	350	26	397.368	1686.27	2739.76	0	2739.76
35	2.39611	6813.2	23.7055	Material 5	350	26	389.622	1653.4	2672.37	0	2672.37
36	2.39611	6655.1	25.5604	Material 5	350	26	380.771	1615.84	2595.35	0	2595.35
37	2.39611	6471.66	27.4444	Material 5	350	26	370.77	1573.4	2508.35	0	2508.35
38	2.39611	6261.59	29.3613	Material 5	350	26	359.574	1525.89	2410.94	0	2410.94
39	2.39611	6023.4	31.315	Material 5	350	26	347.13	1473.08	2302.65	0	2302.65
40	2.39611	5755.36	33.3102	Material 5	350	26	333.366	1414.67	2182.9	0	2182.9
41	2.39611	5455.42	35.3522	Material 5	350	26	318.211	1350.36	2051.04	0	2051.04
42	2.39611	5121.14	37.4474	Material 5	350	26	301.576	1279.77	1906.31	0	1906.31
43	2.39611	4732.47	39.603	Material 5	350	26	282.605	1199.26	1741.25	0	1741.25
44	2.39611	4247.71	41.8282	Material 5	350	26	259.53	1101.34	1540.48	0	1540.48
45	2.24803	3501.02	44.0598	Material 1	450	24	244.603	1038	1320.66	0	1320.66
46	2.24803	2989.47	46.305	Material 1	450	24	221.266	938.966	1098.24	0	1098.24
47	2.24803	2431.11	48.6467	Material 1	450	24	196.126	832.279	858.613	0	858.613
48	2.24803	1819.15	51.103	Material 1	450	24	168.971	717.044	599.791	0	599.791

49	2.24803	1144.63	53.6982	Material 1	450	24	139.535	592.13	319.227	0	319.227
50	2.24803	395.219	56.4655	Material 1	450	24	107.474	456.075	13.6445	0	13.6445

Interslice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 4.62611**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	1.01512	40.1269	0	0	0
2	3.69395	38.5744	567.672	0	0
3	6.37278	37.1255	1473.38	0	0
4	9.0516	35.7754	2655.79	0	0
5	11.7304	34.5199	4060.92	0	0
6	14.4093	33.3554	5640.99	0	0
7	17.0881	32.2784	7353.62	0	0
8	19.7724	31.2843	9132.26	0	0
9	22.4568	30.3727	10976.8	0	0
10	25.1411	29.5414	12856.4	0	0
11	27.8255	28.7884	14743.3	0	0
12	30.5098	28.1119	16612.7	0	0
13	33.1942	27.5105	18442.3	0	0
14	35.8785	26.9828	20212.2	0	0
15	38.5629	26.5278	21904.4	0	0
16	41.2472	26.1443	23505.3	0	0
17	43.9316	25.8317	25013.9	0	0
18	46.6159	25.5892	26416.1	0	0
19	49.3003	25.4165	27696.8	0	0
20	51.9846	25.3132	28842.1	0	0
21	54.669	25.279	29839.8	0	0
22	57.3533	25.3139	30678.8	0	0
23	60.0377	25.4179	31349.6	0	0
24	62.722	25.5913	31843.8	0	0
25	65.4064	25.8344	32154	0	0
26	68.0907	26.1477	32275	0	0
27	70.7751	26.5319	32202.9	0	0
28	73.4594	26.9877	31934.8	0	0
29	76.1438	27.5161	31469.4	0	0
30	78.8281	28.1182	30806.4	0	0
31	81.5125	28.7954	29947	0	0
32	84.1968	29.5492	28893.7	0	0
33	86.8812	30.3813	27650.7	0	0
34	89.5655	31.2937	26223.5	0	0
35	92.2498	32.2886	24619.4	0	0
36	94.9342	33.3687	22847.8	0	0
37	97.6185	34.5369	20920.1	0	0
38	100.303	35.7963	18850	0	0
39	102.987	37.1509	16653.8	0	0
40	105.672	38.6047	14350.9	0	0
41	108.356	40.1626	11964.4	0	0
42	111.04	41.8303	9524.49	0	0
43	113.725	43.614	7100.64	0	0

44	116.409	45.5212	4746.69	0	0
45	118.95	47.4482	2663.21	0	0
46	121.491	49.5021	750.037	0	0
47	124.033	51.6929	-930.196	0	0
48	126.574	54.0326	-2303.34	0	0
49	129.115	56.5354	-3280.67	0	0
50	131.656	59.2187	-3754.75	0	0
51	134.197	62.1041	0	0	0

- **Global Minimum Query (janbu simplified) - Safety Factor: 4.2436**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	7.89535	40.9869	0	0	0
2	10.4264	39.0593	755.076	0	0
3	12.9574	37.2815	1986.4	0	0
4	15.4884	35.6418	3590.62	0	0
5	18.0194	34.1307	5481.81	0	0
6	20.5504	32.7401	7587.73	0	0
7	22.9465	31.5283	9689.44	0	0
8	25.3426	30.4135	11889.8	0	0
9	27.7387	29.3912	14149.2	0	0
10	30.1348	28.4577	16432.8	0	0
11	32.5309	27.6099	18710.2	0	0
12	34.927	26.8449	20954.6	0	0
13	37.3231	26.1603	23142.3	0	0
14	39.7193	25.554	25252.6	0	0
15	42.1154	25.0243	27275.6	0	0
16	44.5115	24.5695	29205.5	0	0
17	46.9076	24.1886	31023.9	0	0
18	49.3037	23.8803	32714.1	0	0
19	51.6998	23.6439	34261.2	0	0
20	54.0959	23.4788	35651.7	0	0
21	56.492	23.3845	36873.6	0	0
22	58.8881	23.3607	37916.4	0	0
23	61.2842	23.4075	38770.5	0	0
24	63.6803	23.5249	39427.7	0	0
25	66.0764	23.7133	39880.8	0	0
26	68.4726	23.973	40124.5	0	0
27	70.8687	24.305	40154.7	0	0
28	73.2648	24.7099	39968.4	0	0
29	75.6609	25.189	39563.8	0	0
30	78.057	25.7436	38940.1	0	0
31	80.4531	26.3752	38097.9	0	0
32	82.8492	27.0858	37039	0	0
33	85.2453	27.8776	35766.5	0	0
34	87.6414	28.7531	34285.2	0	0
35	90.0375	29.7152	32601.4	0	0
36	92.4336	30.7673	30723.4	0	0
37	94.8298	31.9133	28661.5	0	0
38	97.2259	33.1577	26428.6	0	0
39	99.622	34.5057	24040.2	0	0
40	102.018	35.9634	21515.3	0	0
41	104.414	37.5379	18877	0	0
42	106.81	39.2378	16153.1	0	0
43	109.206	41.0729	13377.4	0	0

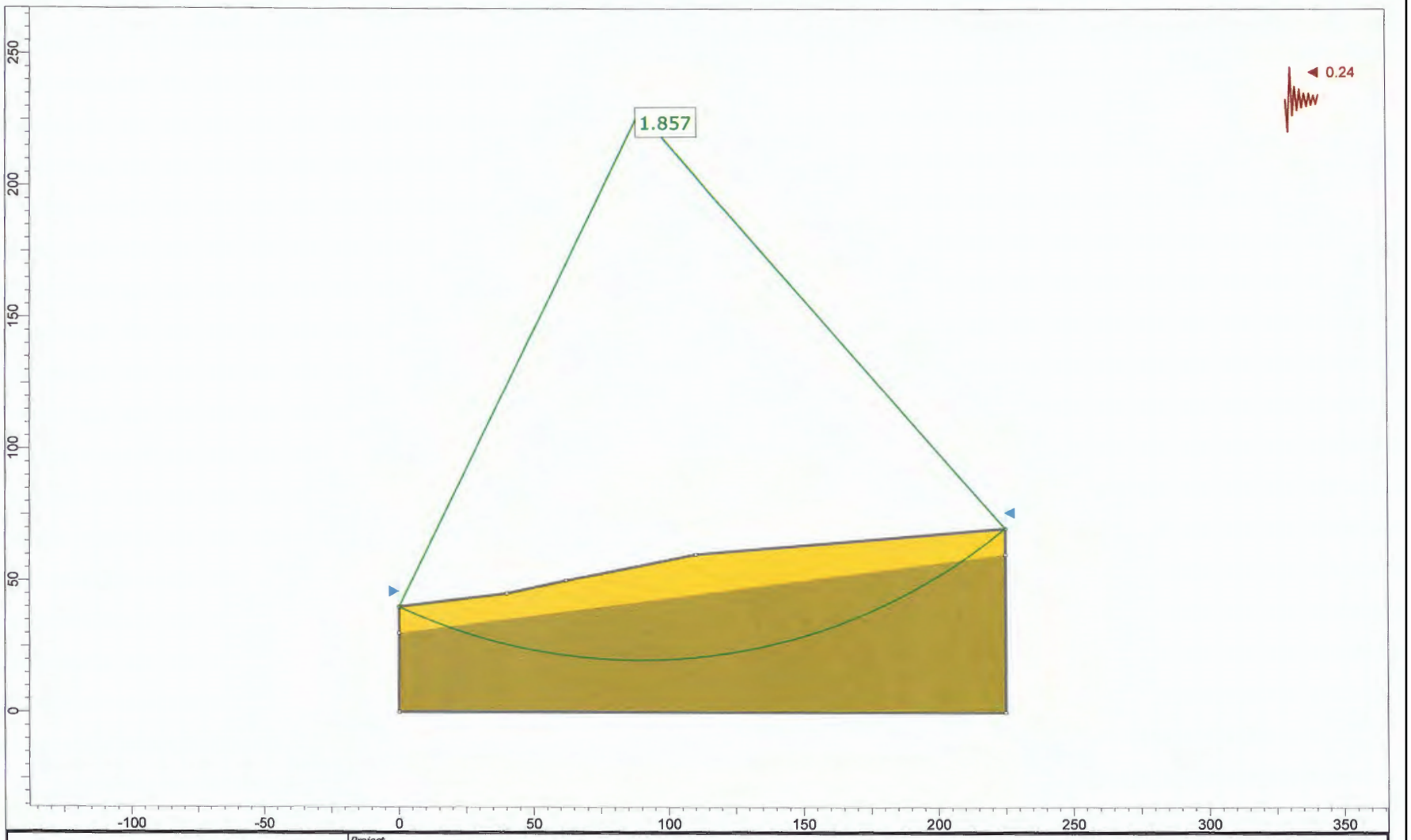
44	111.603	43.0553	10602.6	0	0
45	113.999	45.1998	7920.92	0	0
46	116.247	47.3753	5597.76	0	0
47	118.495	49.7281	3511.2	0	0
48	120.743	52.2822	1759.13	0	0
49	122.991	55.0685	467.77	0	0
50	125.239	58.1286	-195.43	0	0
51	127.487	61.5206	0	0	0

Entity Information

Group: Group 1

Shared Entities

Type	Coordinates
External Boundary	X Y 225 0 225 60 225 70 110 60 62 50 40 45 0 40 0 30 0 0
Material Boundary	X Y 0 30 225 60



rocscience

SLIDEINTERPRET 8.020

Project	Vista Loop Apartments		
Analysis Description			
Drawn By	Daniel M. Redmond, P.E., G.E.	Scale 1:587	Company Redmond Geotechnical Services, LLC
Date	November 21, 2020		File Name Vista Loop Apartments Seismic.slmd

Slide Analysis Information

Vista Loop Apartments Seismic

Project Summary

File Name:	Vista Loop Apartments Seismic.slmd
Slide Modeler Version:	8.02
Compute Time:	00h:00m:00.963s
Project Title:	Vista Loop Apartments
Author:	Daniel M. Redmond, P.E., G.E.
Company:	Redmond Geotechnical Services, LLC
Date Created:	November 21, 2020

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
	Janbu simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Seismic Load Coefficient (Horizontal): 0.24

Materials

Property	Material 1	Material 5
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	110	110
Cohesion [psf]	450	350
Friction Angle [°]	24	26
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: bishop simplified

FS	1.856590
Center:	89.369, 228.460
Radius:	208.568
Left Slip Surface Endpoint:	0.015, 40.002
Right Slip Surface Endpoint:	224.980, 69.998
Resisting Moment:	8.13211e+07 lb-ft
Driving Moment:	4.38013e+07 lb-ft
Total Slice Area:	5650.2 ft2
Surface Horizontal Width:	224.966 ft
Surface Average Height:	25.1158 ft

Method: janbu simplified

FS	1.731380
Center:	95.068, 183.089
Radius:	171.782
Left Slip Surface Endpoint:	0.015, 40.002
Right Slip Surface Endpoint:	224.322, 69.941
Resisting Horizontal Force:	446877 lb
Driving Horizontal Force:	258104 lb
Total Slice Area:	7072.08 ft2
Surface Horizontal Width:	224.307 ft
Surface Average Height:	31.5286 ft

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces:	11493
Number of Invalid Surfaces:	0

Method: janbu simplified

Number of Valid Surfaces: 11438
Number of Invalid Surfaces: 55

Error Codes:

Error Code -108 reported for 41 surfaces
Error Code -111 reported for 4 surfaces
Error Code -112 reported for 10 surfaces

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.85659**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	4.53789	662.052	-24.6812	Material 1	450	24	311.709	578.715	289.1	0	289.1
2	4.53789	1953.83	-23.3164	Material 1	450	24	385.462	715.645	596.65	0	596.65
3	4.53789	3181.93	-21.9656	Material 1	450	24	454.478	843.78	884.444	0	884.444
4	4.53789	4348.21	-20.6274	Material 1	450	24	519.003	963.575	1153.51	0	1153.51
5	4.4484	5336.64	-19.314	Material 5	350	26	554.736	1029.92	1394.04	0	1394.04
6	4.4484	6344.29	-18.0239	Material 5	350	26	615.808	1143.3	1626.51	0	1626.51
7	4.4484	7297.93	-16.7433	Material 5	350	26	672.648	1248.83	1842.88	0	1842.88
8	4.4484	8198.68	-15.4712	Material 5	350	26	725.429	1346.83	2043.79	0	2043.79
9	4.4484	9048.48	-14.207	Material 5	350	26	774.371	1437.69	2230.09	0	2230.09
10	4.4484	9977.17	-12.9497	Material 5	350	26	827.711	1536.72	2433.13	0	2433.13
11	4.4484	10947.5	-11.6987	Material 5	350	26	883.054	1639.47	2643.79	0	2643.79
12	4.4484	11868.4	-10.4534	Material 5	350	26	934.703	1735.36	2840.4	0	2840.4
13	4.4484	12740.4	-9.21307	Material 5	350	26	982.775	1824.61	3023.41	0	3023.41
14	4.4484	13563.7	-7.97707	Material 5	350	26	1027.34	1907.35	3193.04	0	3193.04
15	4.4484	14313.4	-6.74479	Material 5	350	26	1066.95	1980.88	3343.82	0	3343.82
16	4.4484	15000.7	-5.51565	Material 5	350	26	1102.35	2046.62	3478.58	0	3478.58
17	4.4484	15640.9	-4.28904	Material 5	350	26	1134.55	2106.4	3601.14	0	3601.14
18	4.4484	16234.3	-3.06441	Material 5	350	26	1163.61	2160.34	3711.75	0	3711.75
19	4.4484	16781	-1.84117	Material 5	350	26	1189.58	2208.56	3810.62	0	3810.62
20	4.4484	17281.3	-0.618778	Material 5	350	26	1212.51	2251.14	3897.92	0	3897.92
21	4.4484	17735	0.603335	Material 5	350	26	1232.46	2288.18	3973.86	0	3973.86
22	4.4484	18142.4	1.82572	Material 5	350	26	1249.47	2319.75	4038.59	0	4038.59
23	4.4484	18503.2	3.04895	Material 5	350	26	1263.56	2345.91	4092.24	0	4092.24

24	4.4484	18817.4	4.27356	Material 5	350	26	1274.77	2366.73	4134.91	0	4134.91
25	4.4484	19068	5.50013	Material 5	350	26	1282.17	2380.46	4163.06	0	4163.06
26	4.4484	19078.9	6.72924	Material 5	350	26	1275.7	2368.46	4138.45	0	4138.45
27	4.4484	18987.5	7.96147	Material 5	350	26	1263.43	2345.68	4091.75	0	4091.75
28	4.4484	18848.4	9.19742	Material 5	350	26	1248.53	2318.01	4035.01	0	4035.01
29	4.4484	18660.9	10.4377	Material 5	350	26	1231	2285.46	3968.28	0	3968.28
30	4.4484	18424.7	11.683	Material 5	350	26	1210.84	2248.04	3891.55	0	3891.55
31	4.4484	18139	12.9338	Material 5	350	26	1188.07	2205.76	3804.88	0	3804.88
32	4.4484	17803.1	14.191	Material 5	350	26	1162.67	2158.61	3708.2	0	3708.2
33	4.4484	17416.2	15.4552	Material 5	350	26	1134.66	2106.59	3601.55	0	3601.55
34	4.4484	16977.5	16.7272	Material 5	350	26	1104	2049.68	3484.86	0	3484.86
35	4.4484	16485.9	18.0077	Material 5	350	26	1070.7	1987.85	3358.08	0	3358.08
36	4.4484	15940.3	19.2976	Material 5	350	26	1034.73	1921.07	3221.18	0	3221.18
37	4.4484	15339.5	20.5978	Material 5	350	26	996.084	1849.32	3074.06	0	3074.06
38	4.4484	14682	21.9091	Material 5	350	26	954.734	1772.55	2916.65	0	2916.65
39	4.4484	13966.4	23.2326	Material 5	350	26	910.648	1690.7	2748.84	0	2748.84
40	4.4484	13190.9	24.5694	Material 5	350	26	863.799	1603.72	2570.5	0	2570.5
41	4.4484	12353.6	25.9207	Material 5	350	26	814.149	1511.54	2381.52	0	2381.52
42	4.4484	11452.5	27.2876	Material 5	350	26	761.66	1414.09	2181.72	0	2181.72
43	4.4484	10485.2	28.6715	Material 5	350	26	706.292	1311.3	1970.95	0	1970.95
44	4.4484	9449.05	30.074	Material 5	350	26	647.991	1203.05	1749.02	0	1749.02
45	4.4484	8341.23	31.4967	Material 5	350	26	586.704	1089.27	1515.73	0	1515.73
46	4.4484	7158.45	32.9414	Material 5	350	26	522.372	969.831	1270.84	0	1270.84
47	4.4484	5897.03	34.4101	Material 5	350	26	454.932	844.622	1014.13	0	1014.13
48	5.17765	5161.99	36.0301	Material 1	450	24	409.975	761.156	698.868	0	698.868

49	5.17765	3201.89	37.8098	Material 1	450	24	329.402	611.564	362.879	0	362.879
50	5.17765	1093	39.6335	Material 1	450	24	244.462	453.865	8.68085	0	8.68085

- **Global Minimum Query (janbu simplified) - Safety Factor: 1.73138**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	4.54862	872.643	-32.6947	Material 1	450	24	370.438	641.369	429.822	0	429.822
2	4.54862	2568.82	-30.9091	Material 1	450	24	478.934	829.217	851.736	0	851.736
3	4.54862	4169.44	-29.1563	Material 1	450	24	578.719	1001.98	1239.77	0	1239.77
4	4.43565	5521.15	-27.454	Material 5	350	26	647.664	1121.35	1581.5	0	1581.5
5	4.43565	6876.98	-25.7987	Material 5	350	26	739.714	1280.73	1908.27	0	1908.27
6	4.43565	8156.16	-24.1663	Material 5	350	26	824.441	1427.42	2209.03	0	2209.03
7	4.43565	9361.69	-22.5545	Material 5	350	26	902.367	1562.34	2485.65	0	2485.65
8	4.43565	10496.2	-20.9613	Material 5	350	26	973.946	1686.27	2739.75	0	2739.75
9	4.43565	11562.5	-19.3849	Material 5	350	26	1039.6	1799.94	2972.81	0	2972.81
10	4.43565	12685.6	-17.8236	Material 5	350	26	1108.26	1918.82	3216.55	0	3216.55
11	4.43565	13841.4	-16.2759	Material 5	350	26	1178.18	2039.88	3464.76	0	3464.76
12	4.43565	14933.9	-14.7404	Material 5	350	26	1242.77	2151.7	3694.05	0	3694.05
13	4.43565	15964.6	-13.2156	Material 5	350	26	1302.26	2254.71	3905.24	0	3905.24
14	4.43565	16934.5	-11.7003	Material 5	350	26	1356.86	2349.24	4099.04	0	4099.04
15	4.43565	17820.5	-10.1932	Material 5	350	26	1405.15	2432.84	4270.46	0	4270.46
16	4.43565	18631.5	-8.69326	Material 5	350	26	1447.82	2506.73	4421.96	0	4421.96
17	4.43565	19384.5	-7.19928	Material 5	350	26	1486.16	2573.11	4558.06	0	4558.06
18	4.43565	20080.3	-5.71022	Material 5	350	26	1520.28	2632.18	4679.18	0	4679.18
19	4.43565	20719.3	-4.22502	Material 5	350	26	1550.3	2684.15	4785.72	0	4785.72
20	4.43565	21302	-2.74266	Material 5	350	26	1576.3	2729.17	4878.02	0	4878.02
21	4.43565	21828.5	-1.26213	Material 5	350	26	1598.38	2767.4	4956.41	0	4956.41
22	4.43565	22299.1	0.217548	Material 5	350	26	1616.61	2798.96	5021.13	0	5021.13
23	4.43565	22713.9	1.69737	Material 5	350	26	1631.05	2823.96	5072.39	0	5072.39

24	4.43565	23072.6	3.17833	Material 5	350	26	1641.75	2842.5	5110.39	0	5110.39
25	4.43565	23364.8	4.66143	Material 5	350	26	1648.12	2853.53	5133.01	0	5133.01
26	4.43565	23416.2	6.14766	Material 5	350	26	1639.49	2838.58	5102.34	0	5102.34
27	4.43565	23342.7	7.63805	Material 5	350	26	1623.24	2810.44	5044.65	0	5044.65
28	4.43565	23211.8	9.13367	Material 5	350	26	1603.61	2776.45	4974.97	0	4974.97
29	4.43565	23022.8	10.6356	Material 5	350	26	1580.61	2736.64	4893.34	0	4893.34
30	4.43565	22774.9	12.145	Material 5	350	26	1554.25	2690.99	4799.75	0	4799.75
31	4.43565	22467.2	13.6629	Material 5	350	26	1524.52	2639.53	4694.23	0	4694.23
32	4.43565	22098.5	15.1908	Material 5	350	26	1491.42	2582.22	4576.71	0	4576.71
33	4.43565	21667.6	16.7297	Material 5	350	26	1454.93	2519.04	4447.19	0	4447.19
34	4.43565	21173.1	18.2813	Material 5	350	26	1415.02	2449.94	4305.52	0	4305.52
35	4.43565	20613.2	19.8468	Material 5	350	26	1371.67	2374.89	4151.65	0	4151.65
36	4.43565	19986.1	21.4279	Material 5	350	26	1324.84	2293.81	3985.4	0	3985.4
37	4.43565	19289.7	23.0264	Material 5	350	26	1274.49	2206.62	3806.64	0	3806.64
38	4.43565	18521.5	24.6441	Material 5	350	26	1220.55	2113.24	3615.17	0	3615.17
39	4.43565	17678.8	26.283	Material 5	350	26	1162.97	2013.55	3410.79	0	3410.79
40	4.43565	16758.6	27.9455	Material 5	350	26	1101.69	1907.44	3193.22	0	3193.22
41	4.43565	15757.1	29.634	Material 5	350	26	1036.61	1794.76	2962.19	0	2962.19
42	4.43565	14670.5	31.3513	Material 5	350	26	967.639	1675.35	2717.38	0	2717.38
43	4.43565	13494	33.1006	Material 5	350	26	894.691	1549.05	2458.4	0	2458.4
44	4.43565	12222.2	34.8854	Material 5	350	26	817.637	1415.64	2184.87	0	2184.87
45	4.43565	10849	36.71	Material 5	350	26	736.353	1274.91	1896.35	0	1896.35
46	4.43565	9367.16	38.5791	Material 5	350	26	650.7	1126.61	1592.28	0	1592.28
47	4.43565	7767.99	40.4982	Material 5	350	26	560.518	970.47	1272.15	0	1272.15
48	4.43565	6041.34	42.474	Material 5	350	26	465.638	806.196	935.34	0	935.34

49	5.52855	4890.6	44.7759	Material 1	450	24	388.242	672.195	499.057	0	499.057
50	5.52855	1684.4	47.438	Material 1	450	24	264.207	457.444	16.7184	0	16.7184

Interslice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.85659**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	0.0146863	40.0018	0	0	0
2	4.55258	37.9164	1858.09	0	0
3	9.09047	35.9606	4304.83	0	0
4	13.6284	34.1303	7221.71	0	0
5	18.1662	32.4222	10503	0	0
6	22.6146	30.8631	13862.6	0	0
7	27.063	29.4157	17432.8	0	0
8	31.5114	28.0775	21138.9	0	0
9	35.9598	26.8462	24913.7	0	0
10	40.4082	25.72	28697.3	0	0
11	44.8566	24.6971	32472.5	0	0
12	49.305	23.776	36207.4	0	0
13	53.7534	22.9553	39846.9	0	0
14	58.2018	22.2338	43341.2	0	0
15	62.6502	21.6104	46645.1	0	0
16	67.0986	21.0843	49713.9	0	0
17	71.547	20.6548	52510.3	0	0
18	75.9954	20.3211	55003.4	0	0
19	80.4438	20.083	57165.8	0	0
20	84.8922	19.94	58973.5	0	0
21	89.3406	19.892	60405.5	0	0
22	93.789	19.9388	61443.9	0	0
23	98.2374	20.0806	62073.6	0	0
24	102.686	20.3175	62282.4	0	0
25	107.134	20.65	62060.9	0	0
26	111.583	21.0783	61403.3	0	0
27	116.031	21.6032	60325.5	0	0
28	120.479	22.2253	58841.5	0	0
29	124.928	22.9456	56963.9	0	0
30	129.376	23.765	54707.9	0	0
31	133.825	24.6849	52091.1	0	0
32	138.273	25.7065	49134.3	0	0
33	142.721	26.8313	45860.9	0	0
34	147.17	28.0612	42297.4	0	0
35	151.618	29.3981	38473.6	0	0
36	156.067	30.8442	34422.6	0	0
37	160.515	32.4018	30181.2	0	0
38	164.963	34.0736	25790.1	0	0
39	169.412	35.8627	21294.1	0	0
40	173.86	37.7723	16742.8	0	0
41	178.309	39.806	12190.7	0	0
42	182.757	41.968	7697.59	0	0
43	187.205	44.2628	3329.68	0	0

44	191.654	46.6953	-840.208	0	0
45	196.102	49.2713	-4731.66	0	0
46	200.551	51.9969	-8255.71	0	0
47	204.999	54.8793	-11313.7	0	0
48	209.447	57.9263	-13795.9	0	0
49	214.625	61.6923	-15544.6	0	0
50	219.803	65.7099	-16065.9	0	0
51	224.98	69.9983	0	0	0

- **Global Minimum Query (janbu simplified) - Safety Factor: 1.73138**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	0.0146863	40.0018	0	0	0
2	4.5633	37.0823	2731.9	0	0
3	9.11192	34.359	6615.27	0	0
4	13.6605	31.8214	11395.3	0	0
5	18.0962	29.5169	16590.1	0	0
6	22.5318	27.3727	22315.2	0	0
7	26.9675	25.3824	28414.5	0	0
8	31.4031	23.5402	34752.9	0	0
9	35.8388	21.8409	41213.2	0	0
10	40.2744	20.2802	47693.2	0	0
11	44.7101	18.854	54156.1	0	0
12	49.1457	17.559	60551.7	0	0
13	53.5814	16.392	66795.8	0	0
14	58.017	15.3503	72813.6	0	0
15	62.4526	14.4317	78538.5	0	0
16	66.8883	13.6342	83905.6	0	0
17	71.3239	12.956	88860.6	0	0
18	75.7596	12.3957	93360	0	0
19	80.1952	11.9521	97365.4	0	0
20	84.6309	11.6244	100843	0	0
21	89.0665	11.412	103765	0	0
22	93.5022	11.3142	106107	0	0
23	97.9378	11.3311	107847	0	0
24	102.373	11.4625	108970	0	0
25	106.809	11.7088	109463	0	0
26	111.245	12.0705	109316	0	0
27	115.68	12.5483	108537	0	0
28	120.116	13.1431	107140	0	0
29	124.552	13.8562	105140	0	0
30	128.987	14.6892	102556	0	0
31	133.423	15.6438	99408.4	0	0
32	137.859	16.722	95722.8	0	0
33	142.294	17.9264	91528.3	0	0
34	146.73	19.2597	86857.9	0	0
35	151.166	20.725	81749.3	0	0
36	155.601	22.326	76244.7	0	0
37	160.037	24.0668	70391.9	0	0
38	164.473	25.9521	64244	0	0
39	168.908	27.987	57860.9	0	0
40	173.344	30.1776	51309.3	0	0
41	177.779	32.5307	44664.3	0	0
42	182.215	35.0539	38010.2	0	0
43	186.651	37.7563	31441.8	0	0

44	191.086	40.6479	25066.4	0	0
45	195.522	43.7406	19005.8	0	0
46	199.958	47.048	13399	0	0
47	204.393	50.5863	8405.74	0	0
48	208.829	54.3745	4210.72	0	0
49	213.265	58.4353	1029.74	0	0
50	218.793	63.9208	-733.296	0	0
51	224.322	69.941	0	0	0

Entity Information

Group: Group 1

Shared Entities

Type	Coordinates	
	X	Y
External Boundary	225	0
	225	60
	225	70
	110	60
	62	50
	40	45
	0	40
	0	30
	0	0

Type	X	Y
Material Boundary	0	30
	225	60

REDMOND GEOTECHNICAL SERVICES

EXHIBIT J

Mr. Dave Vandehey
Roll Tide Property Corporation
P.O. Box 703
Cornelius, Oregon 97113

Dear Mr. Vandehey:

Re: Supplemental Geotechnical Consultation Services, Proposed Deer Meadows Residential Subdivision, Tax Lot No's. 9000 and 1000, 40808 and 41010 Highway 26, Sandy (Clackamas County), Oregon

In accordance with your request, we have completed our review of the proposed site development plans for the above subject Deer Meadows (previously Vista Loop Apartments) residential subdivision project. As you are aware, we previously performed a Geotechnical Investigation and Consultation Services for the proposed Vista Loop Apartments development the results of which were presented in our formal report dated November 23, 2020.

Specifically, we understand that present plans are to development subject property by constructing thirty-two (32) new single-family residential homes at the site as well as new public street improvements. Reportedly, the new residential homes will be single- and/or two-story wood frame structures constructed with wood-framing and raised wooden post and beam floors.

Earthwork and site grading for the project is anticipated to result in cuts and/or fills of about five (5) feet or less.

In this regard, based on the results of our previous Geotechnical Investigation report as well as the results of our review of the currently proposed Deer Meadows residential subdivision project, it is our professional opinion that the findings, conclusions and/or recommendations presented in the above subject Geotechnical report are applicable and/or suitable for use with the proposed Deer Meadows residential subdivision site and/or project. As such, we take no exceptions at this time with regard to the proposed Deer Meadows residential subdivision project plans.

PO BOX 20547 • PORTLAND, OREGON 97294 • FAX 503/286-7176 • PHONE 503/285-0598

We appreciate this opportunity to be of service to you at this time and trust that the above information is suitable to your present needs. Should you have any questions or require any additional information, please do not hesitate to call.

Sincerely,

Daniel M. Redmond, P.E., G.E.
President/Principal Engineer

Schwabe
WILLIAMSON & WYATT®

EXHIBIT K

March 31, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL

Mr. Kelly O'Neill, Jr., Director
City of Sandy Planning Department
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: Application by Roll Tide Properties Corporation for Approval of the Deer Meadows Tentative Residential Subdivision Application (the "Application") for 32 Lots in the R-1, R-2, C-3 Zoning Districts on 15.91 Acres; March 31, 2021 Submittal Date

Dear Mr. O'Neill:

This office represents the Applicant.

Enclosed with this letter is a completed City of Sandy (the "City") land use application form signed by the property owners and a check in the amount of $5,543.00 made payable to the City. Sandy Development Code ("SDC") 17.18.30.A. The Applicant will submit the remainder of the required application materials within 180 days of this submittal date of March 31, 2021, or by September 27, 2021. The application form and check are sufficient to start the City's thirty-day completeness review period for the Application under ORS 227.178(2).

The relevant approval criteria for the Application are those in effect on the date of the Application submittal. ORS 227.178(3). Subsequently enacted land use regulations will not be applicable to the Application as long as it is made complete within 180 days of the submittal date.

The Application is both a limited land use application ("LLUA") and a residential application within the City's Urban Growth Boundary (the "UGB"). The statutes described below are not the opinion of the Applicant but represent decisions made by the Oregon Legislature that require Oregon cities to apply the statutes to a housing or residential application in order to remove all discretion from review and approval of such applications.

The Application is a LLUA as defined in ORS 197.015(12) because it requests approval of a tentative subdivision application within the UGB. LLUAs are subject to ORS 197.195(1). This statute provides that the City may apply Comprehensive Plan (the "Plan") policies, including elements of the Plan, such as a Parks Master Plan or a Transportation System Plan, to an application only if the Plan policies are expressly incorporated into the land use regulations. The relevant approval criteria in the SDC, the City's land use regulations, for this Application include only Plan policies that have been specifically incorporated into the SDC. *Paterson v. City of*

Bend, 201 Or App 344 (2005)*; Oster v. City of Silverton*, __ Or LUBA __ (LUBA No. 2018-103, July 7, 2019).

The Application is also a residential application within the UGB. The Application seeks approval of a tentative subdivision application to create lots for single family detached and attached dwellings. ORS 197.303(1). The residential application is for property located in the UGB. The City has only a single approval path for tentative subdivision applications, so the Applicant does not have a choice of application paths. ORS 197.307(6). *See also* ORS 227.175(4)(b)(iii). Because only a single path is available to the Applicant, the City may apply only clear and objective approval procedures, standards and conditions to the Application. ORS 197.307(4). The City may apply conditions to an application but the conditions must be clear and objective. ORS 197.307(7). The Application narrative will explain which SDC standards are clear and objective and may be applied to the Application and which SDC standards are not clear and objective and may not be applied to the Application.

The exceptions in ORS 197.303(5) and (6) and 197.307(5) do not apply to this Application.

In the event that the City finds that a relevant approval criteria is not met, the City must offer the Applicant an opportunity to either amend the Application, or to offer a condition of approval to satisfy the approval criteria. ORS 197.522(3).

Finally, ORS 227.175(4)(b) provides that the City may not deny an application for a housing development within the UGB if the application complies with clear and objective approval criteria. The City may not approve a housing development application within the UGB conditioned upon a reduction in density or height unless necessary to resolve a health, safety or habitability issue, or to comply with a protective measure adopted pursuant to a Statewide Planning Goal. ORS 227.175(4)(e). The City did not identify any such protective measures in the pre-application conference with the Applicant on March 17, 2021.

The Applicant held the required pre-application conference on March 17, 2021 after the Planning Director cancelled the first pre-application conference scheduled for February 10, 2021. SDC 17.18.20.

This Application is not prohibited by SDC 17.18.90, "Re-Application Following Denial." The Planning Director told the participants at the pre-application conference that he found this Application not to be prohibited by this standard. Notwithstanding the Director's finding, this standard is not clear and objective because it contains non-clear and objective standards and requires a non-clear and objective procedure for determining compliance and may, therefore, not be applied to the Application.

Please provide me, Mr. Dave Vandehey (dave.vandehey@accessmax.com) and Mr. Brown with the City's completeness determination, all correspondence to and from the City concerning this Application and all notices of public hearings for this Application.

Very truly yours,

Michael C. Robinson

MCR:jmhi
Enclosures

cc: Mr. Dave Vandehey *(via email) (w/enclosures)*
Mr. Carey Sheldon *(via email) (w/enclosures)*
Mr. Alex Reverman *(via email) (w/enclosures)*
Mr. Tracy Brown *(via email) (w/enclosures)*
Mr. Ray Moore *(via email) (w/enclosures)*
Mr. Mike Ard *(via email) (w/enclosures)*
Ms. Shelley Denison *(via email) (w/enclosures)*
Mr. David Doughman *(via email) (w/enclosures)*

PDX\126769\255102\MCR\30488479.1

Schwabe
WILLIAMSON & WYATT®

EXHIBIT L

June 11, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL

Mr. Kelly O'Neill, Jr., Director
City of Sandy Development Services Department
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy File No. 21-014 SUB/TREE

Dear Mr. O'Neill:

This office represents the Applicant for the above-referenced Application. This letter confirms the discussion that you and I had on June 1, 2021 regarding your request that the Applicant consider an initial extension of the 120-day period as authorized by ORS 227.178(5).

The Applicant will submit its completeness response on or about June 14, 2021. Rather than have the 120-day period start on the date of submittal when all missing materials are provided in accordance with state law, the Applicant will extend the 120-day period from the submittal date through July 27, 2021. The 120-day period will start on July 27, 2021 and the 120-day period will end on November 24, 2021. The Applicant is not required to further extend the 120-day period.

The extension is conditioned upon your scheduling the initial evidentiary hearing before the Sandy Planning Commission on September 27, 2021. The final decision must be issued by November 24, 2021 based on this extension.

The Applicant hereby extends the 120-day period from the submittal date through July 27, 2021. Please place this letter in the official Development Services Department file for this Application.

Very truly yours,

Michael C. Robinson

MCR:jmhi

cc: Mr. Dave Vandehey *(via email)*
Mr. Carey Sheldon *(via email)*
Mr. Alex Reverman *(via email)*
Mr. Tracy Brown *(via email)*

Mr. Ray Moore *(via email)*
Mr. Mike Ard *(via email)*
Ms. Shelley Denison *(via email)*
Mr. David Doughman *(via email)*

PDX\126769\255102\MCR\31043687.1

EXHIBIT M

SANDY FIRE DISTRICT NO. 72
Fire Prevention Division

E-mail Memorandum

To: Sandy Planning Department

From: Gary Boyles

Date: August 10, 2021

Re: Deer Meadows 32-lot Subdivision File No. 21-014 SUB/TREE

Review and comments are based upon the current version of the Oregon Fire Code (OFC) as adopted by the Oregon Office of State Fire Marshal. The scope of this review is typically limited to fire apparatus access and water supply, although the applicant shall comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. References, unless otherwise specified, include provisions found in the Metro Code Committee's Fire Code Applications Guide, OFC Chapter 5 and appendices B, C and D.

COMMENTS:

General

1. All future construction activities shall comply with the applicable Oregon Fire Code.
2. Compliance with the following conditions is required prior to the commencement of any new use or occupancy.
    a. construction plans detailing access and water supply requirements are to be submitted to the Fire District for review and approval.
    b. Any additional information required by the Fire District, such as details and specifications, must be provided.
    c. All required inspections, corrections, and final approvals from the Fire District must be obtained.
3. Construction documents detailing compliance with fire apparatus access and fire protection water supply requirements shall be provided to Sandy Fire District for review and approval upon building permit submittal.

4. Where fire apparatus access roads or a water supply for fire protection are required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction except where approved alternative methods of protection are provided.

5. Buildings shall be provided with approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property, including monument signs.

Fire Apparatus Access

FIRE APPARATUS ACCESS ROAD (as defined by the OFC). A road that provides fire apparatus access from a fire station to a facility, building or portion thereof. This is a general term inclusive of all other terms such as *fire lane*, public street, private street, parking lot lane and access roadway.

1. Fire apparatus access roads shall be within 150 feet of all portions of the exterior wall of the first story of any building as measured by an approved route around the exterior of the building. An approved turnaround will be required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet.

2. Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround.

3. Fire apparatus access roadway grades shall not exceed 10 percent. Intersections and turnarounds shall be as level as possible and have a maximum of 5 percent grade with the exception of crowning for water run-off. Considerations of grades up to 15 percent may be allowed with a proposed alternate in accordance with the provisions of ORS 455.610(5).

4. Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet and an unobstructed vertical clearance of 13 feet 6 inches is to be maintained.

5. When the Sandy Planning De distance between the grade plane and a building's highest roof surface exceeds 30 feet, approved aerial fire apparatus access roads shall be provided. For purposes of this requirement, the highest roof surface shall be determined by measurements to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater. If buildings are more than 30 feet in height, as measured above, the following requirements apply:
    a. Aerial fire apparatus access roads shall be provided and have a minimum unobstructed width of 26 feet exclusive of shoulders or parking, in the immediate vicinity of the building or portion thereof that will accommodate aerial operations.
    b. The aerial fire apparatus access road shall be located not less than 15 feet nor greater than 30 feet from the building and shall be positioned parallel to one entire side of the building.
    c. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the fire code official.

d. Overhead utility and power lines shall not be located within the aerial fire apparatus access road or between the aerial fire apparatus access road and the building.

6. The inside turning radius and outside turning radius for fire apparatus access roads shall be not less than 28 feet and 48 feet respectively, measured from the same center point.

7. Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, "NO PARKING-FIRE LANE" signs shall be placed on one or both sides of the roadway and in turnarounds as needed.

8. Streets and roads shall be identified with approved signs. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles.

Firefighting Water Supplies

1. The minimum available fire-flow and flow duration for commercial and industrial buildings shall be as specified in OFC Appendix B. In no case shall the resulting fire-flow be less than 1,500 gpm at 20 psi residual.

2. The minimum available fire flow for one- and two-family dwellings served by a municipal water supply shall be 1,000 gpm at 20 psi residual provided the fire area of the dwelling(s) does not exceed 3,600 square feet. For dwellings that exceed 3,600 square feet, the required fire-flow shall be determined in accordance with OFC Appendix B, Table B105.1(2).

3. Fire flow testing will be required to determine available fire flow. Testing will be the responsibility of the applicant. Applicant to contact the City of Sandy Public Works for testing information and requirements and notify the Fire Marshal prior to fire flow testing.

4. For one- and two-family dwellings served by a municipal water system, all portions of the dwellings shall be located within 600 feet from a fire hydrant on a fire apparatus access road, as measured in an approved route that is approved by the fire code official (The intent is that not more than 600 feet of hose will have to be laid out to reach all portions of the exterior grade level of a structure).

5. Prior to the start of combustible construction, required fire hydrants shall be operational and accessible.

6. Fire hydrants installed within the Sandy Fire District shall comply with the following requirements:
    a. Flow requirements and location of fire hydrants will be reviewed and approved by Sandy Fire upon building permit submittal.
    b. Each new fire hydrant installed shall be ordered in an OSHA safety red finish and have a 4-inch non-threaded metal faced hydrant connection with cap installed on the steamer port. If a new building, structure, or dwelling is already served by an existing hydrant, the existing

hydrant shall also be OSHA safety red and have a 4-inch non-threaded metal faced hydrant connection with cap installed.

7. The minimum number and distribution of fire hydrants shall be in accordance with City of Sandy requirements and OFC Appendix C.

NOTE:

Sandy Fire District comments may not be all inclusive based on information provided. A more detailed review may be needed for future development to proceed.

Please do not hesitate to contact Fire Marshal Gary Boyles at 503-891-7042 or fmboyles.sandyfire@gmail.com should you have any questions or concerns.

Oregon
Kate Brown, Governor

Department of Transportation
Region 1 Headquarters
123 NW Flanders Street
Portland, Oregon 97209
(503) 731.8200
FAX (503) 731.8259

EXHIBIT N

9/1/21 ODOT #11953

ODOT Response

Project Name: Deer Meadows (Bull Run Terrace)	**Applicant:** Dave Vandehey, Roll Tide Properties, Corp.
Jurisdiction: City of Sandy	**Jurisdiction Case #:** 21-014 SUB/TREE
Site Address: 40808 and 41010 Highway 26, Sandy, OR	**Legal Description:** 02S 05E 18CD **Tax Lot(s):** 00900
State Highway: US 26	**Mileposts:** 25.56

The site of this proposed land use action is adjacent to US 26. ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation. **Please direct the applicant to the District Contact indicated below to determine permit requirements and obtain application information.**

COMMENTS/FINDINGS

ODOT recommends that the City require the applicant to construct Dubarko Rd as shown in the adopted Transportation System Plan (TSP). Consistent with OAR 660-012-0045, completing this connection would implement the adopted road network in the TSP. The extension of this arterial would provide increased connectivity for the proposed development as well as other residents of the City. This would help reduce motor vehicle congestion and provide more options for those walking, biking, and using transit.

Planning within the City of Sandy has assumed the Dubark Rd connection for over a decade. For example, the Sandy Area Metro Transit Master Plan identifies this connection as a way to provide increased service on the east side of Sandy and to more efficiently serve residents along Vista Loop Rd. In addition, a signalized intersection at this location would provide a safer location for pedestrians and bicyclists to cross US 26 and for motor vehicles to access the southern part of the City.

This segment of highway is access controlled and ODOT and City policy support consolidating access points at public streets rather than allowing multiple private accesses to individual properties. Due to the high speeds at this location, additional highway access could be dangerous and difficult to approve, particularly for any commercially zoned property such as the parcel on the east side of this proposed development.

Finally, ODOT recommends that the City require frontage improvements consistent with City, ODOT, and ADA standards (Please see additional information below).

ODOT RECOMMENDED LOCAL CONDITIONS OF APPROVAL

Frontage Improvements and Right of Way

☒ Curb, sidewalk, cross walk ramp(s) bikeways and road widening shall be constructed as necessary to be consistent with local, ODOT and ADA standards.

☒ Right of way deeded to ODOT as necessary to accommodate the planned cross section shall be provided. The deed must be to the State of Oregon, Oregon Department of Transportation. The ODOT District contact will assist in coordinating the transfer. ODOT should provide verification to the local jurisdiction that this requirement has been fulfilled. The property owner must be the signatory for the deed and will be responsible for a certified environmental assessment of the site prior to transfer of property to the Department.

Note: It may take up to **3 months** to transfer ownership of property to ODOT.

ADVISORY INFORMATION

Access Control

☒ The applicant is advised that the subject property's highway frontage is access controlled. ODOT has acquired and owns all access rights to the subject property and the proposed use does not have an access right to the highway.

Noise

☒ The applicant is advised that a residential development on the proposed site adjacent to the freeway may be exposed to traffic noise levels that exceed federal noise guidelines. Builders should take appropriate measures to mitigate this impact. It is generally not the State's responsibility to provide mitigation for receptors that are built after the noise source is in place.

Please send a copy of Notice of Decision including conditions of approval to:

ODOT Region 1 Planning
Development Review
123 NW Flanders St
Portland, OR 97209

ODOT_R1_DevRev@odot.state.or.us

Development Review Planner: Seth Brumley	503.731.8234, Seth.A.Brumley@odot.state.or.us
Traffic Contact: Avi Tayar, P.E.	503.731.8221
District Contact: Loretta Kieffer	503.667.7441

Staff Report
City of Sandy
39250 Pioneer Blvd.,
Sandy, OR 97055

EXHIBIT O

To: Planning Commission

Date: August 30, 2021

From: Sarah Richardson, Staff Liaison Parks and Trails Advisory Board

Subject: Deer Meadow Proposed Development

Attachments: Bull Run Terrace Recommendation.

I am sending this communication on behalf of the Sandy Parks and Trails Advisory Board.

The board met on August 11th, 2021 and reviewed the proposed Deer Meadow development.

The subject property is adjacent to the Deer Pointe neighborhood and a portion abuts city owned parkland that was acquired in 2007 (dedicated as Tract D with Deer Pointe No. 2. Plat Number 4111, recorded on February 9, 2007). This parcel is about 1.4 acres in size.

The vision for this currently undeveloped park parcel has always included adjacent parkland dedication from the subject property. Additionally, a conceptual design has been prepared and has been through an initial public comment period as part of the updated Parks and Trails Master Plan.

The residents of the Deer Pointe and surrounding neighborhood have been waiting patiently since 2007 to see the dedicated parkland in their neighborhood developed.

The board received an overview of the Deer Meadow proposal from Development Services Director Kelly O'Neill and heard from the developer's representative Tracy Brown. The board is disappointed in the current proposal because it does not include the dedication of the land that would be adjacent to the Deer Pointe parcel.

The board feels strongly that their original recommendation should stand and recommends that the city require parkland dedication. It is the hope of the board that the city and the developer can reach an agreement that includes land dedication that is adjacent to the existing city owned property in the Deer Pointe neighborhood. This would allow the development of a true neighborhood park in an underserved area of the community.

The updated Parks and Trails Master Plan defines a Neighborhood Park as close to home recreational opportunities that is 2-5 acres in size.

We thank you for your consideration in this matter.

Staff Contact:
Sarah Richardson
503-489-2150
srichardson@cityofsandy.com

REPLINGER & ASSOCIATES LLC
TRANSPORTATION ENGINEERING

EXHIBIT P

August 30, 2021

Mr. Kelly O'Neill
City of Sandy
39250 Pioneer Blvd.
Sandy, OR 97055

SUBJECT: REVIEW OF TRANSPORTATION IMPACT STUDY – DEER MEADOWS SUBDIVISION

Dear Kelly:

In response to your request, I have reviewed materials submitted in support of the Deer Meadows on Dubarko Road in the east part of Sandy. The Transportation Impact Study (TIS), dated June 14, 2021, was prepared under the direction of Michael Ard, PE of Ard Engineering. A future street plan and preliminary plat, dated 7/26/2018, were also provided.

The site, with approximately 16 acres, is on the southwest side of US 26 and is bisected by Dubarko Road, a planned minor arterial road specified in the Sandy Transportation System Plan (TSP). TIS describes a proposal to subdivide the property; extend Dubarko Road from its present east terminus into the site; and create lots for low density dwellings and some apartments. A portion of the development is zoned for commercial uses but is not proposed to be developed at this time.

A significant feature of the development plan is that the applicant ignores the TSP and does not propose extending Dubarko Road, currently a stub street, to connect with US 26 opposite SE Vista Loop (West) as specified in the TSP. Instead, the TIS proposes "a new north/south collector roadway" as the eastern terminus of Dubarko Road.

It is also important to note that the analysis includes no development of the commercially zoned land, which is approximately 3 acres. The TIS indicates a need for further analysis when development of that commercial land is proposed.

Overall

TIS addresses some of the city's requirements but does not provide an adequate basis to evaluate impacts of the proposed development. Key deficiencies include a failure to provide for the extension of Dubarko Road to connect with US 26 as specified in the

TSP and a failure to account for development of or access to the commercially zone land (approximately 3 acres) that comprises a portion of "Lot 32" in the proposed development.

Comments

1. ***Study Area.*** The study includes analyses of:

   - US 26 at SE Ten Eyck Road;
   - US 26 at SE Langensand Road;
   - Highway 211 at Dubarko Road; and
   - Dubarko Road at SE Langensand Road.

   Since the applicant assumes that Dubarko Road will not connect to US 26, the TIS does not include an analysis of this intersection.

2. ***Traffic Counts.*** The AM and PM peak hour traffic counts were conducted during March 2019. The engineer adjusted the traffic counts to account for seasonal variations. The engineer used a combination approach to account for seasonal variation of recreational traffic and separately for commuter traffic on US 26. Volumes on Highway 211 were adjusted by a straight 8 percent. The methodology appears consistent with the procedures defined by the Oregon Department of Transportation (ODOT).

   The engineer's use of pre-COVID-19 counts is understandable, but new analyses needed to address the full impact of the development should be based on new traffic counts.

3. ***Trip Generation.*** The TIS uses trip generation for single-family dwellings and multi-family dwellings (land use code 210 and 220, respectively) from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. The engineer calculates that 32 single-family homes plus 120 apartments would produce 79 total AM peak hour trips; 99 total PM peak hour trips; and 1180 total daily trips. The calculation of trips generated by the residential development appears reasonable.

   This calculation does not include potential trips associated with the future development of the commercially zoned land within the development area. The TIS states that "the nature of this future use has not yet been determined. Accordingly,

a future traffic study will be required as part of the design review application for the future commercial site use."

By failing to any development of the commercially zoned land, the applicant has not shown the impact of the proposed removal of a key element of the TSP – namely Dubarko Road, which is shown connecting with US 26 at Vista Loop Drive (West).

4. ***Trip Distribution.*** The TIS provided information about trip distribution from the site. The engineer assumed 65 percent of the traffic would travel to and from the northwest on US 26; 20 percent would travel to and from the southeast on US 26; and 15 percent would travel to and from the west on Dubarko Road. On a city-wide scale, the trip distribution seems reasonable. However, the proposed elimination of Dubarko Road results in localized impacts in the immediate vicinity that will result in different travel patterns than anticipated in the TSP.

5. ***Traffic Growth.*** The TIS uses a 1.96 percent annual increase for Highway 26 based on projected volumes at the west boundary of Sandy. For Highway 211, the TIS uses an annual growth rate of 3.13 percent. For other facilities it uses a 2.0 percent annual growth rate to account for background traffic growth. The following in-process developments were included in the background traffic: the Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and Bornstedt Views. These assumptions account for future traffic and appear reasonable.

6. ***Analysis.*** Traffic volumes were calculated for the intersections cited in #1, above. Intersection level-of-service (LOS) and the volume-to-capacity (v/c) ratio were provided. The intersection of US 26 with SE Ten Eyck Road is signalized; the other intersections are stop-controlled. The analyses were conducted for existing 2021 conditions, 2023 background conditions, and 2023 with the development.

   The engineer calculates that the signalized intersection of US 26 with Ten Eyck meets the v/c standards specified by ODOT under all scenarios. At the intersection of US 26 with Langensand Road, the v/c for both the mainline and minor street approaches are calculated to meet ODOT's v/c standard. However, long delays (the basis for LOS) are calculated to occur on the minor street approaches under existing and future conditions.

The intersection of Dubarko Road and Langensand Road is predicted to operate acceptably under all scenarios. The intersection will operate at LOS "B" or better, meeting city operational standards.

The engineer makes the following statement about the intersection of Highway 211 with Dubarko Road:

> *The intersection of Oregon Highway 211 at Dubarko Road was previously under the jurisdiction of the Oregon Department of Transportation and subject to a volume-to-capacity ratio standard rather than level of service. The intersection would have met ODOT standards for operation, but with conversion to a city intersection it is projected to operate at level of service "E" either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control (as recommended in the safety analysis section of this report on page 20), the intersection is projected to operate at level of service D, thereby meeting the city's operational standard.*

Since the TIS did not examine the impact of development of the commercially zoned portion of the site, it is not clear that LOS D would be achieved with full development of the subject property. It appears that only a little more development in Sandy would push the Dubarko Road Highway 211 intersection to LOS E and cause the need for mitigation.

The engineer concluded that "All other intersections are projected to operate acceptably per the appropriate jurisdictional standards."

7. ***Crash Information.*** The TIA provides information on crashes for the most recent available five-year period covering 2015 through 2019.

   At the intersection of US 26 and SE Ten Eyck Road, there were eight reported and a relatively low crash rate. At the intersection of US 26 and Langensand Road, there were seven reported crashes and a low crash rate. At the intersection of Dubarko Road and Langensand Road, there was one reported crash.

   The intersection of Highway 211 and Dubarko Road has been a safety concern for years and has undergone safety improvements. During the five-year period, 27 crashes were reported. The crash rate is substantially above the 90th percentile crash rate for similar intersections. Crashes remain a problem following

implementation of safety improvements that included realigning the Dubarko Road approaches and added striping on Highway 211. The engineer notes that the crash history indicates warrants are met for all-way stop control. He recommends consideration of the installation of all-way stop control to address safety issues. I concur.

8. ***Site Plan and Access.*** The site plan provides for the extension of Dubarko Road, but only to a "new north/south collector roadway." Until such time as other development occurs to the south, Dubarko Road will serve as the principal access to the development. The only other access proposed at this time is Fawn Street, which would connect to Meadow Avenue just west of the subdivision.

   The site plan makes no provision for access to the commercially zoned land (a portion of "Lot 32"). The site plan does not show a new subdivision street abutting the commercially zoned portion of "Lot 32." The applicant appears to be assuming that the commercially zone portion of "Lot 32" would have direct driveway access to US 26, though this appears to conflict with ODOT access control policies. Alternatively, the applicant may be assuming some type of cross-easements or shared driveway connections involving the residentially zoned portion of "Lot 32" would be acceptable. Neither option appears viable.

   The engineer failed to explain how the site would be developed to serve all uses in the absence of the Dubarko Road extension identified in the TSP. I think this is a serious deficiency. I recommend delaying any approvals until issues of access are fully developed and justified.

9. ***Sight Distance.*** The engineer did not analyze sight distance at the proposed intersections within the development. Given the terrain, sight distance is unlikely to be a problem and can be dealt with in subsequent proceeding.

10. ***Traffic Signal Warrants.*** The engineer conducted a preliminary traffic signal warrant analysis at several locations based on ODOT procedures. He concluded that traffic signal warrants were not met at any location.

    He concluded that all-way stop-control was warranted at the intersection of Highway 211 and Dubarko Road based on the intersection crash history.

11. ***Left-Turn Lane Warrants.*** The TIS indicates that left-turn lanes are provided on eastbound US 26 at Langensand Road.

According to the engineer, the intersection of Highway 211 at Dubarko Road currently meets warrants for a northbound left-turn lane and a northbound right-turn lane. However, he states that the need for these turn lanes is not materially related to the proposed development. He further states that turn lane may not be needed if all-way stop control is installed at the intersection as recommended based on his safety analysis.

According to the TIS, turn lanes are not warranted at the intersection of Dubarko Road and Langensand Road.

12. ***Conclusions and Recommendations.*** The engineer concludes that the intersections will meet ODOT and city operational standards for the study area intersections either with or without the development. Note that no development is assumed for the commercially zoned portion of the development.

    While most study area intersections are operating relatively safely, the intersection of Highway 211 and Dubarko Road suffers from a high number of crashes and a high crash rate. It is substantially higher than the 90th percentile crash rate for comparable intersections. Recent safety improvements to not appear to have altered this trend. The proposed development is among those that are be expected to increase the traffic using the intersection of Highway 211 and Dubarko Road. The engineer recommends consideration be given to converting the intersection of Highway 211 and Dubarko Road to all-way stop control for safety reasons based on the historical data. He recommends no other mitigation to address safety issues.

Conclusion and Recommendations

As noted repeatedly above, the applicant is proposing to eliminate the planned connection of Dubarko Road with US 26 at Vista Loop Drive (West). Instead, he proposes to terminate Dubarko Road at a "new north/south collector roadway" near his property's west boundary. The TIS provides no justification for this change to the planned street system. There is no analysis showing the impacts on other portions of the street system caused by his proposed elimination of the minor arterial connection represented by Dubarko Road.

Another serious deficiency is the failure to account for development of the commercially zoned portion of "Lot 32." This land, totaling almost 3 acres, has the potential to generate substantial traffic. The traffic generated by this future commercial

use cannot be ignored, especially considering the applicant's proposal to eliminate the planned connection of Dubarko Road to US 26.

The failure to explain site circulation and how all portions of the site will have access to the street network is another deficiency.

I recommend denial of the application based on the inadequacy of the TIS. I think the applicant has two paths to approval. The first involves submitting a new application that provides for the extension of Dubarko Road to US 26 as specified in the TSP. The second involves seeking a TSP amendment with an alternative arterial and collector street network that allows the regional needs to be met without the section of Dubarko Road he proposes to eliminate. Undertaking the necessary analysis to support this amendment and supporting the public process and adoption process would be an expensive and time- consuming undertaking.

If you have any questions or need any further information concerning this review, please contact me at replinger-associates@comcast.net.

Sincerely,

John Replinger, PE
Principal

DeerMeadowsTIS083021

Sandy Transit
16610 Champion Way
Sandy, OR 97055

EXHIBIT Q

Memorandum

Date: August 26, 2021

To: Kelly O'Neill, Planning Director; Marisol Martinez, Permit Technician I

From: Andi Howell, Transit Director

Re: Transit Requests Deer Meadows Subdivision Proposal

Per review of Deer Meadows Subdivision Proposal, the Transit Department requests the extension of Dubarko Rd from Meadow Ave to Highway 26. Dubarko Rd is a planned extension (page 50, Transit Master Plan) providing a minor arterial to Highway 26. Additionally, the Comprehensive Plan requires the street connections and walkability necessary for high transit ridership in high density and mixed use developments such as this proposal. Highway 26 access also allows for the most efficient operations of high ridership transit.

Two complimentary transit amenities will be required along the completed Dubarko Rd. The amenities required are a 6 ft long green metal bench (Fairweather model PL-3, powder-coated RAL6028) mounted on a 7' X 9.5' pad which could accommodate a 5' X 7.5' bus shelter. Transit suggests these are located at lot 3 and lot 32.

Please contact the Transit Department for specific location, amenity information and pad engineering specifications at 503-489-0925 or ahowell@ci.sandy.or.us.

Andi Howell

Transit Director

EXHIBIT R

M E M O R A D U M

TO: KELLY O'NEILL, DEVELOPMENT SERVIES DIRECTOR
FROM: MIKE WALKER, DIRECTOR OF PUBLIC WORKS
RE: PUBLIC WORKS COMMENTS - FILE NO. 21 -014 SUB/TREE
DATE: AUGUST 31, 2021

The following are Public Works' comments on the above-referenced application.

Transportation
Dubarko Rd. and the public access lane identified as Street "C" create "T" intersections at their connection to Street "A" and Street "B" respectively. The distance between the two nearest edges of the right-of-way between Dubarko Rd. (an arterial) and the public access lane is less than the minimum 150 ft. dimension in sections 17.84.50(E)2 Sandy Municipal Code (SMC).

Street "B" is designated as a collector on the site plan and roughly corresponds to the location of a collector street depicted in the TSP. Section 17.98.80 states that "Accesses to arterials or collectors shall be located a minimum of 150 feet from any other access or street intersection. " The distance between public access lane identified as Street "C" at its connection to Street "B" and Dubarko Road is less than the 150 ft. dimensional standard in this section of the Code.

Sheet C5 of the applicant's submission contains a statement indicating that "Both of the proposed cul-de-sacs have less than 50% of their circumference covered by driveway drops". No dimensional information is shown on the site plan to support this statement. The location, number and width of all driveway approaches in cul-de-sacs shall not exceed the dimensional standards in section 17.98.100 SMC.

The site plan does not depict frontage improvements (curbs, sidewalks, street lighting, storm drainage, etc.) on the Highway 26 frontage of the site required under section 17.84.50(F)1 and 17.84.30(A) SMC.

The proposed alignment of Dubarko does not connect to Hwy 26 as shown in the TSP and as required in section 17.84.50(D).

Utilities
The proposed 10' wide public storm drainage easements depicted between lots 27 and 28 and at the rear of lots 9-13 do not meet the minimum dimensional requirement for public facility easements in section 17.84.90(A)2 SMC.

The applicant shall install all water lines and fire hydrants in compliance with the applicable standards in Section 17.100.230, which lists requirements for water facilities. The existing 8-inch diameter water line resides in an easement granted to the City of Sandy recorded at 2004-110340. The applicant shall replace the existing waterline with an 8-inch diameter water line at a depth approved by the City Engineer. There will be no

compensation or credits for replacement of the existing water line. This pipe is a standard pressure line and will be used to provide domestic water service to the development. The City's water master plan shows an 18-inch diameter water line in Dubarko Road south of Highway 26. The applicant shall install an 18-inch water line in Dubarko Rd. connected to the existing 18-inch water line at the west end of the site and the existing 12-inch line on Highway 26. Due to the elevation of the site relative to the existing water reservoirs on Vista Loop Drive this line will be a low-pressure, high-volume line and will be used for fire protection. The cost difference between a standard diameter water line and the required 18-inch water line is eligible for Water System Development Charge (SDC) credits. The amount of the credit provided will be based on the Water System Construction Cost Credit table in the Water System Development Charge Methodology adopted by City Council motion on September 5, 2017.

Section 17.84.60D SMC states: "As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies)". The applicant shall extend the existing 12-inch water main in Highway 26 east from the proposed intersection of Dubarko Road and Highway 26 to the east boundary of the site. The cost difference between a standard diameter (8 inch) water line and the required 12-inch water line is eligible for Water System Development Charge (SDC) credits. The amount of the credit provided will be based on the Water System Construction Cost Credit table in the Water System Development Charge Methodology adopted by City Council motion on September 5, 2017.

General
Public utility and street plans for land use applications are submitted to comply with the requirements in 17.100.60 SMC. Land use approval does not connote approval of utility or street construction plans which are subject to a separate submittal and review process.

Marisol Martinez <mmartinez@ci.sandy.or.us>

EXHIBIT S

21-014 SUB/TREE

Gary Roche <groche51@gmail.com> Mon, Aug 16, 2021 at 9:46 AM
To: planning@ci.sandy.or.us

Deer Meadows
File # 21-014 SUB/TREE

Planning Division,
This is going to be a traffic nightmare for the Deer Pointe neighborhood. The development has most of the new units using Street A or Fawn St to enter or leave the neighborhood.
Going on the worst case scenario where each new unit has two vehicles and they are each used once a day:

30 lots in R-1 = 60 vehicles
68 units in R-2 = 136 vehicles
C-3 zoned land = unknown number of vehicles

That means 196 vehicles times two trips a day equals 392 trips a day on Fawn, Meadow, Antler or Dubarko. I can't imagine 392 additional cars a day going past my house. It would be horrible. These are all narrow streets. When people park on both sides of the street, which they always do, only one vehicle can get through. Children play in the streets. It is only a matter of time before a car is sideswiped or a child is hit when you have that number

of vehicles on these narrow streets.

The developer should be required to connect the development to Hwy 26 to ease the burden on these residential streets. Or do something else to keep the vehicles off those streets and funnel them to Dubarko, which is wider with no parking.

And please add speed humps on those streets to slow the traffic.

Thank you

Gary and Val Roche
40494 Fawn St

COMMENT SHEET for File No. 21-014 SUB/TREE:

EXHIBIT T

The lastest proposal has no R-3 zone which was our major opposition to the last two proposals. However this proposal does not have Dubarko going all the way to Route 26. That means that all the traffic into the new subdivision would come down Dubarko from Langensand. This puts a terrible burden on our neighborhood! We oppose any development that doesn't have Dubarko exiting to Route 26. Such a large new subdivision needs an entrance from Route 26

RECEIVED
AUG 23 2021
CITY OF SANDY

Your Name: Dave & Nancy Allan

Phone Number: 503-826-0282

Address: 18417 Meadow Ave, Sandy, OR

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.20 Public Hearings; 17.22 Notices; 17.28 Appeals; 17.30 Zoning District Amendments; 17.36 Low Density Residential (R-1); 17.38 Medium Density Residential (R-2); 17.46 Village Commercial (C-3); 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.100 Land Division; 17.102 Urban Forestry; 15.30 Dark Sky; and, 15.44 Erosion Control Regulations.

Marisol Martinez <mmartinez@ci.sandy.or.us>

EXHIBIT U

File # 21-014 SUB/TREE

1 message

Ashley <yukich20@gmail.com> Mon, Aug 23, 2021 at 9:11 PM
To: planning@ci.sandy.or.us, koneill@ci.sandy.or.us

To Whom It May Concern,

As a resident, I would like to provide my input on the potential new development located "South of Highway 26, east of Meadow Avenue."

I would like to see this proposed development denied.

These are my following reasons:

Noise:
It is important to keep the treeline and naturescape to limit the amount of noise coming into the neighborhood from HWY 26.

Park:
A community park is not sufficient when you are asking to rip out forest areas to build. I would like to see the entire "R-1 Zone "developed and committed to a significant park - Deer Point Park (trail through nature/trees, dog park, splash pad, playground area, picnic tables). This would show an understanding of the residents of Sandy and put a buffer in between infrastructures. This could also help with noise reduction if more trees were planted.

Roadways:
There needs to be roadway access into the new development directly from HWY 26. A stop light also needs to be put into place on HWY 26 to accommodate the amount of traffic new development would bring into the area. Fawn Street should NOT go through as the neighborhoods do not have the capacity for this much traffic. Dubarko is the only street (if any) that should lead into the new development from the west side. Traffic includes school buses, garbage/recycling trucks, public transportation, street parking, residential traffic, etc. SE Langensand RD and other roads in the neighborhood are not

maintained well enough for the current amount of traffic so there is no way that it could handle anymore.

Multifamily Dwellings:
Only single family homes should be built in this area. No Multifamily dwellings should be approved as the land cannot support this infrastructure long term.

Sincerely,

Ashley Yukich
(503) 758-0359
18331 Antler Ave.
Sandy, OR 97055

EXHIBIT V

COMMENT SHEET for File No. 21-014 SUB/TREE:

My opinion on this matter has not changed. This is a small community + 66 Unites will effect traffic + parking is a big problem for that many Unites. Again this is not what we were told when we purchased our home it was not multi family Unites it was single family homes + a small park for the children. I expect this to be carried out pleas.

RECEIVED
SEP 08 2021
CITY OF SANDY

Marilyn Eutemeier (503) 964-1132
Your Name Phone Number

40482 Buck Street
Address

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.20 Public Hearings; 17.22 Notices; 17.28 Appeals; 17.30 Zoning District Amendments; 17.36 Low Density Residential (R-1); 17.38 Medium Density Residential (R-2); 17.46 Village Commercial (C-3); 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.100 Land Division; 17.102 Urban Forestry; 15.30 Dark Sky; and, 15.44 Erosion Control Regulations.

Exhibit W

Dear Planning Commission, City Planning Staff, and City Councilors:

Received 9.14.21

I have lived in the Deer Pointe neighborhood for the past 10 years. I moved to the City of Sandy because of its small town feel and the lower population compared to many other cities in the Urban Growth Boundary. We, as a community, have seen more and more cars and homeless people moving into the area. The traffic in this area has gotten severely worse over the last few years. There are times when you have to wait several minutes just to get onto 26. This is not acceptable and is only going to get worse when you add in more neighborhoods like the proposed one at the Deer Meadows Subdivision. You all need to think about the ramifications on the residents that currently live here and not the ones that will be moving here. I have no problem with the city growing, but make sure it is done correctly. Please make sure that the builders will adhere to the original plans and not build any apartment complexes. I have no problems with single family dwellings or low density housing.

Also, when we built here, we were told that the park across the street was going to be doubled in size. There was a plan to have a walking path, basketball courts, and a playground in the park. The new plans by the builders don't have a park at all and have houses built there instead. With every other neighborhood in the area, there is a park in the middle of it for the kids and families to use. The original plans should still be intact and not be replaced by more houses.

I don't understand why the citizens of the City of Sandy have to argue against building new subdivision housing areas. The amount of traffic that is going to be in the neighborhood of Deer Pointe is going to be at dangerous levels. The cars in the neighborhoods across the city are already packing the side streets to get away from Highway 26. With the new proposal of Deer Meadows it is going to be a problem with no outlet to Highway 26. All the houses in that neighborhood will have to all go through Deer Pointe. This is going to increase the traffic to an already congested neighborhood. There is no outlet on Dubarko because of the expense that the builders will have to incur. There has to be other outlets out of the neighborhood. Please take in consideration the citizens and their concerns and not just focus on the money that will be coming into the city.

Scott Ruehrdanz
40498 Fawn Street
Sandy, Oregon
715-703-0839

EXHIBIT X

Schwabe
WILLIAMSON & WYATT®

February 8, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL

Mr. Kelly O'Neill, Jr.
Development Services Director
City of Sandy
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: Roll Tide Properties, LLC / Bull Run

Dear Mr. O'Neill:

As we will discuss on February 10 for Bull Run, attached are sections of the Sandy Development Code that (a) include subjective standards and procedures and provide for subjective conditions; and (b) improperly incorporate or fail to incorporate the Sandy Comprehensive Plan, the Sandy TSP, and other public facilities plans. Also included for your reference are related Oregon statutes and case law discussing same. For ease of review, we have highlighted the subjective criteria and procedures (and related statutes/case law) in gold or yellow; and the incorporation of the various Plans (and related statutes/case law) in aqua.

We are looking forward to our next meeting.

Very truly yours,

Michael C. Robinson

MCR:jmhi
Enclosures

cc: Mr. Dave Vandehey *(via email) (w/enclosures)*
Mr. Alex Reverman *(via email) (w/enclosures)*
Mr. Carey Sheldon *(via email) (w/enclosures)*
Mr. Mike Ard *(via email) (w/enclosures)*
Mr. Ray Moore *(via email) (w/enclosures)*
Mr. Tracy Brown *(via email) (w/enclosures)*
Christopher D. Crean, Esq. *(via email) (w/enclosures)*
Ms. Shelley Denison *(via email) (w/enclosures)*
Ms. Erin Forbes *(via email) (w/enclosures)*

PDX\126769\255102\MCR\30094350.1

197.195 Limited land use decision; procedures. (1) A limited land use decision shall be consistent with applicable provisions of city or county comprehensive plans and land use regulations. Such a decision may include conditions authorized by law. Within two years of September 29, 1991, cities and counties shall incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations. A decision to incorporate all, some, or none of the applicable comprehensive plan standards into land use regulations shall be undertaken as a post-acknowledgment amendment under ORS 197.610 to 197.625. If a city or county does not incorporate its comprehensive plan provisions into its land use regulations, the comprehensive plan provisions may not be used as a basis for a decision by the city or county or on appeal from that decision.

(2) A limited land use decision is not subject to the requirements of ORS 197.763.

(3) A limited land use decision is subject to the requirements of paragraphs (a) to (c) of this subsection.

(a) In making a limited land use decision, the local government shall follow the applicable procedures contained within its acknowledged comprehensive plan and land use regulations and other applicable legal requirements.

(b) For limited land use decisions, the local government shall provide written notice to owners of property within 100 feet of the entire contiguous site for which the application is made. The list shall be compiled from the most recent property tax assessment roll. For purposes of review, this requirement shall be deemed met when the local government can provide an affidavit or other certification that such notice was given. Notice shall also be provided to any neighborhood or community organization recognized by the governing body and whose boundaries include the site.

(c) The notice and procedures used by local government shall:

(A) Provide a 14-day period for submission of written comments prior to the decision;

(B) State that issues which may provide the basis for an appeal to the Land Use Board of Appeals shall be raised in writing prior to the expiration of the comment period. Issues shall be raised with sufficient specificity to enable the decision maker to respond to the issue;

(C) List, by commonly used citation, the applicable criteria for the decision;

(D) Set forth the street address or other easily understood geographical reference to the subject property;

(E) State the place, date and time that comments are due;

(F) State that copies of all evidence relied upon by the applicant are available for review, and that copies can be obtained at cost;

(G) Include the name and phone number of a local government contact person;

(H) Provide notice of the decision to the applicant and any person who submits comments under subparagraph (A) of this paragraph. The notice of decision must include an explanation of appeal rights; and

(I) Briefly summarize the local decision making process for the limited land use decision being made.

(4) Approval or denial of a limited land use decision shall be based upon and accompanied by a brief statement that explains the criteria and standards considered relevant to the decision, states the facts relied upon in rendering the decision and explains the justification for the decision based on the criteria, standards and facts set forth.

(5) A local government may provide for a hearing before the local government on appeal of a limited land use decision under this section. The hearing may be limited to the record developed pursuant to the initial hearing under subsection (3) of this section or may allow for the introduction of additional testimony or evidence. A hearing on appeal that allows the introduction of additional testimony or evidence shall comply with the requirements of ORS 197.763. Written notice of the decision rendered on appeal shall be given to all parties who appeared, either orally or in writing, before the hearing. The notice of decision shall include an explanation of the rights of each party to appeal the decision. [1991 c.817 §3; 1995 c.595 §1; 1997 c.844 §1]

197.303 "Needed housing" defined. (1) As used in ORS 197.286 to 197.314, "needed housing" means all housing on land zoned for residential use or mixed residential and commercial use that is determined to meet the need shown for housing within an urban growth boundary at price ranges and rent levels that are affordable to households within the county with a variety of incomes, including but not limited to households with low incomes, very low incomes and extremely low incomes, as those terms are defined by the United States Department of Housing and Urban Development under 42 U.S.C. 1437a. "Needed housing" includes the following housing types:

(a) Attached and detached single-family housing and multiple family housing for both owner and renter occupancy;

(b) Government assisted housing;

(c) Mobile home or manufactured dwelling parks as provided in ORS 197.475 to 197.490;

(d) Manufactured homes on individual lots planned and zoned for single-family residential use that are in addition to lots within designated manufactured dwelling subdivisions; and

(e) Housing for farmworkers.

(2) For the purpose of estimating housing needs, as described in ORS 197.296 (3)(b), a local government shall use the population projections prescribed by ORS 195.033 or 195.036 and shall consider and adopt findings related to changes in each of the following factors since the last review under ORS 197.296 (2)(a)(B) and the projected future changes in these factors over a 20-year planning period:

(a) Household sizes;

(b) Household demographics;

(c) Household incomes;

(d) Vacancy rates; and

(e) Housing costs.

(3) A local government shall make the estimate described in subsection (2) of this section using a shorter time period than since the last review under ORS 197.296 (2)(a)(B) if the local government finds that the shorter time period will provide more accurate and reliable data related to housing need. The shorter time period may not be less than three years.

(4) A local government shall use data from a wider geographic area or use a time period longer than the time period described in subsection (2) of this section if the analysis of a wider geographic area or the use of a longer time period will provide more accurate, complete and reliable data relating to trends affecting housing need than an analysis performed pursuant to

subsection (2) of this section. The local government must clearly describe the geographic area, time frame and source of data used in an estimate performed under this subsection.

(5) Subsection (1)(a) and (d) of this section does not apply to:

(a) A city with a population of less than 2,500.

(b) A county with a population of less than 15,000.

(6) A local government may take an exception under ORS 197.732 to the definition of "needed housing" in subsection (1) of this section in the same manner that an exception may be taken under the goals. [1981 c.884 §6; 1983 c.795 §2; 1989 c.380 §1; 2011 c.354 §2; 2017 c.745 §4; 2019 c.639 §6; 2019 c.640 §10a]

197.307 Effect of need for certain housing in urban growth areas; approval standards for residential development; placement standards for approval of manufactured dwellings. (1) The availability of affordable, decent, safe and sanitary housing opportunities for persons of lower, middle and fixed income, including housing for farmworkers, is a matter of statewide concern.

(2) Many persons of lower, middle and fixed income depend on government assisted housing as a source of affordable, decent, safe and sanitary housing.

(3) When a need has been shown for housing within an urban growth boundary at particular price ranges and rent levels, needed housing shall be permitted in one or more zoning districts or in zones described by some comprehensive plans as overlay zones with sufficient buildable land to satisfy that need.

(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.

(5) The provisions of subsection (4) of this section do not apply to:

(a) An application or permit for residential development in an area identified in a formally adopted central city plan, or a regional center as defined by Metro, in a city with a population of 500,000 or more.

(b) An application or permit for residential development in historic areas designated for protection under a land use planning goal protecting historic areas.

(6) In addition to an approval process for needed housing based on clear and objective standards, conditions and procedures as provided in subsection (4) of this section, a local government may adopt and apply an alternative approval process for applications and permits for residential development based on approval criteria regulating, in whole or in part, appearance or aesthetics that are not clear and objective if:

(a) The applicant retains the option of proceeding under the approval process that meets the requirements of subsection (4) of this section;

(b) The approval criteria for the alternative approval process comply with applicable statewide land use planning goals and rules; and

(c) The approval criteria for the alternative approval process authorize a density at or above the density level authorized in the zone under the approval process provided in subsection (4) of this section.

(7) Subject to subsection (4) of this section, this section does not infringe on a local government's prerogative to:

(a) Set approval standards under which a particular housing type is permitted outright;

(b) Impose special conditions upon approval of a specific development proposal; or

(c) Establish approval procedures.

(8) In accordance with subsection (4) of this section and ORS 197.314, a jurisdiction may adopt any or all of the following placement standards, or any less restrictive standard, for the approval of manufactured homes located outside mobile home parks:

(a) The manufactured home shall be multisectional and enclose a space of not less than 1,000 square feet.

(b) The manufactured home shall be placed on an excavated and back-filled foundation and enclosed at the perimeter such that the manufactured home is located not more than 12 inches above grade.

(c) The manufactured home shall have a pitched roof, except that no standard shall require a slope of greater than a nominal three feet in height for each 12 feet in width.

(d) The manufactured home shall have exterior siding and roofing which in color, material and appearance is similar to the exterior siding and roofing material commonly used on residential dwellings within the community or which is comparable to the predominant materials used on surrounding dwellings as determined by the local permit approval authority.

(e) The manufactured home shall be certified by the manufacturer to have an exterior thermal envelope meeting performance standards which reduce levels equivalent to the performance standards required of single-family dwellings constructed under the Low-Rise Residential Dwelling Code as defined in ORS 455.010.

(f) The manufactured home shall have a garage or carport constructed of like materials. A jurisdiction may require an attached or detached garage in lieu of a carport where such is consistent with the predominant construction of immediately surrounding dwellings.

(g) In addition to the provisions in paragraphs (a) to (f) of this subsection, a city or county may subject a manufactured home and the lot upon which it is sited to any development standard, architectural requirement and minimum size requirement to which a conventional single-family residential dwelling on the same lot would be subject. [1981 c.884 §5; 1983 c.795 §3; 1989 c.380 §2; 1989 c.964 §6; 1993 c.184 §3; 1997 c.733 §2; 1999 c.357 §1; 2001 c.613 §2; 2011 c.354 §3; 2017 c.745 §5; 2019 c.401 §7]

PARKVIEW TERRACE DEVELOPMENT LLC, Petitioner,
and JOSEPHINE HOUSING AND COMMUNITY DEVELOPMENT COUNCIL, Intervenor-Petitioner,
v.
CITY OF GRANTS PASS, Respondent,
and DAVID R. MANNIX, MELISSA S. CANON EAVES, CAREY GILBERT, JAMES FREGO, CYNTHIA FREGO, SHAUN HOBACK, RANDY R. LEMMON, TONI J. LEMMON, DAVID J. HOLMAN and JOANNA H. LOFASO, Intervenors-Respondents.

LUBA No. 2014-024

LAND USE BOARD OF APPEALS OF THE STATE OF OREGON

July 23, 2014

FINAL OPINION AND ORDER

Appeal from City of Grants Pass.

Michael C. Robinson, Portland, filed a joint petition for review and argued on behalf of petitioner. With him on the brief were Seth J. King, Perkins Coie LLP, Benjamin E. Freudenberg and Davis, Adams, Freudenberg, Day & Galli.

Benjamin E. Freudenberg, Grants Pass, filed a joint petition for review

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on behalf of intervenor-petitioner. With him on the brief were Davis, Adams, Freudenberg, Day & Galli, Michael C. Robinson, Seth J. King, and Perkins Coie LLP.

No appearance by City of Grants Pass.

David R. Mannix, Grants Pass, filed the response brief and argued on his own behalf. Melissa S. Canon Eaves, Carey Gilbert, James Frego, Cynthia Frego, Shaun Hoback, Randy R. Lemmon, Toni J. Lemmon, David J. Holman and Joanna H. Lofaso, Grants Pass, represented themselves.

HOLSTUN, Board Member; RYAN, Board Chair; BASSHAM, Board Member, participated in the decision.

You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

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Opinion by Holstun.

NATURE OF THE DECISION

Petitioners appeal a city council decision denying its application for site plan approval and a variance from street and block length standards to permit construction of 50 units of federally assisted housing for low-income individuals.

INTERVENORS-RESPONDENTS

In a June 19, 2014 order, we allowed intervenor-respondent Mannix's response brief. In that order, we determined we would not consider intervenor-respondent Gilbert's response brief because it was not timely filed. No other intervenor-respondent filed a response brief. In this opinion, we therefore refer in the singular to the only intervenor-respondent who timely filed a response brief.

MOTION TO FILE REPLY BRIEF

Petitioner Parkview Terrace Development LLC, the applicant below, and intervenor-petitioner Josephine Housing and Community Development Council, which administers a federally supported housing voucher program and supports the proposal (together petitioners) move for permission to file a reply brief to respond to alleged "new matters" raised in the response brief. The reply brief is allowed.

MOTION TO STRIKE RESPONSE BRIEF

Petitioners move to strike portions of intervenor-respondent's response brief, including three exhibits that are not included in the record filed by the city in this matter, as well as related passages in the response brief that rely upon those exhibits, and additional parts of the response brief that include

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factual assertions that petitioners contend are not supported by evidence in the record.

With exceptions that do not apply here, LUBA's review is limited to the record filed by the local government. ORS 197.835(2). The three exhibits (exhibits A, C and D) are not included in the record, and we understand intervenor-respondent to offer those exhibits for their evidentiary value. Petitioners' motion to strike the exhibits is granted.

With regard to the portions of the response brief that petitioners contend rely on those exhibits and are not supported by the record, LUBA disregards any allegations of material fact that are not supported by the record. However, a lack of evidentiary support for arguments and factual allegations in a response brief is not a basis for striking those portions of the brief. *Hammock & Associates, Inc. v. Washington County,* 16 Or LUBA 75, 78, *aff'd* 89 Or App 40, 747 P2d 373 (1987).

STANDING

In his response brief, intervenor-respondent challenges intervenor-petitioner's standing, arguing that the Josephine Housing and Community Development Council, as an entity, did not "appear through counsel" in the local proceedings in this matter. Intervenor-Respondent's Brief 1. In our May 1, 2014 Order, we concluded that the Council had appeared through its executive director and that intervenor-respondent failed to establish that the Council was required under county procedures to appear through counsel. Intervenor-respondent offers no reason in his response brief to question those conclusions, and we adhere to them.

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FACTS

The subject property is zoned High Density Residential (R-3) and includes approximately 3.02 acres. There are residential townhouses (Maple Park) to the south of the subject property, a warehouse to the north, a mini-storage facility to the east, and a city park to the west. Many of the intervenors-respondents reside in Maple Park.

In 2006, the City of Grants Pass approved the Maple Park planned unit development (Maple Park PUD). The city's Maple Park PUD approval decision authorized an 88-unit residential development in three phases. Simultaneously, the city also approved a major variance to the street section design, maximum cul-de-sac length, and street separation standards. The Maple Park PUD developer constructed 28 townhouse units in developing Phase I but failed to complete the remaining units that were to be constructed as Phases II and III, apparently due to the recent recession. Petitioner is a successor-in-interest to the original developer. Petitioner wishes to construct a 50-unit multi-family housing project (Parkview Terrace) in place of Phases II and III of the Maple Park PUD. The 50 units would be multi-family rental units, all owned by petitioner, rather than town houses that would be separately owned.

In addition to seeking approval for the site plan, petitioner also sought approval for a variance to the city's street block length standards. The city's staff reviewed petitioner's applications and recommended approval, subject to a number of conditions. The Urban Area Planning Commission (UAPC) held a public hearing on the applications and, on December 11, 2013, approved the site plan and variance applications with conditions.

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On December 19, 2013, intervenors-respondents and others appealed the UAPC's decision to the city council. The city council reversed the UAPC's decision and denied petitioner's applications. This appeal followed.

MAPLE PARK PUD PHASES II AND III

Before turning to petitioners' assignments of error, we note that a recurring point of dispute between the parties is the current status of Maple Park PUD Phases II and III. Many of the parties' evidentiary disputes also have to do with Maple Park PUD Phases II and III. The city council's decision is a revision of the UAPC's decision with unchanged text, strikeouts (city council deletions) and bold italic text (city council additions). In the city council's decision, text from the UAPC's decision stating that that Maple Park PUD Phases II and III are "active" is stricken through, indicating that text was deleted from the city council's decision and findings. Record 13. The following finding from the UAPC's decision was not changed by the city council:

> "The applicant has notified the Planning Department of its withdrawal of the previous approval(s) for Phases II and III of Maple Park PUD." *Id.*

According to petitioners, the reference to the applicant's withdrawal is a reference to a January 17, 2014 letter from petitioner's executive director to the planning department that makes the following request:

> "As the owner of the property identified by Josephine County Assessor's map ID #36-05-20-DC and tax lot #2201, we request irrevocable termination of any and all land development entitlement rights under the tentative PUD approval for Phase II & Phase III of the Maple Park Townhomes * * * and hereby waive any right to forever rely on any entitlement rights granted by said approval." Record 201.

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We understand the city council to have determined that the city's approval for Phases II and III of Maple Park PUD has been withdrawn or terminated and are no longer active.

In his response brief, intervenor-respondent argues:

> "This particular application ignored the existence of the PUD when it submitted its plans. When opponents raised the question, supporters of the application came up with an ad hoc series of increasingly bizarre theories as to why the PUD did not currently exist. The last one was that a successor in interest (3 parties away from the original) could simply unilaterally revoke the PUD, and accordingly, in mid-process (February 2014) submitted a letter to the Planning Department saying in effect, 'I revoke.' The theory that a successor in interest may years later simply unilaterally revoke a PUD upon which many other parties have relied, is of course, logical nonsense. * * *. Intervenor-Respondent's Brief 18.

We understand intervenor-respondent to challenge the above finding that the city's approval of Maple Park PUD Phases II and III has been withdrawn. Intervenor-respondent contends that the city's approval of Maple Park PUD Phases II and III remains effective and provides an independent basis for affirming the city council's decision to deny petitioner's site plan, which is inconsistent with Maple Park PUD Phases II and III.

There are two problems with intervenor-respondent's position regarding Maple Park PUD

Phases II and III. First, the city council adopted the opposite position from intervenor-respondent's regarding the continued existence of the city's prior approval of Maple Park PUD Phases II and III. Intervenor-respondent contends the above-quoted finding—that petitioner withdrew that approval—was prepared by the planning staff and was not adopted by the city council. While the above-quoted finding apparently was prepared by planning staff and adopted initially by the UAPC, the city council adopted the UAPC's

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decision, including its findings, as its own, except where the city council adopted additions and deletions. Those findings, as amended, were "Approved by the City Council." Record 24. Thus, while the city council may not have been the author of the disputed finding, the city council clearly adopted the finding.

The second problem with intervenor-respondent's position is that LUBA's rules expressly authorize intervenors-respondents to assign error to aspects of a decision on appeal, whether they agree or disagree with the ultimate disposition in the decision.

> "Cross Petition: Any respondent or intervenor-respondent who seeks reversal or remand of an aspect of the decision on appeal regardless of the outcome under the petition for review may file a cross petition for review that includes one or more assignments of error. *A respondent or intervenor-respondent who seeks reversal or remand of an aspect of the decision on appeal only if the decision on appeal is reversed or remanded under the petition for review may file a cross petition for review that includes contingent cross-assignments of error, clearly labeled as such.* The cover page shall identify the petition as a cross petition and the party filing the cross petition. *The cross petition shall be filed within the time required for filing the petition for review and must comply in all respects with the requirements of this rule governing the petition for review,* except that a notice of intent to appeal need not have been filed by such party." OAR 661-010-0030(7) (emphases added).

Intervernor-respondent asks LUBA to reverse the finding regarding the city's prior approval of Maple Park PUD Phases II and III, so that the continued viability of Maple Park PUD Phases II and III would provide an independent basis for affirming the city council's denial decision in the event LUBA sustains one or more of petitioners' assignment of error. Intervenor-respondent did not file a cross petition for review with a contingent assignment of error

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assigning error to the city council's finding and making the arguments it makes in its response brief.

Citing *BenjFran Development v. Metro Service Dist.,* 17 Or LUBA 1009, 1011-1012 (1988), intervenor-respondent contends it was not required to file a cross petition for review. *BenjFran* was decided in 1988, when LUBA's rules simply authorized cross petitions for review, without specifying the circumstances in which they are to be filed. The reason LUBA adopted OAR 661-010-0030(7) is to require that arguments such as the one intervenor-respondent advances in its response brief be set out earlier in a cross petition for review, to avoid the possibility of delay, since response briefs typically are filed shortly before the date set for oral argument. Because intervenor-respondent did not file a cross petition for review in accordance with OAR 661-010-0030(7), we do not consider intervenor-respondent's arguments that the city's prior approval of Maple Park PUD Phases II and III remains effective or that the possible continued existence of city approval for Phases II and III

provides an independent basis for affirming the city council's decision to deny petitioner's application for site plan approval.

FIRST ASSIGNMENT OF ERROR

Under their first assignment of error, petitioners argue the proposal is a proposal for "needed housing," as that term is defined at ORS 197.303.[1] Because the proposal is a proposal for "needed housing," petitioners contend the proposal may only be subject to approval standards that are "clear and objective." Petitioners argue that the city was advised, during the proceedings below, that petitioners took the position that a number of standards that would

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otherwise apply to the proposal are not "clear and objective standards" and for that reason may not be applied to deny the proposal. Petitioners contend that the city council nevertheless applied a number of standards that are not "clear and objective" to deny the application for site plan approval. Petitioners argue the city council never responded to petitioners' contention that those standards may not be applied to a proposal for "needed housing." Petitioners assign error to the city's failure to respond to this issue in its findings and separately assign error to the city council's decision to apply those standards as bases for denial of the site plan.

A. Needed Housing

The Oregon Legislature has recognized a need to make housing available to people earning low, middle, or fixed incomes. ORS 197.307(1).[2] ORS

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197.303 defines "needed housing" as "housing types determined to meet the need shown for housing within an urban growth boundary at particular price ranges and rent levels * * *." Among other types, the statute identifies "[g]overnment assisted housing" as a type of "needed housing." ORS 197.303(1)(b). The city's comprehensive plan identifies a need for over 4,100 housing units that are affordable to households with incomes of less than $37,200. Record 832. The proposal is for government assisted housing that is affordable to persons with incomes of less than $37,200 and therefore qualifies as "needed housing."

Intervenor-respondent does not really dispute that the proposal qualifies as "needed housing," but argues that the housing that would have been provided if Phases II and III of Maple Park PUD were completed as approved also qualifies as "needed housing." The definition of "needed housing" in ORS 197.303 is so broad that intervenor-respondent is likely correct. However, even if the proposal is a proposal to substitute one type of "needed housing" for another type of "needed housing," that does not mean the proposal is a proposal for something other than "needed housing."

B. Petitioners' Findings Challenge

As we explain in more detail below, we agree with petitioners that a number of standards that the city applied in this case to deny the proposal are not "clear and objective standards," as is required by ORS 197.307(4). Before doing so, we agree initially with petitioners that it was error for the city not to

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respond in its decision to the issue of whether those standards qualify as "clear and objective standards." As we explained in *Rosenzweig v. City of McMinnville,* 64 Or LUBA 402, 410-11 (2011):

> "LUBA has consistently held 'that when a relevant issue is adequately raised by testimony or other evidence in the record, that issue must be addressed in the decision maker's findings.' *Blosser v. Yamhill County,* 18 Or LUBA 253, 264 (1989) (citing *Norvell v. Portland*

> *Metropolitan LGBC,* 43 Or App 849, 852-53, 604 P2d 896 (1979)); *see also Friends of Umatilla County,* 55 Or LUBA 333, 337 (2007); *Marcott Holdings, Inc. v. City of Tigard;* 30 Or LUBA 101, 107-08 (1995). However, as we pointed out in *Faye Wright Neighborhood Planning Council v. Salem,* 1 Or LUBA 246, 252 (1980), 'not every assertion by a participant in a land use decision warrants a specific finding.' A petitioner at LUBA must (1) identify the issue raised, (2) demonstrate that the issue was *adequately* raised and (3) establish that the issue is relevant in some way (usually by showing that the issue raises a question regarding an applicable approval standard). * * *." (Emphasis in original.)

Petitioner identified seven standards that the city ultimately applied to deny the proposal and took the position that they are not "clear and objective" and could not be applied to deny petitioner's request for approval of a proposal for "needed housing." Grants Pass Development Code (GPDC) 19.052(2) (Record 261); GPDC 19.052(4) (Record 271); GPDC 19.052(5) (Record 272); GPDC 19.052(6) (Record 272); GPDC 19.052(8)(a) and (e) (Record 273-74); GPDC 19.052(9) (Record 274-75); GPDC 19.052(11) (Record 275). Petitioners have adequately identified the issue and demonstrated that the issue was adequately raised. Since the city relied on all of those subjective standards to deny the application, the issue is relevant. The city should have responded to that issue in its findings, and it erred by failing to do so.

C. Clear and Objective Standards

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ORS 197.307(4) provides that local governments are only authorized to apply "clear and objective standards, conditions and procedures" in reviewing applications for "needed housing." *See* n 2.

1. Intervenor-Respondent's Arguments

Intervenor-respondent offers a number of reasons why he believes the "clear and objective standards" requirement of ORS 197.307(4) either does not apply or was satisfied in this case.

First, intervenor-respondent contends the requirement for "clear and objective standards" only applies to "[a]esthetic criteria." Intervenor-Respondent's Brief 13. Intervenor-respondent does not identify the basis for that argument, and there is nothing in the text of ORS 197.307(4) that limits the requirement for "clear and objective standards" to aesthetic criteria. Petitioners speculate that intervenor-respondent may be relying on the pre-2011 version of ORS 197.307(3)(b). If so, that version of ORS 197.307(3)(b) was repealed in 2011. Or Laws 2011, ch 354, sec 3. Intervenor-respondent also fails to recognize that the pre-2011 version of ORS 197.307(3) subsections (b) and (c) were a nested exception to the general requirement for "clear and objective standards" for "needed housing" to allow certain large jurisdictions to impose aesthetic regulations on "needed housing." The pre-2011 version of ORS 197.307 also included a general requirement for "clear and objective standards." ORS 197.307(6) (2009).

Intervenor-respondent next argues that the requirement for "clear and objective standards" only applies in cases where the applicant establishes "impermissible bias or prejudice in the application process." Intervenor-Respondent's Brief 14. Again, there is simply no text in ORS 197.307(4) that

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limits the statute to cases where the decision maker exhibits bias or prejudice. *See* n 2.

Next, citing *Rogue Valley Assoc. of Realtors v. City of Ashland,* 158 Or App 1, 4, 970 P2d 685 (1999), intervenor-respondent contends a

standard only violates ORS 197.307(4) if the applicant demonstrates that the standards are "categorically incapable of being clearly and objectively applied under any circumstances where they may be applicable." The appeal in *Rogue Valley* was a facial challenge to an ordinance that adopted new standards and the requirement imposed by the quoted language in the Court of Appeals' decision was limited to facial challenges. We do not understand petitioners to make a facial challenge here. Even if they do, that part of the Court of Appeals' decision was overruled by the legislature in 1999. ORS 197.831.[3]

Intervenor-respondent next argues that the ORS 197.307(4) "clear and objective standards" requirement does not apply to requests for a variance. Intervenor-respondent is correct. *Linstromberg v. City of Veneta,* 47 Or LUBA 99, 108-09 (2004). But petitioners do not argue the city's standards for granting a variance must be "clear and objective." Rather, petitioners contend the city erroneously concluded under the applicable variance standards that

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petitioner's request for a variance could be denied.[4] Petitioners' "clear and objective standards" challenge is limited to standards the city applied to the proposed site plan.

2. The Challenged Site Plan Review Standards

Petitioners contend that seven of the site plan review standards that the city relied on in denying its application for site plan review approval are not "clear and objective standards," and thus may not be applied to the site plan.

a. GPDC 19.052(2)

GPDC 19.052(2) requires that the proposal comply "with applicable elements of the Comprehensive Plan, including: Traffic Plan, Water Plan, Sewer Plan, Storm Drainage Plan, Bicycle Plan, and Park Plan." Record 19. The UAPC found that the proposal satisfies GPDC 19.052(2) and adopted findings to support that conclusion. The city council adopted the UAPC's findings. However, the city council struck through the part of the UAPC's findings that concluded "Satisfied with conditions," and added the following sentence at the end of the UAPC's findings:

> "The City Council found the request was not incompliance with the Comprehensive Plan for traffic management (Element 11 ~ Master Transportation Plan)." Record 19. (Bold and italics deleted.)

GPDC 19.052(2) includes no guidance for determining which elements of the city's comprehensive plan are applicable. The only element identified by the city council's decision is Element 11. Element 11 is the city's Master Transportation Plan. The Master Transportation Plan is eight chapters long.

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One of those chapters is chapter 3, which is 13 pages long and sets out numerous goals and objectives. Many of those goals and objectives are not "clear and objective."[5] We assume the city council was not applying the entire eight-chapter Master Transportation Plan, but the city council's findings do not identify what part it was applying. We agree with petitioners that in this case the city council's application of the Master Transportation Plan, without identifying what part of that plan it was applying, applies a standard that is not "clear and objective," which is prohibited by ORS 197.307(4). The city council erred in doing so.

b. GPDC 19.052(4)

GPDC 19.052(4) requires that "[p]otential land use conflicts have been mitigated through specific conditions of development." Record 21. The UAPC decision found the proposal, with conditions, complies with GPDC 19.052(4). The City Council found that the criterion was "Not Satisfied," but did not identify why. Record 21.

We agree with petitioners that a standard that requires mitigation of "potential land use conflicts" is not a "clear and objective" standard. *See Rogue Valley,* 35 Or LUBA 159-60 (a standard requiring an applicant to "mitigate any potential negative impact caused by the development," is not "clear and objective"). GPDC 19.052(4) is not a "clear and objective" standard, and the city council erred in applying it to deny site plan approval.

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c. GPDC 19.052(5)

GPDC 19.052(5) requires that "[a]dequate basic urban services are available, or can be made available by the applicant as part of a proposed development, or are scheduled by the City Capital Improvement Plan." Record 21. The City Council found that this criterion was not satisfied. Record 21.[6]

Petitioners first argue that the meaning of the key terms "adequate" "basic urban services" and "available" is not explained in GPDC 19.052(5), and without some explanation, those terms are not "clear and objective." We agree with petitioners. *See Home Builders Association of Lane County v. City of Eugene,* 41 Or LUBA 370, 410, 414 (2002) (code requirement to provide "adequate" drainage is not "clear and objective;" a standard that requires an applicant to show that "public facilities and services are available to the site" but does not define the key terms "public facilities and services" or "available" is not "clear and objective"). The city council erred in applying GPDC 19.052(5) to deny petitioner's application for site plan approval.

d. GPDC 19.052(6)

GPDC 19.052(6) requires that the "[p]rovision of public facilities and services to the site will not cause service delivery shortages to existing development." Record 21. The City Council found that this criterion was not satisfied. *Id.*

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Petitioners argue that GPDC 19.052(6) provides no guidance regarding the scope of "public facilities and services" or how to go about determining if the proposal will "cause service delivery shortages to existing development" or what qualifies as a "shortage." Therefore, petitioners argue, GPDC 19.052(6) is not "clear and objective." We agree with petitioners. *See Home Builders Association of Lane County v. City of Eugene,* 41 Or LUBA 370, 414 (2002) (a standard that requires an applicant to show that "public facilities and services are available to the site" but does not define the key terms "public facilities and services" or "available" is not "clear and objective"). The city council erred by applying GPDC 19.052(6) to deny petitioner's application for site plan approval.

e. GPDC 19.052(8)(a) and (e)

GPDC 19.052(8) requires that "[t]he characteristics of existing adjacent development have been determined and considered in the development of the site plan. At a minimum, special design consideration shall be given to:

> "(a) Areas of land use conflicts, such as more restrictive use adjacent or across street from proposal. Mitigate by orienting business operations away from use, additional setbacks, screening/buffering, landscaping, direct traffic away from use.
>
> "* * * * *
>
> "(e) Lighting. Exterior lighting shall not impact adjacent development or traveling motorist." Record 22. (Underscoring in original.)

The City Council found that these criteria were not satisfied. Record 22.

Neither the requirement to "mitigate" in GPDC 19.052(8)(a) nor the methods of suggested mitigation are "clear and objective," as ORS 197.307(4) requires. Neither is the GPDC 19.052(8)(e) requirement that "[e]xterior

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lighting shall not impact adjacent development or traveling motorist." *See Rogue Valley,* 35 Or LUBA at 158 ("'[n]eeded housing' is not to be subjected to standards, conditions, or procedures that involved subjective, value-laden analyses that are designed to balance or mitigate impacts of the development on * * * adjoining properties or community").

We agree with petitioners that GPDC 19.052(a) and (e) are not "clear and objective standards," as required by ORS 197.307(4). The city council erred in applying GPDC 19.052(a) and (e) to deny petitioner's application for site plan approval.

f. GPDC 19.052(9)

GPDC 19.052(9) requires that "[t]raffic conflicts and hazards are minimized on-site and off-site, as provided in Article 27." Record 23. The City Council found that this criterion was not satisfied. *Id.*

The GPDC 19.052(9) requirement that "[t]raffic conflicts and hazards [be] minimized on-site and off-site" is not, by itself, "clear and objective." *See Home Builders Association,* 41 Or LUBA 399 (a standard that requires that "on-site vehicular and pedestrian circulation shall be designed to minimize vehicular/pedestrian conflicts at driveway crossings within parking lots and at vehicle ingress/egress points," is not "clear and objective").

Petitioners next argue that GPDC's 19.052(9)'s reference to Article 27 is not sufficient to make GPDC 19.052(9) "clear and objective" because the code does not identify which standards in Article 27 apply. Joint Petition for Review 19. GPDC Article 27 is 32 pages long and includes a variety of requirements. Petitioners point out that although GPDC 27.121(3) requires a traffic impact analysis, and the city council found the applicant's traffic impact analysis was flawed, GPDC 27.121(3) does not mention "traffic conflicts." A

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different section of Article 27, GPDC 27.121(11)(h)(8), does mention "traffic conflicts," but GPDC 27.121(11)(h)(8) only applies to developments that "abut[] or contain[] an existing or proposed arterial street." The subject property does not abut or contain an arterial street. Even if it did apply, GPDC 27.121(11)(h)(8) requires that the development design "minimize the traffic conflicts." That is not a "clear and objective" standard.

We agree with petitioners that GPDC's 19.052(9) is not "clear and objective" as required by ORS 197.307(4), and the City Council erred in applying GPDC's 19.052(9) to deny petitioner's application for site plan approval.

g. GPDC 19.052(11)

GPDC 19.052(11) requires that "[t]here are adequate provisions for maintenance of open space and other common areas." Record 23. The City Council found that this criterion was not satisfied. *Id.*

Petitioners argue that the City engaged in a subjective analysis to determine whether the maintenance of open space and other common areas is "adequate," because neither the text nor context of the code defines "adequate." For the same reasons explained in our discussion of GPDC 19.052(5), we agree with petitioners that a standard that requires an unguided inquiry to whether something is "adequate" is not a "clear and objective" standard.

Accordingly, we agree with petitioners that GPDC 19.052(11) is not a "clear and objective" standard, as it must be under ORS 197.307(4), if it is to be applied to an application for land use approval of "needed housing." The City Council erred in applying GPDC 19.052(11) to deny petitioner's application for site plan approval.

The first assignment of error is sustained.

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SECOND ASSIGNMENT OF ERROR

Under the second assignment of error, petitioners argue that even if some site plan approval criteria were not barred by ORS 197.307(4) because they are not "clear and objective," the city erred on the merits in its application of all ten site plan approval standards it relied on to deny its application for site plan approval. We have concluded under the first assignment of error that seven of the nine site plan review standards that the city applied to deny petitioner's application for site plan approval are not "clear and objective" and should not have been applied to petitioner's application for "needed housing." We therefore need not and do not consider whether the city also erred on the merits in applying those seven standards.

Petitioners do not argue that two of the site plan review standards are not "clear and objective." We therefore limit our consideration under the second assignment of error to petitioners' challenge to the city council's decision with regard to the variance application and the two site plan review standards that petitioners do not argue the city was precluded from applying under ORS 197.307(4).

A. The Remaining Site Plan Approval Standards

1. GPDC 19.052(3)

GPDC 19.052(3) requires a site plan applicant to demonstrate the proposal "[c]omplies with all other applicable provisions of this Code, including off-street parking, landscaping, buffering and screening, signage, environmental standards, and Special Purpose District standards." Record 20. The UAPC identified the off-street parking requirements set out at GPDC 25.042. GPDC 25.042 requires 1, 1.5 or 2 spaces per unit, depending on the number of bedrooms in each unit. The UAPC concluded that the 86 parking

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spaces petitioner proposed are sufficient to comply with GPDC 25.042. The city council adopted that finding, but added the following finding: "[t]he City Council found that the site plan did not provide adequate parking facilities." Record 20. (Boldface and italics deleted.)

Like the UAPC, the city council found that the proposal to provide 86 parking spaces complies with GPDC 25.042. *Id.* The city council did not identify any GPDC or other standard that requires the applicant to demonstrate that the proposed parking facilities are "adequate." Even if there were such a standard, it would not be "clear and objective" and could not be applied consistently with ORS 197.307(4).

The city council erred in finding that the proposal does not comply with GPDC 19.052(3). The city council found that the proposal satisfies the only GPDC parking standard that it identified. The city council did not identify the source of the "adequacy" standard it imposed to deny the application, and even if such a standard existed, ORS 197.307(4) would preclude applying such a standard to an application for approval for "needed housing."

2. GPDC 19.052(12)

GPDC 19.052(12) requires that an applicant for site plan approval demonstrate that "[i]nternal circulation is accommodated for commercial, institutional and office park uses with walkways and bikeways as provided in Article 27." Record 23. The city council deleted the conditions of approval that the UAPC relied on to determine that the proposal satisfies GPDC 19.052(12). The

city council then concluded the standard is "Not Satisfied." Record 23-24.

Petitioners argue the City Council erred in denying its application based on GPDC 19.052(12). Petitioners contend the text of GPDC 19.052(12) makes

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it clear that it does not apply to its proposal for a *residential* development, because GPDC 19.052(12) only applies to "commercial, institutional and office park uses." We agree with petitioners.

B. The City Council's Denial of the Variance

As noted earlier, petitioner sought a variance from requirements for "[b]lock length for local streets * * * and [t]otal length of a perimeter block for local streets * * *. Record 9. The criteria that must be satisfied to grant the requested variances are set out at GPDC 6.060. The UAPC applied a total of 12 variance criteria, finding that with conditions of approval that were imposed by the UAPC and accepted by petitioner, all 12 variance criteria are satisfied. Record 224-29. Four of those criteria are relevant in this appeal.

Variance criterion 1 requires the applicant to demonstrate the variance is justified by a "unique physical constraint or characteristic of the property to which the variance application is related." Record 14. The UAPC found "[t]he property is constrained by existing development patterns in the area." *Id.* The UAPC set out a number of examples of those existing development patterns. *Id.*

Variance criterion 2 requires an applicant to establish that the unique physical constraint or characteristic identified under criterion 1 was not "self-created." *Id.* If it was self-created, criterion 2 imposes additional requirements. The UAPC found "[t]he existing constrains on the property were not self-created." Record 15.

In relevant part, variance criterion 3 requires the applicant to demonstrate "that a variance is necessary to overcome at least one of three situations:

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> "(a) Allow Reasonable Use of an Existing Property. Due to the unique physical constraint or characteristic of an existing lot or parcel, strict application of the provisions of the Development Code would create a hardship by depriving the owner of the rights commonly enjoyed by other properties in the same zoning district subject to the same regulation. *The variance is necessary for preservation of a property right of the owner,* substantially the same as is possessed by owners of other property in the same district subject to the same regulation.
>
> "* * * * *
>
> "(c) Allow Flexibility for Expansion of Existing Development. The location of existing development on the property poses a unique constraint to expansion in full compliance with the Code. The variance is needed for new construction and site improvements in order to provide for efficient use of the land or avoid demolition of existing development, where the public purpose can be substantially furthered in alternate ways with minimal deviation from standards." Record 15 (emphasis added).

The UAPC found "[t]he variance is necessary to overcome the conditions described under sub

criterion (a) and (b) [of variance criterion 3] * * *." *Id.* For purposes of this appeal, this finding is particularly significant since in finding the variance was necessary under sub criterion (a), the UAPC found the variance was "necessary to preserve a property right."

Finally, criterion 9 imposes the following requirement:

> "Mitigate Adverse Impacts. Adverse impacts shall be avoided where possible and mitigated to the extent practical. If a variance is not necessary to preserve a property right, or if the unique constraint in Subsection (1) was self-created, adverse impacts may be grounds for denial." Record 17.

Variance criterion 9 requires mitigation of adverse impacts, but may be grounds for denial in only two circumstances: (1) where the "variance is not

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necessary to preserve a property right" and (2) where the unique physical constraint or characteristic identified under criterion 1 is found to be self-created under criterion 2. The UAPC found criterion 9 was satisfied: "[a]dverse impacts that may occur as a result of approval of the requested variances can be mitigated by the conditions of approval listed below."[7]

In its decision, the city council adopted the UAPC's findings regarding 11 of the 12 variance criteria, including criteria 1, 2, and 3. The only deviation from the UAPC's findings in the city council decision was for criterion 9. The city council struck through the UAPC's criterion 9 finding that "[a]dverse impacts that may occur as a result of approval of the requested variances can be mitigated by the conditions of approval listed below." The city council added the following finding:

> "Not Satisfied. The City Council found that the applicant did not provide adequate mitigation to avoid the adverse impacts of the development for traffic entering Fruitdale Drive." Record 17-18.

Under variance criterion 9, the city council could have required additional mitigation if it believed additional mitigation is required to avoid adverse traffic impacts on Fruitdale Drive. But variance criterion 9 authorizes the city council to deny the variance based on adverse impacts in only two circumstances: (1) where the "variance is not necessary to preserve a property right" and (2) where the unique physical constraint or characteristic identified under criterion 1 is found to be self-created under criterion 2. In the city's council's findings addressing criteria 1, 2 and 3, the city council found that

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neither of those circumstances is present here. The city council erred by applying criterion 9 to deny the application.

The second assignment of error is sustained.

REMEDY

Petitioners argue LUBA should reverse the city council's decision and order the city to approve its applications for a variance and site plan approval. ORS 197.835(10)(a)(A). ORS 197.835(10)(a) provides, in part:

> "The board shall reverse a local government decision and order the local government to grant approval of an application for development denied by the local government if the board finds:
>
> "(A) Based on the evidence in the record, that the local government decision is outside the range of

> discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

The question posed under ORS 197.835(10)(a)(A) is whether the city council's decision to deny petitioner's site plan and variance application was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]" The city council gave a total of ten reasons why it denied the applications. Seven of the site plan review criteria the city council relied on to support its denial decision are barred by ORS 197.307(4), because the application for site plan approval is an application for approval of "needed housing" and those standards are not "clear and objective." As to those seven standards, the city council's decision was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

Under GPDC 19.052(3), the city council relied on an "adequate" parking standard, but there is no "adequate" parking standard and the proposal

complies with the only identified parking standard. Accordingly, as to GPDC 19.052(3), the city council's decision was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

GPDC 19.052(12) applies to "commercial, institutional and office park uses." GPDC 19.052(12) does not apply to the "residential" use proposed by petitioner. Therefore, as to GPDC 19.052(12), the city council's decision was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

Finally, variance criterion 9 can only be applied to deny a request for variance approval in two circumstances. The city council found that neither of those circumstances is present here. Therefore as to variance criterion 9, the city council's decision was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

Because the city council's application of all ten of the reasons it gave for denying petitioner's applications for variance and site plan approval were "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances," the city council's decision is reversed and the city is ordered to approve petitioner's application.

The UAPC imposed a number of conditions of approval in its decision granting site plan and variance approval. Record 216-20. Since petitioner agreed to all of the conditions of approval that were imposed by the UAPC, the city council's decision to approve the application may include all of those conditions of approval. *Stewart v. City of Salem,* 58 Or LUBA 605, 622 (2009).

The city council's decision is reversed.

Footnotes:

[1.] We set out the relevant statutory text later in this opinion.

[2.] ORS 197.307 provides, in part:

> "(1) The availability of affordable, decent, safe and sanitary housing opportunities for persons of lower, middle and fixed income, including housing for farmworkers, is a matter of statewide concern.
>
> "(2) Many persons of lower, middle and fixed income depend on government assisted housing as a

source of affordable, decent, safe and sanitary housing.

"(3) When a need has been shown for housing within an urban growth boundary at particular price ranges and rent levels, needed housing shall be permitted in one or more zoning districts or in zones described by some comprehensive plans as overlay zones with sufficient buildable land to satisfy that need.

"(4) [*A*] *local government may adopt and apply only clear and objective standards, conditions and procedures regulating the development of needed housing on buildable land described in subsection (3) of this section.* The standards, conditions and procedures may not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay." (Emphasis added.)

[3] ORS 197.831 provides:

"In a proceeding before the Land Use Board of Appeals or an appellate court that involves an ordinance required to contain clear and objective approval standards, conditions and procedures for needed housing, the local government imposing the provisions of the ordinance shall demonstrate that the approval standards, conditions and procedures are capable of being imposed only in a clear and objective manner."

[4] We address petitioner's challenge to the city's variance findings later in this opinion.

[5] For example, policy 2.4.1 provides:

"*Policy 2.4.1:* Integrate decisions about development and transportation investments to ensure the best fit between development in the urban area and the transportation facilities and services needed to serve it."

[6] The city council found:

"Based upon the testimony, the City Council found that the application did not provide adequate service area and internal circulation with regards to fire access and trash/refuse removal." (Boldface and italics omitted.)

[7] A large number of conditions of approval were attached to the UAPC decision. Record 216-220.

GENE R. OSTER, Petitioner,
v.
CITY OF SILVERTON, Respondent,
and
MARY ROSE BRANDT, Intervenor-Respondent.

LUBA No. 2018-103

LAND USE BOARD OF APPEALS OF THE STATE OF OREGON

May 7, 2019

FINAL OPINION AND ORDER

Appeal from City of Silverton.

Alan M. Sorem, Salem, filed the petition for review and argued on behalf of petitioner. With him on the brief was Saalfeld Griggs PC.

Spencer Q. Parsons, Portland, filed a response brief and argued on behalf of respondent. With him on the brief was Beery, Eisner & Hammond, LLP.

David E. Coulombe, Corvallis, filed a response brief and argued on behalf of intervenor-respondent. With him on the brief was Fewel, Brewer & Coulombe.

ZAMUDIO, Board Member; RYAN, Board Chair; RUDD, Board Member, participated in the decision.

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You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

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Opinion by Zamudio.

NATURE OF THE DECISION

Petitioner challenges a city council limited land use decision denying a tentative subdivision plan.

REPLY BRIEF

On January 15, 2019, petitioner filed a motion to file a reply brief. On January 29, 2019, the city filed an objection to petitioner's motion to file a reply brief. Petitioner's appeal was filed in 2018 and is subject to OAR 661-010-0039 (2017), which confines reply briefs "solely to new matters raised in the respondent's brief."[1] "Generally, responses warranting a reply brief tend to be arguments that assignments of error should fail regardless of their stated merits, based on facts or authority not involved in those assignments." *Wal-mart Stores, Inc. v. City of Gresham*, 54 Or LUBA 16, 19 (2007). Where arguments in a reply brief respond to arguments raised in the response brief that could not have been

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reasonably anticipated in the petition for review, we will generally allow the reply brief. *Id.* at 20.

In the petition for review, petitioner argued that the city's decision violated the Takings Clause of the Fifth Amendment of the United States Constitution, relying on *Koontz v. St. Johns River Water Mgmt. Dist.*, 570 US 595, 133 S Ct 2586 (2013). Petitioner also argued that ORS 197.522 is immaterial to the city's constitutional obligations. The city responded, arguing that the *Koontz* case is distinguishable, citing ORS 197.522(4). City's Response Brief 17-18.

In his reply brief, petitioner argues that ORS 197.522(4) is inapposite to his arguments and responds to the city's argument that *Koontz* is distinguishable. The two "matters" petitioner seeks to address in his reply brief at not "new matters" within the meaning of OAR 661-010-0039 (2017). In his petition for review, petitioner relied heavily on *Koontz* and argued that ORS 197.522 was immaterial. Petitioner could have anticipated that the city would attempt to distinguish *Koontz* and would rely on ORS

197.522. Petitioner's reply brief seeks to introduce surrebuttal arguments to the city's arguments in the response brief, and to elaborate upon arguments already set out in the petition for review. A reply brief making surrebuttal to argument in the response brief is not allowed. *Willamette Oaks*, *LLC v. City of Eugene*, 67 Or LUBA 351, 353, *aff'd*, 258 Or App 534, 311 P3d 527 (2013).

The motion to file a reply brief is denied.

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FACTS

The subject property is comprised of approximately 9.5 acres and is zoned single-family residential (R-1). The city annexed the subject property in 2016. On May 11, 2018, petitioner submitted an application for tentative plat approval to subdivide the property into 40 lots, at sizes permitted in the zone, and to develop those lots with housing at densities permitted in the R-1 zone under clear and objective standards. *See* ORS 197.307(4).[2]

The planning commission denied the application because the proposal would not result in improved performance of two off-site intersections to a level of service (LOS) that would satisfy the city, based on a level of service standard contained in the city's transportation system plan document (the LOS D standard). Petitioner's engineer estimated that improvements to comply with the LOS D standard would cost $2,118,550.

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Petitioner appealed the planning commission decision to the city council. After an on-the-record hearing, the city council issued a decision adopting and affirming the planning commission's denial and adopting as findings the staff report in support of the denial. This appeal followed.

SECOND ASSIGNMENT OF ERROR

The city determined that Silverton Municipal Code, Title 18, Development Code and Zoning Map (SDC) incorporated by reference traffic standards in the City of Silverton Transportation System Plan (TSP). The city applied a minimum LOS D standard, derived from the TSP. The city denied the application because petitioner's traffic study showed that the proposed development would send additional peak hour traffic to two intersections at N 1st Street and Hobart Road, and N 1st Street and Jefferson Street, and the proposal did not include transportation system improvements that would bring those intersections to LOS D. No party disputes that the proposed development would slightly exacerbate traffic; however, even without the proposed development, at existing traffic volumes, those two intersections are failing to meet the LOS D standard and operating at LOS F. Record 13.

Under SDC 4.3.130 preliminary plat applicants must "describe the proposed access to and from the site and estimate potential vehicle traffic increases resulting from the project," and the community development director may require a traffic impact study, in accordance with SDC 4.1.900. Neither SDC

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4.3.130 or SDC 4.1.900 define traffic standards or include the LOS D standard that we describe above.

The city concluded that the LOS D standard was incorporated by reference into the SDC by SDC 4.3.140(A)(1) and (B)(7), which provide:

> "A. General Review Criteria. The city shall consider the following review criteria and may approve, approve with conditions, or deny a preliminary plat based on the following; the applicant shall bear the burden of proof.
>
> "1. The proposed preliminary plat

> complies with the applicable development code sections and all other applicable ordinances and regulations. At a minimum, the provisions of this article, and the applicable chapters and sections of Article 2, Land Use (Zoning) Districts, and Article 3, Community Design Standards shall apply.
> * * *
>
> "* * * * *
>
> "B. Layout and Design of Streets, Blocks and Lots. All proposed blocks (i.e., one or more lots bound by public streets), lots and parcels conform to the specific requirements below:
>
> "* * * * *
>
> "7. All applicable engineering design standards for streets, utilities, surface water management, and easements shall be met."

The city determined that those criteria incorporate SDC 3.4.010(A), which governs public facilities and provides:

> "A. Purpose. This chapter provides general development standards and approval criteria for public improvements. The code incorporates by reference the city's public facility

> master plans, including plans for domestic water, sanitary sewer, storm drainage, parks, and transportation. The code also incorporates by reference Silverton's public works design standards. This chapter is intended to provide minimum requirements for public facilities. It is not intended to duplicate or replace the design standards contained in the above documents."

The city found that SDC 3.4.010(A) effectively incorporated the city's TSP, Chapter 2, Goal 4, Policy (f), which provides, in part:

> "(f) The City shall implement performance standards for use in evaluating new development proposals.
>
> "*Action: City performance standards shall be used to evaluate developments impacting City or County facilities. The level of service standard shall be LOS D based on the Highway Capacity Manual methodology and a* [volume to capacity] *v/c ratio of 0.85 for signalized and all-way stop controlled intersections. For unsignalized intersection, the level of service standard shall be LOS D based on the Highway Capacity Manual and*

> *a v/c ratio of 0.90. ODOT v/c ratio standards shall apply to ODOT facilities*." (Italics in original.)[3]

In the second assignment of error, petitioner argues that city's decision violates ORS 197.195(1), which governs limited land use decisions and provides:

> "A limited land use decision shall be consistent with applicable provisions of city or county comprehensive plans and land use regulations. Such a decision may include conditions authorized by law. Within two years of September 29, 1991, cities and counties

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> shall incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations. A decision to incorporate all, some, or none of the applicable comprehensive plan standards into land use regulations shall be undertaken as a post-acknowledgment amendment under ORS 197.610 to 197.625. If a city or county does not incorporate its comprehensive plan provisions into its land use regulations, the comprehensive plan provisions may not be used as a basis for a decision by the city or county or on appeal from that decision."

Petitioner argues that *Paterson v. City of Bend*, 49 Or LUBA 160, *aff'd*, *in part*, *rev'd and rem'd on other grounds*, 201 Or App 344, 118 P3d 842 (2005), supports his argument and is dispositive. We agree. In *Paterson*, the petitioner appealed a limited land use decision in which the city approved a tentative subdivision plan. The petitioner contended that the city had incorporated all comprehensive plan standards applicable to subdivision approvals within the meaning of ORS 197.195(1), by requiring in Bend Subdivision Ordinance (BSO) 3.040(3) that the applicant for a tentative subdivision plan approval demonstrate compliance with the Bend Area General Plan. The petitioner identified several General Plan policies relating to transportation that petitioner argued applied to the proposed subdivision. We rejected that argument and explained:

> "[I]n our view ORS 197.195(1) contemplates more than a broad injunction to comply with unspecified portions of the comprehensive plan. In order to 'incorporate' a comprehensive plan standard into a local government's land use regulations within the meaning of ORS 197.195(1), the local government must at least amend its land use regulations to make clear what specific policies or other provisions of the comprehensive plan apply to a limited land use decision as approval criteria. Under that standard, BSO 3.040(3) falls far short of incorporating any comprehensive plan provisions."

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> *Id*. at 167.

The city responds that the city adopted the TSP in March 3, 2008, by a comprehensive plan text amendment, Ordinance 08-01.[4] That ordinance adopted the TSP "as a support document to the 2002 Silverton Comprehensive Plan." City's Response Brief, App 2, page 2. It is undisputed that the city adopted the TSP as a support document to the comprehensive plan. The dispute is whether the SDC sections applicable to a limited land use decision application sufficiently incorporated the action items in the TSP as approval criteria. Ordinance 08-01 does not support the city's position that the city has incorporated action items in the TSP as approval criteria. Instead, the findings for

Ordinance 08-01 indicate that the city intended further SDC amendments to implement the TSP. The findings attached to Ordinance 08-01 explain that the TSP "goals and policies have been developed to guide the City's twenty-year vision of transportation system needs. Each goal has a number of policies designed to guide the community in the direction of completing each goal. Some policies are provided with details of potential implementing actions." City's Response Brief, App 2, page 5.

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Intervenor argues that the city incorporated the TSP policies into the SDC by Ordinance 08-06, which codified SDC 3.1.100.[5] SDC 3.1.100 provides:

> "The purpose of this chapter is to ensure that developments provide safe and efficient access and circulation for pedestrians and vehicles. SDC 3.1.200 provides standards for vehicular access and circulation. SDC 3.1.300 provides standards for pedestrian access and circulation. General street improvement requirements are provided in SDC 3.4.100, *with more specific requirements provided in the city of Silverton transportation system plan and the city's public works design standards*." (Emphasis added.)

Intervenor argues that the "more specific requirement," *i.e.*, the LOS D standard, is incorporated into the SDC by SDC 3.4.100. The city did not rely on SDC 3.1.100 in the challenged decision and does not cite to it in defense of its decision on appeal. Nevertheless, intervenor's argument and the city's argument rely on the same underlying premise: that the city effectively incorporated the action items of the TSP into the SDC as approval criteria applicable to a limited land use decision by incorporating by reference the entire TSP into sections of the SDC.

The city attempts to distinguish *Paterson* by arguing that, unlike general comprehensive plan policies, "the City's TSP provides specific action items to be implemented under Policies." City's Response Brief 21. The city contends that ORS 197.195(1) does not require the city to codify all approval criteria and

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standards for limited land use decisions. Instead, the city emphasizes, ORS 197.195(1) requires the city to "*incorporate* all comprehensive plan standards applicable to limited land use decisions into their land use regulations." (Emphasis added.) However, the city's arguments are directed at the wrong question. The question under ORS 197.195(1) and *Paterson* is not whether the LOS D standard is clear in the TSP or "codified" in the SDC; instead, the question is whether the SDC provisions that the city concluded incorporated the LOS D standard make clear what specific policies or standards in the TSP apply to a limited land use decision as approval criteria.

We conclude that the sections of the SDC that the city relied upon to deny the application, SDC 4.3.140(A)(1), (B)(7), and SDC 3.4.010(A), fall far short of incorporating the LOS D traffic performance standard in TSP, Chapter 2, Goal 4, Policy (f), under the "incorporation" standard in ORS 197.195(1), as interpreted in *Paterson*. Those provisions do not make clear what specific policies, action items, or performance standards contained in the TSP apply as approval criteria for a limited land use decision. For example, SDC 4.3.140(A)(1) and (B)(7) do not refer to the TSP at all. Similarly, SDC 3.4.010(A) generally "incorporates by reference the city's public facility master plans, including plans for domestic water, sanitary sewer, storm drainage, parks, and transportation." Incorporation by reference of the entirety of each of the city's public facilities plans falls far short of satisfying the incorporation standard in ORS 197.195(1). We agree with petitioner that by applying the LOS D standard, the city violated ORS 197.195(1).

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The second assignment of error is sustained.

FIRST AND THIRD ASSIGNMENTS OF ERROR

In the first assignment of error, first subassignment of error, petitioner argues that the city's decision violated ORS 197.307(4) by applying ambiguous approval standards in a manner that would result in unreasonable cost and unreasonable delay. See n 2. In the first assignment of error, second subassignment of error, petitioner argues that the city's decision violated his constitutional rights. ORS 197.835(9)(a)(E). Under the third assignment of error, petitioner argues that the city's decision misconstrued applicable law and lacks adequate findings with respect to the offsite traffic impacts. ORS 197.835(9)(a)(D), (C).

The city's denial relied solely on its application of the TSP standards. We conclude under the second assignment of error that, because the city did not incorporate the TSP standards into its subdivision regulations, the TSP does not apply to petitioner's application and the city may not use the TSP standard as a basis to deny the subdivision. Because we find that the TSP does not provide applicable approval criteria for a limited land use decision, we need not and do not decide whether the city's application of the TSP standard violates petitioner's constitutional rights or the requirement in ORS 197.307(4) that the city may apply only clear and objective standards in a manner that would not result in unreasonable cost or delay. Accordingly, we do not reach the first and third assignments of error.

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DISPOSITION

Petitioner requests that, if we reverse the city's decision under the first assignment of error, we instruct the city to approve the application subject only to unappealed conditions of approval. Petition for Review 2. We will reverse a decision and order the local government to grant approval if the decision "is outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances." ORS 197.835(10)(a)(A).[6] Petitioner's request for relief invokes the authority granted to LUBA in ORS 197.835(10)(a)(A), notwithstanding petitioner's failure to specifically cite that statute. *See Stewart v. City of Salem*, 58 Or LUBA 605, 619, *aff'd*, 231 Or App 356, 219 P3d 46 (2009), *rev den*, 348 Or 415 (2010) (applying ORS 197.835(10)(a)(A), even where petitioner failed to cite that subsection).

ORS 197.835(10)(a) "requires reversal, and precludes remand, of a denial decision when LUBA determines on the basis of the record that the local

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government lacks the discretion to deny the development application." *Stewart*, 231 Or App at 375.

In *Parkview Terrace Dev. LLC v. City of Grants Pass*, 70 Or LUBA 37 (2014), we reversed a city council decision denying site plan approval and variance for a needed housing development. The city council gave a total of ten reasons why it denied the applications. Seven of the site plan review criteria the city council relied on to support its denial decision could not be applied to the application under ORS 197.307(4), because the application for site plan approval was an application for approval of "needed housing" and we determined those standards are not "clear and objective." The city council also inappropriately relied on three inapplicable criteria: (1) an "adequate" parking standard that did not exist in the city's code, (2) an internal circulation standard that did not apply to the proposed residential use, and (3) a variance criterion that did not apply under the circumstances surrounding the development. We concluded that all ten of the reasons that the city council gave for denying petitioner's applications were "outside the range of discretion allowed the local government under its comprehensive plan and

implementing ordinances." *Id*. at 57-58. Accordingly, we reversed the city council's decision and ordered the city to approve the petitioner's applications for variance and site plan approval. We instructed that the city council's decision to approve the application may include conditions of approval imposed by the urban area planning commission that the petitioner had agreed to. *Id*. at 58 (citing *Stewart*, 58 Or LUBA at 622).

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In this case, the city council gave only one reason for denial, failure of the development proposal to include improvements to failing intersections to satisfy the LOS D traffic performance standard. We have concluded that the TSP does not provide applicable criteria because the city failed to specifically incorporate TSP traffic standards into its land use regulations with the level of specificity required by ORS 197.195(1). Thus, the only reason that the city council gave for denying petitioner's application is "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances." Accordingly, we reverse the city council's decision and order the city to approve the petitioner's application.

On appeal, the city has not identified any applicable standards that would require any further review. Petitioner does not dispute that the city may impose conditions of approval that are "roughly proportional to the impact of the development on public facilities." SDC 3.4.010(D).[7] During the city proceedings,

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petitioner offered, as a compromise condition of approval, to construct a westbound left turn lane at the Highway 214/Hobart Road intersection to mitigate the impact of the proposed development on public facilities at an estimated cost of over twice the estimated proportionate share. Record 14. Despite denying the application, the city's decision appears to accept and adopt that condition of approval, subject to terms and conditions. *Id*. Petitioner does not challenge that condition on appeal.[8] Accordingly, the city council's decision to approve the application may include that condition of approval.[9] *Parkview Terrace*, 70 Or LUBA at 58; *Stewart*, 58 Or LUBA at 622.

The city's decision is reversed, and the city is ordered to approve the application.

Footnotes:

[1.] OAR 661-010-0039 (2017) provided:

> "A reply brief may not be filed unless permission is obtained from the Board. A request to file a reply brief shall be filed with the proposed reply brief together with four copies within seven days of the date the respondent's brief is filed. A reply brief shall be confined solely to new matters raised in the respondent's brief, state agency brief, or amicus brief. A reply brief shall not exceed five pages, exclusive of appendices, unless permission for a longer reply brief is given by the Board. A reply brief shall have gray front and back covers."

[2.] ORS 197.307(4) provides:

> "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."

[3.] In a prior order in this appeal, we granted the city's motion to take official notice of Chapter 2 of the TSP. *Oster v. City of Silverton*, ___ Or LUBA ___ (LUBA No 2018-103, Order, Apr 5, 2019) (slip op at 9).

[4.] In a prior order in this appeal, we granted the city's motion to take official notice of Ordinance 08-01. *Oster*, ___ Or LUBA ___ (LUBA No 2018-103, Order, Apr 5, 2019) (slip op at 9).

[5.] In a prior order in this appeal, we granted intervenor's motion to take official notice of Ordinance 08-06. *Oster*, ___ Or LUBA ___ (LUBA No 2018-103, Order, Apr 5, 2019) (slip op at 10).

[6.] ORS 197.835(10)(a), provides, in part:

> "The board shall reverse a local government decision and order the local government to grant approval of an application for development denied by the local government if the board finds:
>
> "(A) Based on the evidence in the record, that the local government decision is outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

[7.] SDC 3.4.010(D) provides:

> "Conditions of Development Approval. Development shall not occur until all required public facilities are in place or guaranteed, in conformance with the provisions of this code and the city's design standards. Improvements required as a condition of development approval, when not voluntarily accepted by the applicant, must be roughly proportional to the impact of the development on public facilities. Findings in the development approval must indicate how the required improvements are directly related and roughly proportional to the impact of development."

[8.] In *Stewart*, we explained that the "application" required to be approved under ORS 197.835(10)(a) "refers to the application as proposed at the time of the local government's denial, including any conditions of approval that the applicant has proposed and the local government has accepted. Such applicant-proposed conditions can be understood to effectively modify or amend the application." *Stewart*, 58 Or LUBA at 622.

[9.] We do not intend to foreclose the possibility that, at the time that the city grants approval of the application as required by ORS 197.835(10)(a) and this decision, the city and petitioner might agree to include additional or modified conditions of approval.

BEFORE THE LAND USE BOARD OF APPEALS

OF THE STATE OF OREGON

ROBERT PATERSON
Petitioner,

vs.

CITY OF BEND
Respondent,

and

BRIAN DRAMEN, MARK DRAMEN
and GORDON DRAMEN
Intervenors-Respondent.

LUBA No. 2004-155

FINAL OPINION
AND ORDER

Appeal from City of Bend.

William H. Sherlock, Eugene, filed the petition for review and argued on behalf of petitioner. With him on the brief was Hutchinson, Cox Coons, DuPriest, Orr, and Sherlock P.C.

No appearance by the City of Bend.

Elizabeth A. Dickson, Bend, filed the response brief and argued on behalf of intervenors-respondent. With her on the brief was Hurley, Lynch and Re, P.C.

BASSHAM, Board Member; HOLSTUN, Board Chair; DAVIES, Board Member, participated in the decision.

REMANDED 04/05/2005

You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

Opinion by Bassham.

NATURE OF THE DECISION

Petitioner appeals city approval of a tentative subdivision plan authorizing a private road terminating in a cul-de-sac.

FACTS

The subject property is a narrow, rectangular 5-acre parcel zoned RS, Urban Standard Density Residential. The subject parcel is 165 feet wide from north to south, and 1,100 feet deep east to west. The property includes an existing single family dwelling at its east end, adjacent to Eagle Road. To the north the property abuts land owned by petitioner that has recently been approved for development as a residential subdivision. Petitioner's subdivision includes Yellow Ribbon Drive, an east-west street that connects to Eagle Road. A short street, known only as "Future Street," is stubbed from Yellow Ribbon Drive to the subject property's northern property line, in the approximate middle of the subject property. The west end of the subject property adjoins a developed subdivision, where Red Oak Drive is stubbed to the property line. Red Oak Drive is a city-standard 60-foot wide right of way, with parking, curbs, planting strips and sidewalks. To the south the property abuts a large parcel for which a subdivision application (the Conners Park subdivision) has been approved.[1]

Intervenors-respondent (intervenors) seek to develop the subject property with 31 residential lots in three phases. Intervenors initially proposed that Red Oak Drive extend the length of the subject property, curve north around the existing dwelling, and connect to Eagle Road. However, to address neighbors' concerns about through traffic, and to reduce impacts on the existing single family dwelling, intervenors modified the tentative plan to propose that Red Oak Drive end in a cul-de-sac just west of the existing dwelling, rather than extend all the way to Eagle Road. Additional access to the subdivision would be provided by connecting northward to Yellow

[1] We understand that the Conners Park subdivision approval was withdrawn sometime after the decision in the present case.

Ribbon Drive via Future Street, and through two proposed connecting streets ("A" and "C") to the Conners Park subdivision to the south. To maximize the number of lots on the narrow subject property, intervenors also proposed that after entering the property at the west end, Red Oak Drive would become a private street, with a reduced paved width and sidewalks flush with the road surface.

A city hearings officer approved the tentative plan on July 14, 2004. Petitioner, concerned that the design of Red Oak Drive directed traffic through his subdivision, appealed the hearings officer's decision to the city council. The city council declined to hear petitioner's appeal. This appeal followed.

FIRST ASSIGNMENT OF ERROR

Petitioner argues that the hearings officer erred in (1) approving the subdivision without ensuring street access for the first phase and without an adequate facility development plan, under Bend Subdivision Ordinance (BSO) 3.040, and (2) finding that the applicant need not demonstrate compliance with the Bend Area General Plan (General Plan), contrary to BSO 3.040(2).[2]

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[2] BSO 3.040 provides, in relevant part:

> "**PHASED TENTATIVE PLAN**. An overall development plan shall be submitted for all developments affecting land under the same ownership for which phased development is contemplated. The Review Authority shall review a master development plan at the same time the tentative plan for the first phase of a phased subdivision is reviewed. The phased tentative plan shall include * * * the following elements:
>
> "1. Overall development plan, including phase or unit sequence, and the schedule for initiation of improvements and projected completion date.
>
> "2. Show compliance with the Bend Area General Plan and implementing land use ordinances and policies.
>
> "3. Overall facility development plan, including transportation and utility facilities plans, that specify the traffic pattern plan for motor vehicles, bicycles, and pedestrians, water system plans, sewer system plans and utility plans."

A. BSO 3.040(1) and (3)

BSO 3.040(1) and (3) require that the development plan include a "schedule for initiation of improvements," and "transportation and utility facilities plans." *See* n 2. The application proposed development in three phases, with facilities development and final plan approval issuing for each phase before commencing with the next phase. The first phase is at the east end of the property, and includes the existing dwelling, cul-de-sac and surrounding lots. Noting that access to the phase 1 area currently does not exist, the hearings officer stated:

> "It is unclear from the information provided where street access during phase 1 is located. It will be a requirement of approval that the applicant demonstrate that there will be street access for each phase of development in accordance with City Standards prior to final plat approval. Based on the information provided by the applicant and this condition of approval the hearings officer finds the proposal satisfies [BSO 3.040(1)]." Record 30.

Petitioner argues that the hearings officer substituted a condition of approval for a finding of compliance with BSO 3.040(1). However, the hearings officer clearly found compliance with BSO 3.040(1), based on the submitted development plan and the condition of approval. Generally, where there is conflicting evidence regarding whether compliance with an approval criterion is feasible, the local government may determine that compliance is feasible and impose conditions of approval as necessary to ensure compliance. *Rhyne v. Multnomah County*, 23 Or LUBA 442, 447-48 (1992). Although the application did not propose a specific plan for providing access to phase 1, the hearings officer obviously believed that providing such access was feasible, and imposed a condition requiring intervenors to specify how access would be provided. Petitioner does not argue that there is any reason to believe that providing access to phase 1 from Red Oak Drive or from one or more of the three connecting streets to the north and south is infeasible, prior to development of phases 2 and 3. Under these circumstances, we see no error in finding that the development plan complies with BSO 3.040(1), as conditioned.

With respect to BSO 3.040(3), petitioner argues that the hearings officer failed to find that the "overall facility plan" includes a transportation plan that specifies the "traffic pattern plan for

motor vehicles, bicycles, and pedestrians," with respect to phase 1 development. *See* n 2. Instead, petitioner argues, the hearings officer's finding regarding BSO 3.040(3) discusses only utility facilities and does not mention a transportation plan, other than a reference to a traffic study:

> "The applicant has submitted an overall facility plan showing all existing and proposed utility extensions for the proposal. This data is shown on the face of the tentative plat and will be supplemented by engineered drawings for utility construction. A traffic study is included in the supporting materials for the tentative plan application." Record 31.

It is not clear what BSO 3.043(3) requires in terms of a "transportation plan." The above-quoted finding appears to view the tentative plan itself as being the "overall facility plan," at least with respect to utilities. The finding does not expressly reference transportation facilities, but the same approach seems equally applicable. As with utilities, the approved tentative plan depicts the proposed street network and pedestrian pathways, with road and sidewalk cross-sections and details. The finding refers to the transportation impact analysis at Record 601 to 664, which includes a detailed analysis of the proposed and existing street network. It seems reasonably clear that the hearings officer believed that the tentative plan itself, as supplemented by engineered utility drawings and the transportation impact analysis, constituted the "transportation and utility facilities plans" required by BSO 3.043(3). While the finding could have stated that more clearly, petitioner identifies no error in that approach, and we see none. This subassignment of error is denied.

B. BSO 3.040(3)

BSO 3.040(3) requires that the tentative plan shall "[s]how compliance with the Bend Area General Plan and implementing land use ordinances and policies." Intervenors argued, and the hearings officer agreed, that compliance with the General Plan is demonstrated by compliance with its implementing land use regulations, and that intervenors were not required to demonstrate that the plan complied with General Plan policies or provisions:

> "The applicant states that it will comply with the General Plan and the implementing land use ordinances and policies by meeting the requirements of the regulations governing the tentative plan review process. While multiple decisions of the City have found that certain plan policies under specific circumstances constitute

> mandatory criteria, the applicant is not required to demonstrate compliance with the provisions of the comprehensive plan inasmuch as the plan does not establish these mandatory approval criteria for land divisions. This is supported by two facts: (1) ORS 197.195(1) provides that comprehensive plan provisions do not apply to the review of limited land use decisions, such as subdivisions, unless the provisions are adopted as part of the City's zoning or subdivision ordinances. A review of discrete Plan policies is therefore not appropriate; (2) the [General] Plan states that '[t]he policies in the General Plan are statements of public policy, and are used to evaluate any proposed changes to the General Plan. * * *" Record 30-31.

ORS 197.195(1) provides in relevant part that in order to apply comprehensive plan policies directly to a limited land use decision as approval criteria, the local government must "incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations" within two years of September 29, 1991.[3] A limited land use decision includes a decision that approves or denies a subdivision application within an urban growth boundary. ORS 197.015(12).

Petitioner contends that the city has "incorporated" all comprehensive plan standards applicable to subdivision approvals within the meaning of ORS 197.195(1), by requiring at BSO 3.040(3) that the applicant for a tentative subdivision plan approval demonstrate "compliance with the Bend Area General Plan." Petitioner then identifies several comprehensive plan policies relating to transportation that petitioner believes are applicable to the proposed subdivision.

However, in our view ORS 197.195(1) contemplates more than a broad injunction to comply with unspecified portions of the comprehensive plan. In order to "incorporate" a

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[3] ORS 197.195(1) provides:

> "A 'limited land use decision' shall be consistent with applicable provisions of city or county comprehensive plans and land use regulations. Such a decision may include conditions authorized by law. Within two years of September 29, 1991, cities and counties shall incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations. A decision to incorporate all, some, or none of the applicable comprehensive plan standards into land use regulations shall be undertaken as a post-acknowledgment amendment under ORS 197.610 to 197.625. If a city or county does not incorporate its comprehensive plan provisions into its land use regulations, the comprehensive plan provisions may not be used as a basis for a decision by the city or county or on appeal from that decision."

comprehensive plan standard into a local government's land use regulations within the meaning of ORS 197.195(1), the local government must at least amend its land use regulations to make clear what specific policies or other provisions of the comprehensive plan apply to a limited land use decision as approval criteria. Under that standard, BSO 3.040(3) falls far short of incorporating any comprehensive plan provisions. The hearings officer did not err in concluding that the applicant was not required to demonstrate compliance with the comprehensive plan policies cited by petitioner. Because we sustain the hearings officer's conclusion under ORS 197.195(1), we need not address petitioner's challenges to the hearings officer's alternative conclusion under the comprehensive plan.

The first assignment of error is denied.

SECOND ASSIGNMENT OF ERROR

BSO 3.060(1)(A) and (C) require in relevant part that the proposed land division contribute to the "orderly development" of the area.[4] Petitioner contends that the hearings officer erred in concluding that the proposed private street, ending in a cul-de-sac, contributes to "orderly development." According to petitioner, the hearings officer's determination on this point is

[4] There are actually two separate "orderly development" standards, at BSO 3.060(1)(A) and (C). We follow petitioner in discussing them together as a single standard. BSO 3.060(1) provides, in relevant part:

> "No application for subdivision or partition shall be approved unless the following requirements are met:
>
> "A. The land division contributes to orderly development and land use patterns in the area, and provides for the preservation of natural features and resources and other natural resources to the maximum degree practicable as determined by the City of Bend.
>
> "* * * * *
>
> "C. The land division contributes to the orderly development of the Bend area transportation network of roads, bikeways, and pedestrian facilities, and does not conflict with existing public access easements within or adjacent to the land division."

inconsistent with another hearings officer's decision regarding a similar proposal for a private street in a different development application, known as the "Wolfe" decision.

The hearings officer rejected that argument, finding:

> "* * * The applicant proposes to extend Red Oak Drive as a private street through the subdivision culminating in a cul-de-sac at the [east] end of the property. Staff questioned whether this design constitutes orderly development within the meaning of [BSO 3.060(1)(A)]. It did because of a City hearings officer's decision in file numbers PZ 03-651 and 03-652 (the 'Wolfe Application'). There the hearings officer found that the proposed connection between public streets and private streets would not be orderly for the reason that the private street was found by the hearings officer to be an 'integral link in the city's street grid system' and for the reason that the private street would also largely serve persons accessing land and subdivisions outside of the subdivision proposed in that application. It is noted that the same hearings officer has considered different facts (the Coulter subdivision) and allowed the use of a private street system, provided that certain factors or conditions were met, such as demonstrating a permanent maintenance source, lot configuration, etc. * * * Other decisions of the City have also allowed private street connections under certain circumstances. * * * In point of fact there are many private streets with public overlays that connect to publicly owned streets within the City. I agree with the applicant in that here the private street would not be an integral link to the City grid system given the number of existing and proposed connections to Eagle Road from other areas. Further, the private street will have public overlay, be permanently maintained by a homeowner's association and would terminate before Eagle Road, thus serving mostly subdivision residents, at least from the connection with the 'Future Road' [to Yellow Ribbon Drive] to the north. The code provides for private streets in certain cases and sets standards for their construction. *See* table 'B,' Land Division Ordinance. * * * I find that under the present circumstances, including the shape of the lot at issue, the density goal of the zone and the connections to the surrounding developments, the proposed private street would constitute orderly development. The traffic engineer does not object, but has commented that construction should be in accordance with Table B. These standards require a street that is 24 feet in width and bordered by sidewalks. The applicant intends to comply with such standards. Compliance with Table 'B' shall be a condition of approval and this will promote safety, continuity and compatibility with street connections and the established density of surrounding development." Record 33-34.

Petitioner quotes long passages from the Wolfe decision, and argues that for the same reasons expressed by the hearings officer in the Wolfe decision the hearings officer in the present

case should also conclude that the proposed private street and cul-de-sac do not constitute "orderly development."

Even if the reasoning in the Wolfe decision is not persuasive, petitioner contends, the facts in the present case demonstrate that the proposed private street and cul-de-sac are not "orderly development." With respect to the cul-de-sac, petitioner argues that it forces traffic to and from the subdivision to access Eagle Road through adjoining subdivisions. With respect to the private street, petitioner argues that it is unsafe to have public streets with 60-foot wide rights of way, parking, curbs, planting strips and sidewalks transition abruptly to a private street with 20-foot paved width, no parking, curbs or dividers and with sidewalks flush with the road pavement. Further, petitioner questions the ability of the homeowner's association to enforce the no parking prohibition on the private street, or adequately maintain the private street.

Given the imprecision of the "orderly development" standard, the city has significant latitude in determining whether development complies with that standard.[5] As the hearings officer noted, there are significant factual distinctions between the circumstances in the Wolfe decision and the present case. In any case, petitioner does not explain why the present hearings officer is required to apply the same understanding of "orderly development" that was applied in the Wolfe case.

With respect to the cul-de-sac, it is often the case that traffic from a cul-de-sac will travel across local streets to reach collector or arterial streets. Petitioner does not explain why the

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[5] Elsewhere in the decision, the hearings officer notes in addressing the "orderly development" standard in BSO 3.060(1)(C):

> "In other City land use decisions, and based upon the purpose statements contained in the land use ordinances, the term 'orderly' as applied to the above criteria has been found to mean a system or order that is a logical extension of the transportation system, that does not overtax the system, provides for maintenance thereof, that recognizes the limitations that the shape of the parcel and the topography have on the development, does not have internal conflicts with the very development being proposed, meets code layout and design requirements and does not foreclose future development." Record 36.

Petitioner does not challenge that view of the "orderly development" standard, or explain why the hearings officer's application of the standard under that view is erroneous.

"orderly development" standard requires the city to connect Red Oak Drive directly to Eagle Road, or prohibits the city from directing some traffic onto Yellow Ribbon Drive or other adjoining streets.

With respect to the safety of transitioning between a public street and a private street, the code allows private streets to be built to different standards than public streets, and the two must meet somewhere. The fact that private streets may be built to lesser standards, and need not include such amenities as curbs, planting strips, and parking lanes does not mean that such streets do not comply with the orderly development standard. Similarly, that private streets are maintained by homeowners' associations rather than the city does not indicate disorderly development. Petitioner has not demonstrated that the hearings officer erred in concluding that the proposed private street complies with the orderly development standard.

Finally, petitioner argues that at several points in the decision the hearings officer indicated that he understood the proposed private street to have a paved width of 24 or perhaps 28 feet with curbs, whereas the approved tentative plan clearly provides for a private street with paved width of 20 feet and no curbs. *See* above-quoted finding ("These standards require a street that is 24 feet in width and bordered by sidewalks. The applicant intends to comply with such standards"); Record 44 ("The private street will be bounded by curbed sidewalks directing water to catch basins"); and Record 58 (condition of approval stating that "'No Parking' signs on 28-foot wide streets are required"). Petitioner speculates that the hearings officer's confusion on these points may have erroneously led him to conclude that the private street complies with the orderly development standard, and that remand is necessary to allow the hearings officer to apply the standard under a correct appreciation of the facts.

It is not clear to us why the hearings officer referred to the private street as being 24 feet in width and bounded by curbs, in the above-quoted findings. The approved tentative plan, the application materials, the staff report, and everything cited to us in the record indicate that the private street was and always had been proposed as 20 feet in width, with no curbs, a design that is apparently allowed under Table B. Elsewhere in the hearings officer's decision he indicates that he

understood that the private street will have a paved width of 20 feet. Record 47 ("Since the applicant is proposing a private street with a width of 20 feet, as a condition of approval, 'No Parking' signs shall be placed on both sides of the road * * *"). Almost certainly the reference to the width of the street as 24 feet at Record 34 was simply a typographic error. Likewise, the reference to a requirement for "No Parking" signs for 28-foot wide streets is almost certainly a misstatement, since the hearings officer elsewhere indicates his understanding that "No Parking" signs are required for a 20-foot wide street. Record 47.

The reference to curbs at Record 44 may also be a misstatement, although that is less clear. That reference to curbs is part of the findings under BSO 6.020(7), which we discuss below, not part of the findings addressing the orderly development standard at BSO 3.040(1) or (3). As discussed below, we remand the hearings officer's finding under BSO 6.020(7) for clarification with respect to curbs. For present purposes, however, it seems unlikely that the hearings officer relied upon the presence or absence of curbs in finding compliance with BSO 3.040(1) or (3). The findings addressing the orderly development do not mention curbs. Petitioner has not established that any misstatement with respect to curbs provides an independent basis for reversal or remand with respect to the orderly development standard.

The second assignment of error is denied.

THIRD ASSIGNMENT OF ERROR

Petitioner contends that the hearings officer misconstrued street and sidewalk design requirements of BSO 6.020 and failed to make adequate findings supported by substantial evidence in concluding that the proposed cul-de-sac and private street comply with those requirements.

A. BSO 6.020(1)

As relevant here, BSO 6.020(1) requires that "[f]acilities providing safe and convenient motor vehicle, pedestrian and bicycle access shall be provided within new subdivisions." Petitioner repeats his arguments under the BSO 3.060(1) "orderly development" standard, but does not

explain why those arguments establish a basis for reversal or remand under BSO 6.020(1). This subassignment of error is denied.

B. BSO 6.020(2)

BSO 6.020(2) requires in relevant part that "[a]ll streets shall be improved to City standards with curbs, paving, drainage facilities and medians if required."[6] Petitioner argues that the hearings officer's finding under BSO 6.020(2) does not explain why that standard does not require curbs on the proposed private street.

The hearings officer finds that the private street will be constructed under standards for private streets set out in Table B. There is no dispute that Table B does not require curbs for a 20-foot wide private street. Petitioner's quotation of BSO 6.020(2) in the petition for review omits the last two words, "if required." That phrase is somewhat ambiguous, as it could modify only the preceding word "medians" or the entire list of design features including curbs. Petitioner apparently reads BSO 6.020(2) to require curbs on all streets, even if the applicable standards for certain streets do not require curbs. Petitioner's interpretation brings the last sentence of BSO 6.020(2) and Table B into conflict. Although the hearings officer's findings under BSO 6.020(2) do not address this issue, it seems to us that the better reading of the last sentence of BSO 6.020(2) is one that does not bring it into conflict with Table B. In other words, "[a]ll streets" must have curbs and other listed design features only "if required." If other, more specific standards explicitly do not

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[6] BSO 6.020(2) provides, in full:

> "New Streets. The location, width, and grade of streets shall be considered in their relation to existing and planned streets, topographical conditions, public convenience and safety, and the proposed use of land to be served by the streets. The street system shall assure an adequate traffic circulation system with intersection angles, grades, tangents, and curves appropriate for the traffic to be carried considering the terrain. The subdivision shall provide for the continuation of the principal streets existing in the adjoining subdivision or of their proper projection. Where, in the opinion of the Hearings Body, topographic conditions make such continuation or conformity impractical, exception may be made. In cases where the City may adopt a plan or plat of a neighborhood or area of which the subdivision is a part, the subdivision shall conform to such adopted neighborhood or area plan. All streets shall be improved to City standards with curbs, paving, drainage facilities and medians if required."

require curbs for a particular type of street, neither does BSO 6.020(2). With that understanding, we see no reversible error in the hearings officer's findings under BSO 6.020(2). This subassignment of error is denied.

C. BSO 6.020(3)

BSO 6.020(3) permits a cul-de-sac only when certain circumstances are present, including where "existing development on adjacent property prevents a street connection."[7] The hearings officer approved the cul-de-sac because "the applicant's property contains a large established family home and any such connection [of Red Oak Drive to Eagle Road] would require its removal." Record 43.[8]

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[7] BSO 6.020(3) provides:

> "Street Layout and Cul-de-sacs. The street layout shall be generally in a rectangular grid pattern to provide or continue a network of inter-connecting streets. The subdivision streets shall be oriented on an east/west axis to the greatest extent possible to ensure solar access for lots within the subdivision. The grid pattern may be modified to adapt to topography and natural conditions. Cul-de-sacs and dead end streets shall only be permitted when the following conditions are met:
>
> "A. One or more of the following conditions prevent a required street connection:
>
> - natural slopes of 18% or more where it is not practical to construct streets with grades of 12%; or
>
> - presence of a wetland or water body which cannot be crossed; or existing development on adjacent property prevents a street connection; and
>
> "B. A street pattern which either meets standards for connections and spacing or requires less deviation from standards is not possible; * * *"

[8] The decision states, in relevant part:

> "The applicant has modified the subdivision proposal to include a cul-de-sac instead of another road connection to Eagle Road. The hearings officer finds that this connection is unnecessary given the number of already approved or planned connections. As described above the applicant's property contains a large established family home and any such connection would require its removal. The cul-de-sac includes a pedestrian access corridor at its terminus. While private streets are reviewed on case by case bases, the existing home, shape of the lot, requirements to create compatible infill and reduce neighborhood cut-through, makes the private road extension of Red Oak Drive appropriate in this case. The 'Future Street' and 'C' Street connections are proposed as a way to address block length and continue the street grid to adjoining properties where appropriate." Record 43.

Petitioner points out that BSO 6.020(3)(A) allows a cul-de-sac based on "existing development" only where the development is on "adjacent property." The existing dwelling at the east end of the subject property is part of the property, petitioner argues, not on "adjacent property." Even if the dwelling were on adjacent property, petitioner contends, there is no finding or explanation that a street pattern that either meets the standards for connections or requires less deviation from those standards is not possible, under BSO 6.020(3)(B). Petitioner notes, as do the findings, that the original tentative plan proposed that Red Oak Drive connect to Eagle Road, by going north of the existing dwelling. That proposed street pattern was changed, apparently at the request of neighbors to the west of the subject property, who did not want Red Oak Drive to become a through-street to Eagle Road. Petitioner argues that a street pattern without a cul-de-sac and without removing the existing dwelling is obviously possible. Even if moving or removing the existing dwelling were necessary to connect Red Oak Drive to Eagle Road, petitioner contends, there is no reason why the city could not require that the dwelling be moved or removed.

Intervenors do not respond to this argument. The hearings officer's finding that "any connection" of Red Oak Drive to Eagle Road would require removing the existing dwelling is not supported by the record, as evidenced by the originally submitted tentative plan, which proposed just such a connection without removing the house. Further, petitioner is correct that under BSO 6.020(3)(A) "existing development" is only a basis for allowing a cul-de-sac where that development is on "adjacent property." One could presumably avoid that restriction in the present case, by simply partitioning the parcel including the dwelling from the rest of the subject property, and then seeking subdivision plan approval for that remainder parcel. However, even if we assume that the restriction can be avoided in that manner, petitioner is correct that BSO 6.020(3)(A) and

(B) are conjunctive, and the decision does not explain why a cul-de-sac is warranted under BSO 6.020(3)(B).[9] This subassignment of error is sustained.

D. BSO 6.020(7)

BSO 6.020(7) requires that "street right-of-way and roadway surfacing widths shall be in conformance with the standards and specifications" set forth in Table A for public streets and Table B for private streets. As noted, Table B allows a private street with 20 feet of paved width if no curbs are proposed, but requires 24 feet of paved width if curbs are proposed. The hearings officer's finding under BSO 6.020(7) states, in full:

> "According to the latest revised tentative plan all existing and proposed streets will meet the City of Bend standards for both public and private streets. The private street will be bounded by curbed sidewalks directing water to catch basins. This criterion is met." Record 44.

Petitioner argued below that without curbs there is nothing that will direct storm drainage to catch basins, and that water will simply flow over the flush sidewalks onto the adjoining lots, given the slope depicted on the street cross-sections. *See* Record 182 (letter from engineer opining that curbs are necessary to direct water to catch basins); Record 195. Petitioner also argued that adding curbs would require an additional four feet of right-of-way, in order to comply with the standards in Table B, which may affect lot configuration and minimum lot sizes. Petitioner notes the additional complication that the hearings officer found that the private street "will be bounded by curbed sidewalks directing water to catch basins," notwithstanding that the approved tentative plan does not appear to propose curbs on the private street.[10] According to petitioner, remand is necessary to address the following issues: (1) whether the decision requires curbs; (2) if so,

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[9] It was suggested at oral argument that there may be access spacing or sight line reasons why a connection between Red Oak Drive and Eagle Road would be inconsistent with applicable standards. The hearings officer should address such matters on remand.

[10] At oral argument, intervenors' attorney first asserted that the tentative plan did propose curbs, but later seemed to withdraw that assertion. As far as we can tell from the approved plan, no curbs are proposed on the private street portion of Red Oak Drive.

whether the plan needs to be revised to reflect a 24-foot paved width and a 34-foot right of way to comply with Table B; (3) if not, how storm drainage will be directed to the catch basins absent curbs.

Intervenors again do not provide any meaningful response to this subassignment of error. We agree with petitioner that remand is necessary to address the foregoing issues. This subassignment of error is sustained.

E. BSO 6.020(14)

BSO 6.020(14) requires that sidewalks shall be installed at the property line. Petitioner cites language from the Wolfe decision in which the hearings officer opines that sidewalks on private streets must include planting strips just like public streets, and therefore that sidewalks on private streets cannot be street tight. Petitioner adopts that language as his argument that, in the present case, BSO 6.020(14) and Table B effectively require planting strips on all streets and effectively prohibit street-tight sidewalks.

The hearings officer in the present case found that the applicant proposes sidewalks installed at the property line, which is all that BSO 6.020(14) requires. BSO 6.020(14) says nothing about planting strips, and nothing about street-tight sidewalks. Unlike Table A, governing public streets, Table B requires no planting strip at all for any private street.[11] We do not understand petitioner's adopted argument from the Wolfe decision. This subassignment of error is denied.

F. BSO 6.020(16)

BSO 6.020(16) requires in relevant part that "[t]he street is connected to a grid pattern at both ends" and that "[b]locks shall have dedicated public alley access constructed to City standards."[12] The hearings officer's finding under BSO 6.020(16) states, in full: "Since the

[11] Table B indicates "N/A" for all private streets under the column for "Minimum Planter Strip Width."

[12] BSO 6.020(16) provides:

"Performance Standards for Local Residential Streets.

applicant is proposing a private street with a width of 20-feet, as a condition of approval, 'No Parking' signs shall be placed on both sides of the road and spaced to City of Bend Standards and Specifications." Record 47.

Petitioner argues that while the above-quoted finding may be responsive to BSO 6.020(16)(D) and (E), it does not address the requirements at BSO 6.020(16)(B) and (C) that "the street is connected to a grid pattern at both ends" and that blocks "shall have dedicated public alley access."

Intervenor again does not respond to this argument. Although it is not clear to us that BSO 6.020(16)(B) and (C) apply to a private street ending in a cul-de-sac, or what they would require if they do apply, absent some finding or response on this point we agree with petitioner that remand is necessary to adopt findings addressing the applicability of and compliance with BSO 6.020(16)(B) and (C). This subassignment of error is sustained.

The third assignment of error is sustained, in part.

FOURTH ASSIGNMENT OF ERROR

BSO 6.030(2) requires in relevant part that

> "No block shall be longer than 1,200 feet between the centerline of through cross streets *except in residential subdivisions where no block shall be longer than 600 feet between the centerline of through cross streets* and where street location is restricted by natural topography, wetlands, or other bodies of water." (Emphasis added.)

> "A. Average daily traffic volumes on the local street does not exceed 300 ADT.
>
> "B. The street is connected to a grid street pattern at both ends.
>
> "C. Blocks shall have dedicated public alley access constructed to City standards.
>
> "D. 'No Parking' zones are established 55 feet from the centerline of intersecting local streets.
>
> "E. For block lengths exceeding 300 feet, 'No Parking' zones shall be established on either sides of the street spaced no greater than 250 feet apart. The 'No Parking' zones shall be a minimum of 30 feet in length."

The hearings officer found that "[a]s shown on the tentative plan block, the proposed block lengths meet this proposal." Record 47. Petitioner argues that in order to comply with the 600-foot block length requirement, the city must require a new street somewhere east of the "Future Street" connecting Red Oak Drive and Yellow Ribbon Drive.

We do not understand petitioner's argument or the hearings officer's terse finding. For that matter, we are unclear what BSO 6.030(2) requires. It appears to require in residential subdivisions that a block be no longer than 600 feet between the centerline of "through cross-streets." As far as we can tell there are no "through cross-streets" depicted anywhere on the approved tentative plan: only T-intersections where Future, A and C streets intersect Red Oak Drive. It is not clear how one applies BSO 6.030(2) to a residential subdivision with a cul-de-sac and T-intersections. Given the lack of alternatives, it may be appropriate to determine block length for purposes of BSO 6.030(2) on some other basis than "through cross-streets." However, the hearings officer needs to explain how block length is determined under BSO 6.030(2). Petitioner appears to be correct that, depending on where the "block" begins and ends, it is possible that at least the "block" that runs eastward from Future Street toward the end of the cul-de-sac is longer than 600 feet. Given the lack of assistance from the decision and intervenor on these issues, we agree with petitioner that remand is necessary to adopt more adequate findings addressing BSO 6.030(2).

The fourth assignment of error is sustained.

The city's decision is remanded.

CHAPTER 17.10
DEFINITIONS

17.10.00 INTENT

These definitions are intended to provide specific meanings for words and terms commonly used in zoning and land use regulations.

17.10.10 MEANING OF WORDS GENERALLY

All words and terms used in this Code have their commonly accepted dictionary meaning unless they are specifically defined in this Code or the context in which they are used clearly indicated to the contrary.

17.10.20 MEANING OF COMMON WORDS

A. All words used in the present tense include the future tense.

B. All words used in the plural include the singular, and all words used in the singular include the plural unless the context clearly indicates to the contrary.

C. The word "shall" is mandatory and the word "may" is permissive.

D. The word "building" includes the word "structure."

E. The phrase "used for" includes the phrases "arranged for," "designed for," "intended for," "maintained for," and "occupied for."

F. The word "land" and "property" are used interchangeably unless the context clearly indicates to the contrary.

G. The word "person" may be taken for persons, associations, firms, partnerships or corporations.

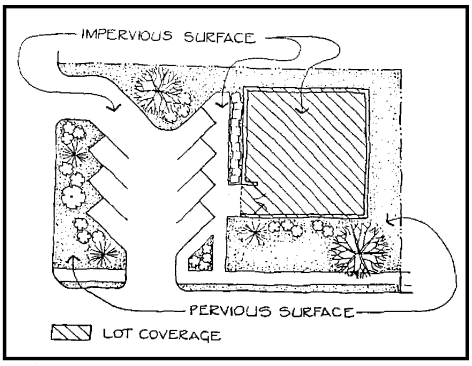
17.10.30 MEANING OF SPECIFIC WORDS AND TERMS

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 by a road, street, alley or public



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 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 2 streets, the interior angle of such intersection not exceeding 135 degrees.

CHAPTER 17.12 - PROCEDURES FOR DECISION MAKING

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.

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 Section 17.90.40(A).
C. Adjustments less than 10% of a quantifiable dimension which does not increase density
D. Flood Slope and Hillside Development-Uses listed in 17.60.40 A.
E. Minor Alteration of an Historic Resource
F. Property Line Adjustments
G. Tree removal involving less than 50 trees
H. Type I FSH Review
I. Minor Partition (no new street created)
J. Administrative Variance

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 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 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 & Variances of up to 20% 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

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 17.50.60 A & 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% 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.

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. Planned Developments
5. Village Specific Area Plan (master plan)
6. Annexations
7. Extension of City Services Outside the City Limits
8. Vacating of Public Lands and Plats
9. 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.

CHAPTER 17.18 - PROCESSING APPLICATIONS

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 generally 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 will generally 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).

In situations where an applicant has attended a pre-application conference and has reviewed the application with the Director prior to submitting the applications, the Director may exercise his/her discretion to review the Type II application(s) at the staff level and only schedule a public hearing for the Type III portion(s) of the development proposal.

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.

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 city and will be scheduled following submittal of required materials and payment of fees. The purpose of the 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 development requirements, arrange such technical and design assistance which will aid the applicant, 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 conference within 10 days of the 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.

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 mailing labels of Affected Property Owners.

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 property affected by the application is in the exclusive ownership of the applicant, that the applicant has the consent of all parties in ownership of the affected property, or the applicant is the contractual owner.

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.

F. Site plan of proposed development

G. Number of Copies to be Submitted:
1. One copy of items A through D listed above;
2. Type I: 2 copies of site plan and other materials required by the Code.
3. Type II: 8 copies of site plan and other materials required by the Code
4. Type III: 15 copies of site plan and other materials required by the Code
5. Type IV 20 copies of site plan and other materials required by the Code

The Director may vary the quantity of materials to be submitted as deemed necessary.

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 of record 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 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, 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) – (3) above.

17.18.50 REFERRAL AND REVIEW OF APPLICATIONS

Within 10 working days of 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.

17.18.60 STAFF EVALUATION

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

17.18.70 TYPE II DEVELOPMENT DECISION

A. Within 60 days of the date of accepting an application, the Director shall grant 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 finds that applicable approvals by others have been granted and the proposed development otherwise conforms to the requirements of this Code.

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 shall describe the reason for denial.

17.18.80 TYPE III OR IV DECISION

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

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.

17.18.100 LEGISLATIVE ENACTMENTS NOT RESTRICTED

Nothing in Chapter 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.

17.18.110 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.

17.18.120 120-DAY RULE; TIME COMPUTATION

Final Decision. Except as allowed for Type IV decisions and applications subject to Section 17.18.110, 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.

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.

CHAPTER 17.30 - ZONING DISTRICTS

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	
Planned Development	**PD**
Cultural & Historic Resource	**CHR**
Flood Slope Hazard	**FSH**
Specific Area Plan Overlay	**SAP**

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.

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.

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 transfers are permitted from restricted development areas to unrestricted areas consistent 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 be calculated in acres based upon a survey of the property boundaries excluding areas dedicated for public use.

Revised by Ordinance 2013-04 effective 07/03/13

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 10 acres in the Single Family Residential Zoning District requires a minimum of 30 units and allows a maximum of 58 units. (NSA x 3 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 Section 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 (8) units per acre has 6 acres of unrestricted site area (USA= 6) and two acres of restricted development area (RDA=2), for a total net site area of 8 acres (NSA= 8). Then NSA (8) x 8 units/acre = 64 and USA (6) x 8 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 3 units. A calculation of 4.2 units is rounded down to 4 units and a calculation of 4.5 units is rounded up to 5 units.

CHAPTER 17.34 - SINGLE-FAMILY RESIDENTIAL (SFR)

17.34.00 INTENT

The 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 allow limited development of property while not precluding more dense future development, as urban services become available. Density shall not be less than 3 or more than 5.8 units per net acre.

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;

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.

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;
3. Duplex;
4. 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;
5. 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;
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.

17.34.30 DEVELOPMENT STANDARDS

Type	Standard
A. Minimum Lot Area - Single detached dwelling - Other permitted uses	7,500 square ft. No minimum
B. Minimum Average Lot Width - Single detached dwelling	 60 ft.
C. Minimum Lot Frontage	20 ft. except as allowed by Section 17.100.160
D. Minimum Average Lot Depth	No minimum
E. Setbacks (Main Building) Front yard Rear yard Side yard (interior) Corner Lot	 10 ft. minimum 20 ft. minimum 7.5 ft. minimum 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 (subject to Section 17.90.220) 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

17.34.40 MINIMUM REQUIREMENTS

A. Must connect to municipal water.
B. Must connect to municipal sewer if service is currently within 200 feet of the site. 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 which directly benefit the property;

[1] Must comply with clear vision requirements of Chapter 17.74.

3. The minimum size of the property is one acre or is a pre-existing buildable lot, as determined by the city;
4. Site consists of a buildable parcel(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 must provide for a future street network to be developed.

D. Must have frontage or approved access to public streets.

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 10 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 5 ft. in width.

CHAPTER 17.80 - ADDITIONAL SETBACKS ON COLLECTOR & ARTERIAL STREETS

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.

17.80.10 APPLICABLITY

These regulations apply to all collector and arterial streets as identified in the latest adopted Sandy Transportation System Plan (TSP). The Central Business District (C-1) is exempt from Chapter 17.80 regulations.

17.80.20 SPECIFIC SETBACKS

Any structure located on streets listed above or identified in the 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

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.

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 Transit System Plan.

17.82.20 BUILDING ORIENTATION

A. All residential dwellings shall have their primary entrances 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.

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 pedestrian route shall consist of materials such as concrete, asphalt, stone, brick, permeable pavers, or other materials 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 5 feet in depth.

D. If the site has frontage on more than one transit street, the dwelling shall provide one main entrance oriented to a transit street or to a corner where two transit streets intersect.

CHAPTER 17.84
IMPROVEMENTS REQUIRED WITH DEVELOPMENT

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.

17.84.10 EXCEPTIONS

Single family residential development on existing lots is exempt from this chapter, with the exception of 17.84.30 Pedestrian and Bicyclist Requirements**.**

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 planned development and/or subdivision, improvements may similarly be phased in accordance with that plan.

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 (5) ft. wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, 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. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of six (6) ft. wide.
   3. Sidewalk improvements shall be made according to City standards, unless the 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, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.
      a) Narrow landscape strips
      b) Narrow sidewalk or portion of sidewalk to no less than four (4) feet in width
      c) Eliminate landscape strips
      d) Narrow 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.

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, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks, as follows:

1. For the purposes of this section, "safe and convenient" means pedestrian and bicyclist facilities that: are reasonably free from hazards which 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.
2. To meet the intent of "B" above, rights-of-way connecting cul-de-sacs or passing through unusually long or oddly shaped blocks shall be a minimum of 15 ft. wide with eight (8) feet of pavement.
3. 12 ft. wide pathways shall be provided in areas with high bicycle volumes or multi-use by bicyclists, pedestrians, and joggers.
4. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:
   a) The pedestrian circulation system shall be at least five (5) feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.
   b) Walkways at least five (5) feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities which abut the site but are not adjacent to the streets abutting the site.
   c) Walkways shall be as direct as possible and avoid unnecessary meandering.
   d) Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.
   e) With the exception of walkway/driveway crossings, 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 standards adopted by the City. (This provision does not require a separated walkway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).
   f) Pedestrian amenities such as covered walk-ways, awnings, visual corridors and benches will be encouraged. For every two benches provided, the minimum parking requirements will be reduced by one, up to a maximum of four benches per site. Benches shall have direct access to the circulation system.

C. Where a development site is traversed by or adjacent to a future trail linkage identified within the Transportation System Plan, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with 17.84. 90(D).

D. To provide for orderly development of an effective pedestrian network, 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, the Planning Commission or Director may require off-site pedestrian facility improvements concurrent with development.

17.84.40 TRANSIT AND SCHOOL BUS TRANSIT REQUIREMENTS

A. Development sites located along existing or planned transit routes shall, where appropriate, incorporate bus pull-outs and/or shelters into the site design. These improvements shall be installed in accordance with the guidelines and standards 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, 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 shall provide safe, convenient pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of 17.84.30 B.

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 conditions less than the minimum standard established in the development code or the 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.

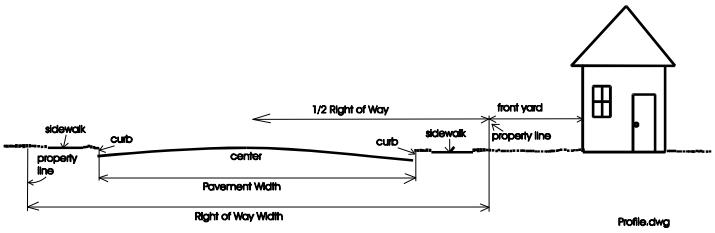
B. Transportation Impact Study (Dwellings). For development applications that propose dwelling units, an applicant must submit a transportation impact study unless the application is exempt from this requirement pursuant to subsection (B)(6), below. Failure to submit the study will result in an incomplete 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. 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 5 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 a.m. and 9 a.m.) and p.m. peak hour (one hour between 4 p.m. and 6 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 and average daily traffic standards and the Oregon Department of Transportation's mobility standard.
   5. If the study identifies level-of-service conditions less than the minimum standard established in the development code or the 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 or fails to meet the Oregon Department of Transportation's mobility 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. 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 5 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; or
      b) The proposed development completed a transportation impact study at the time of annexation within the past 5 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. Location of new arterial streets shall conform to the Transportation System Plan in accordance with the following:
   1. Arterial streets should generally be spaced in one-mile intervals.
   2. Traffic signals should generally not be spaced closer than 1,500 ft. for reasonable traffic progression.

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:
   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.
   2. Local streets should typically intersect in "T" configurations rather than 4-way intersections to minimize conflicts and discourage through traffic. Adjacent "T" intersections shall maintain a minimum of 150 ft. between the nearest edges of the two rights-of-way.
   3. Cul-de-sacs shall not exceed 400 ft. 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.

F. Development sites shall be provided with access from a public street improved to City standards in accordance with the following:
   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.
   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.
   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.
   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.
   5. A half-street improvement includes curb and pavement 2 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.



G. As necessary to provide for orderly development of adjacent properties, 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:
   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.
   2. In order to assure the eventual continuation or completion of the street, reserve strips may be required.

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.

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.

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:
   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.
   2. Grades shall not exceed 6 percent on arterial streets, 10 percent on collector streets, and 15 percent on local streets.
   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 ft. between the nearest edges of the two rights-of-way.
   4. Centerline radii of curves shall not be less than 500 ft. on arterial streets, 300 ft. on collector streets, and 100 ft. on local streets.
   5. Streets shall be designed to intersect at angles as near as practicable to right angles and shall comply with the following:
      a) The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 ft. of straight (tangent) alignment perpendicular to the intersection.

b) The intersection of a local street with another street shall have a minimum of 50 ft. of straight (tangent) alignment perpendicular to 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 ft. along the right-of-way lines of the acute angle.
d) Intersections with arterial and collector streets shall have a minimum curb corner radius of 20 ft. All other intersections shall have a minimum curb corner radius of 10 ft.

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.

17.84.60 PUBLIC FACILITY EXTENSIONS

A. All development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage.

B. Where necessary to serve property as specified in "A" above, required public facility installations shall be constructed concurrent with development.

C. Off-site public facility extensions necessary to fully serve a development site and adjacent properties shall be constructed concurrent with development.

D. As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).

E. All public facility installations required with development shall conform to the City's facilities master plans.

F. Private on-site sanitary sewer and storm drainage facilities may be considered provided 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 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.

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.

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, 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 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.

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 ft. The minimum easement width for two adjacent utilities is 20 ft. 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 (8) feet shall be provided adjacent to all street rights-of-way for franchise utility installations.

C. Where a development site is traversed by a drainageway or water course, a drainage way dedication shall be provided to the City.

D. Where a development is traversed by, or adjacent to, a future trail linkage identified within the Transportation System Plan, dedications of suitable width to accommodate the trail linkage 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, dedications may be required. The need for and widths of those dedications shall be determined by the 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 on standard document forms provided by the City Engineer.

G. If the City has an interest in acquiring any portion of a proposed subdivision or planned development 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 (1) year.

H. 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.

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 and meet the approval 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 standards 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 & OPEN SPACE

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 the population of Sandy. This chapter implements policies of Goal 8 of the Comprehensive Plan and the Parks Master Plan by outlining provisions for parks and open space in the City of Sandy.

17.86.10 MINIMUM PARKLAND DEDICATION REQUIREMENTS

Parkland Dedication: New residential subdivisions, planned developments, multi-family or manufactured home park developments shall be required to provide parkland to serve existing and future residents of those developments. Multi-family developments which provide some "congregate" services and/or facilities, such as group transportation, dining halls, emergency monitoring systems, etc., but which have individual dwelling units rather than sleeping quarters only, are considered to be multi-family developments for the purpose of parkland dedication. Licensed adult congregate living facilities, nursing homes, and all other similar facilities which provide their clients with individual beds and sleeping quarters, but in which all other care and services are communal and provided by facility employees, are specifically exempt from parkland dedication and system development fee requirements.

1. The required parkland shall be dedicated as a condition of approval for the following:

   a. Tentative plat for a subdivision or partition;

   b. Planned Development conceptual or detailed development plan;

   c. Design review for a multi-family development or manufactured home park; and

   d. 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.

2. Calculation of Required Dedication: The required parkland acreage to be dedicated is based on a calculation of the following formula rounded to the nearest 1/100 (0.00) of an acre:

   Required parkland dedication (acres) = (proposed units) x (persons/unit) x 0.0043 (per person park land dedication factor)

   a. Population Formula: The following table shall be used to determine the number of persons per unit to be used in calculating required parkland dedication:

Revised by Ordinance No. 2013-03 (effective 07/03/13)

Type of Unit	Total Persons Per Unit
Single family residential	3.0
Standard multi-family unit	2.0
Manufactured dwelling park	2.0
Congregate multi-family unit	1.5

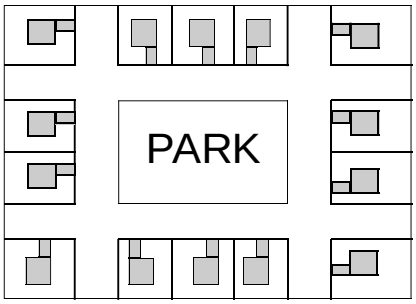
Persons per unit, age distribution, and local conditions change with time. The specific formula for the dedication of land will, therefore, be subject to periodic review and amendment.

b. Per Person Parkland Dedication Factor: The total parkland dedication requirement shall be 0.0043 of an acre per person based on the adopted standard of 4.3 acres of land per one thousand of ultimate population per the Parks Master Plan[1]. This standard represents the citywide land-to-population ratio for city parks, and may be adjusted periodically through amendments to the Parks Master Plan.

17.86.20 MINIMUM PARKLAND STANDARDS

Land required or proposed for parkland dedication shall be contained within a continuous unit and must be suitable for active use as a neighborhood or mini-park, based on the following criteria:

1. Homes must front on the parkland as shown in the example below:



2. The required dedication shall be contained as a contiguous unit and not separated into pieces or divided by roadways.

3. The parkland must be able to accommodate play structures, play fields, picnic areas, or other active park use facilities. The average slope of the active use parkland shall not exceed 15%.

[1] Parks Master Plan, Implementation Plan section, Pages 4 and 5 indicate a required park acreage total of 64.5 acres. This number, divided by population (2015) of 15,000 equates to 4.3 acres per 1000 population or 0.0043 per person.

4. Any retaining wall constructed at the perimeter of the park adjacent to a public right-of-way or private street shall not exceed 4 feet in height.

5. Once dedicated, the City will assume maintenance responsibility for the neighborhood or mini parkland.

17.86.30 DEDICATION PROCEDURES

Prior to approval of the final plat, the developer shall dedicate the land as previously determined by the City in conjunction with approval of the tentative plat. Dedication of land in conjunction with multi-family development shall be required prior to issuance of permits and commencement of construction.

A. Prior to acceptance of required parkland dedications, the applicant/developer shall complete the following items for all proposed dedication areas:

1. The developer shall clear, fill, and/or grade all land to the satisfaction of the City, install sidewalks on the park land adjacent to any street, and seed the park land; and,

2. The developer shall submit a Phase I Environmental Site Assessment 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.

B. Additional Requirements

1. In addition to a formal dedication on the plat to be recorded, the subdivider shall convey the required lands to the city by general warranty deed. The developer of a multi-family development or manufactured home park shall deed the lands required to be dedicated by a general warranty deed. In any of the above situations, the land so dedicated and deeded shall not be subject to any reservations of record, encumbrances of any kind or easements which, in the opinion of the Director, will interfere with the use of the land for park, open space or recreational purposes.

   The subdivider or developer shall be required to present to the City a title insurance policy on the subject property ensuring the marketable state of the title.

2. Where any reservations, encumbrances or easements exist, the City may require payment in lieu of the dedication of lands unless it chooses to accept the land subject to encumbrances.

C. Phased Developments. In a phased development, the required park land for the entire development shall be dedicated prior to approval of the final plat for the first phase. Improvements to the land as required by 17.86.30 (A.1.) shall be made prior to approval of the final plat for the phase that includes the park land.

17.86.40 CASH IN LIEU OF DEDICATION

At the city's discretion only, the city may accept payment of a fee in lieu of land dedication. The city may require payment in lieu of land when the park land to be dedicated is less than 3 acres. A payment in lieu of land dedication is separate from Park Systems Development Charges, and is not eligible for a credit of Park Systems Development Charges. The amount of the fee in lieu of land dedication (in dollars per acre) shall be set by City Council Resolution, and it shall be based on the typical market value of developed property (finished lots) in Sandy net of related development costs.

1. The following factors shall be used in the choice of whether to accept land or cash in lieu:

   a. The topography, geology, access to, parcel size, and location of land in the development available for dedication;

   b. Potential adverse/beneficial effects on environmentally sensitive areas;

   c. Compatibility with the Parks Master Plan, Public Facilities element of the Comprehensive Plan, and the City of Sandy Capital Improvements Program in effect at the time of dedication;

   d. Availability of previously acquired property; and

   e. The feasibility of dedication.

2. Cash in lieu of parkland dedication shall be paid prior to approval of the final plat or as specified below:

   a. 50 percent of the payment shall be paid prior to final plat approval, and

   b. The remaining 50 percent of the payment pro-rated equally among the lots, plus an administrative surcharge as determined by the City Council through a resolution, will constitute a lien against the property payable at the time of sale.

17.86.50 MINIMUM STANDARDS FOR OPEN SPACE DEDICATION

The applicant through a subdivision or design review process may propose the designation and protection of open space areas as part of that process. This open space will not, however, be counted toward the parkland dedication requirement of Sections 17.86.10 through 17.86.40.

1. The types of open space that may be provided are as follows:

   a. Natural Areas: areas of undisturbed vegetation, steep slopes, stream corridors, wetlands, wildlife habitat areas or areas replanted with native vegetation after construction.

   b. Greenways: linear green belts linking residential areas with other open space areas. These greenways may contain bicycle paths or footpaths. Connecting greenways between residences and recreational areas are encouraged.

2. A subdivision or design review application proposing designation of open space shall include the following information as part of this application:

   a. Designate the boundaries of all open space areas; and

   b. Specify the manner in which the open space shall be perpetuated, maintained, and administered; and

   c. Provide for public access to trails included in the Park Master Plan, including but not limited to the Tickle Creek Path.

3. Dedication of open space may occur concurrently with development of the project. At the discretion of the city, for development that will be phased, 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.

4. Open space areas shall be maintained so that the use and enjoyment thereof is not diminished or destroyed. Open space areas may be owned, preserved, and maintained by any of the following mechanisms or combinations thereof:

   a. Dedication to the City of Sandy or an appropriate public agency approved by the City, if there is a public agency willing to accept the dedication. Prior to acceptance of proposed open space, the City may require the developer to submit a Phase I Environmental Site Assessment 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.

   b. Common ownership by a homeowner's association that assumes full responsibility for its maintenance;

   c. Dedication of development rights to an appropriate public agency with ownership remaining with the developer or homeowner's association. Maintenance responsibility will remain with the property owner; and/or

   d. Deed-restricted private ownership preventing development and/or subsequent subdivision and providing for maintenance responsibilities.

5. In the event that any private owner of 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.

CHAPTER 17.92 - LANDSCAPING & SCREENING
GENERAL STANDARDS - ALL ZONES

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 clause as the guiding principle.

17.92.10 GENERAL PROVISIONS

A. Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications. 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 6 months.

C. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-½ ft. 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 be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline.

D. Planter and boundary areas used for required plantings shall have a minimum diameter of 5-ft. (2-½ ft. 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 7-½ ft.

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 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.

G. Required 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.

K. All areas not occupied by paved roadways, walkways, patios, or buildings shall be landscaped.

L. All landscaping shall be continually maintained, including necessary watering, weeding, pruning and replacing.

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%

17.92.30 REQUIRED TREE PLANTINGS

Planting of trees is required for all parking lots with 4 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 should be made from the city-approved list. Alternate selections may be approved by the Director following written request. The type of tree used shall determine frequency of trees in planting areas. Trees in parking areas shall be dispersed throughout the lot to provide a canopy for shade and visual relief.

Area/Type of Planting	Canopy	Spacing
Street Tree	Medium	30 ft. on center
Street Tree	Large	50 ft. on center
Parking Lot Tree	Medium	1 per 8 cars
Parking Lot Tree	Large	1 per 12 cars

Trees may not be planted:

- Within 5 ft. of permanent hard surface paving or walkways, unless specific species, special planting techniques and specifications approved by the Director are used.
- Unless approved otherwise by the City Engineer:
  - Within 10 ft. of fire hydrants and utility poles
  - Within 20 ft. of street light standards
  - Within 5 ft. from an existing curb face
  - Within 10 ft. of a public sanitary sewer, storm drainage or water line
- Where the Director determines the trees may be a hazard to the public interest or general welfare.
- Trees shall be pruned to provide a minimum clearance of 8 ft. above sidewalks and 12 ft. above street and roadway surfaces.

17.92.40 IRRIGATION

Landscaping shall be irrigated, either with a manual or automatic system, to sustain viable plant life.

17.92.50 TYPES AND SIZES OF PLANT MATERIALS

A. At least 75% of the required landscaping area shall be planted with a suitable combination of trees, shrubs, or evergreen ground cover except as otherwise authorized by Chapter 17.92.10 F.

B. Plant Materials. Use of native plant materials or plants acclimatized to the Pacific Northwest is encouraged where possible.

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 5 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 7 feet in overall height or 1 ½ inches in caliper measured 6 inches above the ground, 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 1 gallon in size or 2 feet in height when measured 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 2 years after planting.

H. Vines for screening purposes shall be a minimum of 1 gallon in size or 30 inches in height 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.

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, decorative hard paving and gravel areas, interspersed with planted areas. The exposed area developed with such features shall not exceed 25% of the required landscaped area. Artificial plants are prohibited in any required landscape area.

17.92.60 REVEGETATION IN UNLANDSCAPED OR NATURAL LANDSCAPED AREAS

A. Areas where natural 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 plants acclimatized to the Pacific Northwest is encouraged to reduce irrigation and maintenance demands.

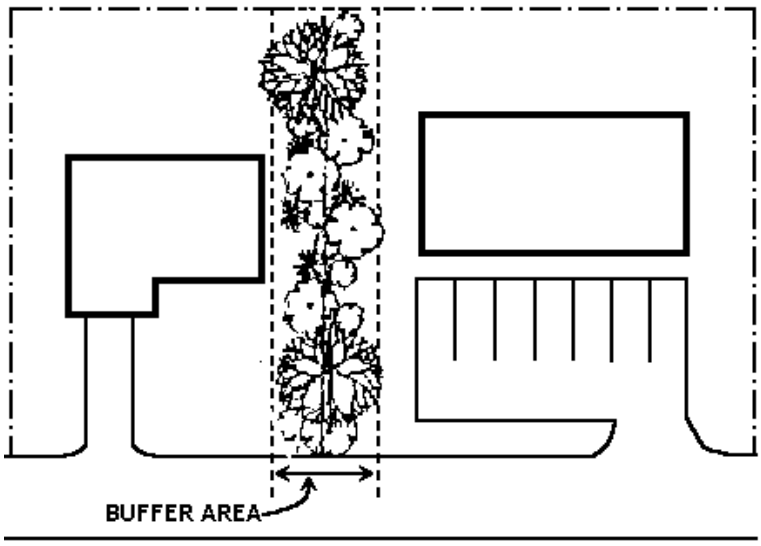
17.92.70 LANDSCAPING BETWEEN PUBLIC RIGHT-OF-WAY AND PROPERTY LINES

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 within the street right-of-way shall not count as part of the lot area percentage to be landscaped.

17.92.80 BUFFER PLANTING - PARKING, LOADING AND MANUEVERING AREAS

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. Where required, a mix of plant materials shall be used to achieve the desired buffering effect.

Buffering is required in conjunction with issuance of construction permits for parking areas containing 4 or more spaces, loading areas, and vehicle maneuvering areas. 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. A balance of low-lying ground cover and shrubs, and vertical shrubs and trees shall be used to buffer the view of these facilities. Decorative walls 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 are exempt from parking bay buffer planting requirements.



17.92.90 SCREENING (HEDGES, FENCES, WALLS, BERMS)

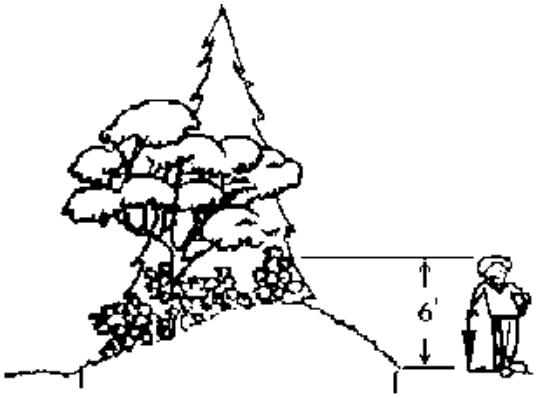
Screening is uses where unsightly views or visual conflicts must be obscured or blocked and where privacy and security are desired. Fences and walls used for screening may be constructed of wood, concrete, stone, brick, and wrought iron, or other commonly used fencing/wall materials. Acoustically designed fences and walls are also used where noise pollution requires mitigation.

A. Height and Opacity. Where landscaping is used for required screening, it shall be at least 6 ft. in height and at least 80 percent opaque, as seen from a perpendicular line of sight, within 2 years following establishment of the primary use of the site.

B. Chain Link Fencing. A chain link fence with slats shall qualify for screening only if a landscape buffer is also provided in compliance with Section 17.92.00 above.

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.

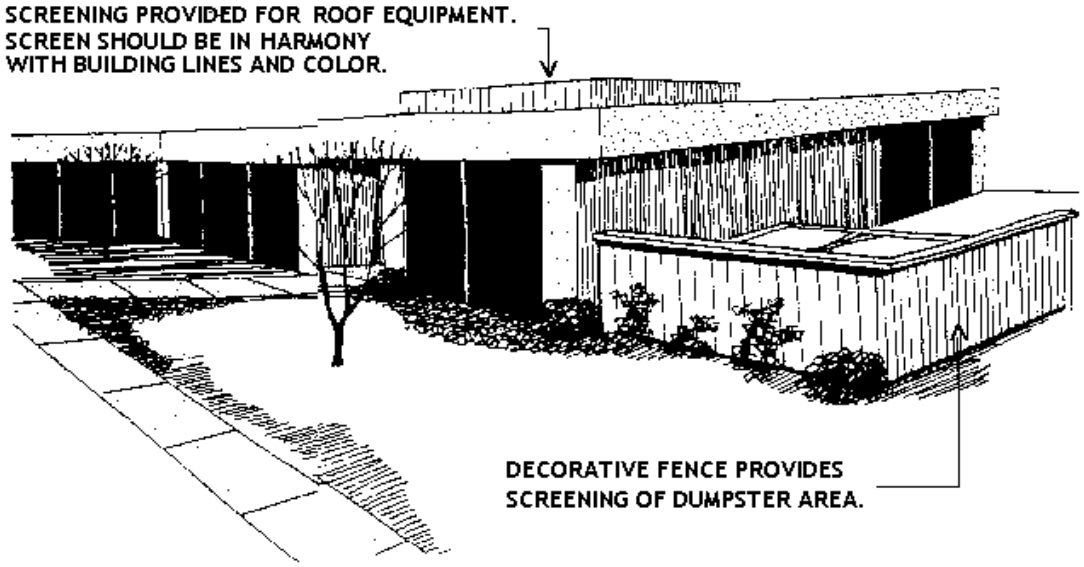
D. Berms. Earthen berms up to 6 ft. in height may be used to comply with screening requirements. Slope of berms may not exceed 2:1 and both faces of the slope shall be planted with ground cover, shrubs, and trees.



A. Long expanses of fences and walls shall be designed to prevent visual monotony through use of offsets, changes of materials and textures, or landscaping.

17.92.100 SCREENING OF SERVICE FACILITIES

Site-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.



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 fence, vegetative materials, or other alternative deemed appropriate by the Director. Exceptions to the preceding requirements include: new or used cars, cycles 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.

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 6 months may be applied for by posting "security" equal to 120% of the cost of the landscaping, assuring installation within 6 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 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% 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.

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 two years. This guarantee shall insure that all plant materials survive in good condition and shall guarantee replacement of dead or dying plant materials.

CHAPTER 17.98 - PARKING, LOADING, & ACCESS REQUIREMENTS

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.

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 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 a planned development 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 requires no more than four (4) 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.

I. Truck Parking. In all residential zoning districts, no overnight parking of trucks or other equipment on wheels or tracks exceeding a 1-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 planned developments, 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 (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. Except where permitted by 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 10 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.
   2. Multi-family dwelling units with more than 10 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.

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.

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 1 seat.
4. Except as otherwise specified, parking for employees shall be provided based on 1 space per 2 employees for the largest shift in addition to required parking specified in Sections 8 – 11 below.
5. Where less than 5 parking spaces are required, then only one bicycle space shall be required except as otherwise modified in Sections 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. Uses 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	2 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

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;	1 per 4 fixed seats or 1 space per 4 participants based on projected	5% or 2 whichever is greater

Theater or similar use	participant capacity, plus 1 per 2 employees	
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

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 10 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. Required parking spaces may be reduced at a ratio of 1 parking space for each 100 square feet of transit amenity space provided above and beyond the minimum requirements.
   3. Uses, 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.

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.

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 5 feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this code.

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.

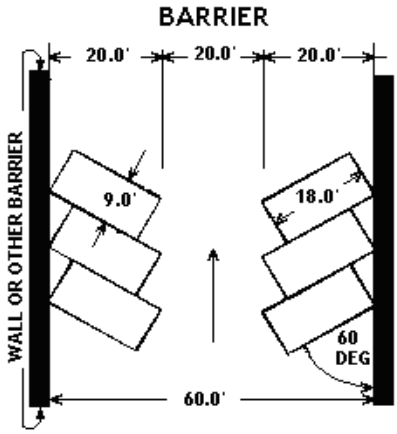
A. Parking Lot Design. All areas for required parking and maneuvering of vehicles shall have a durable hard surface such as concrete or asphalt.

B. Size of Space.
   1. A standard parking space shall be 9 feet by 18 feet.
   2. A compact parking space shall be 8 feet by 16 feet.
   3. Accessible parking spaces shall be 9 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.

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



17.98.70 ON-SITE CIRCULATION

A. Groups of more than three (3) 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 3 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.

17.98.80 ACCESS TO ARTERIAL AND COLLECTOR STREETS

A. Location and design of all accesses to and/or from arterials and collectors (as designated in the Transportation System Plan) are subject to review and approval by the City Engineer. Where practical, access from a lower functional order street may be required. Accesses to

arterials or collectors shall be located a minimum of 150 ft. from any other access or street intersection. Exceptions may be granted 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.

B. No development site shall be allowed more than one access point to any arterial or collector street (as designated in the Transportation System Plan) except as approved by the City Engineer. 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.

C. When developed property is to be expanded or altered in a manner that significantly affects on-site parking or circulation, 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.

17.98.90 ACCESS TO UNIMPROVED STREETS

Access to Unimproved Streets. At the Director's discretion development may occur without access to a City standard street when that development constitutes infill on an existing substandard public street. 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:

- Land partitions
- Conditional uses
- Building permits for new non-residential construction or structural additions to non-residential structures (except accessory development)
- Building permits for new residential units

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 shall have a minimum width of 10 feet. The driveway approach 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 driveway approaches may be required for adjacent lots in cul-de-sacs in order to maximize room for street trees and minimize conflicts with utility facilities (power and telecom pedestals, fire hydrants, streetlights, meter boxes, etc.)

C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. The driveway approach in the public right-of-way shall not exceed 24 feet in width as measured in section B above. A driveway approach shall be constructed in accordance with applicable city standards and the entire driveway shall be paved with asphalt or concrete.

D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width, but such clearance may be reduced in parking structures as approved by the Director.

E. 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.

F. 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.

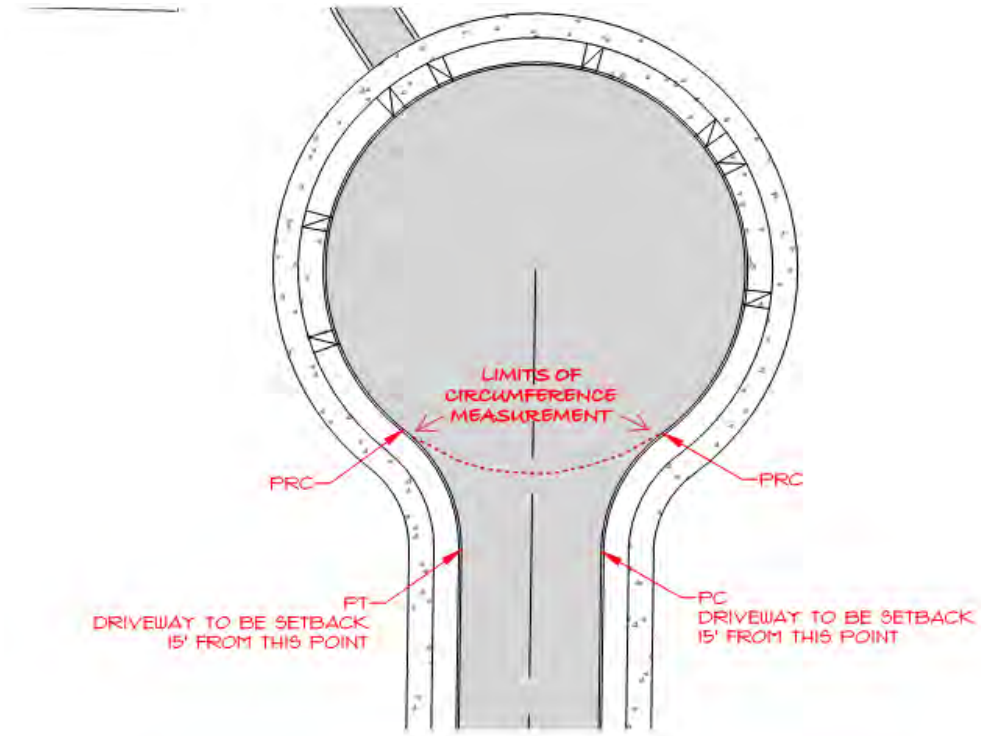
G. The sum of the width of all driveway approaches within the bulb of a cul-de-sac as measured in section B above shall not exceed fifty percent of the circumference of the cul-de-sac bulb. The cul-de-sac bulb circumference shall be measured at the curb line and shall not include the width of the stem 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

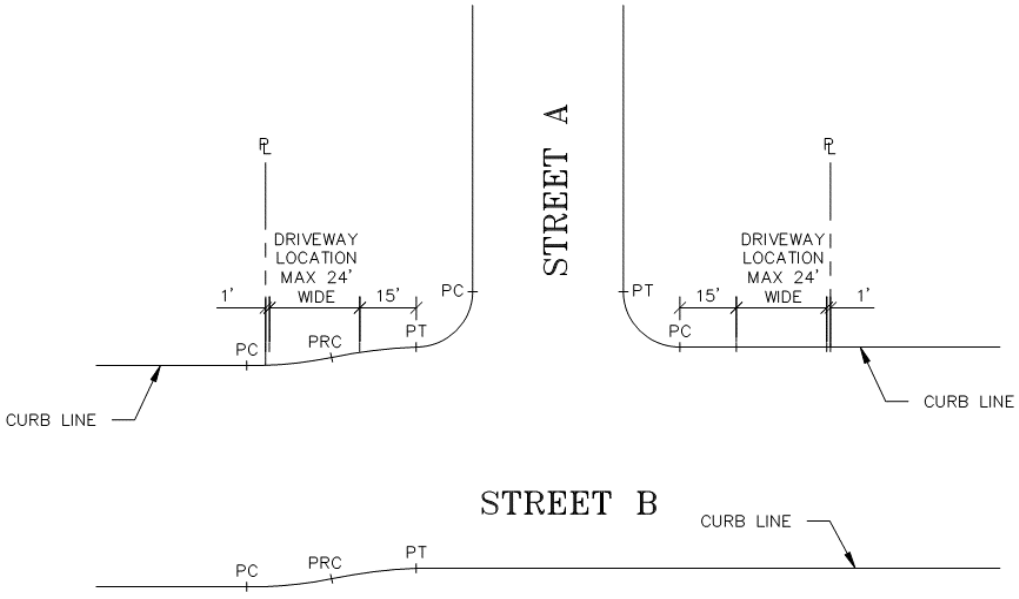
H. The location and design of any driveway approach shall provide for unobstructed sight per the vision clearance requirements in section 17.74.30. Requests for exceptions to these requirements will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.

I. Driveways shall taper to match the driveway approach width to prevent stormwater sheet flow from traversing sidewalks.

CUL-DE-SAC EXHIBIT



DRIVEWAY LOCATION EXHIBIT



Revised by Ordinance No. 2020-06 (effective 05/06/2020)

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 and taking 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.

17.98.120 LANDSCAPING AND SCREENING

A. Screening of all parking areas containing 4 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 5 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 2 and 8 feet above the average ground level shall be required. The screening shall be composed of materials that are an adequate size so as to achieve the required degree of screening within 3 years after installation.

C. Except for a residential development which has landscaped yards, parking facilities shall include landscaping to cover not less than 10 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 5 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 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 5 feet for pedestrian circulation is required.

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. 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.

17.98.140 DRAINAGE

Parking areas, aisles and turnarounds shall have adequate provisions made 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.

17.98.150 LIGHTING

The Dark Sky Ordinance in Chapter 15 of the municipal code applies to all lighting. Artificial lighting shall be provided in all required off-street parking areas. 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.

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 entrance of the primary structure.
   2. Bicycle parking areas shall be visible from building interiors where possible.
   3. For facilities with multiple buildings or parking lots, bicycle parking shall be located in areas of greatest use and convenience to bicyclists.
   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 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 2 ½ feet by 6 feet. If bicycle parking is covered, vertical clearance of 7 feet shall be provided.
   2. An access aisle of at least 5 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. Racks requiring user-supplied locks shall accommodate both cable and U-shaped locks.
   3. Bicycle racks shall be securely anchored to the ground or a structure and shall be designed to hold bicycles securely.
   4. All outdoor bicycle parking facilities shall provide adequate shelter from precipitation where possible.

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.

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 10 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.

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.

17.98.190 OFF-STREET LOADING FACILITIES

B. 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.

C. The required loading berth shall be not less than 10 feet in width by 35 feet in length and shall have an unobstructed height clearance of 14 feet.

D. 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.

E. 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.

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 planned developments, subdivisions and partitions shall provide one (1) on-street parking space within 300 feet of each dwelling except as provided in Section 17.98.200(A)(6) below. The 300 feet shall be measured from the primary entrance of the dwelling.

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 10 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 (10) 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 (2) parking spaces;
   b. Parking spaces within a parking court shall be nine (9) 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 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 (2) 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 (2) parking courts shall be provided within a block, with only one (1) 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 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;

i. A parking court shall be used solely for the parking of operable passenger vehicles.

CHAPTER 17.100
LAND DIVISION

17.100.00 INTENT

The intent of this chapter is to implement the Comprehensive Plan, to provide procedures, regulations, and design standards for land divisions and associated improvements and to provide for orderly and efficient land division patterns supported by a connected system of streets, 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, setbacks, and building height are established in applicable zoning district regulations.

This chapter presents the review procedures, design standards and improvement requirements for land divisions. Procedures for replats and property line adjustments are also addressed in this chapter.

17.100.10 GENERAL PROVISIONS

A. No land shall be divided prior to approval of a minor partition, major partition or subdivision in accordance with this 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, yard or setback requirements of the zoning district.

C. Land division is processed by approval of a tentative plan prior to approval of the final land division plat or map. Where a Type II or Type III procedure is required for land division approval, that procedure shall apply to the tentative plan approval. As long as there is compliance with the approved tentative plat and conditions, the Director shall have the authority to approve final plats and maps for land divisions through a Type I procedure.

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 Development Code and this chapter.

B. Type I Land Division (Minor Partition). A minor 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 major partition or subdivision shall be a Type II procedure when a street is extended, satisfactory street conditions exist and the resulting parcels/lots comply with the standards of the zoning district and this chapter. Satisfactory street conditions exist when the Director determines one of the following:

1. Existing streets are stubbed to the property boundaries and are linked by the land division.
2. An existing street or a new proposed street need not continue beyond the land division in order to complete an appropriate street system or to provide access to adjacent property.
3. The proposed street layout is consistent with a street pattern adopted as part of the Comprehensive Plan or an officially adopted City street plan.

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, when 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 (6) lots.

E. Type III Land Division (Major Partition or Subdivision). A major partition or subdivision shall be a Type III procedure if unsatisfactory street conditions exist or the resulting parcels/lots do not comply with the standards of the zoning district and this chapter. The Director shall determine if unsatisfactory street conditions exist based on one of the following criteria:
1. The land division does not link streets that are stubbed to the boundaries of the property.
2. An existing street or a new proposed street will be extended beyond the boundaries of the land division to complete a street system or provide access to adjacent property.
3. The proposed street layout is inconsistent with a street pattern adopted as part of the Comprehensive Plan or an officially adopted City street plan.

F. Type III Land Division (Major Replat). A major replat involves the realignment of property lines involving more than six lots, even if the subdivision 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.

17.100.30 PROPERTY LINE ADJUSTMENT

Approval of a property line adjustment is required to move a common boundary between two parcels or lots. A Type I property line adjustment is not considered a development action for purposes of determining whether floodplain, greenway, or right-of-way dedication or improvements are required.

A. Application Requirements. Property line adjustment applications shall be made on forms provided by the City and shall be accompanied by:
1. Two (2) copies of the property line adjustment map;
2. The required fee;
3. Any data or narrative necessary to explain the application.

B. Map Information. The property line adjustment map and narrative shall include the following:
1. The names, addresses and phone numbers of the owner(s) of the subject parcels and authorized representative;
2. Scale of the drawing using an engineer's scale;
3. North arrow and date;

4. Legal description of the property;
5. Dimensions and size of the parcels involved in the property line adjustment;
6. Approximate locations of structures, utilities, rights-of-way and easements;
7. Points of access, existing and proposed;
8. Any natural features such as waterways, drainage area, significant vegetation or rock outcroppings;
9. Approximate topography, particularly noting any area of steep slope.

C. 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 proposed future streets will not be adversely affected by the property line adjustment.

D. Final Approval. Three paper copies of the final map shall be submitted within one year 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.

17.100.40 MINOR AND MAJOR PARTITIONS

Approval of a partition is required for a land division of 3 or fewer parcels in a calendar year. Partitions, which do not require creation or extension of a street for access, is classified as a Type I minor partition. Partitions, which require creation or extension of a street for access, are classified as Type II, major partitions.

A. Preapplication Conference. The applicant for a minor or major partition 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 applications shall be made on forms provided by the planning department and shall be accompanied by:
1. Eight copies of the tentative plan for the minor or major partition;
2. The required fee;
3. Any data or narrative necessary to explain the application;
4. List of affected property owners.

C. Tentative Partition Plan. The tentative plan shall be a minimum of 8 1/2 x 11 inches in size and shall include the following information:
1. The date, north point, engineering scale, and legal description;
2. Name and address of the owner of record and of the person who prepared the partition plan;
3. Zoning, size and dimensions of the tract to be partitioned;
4. Size, dimensions and identification of proposed parcels (Parcel 1, Parcel 2, Parcel 3);
5. Approximate location of any structures on the tract to be partitioned, including setbacks to proposed parcel boundaries;

6. Location, names and widths of streets, sidewalks and bikeways within the tract to be partitioned and extending 400 feet beyond the tract boundaries;
7. Location, width and purpose of existing and proposed easements on the tract to be partitioned;
8. Location and size of sanitary sewer, water and stormwater drainage facilities proposed to serve the property to be partitioned;
9. Natural features such as waterways, drainage area, significant vegetation or rock outcroppings;
10. Approximate topography, particularly noting any area of steep slope;
11. 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 or major partition based on the classification procedure (Type I, II or III) and the following approval criteria:
1. The proposed partition is consistent with the density, setback and dimensional standards of the base zoning district.
2. The proposed partition is consistent with the design standards set forth in this chapter.
3. Adequate public facilities are available or can be provided to serve the proposed partition.
4. All proposed improvements meet City standards.
5. Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.
6. The plan preserves the potential for future redivision of the parcels, if applicable.

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 as deemed necessary. In no event, however, shall the Director or Planning Commission require greater dedications or conditions than could be required if the entire tract were subdivided.

F. Approval of Tentative Partition Plan. When a tentative partition plan 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. Approval Signatures for Final Partition Map. Following review and approval of a final partition map, 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 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 and two exact copies to the County Recorder's office. One recorded copy shall be returned to the City of Sandy immediately after recording is completed.

H. Effective Date for Final Partition Map Approval. The partition shall become final upon recording of the approved partition map together with any required documents with the County Recorder. Work specifically authorized following tentative approval may take place

prior to processing of the final partition map. The documents effectuating a partition shall become null and void if not recorded with the County Recorder within one year following approval.

I. Improvements. The same improvements shall be installed to serve each parcel of a partition as required of a subdivision. Improvement standards are set forth in Section 17.90. If the Director and City Engineer find a need to vary the improvement standards for a partition, the application shall be processed through a Type III hearing and may exempt specific improvements.

J. Exceptions to Improvements. Exceptions to improvements may be approved in transition areas or other areas as deemed appropriate by the City. In lieu of excepting an improvement, the Planning Commission may recommend to the City Council that the improvement be installed in the area under special assessment financing or other facility extension policies of the City.

17.100.50 NONRESIDENTIAL PARTITIONS OR SUBDIVISIONS

This section includes special provisions for partitions or subdivisions of land that is zoned for commercial or industrial use.

A. Principles and Standards. In addition to the standards established for partitions or subdivisions, the applicant for a nonresidential partition or subdivision shall demonstrate that the street, parcel and block pattern proposed is adapted to uses in the vicinity. The following principles and standards shall be observed:
   1. Proposed commercial and industrial parcels shall be suitable in area and dimensions to the types of development anticipated.
   2. Street right-of-way and pavement shall be adequate to accommodate the type and volume of traffic anticipated.
   3. Special requirements may be imposed by the City with respect to street, curb, gutter and sidewalk design and construction.
   4. Special requirements may be imposed by the City with respect to the installation of public utilities, including but not limited to water, sanitary sewer, and stormwater drainage facilities.
   5. Efforts shall be made to protect adjacent residential areas from potential nuisance from a proposed commercial or industrial subdivision. Such efforts may include the provision of extra depth in parcels backing up on existing or potential residential development and landscaped buffers.
   6. Streets carrying nonresidential traffic, particularly truck traffic, should not normally be extended through adjacent residential areas.
   7. Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.

17.100.60 SUBDIVISIONS

Approval of a subdivision is required for a land division of 4 or more 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 procedures for approval, applicable state and local requirements, objectives and policies of the Sandy Comprehensive Plan, and the availability of services. The preapplication conference provides the opportunity to discuss the conceptual development of the property in advance of formal submission of the tentative plan in order to save the applicant unnecessary delay and cost.

B. Application Requirements for a Tentative Plat. Subdivision applications shall be made on forms provided by the planning department and shall be accompanied by:
   1. 20 copies of the tentative plat;
   2. Required fee and technical service deposit;
   3. 20 copies of all other supplementary material as may be required to indicate the general program and objectives of the subdivision;
   4. Preliminary title search;
   5. List of affected property owners.

C. Format. The Tentative Plat shall be drawn on a sheet 18 x 24 inches in size and at a scale of one inch equals one hundred 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 8 1/2 x 11, 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. A vicinity map, showing adjacent property boundaries and how proposed streets may be extended to connect to existing streets.
   4. Names, addresses, and telephone numbers of the owner(s) of the property, the engineer or surveyor, and the date of the survey.
   5. Streets: location, names, paved widths, alleys, and right-of-way (existing and proposed) on and within 400 feet of the boundaries of the subdivision tract.
   6. Easements: location, widths, purpose of all easements (existing and proposed) on or serving the tract.
   7. Utilities: location of stormwater drainage, sanitary sewers and water lines (existing and proposed) on and abutting the tract. If utilities are not on or abutting the tract, indicate the direction and distance to the nearest locations.
   8. Ground elevations shown by contour lines at two-foot vertical intervals for ground slopes of less than 10 percent and at ten-foot vertical intervals for ground slopes exceeding 10 percent. Ground elevation shall be related to an established benchmark or other datum approved by the Director.
   9. Natural features such as marshes, rock outcroppings, watercourses on and abutting the property, and location of wooded areas.
   10. Approximate location of areas subject to periodic inundation or storm sewer overflow, location of any floodplain or flood hazard district.
   11. Location, width, and direction of flow of all water courses.
   12. Identification of the top of bank and boundary of mandatory setback for any stream or water course.
   13. Identification of any associated wetland and boundary of mandatory setback.
   14. Identification of any wetland and boundary of mandatory setback.

15. Location of at least one temporary bench mark within the tract boundaries.
16. Existing uses of the property, including location and present use of all existing structures to remain on the property after platting.
17. Lots and Blocks: approximate dimensions of all lots, minimum lot sizes, and proposed lot and block numbers.
18. Existing zoning and proposed land use.
19. Designation of land intended to be dedicated or reserved for public use, with the purpose, conditions, or limitations of such reservations clearly indicated.
20. Proposed development phases, if applicable.
21. Any other information determined necessary by the Director such as a soil report or other engineering study, traffic analysis, floodplain or wetland delineation, etc.

E. Approval Criteria. The Director or Planning Commission shall review the tentative plat for 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 is consistent with the density, setback and dimensional standards of the base zoning district, unless modified by a Planned Development approval.
2. The proposed subdivision is consistent with the design standards set forth in this chapter.
3. The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy.
4. Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.
5. Adequate public facilities are available or can be provided to serve the proposed subdivision.
6. All proposed improvements meet City standards.
7. The phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops.

F. Conditions. The Director or Planning Commission may require dedication of land and easements, and may specify such conditions or modifications of the tentative plat as deemed necessary.

G. Improvements. A detailed list of required improvements for the subdivision shall be set forth in the approval and conditions for the tentative plat.

H. Tentative Plat Expiration Date. The final plat shall be delivered to the Director for approval within two (2) 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 (1) 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. All information shown on the face of the plat shall be mathematically perfect.
   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 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, tenants and servants.
      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 tract.
      b) Sheets and drawings showing the following:
         1) 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.
         2) The computation of distances, angles and courses shown on the plat.
         3) Ties to existing monuments, proposed monuments, adjacent subdivisions, street corners and state highway stationing.
      c) A copy of any deed restrictions applicable to the subdivision.
      d) A copy of any dedication requiring separate documents.
      e) A list of all taxes and assessments on the tract which have become a lien on the tract.
      f) A certificate by the engineer that the subdivider has complied with the improvement requirements.

9. Certification by the City Engineer 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 subdivider of the changes or additions that must be made and shall afford the subdivider 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 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 subdivider 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.

17.100.70 LAND DIVISION DESIGN STANDARDS

All land divisions shall be in conformance with the requirements of the applicable base zoning district and this chapter, as well as with other applicable provisions of this Code. Modifications to these requirements may be accomplished through a Planned Development. The design standards in this section shall be used in conjunction with street design standards included in the City of Sandy Transportation System Plan and standards and construction specifications for public improvements as set forth in adopted Public Facilities Plans and the Sandy Municipal Code.

17.100.80 CHARACTER OF THE LAND

Land which the Director or the Planning Commission finds to be unsuitable for development due to flooding, improper drainage, steep slopes, rock formations, adverse earth formations or topography, utility easements, or other features which will reasonably be harmful to the safety, health, and general welfare of the present or future inhabitants of the partition or subdivision and the surrounding areas, shall not be developed unless adequate methods are formulated by the subdivider and approved by the Director or the Planning Commission to solve the problems created by the unsuitable land conditions.

17.100.90 ACCESS CONTROL GUIDELINES AND COORDINATION

A. Notice and coordination with ODOT required. The city will coordinate and notify ODOT regarding all proposals for new or modified public and private accesses on to Highways 26 and 211.

B. It is the city policy to, over time, reduce noncompliance with the Oregon Highway Plan Access Management Policy guidelines.

C. Reduction of compliance 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.

17.100.100 STREETS GENERALLY

No subdivision or partition shall be approved unless the development has frontage or approved access to an existing public street. In addition, all streets shall be graded and improved in conformance with the City's construction standards, approved by the City Engineer, in accordance with the construction plans.

A. Street Connectivity Principle. The pattern of streets established through land divisions should be connected 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 many streets so that key streets (particularly U.S. 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.:
1.

C. Topography and Arrangement. All streets shall be properly related to special traffic generators such as industries, business districts, schools, and shopping centers and to the pattern of existing and proposed land uses.

D. Street Spacing. Street layout shall generally use a rectangular grid pattern with modifications as appropriate to adapt to topography or natural conditions.

E. Future Street Plan. Future street plans are conceptual plans, street extensions and connections on acreage adjacent to land divisions. They assure access for future development and promote a logical, connected pattern of streets. It is in the interest of the city to promote a logical, connected pattern of streets. All applications for land divisions shall provide a future street plan that shows the pattern of existing and proposed future streets within the boundaries of the proposed land divisions, proposed connections to abutting properties, and extension of streets to adjacent parcels within a 400 foot radius of the study area where development may practically occur.

F. Connections. Except as permitted under Exemptions, all streets, alleys and pedestrian walkways shall connect to other streets within the development and to existing and planned streets outside the development and to undeveloped properties that have no future street plan. Streets shall terminate at other streets or at parks, schools or other public land within a neighborhood.

Local streets shall align and connect with other roads when crossing collectors and arterials per the criteria in Section 17.84.50K(5)(e).

Proposed streets or street extensions shall be located to provide direct access to existing or planned transit stops, and existing or planned neighborhood activity centers, such as schools, shopping areas and parks.

G. 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. Standards for street connections do not apply to freeways and other highways with full access control.
3. 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. Where compliance with the standards would result in unacceptable sight distances, an accessway may be approved in place of a street connection.

17.100.110 STREET STANDARDS AND CLASSIFICATION

Street standards are illustrated in the figures included at the end of this chapter. Functional definitions of each street type are described in the Transportation System Plan as summarized below.

A. Major arterials are designed to carry high volumes of through traffic, mixed with some unavoidable local traffic, through or around the city. Major arterials should generally be spaced at 1-mile intervals.

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. Minor arterials should generally be spaced at 1-mile intervals.

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% 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. Collector streets should generally be spaced at 1/2-mile intervals.

E. Local streets provide direct access to abutting property and connect to collector streets. Local streets shall be spaced no less than 8 and no more than 10 streets per mile, except as the city may otherwise approve through an adjustment or variance pursuant to Chapter 17.66. 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. Cul-de-sacs and dead end streets are discouraged. If deemed necessary, cul-de-sacs shall be as short as possible and shall not exceed 400 feet in length.

G. Public access lanes are designed to provide primary access to a limited number of dwellings when the construction of a local street is unnecessary.

H. Alleys are designed to provide access to multiple dwellings in areas where lot frontages are narrow and driveway spacing requirements cannot be met.

17.100.120 BLOCKS AND ACCESSWAYS

A. Blocks. Blocks shall have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.

B. Residential Blocks. Blocks fronting local streets shall not exceed 400 feet in length, unless topographic, natural resource, or other similar physical conditions justify longer blocks. Blocks may exceed 400 feet if approved as part of a Planned Development, Specific Area Plan, adjustment or variance.

C. Commercial Blocks. Blocks located in commercial districts shall not exceed 400 feet in length.

D. 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 10 feet within a 15-foot right-of-way or tract 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 or through greenway systems.

17.100.130 EASEMENTS

A minimum eight (8) foot public utility easement shall be required along property lines abutting a right-of-way for all lots within a partition or subdivision. Where a partition or subdivision is traversed by a watercourse, drainage way, channel or stream, the land division shall provide a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse, and such further width as determined needed for water quality and quantity protection.

17.100.140 PUBLIC ALLEYS

A. Public alleys shall have a minimum width of 20 feet. Structural section and surfacing shall conform to standards set by the City Engineer.

B. Existing alleys may remain unimproved until redevelopment occurs. When development occurs, each abutting lot 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 as provided in Section 17.100.140(D) below.

D. An alley with a minimum width of 28 feet may permit parallel parking on one side of the alley only.

17.100.150 RESIDENTIAL SHARED PRIVATE DRIVES

A shared private drive is intended to provide access to a maximum of two (2) dwelling units.

A. Criteria for Approval
Shared private drives may be approved by the Director when one or more of the following conditions exist:
1. Direct access to a local street is not possible due to physical aspects of the site including size, shape, or natural features.
2. The construction of a local street is determined to be unnecessary.

B. Design
1. A shared private drive constructed to city standards shall not serve more than two (2) dwelling units.
2. A shared access easement and maintenance agreement shall be established between the two units served by a shared private drive. The language of the easement and maintenance agreement shall be subject to approval by the Director. Such easements shall be recorded in the Deed Records of Clackamas County.
3. Public utility easements shall be provided where necessary in accordance with Section 17.100.130.
4. Shared private drives shall be fully improved with an all weather surface (e.g. concrete, asphalt, permeable pavers) in conformance with city standards. The pavement width shall be 20 feet.
5. Parking shall not be permitted along shared private drives at any time and shall be signed and identified accordingly.

17.100.160 PUBLIC ACCESS LANES

Public access lanes are designed to provide primary access to a limited number of dwellings where the construction of a local street is not necessary. Public access lanes are intended to serve a maximum of six (6) dwelling units.

A. Criteria for Approval
Public access lanes may be approved by the Director when certain conditions exist which make the construction of a standard local street unnecessary. Approval of public access lanes shall be based on one or more of the following:
1. Physical conditions such as natural features, unusual lot size, shape, or other unique features prevent the construction of a local street.

2. It is determined that construction of a local street is not necessary to facilitate orderly development of a future street system.
3. It is determined that there are no logical extensions of an existing local street to serve the site.

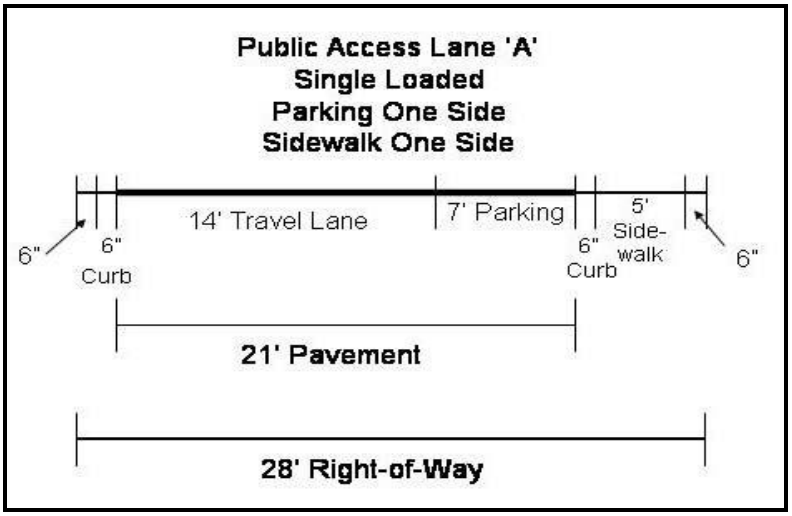
B. General Provisions

1. A public access lane may serve a maximum of six (6) dwelling units.
2. Public access lanes are subject to spacing requirements of Section 17.100.120.
3. Public utility easements shall be provided where necessary in accordance with Section 17.100.130.
4. If a public access lane is designed as a dead end, a turnaround shall be provided at the point where the lane terminates. The design of the turnaround shall be subject to approval by the Director and the Fire Department.
5. Parking shall be prohibited in public access lane turnarounds.
6. Street lighting may be required in public access lanes for traffic and pedestrian safety.

C. Public Access Lane Design

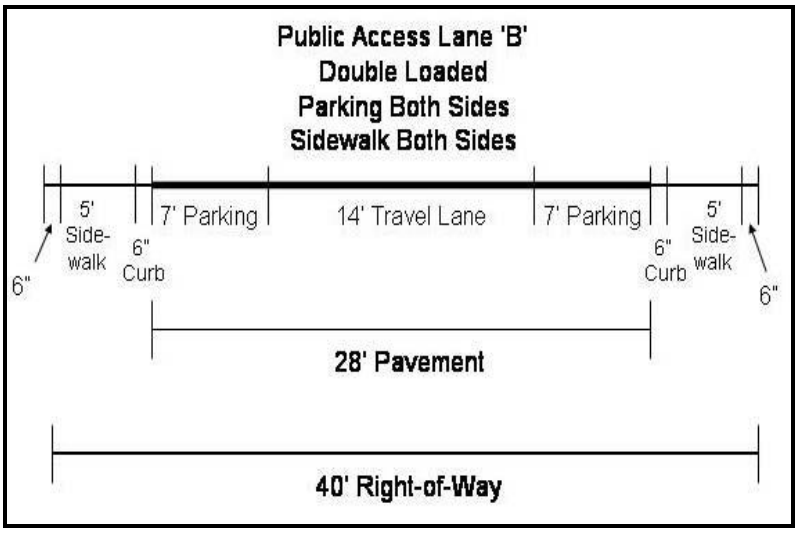
1. Public Access Lane 'A' (Figure 17.100 - A)
   a) Public access lane 'A' is designed to be single loaded and provide access to lots located on one side of the lane only.
   b) Public access lanes shall be constructed to city standards and must meet the required dimensions as specified in this section.
   c) Curbside sidewalks on the side of the lane which abuts lot frontage are along public access lanes to achieve specified dimensions.
   d) Planter strips are not required along public access lanes due to the minimal lots served. Lots abutting a public access lane are required to have street trees planted in accordance with Section 17.100.290.
   e) Parking is permitted on one side of a public access lane 'A' as shown in Figure 17.100 - A. Parking shall be permitted on the side of the lane that abuts lot frontages only. Signage shall be displayed to indicate the parking regulations along the lane and in the turnaround.

Figure 17.100 – A: Public Access Lane 'A'



2. Public Access Lane Option 'B' (Figure 17.100 - B).
   a) Public access lane 'B' is designed to be double loaded and provide access to lots located on both sides of the lane.
   b) Public access lanes shall be constructed to city standards and must meet the required dimensions as specified in this section.
   c) Curbside sidewalks are required along both sides of the access lane to achieve specified dimensions.
   d) Planter strips are not required along public access lanes due to the minimal lots served. Lots abutting a public access lane are required to have street trees planted in accordance with Section 17.100.290.
   e) Parking is permitted on both sides of a public access lane 'B' as shown in Figure 17.100 - B. Signage shall be displayed to indicate the parking regulations along the lane and in the turnaround.

Figure 17.100 – B: Public Access Lane 'B'



17.100.170 FLAG LOTS

Flag lots can be created where it can be shown that no other street access is possible to achieve the requested land division. The flag lot shall have a minimum street frontage of 15 feet for its accessway. The following dimensional 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) may not be counted toward the lot size requirements.

C. The accessway shall have a minimum paved width of 10 feet.

17.100.180 INTERSECTIONS

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.

17.100.190 STREET AND TRAFFIC CONTROL SIGNS

The City Engineer shall specify the type and location of traffic control signs, street signs and/or traffic safety devices.

17.100.200 STREET SURFACING

Public streets, including alleys, within the development shall be improved in accordance with the requirements of the City or the Oregon Standard Specifications. All streets shall be paved with asphaltic concrete or Portland cement concrete surfacing. Where required, speed humps shall be constructed in conformance with the City's standards and specifications.

17.100.210 STREET LIGHTING

A complete lighting system (including, but not limited to: conduits, wiring, bases, poles, arms, and fixtures) shall be the financial responsibility of the subdivider on all cul-de-sacs, local streets, and neighborhood collector streets. The subdivider will be responsible for providing the arterial street lighting system in those cases where the subdivider is required to improve or fronts on an arterial street. Standards and specifications for street lighting shall conform to IESNA roadway illumination standards and the City's streetlighting guidelines

17.100.220 LOT DESIGN

A. The lot arrangement shall be such that there will be no foreseeable difficulties, for reason of topography or other conditions, in securing building permits to build on all lots in compliance with the Development Code.

B. The lot dimensions shall comply with the minimum standards of the Development Code. When lots are more than double the minimum lot size required for the zoning district, the subdivider may be required to arrange such lots to allow further subdivision and the opening of future streets to serve such potential lots.

C. 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. A street frontage of not less than 15 feet is acceptable in the case of a flag lot division resulting from the division of an unusually deep land parcel that is of a size to warrant division into not more than two parcels.

D. Double frontage lots shall be avoided except where necessary to provide separation of residential developments from arterial streets or to overcome specific disadvantages of topography or orientation.

E. 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 necessary for several adjoining lots, the Director or the Planning Commission may require that such lots be served by a common access drive in order to limit traffic conflicts on such streets. Where possible, driveways shall be designed and arranged to avoid requiring vehicles to back into traffic on minor or major arterials.

17.100.230 WATER FACILITIES

Water lines and fire hydrants serving the subdivision or partition, and connecting the development to City mains, shall be installed to provide adequate water pressure to serve present and future consumer demand. 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 standards of the Fire District, the City, and the Oregon Health Authority Drinking Water Services section.

If the City requires the subdivider 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 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 subdivider setting forth methods for reimbursement for the proportionate share of the cost.

17.100.240 SANITARY SEWERS

Sanitary sewers shall be installed to serve the subdivision and to connect the subdivision to existing mains. Design of sanitary sewers shall take into account the capacity and grade to allow for desirable extension beyond the subdivision.

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.

17.100.250 SURFACE DRAINAGE AND STORM SEWER SYSTEM

A. Drainage facilities shall be provided within the subdivision and to connect with off-site drainage ways or storm sewers. Capacity, grade and materials shall be by a design approved by the city engineer. Design of drainage within the subdivision 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.

B. In addition to normal drainage design and construction, provisions shall be taken to handle any drainage from preexisting subsurface drain tile. It shall be the design engineer's duty to 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.

17.100.260 UNDERGROUND UTILITIES

All subdivisions or major partitions shall be required to install underground utilities (including, but not limited to, electrical, fiber, cable, and telephone wiring). The utilities shall be installed pursuant to the requirements of the utility company.

17.100.270 SIDEWALKS

Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision.

17.100.280 BICYCLE ROUTES

If appropriate to the extension of a system of bicycle routes, existing or planned, the Director or the Planning Commission may require the installation of bicycle lanes within streets. Separate bicycle access ways may be required to reduce walking or cycling distance when no feasible street connection is available.

17.100.290 STREET TREES

Where planting strips are provided in the public right-of-way, a master street tree plan shall be submitted and approved by the Director. The street tree plan shall provide street trees approximately every 30' on center for all lots.

17.100.300 EROSION CONTROL

Grass seed planting shall take place prior to September 30th 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 1000 square feet of land area.

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, except as otherwise provided in relation to oversizing.

A. Lot, street and perimeter monumentation
B. Mailbox delivery units
C. Sanitary sewers
D. Stormwater drainage facilities
E. Sidewalks
F. Street lights
G. Street name signs
H. Street trees
I. Streets
J. Traffic control devices and signs
K. Underground communication lines, including broadband (fiber), telephone, and cable. Franchise agreements will dictate whether telephone and cable lines are required.
L. Underground power lines
M. Water distribution lines and fire hydrants
N. Fiber (broadband)

17.100.320 IMPROVEMENT PROCEDURES

Improvements installed by a land divider 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.

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.

C. Improvements shall be constructed under the inspection and to the satisfaction of the City Engineer.

D. All improvements installed by the subdivider shall be guaranteed for a period of one (1) year following acceptance by the City Engineer. Such guarantee shall be secured by cash deposit in the amount of the value of the improvements as set by the City Engineer. Subdividers may elect to provide a subdivision maintenance bond equal to ten (10) percent of the value of the public improvements for a period of two (2) years following acceptance by the City.

E. As-constructed plans in both digital and hard copy formats shall be filed with the City Engineer upon completion of the improvements.

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 subdivision prior to recording the final subdivision plat. If this procedure is to be used, the subdivision plat shall contain all the required certifications except the County Surveyor. The City shall keep the 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 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 subdivision during a construction year and may limit the area of the final subdivision plat to the area to be improved. The performance bond described in section B above shall be required under the improvement district procedure. The formation of a Local Improvement District (LID) is entirely within the discretion of the City.

17.100.340 PERFORMANCE GUARANTEE

If the applicant chooses to utilize the opportunities provided under "A" or "B" 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;
   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. The amount of the letter of credit shall equal 110% of the value of the improvements to be guaranteed; or
   3. Provide bonds in a form approved by the City Attorney.

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 carry out provisions of the agreement 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 expense incurred, the applicant shall be liable to the City for the difference.

CHAPTER 17.102 - URBAN FORESTRY

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.

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 4½ 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 70 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.

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.

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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 city or public utility for the installation or maintenance or repair of roads, utilities, or other structures.

2. Tree removal 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.

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.
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.
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 and species of trees 11" DBH or greater to be retained.

   c. Location and type of tree protection measures to be installed.

2. A brief narrative describing the project.

3. Estimated starting and ending dates.

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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 17.102.50 shall also contain a report from a certified arborist or professional forester 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.

b. 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 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:

a. A list of property owners on mailing labels within 300 feet of the subject property.

b. A written narrative addressing applicable code sections 17.102.50, 17.102.60, and 17.102.70.

17.102.40 PERMIT REVIEW

An application for a Type II or III tree removal permit shall demonstrate that the provisions of Chapter 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 & 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.

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.
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.
4. If possible, at least two of the required trees per acre must be of conifer species.
5. Trees within the required protected setback areas 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, 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. 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 10 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.

17.102.60 TREE REPLANTING REQUIREMENTS

1. All areas with exposed soils resulting from tree removal shall be replanted with a ground cover of native species within 30 days of harvest during the active growing season, or by June 1st of the following spring.
2. 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.
3. Removal of hazard trees as defined shall be replanted with two native trees of quality nursery stock for every tree removed.
4. Tree Removal allowed within the FSH Overlay District shall be replanted with two native trees of quality nursery stock for every tree removed.
5. Tree Removal not associated with a development plan must be replanted following the provisions of OAR Chapter 629, Division 610, Section 020-060

17.102.70 VARIANCES

Under a Type III review process, the Planning Commission may allow newly-planted trees to substitute for retained trees if:

1. 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
2. The substitution more nearly meets the intent of this ordinance due to:
   a. The location of the existing and proposed new trees, or
   b. The physical condition of the existing trees or their compatibility with the existing soil and climate conditions; or
   c. An undue hardship is caused by the requirement for retention of existing trees.
   d. Tree removal is necessary to protect a scenic view corridor.

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. Funds generated as a result of enforcement of this ordinance shall be dedicated to the Urban Forestry Fund established under Section 17.102.100 below.

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.

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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.

17.102.100 URBAN FORESTRY FUND CREATED

In order to encourage planting of trees, the City will create a fund or account to be used for tree planting in rights-of-way, city parks, riparian areas, and other public property. The source of funds will be donations, grants, and any other funds the City Council may designate.

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September 24, 2021

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VIA EMAIL

Kelly O'Neill, Jr.
Development Services Director
City of Sandy
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: Roll Tide Properties Corp. / Deer Meadows Subdivision (File No. 21-014 SUB/TREE)

Dear Kelly:

This firm represents Roll Tide Properties Corp., the Applicant in the above-referenced file. This Letter sets forth the Applicant's objections to the Commission Staff Report dated September 17, 2021, which recommends denial of the Applicant's application for a subdivision. The Applicant's specific objections are set forth below.

1. <u>The Application is a needed housing application and the City must treat it as such</u>.

A. The City may apply on clear and objective standards, conditions, and procedures to the Application.

The Applicant has submitted a proposal for a subdivision located at 40808 and 41010 Highway 26 in Sandy, Oregon, in an area zoned for residential use. ORS 197.307(4) provides that local governments may adopt and apply only clear and objective standards, conditions, and procedures regulating the development of housing, including needed housing, and precludes governments from unreasonably increasing the cost of housing or causing unreasonable delay. ORS 227.173(2) provides that "when an ordinance establishing approval standards is required under ORS 197.307 to provide only clear and objective standards, the standards <u>must be clear and objective on the face of the ordinance</u>."

Land use regulations are not clear and objective if they impose "subjective, value-laden analyses that are designed to balance or mitigate impacts of the development on (1) the property to be developed or (2) the adjoining properties or community." *Rogue Valley Assoc. of Realtors v. City of Ashland*, 35 Or LUBA 139, 158 (1998), *aff'd*, 158 Or App 1, 970 P2d 685, *rev den*, 328 Or 594 (1999). And, regardless of whether a given regulation is "designed to balance or mitigate impacts," it must also be *both* clear *and* objective. *Id.* at 155–56 ("Dictionary definitions of 'clear' and 'objective' suggest that the kinds of standards frequently found in land use

regulations lack the certainty of application required to qualify as 'clear' or 'objective.'"). More fundamentally, standards that are susceptible to multiple interpretations are not clear and objective. *Parkview Terrace Development, LLC v. City of Grants Pass*, 70 Or LUBA 37, 52–53 (2014); *see also Walter v. City of Eugene*, 73 Or LUBA 356, 360–64 (2016) (citing a standard's "multiple possible interpretations" as a basis to find it not clear and objective).

ORS 197.522(2) and ORS 197.522(4) require local governments to approve needed housing applications that are consistent with, or can be made consistent with through reasonable conditions of approval, the comprehensive plan and applicable land use regulations, and to deny applications that are not. Relatedly, ORS 197.522(3),[1] allows an applicant to amend its application or to propose reasonable conditions to make its application consistent with the comprehensive plan and applicable land use regulations. What this means is that, if the Applicant proposes a condition of approval that would satisfy a given approval criterion that the Application does not otherwise meet, the Commission must impose the proposed condition of approval in lieu of denying the Application.

Many of the reasons set forth in the Staff Report that form the basis of Staff's recommendation of denial do not stand up to Oregon's needed housing statutes. Many standards in the Sandy Development Code ("SDC") are not clear and objective on their face or even when interpreted, and as such, cannot be applied to the Application under Oregon's needed housing rules; examples of these standards are highlighted in **Exhibit 1**, attached. Further, the City does not offer a clear and objective approval process for subdivisions under ORS 197.307(6). And, the Commission cannot deny an application that is consistent with the comprehensive plan and applicable land use applications and/or that can be made consistent by the imposition of reasonable conditions of approval. ORS 197.522(2)-(4). Finally, under ORS 197.522(3), the Commission must allow the Applicant to amend the Application or to propose reasonable conditions that will cause the Application to meet all relevant approval criteria.

B. Staff cannot require dedication of parkland because the Development Code's procedures for such requirement are not clear and objective.

Contrary to Staff's assertions, the regulatory scheme created for park dedication is not clear and objective, and therefore is not applicable under ORS 197.307(4). SDC 17.86.10 includes a requirement that all residential development dedicate a certain amount of parkland based on the formula in SDC 17.86.10.B. Alternatively, an applicant may pay a fee-in-lieu for required parkland under SDC 17.86.40. While Staff contends that the formula for parkland dedication is clear and objective, that is not all that ORS 197.307(4) requires. It also requires that local governments "[…] apply only clear and objective […] procedures regulating the development of housing," and that the "standards, conditions and procedures" "may not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay." (Emphasis added.)

[1] **"**If an application is inconsistent with the comprehensive plan and applicable land use regulations, the local government, prior to making a final decision on the application, shall allow the applicant to offer an amendment or to propose conditions of approval that would make the application consistent with the plan and applicable regulations."

The SDC is without any clear and objective guideposts as to whether a developer must provide a fee-in-lieu payment or parkland dedication, and neither decision can be made without the inherent consideration of the other option because SDC Chapter 17.86 provides for both. Thus, the decision maker must exercise discretion in deciding to require one or the other, and it is the required exercise of discretion that makes the parkland dedication requirement inapplicable under ORS 197.307(4). Consequently, Staff is unable to explain how its recommendation that parkland be dedicated next to Deer Pointe Park was based on a clear and objective procedure.

Relatedly, the parkland dedication requirement also violates ORS 197.307(4) because it certainly would have the effect of "discouraging needed housing through unreasonable cost and delay." This is due to Staff's and the Sandy Parks and Trails Advisory Board's (the "Board") attempt to apply the Parks Master Plan to a limited land use decision to which it is inapplicable as a matter of law.[2] As a practical matter, Staff and the Board's attempt to extract a park dedication in a specific area causes a number of problems. First, it represents substantial increased costs to the project, which will have the effect of increasing the costs of resulting housing. Second, Staff has not explained how a parkland dedication at the west end of the site could result in a lot arrangement that would satisfy SDC 17.86.20; the solution to that problem would require a complete re-design of the subdivision, further adding to additional costs and delay.

Finally, it is irrelevant that the proposed lots are not arranged as required by SDC 17.86.20 because there is no clear and objective method by which an applicant can predict whether park land dedication or a fee-in-lieu will be required.

2. <u>The City may not require extension of Dubarko Road through the Subject Property nor require a dedication of parkland</u>.

A. The Transportation System Plan and Parks Master Plan are not adequately incorporated into the land use regulations, in violation of ORS 197.195.

The Applicant has submitted an application for a subdivision, which is a limited land use decision as defined by ORS 197.015(12). Under ORS 197.195(1), cities are required to incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations. This requirement extends to standards set forth in the transportation system plan ("TSP"), parks master plan, and other elements of a city's comprehensive plan as well. *See Oster v. City of Silverton*, LUBA No. 2018-103, at pp. 9-10 (Or LUBA May 7, 2019). Whether such a standard has been properly incorporated turns on whether the land use regulations that are said to incorporate such standards "make clear what *specific policies or standards* in the TSP [or other identified plan] apply to a limited land use decision as approval criteria." *Id.* at p. 12. "ORS 197.195(1) contemplates more than a broad injunction to comply with unspecified portions of the comprehensive plan [or other identified plan]." *Paterson v. City of Bend*, LUBA

[2] As explained in more detail below, the Parks Master Plan is not incorporated into the City's land use regulations and is therefore inapplicable under ORS 197.195.

No. 2004-155, at p. 6 (Or. LUBA 2005). Rather, "[i]n order to 'incorporate' a comprehensive plan [or other plan] standard into a local government's land use regulations within the meaning of ORS 197.195(1), the local government must *at least* amend its land use regulations to make clear what specific policies or other provisions of the comprehensive plan [or other plan] apply to a limited land use decision as approval criteria." *Id.* at pp. 6-7.

The City of Sandy's approval criteria governing review of a tentative plat for a subdivision fails to properly incorporate the Sandy Comprehensive Plan or TSP. Specifically, SDC 17.100.60(E)(3) requires a showing that the "proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy." This is not sufficient to meet the incorporation requirements of ORS 197.195(1) because it merely refers generally to the Comprehensive Plan and the City's official street plan. *See Oster* at p. 12. It does not "make clear what specific policies, action items, or performance standards contained in the TSP apply as approval criteria for a limited land use decision." *Id.*

Staff also recommends denial because the Application does not propose to dedicate parkland adjacent to Deer Point Park, as that park is designated on the 1997 Parks Master Plan. Consequently, according to Staff, the Application violates SDC 17.86.10 and/or .40. Staff's conclusions are incorrect.

Staff's recommendation derives from and principally relies on the City's Parks Master Plan. The Parks Master Plan is not applicable to the Application because, as explained above, the Application is a limited land use decision. Limited land use decisions are not subject to comprehensive plans or their elements unless such provisions are expressly incorporated into a city's land use regulations. ORS 197.195(1). The Parks Master Plan is not incorporated into the Sandy Development Code, the City's land use regulations; nor does Staff's recommendation assert that it is. Therefore, the Parks Master Plan may not be a basis for requiring dedication of parkland adjacent to Deer Point Park.

Indeed, all references to the City's TSP, Parks Master Plan, street plans, and comprehensive plan found in Chapter 17.84 and Chapter 17.100 of the Sandy Development Code are improperly incorporated because none of them specify which policies and standards actually apply. Thus, these requirements cannot be applied to the Application. *See, e.g.*, **Exhibit 1**.

B. In order to require an extension of Dubarko Road and dedication of parkland, the City must demonstrate that those requirements have an essential nexus and are roughly proportional to the project's impacts on those facilities.

The Staff Report suggests that the Applicant should be required to extend Dubarko Road to Highway 26 and to dedicate certain land as parkland to expand Deer Pointe Park. Such dedications are subject to the Takings Clause of the Fifth Amendment of the U.S. Constitution.

Requiring a landowner to convey its private property rights in exchange for development approval is a takings (unconstitutional condition) unless there is an "essential nexus" between the

condition and the government interest. *Nollan v. California Coastal Com*., 483 U.S. 825, 836-37 (1987). Additionally, to withstand a legal challenge, the condition must be "roughly proportional" to the expected impacts caused by the proposed development. *Dolan v. City of Tigard*, 512 U.S. 374, 391-395 (1994). The *Nollan* and *Dolan* takings analysis must be done on a case-by-case basis, and the City carries the burden of demonstrating in the first instance that any exaction has a nexus to and is roughly proportional to the nature and degree of the projected impacts of the project. The City is required to make an "individualized determination" and "some effort to quantify" evidence in the findings to support a conclusion of rough proportionality. *Dolan*, 512 U.S. at 391. The *Nollan/Dolan* analysis applies to requirements to pay money or make public improvements in addition to requirements to dedicate property. *Koontz v. St. Johns River Water Management District*, 570 U.S. 595 (2013).

There is no demonstration in the record that the requirements for the Dubarko Road extension and parkland dedication have a nexus to any governmental interest other than the City's general policies showing the street extension and parkland dedications. However, such policies do not constitute the required nexus; rather, a local government must show that "the proposed project's impacts, either alone or in combination with other construction, are ones that 'substantially impede' the interest identified by the government." *Hill v. City of Portland*, 293 Or App 283, 290-291 (2018).

Despite *Hill's* requirement that the required dedications be tied to an actual potential impact from the proposed development, the Staff Report points to no evidence that the proposed development will lead to a capacity problem in the City's transportation system or parks system.

Staff has made no attempt to identify the essential nexus between the impact of the Project on the City's park system and the dedication requirement, and no attempt to explain how the requirement is roughly proportional to the project's impacts. Relying on a broadly-applicable dedication formula is insufficient because such a determination must be individualized. *Dolan*, 512 U.S. at 391. What is more, simply imposing the same level of exaction on all housing projects does not prove there actually is a nexus between that housing as the parks dedication requirement itself. *Hill*, 293 Or. App. at 290-291.

Finally, there is nothing in the record or the Staff Report even approaching a showing that the Dubarko Road extension and parkland dedication are "roughly proportional" to the impacts of the proposed subdivision.

In sum, the sole questions in the constitutional analysis in this case are as follows. First, do the road extension and parkland dedication have an "essential nexus" to the proposed development? Second, if there is a nexus, are the requirements to extend Dubarko Road and to dedicate parkland "roughly proportional" to the impacts of the proposed development? The City has the burden of proof to answer these two questions, but has utterly failed to do so.

C. SDC 17.100.100.G.2 prohibits the City from require an extension of Dubarko Road through the site.

SDC 17.100.100 governs street requirements with subdivisions. SDC 17.100.100.G establishes exemptions from otherwise-applicable street requirements. Subsection G.2 provides:

> "Standards for street connections do not apply to freeways and other highways with full access control."

As explained in ODOT's September 1, 2021 letter (which is listed as Exhibit N to the Staff Report), Highway 26 is access controlled. Therefore, the City unambiguously lacks the authority to require a connection of Dubarko Road to Highway 26.

D. OAR 660-012-0045 does not apply to the proposed development.

The Director also cites to OAR 660-012-0045 as a basis for denial. This is improper for at least two reasons. For one, this administrative rule is not an approval criterion and as such cannot be the basis for denial of the Application. Moreover, it establishes obligations for a local government's plan and land use regulations; it does not apply directly to review of subdivision application. Even if it did, it establishes obligations that the *City* must meet, not the Applicant. As such, it cannot be used as a basis to deny the Application.

3. <u>Planning Staff's recommendation for denial is inconsistent with applicable law</u>.

The Applicant addresses each of the eleven bases for Staff's recommendation of denial below.

1) The subdivision proposal does not meet subdivision Criteria 17.100.60 (E)(1), (2), (3), (4), (5), and (6).

RESPONSE: Staff's conclusion is incorrect for the following reasons.

- *17.100.60.E.1. "The proposed subdivision is consistent with the density, setback and dimensional standards of the base zoning district, unless modified by a Planned Development approval."*
    - This criterion is not clear and objective as required by ORS 197.307(4) because the phrase "consistent with" is not clear and objective.
    - As Staff concludes in paragraph 24 of the Staff Report, the Application satisfies the density requirements in the applicable zones.
    - Staff's only basis for finding that setback standards are not met is due to the Applicant's plan not to extend Dubarko Road. Staff's position does not make sense; one cannot plausibly argue that a plan does not meet setback requirements adjacent to a new road that is not proposed.

- Chapter 82's requirement that homes "face a transit street" is not applicable because, as noted above, the City's Transportation System Plan and Pedestrian Mater Plans are not incorporated into the City's Land Use Regulations. ORS 197.195.

- Pursuant to ORS 197.522(3), if the transit street orientation requirement in SDC 17.82.20.A did apply, it could be met with the following condition:

  "All residential structures on lots abutting Highway 26, Dubarko Road, and Street B shall have their primary entrances oriented to Highway 26, Dubarko Road, or Street B. If a lot abuts two or more of these streets the residential structure shall be oriented to the highest classification of street."

  This condition was apparently proposed in paragraph 34 of the Staff Report. Under ORS 197.522(3), the Commission is required to impose this condition in lieu of denial because it would ensure satisfaction the frontage orientation requirement.

- Staff does not argue that any lots do not meet dimensional standards.

- *17.100.60.E.2. "The proposed subdivision is consistent with the design standards set forth in this chapter."*

  - As an initial matter, 17.100.E.2 cannot apply to the application because the phrase "consistent with" is not clear and objective as required by ORS 197.307(4) and similarly, E.2 does not identify which "design standards" apply.

  - As explained in paragraph 18 of the Staff Report, Staff's basis for concluding that subsection E.2 is not met relies upon the following arguments:

    - That the project does not provide a Dubarko Road connection to Highway 26;

    - That the project does not meet the "Street Connectivity Principle";

    - That the project does not "promote a logical, connected pattern of streets";

    - That the project does not "provide connectivity to other streets within the development and to existing and planned streets outside the development"; and

    - That the applicant did not submit information on block lengths.

  - Staff is incorrect in the above findings for the following reasons:

- As explained above, the City cannot require an extension of Dubarko Road to Highway 26 because such a requirement is not incorporated into the City's land use regulations. Moreover, SDC 17.100.100.G.2 provides that "standards for street connections do not apply to freeways and other highways with full access control." Highway 26 is access controlled by ODOT.

- The "Street Connectivity Principle"[3] does not apply because it is not clear and objective as required by ORS 197.307(4).

- The Application already shows the pattern of existing and proposed streets as required by SDC 17.100.100.E. Regardless, subsection E is not clear and objective because it includes the requirement that the plan "promote a logical, connected pattern," which is not clear and objective as required ORS 197.307(4); nor is the requirement that a plan show new street extensions to adjacent parcels "where development may practically occur." If the Commission concludes that a different future street plan is required, it can require that as a condition of approval pursuant to ORS 197.522(3).

- The requirement in SDC 17.100.100.F that "all streets, alleys and pedestrian walkways shall connect to other streets within the development and to existing and planned streets outside the development and to undeveloped properties that have no future street plan" is not applicable because it is not clear and objective, as required by ORS 197.307(4).

- Block length information is available because the subdivision plan sheets are to scale. Regardless, this is a submittal requirement and does not provide a basis for denial of the Application.

- *17.100.60.E.3. "The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy."*

[3] The "Street Connectivity Principle" is set forth in SDC 17.100.100.A as follows: "A. Street Connectivity Principle. The pattern of streets established through land divisions should be connected 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 many streets so that key streets (particularly U.S. 26) are not overburdened." This is not clear and objective because it does not define the following terms: "safe and convenient," "a logical, recognizable pattern of circulation," "spread traffic," "many streets," and "overburdened." It is also not clear and objective because it does not explain *how* a "pattern of streets" should be "connected."

- As explained above, this criterion is not applicable because the City's Comprehensive Plan and Transportation System Plan have not been incorporated into the City's land use regulations as required by ORS 197.195.

- As explained above, the City has not demonstrated the required essential nexus and rough proportionality required by *Nollan* and *Dolan*.

- The Applicant is not required to extend Dubarko Road under SDC 17.100.100.G.2 because Highway 26 is access controlled by ODOT.

- *17.100.60.E.4. "Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions."*

  - Mike Ard, the Applicant's transportation engineer, will provide an update to the existing transportation impact study (TIS) which demonstrates that the Application satisfies this section.

- *17.100.60.E.5. "Adequate public facilities are available or can be provided to serve the proposed subdivision."*

  - This standard is not applicable under ORS 197.307(4) because the phrase "adequate public facilities" is ambiguous and subjective.

- *17.100.60.E.6. "All proposed improvements meet City standards."*

  - In paragraph 22, Staff identified three reasons why it believed the above criterion is not met. These are (1) the lack of an extension of Dubarko Road to Highway 26, (2) the lack of frontage improvements on Highway 26, and (3) the lack of dedicated parkland. As explained above, these are not legally permissible bases for denial.

  - Regardless, the above criterion is not applicable under ORS 197.307(4) because the criterion does not identify which City standards are applicable, and does not explain what is sufficient to "meet" those standards.

2) The applicant's statement indicating that "Both of the proposed cul-de-sacs have less than 50% of their circumference covered by driveway drops" is not sufficient as there were no dimensional specifications submitted by the applicant to support this statement.

RESPONSE: **Exhibit 2**, attached hereto, provides driveway width information for the Fawn Street and Street A cul-de-sacs. This exhibit demonstrates that the sum of the driveway widths for each cul-de-sac is less than 50%. SDC 17.98.100.F is satisfied.

3) The applicant proposes two cul-de-sacs but does not propose a pedestrian connection to streets beyond the cul-de-sacs as required by Section 17.84.30.

RESPONSE: Staff's conclusion is incorrect for the following reasons.

- SDC 17.84.30(B) is not clear and objective and therefore inapplicable under ORS 197.307(4), for the following reasons:
    - The phrase "safe and convenient pedestrian and bicyclist facilities that strive to minimize travel distance to the extent practicable shall" is ambiguous, subjective, and requires the use of discretion in its application.
    - The definition of "safe and convenient" in subsection (B)(1) does not make the phrase clear and objective because the definition itself relies on ambiguous and subjective terminology, including "reasonably free from hazards," "interfere with or discourage travel for short trips," "a direct route of travel between destination" and "meet the travel needs of pedestrians and bicyclists." None of these phrases are capable of objective measurement.
- SDC 17.84.30 does not require pedestrian pathways to "streets beyond the cul-de-sacs." Rather, it subjectively requires pedestrian and bicycle facilities "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." Staff's conclusion is incorrect because "streets," as a general matter, are not on this list.
- SDC 17.84.30(B)(2) does not expressly require pedestrian connections from cul-de-sacs; it only requires pedestrian connections to be a minimum of 15 feet wide where they are proposed.

4) The distance between the two nearest edges of the right-of-way between Dubarko Road (an arterial) and Street C (a local street) is less than the minimum 150 ft. dimension in Sections 17.84.50(E)(2) and 17.84.50(J)(3).

RESPONSE: This is not a permissible basis for denial because the 150-foot street spacing requirement does not apply to Street C. Subsection E.2 provides as follows:

> "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."

This standard does not apply here because it applies on its face only to "local streets." However, Dubarko Street is a major arterial and C Street is designed as a "public access lane" according to the standards in SDC 17.100.160. Therefore, there is no "adjacent "T" intersection" to any local street within the Project.

Subsection J.2 provides as follows:

> "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."

This standard does not apply because there are is no "staggered street alignment resulting in a "T" intersection. First, there is no street intersection within 150 feet of the proposed termination of Dubarko Road; only a "public access lane." Second, there are no proposed "staggered" intersections, as demonstrated in **Exhibit 3**.

5) The minimum 100 feet of tangent alignment required in Section 17.84.50(J)5(a) is not provided at the intersection of Street "B" (a collector) and Dubarko Road (an arterial) or at the intersection of Dubarko Road and Street "B".

RESPONSE: This standard is not clear and objective because, by using the word "tangent," it is not clear whether the standard applies only to curved intersections or to roughly straight intersections (as are proposed in the Application). Therefore, it is inapplicable under ORS 197.307(4).

If the Commission does find that the above standard applies, pursuant to ORS 197.522(3) the Commission should impose the following condition of approval:

> *"The intersection of Street B and Dubarko Road shall have a minimum of 100 feet of straight (tangent) alignment perpendicular to the intersection."*

It is feasible for the Applicant to satisfy this condition as demonstrated on **Exhibit 4**. Under ORS 197.522(3), the Commission is required to impose this condition in lieu of denial because it would ensure satisfaction of SDC 17.84.950.J.5.a.

6) The applicant does not propose to extend Dubarko Road to intersect with Highway 26 consistent with the requirements of the Sandy Development Code or the 2011 Transportation System Plan.

RESPONSE: As explained in detail above, the City cannot require an extension of Dubarko Road to Highway 26 because such a requirement is not incorporated into the City's land use regulations. Moreover, SDC 17.100.100.G.2 provides that "standards for street connections do not apply to freeways and other highways with full access control." Highway 26 is access controlled by ODOT. Finally, as explained above, the City has not met its burden of demonstrating essential nexus or rough proportionality for this requirement, as required by *Nollan* and *Dolan*.

7) The applicant does not include highway frontage improvements along Highway 26 consistent with the Sandy Development Code.

RESPONSE: Under *Hill v. City of Portland*, 293 Or App 283, 290 (2018), and *Brown v. City of Medford*, 251 Or App 42, 53 (2012), the City cannot, as a matter of constitutional law, require frontage improvements to a road or highway that is not proposed for access. As the City cannot require such frontage improvements, the above statement is not a permissible reason for denial.

8) The applicant's proposal does not clearly define if they propose to replace the 8-inch diameter water line and/or install an 18-inch water line in conformance with the Water Master Plan.

RESPONSE: Staff's conclusion is incorrect for the following reasons.

- SDC 17.100.230 is not applicable under ORS 197.307(4) because the requirements that it "shall be installed to provide adequate water pressure to serve present and future consumer demand" is not clear and objective.

- The requirements of the Water Master Plan are not incorporated into the City's land use regulations as required by ORS 197.195; therefore, the Water Master Plan does not apply.

- Staff made no attempt to establish the essential nexus between the impacts of the proposed development—which does not include future multifamily dwellings—and the requirement for an 18-inch water main. Staff also makes no attempt to demonstrate how the costs of an 18-inch water main connected into the existing main in Highway 26 is roughly proportional to the impact of the proposed development on the City's water system. Both showings are required for the requirement to pass constitutional muster as required by *Nollan* and *Dolan*.

- The above notwithstanding, pursuant to ORS 197.522(3), the Applicant can satisfy this standard with the following condition of approval:

  "The applicant shall install an 18-inch water line in Dubarko Rd. connected to the existing 18-inch water line at the west end of the site and the existing 12-inch line on Highway 26."

  While this would allow the Applicant to satisfy SDC 17.100.230, the Applicant reserves its right to challenge the constitutionality of the condition under ORS 197.796.

9) The applicant does not propose to extend the existing 12-inch water main in Highway 26 east from the required intersection of Dubarko Road and Highway 26 to the east boundary of the site consistent with the Sandy Development Code.

RESPONSE: This requirement is not a legally permissible basis for denial for the reasons explained under (8), above.

10) The proposed 10-foot-wide public storm drainage easements depicted between Lots 27 and 28 and at the rear of Lots 9-13 do not meet the minimum dimensional requirement for public facility easements in Section 17.84.90(A)(2).

RESPONSE: Pursuant to ORS 197.522(3), the Applicant can satisfy this requirement by accepting the following condition of approval:

> "*Prior to final plat, the Applicant shall grant to the City a 15-foot wide public storm drainage easement between Lots 27 and 28 and at the rear of Lots 9-13*."

Under ORS 197.522(3), the Commission is required to impose this condition in lieu of denial because it would ensure satisfaction of SDC 17.84.90(A)(2).

11) This subdivision proposal does not propose to dedicate 0.96 acres of parkland as required by Chapter 17.86. The additional .96 acres could expand Deer Pointe Park consistent with the Parks and Trails Master Plan that was adopted in 1997.

RESPONSE: As explained in detail above, the City cannot require dedication of 0.96 acres to add to Deer Pointe Park for the following reasons:

- The City's Parks and Trail Master Plan is not incorporated into the City's land use regulations as required by ORS 197.195, and is therefore inapplicable to the Application.
- The process by which the City can require parkland dedication as opposed to a fee-in-lieu is not clear and objective; therefore, the parkland dedication requirement cannot apply under ORS 197.307(4).
- Staff has made no attempt to demonstrate an essential nexus or rough proportionality of the parkland dedication requirement, as required by *Nollan* and *Dolan*.

4. <u>Conclusion</u>.

For the above reasons, the City may not require a dedication of parkland adjacent to Deer Pointe Park and may not require an extension of Dubarko Road. The Commission should approve the Application because Staff's asserted reasons for denial are not permissible under applicable law.

Best regards,

Erin M. Forbes

EMF/jmhi
Enclosures

cc: Michael C. Robinson *(via email) (w/enclosures)*
Garrett H. Stephenson *(via email) (w/enclosures)*
Emily Meharg *(via email) (w/enclosures)*
David Doughman *(via email) (w/enclosures)*
Dave Vandehey *(via email) (w/enclosures)*
Ray Moore *(via email) (w/enclosures)*
Mike Ard *(via email) (w/enclosures)*
Tracy Brown *(via email) (w/enclosures)*
Tyler Henderson *(via email) (w/enclosures)*
Alex Reverman *(via email) (w/enclosures)*
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February 8, 2021

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VIA E-MAIL

Mr. Kelly O'Neill, Jr.
Development Services Director
City of Sandy
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: Roll Tide Properties, LLC / Bull Run

Dear Mr. O'Neill:

As we will discuss on February 10 for Bull Run, attached are sections of the Sandy Development Code that (a) include subjective standards and procedures and provide for subjective conditions; and (b) improperly incorporate or fail to incorporate the Sandy Comprehensive Plan, the Sandy TSP, and other public facilities plans. Also included for your reference are related Oregon statutes and case law discussing same. For ease of review, we have highlighted the subjective criteria and procedures (and related statutes/case law) in gold or yellow; and the incorporation of the various Plans (and related statutes/case law) in aqua.

We are looking forward to our next meeting.

Very truly yours,

Michael C. Robinson

MCR:jmhi
Enclosures

cc: Mr. Dave Vandehey *(via email) (w/enclosures)*
Mr. Alex Reverman *(via email) (w/enclosures)*
Mr. Carey Sheldon *(via email) (w/enclosures)*
Mr. Mike Ard *(via email) (w/enclosures)*
Mr. Ray Moore *(via email) (w/enclosures)*
Mr. Tracy Brown *(via email) (w/enclosures)*
Christopher D. Crean, Esq. *(via email) (w/enclosures)*
Ms. Shelley Denison *(via email) (w/enclosures)*
Ms. Erin Forbes *(via email) (w/enclosures)*

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197.195 Limited land use decision; procedures. (1) A limited land use decision shall be consistent with applicable provisions of city or county comprehensive plans and land use regulations. Such a decision may include conditions authorized by law. Within two years of September 29, 1991, cities and counties shall incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations. A decision to incorporate all, some, or none of the applicable comprehensive plan standards into land use regulations shall be undertaken as a post-acknowledgment amendment under ORS 197.610 to 197.625. If a city or county does not incorporate its comprehensive plan provisions into its land use regulations, the comprehensive plan provisions may not be used as a basis for a decision by the city or county or on appeal from that decision.

(2) A limited land use decision is not subject to the requirements of ORS 197.763.

(3) A limited land use decision is subject to the requirements of paragraphs (a) to (c) of this subsection.

(a) In making a limited land use decision, the local government shall follow the applicable procedures contained within its acknowledged comprehensive plan and land use regulations and other applicable legal requirements.

(b) For limited land use decisions, the local government shall provide written notice to owners of property within 100 feet of the entire contiguous site for which the application is made. The list shall be compiled from the most recent property tax assessment roll. For purposes of review, this requirement shall be deemed met when the local government can provide an affidavit or other certification that such notice was given. Notice shall also be provided to any neighborhood or community organization recognized by the governing body and whose boundaries include the site.

(c) The notice and procedures used by local government shall:

(A) Provide a 14-day period for submission of written comments prior to the decision;

(B) State that issues which may provide the basis for an appeal to the Land Use Board of Appeals shall be raised in writing prior to the expiration of the comment period. Issues shall be raised with sufficient specificity to enable the decision maker to respond to the issue;

(C) List, by commonly used citation, the applicable criteria for the decision;

(D) Set forth the street address or other easily understood geographical reference to the subject property;

(E) State the place, date and time that comments are due;

(F) State that copies of all evidence relied upon by the applicant are available for review, and that copies can be obtained at cost;

(G) Include the name and phone number of a local government contact person;

(H) Provide notice of the decision to the applicant and any person who submits comments under subparagraph (A) of this paragraph. The notice of decision must include an explanation of appeal rights; and

(I) Briefly summarize the local decision making process for the limited land use decision being made.

(4) Approval or denial of a limited land use decision shall be based upon and accompanied by a brief statement that explains the criteria and standards considered relevant to the decision, states the facts relied upon in rendering the decision and explains the justification for the decision based on the criteria, standards and facts set forth.

(5) A local government may provide for a hearing before the local government on appeal of a limited land use decision under this section. The hearing may be limited to the record developed pursuant to the initial hearing under subsection (3) of this section or may allow for the introduction of additional testimony or evidence. A hearing on appeal that allows the introduction of additional testimony or evidence shall comply with the requirements of ORS 197.763. Written notice of the decision rendered on appeal shall be given to all parties who appeared, either orally or in writing, before the hearing. The notice of decision shall include an explanation of the rights of each party to appeal the decision. [1991 c.817 §3; 1995 c.595 §1; 1997 c.844 §1]

197.303 "Needed housing" defined. (1) As used in ORS 197.286 to 197.314, "needed housing" means all housing on land zoned for residential use or mixed residential and commercial use that is determined to meet the need shown for housing within an urban growth boundary at price ranges and rent levels that are affordable to households within the county with a variety of incomes, including but not limited to households with low incomes, very low incomes and extremely low incomes, as those terms are defined by the United States Department of Housing and Urban Development under 42 U.S.C. 1437a. "Needed housing" includes the following housing types:

(a) Attached and detached single-family housing and multiple family housing for both owner and renter occupancy;

(b) Government assisted housing;

(c) Mobile home or manufactured dwelling parks as provided in ORS 197.475 to 197.490;

(d) Manufactured homes on individual lots planned and zoned for single-family residential use that are in addition to lots within designated manufactured dwelling subdivisions; and

(e) Housing for farmworkers.

(2) For the purpose of estimating housing needs, as described in ORS 197.296 (3)(b), a local government shall use the population projections prescribed by ORS 195.033 or 195.036 and shall consider and adopt findings related to changes in each of the following factors since the last review under ORS 197.296 (2)(a)(B) and the projected future changes in these factors over a 20-year planning period:

(a) Household sizes;

(b) Household demographics;

(c) Household incomes;

(d) Vacancy rates; and

(e) Housing costs.

(3) A local government shall make the estimate described in subsection (2) of this section using a shorter time period than since the last review under ORS 197.296 (2)(a)(B) if the local government finds that the shorter time period will provide more accurate and reliable data related to housing need. The shorter time period may not be less than three years.

(4) A local government shall use data from a wider geographic area or use a time period longer than the time period described in subsection (2) of this section if the analysis of a wider geographic area or the use of a longer time period will provide more accurate, complete and reliable data relating to trends affecting housing need than an analysis performed pursuant to

subsection (2) of this section. The local government must clearly describe the geographic area, time frame and source of data used in an estimate performed under this subsection.

(5) Subsection (1)(a) and (d) of this section does not apply to:

(a) A city with a population of less than 2,500.

(b) A county with a population of less than 15,000.

(6) A local government may take an exception under ORS 197.732 to the definition of "needed housing" in subsection (1) of this section in the same manner that an exception may be taken under the goals. [1981 c.884 §6; 1983 c.795 §2; 1989 c.380 §1; 2011 c.354 §2; 2017 c.745 §4; 2019 c.639 §6; 2019 c.640 §10a]

197.307 Effect of need for certain housing in urban growth areas; approval standards for residential development; placement standards for approval of manufactured dwellings. (1) The availability of affordable, decent, safe and sanitary housing opportunities for persons of lower, middle and fixed income, including housing for farmworkers, is a matter of statewide concern.

(2) Many persons of lower, middle and fixed income depend on government assisted housing as a source of affordable, decent, safe and sanitary housing.

(3) When a need has been shown for housing within an urban growth boundary at particular price ranges and rent levels, needed housing shall be permitted in one or more zoning districts or in zones described by some comprehensive plans as overlay zones with sufficient buildable land to satisfy that need.

(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.

(5) The provisions of subsection (4) of this section do not apply to:

(a) An application or permit for residential development in an area identified in a formally adopted central city plan, or a regional center as defined by Metro, in a city with a population of 500,000 or more.

(b) An application or permit for residential development in historic areas designated for protection under a land use planning goal protecting historic areas.

(6) In addition to an approval process for needed housing based on clear and objective standards, conditions and procedures as provided in subsection (4) of this section, a local government may adopt and apply an alternative approval process for applications and permits for residential development based on approval criteria regulating, in whole or in part, appearance or aesthetics that are not clear and objective if:

(a) The applicant retains the option of proceeding under the approval process that meets the requirements of subsection (4) of this section;

(b) The approval criteria for the alternative approval process comply with applicable statewide land use planning goals and rules; and

(c) The approval criteria for the alternative approval process authorize a density at or above the density level authorized in the zone under the approval process provided in subsection (4) of this section.

(7) Subject to subsection (4) of this section, this section does not infringe on a local government's prerogative to:

(a) Set approval standards under which a particular housing type is permitted outright;

(b) Impose special conditions upon approval of a specific development proposal; or

(c) Establish approval procedures.

(8) In accordance with subsection (4) of this section and ORS 197.314, a jurisdiction may adopt any or all of the following placement standards, or any less restrictive standard, for the approval of manufactured homes located outside mobile home parks:

(a) The manufactured home shall be multisectional and enclose a space of not less than 1,000 square feet.

(b) The manufactured home shall be placed on an excavated and back-filled foundation and enclosed at the perimeter such that the manufactured home is located not more than 12 inches above grade.

(c) The manufactured home shall have a pitched roof, except that no standard shall require a slope of greater than a nominal three feet in height for each 12 feet in width.

(d) The manufactured home shall have exterior siding and roofing which in color, material and appearance is similar to the exterior siding and roofing material commonly used on residential dwellings within the community or which is comparable to the predominant materials used on surrounding dwellings as determined by the local permit approval authority.

(e) The manufactured home shall be certified by the manufacturer to have an exterior thermal envelope meeting performance standards which reduce levels equivalent to the performance standards required of single-family dwellings constructed under the Low-Rise Residential Dwelling Code as defined in ORS 455.010.

(f) The manufactured home shall have a garage or carport constructed of like materials. A jurisdiction may require an attached or detached garage in lieu of a carport where such is consistent with the predominant construction of immediately surrounding dwellings.

(g) In addition to the provisions in paragraphs (a) to (f) of this subsection, a city or county may subject a manufactured home and the lot upon which it is sited to any development standard, architectural requirement and minimum size requirement to which a conventional single-family residential dwelling on the same lot would be subject. [1981 c.884 §5; 1983 c.795 §3; 1989 c.380 §2; 1989 c.964 §6; 1993 c.184 §3; 1997 c.733 §2; 1999 c.357 §1; 2001 c.613 §2; 2011 c.354 §3; 2017 c.745 §5; 2019 c.401 §7]

PARKVIEW TERRACE DEVELOPMENT LLC, Petitioner,
and JOSEPHINE HOUSING AND COMMUNITY DEVELOPMENT COUNCIL, Intervenor-Petitioner,
v.
CITY OF GRANTS PASS, Respondent,
and DAVID R. MANNIX, MELISSA S. CANON EAVES, CAREY GILBERT, JAMES FREGO, CYNTHIA FREGO, SHAUN HOBACK, RANDY R. LEMMON, TONI J. LEMMON, DAVID J. HOLMAN and JOANNA H. LOFASO, Intervenors-Respondents.

LUBA No. 2014-024

LAND USE BOARD OF APPEALS OF THE STATE OF OREGON

July 23, 2014

FINAL OPINION AND ORDER

Appeal from City of Grants Pass.

Michael C. Robinson, Portland, filed a joint petition for review and argued on behalf of petitioner. With him on the brief were Seth J. King, Perkins Coie LLP, Benjamin E. Freudenberg and Davis, Adams, Freudenberg, Day & Galli.

Benjamin E. Freudenberg, Grants Pass, filed a joint petition for review

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on behalf of intervenor-petitioner. With him on the brief were Davis, Adams, Freudenberg, Day & Galli, Michael C. Robinson, Seth J. King, and Perkins Coie LLP.

No appearance by City of Grants Pass.

David R. Mannix, Grants Pass, filed the response brief and argued on his own behalf. Melissa S. Canon Eaves, Carey Gilbert, James Frego, Cynthia Frego, Shaun Hoback, Randy R. Lemmon, Toni J. Lemmon, David J. Holman and Joanna H. Lofaso, Grants Pass, represented themselves.

HOLSTUN, Board Member; RYAN, Board Chair; BASSHAM, Board Member, participated in the decision.

You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

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Opinion by Holstun.

NATURE OF THE DECISION

Petitioners appeal a city council decision denying its application for site plan approval and a variance from street and block length standards to permit construction of 50 units of federally assisted housing for low-income individuals.

INTERVENORS-RESPONDENTS

In a June 19, 2014 order, we allowed intervenor-respondent Mannix's response brief. In that order, we determined we would not consider intervenor-respondent Gilbert's response brief because it was not timely filed. No other intervenor-respondent filed a response brief. In this opinion, we therefore refer in the singular to the only intervenor-respondent who timely filed a response brief.

MOTION TO FILE REPLY BRIEF

Petitioner Parkview Terrace Development LLC, the applicant below, and intervenor-petitioner Josephine Housing and Community Development Council, which administers a federally supported housing voucher program and supports the proposal (together petitioners) move for permission to file a reply brief to respond to alleged "new matters" raised in the response brief. The reply brief is allowed.

MOTION TO STRIKE RESPONSE BRIEF

Petitioners move to strike portions of intervenor-respondent's response brief, including three exhibits that are not included in the record filed by the city in this matter, as well as related passages in the response brief that rely upon those exhibits, and additional parts of the response brief that include

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factual assertions that petitioners contend are not supported by evidence in the record.

With exceptions that do not apply here, LUBA's review is limited to the record filed by the local government. ORS 197.835(2). The three exhibits (exhibits A, C and D) are not included in the record, and we understand intervenor-respondent to offer those exhibits for their evidentiary value. Petitioners' motion to strike the exhibits is granted.

With regard to the portions of the response brief that petitioners contend rely on those exhibits and are not supported by the record, LUBA disregards any allegations of material fact that are not supported by the record. However, a lack of evidentiary support for arguments and factual allegations in a response brief is not a basis for striking those portions of the brief. *Hammock & Associates, Inc. v. Washington County,* 16 Or LUBA 75, 78, *aff'd* 89 Or App 40, 747 P2d 373 (1987).

STANDING

In his response brief, intervenor-respondent challenges intervenor-petitioner's standing, arguing that the Josephine Housing and Community Development Council, as an entity, did not "appear through counsel" in the local proceedings in this matter. Intervenor-Respondent's Brief 1. In our May 1, 2014 Order, we concluded that the Council had appeared through its executive director and that intervenor-respondent failed to establish that the Council was required under county procedures to appear through counsel. Intervenor-respondent offers no reason in his response brief to question those conclusions, and we adhere to them.

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FACTS

The subject property is zoned High Density Residential (R-3) and includes approximately 3.02 acres. There are residential townhouses (Maple Park) to the south of the subject property, a warehouse to the north, a mini-storage facility to the east, and a city park to the west. Many of the intervenors-respondents reside in Maple Park.

In 2006, the City of Grants Pass approved the Maple Park planned unit development (Maple Park PUD). The city's Maple Park PUD approval decision authorized an 88-unit residential development in three phases. Simultaneously, the city also approved a major variance to the street section design, maximum cul-de-sac length, and street separation standards. The Maple Park PUD developer constructed 28 townhouse units in developing Phase I but failed to complete the remaining units that were to be constructed as Phases II and III, apparently due to the recent recession. Petitioner is a successor-in-interest to the original developer. Petitioner wishes to construct a 50-unit multi-family housing project (Parkview Terrace) in place of Phases II and III of the Maple Park PUD. The 50 units would be multi-family rental units, all owned by petitioner, rather than town houses that would be separately owned.

In addition to seeking approval for the site plan, petitioner also sought approval for a variance to the city's street block length standards. The city's staff reviewed petitioner's applications and recommended approval, subject to a number of conditions. The Urban Area Planning Commission (UAPC) held a public hearing on the applications and, on December 11, 2013, approved the site plan and variance applications with conditions.

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On December 19, 2013, intervenors-respondents and others appealed the UAPC's decision to the city council. The city council reversed the UAPC's decision and denied petitioner's applications. This appeal followed.

MAPLE PARK PUD PHASES II AND III

Before turning to petitioners' assignments of error, we note that a recurring point of dispute between the parties is the current status of Maple Park PUD Phases II and III. Many of the parties' evidentiary disputes also have to do with Maple Park PUD Phases II and III. The city council's decision is a revision of the UAPC's decision with unchanged text, strikeouts (city council deletions) and bold italic text (city council additions). In the city council's decision, text from the UAPC's decision stating that that Maple Park PUD Phases II and III are "active" is stricken through, indicating that text was deleted from the city council's decision and findings. Record 13. The following finding from the UAPC's decision was not changed by the city council:

> "The applicant has notified the Planning Department of its withdrawal of the previous approval(s) for Phases II and III of Maple Park PUD." *Id.*

According to petitioners, the reference to the applicant's withdrawal is a reference to a January 17, 2014 letter from petitioner's executive director to the planning department that makes the following request:

> "As the owner of the property identified by Josephine County Assessor's map ID #36-05-20-DC and tax lot #2201, we request irrevocable termination of any and all land development entitlement rights under the tentative PUD approval for Phase II & Phase III of the Maple Park Townhomes * * * and hereby waive any right to forever rely on any entitlement rights granted by said approval." Record 201.

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We understand the city council to have determined that the city's approval for Phases II and III of Maple Park PUD has been withdrawn or terminated and are no longer active.

In his response brief, intervenor-respondent argues:

> "This particular application ignored the existence of the PUD when it submitted its plans. When opponents raised the question, supporters of the application came up with an ad hoc series of increasingly bizarre theories as to why the PUD did not currently exist. The last one was that a successor in interest (3 parties away from the original) could simply unilaterally revoke the PUD, and accordingly, in mid-process (February 2014) submitted a letter to the Planning Department saying in effect, 'I revoke.' The theory that a successor in interest may years later simply unilaterally revoke a PUD upon which many other parties have relied, is of course, logical nonsense. * * *. Intervenor-Respondent's Brief 18.

We understand intervenor-respondent to challenge the above finding that the city's approval of Maple Park PUD Phases II and III has been withdrawn. Intervenor-respondent contends that the city's approval of Maple Park PUD Phases II and III remains effective and provides an independent basis for affirming the city council's decision to deny petitioner's site plan, which is inconsistent with Maple Park PUD Phases II and III.

There are two problems with intervenor-respondent's position regarding Maple Park PUD

Phases II and III. First, the city council adopted the opposite position from intervenor-respondent's regarding the continued existence of the city's prior approval of Maple Park PUD Phases II and III. Intervenor-respondent contends the above-quoted finding—that petitioner withdrew that approval—was prepared by the planning staff and was not adopted by the city council. While the above-quoted finding apparently was prepared by planning staff and adopted initially by the UAPC, the city council adopted the UAPC's

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decision, including its findings, as its own, except where the city council adopted additions and deletions. Those findings, as amended, were "Approved by the City Council." Record 24. Thus, while the city council may not have been the author of the disputed finding, the city council clearly adopted the finding.

The second problem with intervenor-respondent's position is that LUBA's rules expressly authorize intervenors-respondents to assign error to aspects of a decision on appeal, whether they agree or disagree with the ultimate disposition in the decision.

> "Cross Petition: Any respondent or intervenor-respondent who seeks reversal or remand of an aspect of the decision on appeal regardless of the outcome under the petition for review may file a cross petition for review that includes one or more assignments of error. *A respondent or intervenor-respondent who seeks reversal or remand of an aspect of the decision on appeal only if the decision on appeal is reversed or remanded under the petition for review may file a cross petition for review that includes contingent cross-assignments of error, clearly labeled as such.* The cover page shall identify the petition as a cross petition and the party filing the cross petition. *The cross petition shall be filed within the time required for filing the petition for review and must comply in all respects with the requirements of this rule governing the petition for review,* except that a notice of intent to appeal need not have been filed by such party." OAR 661-010-0030(7) (emphases added).

Intervernor-respondent asks LUBA to reverse the finding regarding the city's prior approval of Maple Park PUD Phases II and III, so that the continued viability of Maple Park PUD Phases II and III would provide an independent basis for affirming the city council's denial decision in the event LUBA sustains one or more of petitioners' assignment of error. Intervenor-respondent did not file a cross petition for review with a contingent assignment of error

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assigning error to the city council's finding and making the arguments it makes in its response brief.

Citing *BenjFran Development v. Metro Service Dist.,* 17 Or LUBA 1009, 1011-1012 (1988), intervenor-respondent contends it was not required to file a cross petition for review. *BenjFran* was decided in 1988, when LUBA's rules simply authorized cross petitions for review, without specifying the circumstances in which they are to be filed. The reason LUBA adopted OAR 661-010-0030(7) is to require that arguments such as the one intervenor-respondent advances in its response brief be set out earlier in a cross petition for review, to avoid the possibility of delay, since response briefs typically are filed shortly before the date set for oral argument. Because intervenor-respondent did not file a cross petition for review in accordance with OAR 661-010-0030(7), we do not consider intervenor-respondent's arguments that the city's prior approval of Maple Park PUD Phases II and III remains effective or that the possible continued existence of city approval for Phases II and III

provides an independent basis for affirming the city council's decision to deny petitioner's application for site plan approval.

FIRST ASSIGNMENT OF ERROR

Under their first assignment of error, petitioners argue the proposal is a proposal for "needed housing," as that term is defined at ORS 197.303.[1] Because the proposal is a proposal for "needed housing," petitioners contend the proposal may only be subject to approval standards that are "clear and objective." Petitioners argue that the city was advised, during the proceedings below, that petitioners took the position that a number of standards that would

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otherwise apply to the proposal are not "clear and objective standards" and for that reason may not be applied to deny the proposal. Petitioners contend that the city council nevertheless applied a number of standards that are not "clear and objective" to deny the application for site plan approval. Petitioners argue the city council never responded to petitioners' contention that those standards may not be applied to a proposal for "needed housing." Petitioners assign error to the city's failure to respond to this issue in its findings and separately assign error to the city council's decision to apply those standards as bases for denial of the site plan.

A. Needed Housing

The Oregon Legislature has recognized a need to make housing available to people earning low, middle, or fixed incomes. ORS 197.307(1).[2] ORS

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197.303 defines "needed housing" as "housing types determined to meet the need shown for housing within an urban growth boundary at particular price ranges and rent levels * * *." Among other types, the statute identifies "[g]overnment assisted housing" as a type of "needed housing." ORS 197.303(1)(b). The city's comprehensive plan identifies a need for over 4,100 housing units that are affordable to households with incomes of less than $37,200. Record 832. The proposal is for government assisted housing that is affordable to persons with incomes of less than $37,200 and therefore qualifies as "needed housing."

Intervenor-respondent does not really dispute that the proposal qualifies as "needed housing," but argues that the housing that would have been provided if Phases II and III of Maple Park PUD were completed as approved also qualifies as "needed housing." The definition of "needed housing" in ORS 197.303 is so broad that intervenor-respondent is likely correct. However, even if the proposal is a proposal to substitute one type of "needed housing" for another type of "needed housing," that does not mean the proposal is a proposal for something other than "needed housing."

B. Petitioners' Findings Challenge

As we explain in more detail below, we agree with petitioners that a number of standards that the city applied in this case to deny the proposal are not "clear and objective standards," as is required by ORS 197.307(4). Before doing so, we agree initially with petitioners that it was error for the city not to

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respond in its decision to the issue of whether those standards qualify as "clear and objective standards." As we explained in *Rosenzweig v. City of McMinnville,* 64 Or LUBA 402, 410-11 (2011):

> "LUBA has consistently held 'that when a relevant issue is adequately raised by testimony or other evidence in the record, that issue must be addressed in the decision maker's findings.' *Blosser v. Yamhill County,* 18 Or LUBA 253, 264 (1989) (citing *Norvell v. Portland*

> *Metropolitan LGBC,* 43 Or App 849, 852-53, 604 P2d 896 (1979)); *see also Friends of Umatilla County,* 55 Or LUBA 333, 337 (2007); *Marcott Holdings, Inc. v. City of Tigard;* 30 Or LUBA 101, 107-08 (1995). However, as we pointed out in *Faye Wright Neighborhood Planning Council v. Salem,* 1 Or LUBA 246, 252 (1980), 'not every assertion by a participant in a land use decision warrants a specific finding.' A petitioner at LUBA must (1) identify the issue raised, (2) demonstrate that the issue was *adequately* raised and (3) establish that the issue is relevant in some way (usually by showing that the issue raises a question regarding an applicable approval standard). * * *." (Emphasis in original.)

Petitioner identified seven standards that the city ultimately applied to deny the proposal and took the position that they are not "clear and objective" and could not be applied to deny petitioner's request for approval of a proposal for "needed housing." Grants Pass Development Code (GPDC) 19.052(2) (Record 261); GPDC 19.052(4) (Record 271); GPDC 19.052(5) (Record 272); GPDC 19.052(6) (Record 272); GPDC 19.052(8)(a) and (e) (Record 273-74); GPDC 19.052(9) (Record 274-75); GPDC 19.052(11) (Record 275). Petitioners have adequately identified the issue and demonstrated that the issue was adequately raised. Since the city relied on all of those subjective standards to deny the application, the issue is relevant. The city should have responded to that issue in its findings, and it erred by failing to do so.

C. Clear and Objective Standards

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ORS 197.307(4) provides that local governments are only authorized to apply "clear and objective standards, conditions and procedures" in reviewing applications for "needed housing." *See* n 2.

1. Intervenor-Respondent's Arguments

Intervenor-respondent offers a number of reasons why he believes the "clear and objective standards" requirement of ORS 197.307(4) either does not apply or was satisfied in this case.

First, intervenor-respondent contends the requirement for "clear and objective standards" only applies to "[a]esthetic criteria." Intervenor-Respondent's Brief 13. Intervenor-respondent does not identify the basis for that argument, and there is nothing in the text of ORS 197.307(4) that limits the requirement for "clear and objective standards" to aesthetic criteria. Petitioners speculate that intervenor-respondent may be relying on the pre-2011 version of ORS 197.307(3)(b). If so, that version of ORS 197.307(3)(b) was repealed in 2011. Or Laws 2011, ch 354, sec 3. Intervenor-respondent also fails to recognize that the pre-2011 version of ORS 197.307(3) subsections (b) and (c) were a nested exception to the general requirement for "clear and objective standards" for "needed housing" to allow certain large jurisdictions to impose aesthetic regulations on "needed housing." The pre-2011 version of ORS 197.307 also included a general requirement for "clear and objective standards." ORS 197.307(6) (2009).

Intervenor-respondent next argues that the requirement for "clear and objective standards" only applies in cases where the applicant establishes "impermissible bias or prejudice in the application process." Intervenor-Respondent's Brief 14. Again, there is simply no text in ORS 197.307(4) that

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limits the statute to cases where the decision maker exhibits bias or prejudice. *See* n 2.

Next, citing *Rogue Valley Assoc. of Realtors v. City of Ashland,* 158 Or App 1, 4, 970 P2d 685 (1999), intervenor-respondent contends a

standard only violates ORS 197.307(4) if the applicant demonstrates that the standards are "categorically incapable of being clearly and objectively applied under any circumstances where they may be applicable." The appeal in *Rogue Valley* was a facial challenge to an ordinance that adopted new standards and the requirement imposed by the quoted language in the Court of Appeals' decision was limited to facial challenges. We do not understand petitioners to make a facial challenge here. Even if they do, that part of the Court of Appeals' decision was overruled by the legislature in 1999. ORS 197.831.[3]

Intervenor-respondent next argues that the ORS 197.307(4) "clear and objective standards" requirement does not apply to requests for a variance. Intervenor-respondent is correct. *Linstromberg v. City of Veneta,* 47 Or LUBA 99, 108-09 (2004). But petitioners do not argue the city's standards for granting a variance must be "clear and objective." Rather, petitioners contend the city erroneously concluded under the applicable variance standards that

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petitioner's request for a variance could be denied.[4] Petitioners' "clear and objective standards" challenge is limited to standards the city applied to the proposed site plan.

2. The Challenged Site Plan Review Standards

Petitioners contend that seven of the site plan review standards that the city relied on in denying its application for site plan review approval are not "clear and objective standards," and thus may not be applied to the site plan.

a. GPDC 19.052(2)

GPDC 19.052(2) requires that the proposal comply "with applicable elements of the Comprehensive Plan, including: Traffic Plan, Water Plan, Sewer Plan, Storm Drainage Plan, Bicycle Plan, and Park Plan." Record 19. The UAPC found that the proposal satisfies GPDC 19.052(2) and adopted findings to support that conclusion. The city council adopted the UAPC's findings. However, the city council struck through the part of the UAPC's findings that concluded "Satisfied with conditions," and added the following sentence at the end of the UAPC's findings:

> "The City Council found the request was not incompliance with the Comprehensive Plan for traffic management (Element 11 ~ Master Transportation Plan)." Record 19. (Bold and italics deleted.)

GPDC 19.052(2) includes no guidance for determining which elements of the city's comprehensive plan are applicable. The only element identified by the city council's decision is Element 11. Element 11 is the city's Master Transportation Plan. The Master Transportation Plan is eight chapters long.

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One of those chapters is chapter 3, which is 13 pages long and sets out numerous goals and objectives. Many of those goals and objectives are not "clear and objective."[5] We assume the city council was not applying the entire eight-chapter Master Transportation Plan, but the city council's findings do not identify what part it was applying. We agree with petitioners that in this case the city council's application of the Master Transportation Plan, without identifying what part of that plan it was applying, applies a standard that is not "clear and objective," which is prohibited by ORS 197.307(4). The city council erred in doing so.

b. GPDC 19.052(4)

GPDC 19.052(4) requires that "[p]otential land use conflicts have been mitigated through specific conditions of development." Record 21. The UAPC decision found the proposal, with conditions, complies with GPDC 19.052(4). The City Council found that the criterion was "Not Satisfied," but did not identify why. Record 21.

We agree with petitioners that a standard that requires mitigation of "potential land use conflicts" is not a "clear and objective" standard. *See Rogue Valley,* 35 Or LUBA 159-60 (a standard requiring an applicant to "mitigate any potential negative impact caused by the development," is not "clear and objective"). GPDC 19.052(4) is not a "clear and objective" standard, and the city council erred in applying it to deny site plan approval.

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c. GPDC 19.052(5)

GPDC 19.052(5) requires that "[a]dequate basic urban services are available, or can be made available by the applicant as part of a proposed development, or are scheduled by the City Capital Improvement Plan." Record 21. The City Council found that this criterion was not satisfied. Record 21.[6]

Petitioners first argue that the meaning of the key terms "adequate" "basic urban services" and "available" is not explained in GPDC 19.052(5), and without some explanation, those terms are not "clear and objective." We agree with petitioners. *See Home Builders Association of Lane County v. City of Eugene,* 41 Or LUBA 370, 410, 414 (2002) (code requirement to provide "adequate" drainage is not "clear and objective;" a standard that requires an applicant to show that "public facilities and services are available to the site" but does not define the key terms "public facilities and services" or "available" is not "clear and objective"). The city council erred in applying GPDC 19.052(5) to deny petitioner's application for site plan approval.

d. GPDC 19.052(6)

GPDC 19.052(6) requires that the "[p]rovision of public facilities and services to the site will not cause service delivery shortages to existing development." Record 21. The City Council found that this criterion was not satisfied. *Id.*

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Petitioners argue that GPDC 19.052(6) provides no guidance regarding the scope of "public facilities and services" or how to go about determining if the proposal will "cause service delivery shortages to existing development" or what qualifies as a "shortage." Therefore, petitioners argue, GPDC 19.052(6) is not "clear and objective." We agree with petitioners. *See Home Builders Association of Lane County v. City of Eugene,* 41 Or LUBA 370, 414 (2002) (a standard that requires an applicant to show that "public facilities and services are available to the site" but does not define the key terms "public facilities and services" or "available" is not "clear and objective"). The city council erred by applying GPDC 19.052(6) to deny petitioner's application for site plan approval.

e. GPDC 19.052(8)(a) and (e)

GPDC 19.052(8) requires that "[t]he characteristics of existing adjacent development have been determined and considered in the development of the site plan. At a minimum, special design consideration shall be given to:

> "(a) Areas of land use conflicts, such as more restrictive use adjacent or across street from proposal. Mitigate by orienting business operations away from use, additional setbacks, screening/buffering, landscaping, direct traffic away from use.
>
> "* * * * *
>
> "(e) Lighting. Exterior lighting shall not impact adjacent development or traveling motorist." Record 22. (Underscoring in original.)

The City Council found that these criteria were not satisfied. Record 22.

Neither the requirement to "mitigate" in GPDC 19.052(8)(a) nor the methods of suggested mitigation are "clear and objective," as ORS 197.307(4) requires. Neither is the GPDC 19.052(8)(e) requirement that "[e]xterior

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lighting shall not impact adjacent development or traveling motorist." *See Rogue Valley,* 35 Or LUBA at 158 ("'[n]eeded housing' is not to be subjected to standards, conditions, or procedures that involved subjective, value-laden analyses that are designed to balance or mitigate impacts of the development on * * * adjoining properties or community").

We agree with petitioners that GPDC 19.052(a) and (e) are not "clear and objective standards," as required by ORS 197.307(4). The city council erred in applying GPDC 19.052(a) and (e) to deny petitioner's application for site plan approval.

f. GPDC 19.052(9)

GPDC 19.052(9) requires that "[t]raffic conflicts and hazards are minimized on-site and off-site, as provided in Article 27." Record 23. The City Council found that this criterion was not satisfied. *Id.*

The GPDC 19.052(9) requirement that "[t]raffic conflicts and hazards [be] minimized on-site and off-site" is not, by itself, "clear and objective." *See Home Builders Association,* 41 Or LUBA 399 (a standard that requires that "on-site vehicular and pedestrian circulation shall be designed to minimize vehicular/pedestrian conflicts at driveway crossings within parking lots and at vehicle ingress/egress points," is not "clear and objective").

Petitioners next argue that GPDC's 19.052(9)'s reference to Article 27 is not sufficient to make GPDC 19.052(9) "clear and objective" because the code does not identify which standards in Article 27 apply. Joint Petition for Review 19. GPDC Article 27 is 32 pages long and includes a variety of requirements. Petitioners point out that although GPDC 27.121(3) requires a traffic impact analysis, and the city council found the applicant's traffic impact analysis was flawed, GPDC 27.121(3) does not mention "traffic conflicts." A

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different section of Article 27, GPDC 27.121(11)(h)(8), does mention "traffic conflicts," but GPDC 27.121(11)(h)(8) only applies to developments that "abut[] or contain[] an existing or proposed arterial street." The subject property does not abut or contain an arterial street. Even if it did apply, GPDC 27.121(11)(h)(8) requires that the development design "minimize the traffic conflicts." That is not a "clear and objective" standard.

We agree with petitioners that GPDC's 19.052(9) is not "clear and objective" as required by ORS 197.307(4), and the City Council erred in applying GPDC's 19.052(9) to deny petitioner's application for site plan approval.

g. GPDC 19.052(11)

GPDC 19.052(11) requires that "[t]here are adequate provisions for maintenance of open space and other common areas." Record 23. The City Council found that this criterion was not satisfied. *Id.*

Petitioners argue that the City engaged in a subjective analysis to determine whether the maintenance of open space and other common areas is "adequate," because neither the text nor context of the code defines "adequate." For the same reasons explained in our discussion of GPDC 19.052(5), we agree with petitioners that a standard that requires an unguided inquiry to whether something is "adequate" is not a "clear and objective" standard.

Accordingly, we agree with petitioners that GPDC 19.052(11) is not a "clear and objective" standard, as it must be under ORS 197.307(4), if it is to be applied to an application for land use approval of "needed housing." The City Council erred in applying GPDC 19.052(11) to deny petitioner's application for site plan approval.

The first assignment of error is sustained.

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SECOND ASSIGNMENT OF ERROR

Under the second assignment of error, petitioners argue that even if some site plan approval criteria were not barred by ORS 197.307(4) because they are not "clear and objective," the city erred on the merits in its application of all ten site plan approval standards it relied on to deny its application for site plan approval. We have concluded under the first assignment of error that seven of the nine site plan review standards that the city applied to deny petitioner's application for site plan approval are not "clear and objective" and should not have been applied to petitioner's application for "needed housing." We therefore need not and do not consider whether the city also erred on the merits in applying those seven standards.

Petitioners do not argue that two of the site plan review standards are not "clear and objective." We therefore limit our consideration under the second assignment of error to petitioners' challenge to the city council's decision with regard to the variance application and the two site plan review standards that petitioners do not argue the city was precluded from applying under ORS 197.307(4).

A. The Remaining Site Plan Approval Standards

1. GPDC 19.052(3)

GPDC 19.052(3) requires a site plan applicant to demonstrate the proposal "[c]omplies with all other applicable provisions of this Code, including off-street parking, landscaping, buffering and screening, signage, environmental standards, and Special Purpose District standards." Record 20. The UAPC identified the off-street parking requirements set out at GPDC 25.042. GPDC 25.042 requires 1, 1.5 or 2 spaces per unit, depending on the number of bedrooms in each unit. The UAPC concluded that the 86 parking

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spaces petitioner proposed are sufficient to comply with GPDC 25.042. The city council adopted that finding, but added the following finding: "[t]he City Council found that the site plan did not provide adequate parking facilities." Record 20. (Boldface and italics deleted.)

Like the UAPC, the city council found that the proposal to provide 86 parking spaces complies with GPDC 25.042. *Id.* The city council did not identify any GPDC or other standard that requires the applicant to demonstrate that the proposed parking facilities are "adequate." Even if there were such a standard, it would not be "clear and objective" and could not be applied consistently with ORS 197.307(4).

The city council erred in finding that the proposal does not comply with GPDC 19.052(3). The city council found that the proposal satisfies the only GPDC parking standard that it identified. The city council did not identify the source of the "adequacy" standard it imposed to deny the application, and even if such a standard existed, ORS 197.307(4) would preclude applying such a standard to an application for approval for "needed housing."

2. GPDC 19.052(12)

GPDC 19.052(12) requires that an applicant for site plan approval demonstrate that "[i]nternal circulation is accommodated for commercial, institutional and office park uses with walkways and bikeways as provided in Article 27." Record 23. The city council deleted the conditions of approval that the UAPC relied on to determine that the proposal satisfies GPDC 19.052(12). The

city council then concluded the standard is "Not Satisfied." Record 23-24.

Petitioners argue the City Council erred in denying its application based on GPDC 19.052(12). Petitioners contend the text of GPDC 19.052(12) makes

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it clear that it does not apply to its proposal for a *residential* development, because GPDC 19.052(12) only applies to "commercial, institutional and office park uses." We agree with petitioners.

B. The City Council's Denial of the Variance

As noted earlier, petitioner sought a variance from requirements for "[b]lock length for local streets * * * and [t]otal length of a perimeter block for local streets * * *. Record 9. The criteria that must be satisfied to grant the requested variances are set out at GPDC 6.060. The UAPC applied a total of 12 variance criteria, finding that with conditions of approval that were imposed by the UAPC and accepted by petitioner, all 12 variance criteria are satisfied. Record 224-29. Four of those criteria are relevant in this appeal.

Variance criterion 1 requires the applicant to demonstrate the variance is justified by a "unique physical constraint or characteristic of the property to which the variance application is related." Record 14. The UAPC found "[t]he property is constrained by existing development patterns in the area." *Id.* The UAPC set out a number of examples of those existing development patterns. *Id.*

Variance criterion 2 requires an applicant to establish that the unique physical constraint or characteristic identified under criterion 1 was not "self-created." *Id.* If it was self-created, criterion 2 imposes additional requirements. The UAPC found "[t]he existing constrains on the property were not self-created." Record 15.

In relevant part, variance criterion 3 requires the applicant to demonstrate "that a variance is necessary to overcome at least one of three situations:

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> "(a) Allow Reasonable Use of an Existing Property. Due to the unique physical constraint or characteristic of an existing lot or parcel, strict application of the provisions of the Development Code would create a hardship by depriving the owner of the rights commonly enjoyed by other properties in the same zoning district subject to the same regulation. *The variance is necessary for preservation of a property right of the owner,* substantially the same as is possessed by owners of other property in the same district subject to the same regulation.
>
> "* * * * *
>
> "(c) Allow Flexibility for Expansion of Existing Development. The location of existing development on the property poses a unique constraint to expansion in full compliance with the Code. The variance is needed for new construction and site improvements in order to provide for efficient use of the land or avoid demolition of existing development, where the public purpose can be substantially furthered in alternate ways with minimal deviation from standards." Record 15 (emphasis added).

The UAPC found "[t]he variance is necessary to overcome the conditions described under sub

criterion (a) and (b) [of variance criterion 3] * * *." *Id.* For purposes of this appeal, this finding is particularly significant since in finding the variance was necessary under sub criterion (a), the UAPC found the variance was "necessary to preserve a property right."

Finally, criterion 9 imposes the following requirement:

> "Mitigate Adverse Impacts. Adverse impacts shall be avoided where possible and mitigated to the extent practical. If a variance is not necessary to preserve a property right, or if the unique constraint in Subsection (1) was self-created, adverse impacts may be grounds for denial." Record 17.

Variance criterion 9 requires mitigation of adverse impacts, but may be grounds for denial in only two circumstances: (1) where the "variance is not

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necessary to preserve a property right" and (2) where the unique physical constraint or characteristic identified under criterion 1 is found to be self-created under criterion 2. The UAPC found criterion 9 was satisfied: "[a]dverse impacts that may occur as a result of approval of the requested variances can be mitigated by the conditions of approval listed below."[7]

In its decision, the city council adopted the UAPC's findings regarding 11 of the 12 variance criteria, including criteria 1, 2, and 3. The only deviation from the UAPC's findings in the city council decision was for criterion 9. The city council struck through the UAPC's criterion 9 finding that "[a]dverse impacts that may occur as a result of approval of the requested variances can be mitigated by the conditions of approval listed below." The city council added the following finding:

> "Not Satisfied. The City Council found that the applicant did not provide adequate mitigation to avoid the adverse impacts of the development for traffic entering Fruitdale Drive." Record 17-18.

Under variance criterion 9, the city council could have required additional mitigation if it believed additional mitigation is required to avoid adverse traffic impacts on Fruitdale Drive. But variance criterion 9 authorizes the city council to deny the variance based on adverse impacts in only two circumstances: (1) where the "variance is not necessary to preserve a property right" and (2) where the unique physical constraint or characteristic identified under criterion 1 is found to be self-created under criterion 2. In the city's council's findings addressing criteria 1, 2 and 3, the city council found that

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neither of those circumstances is present here. The city council erred by applying criterion 9 to deny the application.

The second assignment of error is sustained.

REMEDY

Petitioners argue LUBA should reverse the city council's decision and order the city to approve its applications for a variance and site plan approval. ORS 197.835(10)(a)(A). ORS 197.835(10)(a) provides, in part:

> "The board shall reverse a local government decision and order the local government to grant approval of an application for development denied by the local government if the board finds:
>
> "(A) Based on the evidence in the record, that the local government decision is outside the range of

> discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

The question posed under ORS 197.835(10)(a)(A) is whether the city council's decision to deny petitioner's site plan and variance application was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]" The city council gave a total of ten reasons why it denied the applications. Seven of the site plan review criteria the city council relied on to support its denial decision are barred by ORS 197.307(4), because the application for site plan approval is an application for approval of "needed housing" and those standards are not "clear and objective." As to those seven standards, the city council's decision was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

Under GPDC 19.052(3), the city council relied on an "adequate" parking standard, but there is no "adequate" parking standard and the proposal

complies with the only identified parking standard. Accordingly, as to GPDC 19.052(3), the city council's decision was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

GPDC 19.052(12) applies to "commercial, institutional and office park uses." GPDC 19.052(12) does not apply to the "residential" use proposed by petitioner. Therefore, as to GPDC 19.052(12), the city council's decision was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

Finally, variance criterion 9 can only be applied to deny a request for variance approval in two circumstances. The city council found that neither of those circumstances is present here. Therefore as to variance criterion 9, the city council's decision was "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

Because the city council's application of all ten of the reasons it gave for denying petitioner's applications for variance and site plan approval were "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances," the city council's decision is reversed and the city is ordered to approve petitioner's application.

The UAPC imposed a number of conditions of approval in its decision granting site plan and variance approval. Record 216-20. Since petitioner agreed to all of the conditions of approval that were imposed by the UAPC, the city council's decision to approve the application may include all of those conditions of approval. *Stewart v. City of Salem,* 58 Or LUBA 605, 622 (2009).

The city council's decision is reversed.

Footnotes:

[1.] We set out the relevant statutory text later in this opinion.

[2.] ORS 197.307 provides, in part:

> "(1) The availability of affordable, decent, safe and sanitary housing opportunities for persons of lower, middle and fixed income, including housing for farmworkers, is a matter of statewide concern.
>
> "(2) Many persons of lower, middle and fixed income depend on government assisted housing as a

source of affordable, decent, safe and sanitary housing.

"(3) When a need has been shown for housing within an urban growth boundary at particular price ranges and rent levels, needed housing shall be permitted in one or more zoning districts or in zones described by some comprehensive plans as overlay zones with sufficient buildable land to satisfy that need.

"(4) [*A*] *local government may adopt and apply only clear and objective standards, conditions and procedures regulating the development of needed housing on buildable land described in subsection (3) of this section.* The standards, conditions and procedures may not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay." (Emphasis added.)

[3] ORS 197.831 provides:

"In a proceeding before the Land Use Board of Appeals or an appellate court that involves an ordinance required to contain clear and objective approval standards, conditions and procedures for needed housing, the local government imposing the provisions of the ordinance shall demonstrate that the approval standards, conditions and procedures are capable of being imposed only in a clear and objective manner."

[4] We address petitioner's challenge to the city's variance findings later in this opinion.

[5] For example, policy 2.4.1 provides:

"*Policy 2.4.1:* Integrate decisions about development and transportation investments to ensure the best fit between development in the urban area and the transportation facilities and services needed to serve it."

[6] The city council found:

"Based upon the testimony, the City Council found that the application did not provide adequate service area and internal circulation with regards to fire access and trash/refuse removal." (Boldface and italics omitted.)

[7] A large number of conditions of approval were attached to the UAPC decision. Record 216-220.

GENE R. OSTER, Petitioner,
v.
CITY OF SILVERTON, Respondent,
and
MARY ROSE BRANDT, Intervenor-Respondent.

LUBA No. 2018-103

LAND USE BOARD OF APPEALS OF THE STATE OF OREGON

May 7, 2019

FINAL OPINION AND ORDER

Appeal from City of Silverton.

Alan M. Sorem, Salem, filed the petition for review and argued on behalf of petitioner. With him on the brief was Saalfeld Griggs PC.

Spencer Q. Parsons, Portland, filed a response brief and argued on behalf of respondent. With him on the brief was Beery, Eisner & Hammond, LLP.

David E. Coulombe, Corvallis, filed a response brief and argued on behalf of intervenor-respondent. With him on the brief was Fewel, Brewer & Coulombe.

ZAMUDIO, Board Member; RYAN, Board Chair; RUDD, Board Member, participated in the decision.

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You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

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Opinion by Zamudio.

NATURE OF THE DECISION

Petitioner challenges a city council limited land use decision denying a tentative subdivision plan.

REPLY BRIEF

On January 15, 2019, petitioner filed a motion to file a reply brief. On January 29, 2019, the city filed an objection to petitioner's motion to file a reply brief. Petitioner's appeal was filed in 2018 and is subject to OAR 661-010-0039 (2017), which confines reply briefs "solely to new matters raised in the respondent's brief."[1] "Generally, responses warranting a reply brief tend to be arguments that assignments of error should fail regardless of their stated merits, based on facts or authority not involved in those assignments." *Wal-mart Stores, Inc. v. City of Gresham*, 54 Or LUBA 16, 19 (2007). Where arguments in a reply brief respond to arguments raised in the response brief that could not have been

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reasonably anticipated in the petition for review, we will generally allow the reply brief. *Id.* at 20.

In the petition for review, petitioner argued that the city's decision violated the Takings Clause of the Fifth Amendment of the United States Constitution, relying on *Koontz v. St. Johns River Water Mgmt. Dist.*, 570 US 595, 133 S Ct 2586 (2013). Petitioner also argued that ORS 197.522 is immaterial to the city's constitutional obligations. The city responded, arguing that the *Koontz* case is distinguishable, citing ORS 197.522(4). City's Response Brief 17-18.

In his reply brief, petitioner argues that ORS 197.522(4) is inapposite to his arguments and responds to the city's argument that *Koontz* is distinguishable. The two "matters" petitioner seeks to address in his reply brief at not "new matters" within the meaning of OAR 661-010-0039 (2017). In his petition for review, petitioner relied heavily on *Koontz* and argued that ORS 197.522 was immaterial. Petitioner could have anticipated that the city would attempt to distinguish *Koontz* and would rely on ORS

197.522. Petitioner's reply brief seeks to introduce surrebuttal arguments to the city's arguments in the response brief, and to elaborate upon arguments already set out in the petition for review. A reply brief making surrebuttal to argument in the response brief is not allowed. *Willamette Oaks*, *LLC v. City of Eugene*, 67 Or LUBA 351, 353, *aff'd*, 258 Or App 534, 311 P3d 527 (2013).

The motion to file a reply brief is denied.

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FACTS

The subject property is comprised of approximately 9.5 acres and is zoned single-family residential (R-1). The city annexed the subject property in 2016. On May 11, 2018, petitioner submitted an application for tentative plat approval to subdivide the property into 40 lots, at sizes permitted in the zone, and to develop those lots with housing at densities permitted in the R-1 zone under clear and objective standards. *See* ORS 197.307(4).[2]

The planning commission denied the application because the proposal would not result in improved performance of two off-site intersections to a level of service (LOS) that would satisfy the city, based on a level of service standard contained in the city's transportation system plan document (the LOS D standard). Petitioner's engineer estimated that improvements to comply with the LOS D standard would cost $2,118,550.

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Petitioner appealed the planning commission decision to the city council. After an on-the-record hearing, the city council issued a decision adopting and affirming the planning commission's denial and adopting as findings the staff report in support of the denial. This appeal followed.

SECOND ASSIGNMENT OF ERROR

The city determined that Silverton Municipal Code, Title 18, Development Code and Zoning Map (SDC) incorporated by reference traffic standards in the City of Silverton Transportation System Plan (TSP). The city applied a minimum LOS D standard, derived from the TSP. The city denied the application because petitioner's traffic study showed that the proposed development would send additional peak hour traffic to two intersections at N 1st Street and Hobart Road, and N 1st Street and Jefferson Street, and the proposal did not include transportation system improvements that would bring those intersections to LOS D. No party disputes that the proposed development would slightly exacerbate traffic; however, even without the proposed development, at existing traffic volumes, those two intersections are failing to meet the LOS D standard and operating at LOS F. Record 13.

Under SDC 4.3.130 preliminary plat applicants must "describe the proposed access to and from the site and estimate potential vehicle traffic increases resulting from the project," and the community development director may require a traffic impact study, in accordance with SDC 4.1.900. Neither SDC

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4.3.130 or SDC 4.1.900 define traffic standards or include the LOS D standard that we describe above.

The city concluded that the LOS D standard was incorporated by reference into the SDC by SDC 4.3.140(A)(1) and (B)(7), which provide:

> "A. General Review Criteria. The city shall consider the following review criteria and may approve, approve with conditions, or deny a preliminary plat based on the following; the applicant shall bear the burden of proof.
>
> "1. The proposed preliminary plat

> complies with the applicable development code sections and all other applicable ordinances and regulations. At a minimum, the provisions of this article, and the applicable chapters and sections of Article 2, Land Use (Zoning) Districts, and Article 3, Community Design Standards shall apply.
> * * *
>
> "* * * * *
>
> "B. Layout and Design of Streets, Blocks and Lots. All proposed blocks (i.e., one or more lots bound by public streets), lots and parcels conform to the specific requirements below:
>
> "* * * * *
>
> "7. All applicable engineering design standards for streets, utilities, surface water management, and easements shall be met."

The city determined that those criteria incorporate SDC 3.4.010(A), which governs public facilities and provides:

> "A. Purpose. This chapter provides general development standards and approval criteria for public improvements. The code incorporates by reference the city's public facility

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> master plans, including plans for domestic water, sanitary sewer, storm drainage, parks, and transportation. The code also incorporates by reference Silverton's public works design standards. This chapter is intended to provide minimum requirements for public facilities. It is not intended to duplicate or replace the design standards contained in the above documents."

The city found that SDC 3.4.010(A) effectively incorporated the city's TSP, Chapter 2, Goal 4, Policy (f), which provides, in part:

> "(f) The City shall implement performance standards for use in evaluating new development proposals.
>
> "*Action: City performance standards shall be used to evaluate developments impacting City or County facilities. The level of service standard shall be LOS D based on the Highway Capacity Manual methodology and a* [volume to capacity] *v/c ratio of 0.85 for signalized and all-way stop controlled intersections. For unsignalized intersection, the level of service standard shall be LOS D based on the Highway Capacity Manual and*

> *a v/c ratio of 0.90. ODOT v/c ratio standards shall apply to ODOT facilities*." (Italics in original.)[3]

In the second assignment of error, petitioner argues that city's decision violates ORS 197.195(1), which governs limited land use decisions and provides:

> "A limited land use decision shall be consistent with applicable provisions of city or county comprehensive plans and land use regulations. Such a decision may include conditions authorized by law. Within two years of September 29, 1991, cities and counties

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> shall incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations. A decision to incorporate all, some, or none of the applicable comprehensive plan standards into land use regulations shall be undertaken as a post-acknowledgment amendment under ORS 197.610 to 197.625. If a city or county does not incorporate its comprehensive plan provisions into its land use regulations, the comprehensive plan provisions may not be used as a basis for a decision by the city or county or on appeal from that decision."

Petitioner argues that *Paterson v. City of Bend*, 49 Or LUBA 160, *aff'd*, *in part*, *rev'd and rem'd on other grounds*, 201 Or App 344, 118 P3d 842 (2005), supports his argument and is dispositive. We agree. In *Paterson*, the petitioner appealed a limited land use decision in which the city approved a tentative subdivision plan. The petitioner contended that the city had incorporated all comprehensive plan standards applicable to subdivision approvals within the meaning of ORS 197.195(1), by requiring in Bend Subdivision Ordinance (BSO) 3.040(3) that the applicant for a tentative subdivision plan approval demonstrate compliance with the Bend Area General Plan. The petitioner identified several General Plan policies relating to transportation that petitioner argued applied to the proposed subdivision. We rejected that argument and explained:

> "[I]n our view ORS 197.195(1) contemplates more than a broad injunction to comply with unspecified portions of the comprehensive plan. In order to 'incorporate' a comprehensive plan standard into a local government's land use regulations within the meaning of ORS 197.195(1), the local government must at least amend its land use regulations to make clear what specific policies or other provisions of the comprehensive plan apply to a limited land use decision as approval criteria. Under that standard, BSO 3.040(3) falls far short of incorporating any comprehensive plan provisions."

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> *Id*. at 167.

The city responds that the city adopted the TSP in March 3, 2008, by a comprehensive plan text amendment, Ordinance 08-01.[4] That ordinance adopted the TSP "as a support document to the 2002 Silverton Comprehensive Plan." City's Response Brief, App 2, page 2. It is undisputed that the city adopted the TSP as a support document to the comprehensive plan. The dispute is whether the SDC sections applicable to a limited land use decision application sufficiently incorporated the action items in the TSP as approval criteria. Ordinance 08-01 does not support the city's position that the city has incorporated action items in the TSP as approval criteria. Instead, the findings for

Ordinance 08-01 indicate that the city intended further SDC amendments to implement the TSP. The findings attached to Ordinance 08-01 explain that the TSP "goals and policies have been developed to guide the City's twenty-year vision of transportation system needs. Each goal has a number of policies designed to guide the community in the direction of completing each goal. Some policies are provided with details of potential implementing actions." City's Response Brief, App 2, page 5.

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Intervenor argues that the city incorporated the TSP policies into the SDC by Ordinance 08-06, which codified SDC 3.1.100.[5] SDC 3.1.100 provides:

> "The purpose of this chapter is to ensure that developments provide safe and efficient access and circulation for pedestrians and vehicles. SDC 3.1.200 provides standards for vehicular access and circulation. SDC 3.1.300 provides standards for pedestrian access and circulation. General street improvement requirements are provided in SDC 3.4.100, *with more specific requirements provided in the city of Silverton transportation system plan and the city's public works design standards*." (Emphasis added.)

Intervenor argues that the "more specific requirement," *i.e.*, the LOS D standard, is incorporated into the SDC by SDC 3.4.100. The city did not rely on SDC 3.1.100 in the challenged decision and does not cite to it in defense of its decision on appeal. Nevertheless, intervenor's argument and the city's argument rely on the same underlying premise: that the city effectively incorporated the action items of the TSP into the SDC as approval criteria applicable to a limited land use decision by incorporating by reference the entire TSP into sections of the SDC.

The city attempts to distinguish *Paterson* by arguing that, unlike general comprehensive plan policies, "the City's TSP provides specific action items to be implemented under Policies." City's Response Brief 21. The city contends that ORS 197.195(1) does not require the city to codify all approval criteria and

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standards for limited land use decisions. Instead, the city emphasizes, ORS 197.195(1) requires the city to "*incorporate* all comprehensive plan standards applicable to limited land use decisions into their land use regulations." (Emphasis added.) However, the city's arguments are directed at the wrong question. The question under ORS 197.195(1) and *Paterson* is not whether the LOS D standard is clear in the TSP or "codified" in the SDC; instead, the question is whether the SDC provisions that the city concluded incorporated the LOS D standard make clear what specific policies or standards in the TSP apply to a limited land use decision as approval criteria.

We conclude that the sections of the SDC that the city relied upon to deny the application, SDC 4.3.140(A)(1), (B)(7), and SDC 3.4.010(A), fall far short of incorporating the LOS D traffic performance standard in TSP, Chapter 2, Goal 4, Policy (f), under the "incorporation" standard in ORS 197.195(1), as interpreted in *Paterson*. Those provisions do not make clear what specific policies, action items, or performance standards contained in the TSP apply as approval criteria for a limited land use decision. For example, SDC 4.3.140(A)(1) and (B)(7) do not refer to the TSP at all. Similarly, SDC 3.4.010(A) generally "incorporates by reference the city's public facility master plans, including plans for domestic water, sanitary sewer, storm drainage, parks, and transportation." Incorporation by reference of the entirety of each of the city's public facilities plans falls far short of satisfying the incorporation standard in ORS 197.195(1). We agree with petitioner that by applying the LOS D standard, the city violated ORS 197.195(1).

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The second assignment of error is sustained.

FIRST AND THIRD ASSIGNMENTS OF ERROR

In the first assignment of error, first subassignment of error, petitioner argues that the city's decision violated ORS 197.307(4) by applying ambiguous approval standards in a manner that would result in unreasonable cost and unreasonable delay. See n 2. In the first assignment of error, second subassignment of error, petitioner argues that the city's decision violated his constitutional rights. ORS 197.835(9)(a)(E). Under the third assignment of error, petitioner argues that the city's decision misconstrued applicable law and lacks adequate findings with respect to the offsite traffic impacts. ORS 197.835(9)(a)(D), (C).

The city's denial relied solely on its application of the TSP standards. We conclude under the second assignment of error that, because the city did not incorporate the TSP standards into its subdivision regulations, the TSP does not apply to petitioner's application and the city may not use the TSP standard as a basis to deny the subdivision. Because we find that the TSP does not provide applicable approval criteria for a limited land use decision, we need not and do not decide whether the city's application of the TSP standard violates petitioner's constitutional rights or the requirement in ORS 197.307(4) that the city may apply only clear and objective standards in a manner that would not result in unreasonable cost or delay. Accordingly, we do not reach the first and third assignments of error.

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DISPOSITION

Petitioner requests that, if we reverse the city's decision under the first assignment of error, we instruct the city to approve the application subject only to unappealed conditions of approval. Petition for Review 2. We will reverse a decision and order the local government to grant approval if the decision "is outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances." ORS 197.835(10)(a)(A).[6] Petitioner's request for relief invokes the authority granted to LUBA in ORS 197.835(10)(a)(A), notwithstanding petitioner's failure to specifically cite that statute. *See Stewart v. City of Salem*, 58 Or LUBA 605, 619, *aff'd*, 231 Or App 356, 219 P3d 46 (2009), *rev den*, 348 Or 415 (2010) (applying ORS 197.835(10)(a)(A), even where petitioner failed to cite that subsection).

ORS 197.835(10)(a) "requires reversal, and precludes remand, of a denial decision when LUBA determines on the basis of the record that the local

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government lacks the discretion to deny the development application." *Stewart*, 231 Or App at 375.

In *Parkview Terrace Dev. LLC v. City of Grants Pass*, 70 Or LUBA 37 (2014), we reversed a city council decision denying site plan approval and variance for a needed housing development. The city council gave a total of ten reasons why it denied the applications. Seven of the site plan review criteria the city council relied on to support its denial decision could not be applied to the application under ORS 197.307(4), because the application for site plan approval was an application for approval of "needed housing" and we determined those standards are not "clear and objective." The city council also inappropriately relied on three inapplicable criteria: (1) an "adequate" parking standard that did not exist in the city's code, (2) an internal circulation standard that did not apply to the proposed residential use, and (3) a variance criterion that did not apply under the circumstances surrounding the development. We concluded that all ten of the reasons that the city council gave for denying petitioner's applications were "outside the range of discretion allowed the local government under its comprehensive plan and

implementing ordinances." *Id*. at 57-58. Accordingly, we reversed the city council's decision and ordered the city to approve the petitioner's applications for variance and site plan approval. We instructed that the city council's decision to approve the application may include conditions of approval imposed by the urban area planning commission that the petitioner had agreed to. *Id*. at 58 (citing *Stewart*, 58 Or LUBA at 622).

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In this case, the city council gave only one reason for denial, failure of the development proposal to include improvements to failing intersections to satisfy the LOS D traffic performance standard. We have concluded that the TSP does not provide applicable criteria because the city failed to specifically incorporate TSP traffic standards into its land use regulations with the level of specificity required by ORS 197.195(1). Thus, the only reason that the city council gave for denying petitioner's application is "outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances." Accordingly, we reverse the city council's decision and order the city to approve the petitioner's application.

On appeal, the city has not identified any applicable standards that would require any further review. Petitioner does not dispute that the city may impose conditions of approval that are "roughly proportional to the impact of the development on public facilities." SDC 3.4.010(D).[7] During the city proceedings,

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petitioner offered, as a compromise condition of approval, to construct a westbound left turn lane at the Highway 214/Hobart Road intersection to mitigate the impact of the proposed development on public facilities at an estimated cost of over twice the estimated proportionate share. Record 14. Despite denying the application, the city's decision appears to accept and adopt that condition of approval, subject to terms and conditions. *Id*. Petitioner does not challenge that condition on appeal.[8] Accordingly, the city council's decision to approve the application may include that condition of approval.[9] *Parkview Terrace*, 70 Or LUBA at 58; *Stewart*, 58 Or LUBA at 622.

The city's decision is reversed, and the city is ordered to approve the application.

Footnotes:

[1.] OAR 661-010-0039 (2017) provided:

> "A reply brief may not be filed unless permission is obtained from the Board. A request to file a reply brief shall be filed with the proposed reply brief together with four copies within seven days of the date the respondent's brief is filed. A reply brief shall be confined solely to new matters raised in the respondent's brief, state agency brief, or amicus brief. A reply brief shall not exceed five pages, exclusive of appendices, unless permission for a longer reply brief is given by the Board. A reply brief shall have gray front and back covers."

[2.] ORS 197.307(4) provides:

> "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."

[3.] In a prior order in this appeal, we granted the city's motion to take official notice of Chapter 2 of the TSP. *Oster v. City of Silverton*, ___ Or LUBA ___ (LUBA No 2018-103, Order, Apr 5, 2019) (slip op at 9).

[4.] In a prior order in this appeal, we granted the city's motion to take official notice of Ordinance 08-01. *Oster*, ___ Or LUBA ___ (LUBA No 2018-103, Order, Apr 5, 2019) (slip op at 9).

[5.] In a prior order in this appeal, we granted intervenor's motion to take official notice of Ordinance 08-06. *Oster*, ___ Or LUBA ___ (LUBA No 2018-103, Order, Apr 5, 2019) (slip op at 10).

[6.] ORS 197.835(10)(a), provides, in part:

> "The board shall reverse a local government decision and order the local government to grant approval of an application for development denied by the local government if the board finds:
>
> "(A) Based on the evidence in the record, that the local government decision is outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances[.]"

[7.] SDC 3.4.010(D) provides:

> "Conditions of Development Approval. Development shall not occur until all required public facilities are in place or guaranteed, in conformance with the provisions of this code and the city's design standards. Improvements required as a condition of development approval, when not voluntarily accepted by the applicant, must be roughly proportional to the impact of the development on public facilities. Findings in the development approval must indicate how the required improvements are directly related and roughly proportional to the impact of development."

[8.] In *Stewart*, we explained that the "application" required to be approved under ORS 197.835(10)(a) "refers to the application as proposed at the time of the local government's denial, including any conditions of approval that the applicant has proposed and the local government has accepted. Such applicant-proposed conditions can be understood to effectively modify or amend the application." *Stewart*, 58 Or LUBA at 622.

[9.] We do not intend to foreclose the possibility that, at the time that the city grants approval of the application as required by ORS 197.835(10)(a) and this decision, the city and petitioner might agree to include additional or modified conditions of approval.

BEFORE THE LAND USE BOARD OF APPEALS

OF THE STATE OF OREGON

ROBERT PATERSON
Petitioner,

vs.

CITY OF BEND
Respondent,

and

BRIAN DRAMEN, MARK DRAMEN
and GORDON DRAMEN
Intervenors-Respondent.

LUBA No. 2004-155

FINAL OPINION
AND ORDER

Appeal from City of Bend.

William H. Sherlock, Eugene, filed the petition for review and argued on behalf of petitioner. With him on the brief was Hutchinson, Cox Coons, DuPriest, Orr, and Sherlock P.C.

No appearance by the City of Bend.

Elizabeth A. Dickson, Bend, filed the response brief and argued on behalf of intervenors-respondent. With her on the brief was Hurley, Lynch and Re, P.C.

BASSHAM, Board Member; HOLSTUN, Board Chair; DAVIES, Board Member, participated in the decision.

REMANDED 04/05/2005

You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

Opinion by Bassham.

NATURE OF THE DECISION

Petitioner appeals city approval of a tentative subdivision plan authorizing a private road terminating in a cul-de-sac.

FACTS

The subject property is a narrow, rectangular 5-acre parcel zoned RS, Urban Standard Density Residential. The subject parcel is 165 feet wide from north to south, and 1,100 feet deep east to west. The property includes an existing single family dwelling at its east end, adjacent to Eagle Road. To the north the property abuts land owned by petitioner that has recently been approved for development as a residential subdivision. Petitioner's subdivision includes Yellow Ribbon Drive, an east-west street that connects to Eagle Road. A short street, known only as "Future Street," is stubbed from Yellow Ribbon Drive to the subject property's northern property line, in the approximate middle of the subject property. The west end of the subject property adjoins a developed subdivision, where Red Oak Drive is stubbed to the property line. Red Oak Drive is a city-standard 60-foot wide right of way, with parking, curbs, planting strips and sidewalks. To the south the property abuts a large parcel for which a subdivision application (the Conners Park subdivision) has been approved.[1]

Intervenors-respondent (intervenors) seek to develop the subject property with 31 residential lots in three phases. Intervenors initially proposed that Red Oak Drive extend the length of the subject property, curve north around the existing dwelling, and connect to Eagle Road. However, to address neighbors' concerns about through traffic, and to reduce impacts on the existing single family dwelling, intervenors modified the tentative plan to propose that Red Oak Drive end in a cul-de-sac just west of the existing dwelling, rather than extend all the way to Eagle Road. Additional access to the subdivision would be provided by connecting northward to Yellow

[1] We understand that the Conners Park subdivision approval was withdrawn sometime after the decision in the present case.

Ribbon Drive via Future Street, and through two proposed connecting streets ("A" and "C") to the Conners Park subdivision to the south. To maximize the number of lots on the narrow subject property, intervenors also proposed that after entering the property at the west end, Red Oak Drive would become a private street, with a reduced paved width and sidewalks flush with the road surface.

A city hearings officer approved the tentative plan on July 14, 2004. Petitioner, concerned that the design of Red Oak Drive directed traffic through his subdivision, appealed the hearings officer's decision to the city council. The city council declined to hear petitioner's appeal. This appeal followed.

FIRST ASSIGNMENT OF ERROR

Petitioner argues that the hearings officer erred in (1) approving the subdivision without ensuring street access for the first phase and without an adequate facility development plan, under Bend Subdivision Ordinance (BSO) 3.040, and (2) finding that the applicant need not demonstrate compliance with the Bend Area General Plan (General Plan), contrary to BSO 3.040(2).[2]

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[2] BSO 3.040 provides, in relevant part:

> "**PHASED TENTATIVE PLAN**. An overall development plan shall be submitted for all developments affecting land under the same ownership for which phased development is contemplated. The Review Authority shall review a master development plan at the same time the tentative plan for the first phase of a phased subdivision is reviewed. The phased tentative plan shall include * * * the following elements:
>
> "1. Overall development plan, including phase or unit sequence, and the schedule for initiation of improvements and projected completion date.
>
> "2. Show compliance with the Bend Area General Plan and implementing land use ordinances and policies.
>
> "3. Overall facility development plan, including transportation and utility facilities plans, that specify the traffic pattern plan for motor vehicles, bicycles, and pedestrians, water system plans, sewer system plans and utility plans."

A. BSO 3.040(1) and (3)

BSO 3.040(1) and (3) require that the development plan include a "schedule for initiation of improvements," and "transportation and utility facilities plans." *See* n 2. The application proposed development in three phases, with facilities development and final plan approval issuing for each phase before commencing with the next phase. The first phase is at the east end of the property, and includes the existing dwelling, cul-de-sac and surrounding lots. Noting that access to the phase 1 area currently does not exist, the hearings officer stated:

> "It is unclear from the information provided where street access during phase 1 is located. It will be a requirement of approval that the applicant demonstrate that there will be street access for each phase of development in accordance with City Standards prior to final plat approval. Based on the information provided by the applicant and this condition of approval the hearings officer finds the proposal satisfies [BSO 3.040(1)]." Record 30.

Petitioner argues that the hearings officer substituted a condition of approval for a finding of compliance with BSO 3.040(1). However, the hearings officer clearly found compliance with BSO 3.040(1), based on the submitted development plan and the condition of approval. Generally, where there is conflicting evidence regarding whether compliance with an approval criterion is feasible, the local government may determine that compliance is feasible and impose conditions of approval as necessary to ensure compliance. *Rhyne v. Multnomah County*, 23 Or LUBA 442, 447-48 (1992). Although the application did not propose a specific plan for providing access to phase 1, the hearings officer obviously believed that providing such access was feasible, and imposed a condition requiring intervenors to specify how access would be provided. Petitioner does not argue that there is any reason to believe that providing access to phase 1 from Red Oak Drive or from one or more of the three connecting streets to the north and south is infeasible, prior to development of phases 2 and 3. Under these circumstances, we see no error in finding that the development plan complies with BSO 3.040(1), as conditioned.

With respect to BSO 3.040(3), petitioner argues that the hearings officer failed to find that the "overall facility plan" includes a transportation plan that specifies the "traffic pattern plan for

motor vehicles, bicycles, and pedestrians," with respect to phase 1 development. *See* n 2. Instead, petitioner argues, the hearings officer's finding regarding BSO 3.040(3) discusses only utility facilities and does not mention a transportation plan, other than a reference to a traffic study:

> "The applicant has submitted an overall facility plan showing all existing and proposed utility extensions for the proposal. This data is shown on the face of the tentative plat and will be supplemented by engineered drawings for utility construction. A traffic study is included in the supporting materials for the tentative plan application." Record 31.

It is not clear what BSO 3.043(3) requires in terms of a "transportation plan." The above-quoted finding appears to view the tentative plan itself as being the "overall facility plan," at least with respect to utilities. The finding does not expressly reference transportation facilities, but the same approach seems equally applicable. As with utilities, the approved tentative plan depicts the proposed street network and pedestrian pathways, with road and sidewalk cross-sections and details. The finding refers to the transportation impact analysis at Record 601 to 664, which includes a detailed analysis of the proposed and existing street network. It seems reasonably clear that the hearings officer believed that the tentative plan itself, as supplemented by engineered utility drawings and the transportation impact analysis, constituted the "transportation and utility facilities plans" required by BSO 3.043(3). While the finding could have stated that more clearly, petitioner identifies no error in that approach, and we see none. This subassignment of error is denied.

B. BSO 3.040(3)

BSO 3.040(3) requires that the tentative plan shall "[s]how compliance with the Bend Area General Plan and implementing land use ordinances and policies." Intervenors argued, and the hearings officer agreed, that compliance with the General Plan is demonstrated by compliance with its implementing land use regulations, and that intervenors were not required to demonstrate that the plan complied with General Plan policies or provisions:

> "The applicant states that it will comply with the General Plan and the implementing land use ordinances and policies by meeting the requirements of the regulations governing the tentative plan review process. While multiple decisions of the City have found that certain plan policies under specific circumstances constitute

> mandatory criteria, the applicant is not required to demonstrate compliance with the provisions of the comprehensive plan inasmuch as the plan does not establish these mandatory approval criteria for land divisions. This is supported by two facts: (1) ORS 197.195(1) provides that comprehensive plan provisions do not apply to the review of limited land use decisions, such as subdivisions, unless the provisions are adopted as part of the City's zoning or subdivision ordinances. A review of discrete Plan policies is therefore not appropriate; (2) the [General] Plan states that '[t]he policies in the General Plan are statements of public policy, and are used to evaluate any proposed changes to the General Plan. * * *" Record 30-31.

ORS 197.195(1) provides in relevant part that in order to apply comprehensive plan policies directly to a limited land use decision as approval criteria, the local government must "incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations" within two years of September 29, 1991.[3] A limited land use decision includes a decision that approves or denies a subdivision application within an urban growth boundary. ORS 197.015(12).

Petitioner contends that the city has "incorporated" all comprehensive plan standards applicable to subdivision approvals within the meaning of ORS 197.195(1), by requiring at BSO 3.040(3) that the applicant for a tentative subdivision plan approval demonstrate "compliance with the Bend Area General Plan." Petitioner then identifies several comprehensive plan policies relating to transportation that petitioner believes are applicable to the proposed subdivision.

However, in our view ORS 197.195(1) contemplates more than a broad injunction to comply with unspecified portions of the comprehensive plan. In order to "incorporate" a

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[3] ORS 197.195(1) provides:

> "A 'limited land use decision' shall be consistent with applicable provisions of city or county comprehensive plans and land use regulations. Such a decision may include conditions authorized by law. Within two years of September 29, 1991, cities and counties shall incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations. A decision to incorporate all, some, or none of the applicable comprehensive plan standards into land use regulations shall be undertaken as a post-acknowledgment amendment under ORS 197.610 to 197.625. If a city or county does not incorporate its comprehensive plan provisions into its land use regulations, the comprehensive plan provisions may not be used as a basis for a decision by the city or county or on appeal from that decision."

comprehensive plan standard into a local government's land use regulations within the meaning of ORS 197.195(1), the local government must at least amend its land use regulations to make clear what specific policies or other provisions of the comprehensive plan apply to a limited land use decision as approval criteria. Under that standard, BSO 3.040(3) falls far short of incorporating any comprehensive plan provisions. The hearings officer did not err in concluding that the applicant was not required to demonstrate compliance with the comprehensive plan policies cited by petitioner. Because we sustain the hearings officer's conclusion under ORS 197.195(1), we need not address petitioner's challenges to the hearings officer's alternative conclusion under the comprehensive plan.

The first assignment of error is denied.

SECOND ASSIGNMENT OF ERROR

BSO 3.060(1)(A) and (C) require in relevant part that the proposed land division contribute to the "orderly development" of the area.[4] Petitioner contends that the hearings officer erred in concluding that the proposed private street, ending in a cul-de-sac, contributes to "orderly development." According to petitioner, the hearings officer's determination on this point is

[4] There are actually two separate "orderly development" standards, at BSO 3.060(1)(A) and (C). We follow petitioner in discussing them together as a single standard. BSO 3.060(1) provides, in relevant part:

> "No application for subdivision or partition shall be approved unless the following requirements are met:
>
> "A. The land division contributes to orderly development and land use patterns in the area, and provides for the preservation of natural features and resources and other natural resources to the maximum degree practicable as determined by the City of Bend.
>
> "* * * * *
>
> "C. The land division contributes to the orderly development of the Bend area transportation network of roads, bikeways, and pedestrian facilities, and does not conflict with existing public access easements within or adjacent to the land division."

inconsistent with another hearings officer's decision regarding a similar proposal for a private street in a different development application, known as the "Wolfe" decision.

The hearings officer rejected that argument, finding:

> "* * * The applicant proposes to extend Red Oak Drive as a private street through the subdivision culminating in a cul-de-sac at the [east] end of the property. Staff questioned whether this design constitutes orderly development within the meaning of [BSO 3.060(1)(A)]. It did because of a City hearings officer's decision in file numbers PZ 03-651 and 03-652 (the 'Wolfe Application'). There the hearings officer found that the proposed connection between public streets and private streets would not be orderly for the reason that the private street was found by the hearings officer to be an 'integral link in the city's street grid system' and for the reason that the private street would also largely serve persons accessing land and subdivisions outside of the subdivision proposed in that application. It is noted that the same hearings officer has considered different facts (the Coulter subdivision) and allowed the use of a private street system, provided that certain factors or conditions were met, such as demonstrating a permanent maintenance source, lot configuration, etc. * * * Other decisions of the City have also allowed private street connections under certain circumstances. * * * In point of fact there are many private streets with public overlays that connect to publicly owned streets within the City. I agree with the applicant in that here the private street would not be an integral link to the City grid system given the number of existing and proposed connections to Eagle Road from other areas. Further, the private street will have public overlay, be permanently maintained by a homeowner's association and would terminate before Eagle Road, thus serving mostly subdivision residents, at least from the connection with the 'Future Road' [to Yellow Ribbon Drive] to the north. The code provides for private streets in certain cases and sets standards for their construction. *See* table 'B,' Land Division Ordinance. * * * I find that under the present circumstances, including the shape of the lot at issue, the density goal of the zone and the connections to the surrounding developments, the proposed private street would constitute orderly development. The traffic engineer does not object, but has commented that construction should be in accordance with Table B. These standards require a street that is 24 feet in width and bordered by sidewalks. The applicant intends to comply with such standards. Compliance with Table 'B' shall be a condition of approval and this will promote safety, continuity and compatibility with street connections and the established density of surrounding development." Record 33-34.

Petitioner quotes long passages from the Wolfe decision, and argues that for the same reasons expressed by the hearings officer in the Wolfe decision the hearings officer in the present

case should also conclude that the proposed private street and cul-de-sac do not constitute "orderly development."

Even if the reasoning in the Wolfe decision is not persuasive, petitioner contends, the facts in the present case demonstrate that the proposed private street and cul-de-sac are not "orderly development." With respect to the cul-de-sac, petitioner argues that it forces traffic to and from the subdivision to access Eagle Road through adjoining subdivisions. With respect to the private street, petitioner argues that it is unsafe to have public streets with 60-foot wide rights of way, parking, curbs, planting strips and sidewalks transition abruptly to a private street with 20-foot paved width, no parking, curbs or dividers and with sidewalks flush with the road pavement. Further, petitioner questions the ability of the homeowner's association to enforce the no parking prohibition on the private street, or adequately maintain the private street.

Given the imprecision of the "orderly development" standard, the city has significant latitude in determining whether development complies with that standard.[5] As the hearings officer noted, there are significant factual distinctions between the circumstances in the Wolfe decision and the present case. In any case, petitioner does not explain why the present hearings officer is required to apply the same understanding of "orderly development" that was applied in the Wolfe case.

With respect to the cul-de-sac, it is often the case that traffic from a cul-de-sac will travel across local streets to reach collector or arterial streets. Petitioner does not explain why the

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[5] Elsewhere in the decision, the hearings officer notes in addressing the "orderly development" standard in BSO 3.060(1)(C):

> "In other City land use decisions, and based upon the purpose statements contained in the land use ordinances, the term 'orderly' as applied to the above criteria has been found to mean a system or order that is a logical extension of the transportation system, that does not overtax the system, provides for maintenance thereof, that recognizes the limitations that the shape of the parcel and the topography have on the development, does not have internal conflicts with the very development being proposed, meets code layout and design requirements and does not foreclose future development." Record 36.

Petitioner does not challenge that view of the "orderly development" standard, or explain why the hearings officer's application of the standard under that view is erroneous.

"orderly development" standard requires the city to connect Red Oak Drive directly to Eagle Road, or prohibits the city from directing some traffic onto Yellow Ribbon Drive or other adjoining streets.

With respect to the safety of transitioning between a public street and a private street, the code allows private streets to be built to different standards than public streets, and the two must meet somewhere. The fact that private streets may be built to lesser standards, and need not include such amenities as curbs, planting strips, and parking lanes does not mean that such streets do not comply with the orderly development standard. Similarly, that private streets are maintained by homeowners' associations rather than the city does not indicate disorderly development. Petitioner has not demonstrated that the hearings officer erred in concluding that the proposed private street complies with the orderly development standard.

Finally, petitioner argues that at several points in the decision the hearings officer indicated that he understood the proposed private street to have a paved width of 24 or perhaps 28 feet with curbs, whereas the approved tentative plan clearly provides for a private street with paved width of 20 feet and no curbs. *See* above-quoted finding ("These standards require a street that is 24 feet in width and bordered by sidewalks. The applicant intends to comply with such standards"); Record 44 ("The private street will be bounded by curbed sidewalks directing water to catch basins"); and Record 58 (condition of approval stating that "'No Parking' signs on 28-foot wide streets are required"). Petitioner speculates that the hearings officer's confusion on these points may have erroneously led him to conclude that the private street complies with the orderly development standard, and that remand is necessary to allow the hearings officer to apply the standard under a correct appreciation of the facts.

It is not clear to us why the hearings officer referred to the private street as being 24 feet in width and bounded by curbs, in the above-quoted findings. The approved tentative plan, the application materials, the staff report, and everything cited to us in the record indicate that the private street was and always had been proposed as 20 feet in width, with no curbs, a design that is apparently allowed under Table B. Elsewhere in the hearings officer's decision he indicates that he

understood that the private street will have a paved width of 20 feet. Record 47 ("Since the applicant is proposing a private street with a width of 20 feet, as a condition of approval, 'No Parking' signs shall be placed on both sides of the road * * *"). Almost certainly the reference to the width of the street as 24 feet at Record 34 was simply a typographic error. Likewise, the reference to a requirement for "No Parking" signs for 28-foot wide streets is almost certainly a misstatement, since the hearings officer elsewhere indicates his understanding that "No Parking" signs are required for a 20-foot wide street. Record 47.

The reference to curbs at Record 44 may also be a misstatement, although that is less clear. That reference to curbs is part of the findings under BSO 6.020(7), which we discuss below, not part of the findings addressing the orderly development standard at BSO 3.040(1) or (3). As discussed below, we remand the hearings officer's finding under BSO 6.020(7) for clarification with respect to curbs. For present purposes, however, it seems unlikely that the hearings officer relied upon the presence or absence of curbs in finding compliance with BSO 3.040(1) or (3). The findings addressing the orderly development do not mention curbs. Petitioner has not established that any misstatement with respect to curbs provides an independent basis for reversal or remand with respect to the orderly development standard.

The second assignment of error is denied.

THIRD ASSIGNMENT OF ERROR

Petitioner contends that the hearings officer misconstrued street and sidewalk design requirements of BSO 6.020 and failed to make adequate findings supported by substantial evidence in concluding that the proposed cul-de-sac and private street comply with those requirements.

A. BSO 6.020(1)

As relevant here, BSO 6.020(1) requires that "[f]acilities providing safe and convenient motor vehicle, pedestrian and bicycle access shall be provided within new subdivisions." Petitioner repeats his arguments under the BSO 3.060(1) "orderly development" standard, but does not

explain why those arguments establish a basis for reversal or remand under BSO 6.020(1). This subassignment of error is denied.

B. BSO 6.020(2)

BSO 6.020(2) requires in relevant part that "[a]ll streets shall be improved to City standards with curbs, paving, drainage facilities and medians if required."[6] Petitioner argues that the hearings officer's finding under BSO 6.020(2) does not explain why that standard does not require curbs on the proposed private street.

The hearings officer finds that the private street will be constructed under standards for private streets set out in Table B. There is no dispute that Table B does not require curbs for a 20-foot wide private street. Petitioner's quotation of BSO 6.020(2) in the petition for review omits the last two words, "if required." That phrase is somewhat ambiguous, as it could modify only the preceding word "medians" or the entire list of design features including curbs. Petitioner apparently reads BSO 6.020(2) to require curbs on all streets, even if the applicable standards for certain streets do not require curbs. Petitioner's interpretation brings the last sentence of BSO 6.020(2) and Table B into conflict. Although the hearings officer's findings under BSO 6.020(2) do not address this issue, it seems to us that the better reading of the last sentence of BSO 6.020(2) is one that does not bring it into conflict with Table B. In other words, "[a]ll streets" must have curbs and other listed design features only "if required." If other, more specific standards explicitly do not

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[6] BSO 6.020(2) provides, in full:

> "New Streets. The location, width, and grade of streets shall be considered in their relation to existing and planned streets, topographical conditions, public convenience and safety, and the proposed use of land to be served by the streets. The street system shall assure an adequate traffic circulation system with intersection angles, grades, tangents, and curves appropriate for the traffic to be carried considering the terrain. The subdivision shall provide for the continuation of the principal streets existing in the adjoining subdivision or of their proper projection. Where, in the opinion of the Hearings Body, topographic conditions make such continuation or conformity impractical, exception may be made. In cases where the City may adopt a plan or plat of a neighborhood or area of which the subdivision is a part, the subdivision shall conform to such adopted neighborhood or area plan. All streets shall be improved to City standards with curbs, paving, drainage facilities and medians if required."

require curbs for a particular type of street, neither does BSO 6.020(2). With that understanding, we see no reversible error in the hearings officer's findings under BSO 6.020(2). This subassignment of error is denied.

C. BSO 6.020(3)

BSO 6.020(3) permits a cul-de-sac only when certain circumstances are present, including where "existing development on adjacent property prevents a street connection."[7] The hearings officer approved the cul-de-sac because "the applicant's property contains a large established family home and any such connection [of Red Oak Drive to Eagle Road] would require its removal." Record 43.[8]

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[7] BSO 6.020(3) provides:

> "Street Layout and Cul-de-sacs. The street layout shall be generally in a rectangular grid pattern to provide or continue a network of inter-connecting streets. The subdivision streets shall be oriented on an east/west axis to the greatest extent possible to ensure solar access for lots within the subdivision. The grid pattern may be modified to adapt to topography and natural conditions. Cul-de-sacs and dead end streets shall only be permitted when the following conditions are met:
>
> "A. One or more of the following conditions prevent a required street connection:
>
> - natural slopes of 18% or more where it is not practical to construct streets with grades of 12%; or
>
> - presence of a wetland or water body which cannot be crossed; or existing development on adjacent property prevents a street connection; and
>
> "B. A street pattern which either meets standards for connections and spacing or requires less deviation from standards is not possible; * * *"

[8] The decision states, in relevant part:

> "The applicant has modified the subdivision proposal to include a cul-de-sac instead of another road connection to Eagle Road. The hearings officer finds that this connection is unnecessary given the number of already approved or planned connections. As described above the applicant's property contains a large established family home and any such connection would require its removal. The cul-de-sac includes a pedestrian access corridor at its terminus. While private streets are reviewed on case by case bases, the existing home, shape of the lot, requirements to create compatible infill and reduce neighborhood cut-through, makes the private road extension of Red Oak Drive appropriate in this case. The 'Future Street' and 'C' Street connections are proposed as a way to address block length and continue the street grid to adjoining properties where appropriate." Record 43.

Petitioner points out that BSO 6.020(3)(A) allows a cul-de-sac based on "existing development" only where the development is on "adjacent property." The existing dwelling at the east end of the subject property is part of the property, petitioner argues, not on "adjacent property." Even if the dwelling were on adjacent property, petitioner contends, there is no finding or explanation that a street pattern that either meets the standards for connections or requires less deviation from those standards is not possible, under BSO 6.020(3)(B). Petitioner notes, as do the findings, that the original tentative plan proposed that Red Oak Drive connect to Eagle Road, by going north of the existing dwelling. That proposed street pattern was changed, apparently at the request of neighbors to the west of the subject property, who did not want Red Oak Drive to become a through-street to Eagle Road. Petitioner argues that a street pattern without a cul-de-sac and without removing the existing dwelling is obviously possible. Even if moving or removing the existing dwelling were necessary to connect Red Oak Drive to Eagle Road, petitioner contends, there is no reason why the city could not require that the dwelling be moved or removed.

Intervenors do not respond to this argument. The hearings officer's finding that "any connection" of Red Oak Drive to Eagle Road would require removing the existing dwelling is not supported by the record, as evidenced by the originally submitted tentative plan, which proposed just such a connection without removing the house. Further, petitioner is correct that under BSO 6.020(3)(A) "existing development" is only a basis for allowing a cul-de-sac where that development is on "adjacent property." One could presumably avoid that restriction in the present case, by simply partitioning the parcel including the dwelling from the rest of the subject property, and then seeking subdivision plan approval for that remainder parcel. However, even if we assume that the restriction can be avoided in that manner, petitioner is correct that BSO 6.020(3)(A) and

(B) are conjunctive, and the decision does not explain why a cul-de-sac is warranted under BSO 6.020(3)(B).[9] This subassignment of error is sustained.

D. BSO 6.020(7)

BSO 6.020(7) requires that "street right-of-way and roadway surfacing widths shall be in conformance with the standards and specifications" set forth in Table A for public streets and Table B for private streets. As noted, Table B allows a private street with 20 feet of paved width if no curbs are proposed, but requires 24 feet of paved width if curbs are proposed. The hearings officer's finding under BSO 6.020(7) states, in full:

> "According to the latest revised tentative plan all existing and proposed streets will meet the City of Bend standards for both public and private streets. The private street will be bounded by curbed sidewalks directing water to catch basins. This criterion is met." Record 44.

Petitioner argued below that without curbs there is nothing that will direct storm drainage to catch basins, and that water will simply flow over the flush sidewalks onto the adjoining lots, given the slope depicted on the street cross-sections. *See* Record 182 (letter from engineer opining that curbs are necessary to direct water to catch basins); Record 195. Petitioner also argued that adding curbs would require an additional four feet of right-of-way, in order to comply with the standards in Table B, which may affect lot configuration and minimum lot sizes. Petitioner notes the additional complication that the hearings officer found that the private street "will be bounded by curbed sidewalks directing water to catch basins," notwithstanding that the approved tentative plan does not appear to propose curbs on the private street.[10] According to petitioner, remand is necessary to address the following issues: (1) whether the decision requires curbs; (2) if so,

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[9] It was suggested at oral argument that there may be access spacing or sight line reasons why a connection between Red Oak Drive and Eagle Road would be inconsistent with applicable standards. The hearings officer should address such matters on remand.

[10] At oral argument, intervenors' attorney first asserted that the tentative plan did propose curbs, but later seemed to withdraw that assertion. As far as we can tell from the approved plan, no curbs are proposed on the private street portion of Red Oak Drive.

whether the plan needs to be revised to reflect a 24-foot paved width and a 34-foot right of way to comply with Table B; (3) if not, how storm drainage will be directed to the catch basins absent curbs.

Intervenors again do not provide any meaningful response to this subassignment of error. We agree with petitioner that remand is necessary to address the foregoing issues. This subassignment of error is sustained.

E. BSO 6.020(14)

BSO 6.020(14) requires that sidewalks shall be installed at the property line. Petitioner cites language from the Wolfe decision in which the hearings officer opines that sidewalks on private streets must include planting strips just like public streets, and therefore that sidewalks on private streets cannot be street tight. Petitioner adopts that language as his argument that, in the present case, BSO 6.020(14) and Table B effectively require planting strips on all streets and effectively prohibit street-tight sidewalks.

The hearings officer in the present case found that the applicant proposes sidewalks installed at the property line, which is all that BSO 6.020(14) requires. BSO 6.020(14) says nothing about planting strips, and nothing about street-tight sidewalks. Unlike Table A, governing public streets, Table B requires no planting strip at all for any private street.[11] We do not understand petitioner's adopted argument from the Wolfe decision. This subassignment of error is denied.

F. BSO 6.020(16)

BSO 6.020(16) requires in relevant part that "[t]he street is connected to a grid pattern at both ends" and that "[b]locks shall have dedicated public alley access constructed to City standards."[12] The hearings officer's finding under BSO 6.020(16) states, in full: "Since the

---

[11] Table B indicates "N/A" for all private streets under the column for "Minimum Planter Strip Width."

[12] BSO 6.020(16) provides:

"Performance Standards for Local Residential Streets.

applicant is proposing a private street with a width of 20-feet, as a condition of approval, 'No Parking' signs shall be placed on both sides of the road and spaced to City of Bend Standards and Specifications." Record 47.

Petitioner argues that while the above-quoted finding may be responsive to BSO 6.020(16)(D) and (E), it does not address the requirements at BSO 6.020(16)(B) and (C) that "the street is connected to a grid pattern at both ends" and that blocks "shall have dedicated public alley access."

Intervenor again does not respond to this argument. Although it is not clear to us that BSO 6.020(16)(B) and (C) apply to a private street ending in a cul-de-sac, or what they would require if they do apply, absent some finding or response on this point we agree with petitioner that remand is necessary to adopt findings addressing the applicability of and compliance with BSO 6.020(16)(B) and (C). This subassignment of error is sustained.

The third assignment of error is sustained, in part.

FOURTH ASSIGNMENT OF ERROR

BSO 6.030(2) requires in relevant part that

> "No block shall be longer than 1,200 feet between the centerline of through cross streets *except in residential subdivisions where no block shall be longer than 600 feet between the centerline of through cross streets* and where street location is restricted by natural topography, wetlands, or other bodies of water." (Emphasis added.)

> "A. Average daily traffic volumes on the local street does not exceed 300 ADT.
>
> "B. The street is connected to a grid street pattern at both ends.
>
> "C. Blocks shall have dedicated public alley access constructed to City standards.
>
> "D. 'No Parking' zones are established 55 feet from the centerline of intersecting local streets.
>
> "E. For block lengths exceeding 300 feet, 'No Parking' zones shall be established on either sides of the street spaced no greater than 250 feet apart. The 'No Parking' zones shall be a minimum of 30 feet in length."

The hearings officer found that "[a]s shown on the tentative plan block, the proposed block lengths meet this proposal." Record 47. Petitioner argues that in order to comply with the 600-foot block length requirement, the city must require a new street somewhere east of the "Future Street" connecting Red Oak Drive and Yellow Ribbon Drive.

We do not understand petitioner's argument or the hearings officer's terse finding. For that matter, we are unclear what BSO 6.030(2) requires. It appears to require in residential subdivisions that a block be no longer than 600 feet between the centerline of "through cross-streets." As far as we can tell there are no "through cross-streets" depicted anywhere on the approved tentative plan: only T-intersections where Future, A and C streets intersect Red Oak Drive. It is not clear how one applies BSO 6.030(2) to a residential subdivision with a cul-de-sac and T-intersections. Given the lack of alternatives, it may be appropriate to determine block length for purposes of BSO 6.030(2) on some other basis than "through cross-streets." However, the hearings officer needs to explain how block length is determined under BSO 6.030(2). Petitioner appears to be correct that, depending on where the "block" begins and ends, it is possible that at least the "block" that runs eastward from Future Street toward the end of the cul-de-sac is longer than 600 feet. Given the lack of assistance from the decision and intervenor on these issues, we agree with petitioner that remand is necessary to adopt more adequate findings addressing BSO 6.030(2).

The fourth assignment of error is sustained.

The city's decision is remanded.

CHAPTER 17.10
DEFINITIONS

17.10.00 INTENT

These definitions are intended to provide specific meanings for words and terms commonly used in zoning and land use regulations.

17.10.10 MEANING OF WORDS GENERALLY

All words and terms used in this Code have their commonly accepted dictionary meaning unless they are specifically defined in this Code or the context in which they are used clearly indicated to the contrary.

17.10.20 MEANING OF COMMON WORDS

A. All words used in the present tense include the future tense.

B. All words used in the plural include the singular, and all words used in the singular include the plural unless the context clearly indicates to the contrary.

C. The word "shall" is mandatory and the word "may" is permissive.

D. The word "building" includes the word "structure."

E. The phrase "used for" includes the phrases "arranged for," "designed for," "intended for," "maintained for," and "occupied for."

F. The word "land" and "property" are used interchangeably unless the context clearly indicates to the contrary.

G. The word "person" may be taken for persons, associations, firms, partnerships or corporations.

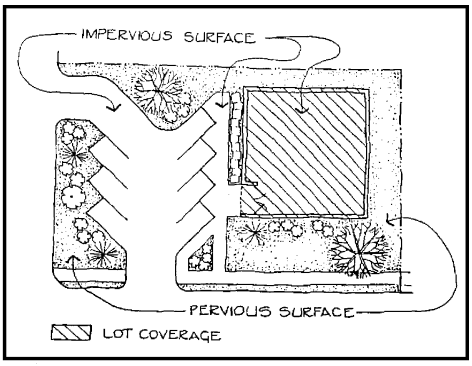
17.10.30 MEANING OF SPECIFIC WORDS AND TERMS

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 by a road, street, alley or public



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 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 2 streets, the interior angle of such intersection not exceeding 135 degrees.

CHAPTER 17.12 - PROCEDURES FOR DECISION MAKING

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.

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 Section 17.90.40(A).
C. Adjustments less than 10% of a quantifiable dimension which does not increase density
D. Flood Slope and Hillside Development-Uses listed in 17.60.40 A.
E. Minor Alteration of an Historic Resource
F. Property Line Adjustments
G. Tree removal involving less than 50 trees
H. Type I FSH Review
I. Minor Partition (no new street created)
J. Administrative Variance

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 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 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 & Variances of up to 20% 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

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 17.50.60 A & 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% 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.

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. Planned Developments
5. Village Specific Area Plan (master plan)
6. Annexations
7. Extension of City Services Outside the City Limits
8. Vacating of Public Lands and Plats
9. 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.

CHAPTER 17.18 - PROCESSING APPLICATIONS

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 generally 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 will generally 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).

In situations where an applicant has attended a pre-application conference and has reviewed the application with the Director prior to submitting the applications, the Director may exercise his/her discretion to review the Type II application(s) at the staff level and only schedule a public hearing for the Type III portion(s) of the development proposal.

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.

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 city and will be scheduled following submittal of required materials and payment of fees. The purpose of the 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 development requirements, arrange such technical and design assistance which will aid the applicant, 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 conference within 10 days of the 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.

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 mailing labels of Affected Property Owners.

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 property affected by the application is in the exclusive ownership of the applicant, that the applicant has the consent of all parties in ownership of the affected property, or the applicant is the contractual owner.

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.

F. Site plan of proposed development

G. Number of Copies to be Submitted:

1. One copy of items A through D listed above;
2. Type I: 2 copies of site plan and other materials required by the Code.
3. Type II: 8 copies of site plan and other materials required by the Code
4. Type III: 15 copies of site plan and other materials required by the Code
5. Type IV 20 copies of site plan and other materials required by the Code

The Director may vary the quantity of materials to be submitted as deemed necessary.

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 of record 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 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, 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) – (3) above.

17.18.50 REFERRAL AND REVIEW OF APPLICATIONS

Within 10 working days of 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.

17.18.60 STAFF EVALUATION

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

17.18.70 TYPE II DEVELOPMENT DECISION

A. Within 60 days of the date of accepting an application, the Director shall grant 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 finds that applicable approvals by others have been granted and the proposed development otherwise conforms to the requirements of this Code.

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 shall describe the reason for denial.

17.18.80 TYPE III OR IV DECISION

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

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.

17.18.100 LEGISLATIVE ENACTMENTS NOT RESTRICTED

Nothing in Chapter 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.

17.18.110 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.

17.18.120 120-DAY RULE; TIME COMPUTATION

Final Decision. Except as allowed for Type IV decisions and applications subject to Section 17.18.110, 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.

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.

CHAPTER 17.30 - ZONING DISTRICTS

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	
Planned Development	**PD**
Cultural & Historic Resource	**CHR**
Flood Slope Hazard	**FSH**
Specific Area Plan Overlay	**SAP**

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.

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.

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 transfers are permitted from restricted development areas to unrestricted areas consistent 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 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 10 acres in the Single Family Residential Zoning District requires a minimum of 30 units and allows a maximum of 58 units. (NSA x 3 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 Section 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 (8) units per acre has 6 acres of unrestricted site area (USA= 6) and two acres of restricted development area (RDA=2), for a total net site area of 8 acres (NSA= 8). Then NSA (8) x 8 units/acre = 64 and USA (6) x 8 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 3 units. A calculation of 4.2 units is rounded down to 4 units and a calculation of 4.5 units is rounded up to 5 units.

CHAPTER 17.34 - SINGLE-FAMILY RESIDENTIAL (SFR)

17.34.00 INTENT

The 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 allow limited development of property while not precluding more dense future development, as urban services become available. Density shall not be less than 3 or more than 5.8 units per net acre.

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;

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.

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;
3. Duplex;
4. 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;
5. 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;
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.

17.34.30 DEVELOPMENT STANDARDS

Type	Standard
A. Minimum Lot Area - Single detached dwelling - Other permitted uses	7,500 square ft. No minimum
B. Minimum Average Lot Width - Single detached dwelling	 60 ft.
C. Minimum Lot Frontage	20 ft. except as allowed by Section 17.100.160
D. Minimum Average Lot Depth	No minimum
E. Setbacks (Main Building) Front yard Rear yard Side yard (interior) Corner Lot	 10 ft. minimum 20 ft. minimum 7.5 ft. minimum 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 (subject to Section 17.90.220) 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

17.34.40 MINIMUM REQUIREMENTS

A. Must connect to municipal water.
B. Must connect to municipal sewer if service is currently within 200 feet of the site. 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 which directly benefit the property;

[1] Must comply with clear vision requirements of Chapter 17.74.

3. The minimum size of the property is one acre or is a pre-existing buildable lot, as determined by the city;
4. Site consists of a buildable parcel(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 must provide for a future street network to be developed.

D. Must have frontage or approved access to public streets.

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 10 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 5 ft. in width.

CHAPTER 17.80 - ADDITIONAL SETBACKS ON COLLECTOR & ARTERIAL STREETS

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.

17.80.10 APPLICABLITY

These regulations apply to all collector and arterial streets as identified in the latest adopted Sandy Transportation System Plan (TSP). The Central Business District (C-1) is exempt from Chapter 17.80 regulations.

17.80.20 SPECIFIC SETBACKS

Any structure located on streets listed above or identified in the 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

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.

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 Transit System Plan.

17.82.20 BUILDING ORIENTATION

A. All residential dwellings shall have their primary entrances 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.

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 pedestrian route shall consist of materials such as concrete, asphalt, stone, brick, permeable pavers, or other materials 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 5 feet in depth.

D. If the site has frontage on more than one transit street, the dwelling shall provide one main entrance oriented to a transit street or to a corner where two transit streets intersect.

CHAPTER 17.84
IMPROVEMENTS REQUIRED WITH DEVELOPMENT

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.

17.84.10 EXCEPTIONS

Single family residential development on existing lots is exempt from this chapter, with the exception of 17.84.30 Pedestrian and Bicyclist Requirements**.**

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 planned development and/or subdivision, improvements may similarly be phased in accordance with that plan.

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 (5) ft. wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, 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. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of six (6) ft. wide.
   3. Sidewalk improvements shall be made according to City standards, unless the 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, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.
      a) Narrow landscape strips
      b) Narrow sidewalk or portion of sidewalk to no less than four (4) feet in width
      c) Eliminate landscape strips
      d) Narrow 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.

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, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks, as follows:

1. For the purposes of this section, "safe and convenient" means pedestrian and bicyclist facilities that: are reasonably free from hazards which 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.
2. To meet the intent of "B" above, rights-of-way connecting cul-de-sacs or passing through unusually long or oddly shaped blocks shall be a minimum of 15 ft. wide with eight (8) feet of pavement.
3. 12 ft. wide pathways shall be provided in areas with high bicycle volumes or multi-use by bicyclists, pedestrians, and joggers.
4. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:
   a) The pedestrian circulation system shall be at least five (5) feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.
   b) Walkways at least five (5) feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities which abut the site but are not adjacent to the streets abutting the site.
   c) Walkways shall be as direct as possible and avoid unnecessary meandering.
   d) Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.
   e) With the exception of walkway/driveway crossings, 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 standards adopted by the City. (This provision does not require a separated walkway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).
   f) Pedestrian amenities such as covered walk-ways, awnings, visual corridors and benches will be encouraged. For every two benches provided, the minimum parking requirements will be reduced by one, up to a maximum of four benches per site. Benches shall have direct access to the circulation system.

C. Where a development site is traversed by or adjacent to a future trail linkage identified within the Transportation System Plan, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with 17.84. 90(D).

D. To provide for orderly development of an effective pedestrian network, 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, the Planning Commission or Director may require off-site pedestrian facility improvements concurrent with development.

17.84.40 TRANSIT AND SCHOOL BUS TRANSIT REQUIREMENTS

A. Development sites located along existing or planned transit routes shall, where appropriate, incorporate bus pull-outs and/or shelters into the site design. These improvements shall be installed in accordance with the guidelines and standards 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, 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 shall provide safe, convenient pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of 17.84.30 B.

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 conditions less than the minimum standard established in the development code or the 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.

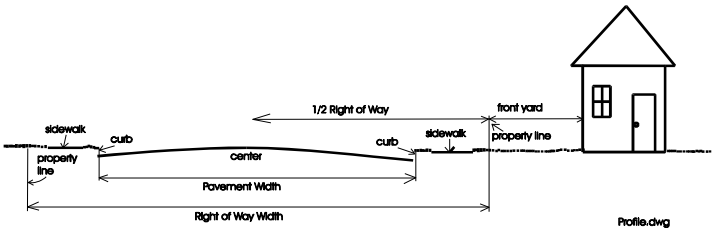
B. Transportation Impact Study (Dwellings). For development applications that propose dwelling units, an applicant must submit a transportation impact study unless the application is exempt from this requirement pursuant to subsection (B)(6), below. Failure to submit the study will result in an incomplete 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. 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 5 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 a.m. and 9 a.m.) and p.m. peak hour (one hour between 4 p.m. and 6 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 and average daily traffic standards and the Oregon Department of Transportation's mobility standard.
   5. If the study identifies level-of-service conditions less than the minimum standard established in the development code or the 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 or fails to meet the Oregon Department of Transportation's mobility 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. 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 5 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; or
      b) The proposed development completed a transportation impact study at the time of annexation within the past 5 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. Location of new arterial streets shall conform to the Transportation System Plan in accordance with the following:
   1. Arterial streets should generally be spaced in one-mile intervals.
   2. Traffic signals should generally not be spaced closer than 1,500 ft. for reasonable traffic progression.

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:
   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.
   2. Local streets should typically intersect in "T" configurations rather than 4-way intersections to minimize conflicts and discourage through traffic. Adjacent "T" intersections shall maintain a minimum of 150 ft. between the nearest edges of the two rights-of-way.
   3. Cul-de-sacs shall not exceed 400 ft. 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.

F. Development sites shall be provided with access from a public street improved to City standards in accordance with the following:
   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.
   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.
   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.
   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.
   5. A half-street improvement includes curb and pavement 2 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.



G. As necessary to provide for orderly development of adjacent properties, 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:
   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.
   2. In order to assure the eventual continuation or completion of the street, reserve strips may be required.

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.

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.

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:
   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.
   2. Grades shall not exceed 6 percent on arterial streets, 10 percent on collector streets, and 15 percent on local streets.
   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 ft. between the nearest edges of the two rights-of-way.
   4. Centerline radii of curves shall not be less than 500 ft. on arterial streets, 300 ft. on collector streets, and 100 ft. on local streets.
   5. Streets shall be designed to intersect at angles as near as practicable to right angles and shall comply with the following:
      a) The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 ft. of straight (tangent) alignment perpendicular to the intersection.

b) The intersection of a local street with another street shall have a minimum of 50 ft. of straight (tangent) alignment perpendicular to 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 ft. along the right-of-way lines of the acute angle.
d) Intersections with arterial and collector streets shall have a minimum curb corner radius of 20 ft. All other intersections shall have a minimum curb corner radius of 10 ft.

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.

17.84.60 PUBLIC FACILITY EXTENSIONS

A. All development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage.

B. Where necessary to serve property as specified in "A" above, required public facility installations shall be constructed concurrent with development.

C. Off-site public facility extensions necessary to fully serve a development site and adjacent properties shall be constructed concurrent with development.

D. As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).

E. All public facility installations required with development shall conform to the City's facilities master plans.

F. Private on-site sanitary sewer and storm drainage facilities may be considered provided 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 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.

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.

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, 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 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.

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 ft. The minimum easement width for two adjacent utilities is 20 ft. 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 (8) feet shall be provided adjacent to all street rights-of-way for franchise utility installations.

C. Where a development site is traversed by a drainageway or water course, a drainage way dedication shall be provided to the City.

D. Where a development is traversed by, or adjacent to, a future trail linkage identified within the Transportation System Plan, dedications of suitable width to accommodate the trail linkage 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, dedications may be required. The need for and widths of those dedications shall be determined by the 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 on standard document forms provided by the City Engineer.

G. If the City has an interest in acquiring any portion of a proposed subdivision or planned development 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 (1) year.

H. 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.

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 and meet the approval 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 standards 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 & OPEN SPACE

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 the population of Sandy. This chapter implements policies of Goal 8 of the Comprehensive Plan and the Parks Master Plan by outlining provisions for parks and open space in the City of Sandy.

17.86.10 MINIMUM PARKLAND DEDICATION REQUIREMENTS

Parkland Dedication: New residential subdivisions, planned developments, multi-family or manufactured home park developments shall be required to provide parkland to serve existing and future residents of those developments. Multi-family developments which provide some "congregate" services and/or facilities, such as group transportation, dining halls, emergency monitoring systems, etc., but which have individual dwelling units rather than sleeping quarters only, are considered to be multi-family developments for the purpose of parkland dedication. Licensed adult congregate living facilities, nursing homes, and all other similar facilities which provide their clients with individual beds and sleeping quarters, but in which all other care and services are communal and provided by facility employees, are specifically exempt from parkland dedication and system development fee requirements.

1. The required parkland shall be dedicated as a condition of approval for the following:

   a. Tentative plat for a subdivision or partition;

   b. Planned Development conceptual or detailed development plan;

   c. Design review for a multi-family development or manufactured home park; and

   d. 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.

2. Calculation of Required Dedication: The required parkland acreage to be dedicated is based on a calculation of the following formula rounded to the nearest 1/100 (0.00) of an acre:

   Required parkland dedication (acres) = (proposed units) x (persons/unit) x 0.0043 (per person park land dedication factor)

   a. 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 Unit
Single family residential	3.0
Standard multi-family unit	2.0
Manufactured dwelling park	2.0
Congregate multi-family unit	1.5

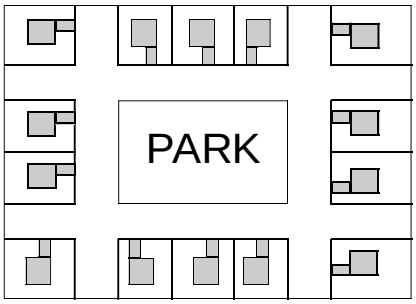
Persons per unit, age distribution, and local conditions change with time. The specific formula for the dedication of land will, therefore, be subject to periodic review and amendment.

b. Per Person Parkland Dedication Factor: The total parkland dedication requirement shall be 0.0043 of an acre per person based on the adopted standard of 4.3 acres of land per one thousand of ultimate population per the Parks Master Plan[1]. This standard represents the citywide land-to-population ratio for city parks, and may be adjusted periodically through amendments to the Parks Master Plan.

17.86.20 MINIMUM PARKLAND STANDARDS

Land required or proposed for parkland dedication shall be contained within a continuous unit and must be suitable for active use as a neighborhood or mini-park, based on the following criteria:

1. Homes must front on the parkland as shown in the example below:



2. The required dedication shall be contained as a contiguous unit and not separated into pieces or divided by roadways.

3. The parkland must be able to accommodate play structures, play fields, picnic areas, or other active park use facilities. The average slope of the active use parkland shall not exceed 15%.

[1] Parks Master Plan, Implementation Plan section, Pages 4 and 5 indicate a required park acreage total of 64.5 acres. This number, divided by population (2015) of 15,000 equates to 4.3 acres per 1000 population or 0.0043 per person.

4. Any retaining wall constructed at the perimeter of the park adjacent to a public right-of-way or private street shall not exceed 4 feet in height.

5. Once dedicated, the City will assume maintenance responsibility for the neighborhood or mini parkland.

17.86.30 DEDICATION PROCEDURES

Prior to approval of the final plat, the developer shall dedicate the land as previously determined by the City in conjunction with approval of the tentative plat. Dedication of land in conjunction with multi-family development shall be required prior to issuance of permits and commencement of construction.

A. Prior to acceptance of required parkland dedications, the applicant/developer shall complete the following items for all proposed dedication areas:

1. The developer shall clear, fill, and/or grade all land to the satisfaction of the City, install sidewalks on the park land adjacent to any street, and seed the park land; and,

2. The developer shall submit a Phase I Environmental Site Assessment 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.

B. Additional Requirements

1. In addition to a formal dedication on the plat to be recorded, the subdivider shall convey the required lands to the city by general warranty deed. The developer of a multi-family development or manufactured home park shall deed the lands required to be dedicated by a general warranty deed. In any of the above situations, the land so dedicated and deeded shall not be subject to any reservations of record, encumbrances of any kind or easements which, in the opinion of the Director, will interfere with the use of the land for park, open space or recreational purposes.

   The subdivider or developer shall be required to present to the City a title insurance policy on the subject property ensuring the marketable state of the title.

2. Where any reservations, encumbrances or easements exist, the City may require payment in lieu of the dedication of lands unless it chooses to accept the land subject to encumbrances.

C. Phased Developments. In a phased development, the required park land for the entire development shall be dedicated prior to approval of the final plat for the first phase. Improvements to the land as required by 17.86.30 (A.1.) shall be made prior to approval of the final plat for the phase that includes the park land.

17.86.40 CASH IN LIEU OF DEDICATION

At the city's discretion only, the city may accept payment of a fee in lieu of land dedication. The city may require payment in lieu of land when the park land to be dedicated is less than 3 acres. A payment in lieu of land dedication is separate from Park Systems Development Charges, and is not eligible for a credit of Park Systems Development Charges. The amount of the fee in lieu of land dedication (in dollars per acre) shall be set by City Council Resolution, and it shall be based on the typical market value of developed property (finished lots) in Sandy net of related development costs.

1. The following factors shall be used in the choice of whether to accept land or cash in lieu:

   a. The topography, geology, access to, parcel size, and location of land in the development available for dedication;

   b. Potential adverse/beneficial effects on environmentally sensitive areas;

   c. Compatibility with the Parks Master Plan, Public Facilities element of the Comprehensive Plan, and the City of Sandy Capital Improvements Program in effect at the time of dedication;

   d. Availability of previously acquired property; and

   e. The feasibility of dedication.

2. Cash in lieu of parkland dedication shall be paid prior to approval of the final plat or as specified below:

   a. 50 percent of the payment shall be paid prior to final plat approval, and

   b. The remaining 50 percent of the payment pro-rated equally among the lots, plus an administrative surcharge as determined by the City Council through a resolution, will constitute a lien against the property payable at the time of sale.

17.86.50 MINIMUM STANDARDS FOR OPEN SPACE DEDICATION

The applicant through a subdivision or design review process may propose the designation and protection of open space areas as part of that process. This open space will not, however, be counted toward the parkland dedication requirement of Sections 17.86.10 through 17.86.40.

1. The types of open space that may be provided are as follows:

   a. Natural Areas: areas of undisturbed vegetation, steep slopes, stream corridors, wetlands, wildlife habitat areas or areas replanted with native vegetation after construction.

   b. Greenways: linear green belts linking residential areas with other open space areas. These greenways may contain bicycle paths or footpaths. Connecting greenways between residences and recreational areas are encouraged.

2. A subdivision or design review application proposing designation of open space shall include the following information as part of this application:

   a. Designate the boundaries of all open space areas; and

   b. Specify the manner in which the open space shall be perpetuated, maintained, and administered; and

   c. Provide for public access to trails included in the Park Master Plan, including but not limited to the Tickle Creek Path.

3. Dedication of open space may occur concurrently with development of the project. At the discretion of the city, for development that will be phased, 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.

4. Open space areas shall be maintained so that the use and enjoyment thereof is not diminished or destroyed. Open space areas may be owned, preserved, and maintained by any of the following mechanisms or combinations thereof:

   a. Dedication to the City of Sandy or an appropriate public agency approved by the City, if there is a public agency willing to accept the dedication. Prior to acceptance of proposed open space, the City may require the developer to submit a Phase I Environmental Site Assessment 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.

   b. Common ownership by a homeowner's association that assumes full responsibility for its maintenance;

   c. Dedication of development rights to an appropriate public agency with ownership remaining with the developer or homeowner's association. Maintenance responsibility will remain with the property owner; and/or

   d. Deed-restricted private ownership preventing development and/or subsequent subdivision and providing for maintenance responsibilities.

5. In the event that any private owner of 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.

CHAPTER 17.92 - LANDSCAPING & SCREENING
GENERAL STANDARDS - ALL ZONES

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 clause as the guiding principle.

17.92.10 GENERAL PROVISIONS

A. Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications. 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 6 months.

C. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-½ ft. 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 be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline.

D. Planter and boundary areas used for required plantings shall have a minimum diameter of 5-ft. (2-½ ft. 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 7-½ ft.

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 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.

G. Required 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.

K. All areas not occupied by paved roadways, walkways, patios, or buildings shall be landscaped.

L. All landscaping shall be continually maintained, including necessary watering, weeding, pruning and replacing.

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%

17.92.30 REQUIRED TREE PLANTINGS

Planting of trees is required for all parking lots with 4 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 should be made from the city-approved list. Alternate selections may be approved by the Director following written request. The type of tree used shall determine frequency of trees in planting areas. Trees in parking areas shall be dispersed throughout the lot to provide a canopy for shade and visual relief.

Area/Type of Planting	Canopy	Spacing
Street Tree	Medium	30 ft. on center
Street Tree	Large	50 ft. on center
Parking Lot Tree	Medium	1 per 8 cars
Parking Lot Tree	Large	1 per 12 cars

Trees may not be planted:

- Within 5 ft. of permanent hard surface paving or walkways, unless specific species, special planting techniques and specifications approved by the Director are used.
- Unless approved otherwise by the City Engineer:
  - Within 10 ft. of fire hydrants and utility poles
  - Within 20 ft. of street light standards
  - Within 5 ft. from an existing curb face
  - Within 10 ft. of a public sanitary sewer, storm drainage or water line
- Where the Director determines the trees may be a hazard to the public interest or general welfare.
- Trees shall be pruned to provide a minimum clearance of 8 ft. above sidewalks and 12 ft. above street and roadway surfaces.

17.92.40 IRRIGATION

Landscaping shall be irrigated, either with a manual or automatic system, to sustain viable plant life.

17.92.50 TYPES AND SIZES OF PLANT MATERIALS

A. At least 75% of the required landscaping area shall be planted with a suitable combination of trees, shrubs, or evergreen ground cover except as otherwise authorized by Chapter 17.92.10 F.

B. Plant Materials. Use of native plant materials or plants acclimatized to the Pacific Northwest is encouraged where possible.

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 5 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 7 feet in overall height or 1 ½ inches in caliper measured 6 inches above the ground, 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 1 gallon in size or 2 feet in height when measured 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 2 years after planting.

H. Vines for screening purposes shall be a minimum of 1 gallon in size or 30 inches in height 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.

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, decorative hard paving and gravel areas, interspersed with planted areas. The exposed area developed with such features shall not exceed 25% of the required landscaped area. Artificial plants are prohibited in any required landscape area.

17.92.60 REVEGETATION IN UNLANDSCAPED OR NATURAL LANDSCAPED AREAS

A. Areas where natural 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 plants acclimatized to the Pacific Northwest is encouraged to reduce irrigation and maintenance demands.

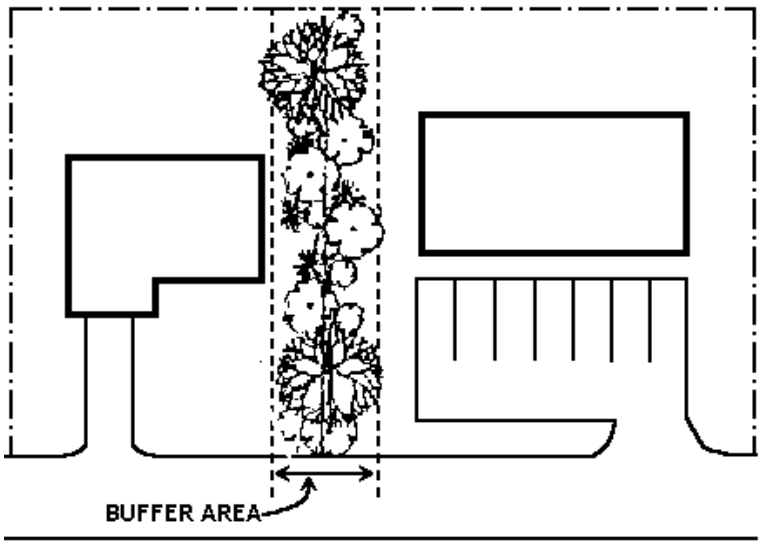
17.92.70 LANDSCAPING BETWEEN PUBLIC RIGHT-OF-WAY AND PROPERTY LINES

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 within the street right-of-way shall not count as part of the lot area percentage to be landscaped.

17.92.80 BUFFER PLANTING - PARKING, LOADING AND MANUEVERING AREAS

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. Where required, a mix of plant materials shall be used to achieve the desired buffering effect.

Buffering is required in conjunction with issuance of construction permits for parking areas containing 4 or more spaces, loading areas, and vehicle maneuvering areas. 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. A balance of low-lying ground cover and shrubs, and vertical shrubs and trees shall be used to buffer the view of these facilities. Decorative walls 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 are exempt from parking bay buffer planting requirements.



17.92.90 SCREENING (HEDGES, FENCES, WALLS, BERMS)

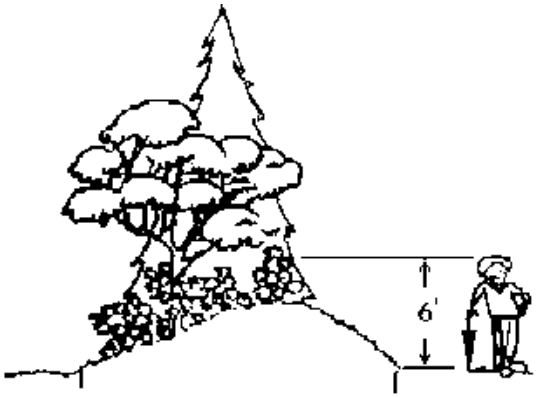
Screening is uses where unsightly views or visual conflicts must be obscured or blocked and where privacy and security are desired. Fences and walls used for screening may be constructed of wood, concrete, stone, brick, and wrought iron, or other commonly used fencing/wall materials. Acoustically designed fences and walls are also used where noise pollution requires mitigation.

A. Height and Opacity. Where landscaping is used for required screening, it shall be at least 6 ft. in height and at least 80 percent opaque, as seen from a perpendicular line of sight, within 2 years following establishment of the primary use of the site.

B. Chain Link Fencing. A chain link fence with slats shall qualify for screening only if a landscape buffer is also provided in compliance with Section 17.92.00 above.

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.

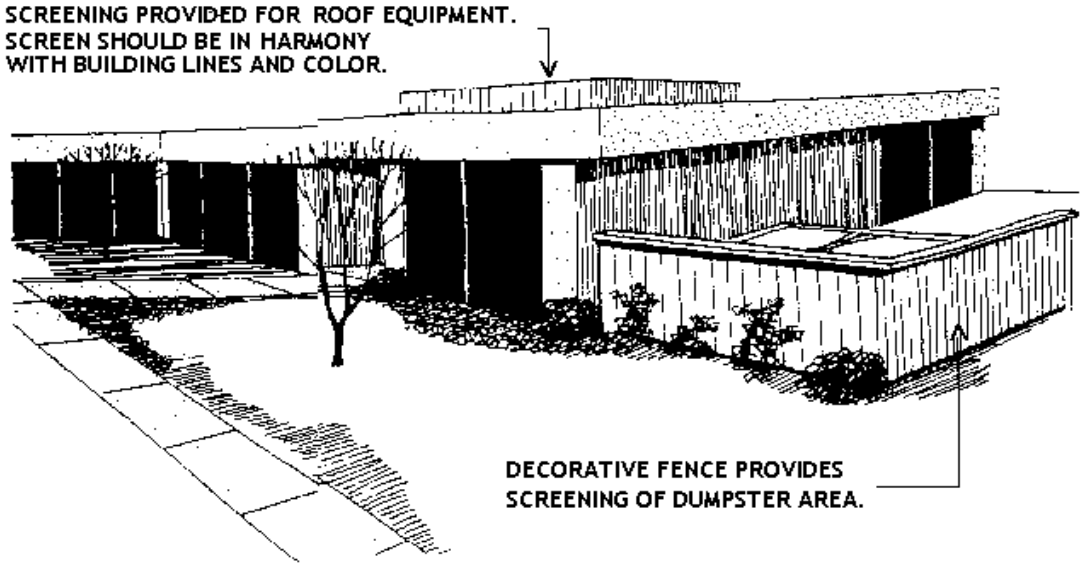
D. Berms. Earthen berms up to 6 ft. in height may be used to comply with screening requirements. Slope of berms may not exceed 2:1 and both faces of the slope shall be planted with ground cover, shrubs, and trees.



A. Long expanses of fences and walls shall be designed to prevent visual monotony through use of offsets, changes of materials and textures, or landscaping.

17.92.100 SCREENING OF SERVICE FACILITIES

Site-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.



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 fence, vegetative materials, or other alternative deemed appropriate by the Director. Exceptions to the preceding requirements include: new or used cars, cycles 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.

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 6 months may be applied for by posting "security" equal to 120% of the cost of the landscaping, assuring installation within 6 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 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% 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.

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 two years. This guarantee shall insure that all plant materials survive in good condition and shall guarantee replacement of dead or dying plant materials.

CHAPTER 17.98 - PARKING, LOADING, & ACCESS REQUIREMENTS

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.

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 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 a planned development 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 requires no more than four (4) 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.

I. Truck Parking. In all residential zoning districts, no overnight parking of trucks or other equipment on wheels or tracks exceeding a 1-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 planned developments, 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 (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. Except where permitted by 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 10 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.
   2. Multi-family dwelling units with more than 10 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.

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.

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 1 seat.
4. Except as otherwise specified, parking for employees shall be provided based on 1 space per 2 employees for the largest shift in addition to required parking specified in Sections 8 – 11 below.
5. Where less than 5 parking spaces are required, then only one bicycle space shall be required except as otherwise modified in Sections 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. Uses 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	2 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

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;	1 per 4 fixed seats or 1 space per 4 participants based on projected	5% or 2 whichever is greater

Theater or similar use	participant capacity, plus 1 per 2 employees	
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

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 10 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. Required parking spaces may be reduced at a ratio of 1 parking space for each 100 square feet of transit amenity space provided above and beyond the minimum requirements.
   3. Uses, 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.

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.

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 5 feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this code.

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.

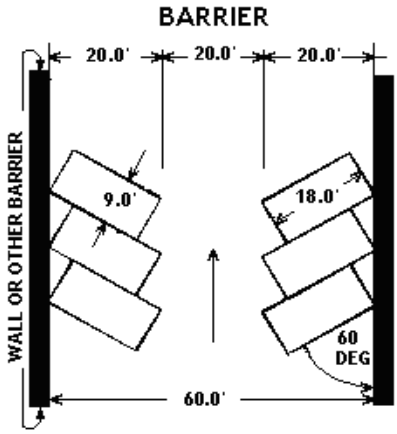
A. Parking Lot Design. All areas for required parking and maneuvering of vehicles shall have a durable hard surface such as concrete or asphalt.

B. Size of Space.
   1. A standard parking space shall be 9 feet by 18 feet.
   2. A compact parking space shall be 8 feet by 16 feet.
   3. Accessible parking spaces shall be 9 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.

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



17.98.70 ON-SITE CIRCULATION

A. Groups of more than three (3) 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 3 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.

17.98.80 ACCESS TO ARTERIAL AND COLLECTOR STREETS

A. Location and design of all accesses to and/or from arterials and collectors (as designated in the Transportation System Plan) are subject to review and approval by the City Engineer. Where practical, access from a lower functional order street may be required. Accesses to

arterials or collectors shall be located a minimum of 150 ft. from any other access or street intersection. Exceptions may be granted 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.

B. No development site shall be allowed more than one access point to any arterial or collector street (as designated in the Transportation System Plan) except as approved by the City Engineer. 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.

C. When developed property is to be expanded or altered in a manner that significantly affects on-site parking or circulation, 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.

17.98.90 ACCESS TO UNIMPROVED STREETS

Access to Unimproved Streets. At the Director's discretion development may occur without access to a City standard street when that development constitutes infill on an existing substandard public street. 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:

- Land partitions
- Conditional uses
- Building permits for new non-residential construction or structural additions to non-residential structures (except accessory development)
- Building permits for new residential units

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 shall have a minimum width of 10 feet. The driveway approach 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 driveway approaches may be required for adjacent lots in cul-de-sacs in order to maximize room for street trees and minimize conflicts with utility facilities (power and telecom pedestals, fire hydrants, streetlights, meter boxes, etc.)

C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. The driveway approach in the public right-of-way shall not exceed 24 feet in width as measured in section B above. A driveway approach shall be constructed in accordance with applicable city standards and the entire driveway shall be paved with asphalt or concrete.

D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width, but such clearance may be reduced in parking structures as approved by the Director.

E. 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.

F. 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.

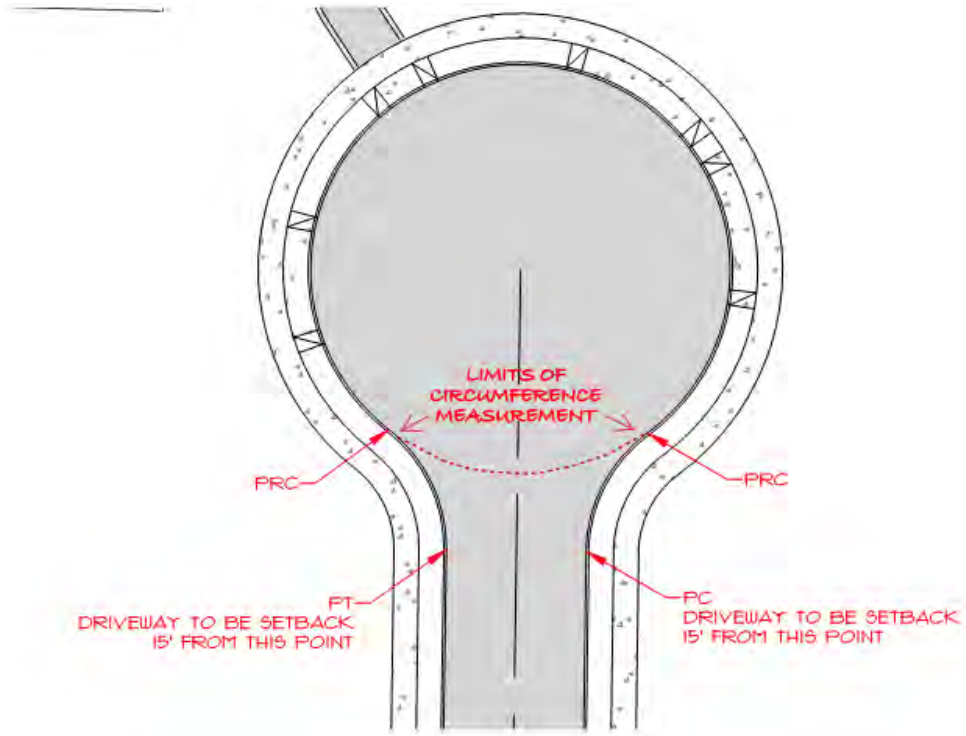
G. The sum of the width of all driveway approaches within the bulb of a cul-de-sac as measured in section B above shall not exceed fifty percent of the circumference of the cul-de-sac bulb. The cul-de-sac bulb circumference shall be measured at the curb line and shall not include the width of the stem 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

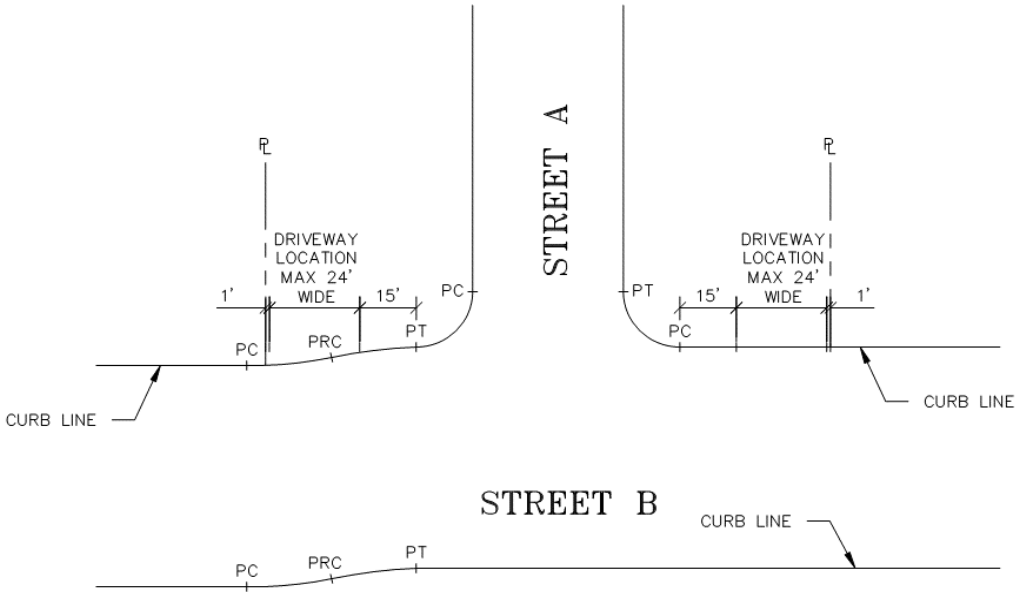
H. The location and design of any driveway approach shall provide for unobstructed sight per the vision clearance requirements in section 17.74.30. Requests for exceptions to these requirements will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.

I. Driveways shall taper to match the driveway approach width to prevent stormwater sheet flow from traversing sidewalks.

CUL-DE-SAC EXHIBIT



DRIVEWAY LOCATION EXHIBIT



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 and taking 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.

17.98.120 LANDSCAPING AND SCREENING

A. Screening of all parking areas containing 4 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 5 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 2 and 8 feet above the average ground level shall be required. The screening shall be composed of materials that are an adequate size so as to achieve the required degree of screening within 3 years after installation.

C. Except for a residential development which has landscaped yards, parking facilities shall include landscaping to cover not less than 10 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 5 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 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 5 feet for pedestrian circulation is required.

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. 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.

17.98.140 DRAINAGE

Parking areas, aisles and turnarounds shall have adequate provisions made 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.

17.98.150 LIGHTING

The Dark Sky Ordinance in Chapter 15 of the municipal code applies to all lighting. Artificial lighting shall be provided in all required off-street parking areas. 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.

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 entrance of the primary structure.
   2. Bicycle parking areas shall be visible from building interiors where possible.
   3. For facilities with multiple buildings or parking lots, bicycle parking shall be located in areas of greatest use and convenience to bicyclists.
   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 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 2 ½ feet by 6 feet. If bicycle parking is covered, vertical clearance of 7 feet shall be provided.
   2. An access aisle of at least 5 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. Racks requiring user-supplied locks shall accommodate both cable and U-shaped locks.
   3. Bicycle racks shall be securely anchored to the ground or a structure and shall be designed to hold bicycles securely.
   4. All outdoor bicycle parking facilities shall provide adequate shelter from precipitation where possible.

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.

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 10 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.

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.

17.98.190 OFF-STREET LOADING FACILITIES

B. 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.

C. The required loading berth shall be not less than 10 feet in width by 35 feet in length and shall have an unobstructed height clearance of 14 feet.

D. 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.

E. 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.

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 planned developments, subdivisions and partitions shall provide one (1) on-street parking space within 300 feet of each dwelling except as provided in Section 17.98.200(A)(6) below. The 300 feet shall be measured from the primary entrance of the dwelling.

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 10 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 (10) 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 (2) parking spaces;
   b. Parking spaces within a parking court shall be nine (9) 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 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 (2) 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 (2) parking courts shall be provided within a block, with only one (1) 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 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;

i. A parking court shall be used solely for the parking of operable passenger vehicles.

CHAPTER 17.100
LAND DIVISION

17.100.00 INTENT

The intent of this chapter is to implement the Comprehensive Plan, to provide procedures, regulations, and design standards for land divisions and associated improvements and to provide for orderly and efficient land division patterns supported by a connected system of streets, 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, setbacks, and building height are established in applicable zoning district regulations.

This chapter presents the review procedures, design standards and improvement requirements for land divisions. Procedures for replats and property line adjustments are also addressed in this chapter.

17.100.10 GENERAL PROVISIONS

A. No land shall be divided prior to approval of a minor partition, major partition or subdivision in accordance with this 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, yard or setback requirements of the zoning district.

C. Land division is processed by approval of a tentative plan prior to approval of the final land division plat or map. Where a Type II or Type III procedure is required for land division approval, that procedure shall apply to the tentative plan approval. As long as there is compliance with the approved tentative plat and conditions, the Director shall have the authority to approve final plats and maps for land divisions through a Type I procedure.

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 Development Code and this chapter.

B. Type I Land Division (Minor Partition). A minor 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 major partition or subdivision shall be a Type II procedure when a street is extended, satisfactory street conditions exist and the resulting parcels/lots comply with the standards of the zoning district and this chapter. Satisfactory street conditions exist when the Director determines one of the following:

1. Existing streets are stubbed to the property boundaries and are linked by the land division.
2. An existing street or a new proposed street need not continue beyond the land division in order to complete an appropriate street system or to provide access to adjacent property.
3. The proposed street layout is consistent with a street pattern adopted as part of the Comprehensive Plan or an officially adopted City street plan.

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, when 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 (6) lots.

E. Type III Land Division (Major Partition or Subdivision). A major partition or subdivision shall be a Type III procedure if unsatisfactory street conditions exist or the resulting parcels/lots do not comply with the standards of the zoning district and this chapter. The Director shall determine if unsatisfactory street conditions exist based on one of the following criteria:
1. The land division does not link streets that are stubbed to the boundaries of the property.
2. An existing street or a new proposed street will be extended beyond the boundaries of the land division to complete a street system or provide access to adjacent property.
3. The proposed street layout is inconsistent with a street pattern adopted as part of the Comprehensive Plan or an officially adopted City street plan.

F. Type III Land Division (Major Replat). A major replat involves the realignment of property lines involving more than six lots, even if the subdivision 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.

17.100.30 PROPERTY LINE ADJUSTMENT

Approval of a property line adjustment is required to move a common boundary between two parcels or lots. A Type I property line adjustment is not considered a development action for purposes of determining whether floodplain, greenway, or right-of-way dedication or improvements are required.

A. Application Requirements. Property line adjustment applications shall be made on forms provided by the City and shall be accompanied by:
1. Two (2) copies of the property line adjustment map;
2. The required fee;
3. Any data or narrative necessary to explain the application.

B. Map Information. The property line adjustment map and narrative shall include the following:
1. The names, addresses and phone numbers of the owner(s) of the subject parcels and authorized representative;
2. Scale of the drawing using an engineer's scale;
3. North arrow and date;

4. Legal description of the property;
5. Dimensions and size of the parcels involved in the property line adjustment;
6. Approximate locations of structures, utilities, rights-of-way and easements;
7. Points of access, existing and proposed;
8. Any natural features such as waterways, drainage area, significant vegetation or rock outcroppings;
9. Approximate topography, particularly noting any area of steep slope.

C. 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 proposed future streets will not be adversely affected by the property line adjustment.

D. Final Approval. Three paper copies of the final map shall be submitted within one year 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.

17.100.40 MINOR AND MAJOR PARTITIONS

Approval of a partition is required for a land division of 3 or fewer parcels in a calendar year. Partitions, which do not require creation or extension of a street for access, is classified as a Type I minor partition. Partitions, which require creation or extension of a street for access, are classified as Type II, major partitions.

A. Preapplication Conference. The applicant for a minor or major partition 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 applications shall be made on forms provided by the planning department and shall be accompanied by:
1. Eight copies of the tentative plan for the minor or major partition;
2. The required fee;
3. Any data or narrative necessary to explain the application;
4. List of affected property owners.

C. Tentative Partition Plan. The tentative plan shall be a minimum of 8 1/2 x 11 inches in size and shall include the following information:
1. The date, north point, engineering scale, and legal description;
2. Name and address of the owner of record and of the person who prepared the partition plan;
3. Zoning, size and dimensions of the tract to be partitioned;
4. Size, dimensions and identification of proposed parcels (Parcel 1, Parcel 2, Parcel 3);
5. Approximate location of any structures on the tract to be partitioned, including setbacks to proposed parcel boundaries;

6. Location, names and widths of streets, sidewalks and bikeways within the tract to be partitioned and extending 400 feet beyond the tract boundaries;
7. Location, width and purpose of existing and proposed easements on the tract to be partitioned;
8. Location and size of sanitary sewer, water and stormwater drainage facilities proposed to serve the property to be partitioned;
9. Natural features such as waterways, drainage area, significant vegetation or rock outcroppings;
10. Approximate topography, particularly noting any area of steep slope;
11. 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 or major partition based on the classification procedure (Type I, II or III) and the following approval criteria:
1. The proposed partition is consistent with the density, setback and dimensional standards of the base zoning district.
2. The proposed partition is consistent with the design standards set forth in this chapter.
3. Adequate public facilities are available or can be provided to serve the proposed partition.
4. All proposed improvements meet City standards.
5. Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.
6. The plan preserves the potential for future redivision of the parcels, if applicable.

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 as deemed necessary. In no event, however, shall the Director or Planning Commission require greater dedications or conditions than could be required if the entire tract were subdivided.

F. Approval of Tentative Partition Plan. When a tentative partition plan 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. Approval Signatures for Final Partition Map. Following review and approval of a final partition map, 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 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 and two exact copies to the County Recorder's office. One recorded copy shall be returned to the City of Sandy immediately after recording is completed.

H. Effective Date for Final Partition Map Approval. The partition shall become final upon recording of the approved partition map together with any required documents with the County Recorder. Work specifically authorized following tentative approval may take place

prior to processing of the final partition map. The documents effectuating a partition shall become null and void if not recorded with the County Recorder within one year following approval.

I. Improvements. The same improvements shall be installed to serve each parcel of a partition as required of a subdivision. Improvement standards are set forth in Section 17.90. If the Director and City Engineer find a need to vary the improvement standards for a partition, the application shall be processed through a Type III hearing and may exempt specific improvements.

J. Exceptions to Improvements. Exceptions to improvements may be approved in transition areas or other areas as deemed appropriate by the City. In lieu of excepting an improvement, the Planning Commission may recommend to the City Council that the improvement be installed in the area under special assessment financing or other facility extension policies of the City.

17.100.50 NONRESIDENTIAL PARTITIONS OR SUBDIVISIONS

This section includes special provisions for partitions or subdivisions of land that is zoned for commercial or industrial use.

A. Principles and Standards. In addition to the standards established for partitions or subdivisions, the applicant for a nonresidential partition or subdivision shall demonstrate that the street, parcel and block pattern proposed is adapted to uses in the vicinity. The following principles and standards shall be observed:
   1. Proposed commercial and industrial parcels shall be suitable in area and dimensions to the types of development anticipated.
   2. Street right-of-way and pavement shall be adequate to accommodate the type and volume of traffic anticipated.
   3. Special requirements may be imposed by the City with respect to street, curb, gutter and sidewalk design and construction.
   4. Special requirements may be imposed by the City with respect to the installation of public utilities, including but not limited to water, sanitary sewer, and stormwater drainage facilities.
   5. Efforts shall be made to protect adjacent residential areas from potential nuisance from a proposed commercial or industrial subdivision. Such efforts may include the provision of extra depth in parcels backing up on existing or potential residential development and landscaped buffers.
   6. Streets carrying nonresidential traffic, particularly truck traffic, should not normally be extended through adjacent residential areas.
   7. Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.

17.100.60 SUBDIVISIONS

Approval of a subdivision is required for a land division of 4 or more 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 procedures for approval, applicable state and local requirements, objectives and policies of the Sandy Comprehensive Plan, and the availability of services. The preapplication conference provides the opportunity to discuss the conceptual development of the property in advance of formal submission of the tentative plan in order to save the applicant unnecessary delay and cost.

B. Application Requirements for a Tentative Plat. Subdivision applications shall be made on forms provided by the planning department and shall be accompanied by:
   1. 20 copies of the tentative plat;
   2. Required fee and technical service deposit;
   3. 20 copies of all other supplementary material as may be required to indicate the general program and objectives of the subdivision;
   4. Preliminary title search;
   5. List of affected property owners.

C. Format. The Tentative Plat shall be drawn on a sheet 18 x 24 inches in size and at a scale of one inch equals one hundred 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 8 1/2 x 11, 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. A vicinity map, showing adjacent property boundaries and how proposed streets may be extended to connect to existing streets.
   4. Names, addresses, and telephone numbers of the owner(s) of the property, the engineer or surveyor, and the date of the survey.
   5. Streets: location, names, paved widths, alleys, and right-of-way (existing and proposed) on and within 400 feet of the boundaries of the subdivision tract.
   6. Easements: location, widths, purpose of all easements (existing and proposed) on or serving the tract.
   7. Utilities: location of stormwater drainage, sanitary sewers and water lines (existing and proposed) on and abutting the tract. If utilities are not on or abutting the tract, indicate the direction and distance to the nearest locations.
   8. Ground elevations shown by contour lines at two-foot vertical intervals for ground slopes of less than 10 percent and at ten-foot vertical intervals for ground slopes exceeding 10 percent. Ground elevation shall be related to an established benchmark or other datum approved by the Director.
   9. Natural features such as marshes, rock outcroppings, watercourses on and abutting the property, and location of wooded areas.
   10. Approximate location of areas subject to periodic inundation or storm sewer overflow, location of any floodplain or flood hazard district.
   11. Location, width, and direction of flow of all water courses.
   12. Identification of the top of bank and boundary of mandatory setback for any stream or water course.
   13. Identification of any associated wetland and boundary of mandatory setback.
   14. Identification of any wetland and boundary of mandatory setback.

15. Location of at least one temporary bench mark within the tract boundaries.
16. Existing uses of the property, including location and present use of all existing structures to remain on the property after platting.
17. Lots and Blocks: approximate dimensions of all lots, minimum lot sizes, and proposed lot and block numbers.
18. Existing zoning and proposed land use.
19. Designation of land intended to be dedicated or reserved for public use, with the purpose, conditions, or limitations of such reservations clearly indicated.
20. Proposed development phases, if applicable.
21. Any other information determined necessary by the Director such as a soil report or other engineering study, traffic analysis, floodplain or wetland delineation, etc.

E. Approval Criteria. The Director or Planning Commission shall review the tentative plat for 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 is consistent with the density, setback and dimensional standards of the base zoning district, unless modified by a Planned Development approval.
2. The proposed subdivision is consistent with the design standards set forth in this chapter.
3. The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy.
4. Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.
5. Adequate public facilities are available or can be provided to serve the proposed subdivision.
6. All proposed improvements meet City standards.
7. The phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops.

F. Conditions. The Director or Planning Commission may require dedication of land and easements, and may specify such conditions or modifications of the tentative plat as deemed necessary.

G. Improvements. A detailed list of required improvements for the subdivision shall be set forth in the approval and conditions for the tentative plat.

H. Tentative Plat Expiration Date. The final plat shall be delivered to the Director for approval within two (2) 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 (1) 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. All information shown on the face of the plat shall be mathematically perfect.
   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 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, tenants and servants.
      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 tract.
      b) Sheets and drawings showing the following:
         1) 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.
         2) The computation of distances, angles and courses shown on the plat.
         3) Ties to existing monuments, proposed monuments, adjacent subdivisions, street corners and state highway stationing.
      c) A copy of any deed restrictions applicable to the subdivision.
      d) A copy of any dedication requiring separate documents.
      e) A list of all taxes and assessments on the tract which have become a lien on the tract.
      f) A certificate by the engineer that the subdivider has complied with the improvement requirements.

9. Certification by the City Engineer 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 subdivider of the changes or additions that must be made and shall afford the subdivider 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 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 subdivider 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.

17.100.70 LAND DIVISION DESIGN STANDARDS

All land divisions shall be in conformance with the requirements of the applicable base zoning district and this chapter, as well as with other applicable provisions of this Code. Modifications to these requirements may be accomplished through a Planned Development. The design standards in this section shall be used in conjunction with street design standards included in the City of Sandy Transportation System Plan and standards and construction specifications for public improvements as set forth in adopted Public Facilities Plans and the Sandy Municipal Code.

17.100.80 CHARACTER OF THE LAND

Land which the Director or the Planning Commission finds to be unsuitable for development due to flooding, improper drainage, steep slopes, rock formations, adverse earth formations or topography, utility easements, or other features which will reasonably be harmful to the safety, health, and general welfare of the present or future inhabitants of the partition or subdivision and the surrounding areas, shall not be developed unless adequate methods are formulated by the subdivider and approved by the Director or the Planning Commission to solve the problems created by the unsuitable land conditions.

17.100.90 ACCESS CONTROL GUIDELINES AND COORDINATION

A. Notice and coordination with ODOT required. The city will coordinate and notify ODOT regarding all proposals for new or modified public and private accesses on to Highways 26 and 211.

B. It is the city policy to, over time, reduce noncompliance with the Oregon Highway Plan Access Management Policy guidelines.

C. Reduction of compliance 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.

17.100.100 STREETS GENERALLY

No subdivision or partition shall be approved unless the development has frontage or approved access to an existing public street. In addition, all streets shall be graded and improved in conformance with the City's construction standards, approved by the City Engineer, in accordance with the construction plans.

A. Street Connectivity Principle. The pattern of streets established through land divisions should be connected 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 many streets so that key streets (particularly U.S. 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.:
1.

C. Topography and Arrangement. All streets shall be properly related to special traffic generators such as industries, business districts, schools, and shopping centers and to the pattern of existing and proposed land uses.

D. Street Spacing. Street layout shall generally use a rectangular grid pattern with modifications as appropriate to adapt to topography or natural conditions.

E. Future Street Plan. Future street plans are conceptual plans, street extensions and connections on acreage adjacent to land divisions. They assure access for future development and promote a logical, connected pattern of streets. It is in the interest of the city to promote a logical, connected pattern of streets. All applications for land divisions shall provide a future street plan that shows the pattern of existing and proposed future streets within the boundaries of the proposed land divisions, proposed connections to abutting properties, and extension of streets to adjacent parcels within a 400 foot radius of the study area where development may practically occur.

F. Connections. Except as permitted under Exemptions, all streets, alleys and pedestrian walkways shall connect to other streets within the development and to existing and planned streets outside the development and to undeveloped properties that have no future street plan. Streets shall terminate at other streets or at parks, schools or other public land within a neighborhood.

Local streets shall align and connect with other roads when crossing collectors and arterials per the criteria in Section 17.84.50K(5)(e).

Proposed streets or street extensions shall be located to provide direct access to existing or planned transit stops, and existing or planned neighborhood activity centers, such as schools, shopping areas and parks.

G. 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. Standards for street connections do not apply to freeways and other highways with full access control.
3. 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. Where compliance with the standards would result in unacceptable sight distances, an accessway may be approved in place of a street connection.

17.100.110 STREET STANDARDS AND CLASSIFICATION

Street standards are illustrated in the figures included at the end of this chapter. Functional definitions of each street type are described in the Transportation System Plan as summarized below.

A. Major arterials are designed to carry high volumes of through traffic, mixed with some unavoidable local traffic, through or around the city. Major arterials should generally be spaced at 1-mile intervals.

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. Minor arterials should generally be spaced at 1-mile intervals.

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% 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. Collector streets should generally be spaced at 1/2-mile intervals.

E. Local streets provide direct access to abutting property and connect to collector streets. Local streets shall be spaced no less than 8 and no more than 10 streets per mile, except as the city may otherwise approve through an adjustment or variance pursuant to Chapter 17.66. 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. Cul-de-sacs and dead end streets are discouraged. If deemed necessary, cul-de-sacs shall be as short as possible and shall not exceed 400 feet in length.

G. Public access lanes are designed to provide primary access to a limited number of dwellings when the construction of a local street is unnecessary.

H. Alleys are designed to provide access to multiple dwellings in areas where lot frontages are narrow and driveway spacing requirements cannot be met.

17.100.120 BLOCKS AND ACCESSWAYS

A. Blocks. Blocks shall have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.

B. Residential Blocks. Blocks fronting local streets shall not exceed 400 feet in length, unless topographic, natural resource, or other similar physical conditions justify longer blocks. Blocks may exceed 400 feet if approved as part of a Planned Development, Specific Area Plan, adjustment or variance.

C. Commercial Blocks. Blocks located in commercial districts shall not exceed 400 feet in length.

D. 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 10 feet within a 15-foot right-of-way or tract 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 or through greenway systems.

17.100.130 EASEMENTS

A minimum eight (8) foot public utility easement shall be required along property lines abutting a right-of-way for all lots within a partition or subdivision. Where a partition or subdivision is traversed by a watercourse, drainage way, channel or stream, the land division shall provide a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse, and such further width as determined needed for water quality and quantity protection.

17.100.140 PUBLIC ALLEYS

A. Public alleys shall have a minimum width of 20 feet. Structural section and surfacing shall conform to standards set by the City Engineer.

B. Existing alleys may remain unimproved until redevelopment occurs. When development occurs, each abutting lot 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 as provided in Section 17.100.140(D) below.

D. An alley with a minimum width of 28 feet may permit parallel parking on one side of the alley only.

17.100.150 RESIDENTIAL SHARED PRIVATE DRIVES

A shared private drive is intended to provide access to a maximum of two (2) dwelling units.

A. Criteria for Approval
Shared private drives may be approved by the Director when one or more of the following conditions exist:
1. Direct access to a local street is not possible due to physical aspects of the site including size, shape, or natural features.
2. The construction of a local street is determined to be unnecessary.

B. Design
1. A shared private drive constructed to city standards shall not serve more than two (2) dwelling units.
2. A shared access easement and maintenance agreement shall be established between the two units served by a shared private drive. The language of the easement and maintenance agreement shall be subject to approval by the Director. Such easements shall be recorded in the Deed Records of Clackamas County.
3. Public utility easements shall be provided where necessary in accordance with Section 17.100.130.
4. Shared private drives shall be fully improved with an all weather surface (e.g. concrete, asphalt, permeable pavers) in conformance with city standards. The pavement width shall be 20 feet.
5. Parking shall not be permitted along shared private drives at any time and shall be signed and identified accordingly.

17.100.160 PUBLIC ACCESS LANES

Public access lanes are designed to provide primary access to a limited number of dwellings where the construction of a local street is not necessary. Public access lanes are intended to serve a maximum of six (6) dwelling units.

A. Criteria for Approval
Public access lanes may be approved by the Director when certain conditions exist which make the construction of a standard local street unnecessary. Approval of public access lanes shall be based on one or more of the following:
1. Physical conditions such as natural features, unusual lot size, shape, or other unique features prevent the construction of a local street.

2. It is determined that construction of a local street is not necessary to facilitate orderly development of a future street system.
3. It is determined that there are no logical extensions of an existing local street to serve the site.

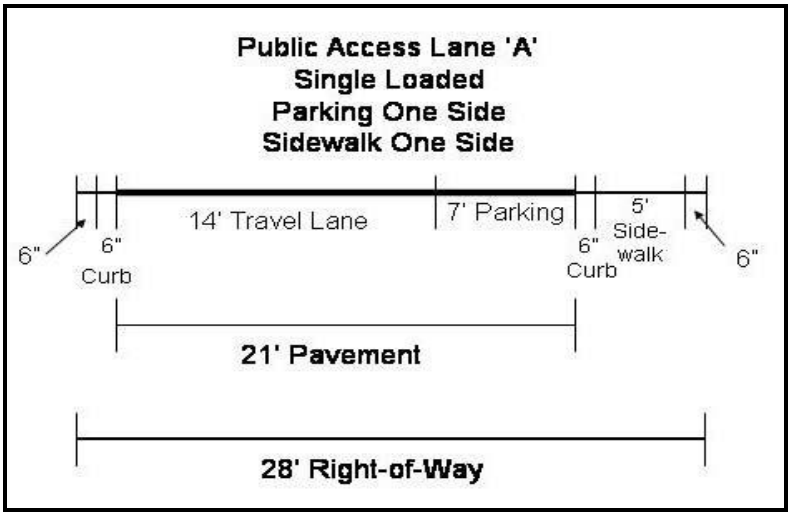
B. General Provisions

1. A public access lane may serve a maximum of six (6) dwelling units.
2. Public access lanes are subject to spacing requirements of Section 17.100.120.
3. Public utility easements shall be provided where necessary in accordance with Section 17.100.130.
4. If a public access lane is designed as a dead end, a turnaround shall be provided at the point where the lane terminates. The design of the turnaround shall be subject to approval by the Director and the Fire Department.
5. Parking shall be prohibited in public access lane turnarounds.
6. Street lighting may be required in public access lanes for traffic and pedestrian safety.

C. Public Access Lane Design

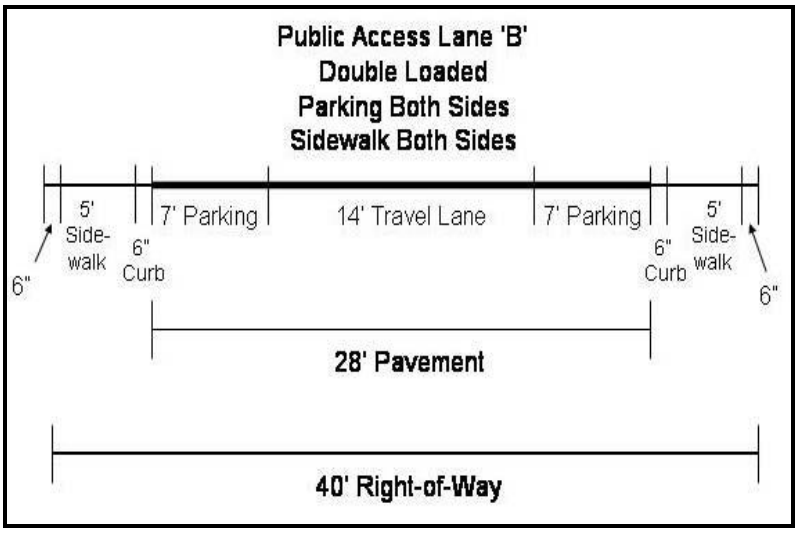
1. Public Access Lane 'A' (Figure 17.100 - A)
   a) Public access lane 'A' is designed to be single loaded and provide access to lots located on one side of the lane only.
   b) Public access lanes shall be constructed to city standards and must meet the required dimensions as specified in this section.
   c) Curbside sidewalks on the side of the lane which abuts lot frontage are along public access lanes to achieve specified dimensions.
   d) Planter strips are not required along public access lanes due to the minimal lots served. Lots abutting a public access lane are required to have street trees planted in accordance with Section 17.100.290.
   e) Parking is permitted on one side of a public access lane 'A' as shown in Figure 17.100 - A. Parking shall be permitted on the side of the lane that abuts lot frontages only. Signage shall be displayed to indicate the parking regulations along the lane and in the turnaround.

Figure 17.100 – A: Public Access Lane 'A'



2. Public Access Lane Option 'B' (Figure 17.100 - B).
   a) Public access lane 'B' is designed to be double loaded and provide access to lots located on both sides of the lane.
   b) Public access lanes shall be constructed to city standards and must meet the required dimensions as specified in this section.
   c) Curbside sidewalks are required along both sides of the access lane to achieve specified dimensions.
   d) Planter strips are not required along public access lanes due to the minimal lots served. Lots abutting a public access lane are required to have street trees planted in accordance with Section 17.100.290.
   e) Parking is permitted on both sides of a public access lane 'B' as shown in Figure 17.100 - B. Signage shall be displayed to indicate the parking regulations along the lane and in the turnaround.

Figure 17.100 – B: Public Access Lane 'B'



17.100.170 FLAG LOTS

Flag lots can be created where it can be shown that no other street access is possible to achieve the requested land division. The flag lot shall have a minimum street frontage of 15 feet for its accessway. The following dimensional 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) may not be counted toward the lot size requirements.

C. The accessway shall have a minimum paved width of 10 feet.

17.100.180 INTERSECTIONS

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.

17.100.190 STREET AND TRAFFIC CONTROL SIGNS

The City Engineer shall specify the type and location of traffic control signs, street signs and/or traffic safety devices.

17.100.200 STREET SURFACING

Public streets, including alleys, within the development shall be improved in accordance with the requirements of the City or the Oregon Standard Specifications. All streets shall be paved with asphaltic concrete or Portland cement concrete surfacing. Where required, speed humps shall be constructed in conformance with the City's standards and specifications.

17.100.210 STREET LIGHTING

A complete lighting system (including, but not limited to: conduits, wiring, bases, poles, arms, and fixtures) shall be the financial responsibility of the subdivider on all cul-de-sacs, local streets, and neighborhood collector streets. The subdivider will be responsible for providing the arterial street lighting system in those cases where the subdivider is required to improve or fronts on an arterial street. Standards and specifications for street lighting shall conform to IESNA roadway illumination standards and the City's streetlighting guidelines

17.100.220 LOT DESIGN

A. The lot arrangement shall be such that there will be no foreseeable difficulties, for reason of topography or other conditions, in securing building permits to build on all lots in compliance with the Development Code.

B. The lot dimensions shall comply with the minimum standards of the Development Code. When lots are more than double the minimum lot size required for the zoning district, the subdivider may be required to arrange such lots to allow further subdivision and the opening of future streets to serve such potential lots.

C. 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. A street frontage of not less than 15 feet is acceptable in the case of a flag lot division resulting from the division of an unusually deep land parcel that is of a size to warrant division into not more than two parcels.

D. Double frontage lots shall be avoided except where necessary to provide separation of residential developments from arterial streets or to overcome specific disadvantages of topography or orientation.

E. 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 necessary for several adjoining lots, the Director or the Planning Commission may require that such lots be served by a common access drive in order to limit traffic conflicts on such streets. Where possible, driveways shall be designed and arranged to avoid requiring vehicles to back into traffic on minor or major arterials.

17.100.230 WATER FACILITIES

Water lines and fire hydrants serving the subdivision or partition, and connecting the development to City mains, shall be installed to provide adequate water pressure to serve present and future consumer demand. 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 standards of the Fire District, the City, and the Oregon Health Authority Drinking Water Services section.

If the City requires the subdivider 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 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 subdivider setting forth methods for reimbursement for the proportionate share of the cost.

17.100.240 SANITARY SEWERS

Sanitary sewers shall be installed to serve the subdivision and to connect the subdivision to existing mains. Design of sanitary sewers shall take into account the capacity and grade to allow for desirable extension beyond the subdivision.

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.

17.100.250 SURFACE DRAINAGE AND STORM SEWER SYSTEM

A. Drainage facilities shall be provided within the subdivision and to connect with off-site drainage ways or storm sewers. Capacity, grade and materials shall be by a design approved by the city engineer. Design of drainage within the subdivision 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.

B. In addition to normal drainage design and construction, provisions shall be taken to handle any drainage from preexisting subsurface drain tile. It shall be the design engineer's duty to 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.

17.100.260 UNDERGROUND UTILITIES

All subdivisions or major partitions shall be required to install underground utilities (including, but not limited to, electrical, fiber, cable, and telephone wiring). The utilities shall be installed pursuant to the requirements of the utility company.

17.100.270 SIDEWALKS

Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision.

17.100.280 BICYCLE ROUTES

If appropriate to the extension of a system of bicycle routes, existing or planned, the Director or the Planning Commission may require the installation of bicycle lanes within streets. Separate bicycle access ways may be required to reduce walking or cycling distance when no feasible street connection is available.

17.100.290 STREET TREES

Where planting strips are provided in the public right-of-way, a master street tree plan shall be submitted and approved by the Director. The street tree plan shall provide street trees approximately every 30' on center for all lots.

17.100.300 EROSION CONTROL

Grass seed planting shall take place prior to September 30th 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 1000 square feet of land area.

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, except as otherwise provided in relation to oversizing.

A. Lot, street and perimeter monumentation
B. Mailbox delivery units
C. Sanitary sewers
D. Stormwater drainage facilities
E. Sidewalks
F. Street lights
G. Street name signs
H. Street trees
I. Streets
J. Traffic control devices and signs
K. Underground communication lines, including broadband (fiber), telephone, and cable. Franchise agreements will dictate whether telephone and cable lines are required.
L. Underground power lines
M. Water distribution lines and fire hydrants
N. Fiber (broadband)

17.100.320 IMPROVEMENT PROCEDURES

Improvements installed by a land divider 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.

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.

C. Improvements shall be constructed under the inspection and to the satisfaction of the City Engineer.

D. All improvements installed by the subdivider shall be guaranteed for a period of one (1) year following acceptance by the City Engineer. Such guarantee shall be secured by cash deposit in the amount of the value of the improvements as set by the City Engineer. Subdividers may elect to provide a subdivision maintenance bond equal to ten (10) percent of the value of the public improvements for a period of two (2) years following acceptance by the City.

E. As-constructed plans in both digital and hard copy formats shall be filed with the City Engineer upon completion of the improvements.

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 subdivision prior to recording the final subdivision plat. If this procedure is to be used, the subdivision plat shall contain all the required certifications except the County Surveyor. The City shall keep the 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 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 subdivision during a construction year and may limit the area of the final subdivision plat to the area to be improved. The performance bond described in section B above shall be required under the improvement district procedure. The formation of a Local Improvement District (LID) is entirely within the discretion of the City.

17.100.340 PERFORMANCE GUARANTEE

If the applicant chooses to utilize the opportunities provided under "A" or "B" 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;
   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. The amount of the letter of credit shall equal 110% of the value of the improvements to be guaranteed; or
   3. Provide bonds in a form approved by the City Attorney.

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 carry out provisions of the agreement 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 expense incurred, the applicant shall be liable to the City for the difference.

CHAPTER 17.102 - URBAN FORESTRY

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.

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 4½ 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 70 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.

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 city or public utility for the installation or maintenance or repair of roads, utilities, or other structures.

2. Tree removal 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.

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.
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.
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 and species of trees 11" DBH or greater to be retained.

   c. Location and type of tree protection measures to be installed.

2. A brief narrative describing the project.

3. Estimated starting and ending dates.

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 17.102.50 shall also contain a report from a certified arborist or professional forester 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.

b. 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 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:

a. A list of property owners on mailing labels within 300 feet of the subject property.

b. A written narrative addressing applicable code sections 17.102.50, 17.102.60, and 17.102.70.

17.102.40 PERMIT REVIEW

An application for a Type II or III tree removal permit shall demonstrate that the provisions of Chapter 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 & 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.

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.
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.
4. If possible, at least two of the required trees per acre must be of conifer species.
5. Trees within the required protected setback areas 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, 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. 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 10 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.

17.102.60 TREE REPLANTING REQUIREMENTS

1. All areas with exposed soils resulting from tree removal shall be replanted with a ground cover of native species within 30 days of harvest during the active growing season, or by June 1st of the following spring.
2. 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.
3. Removal of hazard trees as defined shall be replanted with two native trees of quality nursery stock for every tree removed.
4. Tree Removal allowed within the FSH Overlay District shall be replanted with two native trees of quality nursery stock for every tree removed.
5. Tree Removal not associated with a development plan must be replanted following the provisions of OAR Chapter 629, Division 610, Section 020-060

17.102.70 VARIANCES

Under a Type III review process, the Planning Commission may allow newly-planted trees to substitute for retained trees if:

1. 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
2. The substitution more nearly meets the intent of this ordinance due to:
   a. The location of the existing and proposed new trees, or
   b. The physical condition of the existing trees or their compatibility with the existing soil and climate conditions; or
   c. An undue hardship is caused by the requirement for retention of existing trees.
   d. Tree removal is necessary to protect a scenic view corridor.

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. Funds generated as a result of enforcement of this ordinance shall be dedicated to the Urban Forestry Fund established under Section 17.102.100 below.

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.

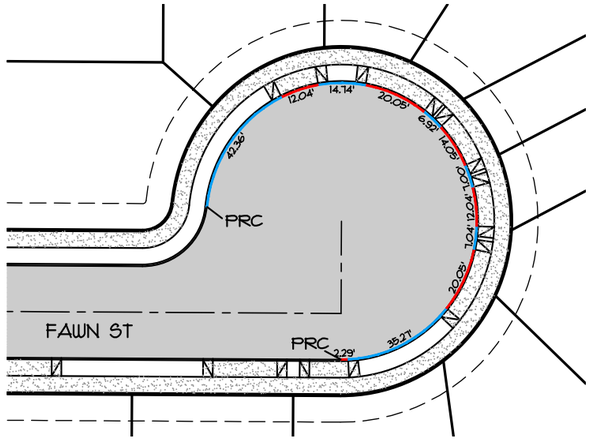
Division 630 - Harvesting. Forest harvesting operations, including but not limited to skidding and yarding practices, construction of landings, construction of drainage systems, treatment of waste materials, storage and removal of slash, yarding and stream crossings, shall not be permitted within protected setback areas. Otherwise, the provisions of Chapter 629, Division 630 shall apply.

17.102.100 URBAN FORESTRY FUND CREATED

In order to encourage planting of trees, the City will create a fund or account to be used for tree planting in rights-of-way, city parks, riparian areas, and other public property. The source of funds will be donations, grants, and any other funds the City Council may designate.

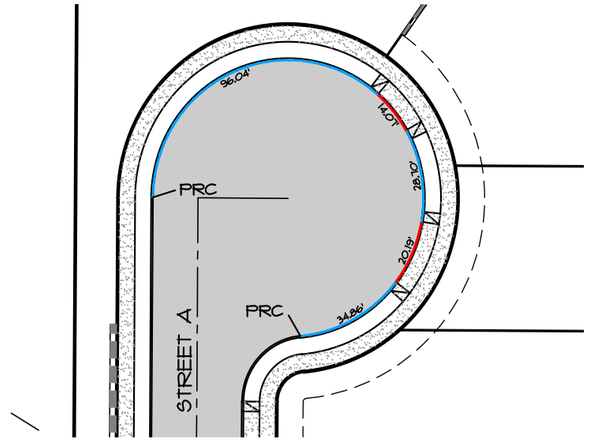
DEER MEADOW CUL-DE-SAC EXHIBIT

FAWN ST CUL-DE-SAC



TOTAL CIRCUMFERENCE FROM PRC TO PRC = 193.85'
TOTAL GAPS = 113.33' (58.5%)
TOTAL DRIVEWAY LENGTH = 80.52' (41.5%)
(41.5% IS LESS THAN 50%. MEETS CODE)

STREET A CUL-DE-SAC



TOTAL CIRCUMFERENCE FROM PRC TO PRC = 193.86'
TOTAL GAPS = 159.60' (82.3%)
TOTAL DRIVEWAY LENGTH = 34.26' (17.7%)
(17.7% IS LESS THAN 50%. MEETS CODE)

All County Surveyors Est. 1990

SCALE : 1" = 40'

0' 20' 40' 80'

REGISTERED PROFESSIONAL ENGINEER
49710
OREGON
JULY 21, 1998
RAY L. MOORE

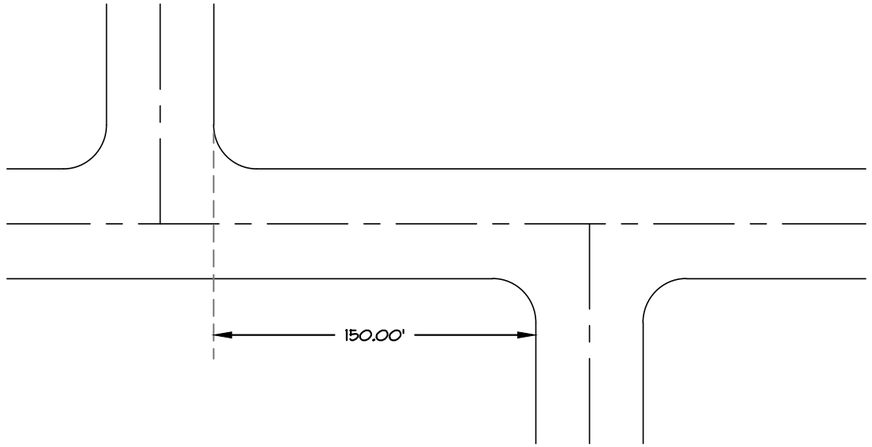
RENEWAL DATE: 12/31/2022

All County Surveyors & Planners, Inc.
Surveying, Planning
and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

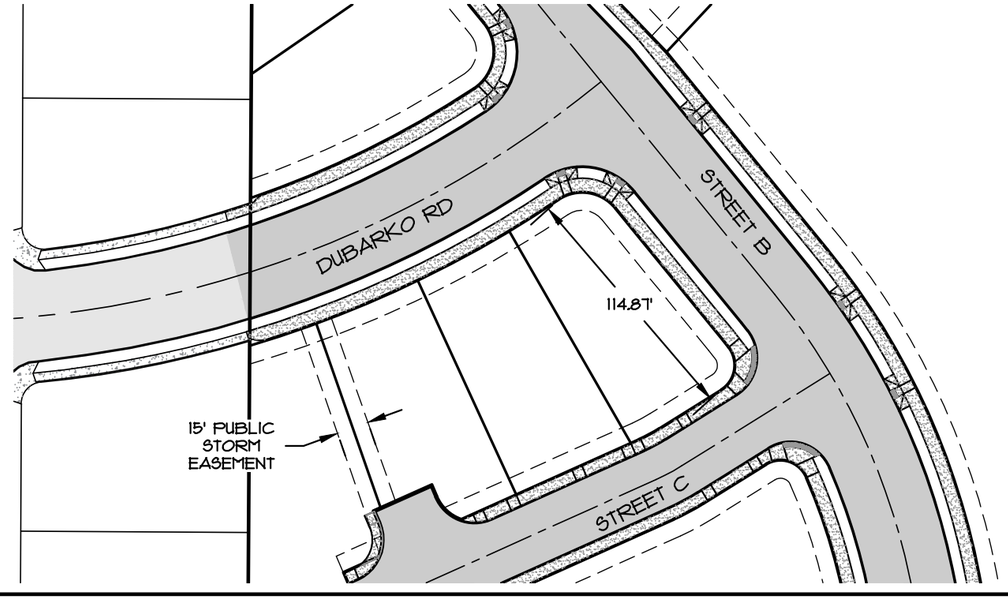
19-035-Planning-B.dwg
DATE OF PLOT: 09/21/2021

DEER MEADOW T-INTERSECTION EXHIBIT

EXAMPLE OF STAGGERED T-INTERSECTION



PROPOSED T-INTERSECTION
(NOT A STAGGERED T-INTERSECTION)



N
All County
Est. 1990
Surveyors
S

SCALE : 1" = 60'

0' 30' 60' 120'

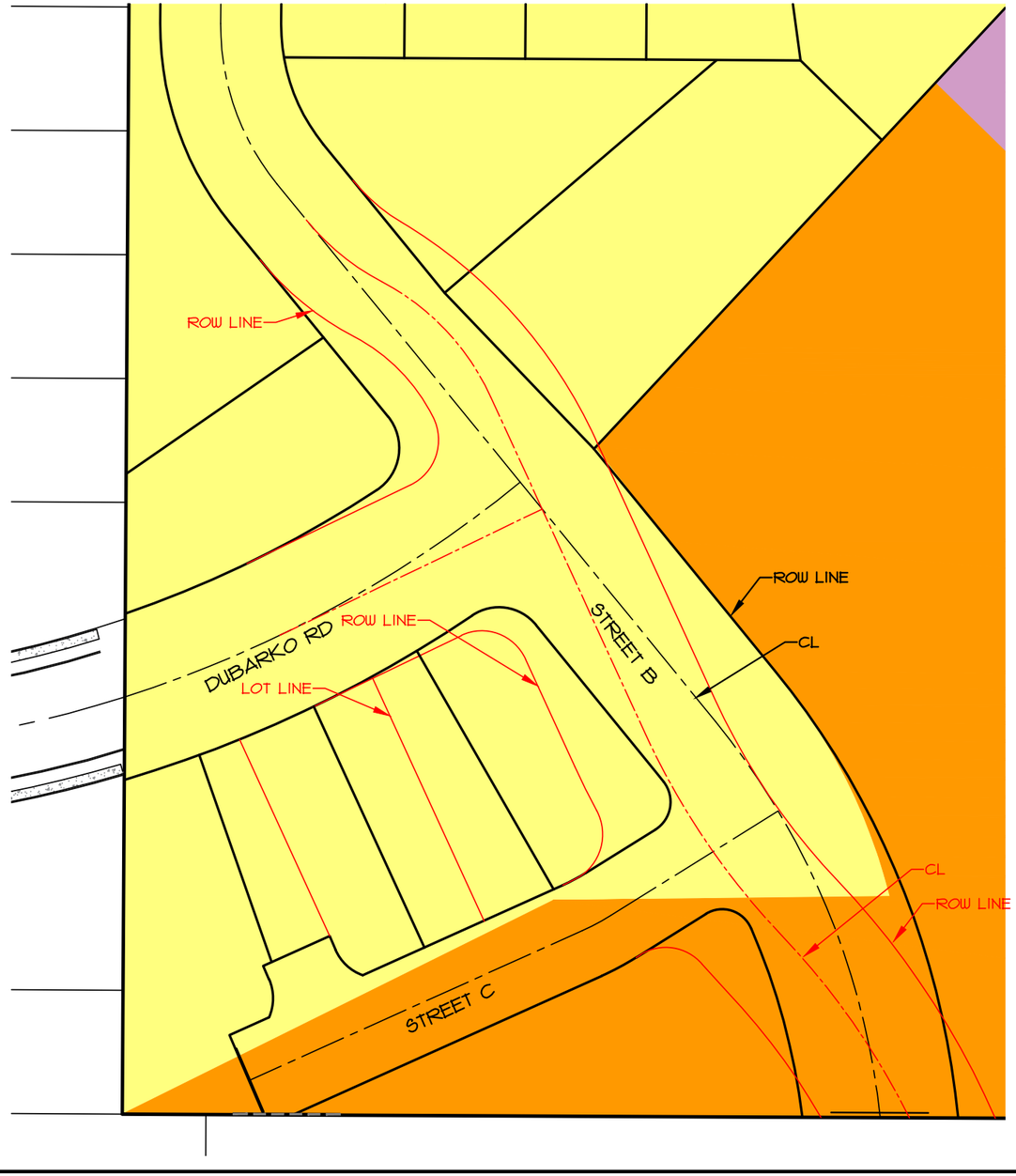
REGISTERED PROFESSIONAL ENGINEER
49710
OREGON
JULY 21, 1998
RAY L. MOORE

RENEWAL DATE: 12/31/2022

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

19-035-Planning-B.dwg
DATE OF PLOT: 09/21/2021

DUBARKO RD WITH 100' TANGENT EXHIBIT



NOTE: 100' TANGENTS CAN BE PROVIDED ON STREET B AND DUBARKO AS SHOWN. THE RESULTING ALIGNMENT WOULD MAKE LOT 32 LARGER, AND ELIMINATE ONE LOT FROM LOTS 27-30.

LEGEND

- R-1 ZONE
- R-2 ZONE
- C-3 ZONE

N All County Est. 1990 Surveyors S

SCALE : 1" = 50'

0' 25' 50' 100'

REGISTERED PROFESSIONAL ENGINEER 49710 OREGON JULY 21, 1998 RAY L. MOORE

RENEWAL DATE: 12/31/2022

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

19-035-Planning-B.dwg
DATE OF PLOT: 09/24/2021

All County Surveyors & Planners, Inc.
PO Box 955 • Sandy, Oregon 97055 • Phone: 503-668-3151 • Fax: 503-668-4730

September 16, 2021

City of Sandy
ATTN: Kelly O'Neill
39250 Pioneer Blvd.
Sandy, OR 97055

RE: Deer Meadow Subdivision City File No. 21-014 SUB/TREE
Our Job Number: 19-035

Dear Mr. O'Neill,

The purpose of this letter is to respond to the public and agency comments received to date for the Deer Meadow Subdivision.

In response to the Sandy Fire District comments from Gary Boyles, dated August 10, 2021:

These are the typical, boiler-plate comments provided during initial review of new development. The applicant intends to meet the requirements of the current Oregon Fire Code, which will satisfy the provided comments. All County will work with the fire department to determine hydrant locations, and locate turnarounds onsite, as needed, at the time of final engineering.

In response to the comments from Gary Roche, dated August 16, 2021:

The proposed subdivision is being processed as a "needed housing" development. The applicant will adhere to those applicable development code sections deemed to be clear and objective. A traffic study was conducted for the proposed subdivision which demonstrates the existing facilities can accommodate the additional proposed lots. Refer to submitted transportation report, as well as response letter from transportation consultant.

In response to the comments from Dave and Nancy Allan, dated August 23, 2021:

The proposed subdivision is being processed as a "needed housing" development. The applicant will adhere to those applicable development code sections deemed to be clear and objective. A traffic study was conducted for the proposed subdivision which demonstrates the existing facilities can accommodate the additional proposed lots. Refer to submitted transportation report, as well as response letter from transportation consultant.

Affiliated: Professional Land Surveys of Oregon • American Congress of Surveying and Mapping

In response to the comments from Ashley Yukich, dated August 23, 2021:

The proposed subdivision is being processed as a "needed housing" development. The applicant will adhere to those applicable development code sections deemed to be clear and objective. The applicant is meeting the approval criteria for tree retention. No park is proposed with the development as legal counsel has advised the applicant that none is needed under the clear and objective development standards process. A traffic study was conducted for the proposed subdivision which demonstrates the existing facilities can accommodate the additional proposed lots. Refer to submitted transportation report, as well as response letter from transportation consultant. Multifamily dwellings are allowed uses within the R-2 and C-3 zones. The applicant will adhere to the density requirements of the applicable code sections for these zones.

In response to the Sandy Transit comments from Andi Howell, dated August 26, 2021:

The proposed subdivision is being processed as a "needed housing" development. The applicant will adhere to those applicable development code sections deemed to be clear and objective. It is the belief of legal counsel that the TSP is not incorporated into the Sandy Development Code (SDC) in an adequate fashion to require the extension of Dubarko Road to Highway 26. As such, no connection to Highway 26 is proposed with this application. The applicant will provide the requested transit amenities. All County will work with city staff to finalize the locations of said amenities, at the time of final engineering.

In response to the Parks and Trails Advisory Board comments from Sarah Richardson, dated August 30, 2021:

The proposed subdivision is being processed as a "needed housing" development. The applicant will adhere to those applicable development code sections deemed to be clear and objective. It is the belief of legal counsel that the Parks and Trails Master Plan is not incorporated into the Sandy Development Code in an adequate fashion to require the dedication of the parkland. The applicant instead seeks to pay the parkland dedication fee-in-lieu-of option pursuant to SDC section 17.86.40.

In response to the Sandy Public Works comments from Mike Walker, dated August 31, 2021:

The proposed subdivision is being processed as a "needed housing" development. The applicant will adhere to those applicable development code sections deemed to be clear and objective. It is the belief of legal counsel that the spacing requirements of sections 17.84.50 and 17.98.80 are not clear and objective, and are therefore not being met with the proposed application. The proposed driveway layout of the cul-de-sacs meet the requirements of section 17.98.100. Additional grading/dimensional exhibits can be provided at the time of final engineering to demonstrate compliance with this section. Legal counsel believes the connection to Highway 26 and the frontage improvements along Highway 26 are not clear and objective, and as such are not being provided with this application.

The applicant will adjust the width of the proposed utility easements between lots 27 & 28, and along lots 9-13 to adhere to the requirements in 17.84.90. A minimum width of 15' will be provided with the final plat for the proposed development. The applicant understands the requirements for the existing water main/s onsite. Utilities will be provided with the subdivision pursuant to all clear and objective Sandy Development Code requirements.

In response to the ODOT comments, dated September 1, 2021:

The proposed subdivision is being processed as a "needed housing" development. The applicant will adhere to those applicable development code sections deemed to be clear and objective. It is the belief of legal counsel that the frontage improvements along Highway 26 and the connection of Dubarko Road to Highway 26 are not clear and objective and are therefore not being proposed with this development. Refer to letter from transportation consultant as well.

In response to the comments from Marilyn Euteneier, dated September 8, 2021:

The proposed subdivision is being processed as a "needed housing" development. The applicant will adhere to those applicable development code sections deemed to be clear and objective. The existing zoning for the site is not changing with the proposed application and will be developed with the allowed uses and densities pursuant to all applicable clear and objective standards in the SDC.

If you have any questions or need additional information, please feel free to contact our office.

Sincerely,

All County Surveyors & Planners, Inc.

Tyler Henderson, PE
Engineering Division

EXHIBIT AA

MINUTES
Parks & Trails Advisory Board Meeting
Wednesday, August 11, 2021 Virtual Via Zoom 7:00 PM

BOARD MEMBERS PRESENT: Don Robertson, Board Member, Will Toogood, Board Member, and Mary Casey, Board Member

BOARD MEMBERS ABSENT: David Breames, Board Member and Sarah Schrodetz, Board Member

STAFF PRESENT: Sarah Richardson, Community Services

MEDIA PRESENT:

1. Meeting Format

Meeting Format Notice:

The Parks and Trails Advisory Board will conduct this meeting electronically using the Zoom video conference platform.
Members of the public may listen, view, and/or participate in this meeting using Zoom.
Using Zoom is free of charge. See the instructions below:

- To login to the electronic meeting online using your computer, click this link:
- **Note a passcode may be required:**
- If you would rather access the meeting via telephone, dial 1-669-900-6833. When prompted, enter the following meeting number: 844 3378 6198
- If you do not have access to a computer or telephone and would like to take part in the meeting, please contact the Sandy Community Center (503-668-5569) by August 10th and arrangements will be made to facilitate your participation.

2. Roll Call

3. Public Comment

4. Consent Agenda

4.1. Meeting Minutes

Moved by Mary Casey, seconded by Will Toogood

Motion to approve the minutes.

CARRIED. 3-0

5. Changes to the Agenda

6. New Business

6.1. Bell St. - 362nd Extension Project

Mike Walker, Public Works Director attended to discuss required mitigation related to the Bell St. -362nd Extension Project. Seeking feedback from the Parks Board regarding some options in city owned open space near Bluff Park.

Mike provided an overview of the extension project and introduced Ivy Watson an environmental scientist with Harper Hauf. Ivy presented two options for the board's consideration.

Ivy explained that there will be some wetland and stream impact that is less than a 10th of an acre, although that could change depending on the design. The city will be required to provide mitigation matching the type of impact. The ratio of mitigation that the Oregon Department of State Lands requires varies depending on whether we will be enhancing an existing resource or creating a new resource.

Ivy provided an overview of the open space area that is being considered for mitigation and shared two options.

Option 1: Drain the in-line pond and convert the depression to scrub-shrub wetland and stream channel.

Option 2: Enhance existing stream and pond and create wetland at the pond fringe. Result would be water quality and habitat enhancement.

Board member Will Toogood asked about what the construction of the stream channel would look like in option one. Ivy described the plan and explained that the channel would move around naturally once the area was graded and other enhancements completed. Clarified that this would change the area to more of a marsh in the winter. Might be able to add an access point for wildlife and wetland habitat viewing. Will asked if either option was beneficial to migratory birds. Option 1 would provide less attractive habitat for migratory birds, and option 2 would provide more attractive habitat for migratory birds.

Mary Casey asked a question about pollinators and whether the plan could incorporate habitat to support them. Ivy noted that flowering wetland shrubs could be utilized. Mary expressed some concern about marshland attracting mosquitos etc. Wondered if this would be an issue. Ivy noted they are already likely breeding in the pond and that both options would likely attract more frogs. Identified Option 1 as likely best for native frogs. Clarified that marsh is not the best description of what will be the result of option 1.

Don Robertson asked if Option 2 would create any flow through the pond. Ivy noted that it would flow longer than it does now but once it drops below the outlet level it would slow. Don asked Mike Walker about stormwater. Mike provided an overview of the stormwater systems. Don noted the pond had been there for quite some time and Mike described its history. Don asked if Public Works had a preference. Mike identified Option 2 as a preference.

Public Works is interested in advice from the Parks Board and noted that it will be Council who makes the final decision. Mike noted these options will likely be acceptable to the regulatory agencies.
Important that this parcel is owned by the public and will remain so whereas other nearby areas will likely be developed.

Don asked if the board members had a preference. Mary noted both have good points with Option 2 being more migratory bird friendly. Don identified the path and some benches that are already there and good for viewing. Will noted he is torn between what may be better water quality vs better habitat for migratory birds and esthetically likes Option 2. Don said his personal preference would be Option 2. Likes that it maintains the historical use, viewing opportunities, and it really is an amenity for the park area.

Don asked that along with the motion that the feedback about habitat for birds and pollinators be included in information being forwarded to council.

Moved by Mary Casey, seconded by Will Toogood

Mary Casey moves that the board recommend Option 2.

CARRIED. 3-0

6.2. Deer Meadows Proposed Development

Kelly O'Neill, Development Services Director attended to provide an overview of the Deer Meadows proposed development.

Deer Meadows is a 32 lot proposed subdivision in the area of Hwy 26 and Dubarko road. Kelly provided a visual denoting the proposed development site. Deer Meadows is adjacent to parkland dedicated with the Deerpointe plat. It is undeveloped and is about 1.4 acres. One of the main reason this park has not been developed is because of the intended parkland dedication that would expand the area of the park that is part of the subject property. It is staff recommendation that dedication of this land would be consistent with the long term vision for this park, and align with the new Parks and Trails Master Plan that will be before council for adoption in September.

Kelly reviewed the formula for determining parkland dedication and what variables can impact the total dedication.

Tracy Brown, the developers representative. reviewed the previous application known as Bull Run Terrace. As part of the Bull Run proposal the developer proposed dedicating 1.4 acres of parkland and offered to assist with preparing the land for park development. Tracy noted that the board at that time recommended the parkland dedication and entering into an agreement with the developer to do the initial park improvements.

The Bull Run proposal included a request for a zone change. Tracy noted this proposal was recommended for approval by the Planning Commission but denied by council. As a result the developers proposal to dedicate the parkland and to assist with the park improvements went away. The new Deer Meadow proposal is not requesting a zone change. Without a change in the zoning and the ability to increase housing density the dedication of parkland becomes problematic to the economic viability of the project, and the developers attorney believes that the city cannot legally require parkland dedication because the standards in 17.86 are not "clear and objective". The applicant is interested in working with the city on a win-win scenario. Tracy outlined the applicants proposal and invited questions. Kelly shared a visual of the proposal.

Will noted the proposed dedication is not a lot of land. Mary agreed. Don shared that he is extremely disappointed that we are having this conversation although he doesn't doubt council had good reasons for the denial. Referencing the current proposal he noted that just because you have the legal right to do something, doesn't mean it is the right thing to do. Don shared that he believes that the board got it right the first time and is inclined

to stand pat on that original decision. Recognizes that the applicant may go forward but noted they would responsible for the Fee in Lieu and the System Development Charges.

Kelly shared that the city attorney agrees with the applicants attorney that the current Parks and Trails Master Plan is not fully incorporated into the city development code but they disagree on parkland dedication. Our attorney believes the city has the legal right to require parkland dedication but may have difficulty dictating the location of the dedication within a proposal. Wants to be clear the attorneys do not agree on the interpretation. Don noted to acquire the parkland adjacent to Deer Pointe we would be relying on the good will of the applicant. Kelly added or alternatively relying on the city forcing the issue in an approval, and then the applicant would need to appeal it to the State of Oregon, or the city denying the application. It could lead to a legal decision.

Will noted the proposal doesn't come close to realizing the Deer Pointe vision and the strip of land proposed does not add much. Mary does not see another place in the proposal for a park except that one little area. Don shared the the neighborhood has been very patient and waiting a long time for a developed park.

Moved by Don Robertson, seconded by Will Toogood

Motion to stick with the first recommendation of accepting land dedication and some hope of connectivity to the other parkland property in Deer Pointe.

CARRIED. 3-0

6.3. Bornstedt Views Proposed Development

Kelly O'Neill, Development Services Director, noted Bornstedt Views application is considered incomplete at this time.

Staff recommends Fee in Lieu of Parkland Dedication given the size of the development and its proximity to both Bornstedt and Cascadia Park.

Mac Even, the applicant, notes they are proposing Fee in Lieu and they are proposing to preserve quite a lot of trees.

Don pointed out that we are pretty park rich in this area of the community. Agrees the best option is to accept the Fee in Lieu.

Mary asked about the blue area noted in the packet. Kelly clarified that is the retention pond.

Moved by Mary Casey, seconded by Will Toogood

Motion to accept the Fee in Lieu for Bornstedt Views proposed development.

CARRIED. 3-0

6.4. Sandy Woods Phase II Proposed Development

Kelly O'Neill, Development Services Director attended to provide an overview of the proposed development.

43 lot subdivision and although the application is currently incomplete the planning staff does not anticipate big changes.

Kelly shared a visual and noted the location of Sandy Woods Phase I. Noted pedestrian access between the two Sandy Wood Phases. Sarah Richardson, staff liaison, noted that it gives the residents in the new phase pretty direct access to Bluff Park. Kelly pointed out that the access points will be a requirement as well as a tree tract through Phase II. The tract will include many old growth trees. It will not officially be parkland but it will provide some open space in this new phase.

Don asked for board questions or comment.

Moved by Mary Casey, seconded by Will Toogood

Motion to accept a Fee in Lieu of land dedication for the Sandy Woods Phase II proposed development. Includes the support for the requirement of the access points connecting Phase 1 and Phase II which provides direct access to Bluff Park and future trail connections.

CARRIED. 3-0

7. Old Business

Don reminded the board that we have two open seats on the board, and a vacancy in the Vice Chair position that needs to be filled.

8. STAFF UPDATES

Looking forward to the updates to the development code that relates to parks (17.86 and 17.32). Will give the board a stronger position to implement the new Parks and Trails Master Plan and more certainty with regard to the interpretation of the code.

9. Adjourn

EXHIBIT BB

COMMENT SHEET for File No. 21-014 SUB/TREE:

Sandy's future should include Dubarko connecting to Hwy. 26 at Vista Loop DR. This would be beneficial for Sandy Fire and Police. Also, Vista Loop has plans under review for over 250 home sites with more coming. Public safety would be well served with this change.

RECEIVED
SEP 27 2021
City of Sandy

Dave Carter — 503 883-3313
Your Name — Phone Number

41248 SE Vista Loop DR, Sandy
Address

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.20 Public Hearings; 17.22 Notices; 17.28 Appeals; 17.30 Zoning District Amendments; 17.36 Low Density Residential (R-1); 17.38 Medium Density Residential (R-2); 17.46 Village Commercial (C-3); 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.100 Land Division; 17.102 Urban Forestry; 15.30 Dark Sky; and, 15.44 Erosion Control Regulations.

EXHIBIT CC

ARD ENGINEERING

DEER MEADOWS SUBDIVISION
TRAFFIC IMPACT STUDY

SANDY, OREGON

PREPARED FOR:
Alex Reverman

PREPARED BY:
Michael Ard, PE
Ard Engineering

DATE:
September 27, 2021

21370 SW Langer Farms Parkway, Suite 142, Sherwood, OR 97140 - (503)862-6960

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EXECUTIVE SUMMARY

1. A property located on the south side of US Highway 26 opposite SE Vista Loop Drive in Sandy, Oregon is proposed for a 32-lot subdivision which will support up to 32 single-family homes and 120 apartment units. The site will take access via extensions of Dubarko Road and Fawn Street into the site.

2. Upon completion of residential development within the R-1, R-2, and C-3 zones, the subject property is projected to generate up to 79 site trips during the morning peak hour, 99 trips during the evening peak hour, and 1,180 daily site trips.

3. With conversion to all-way stop control, the intersection of Highway 211 at Dubarko Road is projected to operate better under year 2023 traffic conditions with construction of the proposed development than without the development and the all-way stop control conversion. Accordingly, installation of all-way stop control is sufficient to offset the impacts of the proposed development and any additional mitigation would be disproportionate to the actual impact of the proposed development. All other study intersections are projected to operate acceptably through year 2023 either with or without the addition of site trips from the proposed development. No other operational mitigations are necessary or recommended in conjunction with the proposed subdivision.

4. Based on the examination of existing and future local street volumes, the local streets in the site vicinity currently carry fewer than 1,000 daily trips and will continue to carry fewer than 1,000 daily trips upon completion of the proposed development. No mitigations are necessary or recommended for the local streets in the site vicinity in conjunction with the proposed development.

5. Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. This intersection meets all-way stop control warrants based on crash history, and conversion to all-way stop control would be expected to reduce the frequency and severity of right-angle and turning-movement collisions. It is therefore recommended that all-way stop control be installed at the intersection of Highway 211 and Dubarko Road. No other safety improvements are recommended.

6. Based on the warrant analysis, no new turn lanes or traffic signals are recommended in conjunction with the proposed subdivision.

PROJECT DESCRIPTION & LOCATION

INTRODUCTION

A property located on the south side of US Highway 26 opposite SE Vista Loop Drive is proposed for development with 32 lots across R-1, R-2, and C-3 zoning. The site can support up to 30 single-family homes, 2 duplex units, and 120 apartment units. The portion of the site zoned C-3 is expected to ultimately include some form of commercial development; however, the nature of this future use has not yet been determined. Accordingly, a future traffic study will be required as part of the design review application for the future commercial site use. The site will take access via extensions of Dubarko Road and Fawn Street into the site. Dubarko Road will be extended to intersect a new north/south collector street within the site, which will stub to the south side of the property.

This report addresses the impacts of the proposed development on the surrounding street system. An operational and safety analysis was conducted for the intersections of:

- Highway 26 at SE Ten Eyck Road;
- Highway 26 at SE Langensand Road;
- Highway 211 at Dubarko Road; and
- Dubarko Road at SE Langensand Road.

An analysis of future traffic volumes on local streets in the site vicinity is also included in this report.

The purpose of this analysis is to determine whether the surrounding transportation system is capable of safely and efficiently supporting the proposed use and to identify any necessary improvements and mitigations.

SITE LOCATION AND STUDY AREA DESCRIPTION

The project site has an area of approximately 16 acres, which is currently undeveloped. The property is surrounded by a mixture of residential development, agricultural uses and undeveloped forested land.

The proposed development will include an extension of Dubarko Road into the site to intersect a new north/south collector roadway. The proposed development will connect to the existing street system via extensions of Dubarko Road and Fawn Street into the project site.

US Highway 26 (Mt. Hood Highway) is classified by the Oregon Department of Transportation as a Statewide Highway and a Freight Route. It has two through lanes in each direction and added turn lanes at intersections. Between SE Langensand Road and SE Vista Loop Drive it has a center two-way left-turn lane. It has a posted speed limit of 25 mph at SE Ten Eyck Road, 40 mph at SE Langensand Road, and 55 mph at SE Vista Loop Drive. West of SE Ten Eyck Road the highway divides into a couplet, with westbound traffic traveling on Proctor Boulevard and eastbound traffic traveling on Pioneer Boulevard. It should be noted that Highway 26 is access controlled by the Oregon Department of Transportation.

SE Ten Eyck Road has one through lane in each direction and is striped to prohibit passing in the site vicinity. It has a basic rule speed limit of 55 mph and is classified by the City of Sandy as a Minor Arterial.

SE Langensand Road is also classified by the City of Sandy as a Minor Arterial. It has a two-lane cross-section with one through lane in each direction and a posted speed limit of 25 mph. Partial sidewalks are in place on both sides of the roadway, and on-street parking is available where sufficient paved width is provided.

Oregon Highway 211 (Eagle Creek Sandy Highway) is classified by the Oregon Department of Transportation as a District Highway. It has a two-lane cross-section with one through lane in each direction and added turn lanes at major intersections. It has a posted speed limit of 45 mph in the vicinity of Dubarko Road.

Dubarko Road is classified by the City of Sandy as a Minor Arterial. It generally has a two-lane cross-section with some added turn lanes at major intersections and bike lanes on each side of the roadway. Partial sidewalks are in place on each side of the roadway adjacent to developed properties. It has a posted residential speed limit of 25 mph.

EXISTING CONDITIONS

The intersection of US Highway 26 at SE Ten Eyck Road/Wolf Drive is controlled by a traffic signal. The northbound and southbound approaches each have a single, shared lane for all turning movements. The westbound approach has a left-turn lane, two through lanes, and a short right-turn pocket. The eastbound approach has a left-turn lane, a dedicated through lane and a shared through/right lane. The northbound and southbound approaches operate with concurrent signal phasing. Protected phasing is provided for the eastbound and westbound left-turn movements. Bike lanes are provided along Highway 26 to the right of the through lanes.

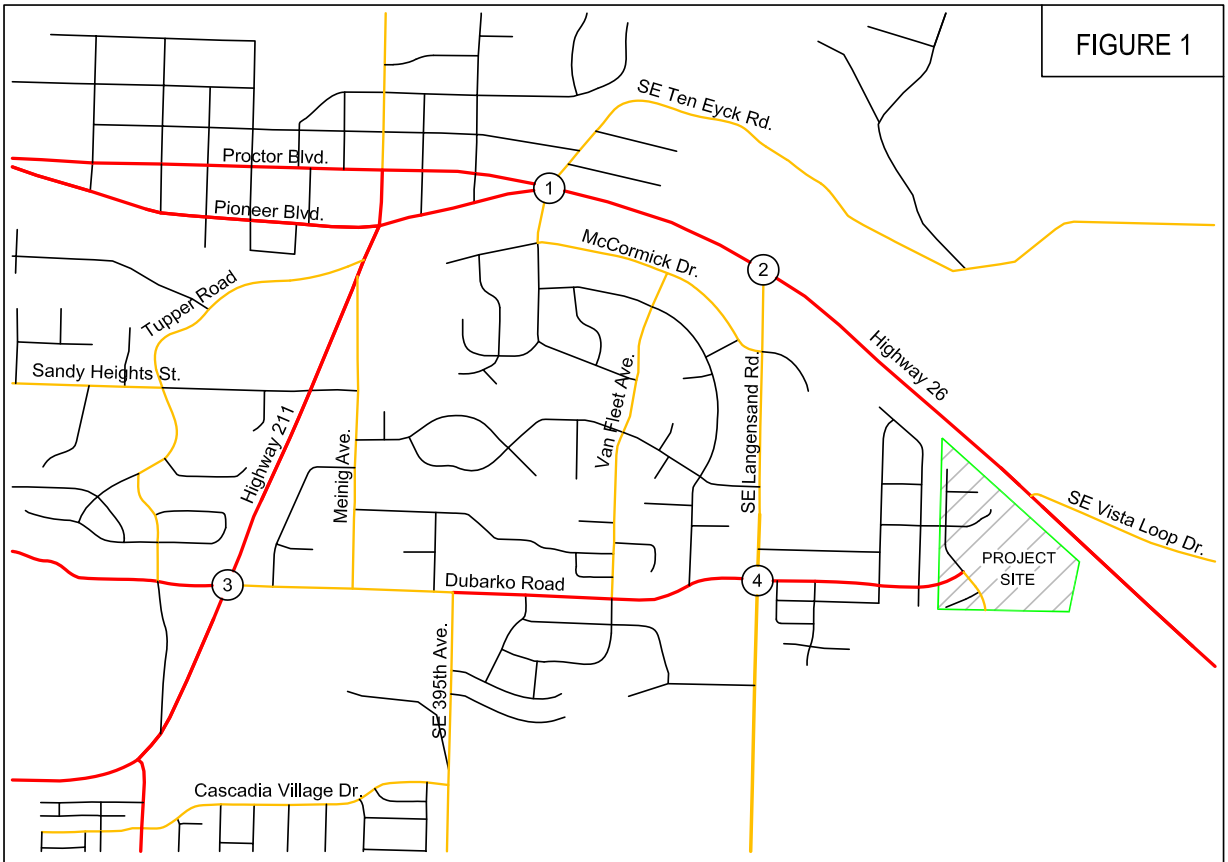
The intersection of US Highway 26 at SE Langensand Road is a T- intersection controlled by a stop sign on the northbound Langensand Road approach. Through traffic traveling along Highway 26 does not stop. The northbound approach has a left-turn lane and a right-turn lane. The eastbound approach has two through lanes and a right-turn lane. The westbound approach has a left-turn lane and two through lanes. Bike lanes are provided along Highway 26 to the right of the through lanes.

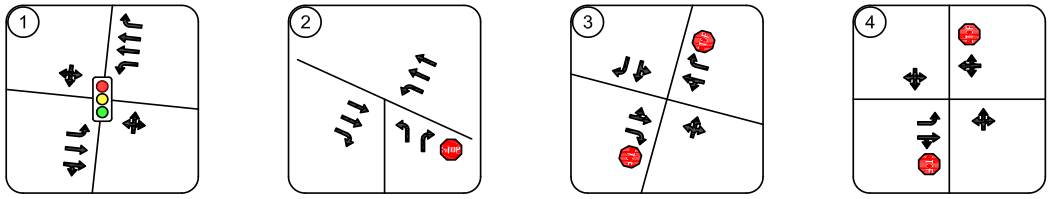
The intersection of Oregon Highway 211 at Dubarko Road is a four-way intersection controlled by stop signs on the eastbound and westbound Dubarko Road approaches. The southbound, eastbound and westbound approaches each have a shared through/left lane, a bike lane, and a dedicated right-turn lane. The northbound approach has a single, shared lane for all motorized turning movements and a bike lane.

The intersection of Dubarko Road at SE Langensand Road is a four-way intersection currently controlled by stop signs on the eastbound and westbound Dubarko Road approaches. Through traffic traveling along SE Langensand Road does not stop. The northbound and southbound approaches each have a single, shared lane for all turning movements. The westbound approach has a single, shared lane for all motor vehicle turning movements and a bike lane. The eastbound approach has a left-turn lane, a shared through/right lane and a bike lane.

A vicinity map displaying the project site, vicinity streets, and the study intersections including lane configurations is provided in Figure 1 on page 7.

FIGURE 1





LEGEND

- Study Intersection
- Traffic Signal
- Stop Sign

VICINITY MAP
Study Intersections
Lane Configurations and Traffic Control

PAGE 7

TRAFFIC COUNT DATA

Traffic counts were conducted at the two intersections on Highway 26 as well as the intersection of Dubarko Road at Langensand Road on Tuesday September 21, 2021 from 7:00 to 9:00 AM and from 4:00 to 6:00 PM. Traffic count data for the intersection of Highway 211 at Dubarko Road was collected on Wednesday June 9th, 2021 from 7:00 to 9:00 AM and from 4:00 to 6:00 PM. Data was used from the highest-volume hour for each study intersection during each analysis period.

Since the count data was collected during a non-peak period of the year, the observed traffic volumes were adjusted to account for seasonal traffic variations in order to represent the 30th-highest hour design volumes.

US Highway 26 serves local and commuter traffic as well as trips to and from Mt. Hood and beyond. These trip types would be expected to exhibit very different seasonal variations in travel demands over the course of the year, since local and commuter traffic volumes are relatively stable regardless of season, while travel volumes to and from Mt. Hood vary significantly based on the season.

In order to determine the portion of traffic attributable to each of the two primary travel types, data from ODOT's 2019 Highway Volume Tables was utilized. Specifically, the data used was collected at ODOT's Automatic Count Data station 03-006, located 0.30 miles east of Camp Creek Road in Rhododendron, Oregon. This site is located on Highway 26 approximately 21 miles east of SE Vista Loop Drive. Although the distance to the ATR station means the data cannot be used directly, the ATR data provides useful information regarding the variation in traffic volumes traveling to Mt. Hood and beyond during the time of the count data collection as well as during the peak season of the year. Accordingly, this data allows determination of the likely portion of highway traffic that falls into each of the two seasonal variation categories ("commuter" and "recreational summer/winter"), as well as providing information regarding the most appropriate seasonal adjustment factor for the recreational summer/winter traffic.

Based on the data, 8,391 vehicles per day (approximately 839 per hour during the peak hour) travel along Highway 26 to and from Mt. Hood at the Rhododendron permanent count station location during the month of September, with 55 percent westbound and 45 percent eastbound. This volume represents 39.4 percent of the through traffic volumes measured on Highway 26 east of Oregon Highway 211, sine the September counts showed 2,129 vehicles on Highway 26 west of Ten Eyck Road. Accordingly, no more than 39.4 percent of the trips traveling along Highway 26 at that location can be traveling to and from destinations beyond the Rhododendron count station. Since the remaining 60.6 percent of through traffic volumes on Highway 26 at Highway 211 never reach Mt. Hood, it was assumed that these traffic volumes represent more typical commuter and local trips.

The ODOT data also showed that 10,810 vehicles were measured per day (approximately 1081 per hour during the peak hour) during the peak-season month of July at the ATR station near Rhododendron. This indicates that the seasonal recreational traffic volumes along the Highway 26 corridor increased by no more than 2,419 vehicles per day (10,810 vehicles per day in August - 8,391 vehicles per day in September). This equates to roughly 242 additional vehicles per hour during the peak hour of the peak recreational season. Accounting for directionality of trips, this is approximately 133 westbound vehicles and 109 eastbound vehicles.

In order to seasonally adjust the local and commuter traffic volumes, the through traffic volumes on Highway 26 were reduced by the amount of the ATR-recorded traffic traveling to and from Mt. Hood (839 vehicles per hour during the evening peak hour), and a seasonal adjustment of 2.8 percent was applied to the remaining local and commuter traffic volumes based on data from ODOT's Seasonal Trend Table. Following this commuter adjustment, the 839 Mt. Hood trips previously subtracted were re-added to the totals, and the additional projected 242 peak-season Mt Hood trips were added to determine the total peak-season traffic volumes. This methodology accounts for both the commuter and the recreational summer/winter peak season traffic adjustments in direct proportion to the calculated mix of each traffic type.

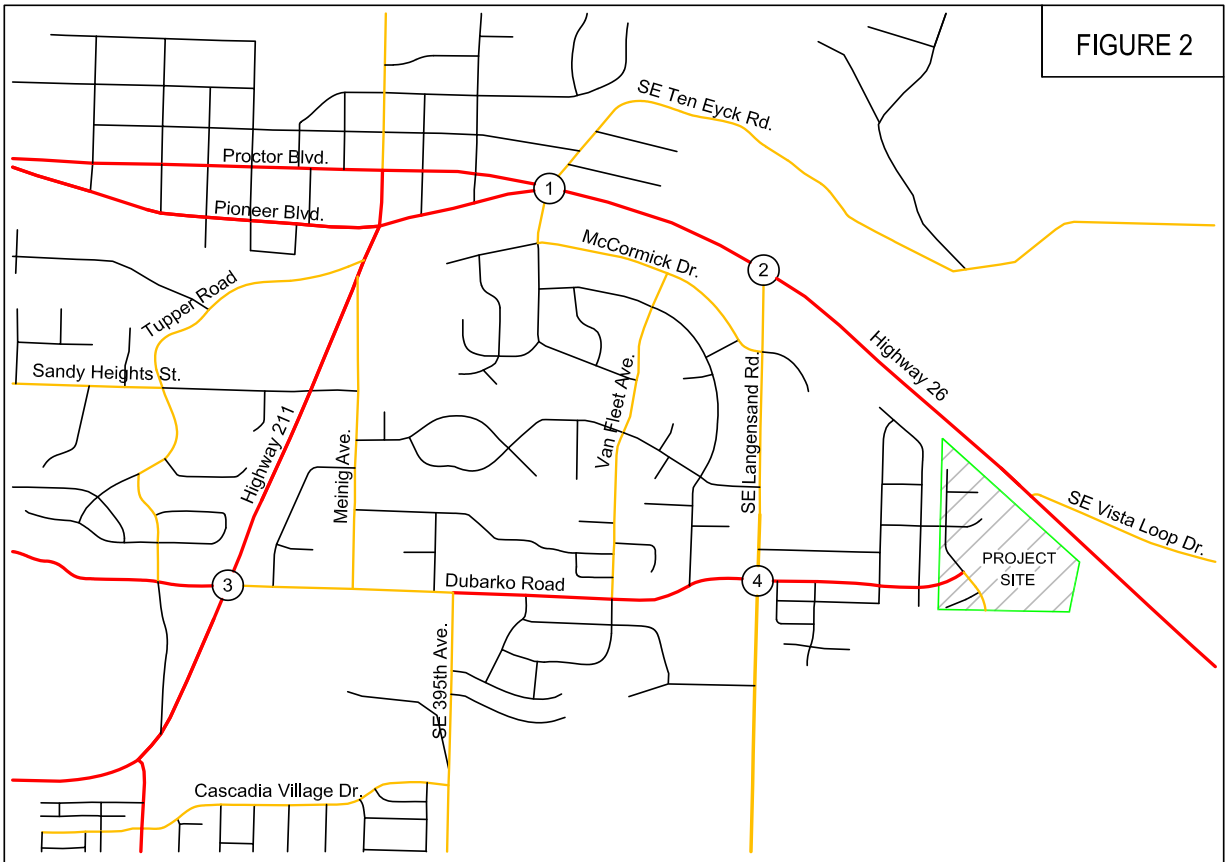
The resulting calculated through traffic volumes represent the anticipated traffic volumes on Highway 26 immediately west of Ten Eyck Road during the 30th-highest hour in July. The morning peak hour through traffic volumes along Highway 26 were then increased by the same overall percentage as the evening peak hour volumes (16.2 percent).

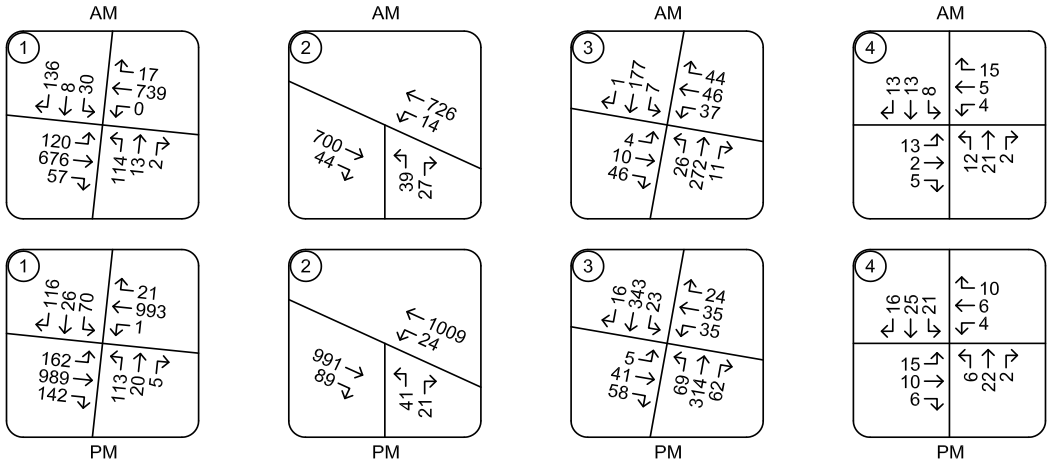
The observed traffic volumes along Highway 211 had a commuter seasonal adjustment of 0.7 percent applied based on ODOT's Seasonal Trend Table data for commuter routes and for data collected on June 9th to reflect the peak commuter time of June 15th.

In addition to the seasonal adjustments, the observed traffic volumes were increased to account for the impacts of the COVID-19 pandemic on traffic volumes in the site vicinity. Based on data from ODOT's most recent Weekly COVID-19 Traffic Reports, traffic volumes along Highway 26 are currently approximately 5.0 percent below the levels that would have otherwise been projected for this corridor in 2021. Similarly, the traffic volumes statewide average approximately 5.6 percent lower than would otherwise be projected absent the impacts of the pandemic. Accordingly, the projected year 2021 peak-season traffic volumes were increased by 5.0 percent for through traffic on Highway 26 and by 5.6 percent for all other roadways to estimate traffic volumes absent the impacts of the continuing pandemic.

Figure 2 on page 10 shows the existing year 2021 30th-highest hour traffic volumes for the morning and evening peak hours at the study intersections.

FIGURE 2





TRAFFIC VOLUMES
2021 Existing 30th-Highest Hour (August) Conditions
Morning and Evening Peak Hours

PAGE 10

OPERATIONAL ANALYSIS

An operational analysis was conducted for the study intersections using Synchro 10 software, with outputs calculated based on the *HIGHWAY CAPACITY MANUAL, 6th Edition.* The analysis was conducted for the weekday morning and evening peak hours.

The purpose of the existing conditions analysis is to establish how the study area intersections operate currently and allow for calibration of the operational analysis if required.

The results of the operational analysis are reported based on delay, Level of Service (LOS), and volume-to-capacity ratio (v/c). Delays are reported in seconds. Level of service is reported as a letter grade and can range from A to F, with level of service A representing nearly free-flow conditions and level of service F representing high delays and severe congestion. A report of level of service D generally indicates moderately high but tolerable delays, and typically occurs prior to reaching intersection capacity. For unsignalized intersections, the v/c represents the portion of the available intersection capacity that is being utilized on the worst intersection approach. For signalized intersections, it indicates the portion of the overall intersection's capacity that is being used. A v/c ratio of 1.0 would indicate that the intersection is operating at capacity.

The Oregon Department of Transportation requires that the signalized intersection of Highway 26 at SE Ten Eyck Road operate with a v/c ratio of 0.85 or less during the peak hours. The intersection of Highway 26 at SE Langensand Road is required to operate with a v/c ratio of 0.80 or less on the major-street approaches and a v/c ratio of 0.90 or less on the minor-street approaches.

Intersections operating under the jurisdiction of the City of Sandy are required to operate at level of service D or better. This operational standard applies to the intersections of Dubarko Road at Langensand Road and Highway 211 at Dubarko Road.

A summary of the existing conditions operational analysis is provided in Table 1 on the following page. For the unsignalized intersections the reported delays and levels-of-service represent the approach lane which experiences the highest delays. The reported v/c ratios represent the highest ratio for the major-street and minor-street movements. For the signalized intersection of Highway 26 at SE Ten Eyck Road, the reported delays, levels-of-service and v/c ratios represent the operation of the overall intersection.

Based on the analysis, the intersections are currently operating acceptably per the respective ODOT and City of Sandy standards. Detailed capacity analysis worksheets are provided in the technical appendix.

Table 1 - Operational Analysis Summary: Year 2021 30th-Highest Hour Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c*	Delay	LOS	v/c*
Highway 26 at Ten Eyck Road	23.5	C	0.55	25.2	C	0.64
Highway 26 at Langensand Road	33.5	D	0.24 / 0.26	80.2	F	0.32 / 0.49
Highway 211 at Dubarko Road	2.9	C	0.32	32.4	D	0.36
Dubarko Road at Langensand Road	9.7	A	0.04	9.6	A	0.03

*(major street v/c) / (minor-street v/c) is shown for the unsignalized ODOT intersection.

SITE TRIPS

Proposed Development

The proposed subdivision will support development of 32 single-family homes as well as up to 120 apartment units. Although some commercial development is expected to occur within the C-3 zoned portion of the property in the longer-range future, a separate design review application and analysis will be required for future commercial development. To estimate the number of trips that will be generated by the potential residential development within the proposed subdivision, trip rates from the *TRIP GENERATION MANUAL, 10th EDITION* were used. Data from land-use code 210, *Single-Family Detached* Housing, and 220, *Multi-Family Housing*, were used. The trip estimates are based on the number of dwelling units.

A summary of the trip generation calculations is provided in Table 2 below. Detailed trip generation worksheets are also included in the technical appendix.

Table 2 - Proposed Development Trip Generation Summary

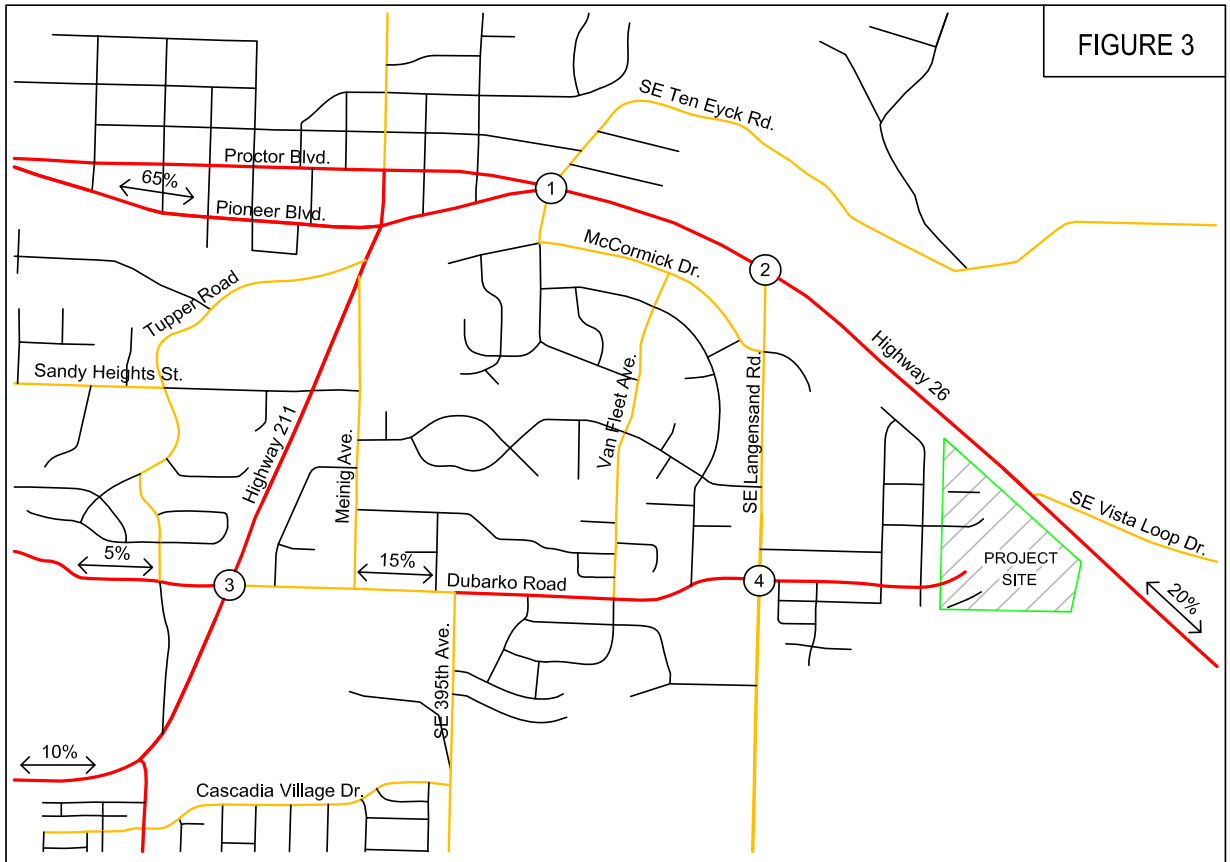
	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
32 Single-Family Homes	6	18	24	20	12	32	302
120 Multi-Family Dwelling Units	13	42	55	42	25	67	878
Total Site Trips	19	60	79	62	37	99	1,180

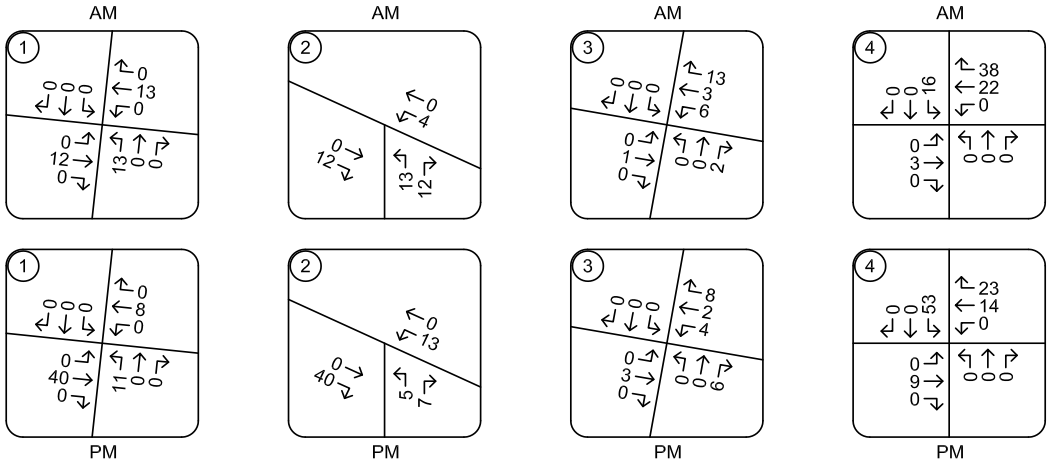
TRIP DISTRIBUTION

The directional distribution of site trips to and from the project site was estimated based the existing travel patterns in the site vicinity, as well as the locations of likely trip destinations and major transportation routes. Overall, 65 percent of the anticipated site trips are projected to travel to and from the northwest on Highway 26, 20 percent are projected to travel to and from the southeast on Highway 26, and the remaining 15 percent of site trips are projected to travel to and from the west on Dubarko Road. Site trips will travel to and from Highway 26 using the existing streets in the site vicinity, which will be extended into the Deer Meadows Subdivision.

The trip distribution percentages and trip assignment for residential development within the proposed subdivision are shown in Figure 3 on page 14.

FIGURE 3





TRAFFIC VOLUMES
Proposed Development - Primary Site Trips
Morning and Evening Peak Hours

PAGE 14

FUTURE CONDITIONS ANALYSIS

BACKGROUND VOLUMES

In order to determine the expected impact of site trips on the study area intersections, it is necessary to compare traffic conditions both with and without the addition of the projected traffic from the proposed development. This comparison is made for future traffic conditions at the time of project completion. It is anticipated that the proposed use will be completed and occupied within two years. Accordingly, the analysis was conducted for year 2023 traffic conditions.

Prior to adding the projected site trips to the study intersections, the existing traffic volumes were adjusted to account for background traffic growth over time. Based on data from ODOT's Future Volume Tables, the growth rate for traffic volumes on Highway 26 in the site vicinity was calculated to be 1.96 percent per year (linear). This growth rate was applied to the through traffic volumes on Highway 26. All other turning movements had a growth factor of 2 percent per year (exponential) applied.

In addition to the background growth, future site trips associated with other anticipated developments within the City of Sandy were added to the background traffic volumes. These projects included the Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and Bornstedt Views. The projected site trips for these residential developments are shown in Figure 6 in the attached technical appendix.

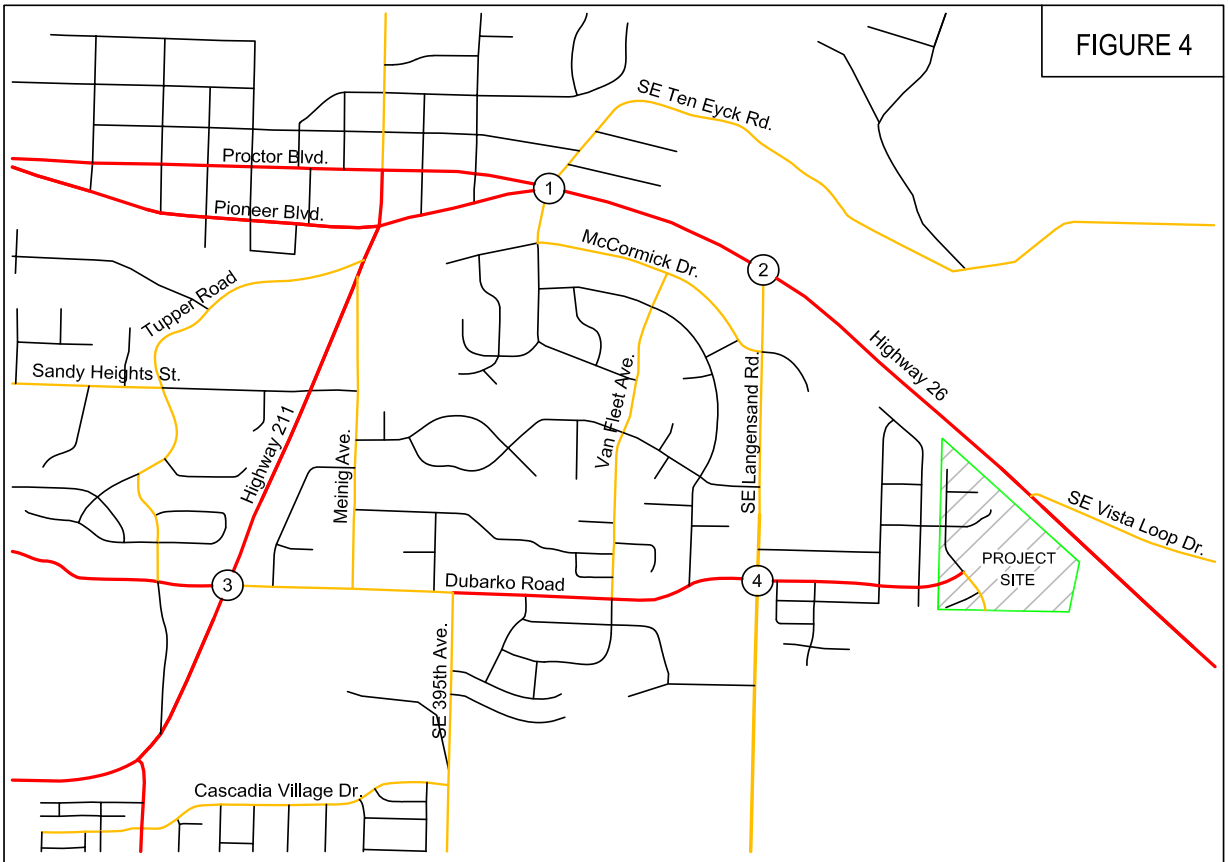
Figure 4 on page 16 shows the projected year 2023 background traffic volumes at the study intersections during the morning and evening peak hours.

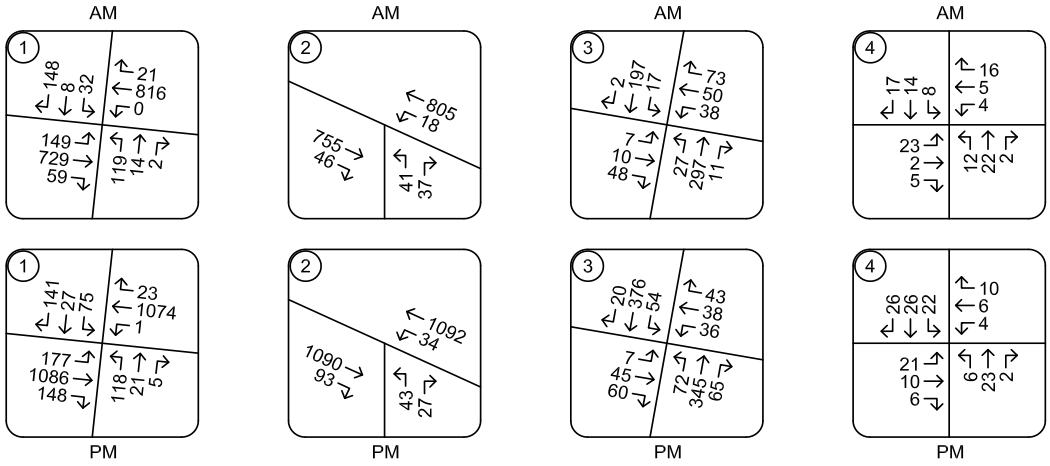
BACKGROUND VOLUMES PLUS SITE TRIPS

Peak hour trips calculated to be generated by the proposed development were added to the projected year 2023 background traffic volumes to obtain the year 2023 total traffic volumes following completion of the proposed residential development.

Figure 5 on page 17 shows the projected year 2023 peak hour volumes including background growth, and site trips from the proposed development for the morning and evening peak hours.

FIGURE 4

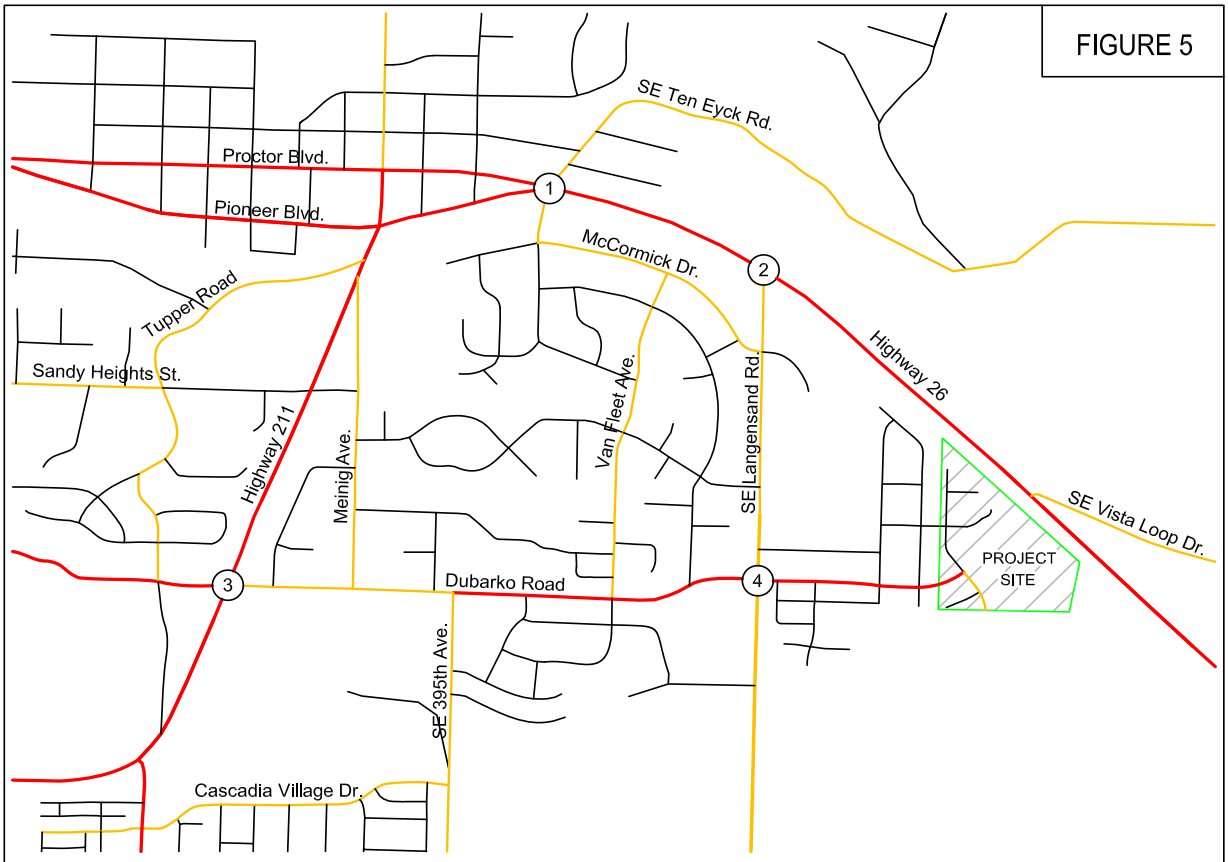


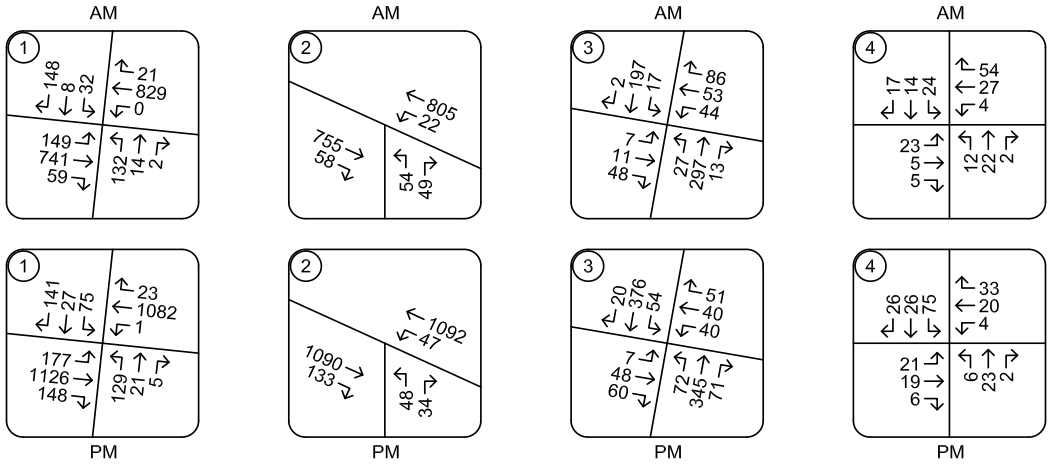


TRAFFIC VOLUMES
2023 Background Conditions
Morning and Evening Peak Hours

PAGE 16

FIGURE 5





TRAFFIC VOLUMES
2023 Background Plus Site Trips
Morning and Evening Peak Hours

PAGE 17

OPERATIONAL ANALYSIS

The operational analysis for future traffic conditions was again conducted using Synchro analysis software, with outputs based on the analysis methodologies contained in the *HIGHWAY CAPACITY MANUAL*. The analysis was prepared for the intersections' morning and evening peak hours.

The results of the operational analysis are summarized in Table 4 below. Detailed analysis worksheets are also included in the technical appendix.

Table 4 - Operational Analysis Summary: Year 2023 Future Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c*	Delay	LOS	v/c*
Highway 26 at Ten Eyck Road						
2023 Background Conditions	25.2	C	0.62	26.7	C	0.70
2023 Background plus Site	25.4	C	0.64	26.9	C	0.72
Highway 26 at Langensand Road						
2023 Background Conditions	41.9	E	0.26 / 0.32	136.6	F	0.36 / 0.69
2023 Background plus Site	48.7	E	0.26 / 0.43	173.2	F	0.38 / 0.82
Highway 211 at Dubarko Road						
2023 Background Conditions	25.6	D	0.39	51.0	F	0.51
2023 Background plus Site	27.5	D	0.44	56.3	F	0.56
2023 Background plus Site AWSC	23.8	C	0.73	36.3	E	0.86
Dubarko Road at Langensand Road						
2023 Background Conditions	9.8	A	0.04	9.7	A	0.04
2023 Background plus Site	11.3	B	0.15	11.4	B	0.08

*(major street v/c) / (minor-street v/c) is shown for the unsignalized ODOT intersection.
AWSC = Mitigated conditions analysis with conversion to all-way stop control

The intersection of Oregon Highway 211 at Dubarko Road was previously under the jurisdiction of the Oregon Department of Transportation and subject to a volume-to-capacity ratio standard rather than level of service. The intersection would have met ODOT's volume-to-capacity based standards for operation, but with conversion to a city intersection it is subject to the city's level-of-service standards. This intersection is projected to operate at level of service "F" under year 2023 background conditions during the evening peak hour.

Upon completion of the proposed development, the intersection is projected to continue to operate at level of service F during the evening peak hour, with average delays for the highest-delay movement increasing from 51.0 seconds to 56.3 seconds if no mitigation is provided. However, if the intersection is converted to all-way stop control (as recommended in the Traffic Signal and All-Way Stop Control Analysis section of this report on page 20), the intersection is projected to operate at level of service E, with average delays for the highest-delay movement reduced to 36.3 seconds. Since intersection operation is better than under background conditions, this proposed mitigation is sufficient to fully

offset the transportation impacts of the Deer Meadows Subdivision site trips. As such, any requirement for additional mitigation would be disproportionate to the impact of the proposed development.

All other intersections are projected to operate acceptably per the appropriate jurisdictional standards. No other operational mitigations are recommended in conjunction with the proposed development.

LOCAL STREET TRAFFIC VOLUMES

Traffic volumes on local streets in the site vicinity may also be impacted by the proposed development. In particular, the proposed street network includes an extension of Fawn Street, which provides connections to Meadow Avenue, Antler Avenue, and Therese Street.

Section 17.10.30 "Street", Sub-section E "Local Streets", the City of Sandy's Development Code requires that:

> "Average daily traffic (ADT) shall not exceed 1,000 vehicles/day. Proposed 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."

It should be noted that Dubarko Road and Langensand Road are classified as Minor Arterial roadways, are intended to carry higher volumes of traffic, and are not subject to the traffic limitations described in this code section. However, an assessment of daily traffic volumes is necessary to determine whether the Local streets will comply with this requirement.

Existing daily traffic volumes on these streets were estimated by determining the fastest travel paths for the homes within the existing and proposed developments. Since all affected streets in the site vicinity have 25 mph statutory speed limits, the distribution was estimated based on the shortest travel paths. Based on the analysis, Meadow Avenue currently carries 200 daily trips immediately north of Dubarko Road. Antler Avenue currently carries 250 daily trips immediately north of Dubarko Road. Fawn Street currently carries 20 daily trips immediately east of Meadow Avenue and 100 daily trips immediately east of Antler Avenue. Therese Street currently carries 600 average daily trips immediately east of Langensand Road.

The proposed development will add trips to these existing local streets, since the site will connect to the exiting local street system via the extension of Fawn Street into the site. Based on the proposed development plan, it is projected that lots 5 through 26 (22 single-family homes) may utilize Fawn Street. The multifamily development, lots 1-4, and lost 27-30 would not be projected to utilize Fawn Street since Dubarko Road provides a more direct connection to all potential destinations. Accordingly, the proposed development cannot add more than 210 daily trips to any of the existing local streets. Since none of the existing local streets that will be impacted by the proposed development are within 210 daily trips of the 1,000 daily trip maximum threshold established by the City of Sandy, the proposed development cannot result in traffic volumes exceeding 1,000 daily trips on any local streets in the site vicinity. Based on the analysis, no traffic calming or traffic diverting mitigations are necessary or recommended for the existing and proposed local streets in conjunction with development within the Deer Meadows subdivision.

SAFETY ANALYSIS

CRASH DATA ANALYSIS

Using data obtained from the Oregon Department of Transportation, a review of the five most recent years of available crash history (from January 2015 through December 2019) was performed for the study intersections. The crash data was evaluated based on the number, type, and severity of collisions, as well as the intersection crash rate. Crash rates allow comparison of relative safety risks at intersections with different lane configurations, volumes, and traffic control devices by accounting for both the number of crashes that occur during the study period and the number of vehicles that traveled through the intersection during that period. Crash rates are calculated using the standard assumption that evening peak hour volumes are approximately 10 percent of the average daily traffic volume at an intersection. The crash rates were compared to statewide crash rates for similar intersection types to identify any locations with crash rates in excess of the 90th percentile.

The intersection of Highway 26 at SE Ten Eyck Road had eight reported collisions during the five-year analysis period. These included four rear-end collisions, three turning movement collisions, and one angle collision. The crashes resulted in no serious injuries or fatalities and six reports of a "possible injury/complaint of pain". The crash rate for the intersection was calculated to be 0.15 crashes per million entering vehicles. This is well below the 90th percentile crash rate of 0.86 crashes per million entering vehicles for signalized, four-way urban intersections in Oregon.

The intersection of Highway 26 at SE Langensand Road had seven reported collisions during the five-year analysis period. These included five turning-movement collisions, one backing collision and one pedestrian collision. The pedestrian collision occurred when a pedestrian walking along the south side of Highway 26 crossing Langensand Road was struck by a driver making an eastbound right turn from the highway onto Langensand Road. The collision resulted in a report of a "possible injury/complaint of pain" by the pedestrian. Overall, the crashes resulted in one non-incapacitating injury and five reports of a "possible injury/complaint of pain". The crash rate for the intersection was calculated to be 0.16 crashes per million entering vehicles. This is well below the 90th percentile crash rate of 0.29 crashes per million entering vehicles for stop-controlled, three-way urban intersections in Oregon.

The intersection of Highway 211 at Dubarko Road had 27 reported crashes during the five-year analysis period. These included 16 angle collisions, 4 turning-movement collisions, 4 rear-end collisions, 1 backing collision, 1 sideswipe-overtaking collision, and 1 pedestrian collision. The crashes resulted in one incapacitating injury and no fatalities. There were 10 "non-incapacitating" injuries reported and 19 reports of a "possible injury/complaint of pain". The incapacitating injury occurred when a westbound driver failed to yield to a southbound vehicle and was struck in the intersection. The pedestrian collision occurred when a southbound pedestrian was struck by a westbound driver that failed to yield right-of-way to the pedestrian crossing, resulting in a report of a possible injury/complaint of pain by the pedestrian. The crash rate for the intersection was calculated to be 1.56 crashes per million entering vehicles. This is above the 90th percentile crash rate of 1.08 crashes per million entering vehicles for rural unsignalized four-way intersections in the state of Oregon.

The Oregon Department of Transportation recently undertook safety improvements at this intersection, including re-alignment of the minor-street approaches to intersect at a 90-degree angle and the addition

of some striping and speed feedback signs along the major-street to increase driver awareness of speed. However, the crash data for subsequent years has shown no significant improvement in the crash frequency at this intersection. An examination of the current intersection configuration revealed no significant apparent hazards and adequate sight distance from the minor-street approaches, allowing drivers approaching the highway to select safe gaps when turning onto or crossing the highway.

As described in the Warrant Analysis section of this report below, the intersection currently meets all-way stop control warrants based on crash history. Accordingly, it is recommended that all-way stop control be installed at this intersection. No other safety mitigations are recommended at this time.

The intersection of Dubarko Road at SE Langensand Road had one reported collision during the five-year analysis period. It was an angle collision that resulted in property damage only. The crash rate for the intersection was calculated to be 0.34 crashes per million entering vehicles. This is well below the 90th percentile crash rate of 0.408 crashes per million entering vehicles for stop-controlled, four-way urban intersections in Oregon.

Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. It is recommended that consideration be given to installing all-way stop control at this intersection. No other safety improvements are recommended for the study area intersections at this time.

TRAFFIC SIGNAL AND ALL-WAY STOP CONTROL WARRANT ANALYSIS

Traffic signal warrants were examined for the unsignalized study intersections. Based on the projected traffic volumes, traffic signal warrants are not projected to be met for any of the unsignalized study intersections under any of the analysis scenarios.

All-way stop control can be installed where there are “Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.” Examination of the crash data shows that there were six angle collisions at the intersection in the most recent year for which complete data is available (2019). Accordingly, installation of all-way stop control is warranted based on crash history.

Consideration was also given to installing a roundabout at the intersection of Highway 211 and Dubarko Road. Installation of a roundabout would result in operation well within capacity and at level of service A. However, according to *Roundabouts: An Informational Guide*, published by the Federal Highway Administration, “It is generally not desirable to locate roundabouts in locations where grades through the intersection are greater than four percent. The installation of roundabouts on roadways with grades lower than three percent is generally not problematic.” In this instance, Highway 211 has a constant grade of approximately 6 percent through its intersection with Dubarko Road. Accordingly, installation of a roundabout would not be recommended absent significant re-grading of the approach roadways. The potential for snow and ice at the intersection compound this concern.

TURN LANE WARRANT ANALYSIS

Turn lane warrants were also examined for the major-street approaches to the unsignalized study intersections. Left-turn lane warrants are intended to evaluate whether a meaningful safety benefit may be expected if the turning vehicles are provided with turn lane within the street, allowing left-turning drivers to move out of the through travel lane so that following vehicles may pass without conflicts.

The intersection of Highway 26 at Langensand Road already has left and right turn lanes in place.

The intersection of Highway 211 at Dubarko Road currently meets ODOT warrants for a northbound left-turn lane and a northbound right-turn lane. However, the need for these turn lanes is not meaningfully related to the proposed development. Further, if all-way stop control is installed at the intersection as recommended based on the safety analysis, additional turn lanes will not be required for either safety or operations.

The intersection of Dubarko Road at Langensand Road is not projected to meet turn lane warrants under any analysis scenarios.

CONCLUSIONS

With conversion to all-way stop control, the intersection of Highway 211 at Dubarko Road is projected to operate better under year 2023 traffic conditions with construction of the proposed development than without the development and the all-way stop control conversion. Accordingly, installation of all-way stop control is sufficient to offset the impacts of the proposed development and any additional mitigation would be disproportionate to the actual impact of the proposed development. All other study intersections are projected to operate acceptably through year 2023 either with or without the addition of site trips from the proposed development. No other operational mitigations are necessary or recommended in conjunction with the proposed subdivision.

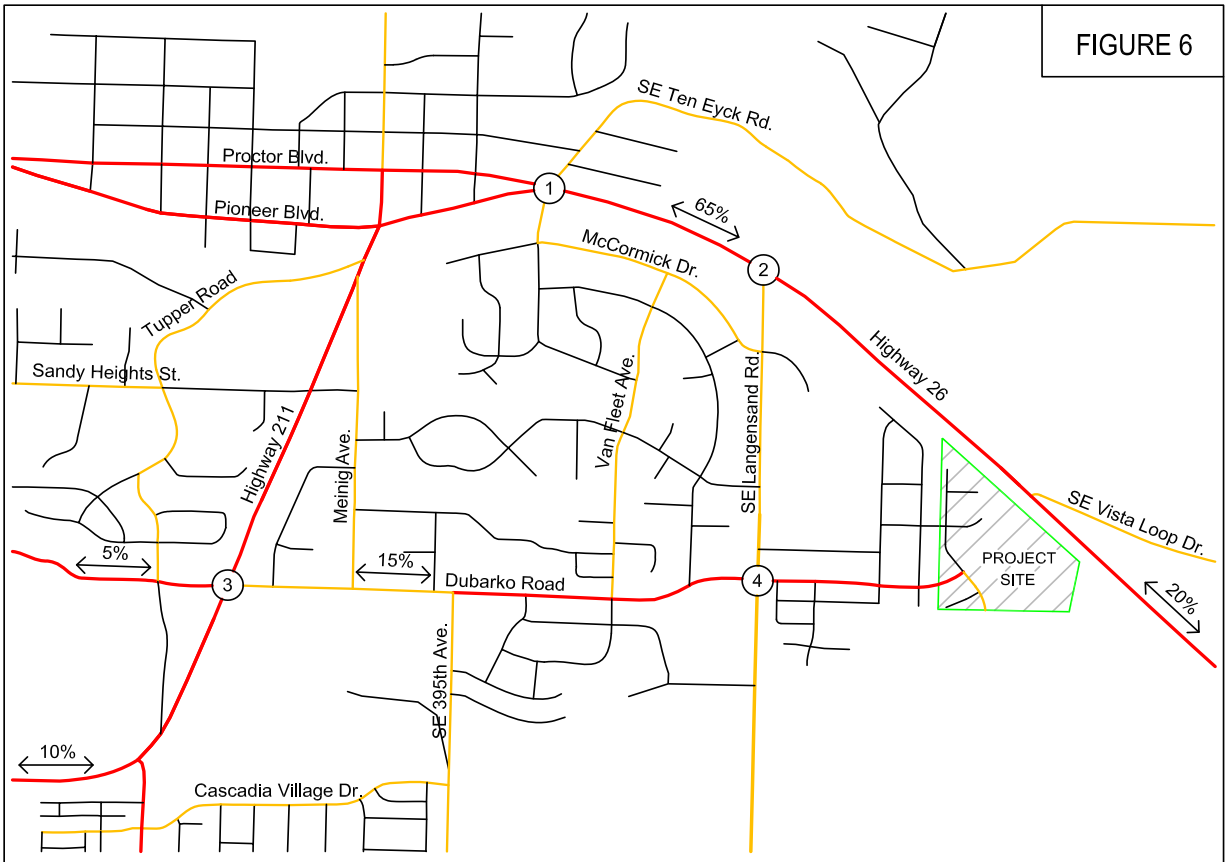
Based on the examination of existing and future local street volumes, the local streets in the site vicinity currently carry fewer than 1,000 daily trips and will continue to carry fewer than 1,000 daily trips upon completion of the proposed development. No mitigations are necessary or recommended for the local streets in the site vicinity in conjunction with the proposed development.

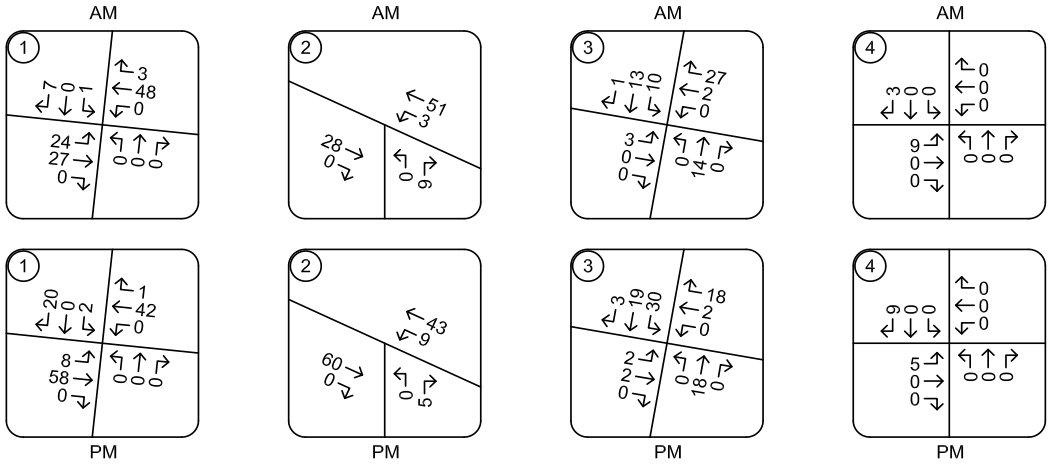
Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. This intersection meets all-way stop control warrants based on crash history, and conversion to all-way stop control would be expected to reduce the frequency and severity of right-angle and turning-movement collisions. It is therefore recommended that all-way stop control be installed at the intersection of Highway 211 and Dubarko Road. No other safety improvements are recommended.

Based on the warrant analysis, no new turn lanes or traffic signals are recommended in conjunction with the proposed subdivision.

APPENDIX

FIGURE 6





TRAFFIC VOLUMES
In-Process Development - Site Trips
Morning and Evening Peak Hours

PAGE
APP1

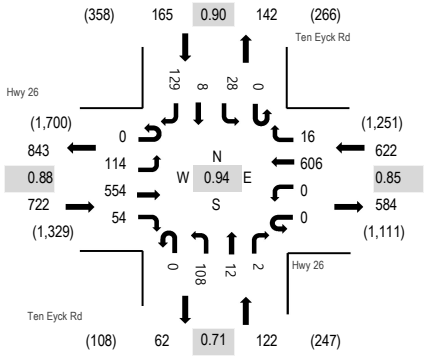
Location: 2 Ten Eyck Rd & Hwy 26 AM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

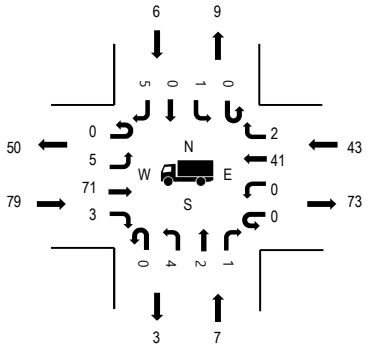
Location: 2 Ten Eyck Rd & Hwy 26 AM
Date: Tuesday, September 21, 2021
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour

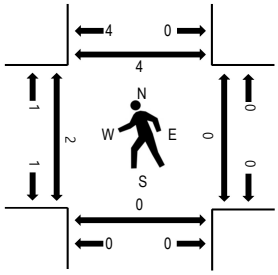
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	10.9%	0.88
WB	6.9%	0.85
NB	5.7%	0.71
SB	3.6%	0.90
All	8.3%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 26 Eastbound				Hwy 26 Westbound				Ten Eyck Rd Northbound				Ten Eyck Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	7	15	1	0	0	36	0	0	10	0	0	0	2	1	15	87	1,559
7:05 AM	0	8	32	5	0	0	49	1	0	9	0	0	0	2	0	10	116	1,578
7:10 AM	0	2	35	2	0	1	60	1	0	7	1	0	0	2	1	12	124	1,586
7:15 AM	0	4	34	1	0	0	54	2	0	13	3	0	0	3	0	12	126	1,593
7:20 AM	0	3	29	2	0	0	56	3	0	8	2	1	0	1	0	17	122	1,600
7:25 AM	0	3	38	1	0	0	55	3	0	18	4	0	0	2	0	17	141	1,610
7:30 AM	0	10	40	1	0	0	67	3	0	9	2	0	0	1	2	12	147	1,631
7:35 AM	0	14	42	4	0	0	47	1	0	8	0	0	0	3	1	11	131	1,610
7:40 AM	0	11	41	9	0	0	67	2	0	8	1	0	0	4	0	14	157	1,609
7:45 AM	0	16	53	1	0	0	35	1	0	9	0	1	0	1	1	11	129	1,597
7:50 AM	0	8	48	8	0	0	50	0	0	10	1	0	0	6	0	15	146	1,624
7:55 AM	0	8	60	7	0	0	41	2	0	3	3	0	0	1	0	8	133	1,620
8:00 AM	0	8	43	3	0	0	35	1	0	8	2	0	0	0	0	6	106	1,626
8:05 AM	0	3	38	5	0	0	46	3	0	17	1	0	0	2	2	7	124	
8:10 AM	0	11	47	3	0	0	52	1	0	6	1	0	0	2	1	7	131	
8:15 AM	0	6	39	5	0	0	55	0	0	13	0	0	0	3	0	12	133	
8:20 AM	0	7	44	1	0	0	47	0	0	15	0	0	0	3	1	14	132	
8:25 AM	0	12	59	7	0	0	64	2	0	2	1	1	0	2	0	12	162	
8:30 AM	0	10	37	4	0	0	48	2	0	8	0	0	0	5	0	12	126	
8:35 AM	0	10	45	4	0	0	49	0	0	9	1	0	0	2	1	9	130	
8:40 AM	0	15	57	5	0	0	47	0	0	8	0	1	0	3	0	9	145	
8:45 AM	0	3	58	5	0	0	56	3	0	8	1	1	0	10	0	11	156	
8:50 AM	0	11	52	2	0	0	47	4	0	5	2	0	0	5	3	11	142	
8:55 AM	0	11	49	7	0	0	48	4	0	4	0	1	0	5	0	10	139	
Count Total	0	201	1,035	93	0	1	1,211	39	0	215	26	6	0	70	14	274	3,185	
Peak Hour	0	114	554	54	0	0	606	16	0	108	12	2	0	28	8	129	1,631	

Location: 2 Ten Eyck Rd & Hwy 26 AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	4	0	5	1	10	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	8	0	4	0	12	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	3	1	1	1	6	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	7	1	1	0	9	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	2	0	3	0	5	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	4	0	3	0	7	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	2	1	3	0	6	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	10	0	6	1	17	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	11	1	3	1	16	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	1	1
7:45 AM	5	1	4	0	10	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	3	0	5	0	8	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	9	1	4	0	14	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	1	1
8:00 AM	8	0	1	0	9	8:00 AM	0	0	0	0	0	8:00 AM	1	0	0	2	3
8:05 AM	5	0	4	0	9	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	6	2	6	0	14	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	8	0	3	2	13	8:15 AM	0	0	0	0	0	8:15 AM	1	0	0	0	1
8:20 AM	7	0	1	1	9	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	5	1	3	1	10	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	6	0	2	0	8	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	8	0	2	0	10	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	13	0	7	0	20	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	8	0	4	0	12	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	9	0	3	1	13	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	1	1
8:55 AM	6	0	3	0	9	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	157	9	81	9	256	Count Total	0	0	0	0	0	Count Total	2	0	0	5	7
Peak Hour	79	7	43	6	135	Peak Hour	0	0	0	0	0	Peak Hour	2	0	0	4	6

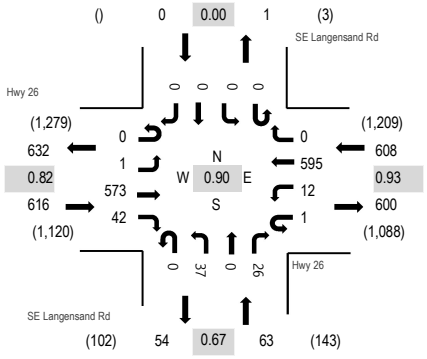
Location: 3 SE Langensand Rd & Hwy 26 AM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

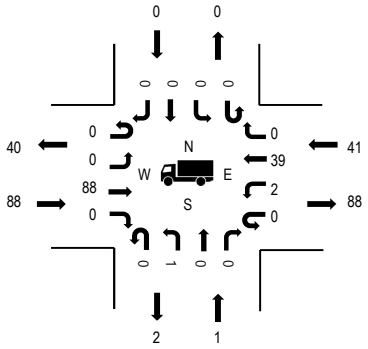
Location: 3 SE Langensand Rd & Hwy 26 AM
Date: Tuesday, September 21, 2021
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

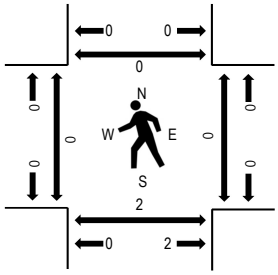
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	14.3%	0.82
WB	6.7%	0.93
NB	1.6%	0.67
SB	0.0%	0.00
All	10.1%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 26 Eastbound				Hwy 26 Westbound				SE Langensand Rd Northbound				SE Langensand Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	17	3	0	0	47	0	0	6	0	0	0	0	0	0	73	1,185
7:05 AM	0	0	33	4	0	0	47	0	0	5	0	1	0	0	0	0	90	1,198
7:10 AM	0	0	32	1	0	0	46	0	0	6	0	1	0	0	0	0	86	1,203
7:15 AM	0	0	31	4	0	1	54	0	0	8	1	4	0	0	0	0	103	1,221
7:20 AM	0	0	30	4	0	3	56	0	0	4	0	2	0	0	0	0	99	1,225
7:25 AM	0	0	42	3	0	1	52	1	0	11	0	0	0	0	0	0	110	1,238
7:30 AM	0	0	30	2	0	1	55	0	0	5	0	1	0	0	0	0	94	1,248
7:35 AM	0	0	47	2	0	2	57	0	0	4	0	1	0	0	0	0	113	1,241
7:40 AM	0	0	47	3	0	1	54	0	0	3	0	2	0	0	0	0	110	1,237
7:45 AM	0	0	45	4	0	1	35	0	0	2	0	2	0	0	0	0	89	1,238
7:50 AM	0	0	53	4	0	2	49	0	0	3	0	3	0	0	0	0	114	1,271
7:55 AM	0	0	62	1	0	1	35	0	0	3	0	2	0	0	0	0	104	1,273
8:00 AM	0	0	33	2	0	3	44	0	0	4	0	0	0	0	0	0	86	1,287
8:05 AM	0	0	41	2	0	0	46	0	0	1	0	5	0	0	0	0	95	
8:10 AM	0	0	45	2	0	2	51	0	0	3	0	1	0	0	0	0	104	
8:15 AM	0	0	43	4	0	2	53	0	0	4	0	1	0	0	0	0	107	
8:20 AM	0	0	45	5	1	0	52	0	0	4	0	5	0	0	0	0	112	
8:25 AM	0	0	47	7	0	1	53	0	0	7	0	5	0	0	0	0	120	
8:30 AM	0	0	35	1	0	0	45	0	0	6	0	0	0	0	0	0	87	
8:35 AM	0	0	59	3	0	1	42	0	0	3	0	1	0	0	0	0	109	
8:40 AM	0	0	54	5	0	0	49	0	0	1	0	2	0	0	0	0	111	
8:45 AM	0	0	63	4	0	1	52	0	0	1	0	1	0	0	0	0	122	
8:50 AM	0	1	46	3	0	0	60	0	0	1	0	5	0	0	0	0	116	
8:55 AM	0	0	62	4	0	2	48	0	0	2	0	0	0	0	0	0	118	
Count Total	0	1	1,042	77	1	25	1,182	1	0	97	1	45	0	0	0	0	2,472	
Peak Hour	0	1	573	42	1	12	595	0	0	37	0	26	0	0	0	0	1,287	

Location: 3 SE Langensand Rd & Hwy 26 AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	3	0	5	0	8	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	7	1	2	0	10	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	4	0	0	0	4	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	3	3	3	0	9	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	2	1	4	0	7	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	6	0	3	0	9	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	1	0	3	0	4	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	13	0	6	0	19	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	5	0	4	0	9	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	5	1	4	0	10	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	5	0	5	0	10	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	7	0	1	0	8	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	5	0	1	0	6	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	3	0	8	0	11	8:05 AM	0	0	0	0	0	8:05 AM	0	1	0	0	1
8:10 AM	7	0	5	0	12	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	10	0	1	0	11	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	6	0	2	0	8	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	7	0	4	0	11	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	5	1	1	0	7	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	11	0	3	0	14	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	9	0	4	0	13	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	9	0	4	0	13	8:45 AM	0	0	0	0	0	8:45 AM	0	1	0	0	1
8:50 AM	7	0	3	0	10	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	9	0	5	0	14	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	149	7	81	0	237	Count Total	0	0	0	0	0	Count Total	0	2	0	0	2
Peak Hour	88	1	41	0	130	Peak Hour	0	0	0	0	0	Peak Hour	0	2	0	0	2

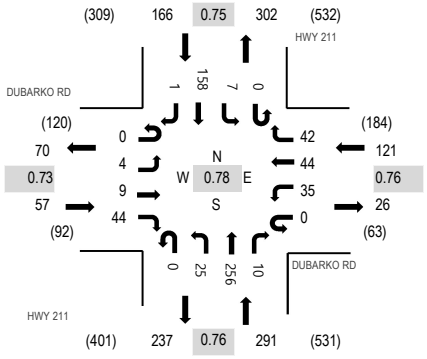
Location: HWY 211 & DUBARKO RD AM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

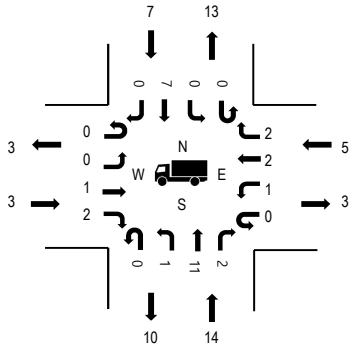
Location: HWY 211 & DUBARKO RD AM
Date: Wednesday, June 9, 2021
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:25 AM - 07:40 AM

Peak Hour

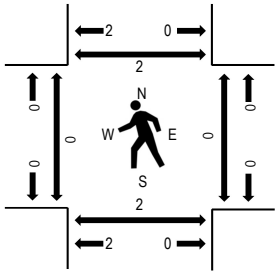
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.3%	0.73
WB	4.1%	0.76
NB	4.8%	0.76
SB	4.2%	0.75
All	4.6%	0.78

Traffic Counts - Motorized Vehicles

Interval Start Time	DUBARKO RD Eastbound				DUBARKO RD Westbound				HWY 211 Northbound				HWY 211 Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	1	1	0	0	2	1	2	0	2	19	1	0	0	20	0	49	635
7:05 AM	0	0	1	3	0	2	5	2	0	1	19	0	0	0	4	0	37	617
7:10 AM	0	0	0	4	0	3	4	5	0	4	16	0	0	1	8	0	45	613
7:15 AM	0	0	1	6	0	2	5	4	0	1	22	0	0	0	15	0	56	612
7:20 AM	0	0	1	4	0	6	4	2	0	1	26	0	0	0	13	0	57	596
7:25 AM	0	0	1	3	0	1	6	9	0	2	33	1	0	0	14	0	70	564
7:30 AM	0	1	1	9	0	2	2	3	0	2	22	2	0	0	15	0	59	536
7:35 AM	0	0	0	3	0	4	6	7	0	4	26	4	0	2	19	0	75	514
7:40 AM	0	0	0	2	0	6	3	3	0	1	19	2	0	1	17	1	55	483
7:45 AM	0	2	1	2	0	0	3	1	0	5	22	0	0	1	10	0	47	465
7:50 AM	0	0	0	4	0	3	2	0	0	2	13	0	0	1	9	0	34	485
7:55 AM	0	0	2	4	0	4	3	4	0	0	19	0	0	1	14	0	51	491
8:00 AM	0	2	0	1	0	2	0	3	0	1	15	1	0	0	6	0	31	481
8:05 AM	0	0	2	2	0	0	1	3	0	2	14	1	0	1	7	0	33	
8:10 AM	0	0	0	0	0	3	1	1	0	1	20	1	0	2	15	0	44	
8:15 AM	0	1	2	1	0	3	4	0	0	2	13	2	0	1	11	0	40	
8:20 AM	1	0	0	0	0	1	3	1	0	3	9	0	0	1	5	1	25	
8:25 AM	0	1	1	1	0	1	1	3	0	3	12	1	0	0	18	0	42	
8:30 AM	0	2	2	1	0	3	1	2	0	0	14	0	0	0	12	0	37	
8:35 AM	0	0	2	1	0	0	2	3	0	2	20	1	0	0	12	1	44	
8:40 AM	0	1	0	3	0	2	1	2	0	2	15	3	0	1	6	1	37	
8:45 AM	0	0	2	0	0	1	5	2	0	5	34	4	0	0	14	0	67	
8:50 AM	0	0	1	1	0	1	0	2	0	5	13	0	0	1	16	0	40	
8:55 AM	0	1	3	0	0	3	1	1	0	0	20	1	0	0	11	0	41	
Count Total	1	12	24	55	0	55	64	65	0	51	455	25	0	14	291	4	1,116	
Peak Hour	0	4	9	44	0	35	44	42	0	25	256	10	0	7	158	1	635	

Location: HWY 211 & DUBARKO RD AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	1	2	0	0	3	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	1	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	2	2	1	5	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	2	0	0	2	4	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	2	0	0	2	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	1	0	0	1	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	2	1	1	4	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	1	0	1	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	0	1	1	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	3	0	1	4	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	2	2
7:50 AM	0	1	0	0	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0	7:55 AM	0	2	0	0	2
8:00 AM	0	0	0	1	1	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	1	0	1	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	1	0	0	1	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	1	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	1	0	1	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	3	0	1	4	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	1	1	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	0	0	1	1	2	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	1	1	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	4	1	3	8	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	1	2	3	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	3	23	9	19	54	Count Total	0	0	0	0	0	Count Total	0	2	0	2	4
Peak Hour	3	14	5	7	29	Peak Hour	0	0	0	0	0	Peak Hour	0	2	0	2	4

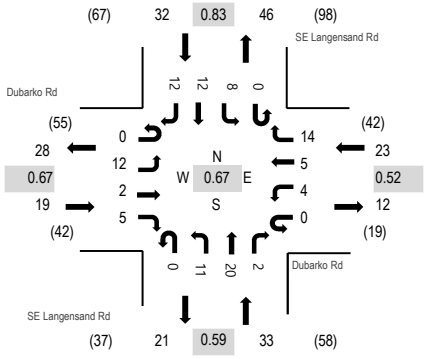
Location: 4 SE Langensand Rd & Dubarko Rd AM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

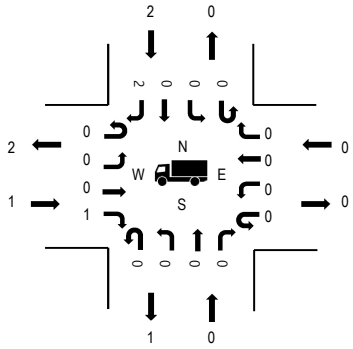
Location: 4 SE Langensand Rd & Dubarko Rd AM
Date: Tuesday, September 21, 2021
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:15 AM - 08:30 AM

Peak Hour

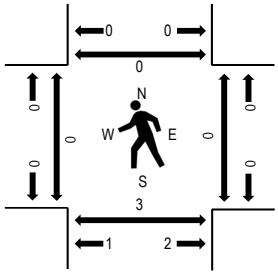
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.3%	0.67
WB	0.0%	0.52
NB	0.0%	0.59
SB	6.3%	0.83
All	2.8%	0.67

Traffic Counts - Motorized Vehicles

Interval Start Time	Dubarko Rd Eastbound				Dubarko Rd Westbound				SE Langensand Rd Northbound				SE Langensand Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	4	102
7:05 AM	0	1	0	0	0	0	0	1	0	1	1	0	0	0	2	2	8	104
7:10 AM	0	2	0	0	0	0	1	1	0	0	2	0	0	0	0	0	6	100
7:15 AM	0	3	0	0	0	0	2	0	0	1	1	0	0	0	3	2	12	100
7:20 AM	0	3	1	0	0	0	1	4	0	0	5	0	0	0	2	0	16	95
7:25 AM	0	0	1	0	0	0	1	3	0	0	3	0	0	0	1	2	11	98
7:30 AM	0	2	0	0	0	0	0	0	0	0	1	0	0	0	1	1	5	101
7:35 AM	0	2	0	0	0	0	0	0	0	0	1	0	0	1	1	2	7	100
7:40 AM	0	0	1	0	0	0	0	0	0	1	2	0	0	2	2	0	8	103
7:45 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	2	6	103
7:50 AM	0	5	0	0	0	0	0	1	0	2	1	0	0	0	1	2	12	101
7:55 AM	0	1	0	0	0	0	0	2	0	0	2	0	0	0	0	2	7	102
8:00 AM	0	0	0	1	0	0	0	0	0	0	2	0	0	0	1	2	6	107
8:05 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2	0	4	
8:10 AM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	4	6	
8:15 AM	0	0	0	1	0	0	0	3	0	1	0	0	0	0	0	2	7	
8:20 AM	0	4	1	0	0	0	1	2	0	1	4	0	0	2	1	3	19	
8:25 AM	0	1	0	1	0	1	1	3	0	0	3	0	0	1	3	0	14	
8:30 AM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	4	
8:35 AM	0	1	0	2	0	2	0	1	0	1	2	0	0	0	1	0	10	
8:40 AM	0	2	0	0	0	0	1	0	0	0	1	0	0	2	2	0	8	
8:45 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	4	
8:50 AM	0	3	1	0	0	0	0	3	0	1	2	2	0	1	0	0	13	
8:55 AM	0	1	0	0	0	0	1	1	0	4	3	0	0	1	0	1	12	
Count Total	0	31	6	5	0	4	11	27	0	16	40	2	0	11	28	28	209	
Peak Hour	0	12	2	5	0	4	5	14	0	11	20	2	0	8	12	12	107	

Location: 4 SE Langensand Rd & Dubarko Rd AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	1	0	1	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	1	1
7:10 AM	1	0	0	0	1	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	1	1	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	1	1	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0	7:30 AM	1	0	0	0	1
7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	1	0	0	0	1	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	1	1	0	0	2	7:50 AM	0	0	0	0	0	7:50 AM	0	0	1	0	1
7:55 AM	0	0	1	0	1	7:55 AM	0	1	0	0	1	7:55 AM	0	0	0	0	0
8:00 AM	1	0	0	0	1	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	2	2	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0	8:25 AM	0	1	0	0	1
8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0	8:30 AM	0	1	0	0	1
8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0	8:40 AM	0	1	0	0	1
8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	4	1	2	4	11	Count Total	0	1	0	0	1	Count Total	1	3	1	1	6
Peak Hour	1	0	0	2	3	Peak Hour	0	0	0	0	0	Peak Hour	0	3	0	0	3

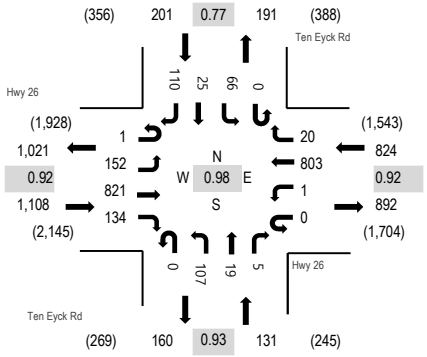
Location: 2 Ten Eyck Rd & Hwy 26 PM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

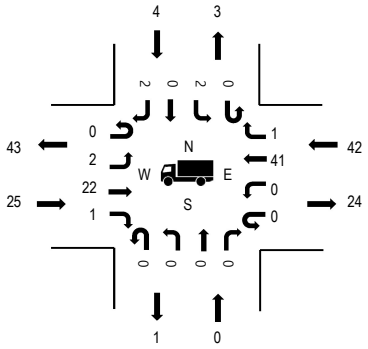
Location: 2 Ten Eyck Rd & Hwy 26 PM
Date: Tuesday, September 21, 2021
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour

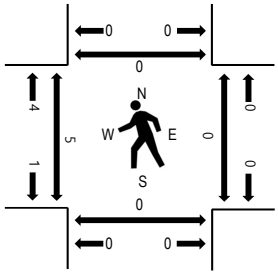
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.3%	0.92
WB	5.1%	0.92
NB	0.0%	0.93
SB	2.0%	0.77
All	3.1%	0.98

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 26 Eastbound				Hwy 26 Westbound				Ten Eyck Rd Northbound				Ten Eyck Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	10	63	7	0	0	61	1	0	8	2	0	0	2	2	6	162	2,156
4:05 PM	0	7	80	10	0	0	51	3	0	10	1	1	0	3	3	9	178	2,166
4:10 PM	0	18	58	9	0	0	67	4	0	6	1	0	0	2	1	10	176	2,182
4:15 PM	0	13	54	11	0	0	69	1	0	8	0	0	0	1	0	16	173	2,187
4:20 PM	1	13	56	7	0	0	53	1	0	5	1	0	0	1	1	8	147	2,207
4:25 PM	0	7	62	5	0	0	77	7	0	10	3	0	0	2	1	8	182	2,253
4:30 PM	0	17	64	14	0	0	64	2	0	9	0	0	0	1	1	8	180	2,264
4:35 PM	0	7	73	7	0	0	77	2	0	8	2	1	0	2	0	10	189	2,264
4:40 PM	1	10	87	12	0	0	71	1	0	7	0	0	0	2	1	7	199	2,262
4:45 PM	0	15	68	8	0	1	56	5	0	14	3	2	0	5	2	11	190	2,238
4:50 PM	0	8	72	19	0	0	50	1	0	9	0	0	0	12	4	14	189	2,220
4:55 PM	0	11	68	17	0	0	64	3	0	5	4	0	0	7	3	9	191	2,200
5:00 PM	0	8	53	10	0	0	73	1	0	12	0	1	0	6	2	6	172	2,133
5:05 PM	0	14	63	5	0	0	85	2	0	11	2	0	0	5	1	6	194	
5:10 PM	0	13	59	8	0	0	63	0	0	9	2	0	0	12	3	12	181	
5:15 PM	0	15	68	6	0	0	76	1	0	8	2	0	0	7	2	8	193	
5:20 PM	0	14	70	14	0	0	60	1	0	11	2	0	0	2	4	15	193	
5:25 PM	0	20	76	14	0	0	64	1	0	4	2	1	0	5	2	4	193	
5:30 PM	0	22	65	6	0	0	62	2	0	7	1	0	0	3	0	12	180	
5:35 PM	0	10	70	11	0	0	74	2	0	8	0	0	0	2	0	10	187	
5:40 PM	0	16	72	15	0	1	46	2	0	10	1	1	0	2	0	9	175	
5:45 PM	0	10	74	9	0	0	54	1	0	9	2	0	0	5	0	8	172	
5:50 PM	0	21	78	3	0	0	38	2	0	9	1	0	0	2	0	15	169	
5:55 PM	0	10	49	5	0	0	40	0	0	6	1	2	0	2	2	7	124	
Count Total	2	309	1,602	232	0	2	1,495	46	0	203	33	9	0	93	35	228	4,289	
Peak Hour	1	152	821	134	0	1	803	20	0	107	19	5	0	66	25	110	2,264	

Location: 2 Ten Eyck Rd & Hwy 26 PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	4	2	6	0	12	4:00 PM	0	0	0	0	0	4:00 PM	0	0	1	0	1
4:05 PM	2	1	4	0	7	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	0	7	0	9	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	3	0	3	3	9	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	3	0	2	2	7	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	2	0	4	0	6	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	6	0	7	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	3	0	3	0	6	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	4	0	5	0	9	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	2	0	1	1	4	4:45 PM	0	0	0	1	1	4:45 PM	0	0	0	0	0
4:50 PM	0	0	2	1	3	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	2	0	10	0	12	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	3	0	3	1	7	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	2	0	6	1	9	5:05 PM	0	0	0	0	0	5:05 PM	4	0	0	0	4
5:10 PM	1	0	2	0	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	4	0	1	0	5	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	0	1	0	2	5:20 PM	0	0	0	0	0	5:20 PM	1	0	0	0	1
5:25 PM	2	0	2	0	4	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	3	0	1	0	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	5	0	5	5:35 PM	0	0	0	0	0	5:35 PM	2	0	0	0	2
5:40 PM	5	0	2	0	7	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	2	0	3	0	5	5:45 PM	0	0	0	0	0	5:45 PM	1	0	0	0	1
5:50 PM	2	0	1	1	4	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	2	1	2	1	6	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	55	4	82	11	152	Count Total	0	0	0	1	1	Count Total	8	0	1	0	9
Peak Hour	25	0	42	4	71	Peak Hour	0	0	0	1	1	Peak Hour	5	0	0	0	5

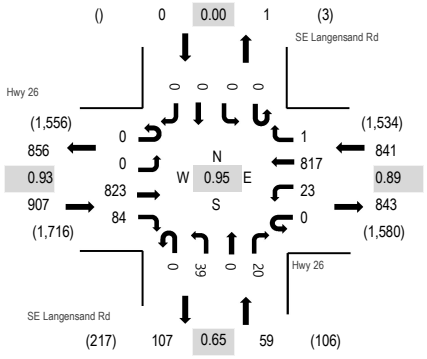
Location: 3 SE Langensand Rd & Hwy 26 PM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

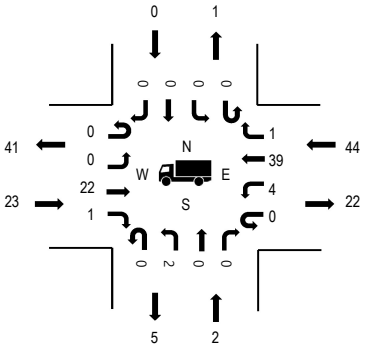
Location: 3 SE Langensand Rd & Hwy 26 PM
Date: Tuesday, September 21, 2021
Peak Hour: 04:25 PM - 05:25 PM
Peak 15-Minutes: 04:25 PM - 04:40 PM

Peak Hour

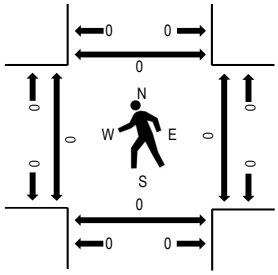
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.5%	0.93
WB	5.2%	0.89
NB	3.4%	0.65
SB	0.0%	0.00
All	3.8%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 26 Eastbound				Hwy 26 Westbound				SE Langensand Rd Northbound				SE Langensand Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	69	9	0	3	51	0	0	2	0	3	0	0	0	0	137	1,696
4:05 PM	0	0	50	6	0	2	56	0	0	1	0	3	0	0	0	0	118	1,708
4:10 PM	0	0	66	9	0	1	78	0	0	2	0	2	0	0	0	0	158	1,754
4:15 PM	0	0	45	7	0	2	61	0	0	2	0	4	0	0	0	0	121	1,734
4:20 PM	0	0	40	5	0	0	59	0	0	1	0	0	0	0	0	0	105	1,746
4:25 PM	0	0	65	8	0	0	74	0	0	8	0	1	0	0	0	0	156	1,807
4:30 PM	0	0	62	7	0	0	65	0	0	7	0	2	0	0	0	0	143	1,788
4:35 PM	0	0	80	7	0	2	81	0	0	3	0	3	0	0	0	0	176	1,796
4:40 PM	0	0	72	9	0	3	61	1	0	3	0	2	0	0	0	0	151	1,755
4:45 PM	0	0	73	6	0	1	53	0	0	0	0	2	0	0	0	0	135	1,733
4:50 PM	0	0	72	4	0	2	65	0	0	5	0	2	0	0	0	0	150	1,732
4:55 PM	0	0	76	7	0	4	55	0	0	2	0	2	0	0	0	0	146	1,705
5:00 PM	0	0	57	6	0	2	82	0	0	1	0	1	0	0	0	0	149	1,660
5:05 PM	0	0	69	8	0	3	82	0	0	2	0	0	0	0	0	0	164	
5:10 PM	0	0	55	11	0	1	66	0	0	2	0	3	0	0	0	0	138	
5:15 PM	0	0	60	9	0	3	56	0	0	4	0	1	0	0	0	0	133	
5:20 PM	0	0	82	2	0	2	77	0	0	2	0	1	0	0	0	0	166	
5:25 PM	0	0	62	9	0	1	62	0	0	2	0	1	0	0	0	0	137	
5:30 PM	0	0	72	10	0	0	65	0	0	0	0	4	0	0	0	0	151	
5:35 PM	0	0	68	8	0	0	55	2	0	0	0	2	0	0	0	0	135	
5:40 PM	0	0	57	12	0	0	54	0	0	3	0	3	0	0	0	0	129	
5:45 PM	0	0	75	6	0	0	51	0	0	0	0	2	0	0	0	0	134	
5:50 PM	0	0	69	12	0	0	40	0	0	1	0	1	0	0	0	0	123	
5:55 PM	0	0	37	6	0	2	48	0	0	6	0	2	0	0	0	0	101	
Count Total	0	0	1,533	183	0	34	1,497	3	0	59	0	47	0	0	0	0	3,356	
Peak Hour	0	0	823	84	0	23	817	1	0	39	0	20	0	0	0	0	1,807	

Location: 3 SE Langensand Rd & Hwy 26 PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	3	1	3	0	7	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	1	1	4	0	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	0	8	0	10	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	2	1	1	0	4	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	3	0	4	0	7	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	5	0	5	4:25 PM	2	0	0	0	2	4:25 PM	0	0	0	0	0
4:30 PM	1	0	1	0	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	0	5	0	7	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	5	0	5	0	10	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	2	0	1	0	3	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	1	2	4	0	7	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	2	0	10	0	12	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	2	0	6	0	8	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	2	0	3	0	5	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	0	1	0	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	2	0	1	0	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	2	0	2	0	4	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	4	0	1	0	5	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	0	5	0	6	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	2	0	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	2	0	3	0	5	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	3	0	3	0	6	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	2	0	1	0	3	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	1	0	3	0	4	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	48	5	82	0	135	Count Total	2	0	0	0	2	Count Total	0	0	0	0	0
Peak Hour	23	2	44	0	69	Peak Hour	2	0	0	0	2	Peak Hour	0	0	0	0	0

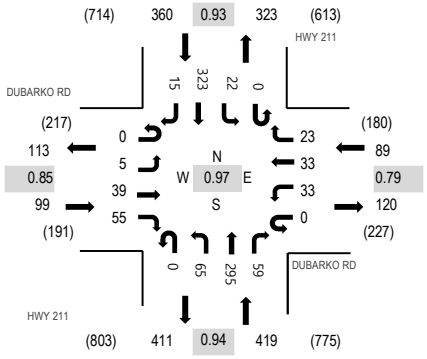
Location: HWY 211 & DUBARKO RD PM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

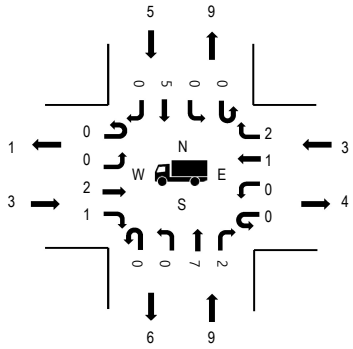
Location: HWY 211 & DUBARKO RD PM
Date: Wednesday, June 9, 2021
Peak Hour: 04:20 PM - 05:20 PM
Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour

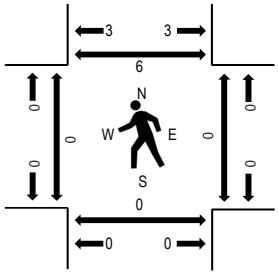
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.0%	0.85
WB	3.4%	0.79
NB	2.1%	0.94
SB	1.4%	0.93
All	2.1%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	DUBARKO RD Eastbound				DUBARKO RD Westbound				HWY 211 Northbound				HWY 211 Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	2	2	0	3	1	0	0	4	22	2	0	0	16	0	52	933
4:05 PM	0	0	5	6	0	1	5	2	0	3	15	3	0	1	38	0	79	949
4:10 PM	0	0	2	6	0	2	3	0	0	3	18	3	0	2	41	2	82	965
4:15 PM	0	1	4	3	0	1	2	8	0	1	23	7	0	1	17	2	70	961
4:20 PM	0	1	4	5	0	5	4	4	0	5	31	4	0	0	23	0	86	967
4:25 PM	0	0	2	4	0	1	3	2	0	5	30	7	0	4	28	1	87	954
4:30 PM	0	1	1	4	0	3	2	1	0	6	17	6	0	1	24	1	67	947
4:35 PM	0	0	5	6	0	3	2	2	0	5	28	8	0	1	31	0	91	961
4:40 PM	0	0	4	2	0	3	7	1	0	7	20	1	0	2	29	3	79	934
4:45 PM	0	0	5	4	0	0	4	2	0	3	19	6	0	1	31	0	75	950
4:50 PM	0	0	3	5	0	4	3	2	0	4	31	4	0	0	26	1	83	937
4:55 PM	0	1	2	2	0	4	1	2	0	5	31	7	0	3	22	2	82	933
5:00 PM	0	0	2	7	0	1	1	1	0	4	21	2	0	2	25	2	68	927
5:05 PM	0	0	5	6	0	1	1	3	0	10	27	3	0	4	33	2	95	
5:10 PM	0	0	1	7	0	6	4	1	0	4	16	8	0	3	27	1	78	
5:15 PM	0	2	5	3	0	2	1	2	0	7	24	3	0	1	24	2	76	
5:20 PM	0	0	4	2	0	4	2	2	0	2	19	7	0	1	30	0	73	
5:25 PM	0	1	4	4	0	1	3	1	0	11	29	5	0	1	20	0	80	
5:30 PM	0	2	1	2	0	0	4	6	0	4	19	7	0	2	33	1	81	
5:35 PM	0	0	1	1	0	1	3	2	0	5	22	3	0	1	24	1	64	
5:40 PM	0	0	4	8	0	3	6	3	0	4	23	5	0	1	34	4	95	
5:45 PM	0	1	3	6	0	3	1	3	0	2	15	2	0	1	24	1	62	
5:50 PM	0	0	2	5	0	0	5	1	0	8	28	3	0	4	23	0	79	
5:55 PM	0	1	4	5	0	0	5	4	0	4	19	6	0	3	23	2	76	
Count Total	0	11	75	105	0	52	73	55	0	116	547	112	0	40	646	28	1,860	
Peak Hour	0	5	39	55	0	33	33	23	0	65	295	59	0	22	323	15	967	

Location: HWY 211 & DUBARKO RD PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	1	0	1	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	3	3	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	1	1	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	1	2	0	0	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	1	0	3	4
4:30 PM	0	1	1	0	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	1	1	0	2	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	1	1	4:45 PM	1	0	0	0	1	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	2	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	1	1	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	1	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	2	0	1	4	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	3	3
5:20 PM	0	1	0	1	2	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	1	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	3	3
5:30 PM	0	2	0	2	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	1	0	0	1	5:35 PM	0	0	0	1	1	5:35 PM	0	0	0	1	1
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	1	1	1	0	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	4	16	5	15	40	Count Total	1	0	0	1	2	Count Total	0	1	0	10	11
Peak Hour	3	9	3	5	20	Peak Hour	1	0	0	0	1	Peak Hour	0	1	0	6	7

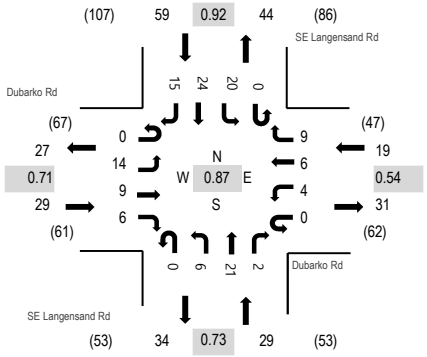
Location: 4 SE Langensand Rd & Dubarko Rd PM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

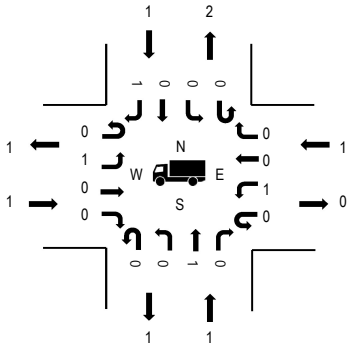
Location: 4 SE Langensand Rd & Dubarko Rd PM
Date: Tuesday, September 21, 2021
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour

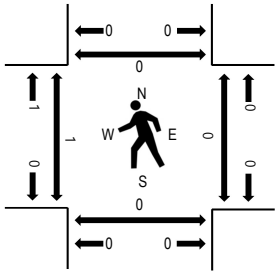
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.4%	0.71
WB	5.3%	0.54
NB	3.4%	0.73
SB	1.7%	0.92
All	2.9%	0.87

Traffic Counts - Motorized Vehicles

Interval Start Time	Dubarko Rd Eastbound				Dubarko Rd Westbound				SE Langensand Rd Northbound				SE Langensand Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	3	1	0	0	0	0	1	0	2	1	1	0	2	5	1	17	132
4:05 PM	0	1	0	0	0	0	1	0	0	3	1	0	0	2	1	2	11	125
4:10 PM	0	2	1	1	0	0	0	2	0	1	0	1	0	1	1	1	11	126
4:15 PM	0	1	0	1	0	1	0	1	0	2	0	1	0	0	0	2	9	125
4:20 PM	0	0	0	0	0	0	2	2	0	0	1	0	0	5	1	1	12	133
4:25 PM	0	1	0	0	0	0	4	2	0	1	4	0	0	1	1	0	14	127
4:30 PM	0	2	1	0	0	0	1	3	0	0	0	0	0	1	1	0	9	121
4:35 PM	0	3	1	0	0	0	1	2	0	2	0	1	0	1	0	4	15	119
4:40 PM	0	1	1	0	0	0	3	0	0	0	0	0	0	1	1	1	8	119
4:45 PM	0	1	1	0	0	0	1	0	0	0	2	0	0	1	2	1	9	123
4:50 PM	0	4	1	0	0	0	0	0	0	0	0	0	0	1	0	1	7	126
4:55 PM	0	1	2	1	0	0	1	0	0	0	0	0	0	2	2	1	10	133
5:00 PM	0	2	1	0	0	0	0	0	0	0	0	1	0	2	2	2	10	136
5:05 PM	0	1	0	0	0	0	2	2	0	0	2	0	0	0	1	4	12	
5:10 PM	0	0	2	1	0	0	1	0	0	1	0	0	0	2	3	0	10	
5:15 PM	0	2	1	1	0	2	0	1	0	0	5	0	0	2	1	2	17	
5:20 PM	0	1	0	0	0	0	0	2	0	0	0	0	0	0	3	0	6	
5:25 PM	0	0	1	0	0	1	0	0	0	1	1	0	0	1	2	1	8	
5:30 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	2	3	0	7	
5:35 PM	0	2	1	0	0	1	0	0	0	3	3	1	0	0	2	2	15	
5:40 PM	0	1	0	0	0	0	1	2	0	0	2	0	0	3	3	0	12	
5:45 PM	0	2	3	2	0	0	0	1	0	0	1	0	0	1	2	0	12	
5:50 PM	0	1	0	1	0	0	1	1	0	0	3	0	0	5	0	2	14	
5:55 PM	0	1	0	1	0	0	1	0	0	1	3	0	0	2	2	2	13	
Count Total	0	34	18	9	0	5	20	22	0	17	30	6	0	38	39	30	268	
Peak Hour	0	14	9	6	0	4	6	9	0	6	21	2	0	20	24	15	136	

Location: 4 SE Langensand Rd & Dubarko Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	0	1	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	1	0	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	1	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	1	1	2
4:40 PM	0	0	1	1	2	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	1	0	0	0	1
5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	1	0	0	0	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	3	2	3	3	11	Count Total	0	0	0	0	0	Count Total	1	0	1	1	3
Peak Hour	1	1	1	1	4	Peak Hour	0	0	0	0	0	Peak Hour	1	0	0	0	1

Location	US26; MP 46.38; MT. HOOD HIGHWAY NO. 26; 0.30 mile east of Camp Creek Rd (USFS 28)	Site Name	Rhododendron (03-006)
		Installed	August, 1995

HISTORICAL ANNUAL TRAFFIC DATA

Year	Annual Average Daily Traffic (AADT)	Critical Values as percent of Annual Average Daily Traffic (AADT)				
		Max Day	Max Hour	10th Hour	20th Hour	30th Hour
2010	8714	207	21.6	19.8	18.9	18.5
2011	8330	214	24.7	20.0	18.6	18.1
2012	8480	227	24.0	21.0	20.2	19.4
2013	8527	213	23.4	21.1	20.3	19.1
2014	8652	216	23.2	21.1	20.3	19.2
2015	8861	242	21.4	20.3	19.4	18.7
2016	10071	208	22.9	19.6	18.8	17.9
2017	10223	200	19.9	19.1	18.1	17.5
2018	10291	199	20.4	19.5	19.0	18.5
2019	10218	204	20.5	19.5	19.1	18.6

2019 SEASONAL TRAFFIC DATA

Month	Weekday		Daily	
	Average	% AADT	Average	% AADT
January	8537	84	11650	114
February	7637	75	9937	97
March	7393	72	10238	100
April	6402	63	8476	83
May	7666	75	9670	95
June	8771	86	11100	109
July	10810	106	13605	133
August	10610	104	13497	132
September	8391	82	9937	97
October	6484	63	7998	78
November	5653	55	6971	68
December	7878	77	9535	93

Location	26/Camp Creek Road (USFS 28) ; MT. HOOD HIGHWAY NO. 26; 0.30 miles east of Camp Creek Road (USFS 28)	Site Name	Rhododendron (03-006)
		Installed	August, 1995

HISTORICAL ANNUAL TRAFFIC DATA

Year	Annual Average Daily Traffic (AADT)	Critical Values as percent of Annual Average Daily Traffic (AADT)				
		Max Day	Max Hour	10th Hour	20th Hour	30th Hour
2011	8330	214.3	24.7	20.0	18.6	18.1
2012	8480	227.4	24.0	21.0	20.2	19.4
2013	8527	213.0	23.4	21.1	20.3	19.1
2014	8652	215.7	23.2	21.1	20.3	19.2
2015	8861	242.4	21.4	20.3	19.4	18.7
2016	10100	208.0	22.8	19.5	18.7	17.8
2017	10223	200.1	19.9	19.1	18.1	17.5
2018	10291	198.7	20.4	19.5	19.0	18.5
2019	10218	204.5	20.5	19.5	19.1	18.6
2020	9424	243.8	25.1	23.2	22.5	21.7

2020 SEASONAL TRAFFIC DATA

Month	Weekday		Daily	
	Average	% AADT	Average	% AADT
January	8614	91	10821	115
February	9017	96	10856	115
March	5718	61	6931	74
April	4035	43	4233	45
May	6874	73	7385	78
June	9094	96	10055	107
July	12427	132	14166	150
August	11697	124	13411	142
September	4654	49	4799	51
October	8486	90	9334	99
November	6838	73	8021	85
December	11615	123	13083	139

Highest Hour

Date	Day	Hours of Day	Rank	Volume	%AADT
07/26/2020	Sunday	1:00 - 2:00 pm	1	2368	25.1
12/26/2020	Saturday	2:00 - 3:00 pm	10	2187	23.2
07/26/2020	Sunday	11:00 - 12:00 am	20	2123	22.5
12/31/2020	Thursday	2:00 - 3:00 pm	30	2044	21.7
12/31/2020	Thursday	1:00 - 2:00 pm	40	1966	20.9
07/19/2020	Sunday	11:00 - 12:00 am	50	1915	20.3

Highest Day

Date	Day	Volume	AADT
12/27/2020	Sunday	22974	243.8

Comments:
2020 - COVID-19

Table 1 provides traffic volumes by corridor for weekdays and weekends for the last five weeks of available data, May 31 to July 4, 2021[5]. Corridor volumes are prepared by summing traffic volumes from ATRs across 13 corridors for years 2019, 2020 and 2021[6].

Overall statewide traffic volumes are close to pre-COVID traffic volumes. For the month of June, statewide average weekday traffic volumes ranged between 5% below and 5% above 2019 pre-COVID conditions, while weekend volumes ranged between 9% below and equal to 2019 levels. Recent forecast news from the Oregon DAS Office of Economic Analysis indicates economic recovery is expected to move faster than past recessions [7]

Table 1. Observed Year-Over-Year Difference in Traffic Volumes by Corridor 2019-2021

		2021 Volumes		2020 Volumes		2019 Volumes		2021 as % of 2020	
Date	Corridor	Average Weekday	Average Weekend	Average Weekday	Average Weekend	Average Weekday	Average Weekend	Weekday Diff	Weekend Diff
Week 23 May 31- June 6, 2021	I-5	558,510	483,914	466,638	356,866	588,873	519,086	20%	36%
	I-205	244,436	204,969	210,138	158,028	269,797	235,467	16%	30%
	I-405	121,681	101,902	103,291	66,692	143,769	119,357	18%	53%
	I-84	367,455	323,293	308,732	238,313	371,031	343,419	19%	36%
	US 97	158,986	135,404	146,823	118,339	168,151	143,367	8%	14%
	US197	3,578	3,120	2,959	2,583	3,325	2,777	21%	21%
	US20	28,808	24,285	23,669	19,012	25,683	24,331	22%	28%
	US26	54,746	48,449	45,634	41,742	52,260	55,722	20%	16%
	US30	13,271	11,148	10,584	9,625	11,896	11,960	25%	16%
	US395	27,000	22,600	25,703	19,130	29,165	21,212	5%	18%
	OR18	20,746	20,537	17,111	19,026	16,663	21,557	21%	8%
	OR22	31,732	25,749	28,307	20,870	31,838	27,314	12%	23%
	US101	89,221	76,993	69,722	62,523	85,138	78,636	28%	23%
Statewide Average		341,488	295,401	287,606	220,203	359,073	318,941	19%	34%
Week 24 June 7-13, 2021	I-5	563,778	506,995	482,153	403,769	604,078	557,050	17%	26%
	I-205	254,111	216,643	217,082	173,873	274,976	241,338	17%	25%
	I-405	130,579	103,765	106,251	67,900	138,162	111,721	23%	53%
	I-84	373,222	336,902	317,742	265,804	371,513	350,983	17%	27%
	US 97	162,982	143,270	151,426	128,987	167,322	144,049	8%	11%
	US197	3,279	3,081	2,875	2,874	3,300	2,984	14%	7%
	US20	26,872	24,396	23,035	21,125	27,478	26,848	17%	15%
	US26	49,816	50,297	44,922	46,867	54,733	59,844	11%	7%
	US30	11,968	11,572	10,544	10,341	12,629	12,870	14%	12%
	US395	28,230	24,050	25,522	19,638	27,868	21,759	11%	22%
	OR18	17,979	20,422	15,673	20,177	18,915	25,441	15%	1%
	OR22	32,004	25,896	27,696	23,442	32,686	29,214	16%	10%
	US101	90,358	75,148	68,825	67,046	90,295	84,241	31%	12%
Statewide Average		346,835	308,995	296,567	246,468	365,312	335,096	17%	25%

[5] Table 1 was revised to add Week 25, which was missing in the original publication, and correct 2021 volumes for I-5 Week 27.

[6] Statewide average values are weighted by pre-COVID traffic volumes in order to monitor relative change in traffic volumes. Without weighting, the higher volume corridors would dominate the results.

[7] See latest post by OEA: https://oregoneconomicanalysis.com/2021/07/09/no-permanent-damage-expected/

Table 1. Continued

Date	Corridor	2021 Volumes Average Weekday	2021 Volumes Average Weekend	2020 Volumes Average Weekday	2020 Volumes Average Weekend	2019 Volumes Average Weekday	2019 Volumes Average Weekend	2021 as % of 2020 Weekday Diff	2021 as % of 2020 Weekend Diff
Week 25 June 14-20, 2021	I-5	648,473	609,942	554,470	494,751	673,765	610,103	17%	23%
	I-205	256,067	232,607	224,414	185,383	274,694	234,369	14%	25%
	I-405	128,869	109,810	109,806	79,495	141,311	114,910	17%	38%
	I-84	378,980	359,454	331,515	287,292	376,594	352,837	14%	25%
	US 97	169,034	146,588	160,280	132,946	171,174	147,726	5%	10%
	US197	3,395	3,341	3,015	3,036	3,166	2,731	13%	10%
	US20	28,539	30,030	24,947	23,959	27,406	24,966	14%	25%
	US26	53,933	60,981	50,366	54,846	54,979	55,720	7%	11%
	US30	12,818	14,357	11,269	11,966	12,460	11,980	14%	20%
	US395	27,073	23,257	25,763	20,327	27,402	20,930	5%	14%
	OR18	19,698	26,584	17,126	22,632	19,082	24,222	15%	17%
	OR22	32,931	28,974	29,588	26,529	32,314	27,944	11%	9%
	US101	94,349	89,564	76,662	73,846	90,133	83,432	23%	21%
Statewide Average		379,839	355,209	328,305	287,463	392,232	354,110	16%	24%
	I-5	672,022	581,232	582,499	504,375	681,564	637,628	15%	15%
	I-205	256,997	206,426	232,417	183,951	272,315	242,337	11%	12%
	I-405	128,555	97,279	114,923	82,361	141,796	114,097	12%	18%
	I-84	377,968	335,713	345,827	292,369	374,522	360,083	9%	15%
	US 97	170,495	145,017	158,539	138,318	175,540	153,776	8%	5%
Week 26	US197	3,489	2,961	2,983	2,838	3,225	2,773	17%	4%
June 21-27, 2021	US20	29,800	34,010	26,999	23,481	26,630	26,566	10%	45%
	US26	55,717	61,416	54,904	52,928	53,689	60,187	1%	16%
	US30	13,693	15,809	12,405	11,676	12,311	13,294	10%	35%
	US395	28,460	22,779	25,976	20,373	27,715	22,494	10%	12%
	OR18	21,182	30,189	19,576	22,294	18,222	24,136	8%	35%
	OR22	33,385	26,101	31,422	26,587	31,992	28,362	6%	-2%
	US101	98,804	100,833	82,993	74,592	88,651	84,620	19%	35%
Statewide Average		388,764	335,669	343,294	292,392	394,581	367,406	13%	15%
								2021 as % of 2020	
	I-5	680,017	557,497	599,387	439,212	636,787	603,551	13%	27%
	I-205	255,230	201,890	230,486	160,365	264,679	233,850	11%	26%
	I-405	126,822	95,191	111,968	70,889	123,646	102,444	13%	34%
	I-84	380,689	323,545	348,858	267,641	361,921	355,128	9%	21%
	US 97	165,621	132,609	169,566	126,035	166,794	152,338	-2%	5%
Week 27	US197	3,272	3,267	3,408	3,325	3,231	3,371	-4%	-2%
June 28-July 4, 2021	US20	29,660	25,853	26,266	22,930	27,245	26,959	13%	13%
	US26	55,721	54,020	53,748	53,855	57,856	59,219	4%	0%
	US30	14,587	13,656	12,567	12,890	13,743	13,935	16%	6%
	US395	28,260	25,150	25,480	17,543			11%	43%
	OR18	22,173	24,161	18,925	22,146	21,539	25,550	17%	9%
	OR22	32,802	25,515	31,403	24,722	31,276	29,115	4%	3%
	US101	101,435	91,215	81,079	72,810	94,911	88,308	25%	25%
Statewide Average		391,562	321,992	350,290	258,291	372,567	351,591	12%	25%

Figure 2 presents weekday and weekend average volumes by week for years 2019-2021 for each corridor, graphically representing current and past data provided in the Table 1 format.

Notable patterns observed for the month of June include:

SEASONAL TREND TABLE (Updated: 7/20/2021)[1]															Seasonal Trend Peak Period Factor
TREND	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	
INTERSTATE URBANIZED	0.9615	0.9463	0.9517	0.9571	0.9551	0.9531	0.9674	0.9816	0.9850	0.9884	1.0045	1.0206	1.0322	1.0438	0.9463
INTERSTATE NONURBANIZED	0.9005	0.8506	0.8322	0.8139	0.8221	0.8302	0.8719	0.9135	0.9441	0.9747	1.0178	1.0608	1.1123	1.1638	0.8139
COMMUTER	0.9503	0.9355	0.9470	0.9585	0.9509	0.9433	0.9528	0.9623	0.9614	0.9604	0.9938	1.0272	1.0474	1.0676	0.9355
COASTAL DESTINATION	0.9347	0.8972	0.8612	0.8252	0.8205	0.8159	0.8686	0.9214	0.9689	1.0164	1.0660	1.1156	1.1580	1.2005	0.8159
COASTAL DESTINATION ROUTE	0.8941	0.8409	0.7820	0.7231	0.7218	0.7205	0.8016	0.8827	0.9669	1.0511	1.1133	1.1754	1.2480	1.3206	0.7205
AGRICULTURE	0.8579	0.8146	0.8058	0.7970	0.7922	0.7873	0.7772	0.7670	0.8288	0.8905	0.9947	1.0989	1.2462	1.3934	0.7670
RECREATIONAL SUMMER	0.8256	0.7484	0.7018	0.6552	0.6708	0.6864	0.7393	0.7922	0.8898	0.9874	1.1242	1.2610	1.3965	1.5320	0.6552
RECREATIONAL SUMMER WINTER	0.9760	0.8821	0.8005	0.7190	0.7305	0.7420	0.8897	1.0374	1.2010	1.3645	1.5212	1.6778	1.3812	1.0847	0.7190
RECREATIONAL WINTER	1.2832	1.1625	0.9985	0.8344	0.8600	0.8857	1.0560	1.2262	1.4100	1.5937	1.8758	2.1580	1.5328	0.9076	0.6389
SUMMER	0.8976	0.8615	0.8457	0.8299	0.8354	0.8410	0.8743	0.9077	0.9357	0.9638	1.0273	1.0908	1.1322	1.1737	0.8299
SUMMER < 2500	0.8720	0.8387	0.8237	0.8086	0.8229	0.8373	0.8616	0.8859	0.9233	0.9607	1.0428	1.1249	1.2016	1.2783	0.8086

* Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.
* Grey shading indicates months were seasonal factor is greater than or less than 30%
* February 2019 snow event causing lower seasonal factors

[1]Seasonal Trend Table: The 2020 table is based on 2019 values due to the irregularity caused by the Covid epidemic shutdown during the 2020 count year.

Commuter Seasonal Adjustment Calculations:

15-Sep	0.9623		1-Jun	0.9503	
1-Oct	0.9614		15-Jun	0.9355	
Difference	0.0009	(over 16 days)	Difference	0.0148	
Daily	5.63E-05		Daily	0.001057	
21-Sep	0.961963		9-Jun	0.941843	
Peak Season	0.9355		Peak Season	0.9355	
September 21 Adjustment	2.8%		**June 9 Adjustment**	0.7%	

Site id	HWY	MP	DIR	HS	Description	2017	2018	2019	2039	RSQ
1778	026	22.72	1		0.02 mile northwest of SE 362nd Drive, west city limits of Sandy		33700		47300	MODEL
1779	026	23.85	1		0.02 mile west of Bluff Road		33300		47100	MODEL
1780	026	23.89	1		0.02 mile east of Bluff Road		15700		22400	MODEL
1781	026	24.02	1		0.02 mile west of Beers Avenue		16200		23100	MODEL
1782	026	24.35	1		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		16000		23400	MODEL
1783	026	24.42	1		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		12400		17700	MODEL
1784	026	24.59	1		0.02 mile west of Ten Eyck Road		12500		17800	MODEL
1785	026	23.89	2		0.02 mile east of Bluff Road		16600		23300	MODEL
1786	026	24.04	2		0.02 mile west of Beers Avenue		18300		25600	MODEL
1787	026	24.36	2		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		15900		22700	MODEL
1788	026	24.40	2		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		13700		19200	MODEL
1789	026	24.61	2		0.02 mile west of Ten Eyck Road		12600		17600	MODEL
1790	026	25.10	1		0.02 mile west of Langensand Road		20700		29200	MODEL
1791	026	25.66	1		0.10 mile east of Vista Loop Drive		23500		32900	MODEL

Site id	HWY	MP	DIR	HS	Description	2017	2018	2019	2039	RSQ
3563	172	-0.13	1		0.10 mile east of Clackamas Highway (OR224)			6000	9400	MODEL
3564	172	1.45	1		0.10 mile southwest of Judd Road			7100	11200	MODEL
3565	172	1.65	1		0.10 mile northeast of Judd Road			7400	11400	MODEL
3566	172	3.65	1		0.05 mile west of 362nd Drive			8000	12200	MODEL
3567	172	3.75	1		0.05 mile east of 362nd Drive			5900	8800	MODEL
3568	172	5.07	1		0.10 mile west of Bornstedt Road			4600	7600	MODEL
3569	172	5.29	1		0.10 mile south of Dubarko Road			6300	10300	MODEL
3570	172	5.50	1		0.11 mile north of Dubarko Road			5700	9200	MODEL
3571	172	5.83	1		0.05 mile south of Mt. Hood Highway (US26-EB)			7500	12100	MODEL
3572	172	5.92	1		0.02 mile south of Mt. Hood Highway (US26-WB)			4400	7100	MODEL

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	676	57	0	739	17	114	13	2	30	8	136
Future Volume (vph)	120	676	57	0	739	17	114	13	2	30	8	136
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00			0.99	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.99			1.00	0.85		1.00			0.89	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.99	
Satd. Flow (prot)	1498	2955			3107	1343		1575			1474	
Flt Permitted	0.95	1.00			1.00	1.00		0.56			0.93	
Satd. Flow (perm)	1498	2955			3107	1343		914			1389	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	128	719	61	0	786	18	121	14	2	32	9	145
RTOR Reduction (vph)	0	4	0	0	0	10	0	1	0	0	101	0
Lane Group Flow (vph)	128	776	0	0	786	8	0	136	0	0	85	0
Confl. Peds. (#/hr)	4					4	2					2
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	11%	11%	11%	7%	7%	7%	6%	6%	6%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	15.5	74.5			54.5	54.5		36.5			36.5	
Effective Green, g (s)	15.5	74.5			54.5	54.5		36.5			36.5	
Actuated g/C Ratio	0.13	0.62			0.45	0.45		0.30			0.30	
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	193	1834			1411	609		278			422	
v/s Ratio Prot	c0.09	0.26			c0.25							
v/s Ratio Perm						0.01		c0.15			0.06	
v/c Ratio	0.66	0.42			0.56	0.01		0.49			0.20	
Uniform Delay, d1	49.8	11.7			23.9	18.0		34.1			30.9	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	8.3	0.7			1.6	0.0		6.1			0.2	
Delay (s)	58.1	12.4			25.5	18.0		40.2			31.2	
Level of Service	E	B			C	B		D			C	
Approach Delay (s)		18.8			25.4			40.2			31.2	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
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)	120	676	57	0	739	17	114	13	2	30	8	136
Future Volume (veh/h)	120	676	57	0	739	17	114	13	2	30	8	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1600	1600	1654	1654	1654	1668	1668	1668	1695	1695	1695
Adj Flow Rate, veh/h	128	719	61	0	786	18	121	14	2	32	9	145
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	11	11	11	7	7	7	6	6	6	4	4	4
Cap, veh/h	152	1757	149	1	1521	661	323	34	4	93	42	351
Arrive On Green	0.10	0.62	0.62	0.00	0.48	0.48	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1524	2830	240	1576	3143	1367	877	113	15	189	137	1153
Grp Volume(v), veh/h	128	386	394	0	786	18	137	0	0	186	0	0
Grp Sat Flow(s),veh/h/ln	1524	1520	1550	1576	1572	1367	1005	0	0	1479	0	0
Q Serve(g_s), s	9.9	15.5	15.5	0.0	20.7	0.8	4.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.9	15.5	15.5	0.0	20.7	0.8	16.4	0.0	0.0	11.6	0.0	0.0
Prop In Lane	1.00		0.15	1.00		1.00	0.88		0.01	0.17		0.78
Lane Grp Cap(c), veh/h	152	944	962	1	1521	661	362	0	0	485	0	0
V/C Ratio(X)	0.84	0.41	0.41	0.00	0.52	0.03	0.38	0.00	0.00	0.38	0.00	0.00
Avail Cap(c_a), veh/h	273	944	962	66	1521	661	362	0	0	485	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	53.1	11.6	11.6	0.0	21.3	16.2	35.4	0.0	0.0	33.2	0.0	0.0
Incr Delay (d2), s/veh	11.8	1.3	1.3	0.0	1.3	0.1	3.0	0.0	0.0	0.5	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	5.5	5.6	0.0	7.9	0.3	3.7	0.0	0.0	4.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	12.9	12.9	0.0	22.6	16.3	38.4	0.0	0.0	33.7	0.0	0.0
LnGrp LOS	E	B	B	A	C	B	D	A	A	C	A	A
Approach Vol, veh/h		908			804			137			186	
Approach Delay, s/veh		20.2			22.4			38.4			33.7	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	79.0		41.0	16.4	62.6		41.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	65.0		36.5	21.5	48.5		36.5				
Max Q Clear Time (g_c+I1), s	0.0	17.5		18.4	11.9	22.7		13.6				
Green Ext Time (p_c), s	0.0	6.3		0.7	0.2	6.4		1.2				

Intersection Summary			
HCM 6th Ctrl Delay		23.5	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	700	44	14	726	39	27
Future Vol, veh/h	700	44	14	726	39	27
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	14	14	7	7	2	2
Mvmt Flow	778	49	16	807	43	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	829	0	1216	391
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	436	-
Critical Hdwy	-	-	4.24	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.27	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	767	-	173	608
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	766	-	169	607
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	411	-
Stage 2	-	-	-	-	606	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	24.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	169	607	-	-	766	-
HCM Lane V/C Ratio	0.256	0.049	-	-	0.02	-
HCM Control Delay (s)	33.5	11.2	-	-	9.8	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	10	46	37	46	44	26	272	11	7	177	1
Future Vol, veh/h	4	10	46	37	46	44	26	272	11	7	177	1
Conflicting Peds, #/hr	2	0	2	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	5	13	59	47	59	56	33	349	14	9	227	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	729	678	231	708	672	360	230	0	0	365	0	0
Stage 1	247	247	-	424	424	-	-	-	-	-	-	-
Stage 2	482	431	-	284	248	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	335	370	801	347	375	680	1320	-	-	1183	-	-
Stage 1	750	696	-	604	584	-	-	-	-	-	-	-
Stage 2	560	578	-	719	698	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	259	354	798	302	359	677	1317	-	-	1181	-	-
Mov Cap-2 Maneuver	259	354	-	302	359	-	-	-	-	-	-	-
Stage 1	725	688	-	584	565	-	-	-	-	-	-	-
Stage 2	445	559	-	646	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	17.4	0.7	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1317	-	-	320	798	331	677	1181	-	-
HCM Lane V/C Ratio	0.025	-	-	0.056	0.074	0.321	0.083	0.008	-	-
HCM Control Delay (s)	7.8	0	-	16.9	9.9	20.9	10.8	8.1	0	-
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.2	1.4	0.3	0	-	-

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	13	2	5	4	5	15	12	21	2	8	13	13
Future Vol, veh/h	13	2	5	4	5	15	12	21	2	8	13	13
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	2	2	2	6	6	6
Mvmt Flow	19	3	7	6	7	22	18	31	3	12	19	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	136	123	32	130	131	33	38	0	0	34	0	0
Stage 1	53	53	-	69	69	-	-	-	-	-	-	-
Stage 2	83	70	-	61	62	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.12	6.52	6.22	4.12	-	-	4.16	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.518	4.018	3.318	2.218	-	-	2.254	-	-
Pot Cap-1 Maneuver	828	762	1033	843	760	1041	1572	-	-	1552	-	-
Stage 1	952	845	-	941	837	-	-	-	-	-	-	-
Stage 2	918	831	-	950	843	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	792	747	1030	819	745	1041	1572	-	-	1552	-	-
Mov Cap-2 Maneuver	792	747	-	819	745	-	-	-	-	-	-	-
Stage 1	941	838	-	930	827	-	-	-	-	-	-	-
Stage 2	879	821	-	930	836	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	9.1	2.5	1.7
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1572	-	-	792	929	923	1552	-	-
HCM Lane V/C Ratio	0.011	-	-	0.024	0.011	0.039	0.008	-	-
HCM Control Delay (s)	7.3	0	-	9.7	8.9	9.1	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	989	142	1	993	21	113	20	5	70	26	116
Future Volume (vph)	162	989	142	1	993	21	113	20	5	70	26	116
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		1.00			0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			0.98	
Satd. Flow (prot)	1630	3190		1583	3167	1387		1633			1544	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.55			0.86	
Satd. Flow (perm)	1630	3190		1583	3167	1387		938			1357	
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)	165	1009	145	1	1013	21	115	20	5	71	27	118
RTOR Reduction (vph)	0	9	0	0	0	11	0	1	0	0	36	0
Lane Group Flow (vph)	165	1145	0	1	1013	10	0	139	0	0	180	0
Confl. Peds. (#/hr)							5					5
Confl. Bikes (#/hr)			2			1						1
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	16.9	73.0		1.0	57.1	57.1		32.5			32.5	
Effective Green, g (s)	16.9	73.0		1.0	57.1	57.1		32.5			32.5	
Actuated g/C Ratio	0.14	0.61		0.01	0.48	0.48		0.27			0.27	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	229	1940		13	1506	659		254			367	
v/s Ratio Prot	c0.10	0.36		0.00	c0.32							
v/s Ratio Perm						0.01		c0.15			0.13	
v/c Ratio	0.72	0.59		0.08	0.67	0.02		0.55			0.49	
Uniform Delay, d1	49.3	14.4		59.0	24.2	16.6		37.4			36.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	10.6	1.3		2.5	2.4	0.0		8.2			1.0	
Delay (s)	59.9	15.7		61.6	26.7	16.6		45.6			37.8	
Level of Service	E	B		E	C	B		D			D	
Approach Delay (s)		21.2			26.5			45.6			37.8	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26

09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	989	142	1	993	21	113	20	5	70	26	116
Future Volume (veh/h)	162	989	142	1	993	21	113	20	5	70	26	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	1723	1723	1723	1682	1682	1682	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	165	1009	145	1	1013	21	115	20	5	71	27	118
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	2	2	2	2	2	2
Cap, veh/h	192	1762	253	2	1596	697	285	46	10	156	68	222
Arrive On Green	0.12	0.62	0.62	0.00	0.50	0.50	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1641	2864	411	1602	3195	1396	849	170	38	429	251	819
Grp Volume(v), veh/h	165	576	578	1	1013	21	140	0	0	216	0	0
Grp Sat Flow(s),veh/h/ln	1641	1637	1638	1602	1598	1396	1057	0	0	1499	0	0
Q Serve(g_s), s	11.8	25.1	25.2	0.1	27.9	0.9	2.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.8	25.1	25.2	0.1	27.9	0.9	16.1	0.0	0.0	13.7	0.0	0.0
Prop In Lane	1.00		0.25	1.00		1.00	0.82		0.04	0.33		0.55
Lane Grp Cap(c), veh/h	192	1007	1008	2	1596	697	341	0	0	446	0	0
V/C Ratio(X)	0.86	0.57	0.57	0.46	0.63	0.03	0.41	0.00	0.00	0.48	0.00	0.00
Avail Cap(c_a), veh/h	297	1007	1008	68	1596	697	341	0	0	446	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	52.0	13.7	13.7	59.9	22.0	15.3	38.0	0.0	0.0	37.0	0.0	0.0
Incr Delay (d2), s/veh	14.2	2.4	2.4	104.7	1.9	0.1	3.6	0.0	0.0	0.8	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	5.7	9.7	9.7	0.1	10.8	0.3	3.9	0.0	0.0	5.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.2	16.1	16.1	164.6	23.9	15.3	41.6	0.0	0.0	37.8	0.0	0.0
LnGrp LOS	E	B	B	F	C	B	D	A	A	D	A	A
Approach Vol, veh/h		1319			1035			140			216	
Approach Delay, s/veh		22.3			23.9			41.6			37.8	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	78.3		37.0	18.5	64.5		37.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	68.9		32.5	21.7	52.3		32.5				
Max Q Clear Time (g_c+I1), s	2.1	27.2		18.1	13.8	29.9		15.7				
Green Ext Time (p_c), s	0.0	11.0		0.6	0.3	8.3		1.2				

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	991	89	24	1009	41	21
Future Vol, veh/h	991	89	24	1009	41	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	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	5	5	3	3
Mvmt Flow	1043	94	25	1062	43	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1137	0	1624	522
Stage 1	-	-	-	-	1043	-
Stage 2	-	-	-	-	581	-
Critical Hdwy	-	-	4.2	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.25	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	593	-	92	497
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	520	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	593	-	88	497
Mov Cap-2 Maneuver	-	-	-	-	88	-
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	498	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	57.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	88	497	-	-	593	-
HCM Lane V/C Ratio	0.49	0.044	-	-	0.043	-
HCM Control Delay (s)	80.2	12.6	-	-	11.3	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	2.1	0.1	-	-	0.1	-

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	5	41	58	35	35	24	69	314	62	23	343	16
Future Vol, veh/h	5	41	58	35	35	24	69	314	62	23	343	16
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	2	2	2
Mvmt Flow	5	42	60	36	36	25	71	324	64	24	354	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	937	932	354	959	916	362	370	0	0	388	0	0
Stage 1	402	402	-	498	498	-	-	-	-	-	-	-
Stage 2	535	530	-	461	418	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	244	265	688	236	271	680	1189	-	-	1170	-	-
Stage 1	623	599	-	552	543	-	-	-	-	-	-	-
Stage 2	527	525	-	579	589	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	192	238	688	172	244	676	1189	-	-	1170	-	-
Mov Cap-2 Maneuver	192	238	-	172	244	-	-	-	-	-	-	-
Stage 1	575	583	-	509	501	-	-	-	-	-	-	-
Stage 2	432	485	-	478	574	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	26.8	1.3	0.5
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1189	-	-	232	688	202	676	1170	-	-
HCM Lane V/C Ratio	0.06	-	-	0.204	0.087	0.357	0.037	0.02	-	-
HCM Control Delay (s)	8.2	0	-	24.5	10.7	32.4	10.5	8.1	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.3	1.5	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	10	6	4	6	10	6	22	2	21	25	16
Future Vol, veh/h	15	10	6	4	6	10	6	22	2	21	25	16
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	5	5	5	3	3	3	2	2	2
Mvmt Flow	17	11	7	5	7	11	7	25	2	24	29	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	136	128	39	135	136	26	48	0	0	27	0	0
Stage 1	87	87	-	40	40	-	-	-	-	-	-	-
Stage 2	49	41	-	95	96	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.15	6.55	6.25	4.13	-	-	4.12	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.545	4.045	3.345	2.227	-	-	2.218	-	-
Pot Cap-1 Maneuver	833	761	1030	829	749	1041	1553	-	-	1587	-	-
Stage 1	918	821	-	967	856	-	-	-	-	-	-	-
Stage 2	962	859	-	904	810	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	804	744	1029	801	733	1041	1552	-	-	1587	-	-
Mov Cap-2 Maneuver	804	744	-	801	733	-	-	-	-	-	-	-
Stage 1	912	807	-	962	852	-	-	-	-	-	-	-
Stage 2	939	855	-	871	796	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	9.2	1.5	2.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1552	-	-	804	830	878	1587	-	-
HCM Lane V/C Ratio	0.004	-	-	0.021	0.022	0.026	0.015	-	-
HCM Control Delay (s)	7.3	0	-	9.6	9.4	9.2	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	0	-	-

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 32 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

32 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	6	18	24
PM Peak Hour	20	12	32
Weekday	151	151	302

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet

Land Use Description: Multi-Family Housing (Low-Rise)
ITE Land Use Code: 220
Independent Variable: Dwelling Units
Quantity: 120 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.46 trips per dwelling unit
Directional Distribution: 23% Entering 77% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.56 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 7.32 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

120 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	13	42	55
PM Peak Hour	42	25	67
Weekday	439	439	878

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	729	59	0	816	21	119	14	2	32	8	148
Future Volume (vph)	149	729	59	0	816	21	119	14	2	32	8	148
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00			0.99	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.99			1.00	0.85		1.00			0.89	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.99	
Satd. Flow (prot)	1498	2957			3107	1343		1575			1473	
Flt Permitted	0.95	1.00			1.00	1.00		0.53			0.93	
Satd. Flow (perm)	1498	2957			3107	1343		874			1385	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	159	776	63	0	868	22	127	15	2	34	9	157
RTOR Reduction (vph)	0	4	0	0	0	12	0	1	0	0	110	0
Lane Group Flow (vph)	159	835	0	0	868	10	0	143	0	0	90	0
Confl. Peds. (#/hr)	4					4	2					2
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	11%	11%	11%	7%	7%	7%	6%	6%	6%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	17.4	75.5			53.6	53.6		35.5			35.5	
Effective Green, g (s)	17.4	75.5			53.6	53.6		35.5			35.5	
Actuated g/C Ratio	0.14	0.63			0.45	0.45		0.30			0.30	
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	217	1860			1387	599		258			409	
v/s Ratio Prot	c0.11	0.28			c0.28							
v/s Ratio Perm						0.01		c0.16			0.07	
v/c Ratio	0.73	0.45			0.63	0.02		0.56			0.22	
Uniform Delay, d1	49.1	11.5			25.5	18.5		35.6			31.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.0	0.8			2.1	0.1		8.4			0.3	
Delay (s)	61.1	12.3			27.6	18.6		44.0			32.1	
Level of Service	E	B			C	B		D			C	
Approach Delay (s)		20.1			27.4			44.0			32.1	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26 09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	729	59	0	816	21	119	14	2	32	8	148
Future Volume (veh/h)	149	729	59	0	816	21	119	14	2	32	8	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1600	1600	1654	1654	1654	1668	1668	1668	1695	1695	1695
Adj Flow Rate, veh/h	159	776	63	0	868	22	127	15	2	34	9	157
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	11	11	11	7	7	7	6	6	6	4	4	4
Cap, veh/h	184	1787	145	1	1481	644	305	33	4	90	40	347
Arrive On Green	0.12	0.63	0.63	0.00	0.47	0.47	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1524	2841	231	1576	3143	1367	840	112	13	187	134	1172
Grp Volume(v), veh/h	159	415	424	0	868	22	144	0	0	200	0	0
Grp Sat Flow(s),veh/h/ln	1524	1520	1552	1576	1572	1367	965	0	0	1493	0	0
Q Serve(g_s), s	12.3	16.7	16.7	0.0	24.2	1.0	5.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.3	16.7	16.7	0.0	24.2	1.0	18.3	0.0	0.0	12.7	0.0	0.0
Prop In Lane	1.00		0.15	1.00		1.00	0.88		0.01	0.17		0.78
Lane Grp Cap(c), veh/h	184	956	976	1	1481	644	342	0	0	477	0	0
V/C Ratio(X)	0.86	0.43	0.43	0.00	0.59	0.03	0.42	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	286	956	976	66	1481	644	342	0	0	477	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	51.8	11.4	11.4	0.0	23.2	17.1	37.1	0.0	0.0	34.3	0.0	0.0
Incr Delay (d2), s/veh	15.3	1.4	1.4	0.0	1.7	0.1	3.8	0.0	0.0	0.6	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	5.5	5.9	6.0	0.0	9.3	0.4	4.0	0.0	0.0	4.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.1	12.8	12.8	0.0	24.9	17.2	40.8	0.0	0.0	34.9	0.0	0.0
LnGrp LOS	E	B	B	A	C	B	D	A	A	C	A	A
Approach Vol, veh/h		998			890			144			200	
Approach Delay, s/veh		21.4			24.7			40.8			34.9	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	80.0		40.0	19.0	61.0		40.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	66.0		35.5	22.5	48.5		35.5				
Max Q Clear Time (g_c+I1), s	0.0	18.7		20.3	14.3	26.2		14.7				
Green Ext Time (p_c), s	0.0	7.0		0.7	0.3	6.9		1.2				

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	755	46	18	805	41	37
Future Vol, veh/h	755	46	18	805	41	37
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	14	14	7	7	2	2
Mvmt Flow	839	51	20	894	46	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	892	0	1328	422
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	487	-
Critical Hdwy	-	-	4.24	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.27	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	725	-	146	580
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	724	-	142	579
Mov Cap-2 Maneuver	-	-	-	-	142	-
Stage 1	-	-	-	-	382	-
Stage 2	-	-	-	-	567	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	27.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	142	579	-	-	724	-
HCM Lane V/C Ratio	0.321	0.071	-	-	0.028	-
HCM Control Delay (s)	41.9	11.7	-	-	10.1	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	1.3	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	10	48	38	50	73	27	297	11	17	197	2
Future Vol, veh/h	7	10	48	38	50	73	27	297	11	17	197	2
Conflicting Peds, #/hr	2	0	2	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	13	62	49	64	94	35	381	14	22	253	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	838	766	257	798	762	392	258	0	0	397	0	0
Stage 1	299	299	-	460	460	-	-	-	-	-	-	-
Stage 2	539	467	-	338	302	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	282	329	774	302	332	652	1289	-	-	1151	-	-
Stage 1	703	661	-	577	562	-	-	-	-	-	-	-
Stage 2	521	557	-	672	661	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	194	309	771	257	312	650	1287	-	-	1149	-	-
Mov Cap-2 Maneuver	194	309	-	257	312	-	-	-	-	-	-	-
Stage 1	677	645	-	556	541	-	-	-	-	-	-	-
Stage 2	379	536	-	592	645	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	19.2	0.6	0.6
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1287	-	-	248	771	286	650	1149	-	-
HCM Lane V/C Ratio	0.027	-	-	0.088	0.08	0.394	0.144	0.019	-	-
HCM Control Delay (s)	7.9	0	-	20.9	10.1	25.6	11.5	8.2	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	1.8	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	2	5	4	5	16	12	22	2	8	14	17
Future Vol, veh/h	23	2	5	4	5	16	12	22	2	8	14	17
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	2	2	2	6	6	6
Mvmt Flow	34	3	7	6	7	24	18	33	3	12	21	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	144	130	37	137	141	35	46	0	0	36	0	0
Stage 1	58	58	-	71	71	-	-	-	-	-	-	-
Stage 2	86	72	-	66	70	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.12	6.52	6.22	4.12	-	-	4.16	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.518	4.018	3.318	2.218	-	-	2.254	-	-
Pot Cap-1 Maneuver	818	755	1027	834	750	1038	1562	-	-	1549	-	-
Stage 1	946	841	-	939	836	-	-	-	-	-	-	-
Stage 2	914	829	-	945	837	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	781	740	1024	811	735	1038	1562	-	-	1549	-	-
Mov Cap-2 Maneuver	781	740	-	811	735	-	-	-	-	-	-	-
Stage 1	935	834	-	928	826	-	-	-	-	-	-	-
Stage 2	874	819	-	925	830	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	9.1	2.4	1.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1562	-	-	781	923	921	1549	-	-
HCM Lane V/C Ratio	0.011	-	-	0.044	0.011	0.041	0.008	-	-
HCM Control Delay (s)	7.3	0	-	9.8	8.9	9.1	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	1086	148	1	1074	23	118	21	5	75	27	141
Future Volume (vph)	177	1086	148	1	1074	23	118	21	5	75	27	141
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		1.00			0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			0.98	
Satd. Flow (prot)	1630	3193		1583	3167	1387		1634			1537	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.51			0.87	
Satd. Flow (perm)	1630	3193		1583	3167	1387		870			1357	
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)	181	1108	151	1	1096	23	120	21	5	77	28	144
RTOR Reduction (vph)	0	8	0	0	0	12	0	1	0	0	41	0
Lane Group Flow (vph)	181	1251	0	1	1096	11	0	145	0	0	208	0
Confl. Peds. (#/hr)							5					5
Confl. Bikes (#/hr)			2			1						1
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	17.4	74.0		1.0	57.6	57.6		31.5			31.5	
Effective Green, g (s)	17.4	74.0		1.0	57.6	57.6		31.5			31.5	
Actuated g/C Ratio	0.14	0.62		0.01	0.48	0.48		0.26			0.26	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	236	1969		13	1520	665		228			356	
v/s Ratio Prot	c0.11	0.39		0.00	c0.35							
v/s Ratio Perm						0.01		c0.17			0.15	
v/c Ratio	0.77	0.64		0.08	0.72	0.02		0.64			0.58	
Uniform Delay, d1	49.3	14.5		59.0	24.8	16.4		39.2			38.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	13.8	1.6		2.5	3.0	0.0		12.8			2.4	
Delay (s)	63.2	16.1		61.6	27.8	16.4		52.0			41.0	
Level of Service	E	B		E	C	B		D			D	
Approach Delay (s)		22.0			27.6			52.0			41.0	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	73.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26

09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	1086	148	1	1074	23	118	21	5	75	27	141
Future Volume (veh/h)	177	1086	148	1	1074	23	118	21	5	75	27	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	1723	1723	1723	1682	1682	1682	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	181	1108	151	1	1096	23	120	21	5	77	28	144
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	2	2	2	2	2	2
Cap, veh/h	208	1800	245	2	1593	696	259	42	9	145	63	231
Arrive On Green	0.13	0.62	0.62	0.00	0.50	0.50	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1641	2886	392	1602	3195	1396	777	159	33	403	239	880
Grp Volume(v), veh/h	181	627	632	1	1096	23	146	0	0	249	0	0
Grp Sat Flow(s),veh/h/ln	1641	1637	1642	1602	1598	1396	969	0	0	1522	0	0
Q Serve(g_s), s	13.0	28.1	28.2	0.1	31.4	1.0	2.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.0	28.1	28.2	0.1	31.4	1.0	19.0	0.0	0.0	16.4	0.0	0.0
Prop In Lane	1.00		0.24	1.00		1.00	0.82		0.03	0.31		0.58
Lane Grp Cap(c), veh/h	208	1021	1024	2	1593	696	309	0	0	439	0	0
V/C Ratio(X)	0.87	0.61	0.62	0.46	0.69	0.03	0.47	0.00	0.00	0.57	0.00	0.00
Avail Cap(c_a), veh/h	280	1021	1024	68	1593	696	309	0	0	439	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	51.5	13.8	13.8	59.9	23.0	15.3	40.0	0.0	0.0	38.7	0.0	0.0
Incr Delay (d2), s/veh	19.6	2.8	2.8	104.7	2.5	0.1	5.1	0.0	0.0	1.7	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	6.5	10.8	10.9	0.1	12.3	0.3	4.4	0.0	0.0	6.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	16.5	16.6	164.6	25.4	15.4	45.1	0.0	0.0	40.5	0.0	0.0
LnGrp LOS	E	B	B	F	C	B	D	A	A	D	A	A
Approach Vol, veh/h		1440			1120			146			249	
Approach Delay, s/veh		23.4			25.3			45.1			40.5	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	79.3		36.0	19.7	64.3		36.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	69.9		31.5	20.5	54.5		31.5				
Max Q Clear Time (g_c+I1), s	2.1	30.2		21.0	15.0	33.4		18.4				
Green Ext Time (p_c), s	0.0	12.4		0.6	0.2	8.8		1.3				

Intersection Summary	
HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1090	93	34	1092	43	27
Future Vol, veh/h	1090	93	34	1092	43	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	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	5	5	3	3
Mvmt Flow	1147	98	36	1149	45	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1245	0	1794	574
Stage 1	-	-	-	-	1147	-
Stage 2	-	-	-	-	647	-
Critical Hdwy	-	-	4.2	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.25	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	539	-	71	459
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	480	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	539	-	66	459
Mov Cap-2 Maneuver	-	-	-	-	66	-
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	448	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	89.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	66	459	-	-	539	-
HCM Lane V/C Ratio	0.686	0.062	-	-	0.066	-
HCM Control Delay (s)	136.6	13.4	-	-	12.2	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	3	0.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	45	60	36	38	43	72	345	65	54	376	20
Future Vol, veh/h	7	45	60	36	38	43	72	345	65	54	376	20
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	2	2	2
Mvmt Flow	7	46	62	37	39	44	74	356	67	56	388	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1085	1071	388	1103	1059	396	409	0	0	423	0	0
Stage 1	500	500	-	538	538	-	-	-	-	-	-	-
Stage 2	585	571	-	565	521	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	193	220	658	188	223	651	1150	-	-	1136	-	-
Stage 1	551	541	-	525	521	-	-	-	-	-	-	-
Stage 2	495	503	-	508	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	135	188	658	123	191	647	1150	-	-	1136	-	-
Mov Cap-2 Maneuver	135	188	-	123	191	-	-	-	-	-	-	-
Stage 1	504	506	-	480	477	-	-	-	-	-	-	-
Stage 2	385	460	-	391	496	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.4	36.3	1.2	1
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1150	-	-	179	658	151	647	1136	-	-
HCM Lane V/C Ratio	0.065	-	-	0.299	0.094	0.505	0.069	0.049	-	-
HCM Control Delay (s)	8.3	0	-	33.5	11	51	11	8.3	0	-
HCM Lane LOS	A	A	-	D	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.2	0.3	2.4	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	10	6	4	6	10	6	23	2	22	26	26
Future Vol, veh/h	21	10	6	4	6	10	6	23	2	22	26	26
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	5	5	5	3	3	3	2	2	2
Mvmt Flow	24	11	7	5	7	11	7	26	2	25	30	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	146	138	46	145	152	27	61	0	0	28	0	0
Stage 1	96	96	-	41	41	-	-	-	-	-	-	-
Stage 2	50	42	-	104	111	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.15	6.55	6.25	4.13	-	-	4.12	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.545	4.045	3.345	2.227	-	-	2.218	-	-
Pot Cap-1 Maneuver	820	751	1021	817	734	1040	1536	-	-	1585	-	-
Stage 1	908	814	-	966	855	-	-	-	-	-	-	-
Stage 2	961	858	-	894	798	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	791	734	1020	789	718	1040	1535	-	-	1585	-	-
Mov Cap-2 Maneuver	791	734	-	789	718	-	-	-	-	-	-	-
Stage 1	903	800	-	961	851	-	-	-	-	-	-	-
Stage 2	938	854	-	861	784	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	9.3	1.4	2.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1535	-	-	791	820	868	1585	-	-
HCM Lane V/C Ratio	0.004	-	-	0.031	0.022	0.026	0.016	-	-
HCM Control Delay (s)	7.4	0	-	9.7	9.5	9.3	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	741	59	0	829	21	132	14	2	32	8	148
Future Volume (vph)	149	741	59	0	829	21	132	14	2	32	8	148
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00			0.99	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.99			1.00	0.85		1.00			0.89	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.99	
Satd. Flow (prot)	1498	2958			3107	1343		1575			1473	
Flt Permitted	0.95	1.00			1.00	1.00		0.53			0.93	
Satd. Flow (perm)	1498	2958			3107	1343		870			1381	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	159	788	63	0	882	22	140	15	2	34	9	157
RTOR Reduction (vph)	0	4	0	0	0	12	0	1	0	0	110	0
Lane Group Flow (vph)	159	847	0	0	882	10	0	156	0	0	90	0
Confl. Peds. (#/hr)	4					4	2					2
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	11%	11%	11%	7%	7%	7%	6%	6%	6%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	17.4	75.5			53.6	53.6		35.5			35.5	
Effective Green, g (s)	17.4	75.5			53.6	53.6		35.5			35.5	
Actuated g/C Ratio	0.14	0.63			0.45	0.45		0.30			0.30	
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	217	1861			1387	599		257			408	
v/s Ratio Prot	c0.11	0.29			c0.28							
v/s Ratio Perm						0.01		c0.18			0.07	
v/c Ratio	0.73	0.46			0.64	0.02		0.61			0.22	
Uniform Delay, d1	49.1	11.6			25.7	18.5		36.3			31.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.0	0.8			2.2	0.1		10.3			0.3	
Delay (s)	61.1	12.4			27.9	18.6		46.5			32.1	
Level of Service	E	B			C	B		D			C	
Approach Delay (s)		20.0			27.7			46.5			32.1	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26 09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	741	59	0	829	21	132	14	2	32	8	148
Future Volume (veh/h)	149	741	59	0	829	21	132	14	2	32	8	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1600	1600	1654	1654	1654	1668	1668	1668	1695	1695	1695
Adj Flow Rate, veh/h	159	788	63	0	882	22	140	15	2	34	9	157
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	11	11	11	7	7	7	6	6	6	4	4	4
Cap, veh/h	184	1790	143	1	1481	644	307	30	4	91	40	349
Arrive On Green	0.12	0.63	0.63	0.00	0.47	0.47	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1524	2845	227	1576	3143	1367	846	102	12	189	134	1180
Grp Volume(v), veh/h	159	421	430	0	882	22	157	0	0	200	0	0
Grp Sat Flow(s),veh/h/ln	1524	1520	1552	1576	1572	1367	960	0	0	1504	0	0
Q Serve(g_s), s	12.3	17.0	17.1	0.0	24.8	1.0	7.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.3	17.0	17.1	0.0	24.8	1.0	19.8	0.0	0.0	12.7	0.0	0.0
Prop In Lane	1.00		0.15	1.00		1.00	0.89		0.01	0.17		0.78
Lane Grp Cap(c), veh/h	184	956	977	1	1481	644	341	0	0	480	0	0
V/C Ratio(X)	0.86	0.44	0.44	0.00	0.60	0.03	0.46	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	286	956	977	66	1481	644	341	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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	51.8	11.4	11.4	0.0	23.3	17.1	37.8	0.0	0.0	34.3	0.0	0.0
Incr Delay (d2), s/veh	15.3	1.5	1.4	0.0	1.8	0.1	4.4	0.0	0.0	0.6	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	5.5	6.0	6.1	0.0	9.5	0.4	4.5	0.0	0.0	4.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.1	12.9	12.9	0.0	25.1	17.2	42.2	0.0	0.0	34.9	0.0	0.0
LnGrp LOS	E	B	B	A	C	B	D	A	A	C	A	A
Approach Vol, veh/h		1010			904			157			200	
Approach Delay, s/veh		21.4			24.9			42.2			34.9	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	80.0		40.0	19.0	61.0		40.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	66.0		35.5	22.5	48.5		35.5				
Max Q Clear Time (g_c+I1), s	0.0	19.1		21.8	14.3	26.8		14.7				
Green Ext Time (p_c), s	0.0	7.1		0.7	0.3	7.0		1.2				

Intersection Summary	
HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	755	58	22	805	54	49
Future Vol, veh/h	755	58	22	805	54	49
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	14	14	7	7	2	2
Mvmt Flow	839	64	24	894	60	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	905	0	1336	422
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	495	-
Critical Hdwy	-	-	4.24	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.27	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	717	-	145	580
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	578	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	716	-	140	579
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	382	-
Stage 2	-	-	-	-	558	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	31.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	140	579	-	-	716	-
HCM Lane V/C Ratio	0.429	0.094	-	-	0.034	-
HCM Control Delay (s)	48.7	11.9	-	-	10.2	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	1.9	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	48	44	53	86	27	297	13	17	197	2
Future Vol, veh/h	7	11	48	44	53	86	27	297	13	17	197	2
Conflicting Peds, #/hr	2	0	2	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	62	56	68	110	35	381	17	22	253	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	850	769	257	801	764	394	258	0	0	400	0	0
Stage 1	299	299	-	462	462	-	-	-	-	-	-	-
Stage 2	551	470	-	339	302	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	277	328	774	300	331	651	1289	-	-	1148	-	-
Stage 1	703	661	-	576	561	-	-	-	-	-	-	-
Stage 2	513	555	-	671	661	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	183	308	771	254	311	649	1287	-	-	1146	-	-
Mov Cap-2 Maneuver	183	308	-	254	311	-	-	-	-	-	-	-
Stage 1	677	645	-	555	540	-	-	-	-	-	-	-
Stage 2	359	534	-	590	645	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	20.1	0.6	0.6
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1287	-	-	243	771	282	649	1146	-	-
HCM Lane V/C Ratio	0.027	-	-	0.095	0.08	0.441	0.17	0.019	-	-
HCM Control Delay (s)	7.9	0	-	21.4	10.1	27.5	11.7	8.2	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	2.1	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	5	5	4	27	54	12	22	2	24	14	17
Future Vol, veh/h	23	5	5	4	27	54	12	22	2	24	14	17
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	2	2	2	6	6	6
Mvmt Flow	34	7	7	6	40	81	18	33	3	36	21	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	237	178	37	187	189	35	46	0	0	36	0	0
Stage 1	106	106	-	71	71	-	-	-	-	-	-	-
Stage 2	131	72	-	116	118	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.12	6.52	6.22	4.12	-	-	4.16	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.518	4.018	3.318	2.218	-	-	2.254	-	-
Pot Cap-1 Maneuver	711	710	1027	774	706	1038	1562	-	-	1549	-	-
Stage 1	892	802	-	939	836	-	-	-	-	-	-	-
Stage 2	865	829	-	889	798	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	609	684	1024	739	681	1038	1562	-	-	1549	-	-
Mov Cap-2 Maneuver	609	684	-	739	681	-	-	-	-	-	-	-
Stage 1	881	783	-	928	826	-	-	-	-	-	-	-
Stage 2	750	819	-	851	779	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.8	9.8	2.4	3.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1562	-	-	609	820	876	1549	-	-
HCM Lane V/C Ratio	0.011	-	-	0.056	0.018	0.145	0.023	-	-
HCM Control Delay (s)	7.3	0	-	11.3	9.5	9.8	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0.5	0.1	-	-

HCM Signalized Intersection Capacity Analysis
1: Wolf Drive/Ten Eyck Road & Highway 26 09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	1126	148	1	1082	23	129	21	5	75	27	141
Future Volume (vph)	177	1126	148	1	1082	23	129	21	5	75	27	141
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		1.00			0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			0.98	
Satd. Flow (prot)	1630	3195		1583	3167	1387		1634			1537	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.51			0.87	
Satd. Flow (perm)	1630	3195		1583	3167	1387		864			1357	
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)	181	1149	151	1	1104	23	132	21	5	77	28	144
RTOR Reduction (vph)	0	8	0	0	0	12	0	1	0	0	41	0
Lane Group Flow (vph)	181	1292	0	1	1104	11	0	157	0	0	208	0
Confl. Peds. (#/hr)							5					5
Confl. Bikes (#/hr)			2			1						1
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4			8		
Actuated Green, G (s)	17.4	74.0		1.0	57.6	57.6		31.5			31.5	
Effective Green, g (s)	17.4	74.0		1.0	57.6	57.6		31.5			31.5	
Actuated g/C Ratio	0.14	0.62		0.01	0.48	0.48		0.26			0.26	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	236	1970		13	1520	665		226			356	
v/s Ratio Prot	c0.11	0.40		0.00	c0.35							
v/s Ratio Perm						0.01		c0.18			0.15	
v/c Ratio	0.77	0.66		0.08	0.73	0.02		0.70			0.58	
Uniform Delay, d1	49.3	14.8		59.0	24.9	16.4		39.9			38.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	13.8	1.7		2.5	3.1	0.0		16.3			2.4	
Delay (s)	63.2	16.5		61.6	28.0	16.4		56.2			41.0	
Level of Service	E	B		E	C	B		E			D	
Approach Delay (s)		22.2			27.8			56.2			41.0	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Wolf Drive/Ten Eyck Road & Highway 26

09/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	1126	148	1	1082	23	129	21	5	75	27	141
Future Volume (veh/h)	177	1126	148	1	1082	23	129	21	5	75	27	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	1723	1723	1723	1682	1682	1682	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	181	1149	151	1	1104	23	132	21	5	77	28	144
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	2	2	2	2	2	2
Cap, veh/h	208	1809	237	2	1593	696	262	38	8	146	63	233
Arrive On Green	0.13	0.62	0.62	0.00	0.50	0.50	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1641	2901	380	1602	3195	1396	787	146	30	407	240	888
Grp Volume(v), veh/h	181	647	653	1	1104	23	158	0	0	249	0	0
Grp Sat Flow(s),veh/h/ln	1641	1637	1645	1602	1598	1396	963	0	0	1535	0	0
Q Serve(g_s), s	13.0	29.5	29.8	0.1	31.8	1.0	4.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.0	29.5	29.8	0.1	31.8	1.0	20.4	0.0	0.0	16.3	0.0	0.0
Prop In Lane	1.00		0.23	1.00		1.00	0.84		0.03	0.31		0.58
Lane Grp Cap(c), veh/h	208	1021	1026	2	1593	696	308	0	0	442	0	0
V/C Ratio(X)	0.87	0.63	0.64	0.46	0.69	0.03	0.51	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	280	1021	1026	68	1593	696	308	0	0	442	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	51.5	14.1	14.1	59.9	23.1	15.3	40.7	0.0	0.0	38.7	0.0	0.0
Incr Delay (d2), s/veh	19.6	3.0	3.0	104.7	2.5	0.1	6.0	0.0	0.0	1.6	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	6.5	11.4	11.6	0.1	12.4	0.3	4.8	0.0	0.0	6.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	17.0	17.1	164.6	25.6	15.4	46.7	0.0	0.0	40.3	0.0	0.0
LnGrp LOS	E	B	B	F	C	B	D	A	A	D	A	A
Approach Vol, veh/h		1481			1128			158			249	
Approach Delay, s/veh		23.7			25.5			46.7			40.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	79.3		36.0	19.7	64.3		36.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	69.9		31.5	20.5	54.5		31.5				
Max Q Clear Time (g_c+I1), s	2.1	31.8		22.4	15.0	33.8		18.3				
Green Ext Time (p_c), s	0.0	12.9		0.6	0.2	8.8		1.3				

Intersection Summary	
HCM 6th Ctrl Delay	26.9
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1090	133	47	1092	48	34
Future Vol, veh/h	1090	133	47	1092	48	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	160	215	-	120	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	5	5	3	3
Mvmt Flow	1147	140	49	1149	51	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1287	0	1820	574
Stage 1	-	-	-	-	1147	-
Stage 2	-	-	-	-	673	-
Critical Hdwy	-	-	4.2	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.25	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	519	-	68	459
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	466	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	519	-	62	459
Mov Cap-2 Maneuver	-	-	-	-	62	-
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	422	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	107
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	62	459	-	-	519	-
HCM Lane V/C Ratio	0.815	0.078	-	-	0.095	-
HCM Control Delay (s)	173.2	13.5	-	-	12.7	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	3.7	0.3	-	-	0.3	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	48	60	40	40	51	72	345	71	54	376	20
Future Vol, veh/h	7	48	60	40	40	51	72	345	71	54	376	20
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	125	-	-	-	-	-	330
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	2	2	2
Mvmt Flow	7	49	62	41	41	53	74	356	73	56	388	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1094	1077	388	1107	1062	399	409	0	0	429	0	0
Stage 1	500	500	-	541	541	-	-	-	-	-	-	-
Stage 2	594	577	-	566	521	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	191	218	658	187	223	649	1150	-	-	1130	-	-
Stage 1	551	541	-	523	519	-	-	-	-	-	-	-
Stage 2	490	500	-	507	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	130	187	658	121	191	645	1150	-	-	1130	-	-
Mov Cap-2 Maneuver	130	187	-	121	191	-	-	-	-	-	-	-
Stage 1	504	506	-	479	475	-	-	-	-	-	-	-
Stage 2	374	458	-	388	496	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.3	38.7	1.2	1
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1150	-	-	177	658	148	645	1130	-	-
HCM Lane V/C Ratio	0.065	-	-	0.32	0.094	0.557	0.082	0.049	-	-
HCM Control Delay (s)	8.3	0	-	34.6	11	56.3	11.1	8.4	0	-
HCM Lane LOS	A	A	-	D	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.3	0.3	2.8	0.3	0.2	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	19	6	4	20	33	6	23	2	75	26	26
Future Vol, veh/h	21	19	6	4	20	33	6	23	2	75	26	26
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	5	5	5	3	3	3	2	2	2
Mvmt Flow	24	22	7	5	23	38	7	26	2	86	30	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	290	260	46	273	274	27	61	0	0	28	0	0
Stage 1	218	218	-	41	41	-	-	-	-	-	-	-
Stage 2	72	42	-	232	233	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.15	6.55	6.25	4.13	-	-	4.12	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.545	4.045	3.345	2.227	-	-	2.218	-	-
Pot Cap-1 Maneuver	660	643	1021	673	628	1040	1536	-	-	1585	-	-
Stage 1	782	721	-	966	855	-	-	-	-	-	-	-
Stage 2	935	858	-	764	706	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	588	603	1020	620	589	1040	1535	-	-	1585	-	-
Mov Cap-2 Maneuver	588	603	-	620	589	-	-	-	-	-	-	-
Stage 1	777	680	-	961	851	-	-	-	-	-	-	-
Stage 2	872	854	-	693	666	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	10	1.4	4.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1535	-	-	588	669	790	1585	-	-
HCM Lane V/C Ratio	0.004	-	-	0.041	0.043	0.083	0.054	-	-
HCM Control Delay (s)	7.4	0	-	11.4	10.6	10	7.4	0	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.3	0.2	-	-

Intersection	
Intersection Delay, s/veh	17.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	48	44	53	86	27	297	13	17	197	2
Future Vol, veh/h	7	11	48	44	53	86	27	297	13	17	197	2
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	62	56	68	110	35	381	17	22	253	3
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	10.2	11.4	23.8	14.6
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	8%	39%	0%	45%	0%	8%	0%
Vol Thru, %	88%	61%	0%	55%	0%	92%	0%
Vol Right, %	4%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	337	18	48	97	86	214	2
LT Vol	27	7	0	44	0	17	0
Through Vol	297	11	0	53	0	197	0
RT Vol	13	0	48	0	86	0	2
Lane Flow Rate	432	23	62	124	110	274	3
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.729	0.048	0.111	0.245	0.188	0.477	0.004
Departure Headway (Hd)	6.071	7.425	6.507	7.092	6.144	6.262	5.511
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	592	479	546	504	580	573	646
Service Time	4.128	5.217	4.298	4.868	3.92	4.028	3.276
HCM Lane V/C Ratio	0.73	0.048	0.114	0.246	0.19	0.478	0.005
HCM Control Delay	23.8	10.6	10.1	12.2	10.4	14.7	8.3
HCM Lane LOS	C	B	B	B	B	B	A
HCM 95th-tile Q	6.2	0.2	0.4	1	0.7	2.6	0

Intersection	
Intersection Delay, s/veh	27.2
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	48	60	40	40	51	72	345	71	54	376	20
Future Vol, veh/h	7	48	60	40	40	51	72	345	71	54	376	20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	2	2	2
Mvmt Flow	7	49	62	41	41	53	74	356	73	56	388	21
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	11.2	11.7	36.3	26
HCM LOS	B	B	E	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	15%	13%	0%	50%	0%	13%	0%
Vol Thru, %	71%	87%	0%	50%	0%	87%	0%
Vol Right, %	15%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	488	55	60	80	51	430	20
LT Vol	72	7	0	40	0	54	0
Through Vol	345	48	0	40	0	376	0
RT Vol	71	0	60	0	51	0	20
Lane Flow Rate	503	57	62	82	53	443	21
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.861	0.124	0.122	0.183	0.103	0.767	0.031
Departure Headway (Hd)	6.164	7.882	7.093	8.006	7.024	6.226	5.451
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	584	457	508	450	513	576	649
Service Time	4.262	5.588	4.799	5.712	4.731	4.025	3.249
HCM Lane V/C Ratio	0.861	0.125	0.122	0.182	0.103	0.769	0.032
HCM Control Delay	36.3	11.7	10.8	12.5	10.5	26.8	8.4
HCM Lane LOS	E	B	B	B	B	D	A
HCM 95th-tile Q	9.5	0.4	0.4	0.7	0.3	7	0.1

SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L G N V	R J I H L	S C O K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03911	N	N	N			10/27/2018	17	PROCTOR BLVD	INTER	5-LEG	N	N	UNK	S-1STOP	01	NONE 0	STRGHT									29
NONE						SA	0	SE TEN EYCK RD	NE		TRF SIGNAL	N	UNK	REAR		PRVTE	NE-SW								000	00
N						5P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y		026	000	29
N						45 23 49.25	-122 15 19.74																OR<25				
															02	NONE 0	STOP									
																PRVTE	NE-SW								011	00
																PSNGR CAR		01	DRVR	INJC	55	F	OR-Y		000	00
																							OR<25			
03089	N	N	N			09/03/2018	14	PROCTOR BLVD	INTER	5-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									29
NONE						MO		SE TEN EYCK RD	SE		TRF SIGNAL	N	DRY	REAR		UNKN	SE-NW								000	00
N						3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000	29
N						45 23 49.25	-122 15 19.75	002600200S00															UNK				
															02	NONE 0	STOP									
																PRVTE	SE-NW								011	00
																PSNGR CAR		01	DRVR	INJC	25	F	OR-Y		000	00
																							OR>25			
03213	N	N	N			09/17/2019	14	PROCTOR BLVD	INTER	5-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									29
NONE						TU		SE TEN EYCK RD	SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE-NW								000	00
N						3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	41	F	OTH-Y		026	000	29
N						45 23 49.26	-122 15 19.69	002600200S00															N-RES				
															02	NONE 0	STOP									
																PRVTE	SE-NW								011	00
																PSNGR CAR		01	DRVR	INJC	48	F	OR-Y		000	00
																							OR<25			
															02	NONE 0	STOP									
																PRVTE	SE-NW								011	00
																PSNGR CAR		02	PSNG	INJC	50	M			000	00
05173	N	N	N			11/08/2016	14	PROCTOR BLVD	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	U-TURN									06
NONE						TU		SE TEN EYCK RD	W		TRF SIGNAL	N	DRY	TURN		N/A	W -W								000	00
N						5P			05	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N						45 23 49.25	-122 15 19.74	002600200S00		(02)													UNK				
															02	NONE 9	TURN-R									
																N/A	NE-W								000	00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																							UNK			
04335	N	N	N			11/06/2018	14	PROCTOR BLVD	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT									02
NONE						TU		SE TEN EYCK RD	CN		TRF SIGNAL	N	DRY	TURN		N/A	SE-NW								000	00
N						2P			01	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000	00
N						45 23 49.25	-122 15 19.72	002600200S00															UNK				

SER# / INVEST / RD DPT / UNLOC?	S P / E / D	A	R U / L / C	J / G / S	S / N / V	W / H / L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V# TYPE	MOVE / FROM / TO	P# TYPE	PRTC / INJ / SVRTY	A G E	S X	LICNS / RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02 NONE 9	TURN-R								
																N/A	NE-NW								015	00
																PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
																						UNK				

CITY OF SANDY, CLACKAMAS COUNTY **TEN EYCK RD at PIONEER BLVD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019**

1 - 1 of 1 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L S	D R G N	M U I H	J N	S C R K	W O L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03787	N	N	N		N	N		09/15/2015	14	PIONEER BLVD	INTER	5-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE				TU						SE TEN EYCK RD	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W									000	00
N				1P							06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	71	M	OR-Y		026	000	29
N				45 23 49.24					-122 15 19.74	002600100S00															OR<25				
																	02	NONE 0	STOP									011	00
																		PRVTE	E -W										
																		PSNGR CAR		01	DRVR	INJC	38	F	OTH-Y N-RES	000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L S	D R G N	M J U I H	S C V	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
01741	N	N	N		N	N	05/09/2015	14	PIONEER BLVD	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
NONE					SA				WOLF DR	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	S -N								000	00
N					6A					04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	25	M	OTH-Y		020	026	04
N					45 23 49.25			-122 15 19.74	002600100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	W -E								000	00
																	PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		000	000	00
																								OR<25				
00512	N	N	N		N	N	02/07/2017	14	PIONEER BLVD	INTER	5-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L										04
CITY					TU				WOLF DR	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S -W								000	00
N					4P					04	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJC	55	F	OR-Y		000	000	00
N					45 23 49.25			-122 15 19.74	002600100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	W -E								000	00
																	PSNGR CAR		01	DRVR	NONE	63	M	OR-Y		020	000	04
																								OR>25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V#	TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05355	N	N	N				11/18/2016	14	LANGENSAND RD	INTER	3-LEG	N	N	RAIN	PED	01	NONE 0	TURN-R										19,02
CITY							FR		MT HOOD HY	S		UNKNOWN	N	WET	PED		PRVTE	S -SE								015	00
N							6P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	59	M	OR-Y		029	000	02
N							45 23 44.19	-122 15 .03	002600100S00															OR>25				
																		- STRGHT	01	PED	INJC	34	M		I XWK?	000	034	19
																		SE NW									
05056	N	N	N				12/01/2017	14	LANGENSAND RD	INTER	3-LEG	N	N	RAIN	ANGL-STP	01	NONE 0	TURN-R										08
NONE							FR		MT HOOD HY	S		STOP SIGN	N	WET	TURN		PRVTE	NW-S								000	00
N							9P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		001	000	08
N							45 23 44.19	-122 15 .03	002600100S00															OR<25				
																02	NONE 0	STOP										
																	PRVTE	S -N								012	00
																	PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000	000	00
																								OR<25				
																02	NONE 0	STOP										
																	PRVTE	S -N								012	00
																	PSNGR CAR		02	PSNG	INJC	25	M			000	000	00
01431	N	N	N				04/14/2017	14	LANGENSAND RD	INTER	3-LEG	N	N	CLR	O-1STOP	01	NONE 9	BACK										10
NONE							FR		MT HOOD HY	S		STOP SIGN	N	DRY	BACK		N/A	N -S								000	00
N							3P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 44.19	-122 15 .03	002600100S00															UNK				
																02	NONE 9	STOP										
																	N/A	S -N								012	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
00297	N	N	N	N	N		01/24/2015	14	LANGENSAND RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02,08
CITY							SA		MT HOOD HY	CN		UNKNOWN	N	DRY	TURN		PRVTE	NW-SE								000	00
N							4P			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		000	000	00
N							45 23 44.19	-122 15 .03	002600100S00															OR<25				
																01	NONE 0	STRGHT										
																	PRVTE	NW-SE								000	00
																	PSNGR CAR		02	PSNG	NO<5	01	F			000	000	00
																02	NONE 0	TURN-L										
																	PRVTE	SE-S								000	00
																	PSNGR CAR		01	DRVR	INJC	78	F	OR-Y		028,004	000	02,08
																								OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	D A L C	M R G S	J U N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04571	N	N	N	N	Y	N	10/05/2016	14	LANGENSAND RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L										013	02,08
CITY							WE		MT HOOD HY	CN		STOP SIGN	N	WET	TURN		PRVTE	S -W									015		00
N							6P			04	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		028	000		02
N							45 23 44.19	-122 15 .03	002600100S00									OR<25											
																02	NONE 0	STRGHT											
																	PRVTE	W -E									000	013	00
																	PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		000	000		00
																		OR>25											
																03	NONE 0	STRGHT											
																	PRVTE	E -W									022		00
																	PSNGR CAR		01	DRVR	INJB	61	M	OR-Y		000	000		00
																		OR<25											
																03	NONE 0	STRGHT											
																	PRVTE	E -W									022		00
																	PSNGR CAR		02	PSNG	INJC	59	F			000	000		00
03612	N	N	N	N	N	N	10/16/2019	14	LANGENSAND RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 9	TURN-L											02
CITY							WE		MT HOOD HY	CN		STOP SIGN	N	WET	TURN		N/A	S -NW									015		00
N							2P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 44.19	-122 15 .03	002600100S00									UNK											
																02	NONE 9	STRGHT											
																	N/A	SE-NW									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																		UNK											
04040	N	N	N				11/14/2019	14	LANGENSAND RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
NONE							TH		MT HOOD HY	CN		STOP SIGN	N	DRY	TURN		N/A	E -W									000		00
N							8A			02	0		N	DAWN	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 44.2	-122 15 .04	002600100S00									UNK											
																02	NONE 9	TURN-L											
																	N/A	S -W									015		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																		UNK											

SER# / INVEST / RD DPT / UNLOC?	S P E D	D A L C	M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
02296	N	N	N	N	N		07/06/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT									27,29,32
CITY							SA		EAGLE CRK-SANDY HY	N		NONE	N	DRY	REAR		N/A	NE-SW								000	00
N							11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 22.65	-122 15 48.74	017200100S00															UNK				
																02	NONE 9	STOP									
																	N/A	NE-SW								011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
01165	N	N	N				03/10/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	O-1STOP	01	NONE 0	BACK									10
NONE							TH		EAGLE CRK-SANDY HY	E		STOP SIGN	N	DRY	BACK		PRVTE	W -E								000	00
N							6P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y		011	000	10
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25				
																02	NONE 0	STOP									
																	PRVTE	E -W								012	00
																	PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000	00
																								OR<25				
04008	N	N	N		N	N	11/02/2018	16	DUBARKO RD	INTER	CROSS	N	N	CLD	PED	01	NONE 0	STRGHT									02
CITY							FR		EAGLE CRK-SANDY HY	E		STOP SIGN	N	WET	PED		PRVTE	E -W								000	00
N							7P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	74	M	OR-Y		029	000	02
N							45 23 22.54	-122 15 48.5	017200100S00															OR<25				
																		- STRGHT	01	PED	INJC	36	M		I XWK?	000	034	00
																		N S									
03026	N	N	N				07/27/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									07,29
CITY							MO		EAGLE CRK-SANDY HY	SW		NONE	N	DRY	REAR		PRVTE	SW-NE								000	00
N							8P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJC	19	M	OR-Y		043,026	000	07,29
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25				
																02	NONE 0	STOP									
																	PRVTE	SW-NE								012	00
																	PSNGR CAR		01	DRVR	INJC	36	M	OR-Y		000	000	00
																								OR<25				
01095	N	N	N		N	N	03/04/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT									27,07,32
CITY							FR		EAGLE CRK-SANDY HY	SW		STOP SIGN	N	DRY	SS-O		PRVTE	NE-SW								000	00
N							4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		016,043,052	010	27,07,32
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25				
																01	NONE 0	STRGHT									
																	PRVTE	NE-SW								000	00
																	PSNGR CAR		02	PSNG	NO<5	01	F			000	000	00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D A L C	M R G S	J U N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TO	MOVE / FROM	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	NONE	18	F	OR-Y OR<25		000	012 000	00 00
																03	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	INJB	26	M	OR-Y OR<25		000	000 000	00 00
00763	N	N	N	N	N		02/17/2016 16	DUBARKO RD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										07
CITY							WE	EAGLE CRK-SANDY HY	SW		NONE	N	WET	REAR		N/A	S -N									000	00
N							5P		06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 22.76 -122 15 48.39	017200100S00																UNK				
																02	NONE 9 N/A PSNGR CAR	STOP S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	012 000	00 00
01324	N	N	N	N	N		04/19/2018 16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
CITY							TH	EAGLE CRK-SANDY HY	SW		UNKNOWN	N	DRY	REAR		PRVTE	SW-NE									000	00
N							6P		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		026	000	29
N							45 23 22.55 -122 15 48.5	017200100S00																				
																02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	21	F	OR-Y OR<25		000	012 000	00 00
																02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	02	PSNG	INJC	18	M			000	012 000	00 00
04952	N	N	N	N	N		11/22/2015 16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L										03
CITY							SU	EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -NE									000	00
N							4P		03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	53	F	OTH-Y OR<25		021	000	03
N							45 23 22.76 -122 15 48.39	017200100S00																				
																02	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	19	F	OR-Y OR>25		000	000 000	00 00
																03	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	41	M	OR-Y OR<25		000	000 000	00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05614	N	N	N	N	N		12/25/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		PRVTE	N -S								000	00
N							6P			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y	000	000	00
N							45 23 22.76	-122 15 48.39	017200100S00															OR>25			
																02	NONE 0	STRGHT									
																	PRVTE	E -W								015	00
																	PSNGR CAR		01	DRVR	INJC	53	M	OR-Y	028	000	02
																								OR<25			
02172	N	N	N				06/05/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
NONE							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E								015	00
N							7A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25			
																02	NONE 0	TURN-L									
																	PRVTE	SW-W								000	00
																	PSNGR CAR		01	DRVR	NONE	29	M	OR-Y	000	000	00
																								OR<25			
03589	N	N	N	N	N		08/05/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	E -W								015	00
N							6P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	77	M	OTH-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															N-RES			
																02	NONE 0	STRGHT									
																	PRVTE	N -S								000	00
																	PSNGR CAR		01	DRVR	NONE	40	M	OR-Y	000	000	00
																								OR<25			
03967	N	N	N	N	N		08/30/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							TU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W -E								015	00
N							12P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	61	F	OTH-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															N-RES			
																01	NONE 0	STRGHT									
																	PRVTE	W -E								015	00
																	PSNGR CAR		02	PSNG	INJC	06	F		000	000	00
																02	NONE 0	STRGHT									
																	PRVTE	S -N								000	00
																	PSNGR CAR		01	DRVR	INJB	53	F	OR-Y	000	000	00
																								OR<25			
02427	N	N	N				05/31/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										03,32
CITY							TU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	UNK	ANGL		N/A	W -E								000	00
N							11A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 22.76	-122 15 48.39	017200100S00															UNK			

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	M R G S	J N	S H	W R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 9	STRGHT										
																	N/A	N -S								000		00
																	PSNGR CAR			01 DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
02031	N	N	N	N	N		05/06/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		N/A	N -S								000		00
N							4P			01	0		N	DAY	PDO		PSNGR CAR			01 DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 22.76	-122 15 48.39	017200100S00															UNK					
																02	NONE 9	STRGHT										
																	N/A	E -W								000		00
																	PSNGR CAR			01 DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
00805	N	N	N	N	N		03/01/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										082,013	02
CITY							WE		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W -E								015		00
N							3P			04	0		N	DAY	INJ		PSNGR CAR			01 DRVR	INJC	17	F	OR-Y		028	000	082	02
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25					
																02	NONE 0	STRGHT										
																	PRVTE	S -N								000	013	00
																	PSNGR CAR			01 DRVR	INJC	43	M	OR-Y		000	000		00
																								OR<25					
																03	NONE 0	STOP										
																	PRVTE	E -W								022		00
																	PSNGR CAR			01 DRVR	INJB	27	F	OR-Y		000	000		00
																								OR<25					
00846	N	N	N	N	N		03/04/2017	16	DUBARKO RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							SA		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		PRVTE	W -E								015		00
N							6P			04	0		N	DLIT	INJ		PSNGR CAR			01 DRVR	NONE	21	M	OR-Y		028	000		02
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25					
																02	NONE 0	STRGHT										
																	PRVTE	N -S								000		00
																	PSNGR CAR			01 DRVR	INJC	21	F	OR-Y		000	000		00
																								OR<25					
02225	N	N	N				06/07/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							WE		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N							4P			04	0		N	DAY	INJ		PSNGR CAR			01 DRVR	INJB	40	M	OR-Y		000	000		00
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25					
																02	NONE 0	STRGHT										
																	PRVTE	W -E								015		00
																	PSNGR CAR			01 DRVR	INJC	38	M	OR-Y		028	000		02
																								OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02958	N	N	N	N	N		07/21/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										02
CITY				FR					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	S -W									000	00
N				8P						01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y		028	000		02
N				45 23 22.76			-122 15 48.39		017200100S00															OR<25					
																02	NONE 0	STRGHT									000		00
																	PRVTE	N -S											
																	PSNGR CAR		01	DRVR	INJB	29	F	OR-Y		000	000		00
																								OR<25					
00647	N	N	N	N	N		02/18/2017	16	DUBARKO RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											03
CITY				SA					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		N/A	W -E									000	00
N				7P						03	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 23 22.76			-122 15 48.39		017200100S00															UNK					
																02	NONE 9	STRGHT									000		00
																	N/A	N -S											
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
03467	N	N	N	N	N		08/23/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
CITY				WE					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		N/A	NE-SW									000	00
N				8A						01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 23 22.76			-122 15 48.39		017200100S00															UNK					
																02	NONE 9	STRGHT									015		00
																	N/A	E -W											
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
03265	N	N	N				09/14/2018	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										082	02
CITY				FR					EAGLE CRK-SANDY HY	CN		FLASHBCN-R	N	DRY	TURN		PRVTE	W -N									015		00
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																	PSNGR CAR		02	PSNG	NONE	02	F			000	000		00
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																	PRVTE	N -S									000		00
																	PSNGR CAR		01	DRVR	NONE	62	M	OR-Y		000	000		00
																								OR<25					

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF SANDY, CLACKAMAS COUNTY

DUBARKO RD at EAGLE CRK-SANDY HY, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019

22 - 24 of 27 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S D M: P R J S W / E A U I C O / E L G N H R / D C S V L K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V# TYPE	MOVE / FROM / TO	PRTC / P# TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED / LOC	ERROR	ACT	EVENT	CAUSE
03281	N N N N N	09/23/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE 0	STRGHT										02
CITY		MO		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL	PRVTE	NE-SW								000		00
N		7A			02	0		N	DAWN	INJ	PSNGR CAR		01 DRVR	NONE	31	M	OR-Y		000	000		00
N		45 23 22.59	-122 15 48.49	017200100S00													OR<25					
											02 NONE 0	STRGHT										
											PRVTE	E -W								015		00
											PSNGR CAR		01 DRVR	INJC	17	F	OR-Y		028	000		02
																	OR<25					
											02 NONE 0	STRGHT										
											PRVTE	E -W								015		00
											PSNGR CAR		02 PSNG	INJA	12	F			000	000		00
00075	N N N N N	01/08/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE 0	STRGHT									013	27,02
CITY		TU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL	PRVTE	N -S								000		00
N		4P			03	0		N	DLIT	INJ	PSNGR CAR		01 DRVR	INJB	52	M	OR-Y		000	000		00
N		45 23 22.54	-122 15 48.5	017200100S00													OR<25					
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											PSNGR CAR		01 DRVR	INJC	16	F	OR-Y		028	000		27,02
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											PRVTE	W -E								022		00
											PSNGR CAR		01 DRVR	NONE	21	M	OR-Y		000	000		00
																	OR<25					
00908	N N N	03/14/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE 0	STRGHT										02
NO RPT		TH		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL	PRVTE	S -N								000		00
N		2P			04	0		N	DAY	INJ	SEMI TOW		01 DRVR	INJC	58	M	OR-Y		000	000		00
N		45 23 22.76	-122 15 48.39	017200100S00													OR<25					
											02 NONE 0	STRGHT										
											PRVTE	W -E								015		00
											PSNGR CAR		01 DRVR	INJB	19	M	OR-Y		028	000		02
																	OR<25					
											02 NONE 0	STRGHT										
											PRVTE	W -E								015		00
											PSNGR CAR		02 PSNG	INJB	18	F			000	000		00
01291	N N N N N	04/22/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01 NONE 0	STRGHT										02
CITY		MO		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL	PRVTE	S -N								000		00
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N		45 23 22.54	-122 15 48.5	017200100S00													OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	37	M	OR-Y OR<25		028	015 000	00 02
03399	N	N	N	N	N		10/03/2019	16	DUBARKO RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	STRGHT										02
CITY							TH		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		PRVTE	N -S									000	00
N N							7P 45 23 22.78	-122 15 48.4	017200100S00	03	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	48	F	OR-Y OR<25		000	000	00
																02	NONE PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	19	M	OTH-Y N-RES		028	015 000	00 02
04270	N	N	N				11/29/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000	00
N N							5P 45 23 22.55	-122 15 48.51	017200100S00	01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	49	F	OR-Y OR<25		000	000	00
																02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	INJC	59	F	OR-Y OR<25		028	015 000	00 02

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M U N V	J I H L	S C R K	W O	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03066	N	N	N					06/09/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										083	02
NONE								TU	0	LANGENSAND RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000		00
N								12P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		000	000		00
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																	02	NONE 0	STRGHT											
																		PRVTE	W -E									015		00
																		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y		028	000	083	02
																									OR<25					

Preliminary Traffic Signal Warrant Analysis

Project Name: Deer Meadows Development
Intersection: Highway 26 at Langensand Road
Scenario: 2023 Background Plus Site Trips
Number of Major Street Lanes: 2 PM Peak Hour Volume 2362 (sum of both approaches)
Number of Minor Street Lanes 1 PM Peak Hour Volume 48 (highest-volume approach)[a]
Posted or 85th percentile speed > 40 mph: Yes
Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Anaylsis Calculations	8th Highest Hour[b]	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	1335	420	
Minor Street Volume	27	105	**No**
Condition B - Interruption of Continuous Traffic			
Major Street Volume	1335	630	
Minor Street Volume	27	53	**No**
Combination Warrant[c]			
Major Street Volume	1335	504	
Minor Street Volume	27	84	**No**

[a] Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.
[b] Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.
[c] This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis

Project Name: Deer Meadows Development
Intersection: Highway 211 at Dubarko Road
Scenario: 2023 Background Plus Site Trips
Number of Major Street Lanes: 1 PM Peak Hour Volume 918 (sum of both approaches)
Number of Minor Street Lanes 1 PM Peak Hour Volume 80 (highest-volume approach)[a]
Posted or 85th percentile speed > 40 mph: Yes
Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Anaylsis Calculations	8th Highest Hour[b]	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	519	350	
Minor Street Volume	45	105	**No**
Condition B - Interruption of Continuous Traffic			
Major Street Volume	519	525	
Minor Street Volume	45	53	**No**
Combination Warrant[c]			
Major Street Volume	519	420	
Minor Street Volume	45	84	**No**

[a] Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.
[b] Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.
[c] This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis

Project Name: Deer Meadows Development
Intersection: Dubarko Road at Langensand Road
Scenario: 2023 Background Plus Site Trips
Number of Major Street Lanes: 1 PM Peak Hour Volume 158 (sum of both approaches)
Number of Minor Street Lanes 1 PM Peak Hour Volume 44 (highest-volume approach)[a]
Posted or 85th percentile speed > 40 mph: No
Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Anaylsis Calculations	8th Highest Hour[b]	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	89	500	
Minor Street Volume	25	150	**No**
Condition B - Interruption of Continuous Traffic			
Major Street Volume	89	750	
Minor Street Volume	25	75	**No**
Combination Warrant[c]			
Major Street Volume	89	600	
Minor Street Volume	25	120	**No**

[a] Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.
[b] Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.
[c] This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

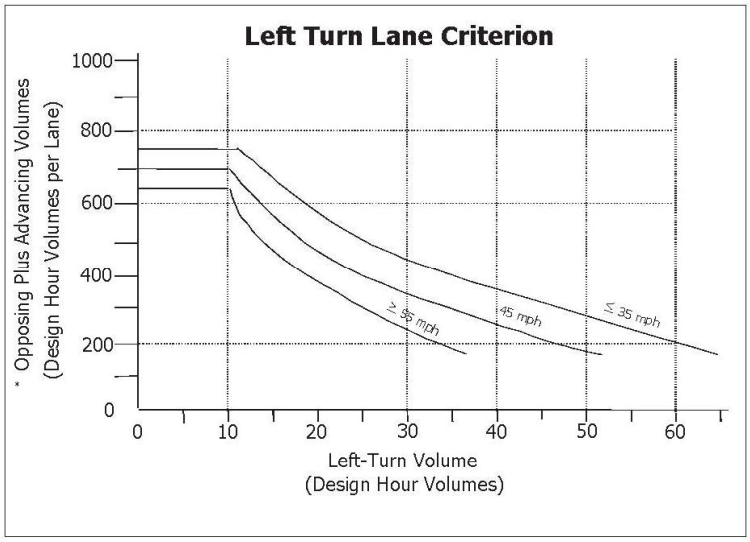
Left-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Deer Meadows Development
Approach: Highway 211 NB at Dubarko Road
Scenario: 2021 Existing Conditions

Number of Advancing Lanes: 1
Number of Opposing Lanes: 1
Major-Street Design Speed: 45 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	309	445
Opposing Volume for Design Hour:	184	382
Design Hour Volume Per Lane:	493	827
Number of Left Turns per Hour:	26	69
Left-turn lane warrants satisfied?	**YES**	**YES**

Exhibit 7-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Right-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Deer Meadows Development
Approach: Highway 211 Northbound at Dubarko Road
Scenario: 2021 Existing Conditions

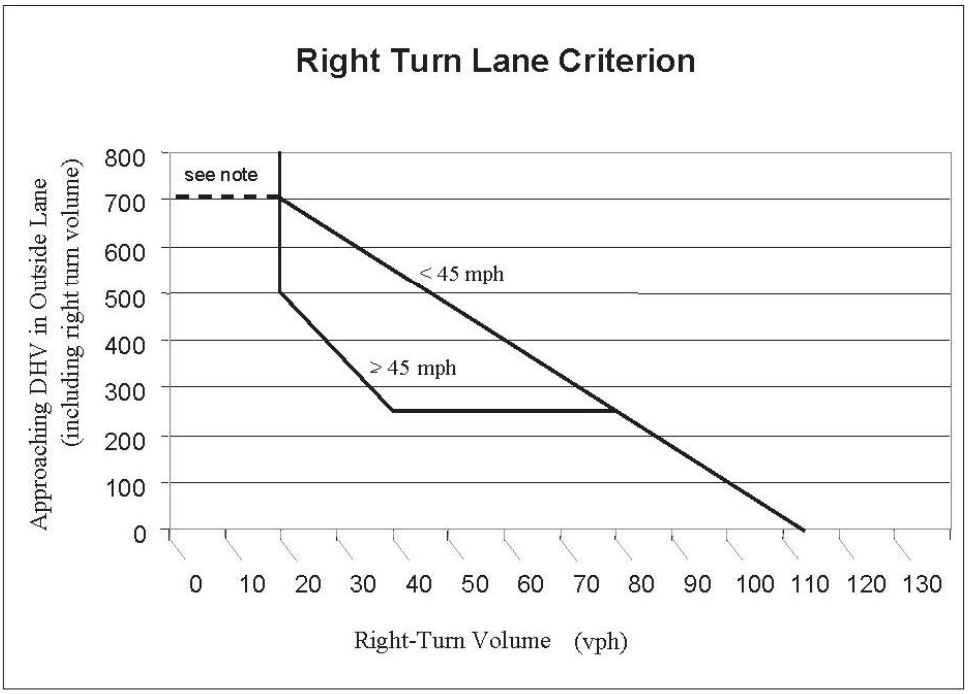
Major-Street Design Speed: 45 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	11	62
Approaching DVH in Outside Lane:	309	445
Calculated Turn Volume Threshold:	35	24
Right Turn Volume Exceeds Threshold?	**NO**	**YES**

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

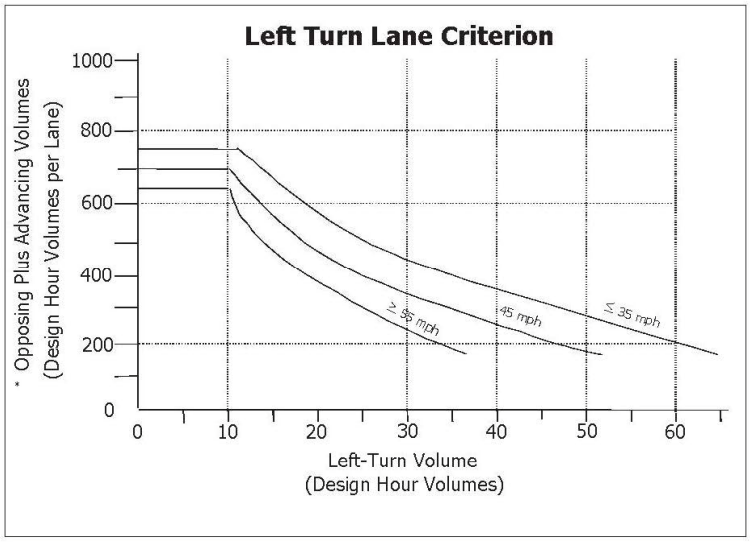
Left-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Deer Meadows Development
Approach: Dubarko Road eastbound at Langensand Road
Scenario: 2023 Background plus Site Trips

Number of Advancing Lanes: 1
Number of Opposing Lanes: 1
Major-Street Design Speed: 25 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	33	46
Opposing Volume for Design Hour:	85	57
Design Hour Volume Per Lane:	118	103
Number of Left Turns per Hour:	23	21
Left-turn lane warrants satisfied?	**NO**	**NO**

Exhibit 7-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Right-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Deer Meadows Development
Approach: Dubarko Road Westbound at Langensand Road
Scenario: 2023 Background Plus Site Trips

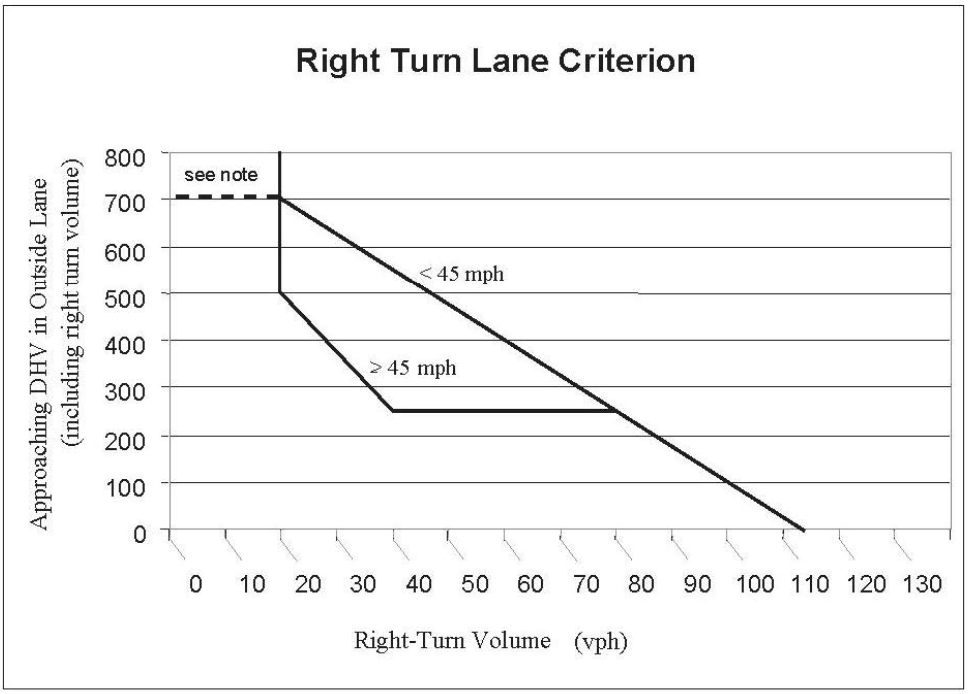
Major-Street Design Speed: 25 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	54	33
Approaching DVH in Outside Lane:	85	57
Calculated Turn Volume Threshold:	102	105
Right Turn Volume Exceeds Threshold?	**NO**	**NO**

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

EXHIBITS DD

9/18/2021

Re: Proposed New Development
Meeting Date: 9/27/2021 – Public Comment
File No: 21-014 SUB/TREE Deer Meadows Subdivision (TYPE III)
Physical Address: 40808 and 41010 Highway 26
Tax Map/Lots: T2 R5E Section 18 CD, Tax Lots 900 and 1000

Sir(s):

I would like to ask the planning commission to consider the following proposals.

After reviewing the latest notice that was issued and mailed to property owners within 300 feet of the site on August 10th, 2021; I/We would like to voice our opinions about the following two items we don't feel have been addressed fully in this latest proposal.

1.) Access in and out of the new proposed development is very limited. After reviewing the latest map it is clear that the only access into the new development will be by driving into or out of either Fawn Street or Dubarko. This is a huge concern of our quiet neighborhood. Our neighborhood takes pride in the fact that it is quiet and pedestrian safe and friendly. Because of that we have two suggestions as follows:

- Proposal No. 1: is that commission provides access into and off of Highway 26 into this new neighborhood somewhere between Langensand and Shorty's Corner. With 32+ new homes going into the proposed area we feel traffic volume will become a much bigger problem. With the average residence having a minimum of two vehicles, that would increase daily traffic by 64 vehicles traveling twice a day through our quiet neighborhood streets.
- Proposal No. 2: We would like to suggest that the commission would consider constructing traffic circles into this new area on both the intersections of Fawn and Meadow and Dubarko and Meadow. Without excessive speed deterrent's a straight shot into the new proposed neighborhood we foresee a huge pedestrian safety problem. Speed bumps "DO NOT" slow anyone down enough. The pick-up trucks using Meadow Avenue, Fawn Street, and Dubarko lately have developed excessive speed issues. Traffic circles will and would be a great solution to that problem.
- Proposal No. 3: We would like to see the developer remove the Douglas Fir trees behind the homes on Meadow Avenue between Fawn and Dubarko. Those trees create a potential HUGE fire and safety hazard. With the increase risk of fires growing annually and the development of these new homes those Douglas Firs most definitely are more and more of a huge fire risk. If a fire were to enter into our area in the future like we almost experienced in 2020, our whole neighborhood would have to flee just because of those trees. Please remove them - We do not want those trees to remain.

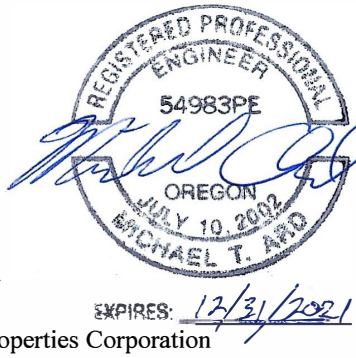
Both my wife and I have discussed these items with our neighbors numerous times. We love our neighborhood and would like to continue to find it safe and livable for our grandchildren, neighbors children and ourselves, and as free as possible from any future fire risk and traffic issues.

Respectfully,

Vincent & Lynn Mandina

Vincent & Lynn K. Mandina
18351 Meadow Avenue
Sandy, OR 97055

EXHIBIT EE



ARD ENGINEERING
21370 SW Langer Farms Pkwy
Suite 142, Sherwood, OR 97140

Technical Memorandum

To: Dave Vandehey, Roll Tide Properties Corporation

From: Michael Ard, PE

Date: September 27, 2021

Re: **Deer Meadows Subdivision – Response to Agency Comments**

During review of the proposed Deer Meadows Subdivision project, several questions and concerns have been raised regarding traffic and transportation impacts and facilities within and near the proposed development. This memorandum is written to provide responses to the transportation-related comments raised by the city's on-call Transportation Engineering consultant John Replinger, the Oregon Department of Transportation, City of Sandy staff, and the general public.

COMMENTS BY JOHN REPLINGER, P.E.

John Replinger raised several concerns in his review letter dated August 30, 2021. Each concern is quoted along with a response below.

> *"Key deficiencies include a failure to provide for the extension of Dubarko Road to connect with US 26 as specified in the TSP and a failure to account for development of or access to the commercially zone[d] land (approximately 3 acres) that comprises a portion of 'Lot 32' in the proposed development" (pages 1-2).*

As detailed by the applicant's attorney, the City's Transportation System Plan has not been properly incorporated into the city's code requirements. Since the proposed development consists of permitted uses within the underlying zones and does not propose any plan amendments or zone changes which would require a long-range planning analysis, the obligation of the applicant is to address the near-term impacts of the actual development proposed. There is no legal obligation or authority to require consideration of transportation facilities or future development that is not proposed as part of this application. Future development within the C-3 zone will require a separate transportation impact analysis; however, that analysis cannot be required as part of a separate project that does not propose development within the C-3 zone, and any analysis of development within the C-3 zone would be purely speculative since the mix of future uses is not currently known.

As detailed in the updated traffic study dated September 27, 2021, operation and safety of the intersection of Highway 211 at Dubarko Road will be improved following completion of the proposed development and the associated mitigation (all-way stop control). All other study intersections and roadways meet the respective operational and safety requirements of ODOT and the City of Sandy.

> *"The engineer's use of pre-COVID-19 counts is understandable, but new analysis needed to address the full impact of the development should be based on new traffic counts" (page 2).*

An updated traffic impact study has been prepared using count data collected in June and September of 2021. These updated counts are all within one year and therefore fully address the cited deficiency.

Having conducted the analysis based on pre-COVID counts while applying a growth factor to determine the appropriate design traffic volumes **and** based on current year counts while applying a COVID adjustment factor to determine the appropriate design traffic volumes, the results are substantially similar. No changes to the recommendations of the prior report were necessary based on the newer count data.

> *"By failing to [show] any development of the commercially zoned land, the applicant has not shown the impact of the proposed removal of a key element of the TSP – namely Dubarko Road, which is shown connecting with US 26 at Vista Loop Drive (West)" (page 3).*

This comment reiterates the concern raised in the first comment. The response is similar. The applicant has no responsibility to provide the city with long-range transportation impact analysis or construction of physical facilities for the city's long-range planning goals when the city has not properly incorporated the Transportation System Plan into the city's code requirements. Because this is not a plan amendment or an amendment to a land use regulation, the Transportation Planning Rule as set forth in OAR 660-012-0060(1) does not require the applicant to analyze potential transportation impacts beyond those associated with the actual land use currently proposed in the Deer Meadows Subdivision application.

> *"On a city-wide scale, the trip distribution seems reasonable. However, the proposed elimination of Dubarko Road results in localized impacts in the immediate vicinity that will result in different travel patterns than anticipated in the TSP" (page 3).*

The traffic impact studies provided for the proposed development contemplated the distribution of site trips based on the actual street connections proposed. Accordingly, the near-term impacts of the development were properly considered. Again, the applicant has no responsibility to assess or address potential inadequacies of the city's long range transportation plan in conjunction with an allowed use on this property.

> *"Since the TIS did not examine the impact of development of the commercially zoned portion of the site, it is not clear that LOS D would be achieved with full development of the subject property. It appears that only a little more development in Sandy would push the Dubarko Road Highway 211 intersection to LOS E and cause the need for mitigation" (page 4).*

Per the updated traffic impact study, the intersection of Highway 211 at Dubarko Road is projected to operate at level of service E, which does not meet the city's operational standards. However, conversion of the intersection to all-way stop control is sufficient to reduce average delays for the critical movement as compared to background conditions. As such, the proposed mitigation is sufficient to address the impacts of the development and additional mitigation cannot lawfully be required since the request would be disproportionate to actual impacts.

It is anticipated that future development within the commercially zoned property will require a separate transportation analysis and it is very likely that additional operational mitigation will be required at that time to ensure that operation of this intersection is not degraded by future development. Determination of the appropriate type and scale of mitigation for this future project should be based on the actual characteristics of the future development. This determination lawfully must be made in conjunction with the future land use application for that property.

> *"The site plan makes no provision for access to the commercially zoned land (a portion of 'Lot 32'). The site plan does not show a new subdivision street abutting the commercially zoned portion of 'Lot 32.' The applicant appears to be assuming that the commercially zone portion of 'Lot 32' would have direct driveway access to US 26, though this appears to conflict with ODOT access control policies. Alternatively, the applicant may be assuming some type of cross-easements or shared driveway connections involving the residentially zoned portion of 'Lot 32' would be acceptable. Neither option appears viable.*
>
> *The engineer failed to explain how the site would be developed to serve all uses in the absence of the Dubarko Road extension identified in the TSP. I think this is a serious deficiency. I recommend delaying any approvals until issues of access are fully developed and justified" (page 5).*

No access is proposed to Highway 26 as part of the subdivision application. The proposed street network includes "Street B" extending south from Dubarko Road. This street abuts the undeveloped property within Lot 32 and can provide access to future development on the east side of Street B. Future development within Lot 32 will be subject to Design Review, at which time it will be appropriate to assess how circulation works within this lot. However, there is no clear and objective code standard which requires assessment of access to the C-3 portion of the site as part of this subdivision application.

ADDITIONAL INFORMATION

Although not raised explicitly in Mr. Replinger's review of the traffic study, one other deficiency was addressed in the updated traffic impact analysis. The city's development code requires that local streets carry no more than 1,000 average daily trips. Several local streets will be impacted by the proposed development, and no explicit assessment of daily traffic volumes was included in the traffic study dated June 6, 2021. This omission has been corrected in the updated traffic study dated September 27, 2021. Based on the analysis, no local streets will experience average daily traffic volumes in excess of the 1,000 ADT limit upon completion of the proposed development.

ODOT COMMENTS

The Oregon Department of Transportation has provided comments into the record in the form of a response memo dated September 1, 2021.

The ODOT comments requested that the Dubarko Road extension be completed and that frontage improvements be constructed along Highway 26. It was also noted that "…additional highway access could be dangerous and difficult to approve, particularly for any commercially zoned property such as the parcel on the east side of the proposed development.

Similar to the response to Mr. Replinger's review, the applicant cannot be required to complete improvements contemplated in the city's Transportation System Plan since the TSP has not been properly incorporated into the city's development code. Additionally, since the proposed subdivision does not include a plan amendment or an amendment to a land use regulation, the Transportation Planning Rule as set forth in OAR 660-012-0060(1) does not require the applicant to analyze potential transportation impacts beyond those associated with the actual land use currently proposed in the Deer Meadows Subdivision application.

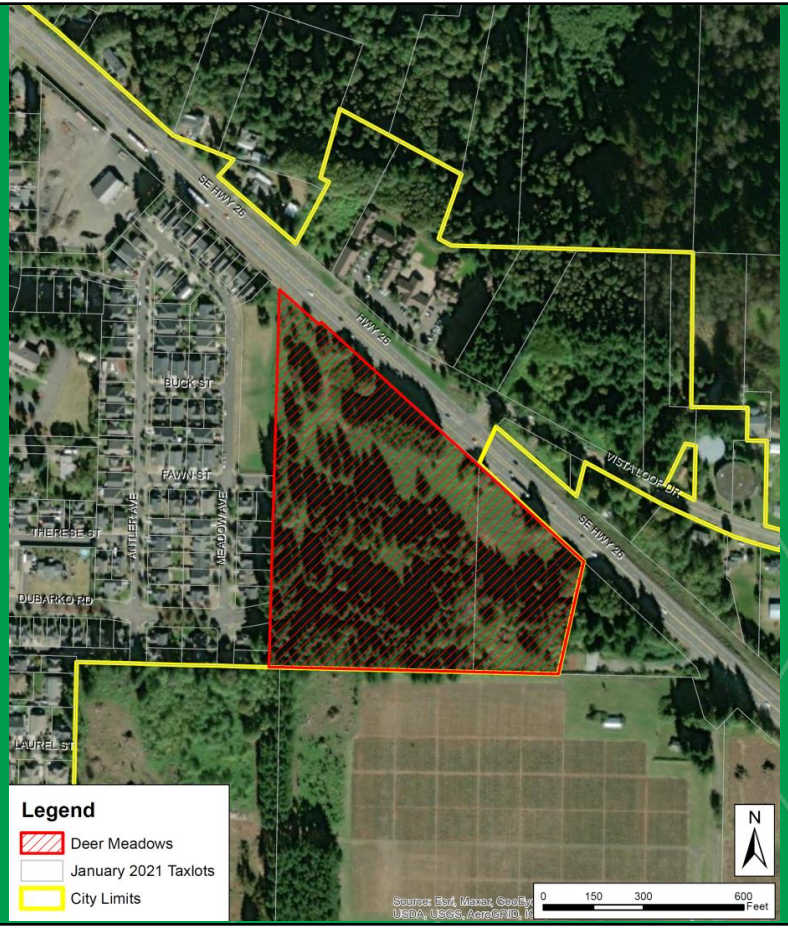
SANDY
WHERE INNOVATION MEETS ELEVATION

File # 21-014 SUB/TREE

Deer Meadows Subdivision

Planning Commission
September 27, 2021

Vicinity Map



Request

- Type II Subdivision
- Based on Section 17.12.20 the Director elevated this application to a Planning Commission hearing because of expected public interest.

WHERE INNOVATION MEETS ELEVATION

Notices

- Transmittal sent to agencies asking for comment on August 2.
- Notification was mailed to affected property owners within 300 feet of the subject property on August 10.
- A supplemental notice regarding the Planning Commission meeting was mailed to affected property owners within 300 feet of the subject property on August 24.
- A legal notice was published in the Sandy Post on September 15.

SANDY
WHERE INNOVATION MEETS ELEVATION

Public comments

- At publication of the staff report five (5) written public comments were received. The main concerns:
  - Dubarko Road is not proposed to intersect with Highway 26.
  - More housing will increase congestion and exacerbate parking issues.
  - Deer Pointe Park is not proposed to be expanded.
  - Multifamily housing should not be approved.

SANDY
WHERE INNOVATION MEETS ELEVATION

Agency comments

- Fire Marshal (dated August 10, 2021)
- ODOT (dated September 1, 2021)
- Parks and Trails Advisory Board (dated September 1, 2021)
- City Transportation Engineer (dated August 30, 2021)
- City Transit Director (dated August 30, 2021)
- City Public Works Director (dated September 2, 2021)

SANDY
WHERE INNOVATION MEETS ELEVATION

Proposal

- 32-lot subdivision
- 30 lots of Low Density Residential (R-1) that will contain single family homes or duplexes
- one small lot (9,023 square feet) of Medium Density Residential (R-2)
- one large lot (7.35 acres) with a combination of Medium Density Residential (R-2) and Village Commercial (C-3)

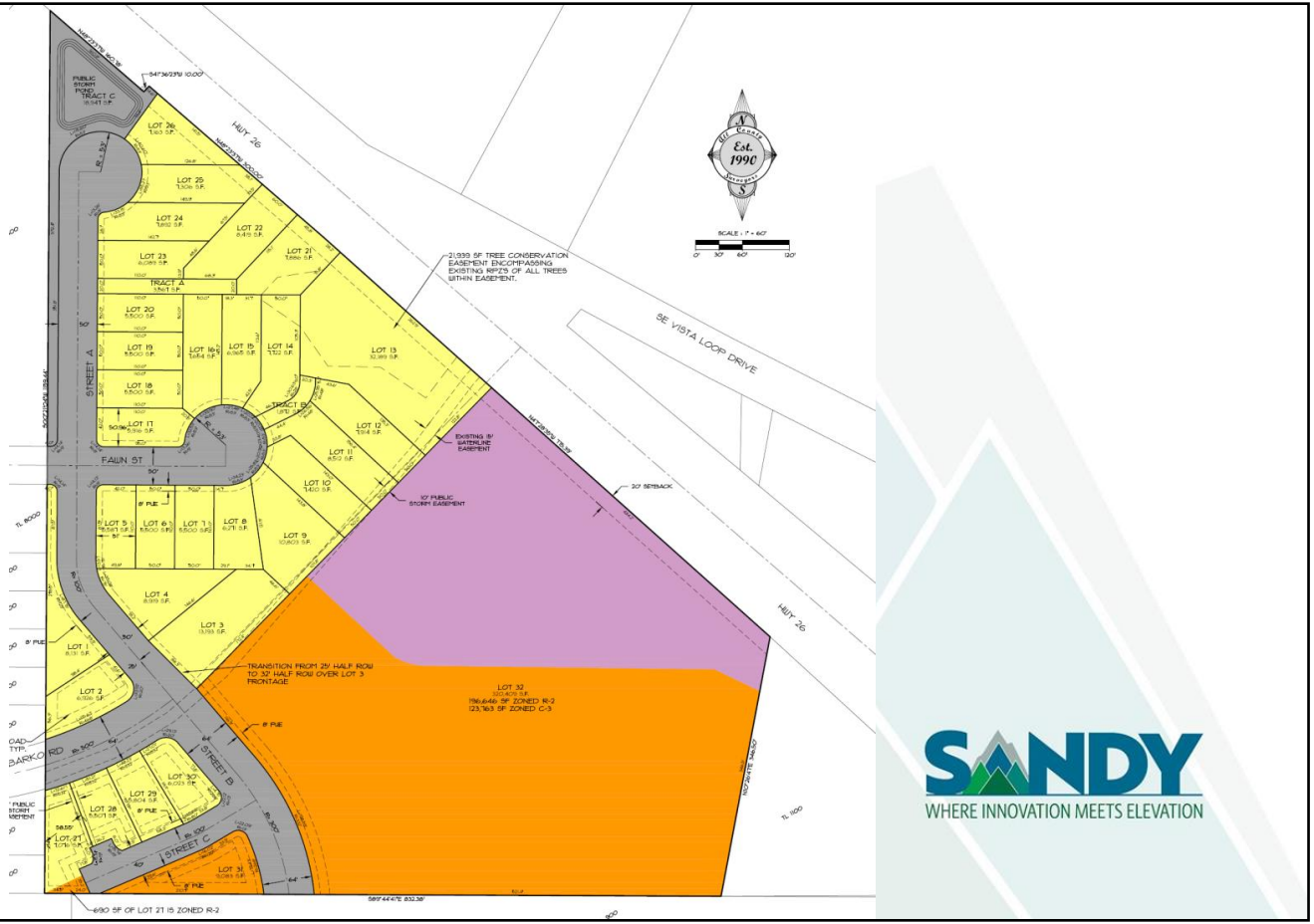
SANDY
WHERE INNOVATION MEETS ELEVATION

Proposal

- The 30 lots of R-1 land range in size from 5,500 square feet to 32,189 square feet.
- The exact number of multifamily units will be determined with a subsequent design review application, but the applicant claims the number of multifamily dwelling units on the R-2 zoned land will be between 38 dwelling units and 66 dwelling units.
- The C-3 zoned land will likely contain a mix of commercial and residential development.

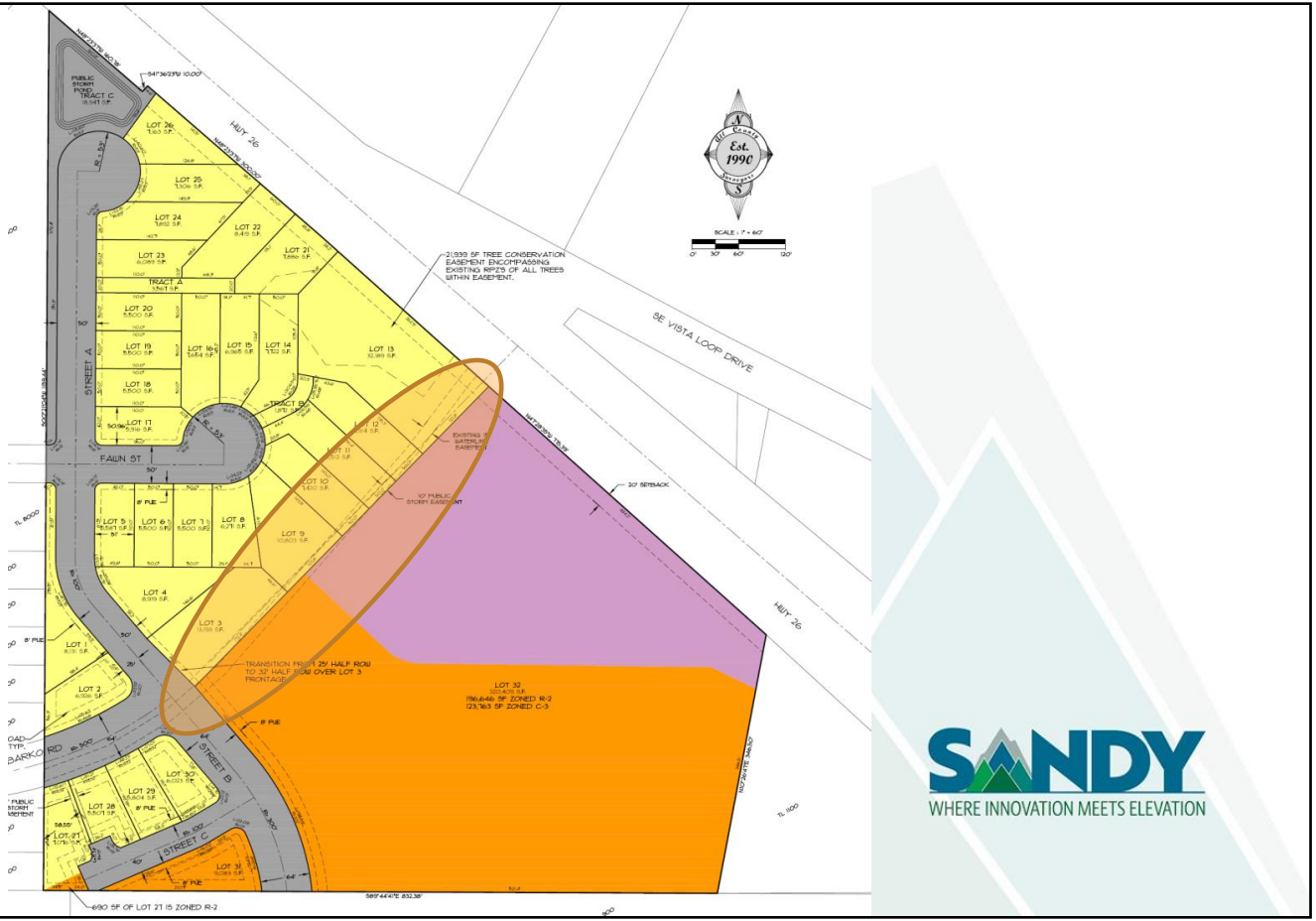
SANDY
WHERE INNOVATION MEETS ELEVATION

Plat Map



SANDY
WHERE INNOVATION MEETS ELEVATION

No Dubarko Road



SANDY
WHERE INNOVATION MEETS ELEVATION

TSP Plan (M20)

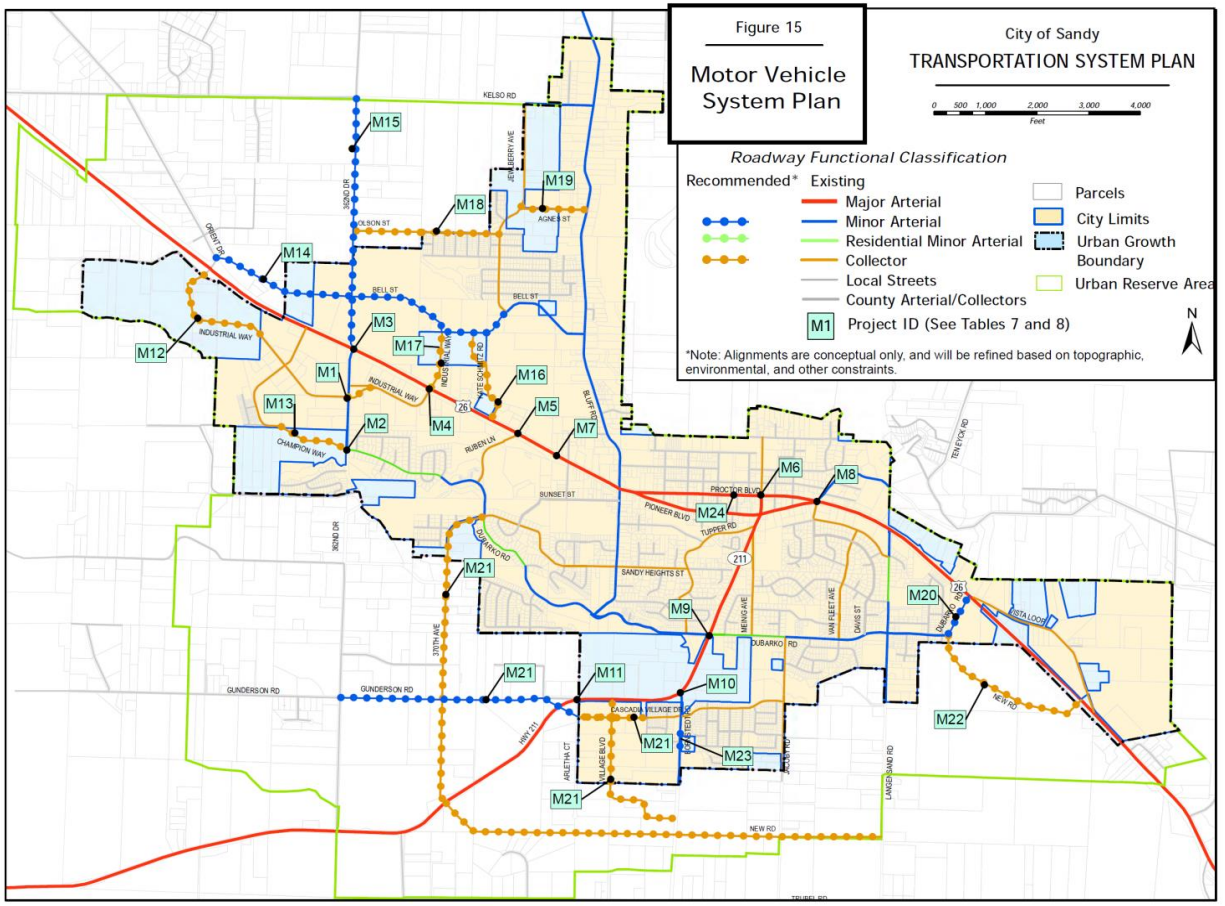
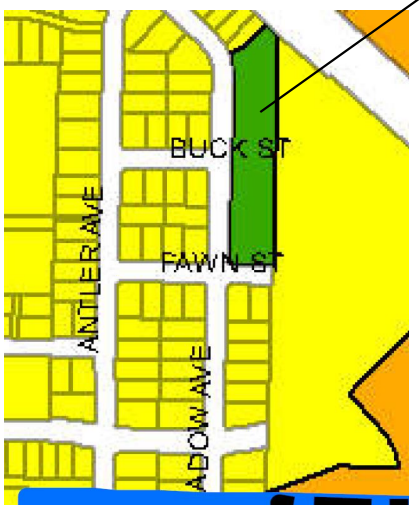
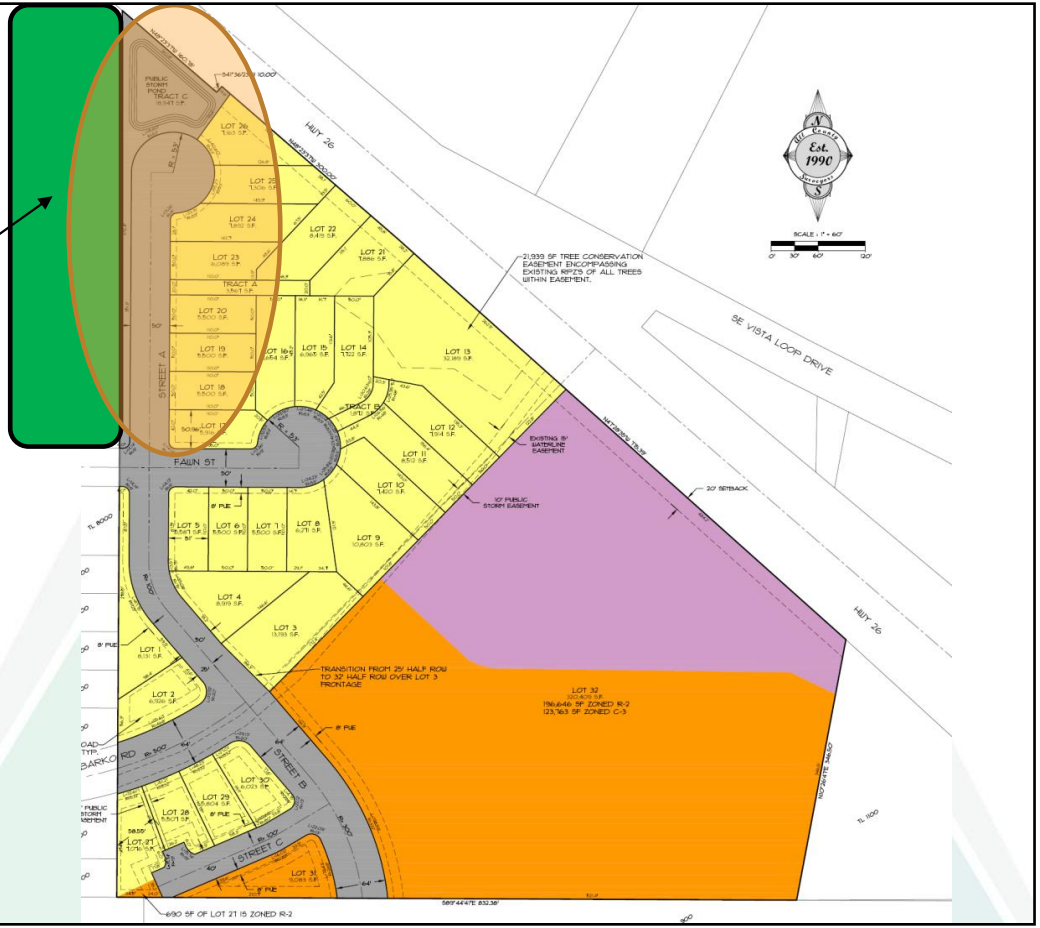


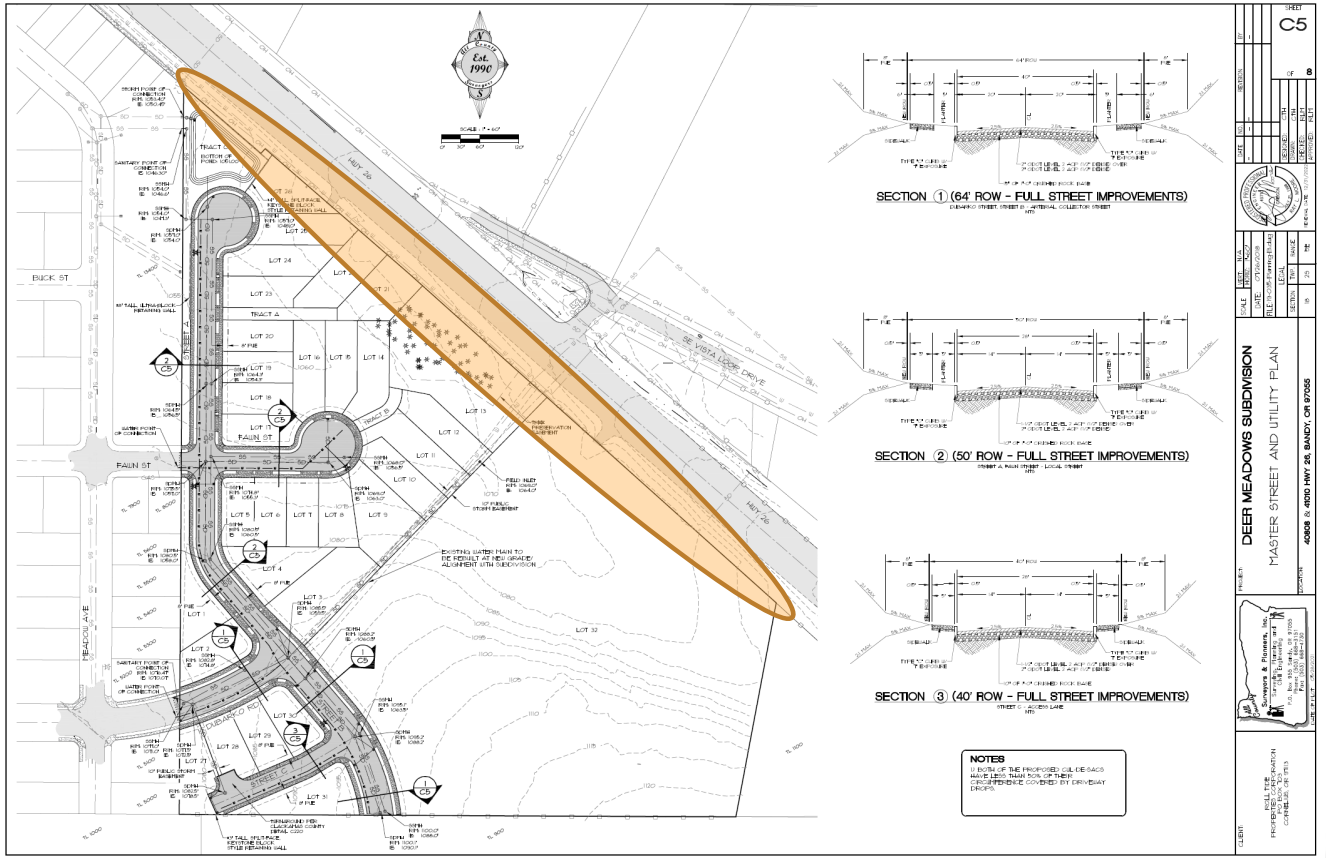
Figure 15
Motor Vehicle System Plan
City of Sandy
TRANSPORTATION SYSTEM PLAN
0 500 1,000 2,000 3,000 4,000
Feet
Roadway Functional Classification
Recommended* Existing
Major Arterial
Minor Arterial
Residential Minor Arterial
Collector
Local Streets
County Arterial/Collectors
Parcels
City Limits
Urban Growth Boundary
Urban Reserve Area
M1 Project ID (See Tables 7 and 8)
*Note: Alignments are conceptual only, and will be refined based on topographic, environmental, and other constraints.
N
KELSO RD
M15
M19
M18
M14
M3
M17
M12
M1
M16
M13
M2
M4
M5
M7
M6
M8
M24
M21
M9
M20
M11
M10
M22
M23
GUNDERSON RD
SUNSET ST
PROCTOR BLVD
PIONEER BLVD
TUPPER RD
SANDY HEIGHTS ST
DUBARKO RD
INDUSTRIAL WAY
CHAMPION WAY
RUBEN LN
BELL ST
OLSON ST
AGNES ST
JEAN BERRY AVE
362ND DR
ORIENT DR
INDUSTRIAL WAY
PIONEER BLVD
TENEYCK RD
MERIDIAN AVE
VAN FLEET AVE
DAVIS ST
DUBARKO RD
SISTA LOOP
NEW RD
CASCADE VILLAGE DRIVE
VILLAGE BLVD
ARLETHA CT
JACOBS RD
LANGER FARMS RD
NEW RD
TRUBEL RD
HWY 211
211
26

No Park Expansion

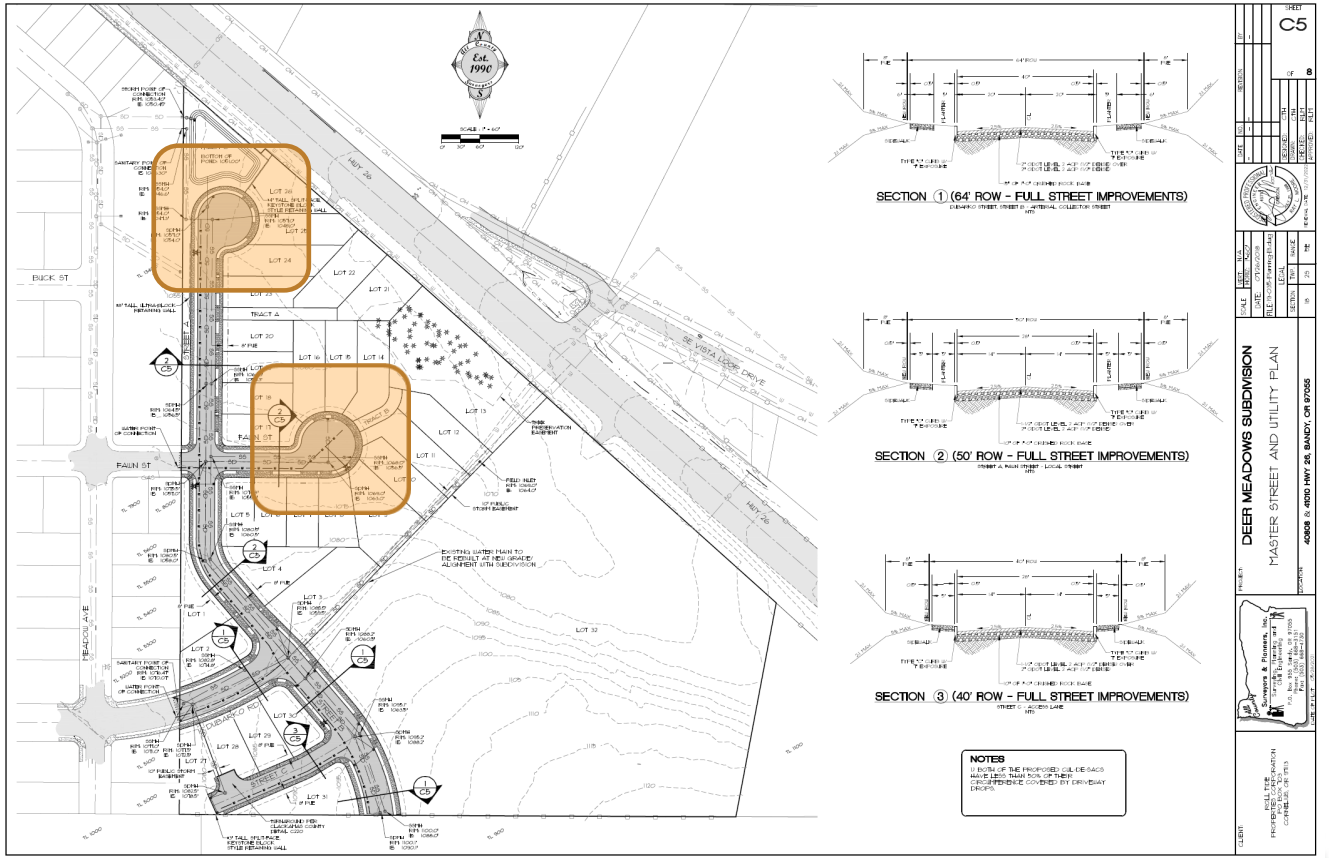




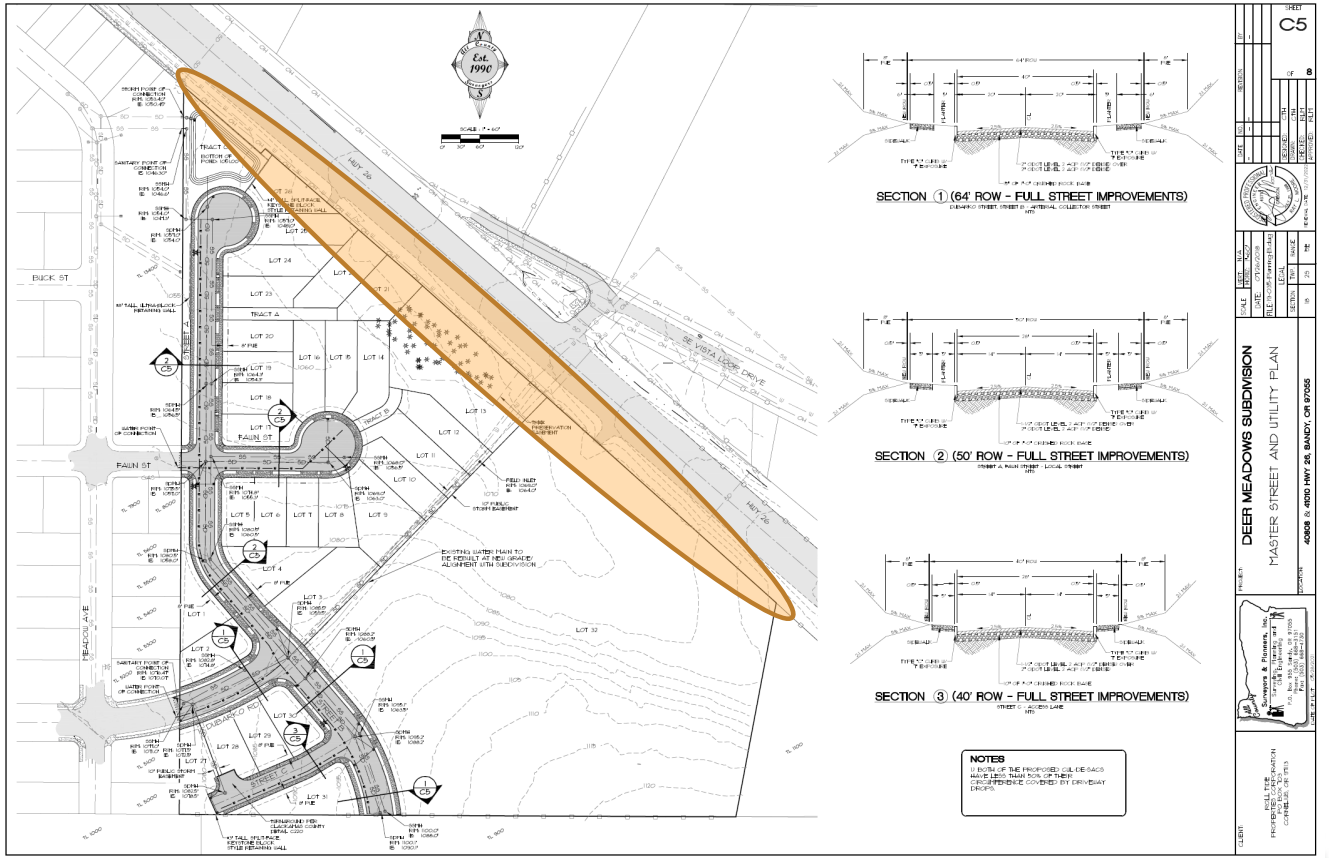
No
HWY 26
Frontage
Improvements



No Pedestrian Connectivity From Cul-de-sacs



Lack of Utility Extensions



Subdivision approval criteria

- Based on findings 17 – 23 (pages 5 – 8) in the staff report the subdivision proposal is not meeting 6 of the 7 approval criteria.

SANDY
WHERE INNOVATION MEETS ELEVATION

Legal arguments from the applicant

- Based on the applicant's submission materials and letters from their attorney they are arguing that large portions of the Sandy Development Code are not clear and objective and do not properly incorporate the Transportation System Plan.
- The applicant's attorney also wants rough proportionality and nexus tests completed for the parkland and Dubarko Road.

SANDY
WHERE INNOVATION MEETS ELEVATION

Staff responses to the applicant's arguments

- Staff does not agree with the applicant on the majority of their clear and objective arguments, and believes the TSP is properly incorporated into the subdivision criteria.
- Rough proportionality and nexus tests will need to be completed by the City Attorney and City Engineer, neither of which can be addressed on Sep. 27.

SANDY
WHERE INNOVATION MEETS ELEVATION

Staff responses to the applicant's arguments

- Take the applicant's arguments with a grain of salt! The applicant's attorney is hired to try and limit construction costs and argue on behalf of the developer.
- The applicant admitted that Dubarko Road is needed per the TSP and development code in their previous subdivision proposal for this same site.
- Applicant completed a records request of staff emails in search of a smoking gun.

SANDY
WHERE INNOVATION MEETS ELEVATION

Recommendation

Staff recommends that the Planning Commission deny the Deer Meadows Subdivision based on the findings of fact in the staff report and the reasons as listed on page 28 of the staff report.

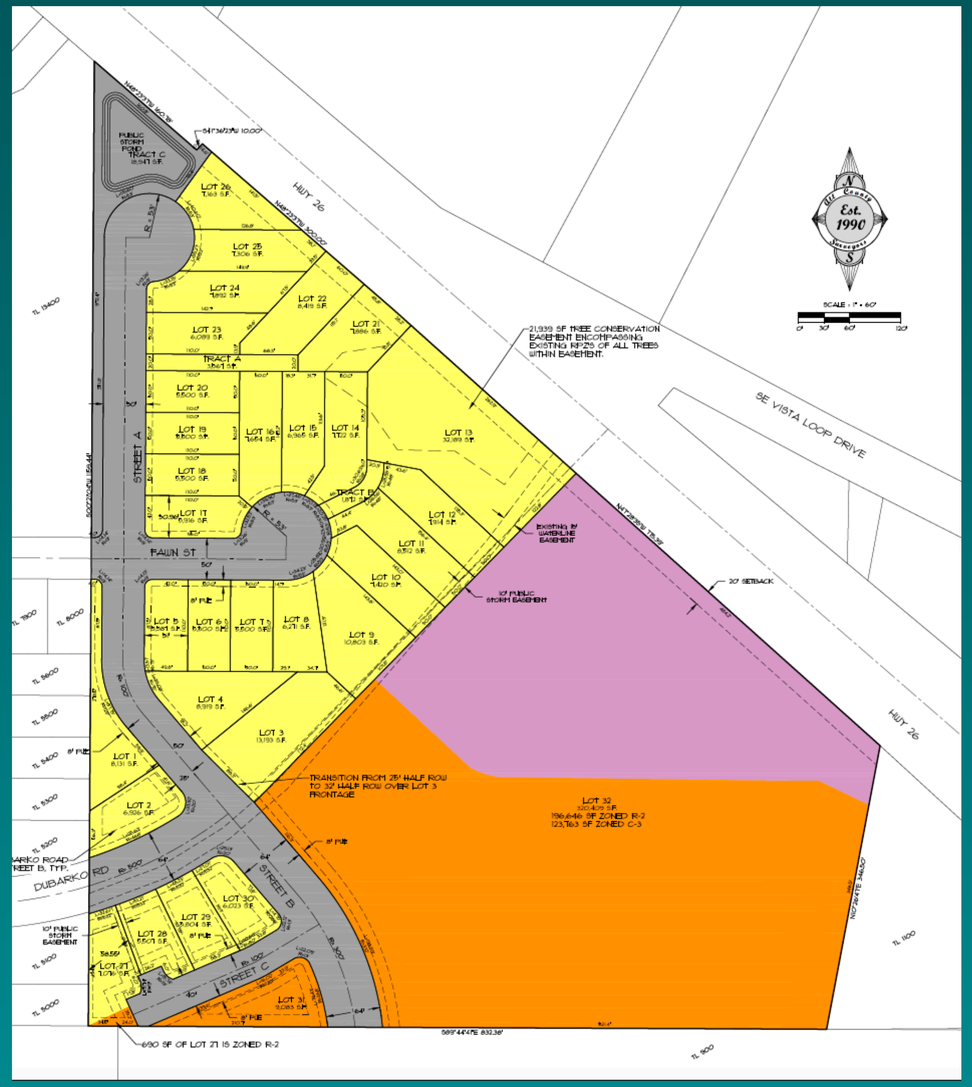
SANDY
WHERE INNOVATION MEETS ELEVATION

Deer Meadows Subdivision

Planning Commission Hearing
September 27, 2021

Application History

- The previous property owner submitted Vista Loop South Subdivision (81 lots, zone change). Approved October 2006.
- This approval expired in 2008 and was reinstated by the Council in 2013. Due to public improvement construction costs, the preliminary plat expired for a second time in 2015.
- The current owner purchased the property in 2018 and the Bull Run Terrace Subdivision application was submitted to the City at the end of 2019 (7 lots and zone change).
- This application was reviewed in 2020. Both staff and the Planning Commission recommended approval.
- The City Council reviewed the application and initially approved it. At the second reading the Council changed their vote and the application was denied.



Current Application

- Needed Housing application containing 32 lots in compliance with existing zoning.
- 30 lots zoned R-1 (density range 28 - 45 lots)
- 2 lots zoned R-2 (38 - 66 units).
- Lot 32 to contain both R-2 and C-3 zoning.
- The portion of Lot 32 zoned R-2 will contain multi-family dwellings as allowed.
- Uses on the C-3 zoned part of Lot 32 have not been determined. All future uses require a separate Design Review application.

Staff Recommendations (page 28)

1. **Proposal does not meet Subdivision Criteria 17.100.60 (E1 - E6) -** *As explained on pages 6 - 9 of the applicant's attorney's 9/24/21 letter, the majority of these criteria are not clear and objective and cannot be applied. To address Criteria E.4, the applicant has provided additional evidence from our traffic consultant related to ADT on local streets.*

2. **No evidence that the proposal complies with cul-de-sac (50%) requirement.** *An exhibit prepared by All County demonstrates how the proposal complies with this standard. This standard is satisfied.*

3. **Plan does not contain pedestrian connections beyond cul-de-sacs (17.84.30).** *As explained on page 10 of the attorney's letter, this section is not clear and objective and cannot be applied.*

4. **The distance between Dubarko Road and Street C is less than 150 feet (Section 17.84.50(E)(2) and 17.84.50(J)(3).** *The requirements of these sections are not applicable to the proposed development. Street C is a public access lane, not a local street.*

Staff Recommendations continued

5. **Minimum 100' tangent Dubarko and Street B not met (17.84.50(J)5(a)).** *The requirements in this section are not clear and objective. If this standard is found to apply, the plan can be modified to comply.*

6. **Dubarko Road not extended to Highway 26 (Development Code and TSP).** *As explained in the attorney's letter, the City cannot require the extension of Dubarko Road because such a requirement has not been incorporated into the City's land use regulations.*

7. **Frontage improvements along Highway 26 not included (Development Code).** *The City cannot require these improvements.*

8. **Plan does not clearly identify if 8" waterline will be replaced and 18" line installed (Water Master Plan).** *As explained in the attorney's letter, although this requirement could be resolved with a Condition of Approval, the applicant reserves the right to challenge the constitutionality of this condition.*

Staff Recommendations continued

9. **Plans do not show 12” waterline along Highway 26 extended east (Development Code).** *The applicant is unclear what specific code section requires this improvement and whether this standard is clear and objective. If it found to be applicable, this requirement could be a condition but cannot be a basis for denying the application.*

10. **Ten foot public storm easement shown on Lots 9-13, 27, 28 should be 15 feet (17.84.90(A)(2).** *The applicant is fine with a condition of approval to address this requirement.*

11. **Plan does not include parkland dedication (Chapter 17.86, 1997 Parks Master Plan).** *As explained in the attorney’s letter, the City cannot legally require parkland dedication.*

Conclusion

- The submitted application is a Needed Housing application.
- The proposal complies with all applicable clear and objective standards.
- As explained in the attorney's letter, City Code does not require dedication of parkland or Dubarko Road to be extended.
- A few of Staff's recommendations should have been Conditions of Approval, not grounds for denying the application.
- The Deer Meadows Subdivision application should be approved.

Questions?

EXHIBIT HH

Kelly O'Neill <koneill@ci.sandy.or.us>

FW: Deer Meadows Application in Sandy, Oregon

Robinson, Michael C. <MRobinson@schwabe.com> Wed, Oct 6, 2021 at 12:31 PM
To: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>, Dave Vandehey <dave.vandehey@rolltideproperties.com>, Tracy Brown <tbrownplan@gmail.com>
Cc: David Doughman <David@gov-law.com>

Hi, Kelly. Please place this email in the record before the planning Commisison s part of the Applciant's first open record period submittal.

Michael C. Robinson
Shareholder
Direct: 503-796-3756
Mobile: 503-407-2578
mrobinson@schwabe.com

Schwabe Williamson & Wyatt

-----Original Message-----
From: Robinson, Michael C. <MRobinson@schwabe.com>
Sent: Wednesday, September 1, 2021 6:29 AM
To: Jon Makler <Jon.Makler@odot.state.or.us>; Abraham Tayar <Abraham.Tayar@odot.state.or.us>
Cc: Dave Vandehey <Dave.Vandehey@accessmax.com>
Subject: Deer Meadows Application in Sandy, Oregon

Good morning, Jon and Avi.

My client Dave and I had a call with Kelly O'Neil last week to talk about the Deer Meadows application. Kelly said that you intended you to ask the DOJ to get involved in this application. It would seem appropriate that you'd want to talk with the applicant about ODOT's issues before submitting a comment on the application.

Can we schedule a call for next week after Labor Day?

Thanks. Mike

Sent from my iPhone

Schwabe
WILLIAMSON & WYATT®

EXHIBIT II

October 6, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

PRIVILEGED AND CONFIDENTIAL

VIA E-MAIL

Mr. Kelly O'Neill, Jr., Director
City of Sandy Development Services Department
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy File No. 21-014 SUB/TREE; Applicant's Extension of the 120-Day Period in ORS 277.178(1)

Dear Mr. O'Neill:

This office represents the Applicant. The Applicant has authorized me to extend the 120-day period in ORS 227.178(1) as allowed by ORS 227.178(5).

The Applicant submitted the application on March 31, 2021. The City deemed the application incomplete. The Development Services Director asked the Applicant to delay making the application complete because he was taking an extended vacation and did not want the 120-day period to begin during this period. The Applicant agreed to do so as a courtesy and agreed to start the 120-day period on July 27, 2021 (**Exhibit 1**) and end the 120-day period on November 24, 2021.

Prior to the conclusion of the initial evidentiary hearing on September 27, 2021, the Applicant requested that the Sandy Planning Commission close the public hearing but leave the written record open on the following schedule:

1. Until Monday October 11, 2021 at 4 p.m. for anyone to submit argument and evidence as those terms are defined in ORS 197.763(9);
2. Until Monday, October 18, 2021 at 4 p.m. for anyone to rebut argument and evidence submitted during the first open record period with argument and evidence; and
3. Until Monday, October 25, 2021 at 4 p.m. for the applicant only to submit final written argument without new evidence.

The Planning Commission adopted the above schedule and closed the public hearing.

The Planning Commission scheduled a special meeting on November 8, 2021 to deliberate to a tentative decision on the application.

The Applicant extended the 120-day period by 42 days, the period of its open record period, and 14 days, the period from the end of the open record period and the special meeting date, for a total of 42 days. The Applicant extends the 120-day period from November 24, 2021 to January 5, 2022.

Please place this letter in the official Development Services Department file for this application and before the Planning Commission prior to its meeting on November 8, 2021.

Very truly yours,

Michael C. Robinson

MCR:jmhi
Enclosure

cc: Mr. Dave Vandehey (*via email) (w/enclosure*)
Mr. Carey Sheldon (*via email) (w/enclosure*)
Mr. Alex Reverman (*via email) (w/enclosure*)
Mr. Ray Moore (*via email) (w/enclosure*)
Mr. Tyler Henderson (*via email) (w/enclosure*)
Mr. Tracy Brown (*via email) (w/enclosure*)
Mr. Garrett H. Stephenson (*via email) (w/enclosure*)
Ms. Erin Forbes (*via email) (w/enclosure*)
Mr. David Doughman (*via email) (w/enclosure*)

PDX\126769\255102\MCR\31870489.1

Schwabe
WILLIAMSON & WYATT®

June 11, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL

Mr. Kelly O'Neill, Jr., Director
City of Sandy Development Services Department
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy File No. 21-014 SUB/TREE

Dear Mr. O'Neill:

This office represents the Applicant for the above-referenced Application. This letter confirms the discussion that you and I had on June 1, 2021 regarding your request that the Applicant consider an initial extension of the 120-day period as authorized by ORS 227.178(5).

The Applicant will submit its completeness response on or about June 14, 2021. Rather than have the 120-day period start on the date of submittal when all missing materials are provided in accordance with state law, the Applicant will extend the 120-day period from the submittal date through July 27, 2021. The 120-day period will start on July 27, 2021 and the 120-day period will end on November 24, 2021. The Applicant is not required to further extend the 120-day period.

The extension is conditioned upon your scheduling the initial evidentiary hearing before the Sandy Planning Commission on September 27, 2021. The final decision must be issued by November 24, 2021 based on this extension.

The Applicant hereby extends the 120-day period from the submittal date through July 27, 2021. Please place this letter in the official Development Services Department file for this Application.

Very truly yours,

Michael C. Robinson

MCR:jmhi

cc: Mr. Dave Vandehey *(via email)*
Mr. Carey Sheldon *(via email)*
Mr. Alex Reverman *(via email)*
Mr. Tracy Brown *(via email)*

Pacwest Center | 1211 SW 5th | Suite 1900 | Portland, OR | 97204 | **M** 503-222-9981 | **F** 503-796-2900 | schwabe.com

Mr. Ray Moore *(via email)*
Mr. Mike Ard *(via email)*
Ms. Shelley Denison *(via email)*
Mr. David Doughman *(via email)*

PDX\126769\255102\MCR\31043687.1

EXHIBIT JJ

REPLINGER & ASSOCIATES LLC
TRANSPORTATION ENGINEERING

October 6, 2021

Mr. Kelly O'Neill
City of Sandy
39250 Pioneer Blvd.
Sandy, OR 97055

SUBJECT: REVIEW OF TRANSPORTATION IMPACT STUDY – DEER MEADOWS SUBDIVISION

Dear Kelly:

In response to your request, I have reviewed materials submitted in support of the Deer Meadows Subdivision on Dubarko Road in the east part of Sandy. The Transportation Impact Study (TIS), dated September 27, 2021, was prepared under the direction of Michael Ard, PE of Ard Engineering. A future street plan and preliminary plat, dated 7/26/2018, were also provided.

The site, with approximately 16 acres, is on the southwest side of US 26 and is bisected by Dubarko Road, a planned minor arterial road specified in the Sandy Transportation System Plan (TSP). TIS describes a proposal to subdivide the property; extend Dubarko Road from its present east terminus into the site; and create lots for low density dwellings and some apartments. A portion of the development is zoned for commercial uses but is not proposed to be developed at this time.

A significant feature of the development plan is that the applicant ignores the TSP and does not propose extending Dubarko Road, currently a stub street, to connect with US 26 opposite SE Vista Loop (West) as specified in the TSP. Instead, the TIS proposes "a new north/south collector roadway" as the eastern terminus of Dubarko Road.

It is also important to note that the analysis includes no development of the commercially zoned land, which is approximately 3 acres. The TIS indicates a need for further analysis when development of that commercial land is proposed.

Overall

TIS addresses most of the city's requirements and provides information useful in assessing many impacts of the proposed development. A key issue with the development proposal is a failure to provide for the extension of Dubarko Road to

connect with US 26 as specified in the TSP. Another conflict with the TSP is a proposal to construct a new north-south collector beginning at the proposed easterly terminus of Dubarko Road within the proposed subdivision.

Comments

1. ***Study Area.*** The study includes analyses of:

   - US 26 at SE Ten Eyck Road;
   - US 26 at SE Langensand Road;
   - Highway 211 at Dubarko Road; and
   - Dubarko Road at SE Langensand Road.

   Since the applicant assumes that Dubarko Road will not connect to US 26, the TIS does not include an analysis of this intersection.

2. ***Traffic Counts.*** The AM and PM peak hour traffic counts were conducted on September 21, 2021 or on June 9, 2021, depending on location. The engineer adjusted the traffic counts to account for seasonal variations. The engineer used a combination approach to account for seasonal variation of recreational traffic and separately for commuter traffic on US 26. Volumes on Highway 211 were adjusted to develop 30th highest hour traffic volume. The methodology appears consistent with the procedures defined by the Oregon Department of Transportation (ODOT).

   The engineer's also made adjustment to account for lower traffic volumes caused by COVID-19 impact. He increased US 26 volumes by 5.0 percent and others by 5.6 percent to account for the pandemic. The new counts and adjustments appear reasonable.

3. ***Trip Generation.*** The TIS uses trip generation for single-family dwellings and multi-family dwellings (land use code 210 and 220, respectively) from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. The engineer calculates that 32 single-family homes plus 120 apartments would produce 79 total AM peak hour trips; 99 total PM peak hour trips; and 1180 total daily trips. The calculation of trips generated by the residential development appears reasonable.

   This calculation does not include potential trips associated with the future development of the commercially zoned land within the development area. The TIS states that "the nature of this future use has not yet been determined. Accordingly,

a future traffic study will be required as part of the design review application for the future commercial site use."

By failing to account for any development of the commercially zoned land, the applicant has not shown the impact of the proposed removal of a key element of the TSP – namely Dubarko Road, which is shown connecting with US 26 at Vista Loop Drive (West).

4. ***Trip Distribution.*** The TIS provided information about trip distribution from the site. The engineer assumed 65 percent of the traffic would travel to and from the northwest on US 26; 20 percent would travel to and from the southeast on US 26; and 15 percent would travel to and from the west on Dubarko Road. On a city-wide scale, the trip distribution seems reasonable. However, the long-range impact from the proposed elimination of Dubarko Road will likely result in different travel patterns and different traffic volumes at key intersections than anticipated in the TSP.

5. ***Traffic Growth.*** The TIS uses a 1.96 percent annual increase for Highway 26 based on projected volumes at the west boundary of Sandy. For other facilities it uses a 2.0 percent annual growth rate to account for background traffic growth. The following in-process developments were included in the background traffic: the Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and Bornstedt Views. These assumptions account for future traffic and appear reasonable.

6. ***Analysis.*** Traffic volumes were calculated for the intersections cited in #1, above. Intersection level-of-service (LOS) and the volume-to-capacity (v/c) ratio were provided. The intersection of US 26 with SE Ten Eyck Road is signalized; the other intersections are stop-controlled. The analyses were conducted for existing 2021 conditions, 2023 background conditions, and 2023 with the development.

   The engineer calculates that the signalized intersection of US 26 with Ten Eyck meets the v/c standards specified by ODOT under all scenarios. At the intersection of US 26 with Langensand Road, the v/c for both the mainline and minor street approaches are calculated to meet ODOT's v/c standard. However, long delays (the basis for LOS) are calculated to occur on the minor street approach under existing and future conditions.

The intersection of Dubarko Road and Langensand Road is predicted to operate acceptably under all scenarios. The intersection will operate at LOS "B" or better, meeting city operational standards.

The engineer makes the following statement about the intersection of Highway 211 with Dubarko Road:

> *The intersection of Oregon Highway 211 at Dubarko Road was previously under the jurisdiction of the Oregon Department of Transportation and subject to a volume-to-capacity ratio standard rather than level of service. The intersection would have met ODOT's volume-to-capacity based standards for operation, but with conversion to a city intersection it is subject to the city's level-of-service standards. This intersection is projected to operate at level of service "F" under year 2023 background conditions during the evening peak hour.*
>
> *Upon completion of the proposed development, the intersection is projected to continue to operate at level of service F during the evening peak hour, with average delays for the highest-delay movement increasing from 51.0 seconds to 56.3 seconds if no mitigation is provided. However, if the intersection is converted to all-way stop control (as recommended in the Traffic Signal and All-Way Stop Control Analysis section of this report on page 20), the intersection is projected to operate at level of service E, with average delays for the highest-delay movement reduced to 36.3 seconds. Since intersection operation is better than under background conditions, this proposed mitigation is sufficient to fully offset the transportation impacts of the Deer Meadows Subdivision site trips. As such, any requirement for additional mitigation would be disproportionate to the impact of the proposed development.*

I think further explanation and comment about the engineer's statement is in order. The predicted LOS "F" at the intersection relates to the delay encountered by the motorists on the westbound minor street (Dubarko Road) approach during the PM peak hour with the existing traffic control (two-way stop control on the Dubarko Road approaches). Under current traffic control, the northbound and southbound approaches (Highway 211) encounter minimal delay and experience LOS A conditions.

As mitigation for the long delays and poor LOS for the Dubarko Road approaches, the engineer proposes conversion to all-way stop control. Under this traffic control

scenario, all traffic is required to stop at the intersection. Because northbound and southbound traffic volumes are higher, they will be the ones experiencing longer delays if all-way stop control is implemented. Because delays will be encountered on all approaches and the total delay will increase, it is somewhat misleading to describe the intersection as operating "better than under background conditions." Under all-way stop control, the total delay encountered by motorists using the intersection will increase substantially. The delays encountered by motorists on the poorest performing approach with all-way stop control will be lower than the delays encountered by the motorists on the poorest performing approach with the current two-way stop control. The poorest performing approach changes between scenarios.

The proposed conversion to all-way stop control does offer some advantages, including the potential for improving safety. I leave it to others to assess the engineer's contention that "any requirement for additional mitigation would be disproportionate to the impact of the proposed development."

The engineer concluded that "All other intersections are projected to operate acceptably per the appropriate jurisdictional standards."

7. ***Analysis of Local Street Impacts.*** The TIS also assessed traffic volumes on local streets to assure compliance with Section 17.10.30 of the Sandy Development Code. The proposed street network includes an extension of Fawn Street, which provides connections to Meadow Avenue, Antler Avenue, and Therese Street. The TIS provided estimates of current traffic volumes on these streets with the highest (600 vehicles per day) on Therese Street just east of Langensand Road. He calculates that no more than 210 daily trips would be added to these local streets by the dwellings in the proposed development. He concludes that all impacted local streets will continue to operate with volumes below 1,000 vehicles per day. I concur with his calculations and conclusion.

8. ***Crash Information.*** The TIA provides information on crashes for the most recent available five-year period covering 2015 through 2019.

   At the intersection of US 26 and SE Ten Eyck Road, there were eight reported and a relatively low crash rate. At the intersection of US 26 and Langensand Road, there were seven reported crashes and a low crash rate. At the intersection of Dubarko Road and Langensand Road, there was one reported crash.

The intersection of Highway 211 and Dubarko Road has been a safety concern for years and has undergone safety improvements. During the five-year period, 27 crashes were reported. The crash rate is substantially above the 90th percentile crash rate for similar intersections. Crashes remain a problem following implementation of safety improvements that included realigning the Dubarko Road approaches and added striping on Highway 211. The engineer notes that the crash history indicates warrants are met for all-way stop control. He recommends consideration of the installation of all-way stop control to address safety issues. I concur.

9. ***Site Plan and Access.*** The site plan provides for the extension of Dubarko Road, but only to a "new north/south collector roadway." Until such time as other development occurs to the south, Dubarko Road will serve as the principal access to the development. The only other access proposed at this time is Fawn Street, which would connect to Meadow Avenue just west of the subdivision.

   Neither the TIS nor the site plan describes how the new north/south collector would be integrated with the rest of the street system or would impact the TSP.

10. ***Sight Distance.*** The engineer did not analyze sight distance at the proposed intersections within the development. Given the terrain, sight distance is unlikely to be a problem and can be dealt with during design of the streets.

11. ***Traffic Signal Warrants.*** The engineer conducted a preliminary traffic signal warrant analysis at several locations based on ODOT procedures. He concluded that traffic signal warrants were not met at any location.

    He concluded that all-way stop-control was warranted at the intersection of Highway 211 and Dubarko Road based on the intersection crash history.

12. ***Left-Turn Lane Warrants.*** The TIS indicates that left-turn lanes are provided on eastbound US 26 at Langensand Road.

    According to the engineer, the intersection of Highway 211 at Dubarko Road currently meets warrants for a northbound left-turn lane and a northbound right-turn lane. However, he states that the need for these turn lanes is not materially related to the proposed development. He further states that turn lane may not be needed if all-way stop control is installed at the intersection as recommended based on his safety analysis.

According to the TIS, turn lanes are not warranted at the intersection of Dubarko Road and Langensand Road.

13. ***Conclusions and Recommendations.*** The engineer concludes that with conversion to all-way stop control, the intersection of Highway 211 at Dubarko Road would operate better under year 2023 traffic conditions with construction of the proposed development than without the development and the all-way stop control conversion. Further, he opines that installation of all-way stop control is sufficient to offset the impacts of the proposed development and any additional mitigation would be disproportionate to the actual impact of the proposed development.

    He concludes that all other study intersections are projected to operate acceptably through year 2023 either with or without the addition of site trips from the proposed development.

    While most study area intersections are operating relatively safely, the intersection of Highway 211 and Dubarko Road suffers from a high number of crashes and a high crash rate. It is substantially higher than the 90th percentile crash rate for comparable intersections. Recent safety improvements to not appear to have altered this trend. The proposed development is among those that are be expected to increase the traffic using the intersection of Highway 211 and Dubarko Road. The engineer recommends consideration be given to converting the intersection of Highway 211 and Dubarko Road to all-way stop control for safety reasons based on the historical data. He recommends no other mitigation to address safety issues.

Conclusion and Recommendations

As noted repeatedly above, the applicant is proposing to eliminate the planned connection of Dubarko Road with US 26 at Vista Loop Drive (West). Instead, he proposes to terminate Dubarko Road at a "new north/south collector roadway" near his property's west boundary. The TIS provides no justification for this change to the planned street system. There is no analysis showing the impacts on other portions of the street system caused by his proposed elimination of the minor arterial connection represented by Dubarko Road.

The proposal to eliminate a portion of Dubarko Road as a minor arterial street and to develop the new north/south collector roadway may or may not be actions requiring amendment of the TSP.

The intersection of Highway 211 and Dubarko Road is a known problem both because of a high crash rate and a poor LOS, especially for the westbound Dubarko Road approach. The engineer's proposed mitigation (conversion to all-way stop control) has some benefits or potential benefits, but there are also disadvantages particularly with regard to the overall delay at the intersection. The engineer contends that the proposed conversion to all-way stop control is sufficient to offset the impact from the proposed development. Further, he opines that additional mitigation would be disproportionate to the impacts of the development. I leave it to others to assess those opinions.

My highest concern relates to the applicant's proposal to eliminate the Dubarko Road connection to US 26 as specified in the TSP. My second concern is with the operation of Highway 211 and Dubarko Road. I think the proposal to convert it to all-way stop control has some potential benefits. I am not, however, convinced that the developer has no responsibility to participate in additional mitigation to improve the operational performance of the intersection given the additional trips his development will add to the intersection.

If you have any questions or need any further information concerning this review, please contact me at replinger-associates@comcast.net.

Sincerely,

John Replinger, PE
Principal

DeerMeadows2TIS100621

EXHIBIT KK

Kelly O'Neill <koneill@ci.sandy.or.us>

HB 2001 question

EDGING Sean * DLCD <Sean.EDGING@dlcd.oregon.gov> Thu, Oct 7, 2021 at 11:02 AM
To: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>, STUCKMAYER Ethan * DLCD <Ethan.STUCKMAYER@dlcd.oregon.gov>
Cc: Emily Meharg <emeharg@ci.sandy.or.us>, Shelley Denison <sdenison@ci.sandy.or.us>

Hey Kelly,

Of course! We grappled with this question as part of rulemaking. Because Oregon Fire Code is provided by the state, a local government would not be violating the requirement to allow a duplex "on each lot or parcel" if a subdivision did not meet this standard. There's a difference as to whether a duplex is "allowed" and whether it is "permitted".

For example, if someone created a 29-lot subdivision and indicated they would only build SFDs to avoid providing a fire apparatus turnaround, if an applicant came in later to apply for a building permit for a duplex, the city retains the ability to withhold issuing permit until a fire apparatus is provided. They would not be in violation of HB 2001 by doing so.

This same concept can be applied to other types of infrastructure planning as well, such as sizing of pipes and roadways. This creates an incentive for the subdivider to accurately convey the type of housing that will be built at the subdivision stage.

Best,

Sean Edging

Housing Policy Analyst | Community Services Division

Pronouns: He / Him / His

Cell: 971-375-5362 | Main: 503-373-0050

sean.edging@dlcd.oregon.gov | www.oregon.gov/LCD

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Thursday, October 7, 2021 7:55 AM
To: STUCKMAYER Ethan * DLCD <Ethan.STUCKMAYER@dlcd.oregon.gov>; EDGING Sean * DLCD <Sean.EDGING@dlcd.oregon.gov>
Cc: Emily Meharg <emeharg@ci.sandy.or.us>; Shelley Denison <sdenison@ci.sandy.or.us>
Subject: HB 2001 question

Sean and Ethan,

I hope all is well. I have an HB2001 related question. How do the HB2001 rules anticipate compliance with Appendix D of the Oregon Fire Code? That appendix contains access requirements and design guidelines for fire apparatus turnarounds. Section D107 states that any roads (i.e. subdivision or combination thereof) with access to 30 or more dwellings shall install a second fire emergency access. If we approve a 29 lot subdivision we have to assume the potential for 58 dwellings. How do you see HB2001 and the Oregon Fire Code working together?

I believe that any subdivision with more than 14 lots will trigger a second access road now or at the very least the requirement for every dwelling to include sprinklers. Do you agree?

https://codes.iccsafe.org/content/OFC2019P1/appendix-d-fire-apparatus-access-roads

Thanks for your help. -Kelly

Schwabe
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EXHIBIT LL

Memorandum

VIA E-MAIL

To: Jerry Crosby, Chair, and Sandy Planning Commission Members

From: Michael C. Robinson

Date: October 11, 2021

Subject: City of Sandy File No. 21-014 SUB/TREE; Part of Applicant's First Open Record Period Submittal

File No.:

Dear Chair Crosby and Sandy Planning Commission members,

Attached are two pages from the Staff Report for the December 7, 2020 Sandy City Council public hearing for the Bull Run application, the prior application concerning this property. These pages are submitted to support the Applicant's argument that the Dubarko Road frontage improvements cannot be based on any City plan, incorporated or otherwise, and that a connection to U.S. Highway 26 requires a Grant of Access.

Exhibit 1 is Finding 75 from Staff Report page 22 which explained that the U.S. Highway 26 improvements requested by ODOT are not based on the City's Transportation System Plan (the "TSP"). Without the TSP as a basis for the proposed exaction and because applicable law prevents the improvements as an exaction, the City is without authority to require the improvements for this Application, especially because the Application's vehicle trips will not access U.S. Highway 26.

Exhibit 2 is Finding 86 from Staff Report page 24 which explained that the Dubarko Road connection requires a Grant of Access, the argument made by the Applicant in this Application.

MCR:jmhi
Attachments

PDX\126769\255102\MCR\31953452.1

Pacwest Center | 1211 SW 5th | Suite 1900 | Portland, OR | 97204 | **M** 503-222-9981 | **F** 503-796-2900 | schwabe.com

easement will impact the tree retention area. If the tree retention area is negatively impacted the applicant shall preserve additional trees. Street B (defined as 'New Road in the TSP) is classified as a collector street and does not need to adhere to the standards in Section 17.84.50(B).

73. The alignment of Street B and Dubarko Road does not provide the minimum 100 feet of tangent alignment (as measured from the curb line on Dubarko extended) on Street B as required by Section 17.84.50(H)(5)(a) of the Sandy Municipal Code (SMC). **The alignment of the intersection of Street B and Dubarko Road shall be revised to provide the minimum 100 feet of tangent section to comply with the Development Code or as otherwise approved by the City Engineer.**

74. The widening of Dubarko Road to accommodate the section recommended in the TSP is eligible for Transportation System Development Charge credits. The difference in cost between the required minor arterial improvements and a standard local street section is eligible for credits. **Estimated costs shall be submitted to City staff and reviewed and approved by the City Engineer. The City and the Applicant shall enter into an agreement defining the eligible improvements and estimated costs prior to plat approval. SDC credits shall be based on final audited costs.**

75. Dubarko Road will contain a dedicate left turn and right turn/through lane, a median with street trees, and a dedicated left turn lane to Street B. Highway 26 improvements will include among other things a dedicated right turn lane to Dubarko Road, sidewalks, street trees, and restriping. **The applicant shall adhere to all standards and requirements that are defined by ODOT, including the Dubarko Road connection to Highway 26 and all required improvements along Highway 26 including stormwater facilities constructed as necessary to be consistent with local, ODOT, and ADA standards.** As stated by the Public Works Director any ODOT required improvements on and adjacent to the Highway 26 frontage of the site are not included in the City's TSP or capital plans and as such are not eligible for SDC credits or reimbursement.

76. The proposed development does not include any long straight street segments or cul-de-sac streets and is thus not required to follow the standards in Section 17.84.50(C).

77. Section 17.84.50(D) requires that development sites shall be provided with access from a public street improved to City standards. All single-family homes will gain direct access from a public street improved to city standards with the exception of Lot 4 which will be accessed across an easement on Lot 3. All new streets are proposed as full street improvements with the exception of improvements along Highway 26. No off-site improvements have been identified or are warranted with the construction of this subdivision. All streets are proposed as full streets; with no three-quarter streets being proposed.

78. Section 17.84.50(E) requires that public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property. The proposed street layout results in one temporary dead-end street (Street B) that will be stubbed to the southern property line of the subject property. To accommodate fire apparatus turnaround the

Collector road terminating at the southern extents of the subject property to allow the road to extend south from the westernmost leg of the SE Vista Loop Drive intersection; and curb, sidewalks, cross walk ramp, bikeways and road widening along Highway 26 constructed as necessary to be consistent with local, ODOT, and ADA standards.

86. The intersection of Dubarko Road and Highway 26 requires a grant of access from ODOT. **Prior to final plat approval the applicant shall obtain a grant of access or other necessary approval from ODOT for access to Highway 26 at Dubarko Road.**

87. The City Transportation Engineer (Exhibit M) stated that conditions of approval should be included requiring the development comply with the standards and procedures specified by ODOT. He went on to say that ODOT requirements and standards associated with frontage improvements where the development abuts Highway 26 shall be made conditions of approval with the development.

17.86 – Parkland and Open Space

88. The applicant intends to dedicate parkland as outlined in the requirements of Section 17.86.

89. 17.86.10(2) contains the calculation requirements for parkland dedication. The formula is acres = proposed units x (persons/unit) x 0.0043. For the four single family homes, acres = 4 x 3 x 0.0043 = 0.05 acres. For the maximum development of 147 multifamily units, acres = 147 x 2 x 0.0043 = 1.26 acres. Combined, this totals 1.31 acres. The applicant proposes to dedicate 1.426 acres of parkland and is thus in compliance with this requirement.

90. If the applicant proposes multifamily dwellings as part of the development of Lot 7 which is proposed to be zoned C-3 the applicant is eligible for parks fee in-lieu credit up to 0.11 acres (the rounded difference between the required amount of parkland dedication and the proposed amount of parkland dedication). **The applicant can propose up to 13 multifamily units (13 x 2 x 0.0043 = 0.11 acres) prior to incurring parks fee in-lieu charges. Anything beyond 13 multifamily units on Lot 7 will incur parks fee in-lieu fees per the calculations as defined in the Sandy Development Code. However, if the applicant does not propose any multifamily units on Lot 7 the applicant will not be owed a monetary credit.**

91. Section 17.86.20 has a requirement that all homes must front on the parkland. The applicant is not proposing any houses to the south or east of the parkland, but instead are proposing future commercial development. The applicant's narrative states, "in order to address the spirit of the requirement of this requirement in this section, the applicant proposes constructing a widened sidewalk along the eastern park frontage adjacent to Lot 7". Staff supports the shift of commercial lands from the east side of Dubarko Road to the west side of Dubarko Road if the parkland is accommodated with adequate landscape buffering, pedestrian amenities, and commercial development (albeit mixed use or traditional commercial) having active storefronts or patios facing the parkland. The purpose of having homes front the parkland is to provide eyes on the park and increase safety for park users. Having active storefronts or patios facing the park will provide the same safety measures as homes facing the park. **Staff recommends that the design review approval for Lot 7 shall**

EXHIBIT MM

Home Builders Association
of Metropolitan Portland

October 11, 2021

Chair Crosby
Sandy Planning Commission
39250 Pioneer Blvd
Sandy, OR 97055

Subject: Deer Meadows Subdivision, Case File No. 21-014 SUB/TREE

Dear Chair Crosby, Vice-chair Carlton, and Commissioners:

The Home Builders Association of Metropolitan Portland ("HBA") represents over 850 companies and tens of thousands of women and men who work in the residential building and remodeling industries throughout the greater Portland area. We work to promote housing affordability and are dedicated to maximizing housing choice for all who reside in the region.

The State of Oregon generally – and the Portland Metropolitan region in particular – is suffering from an historic deficit of available housing. The Portland Metro region faces a nearly 60,000 unit current deficit, with an additional 225,000 units needed by 2040[1]. One of the most important measures that the legislature has taken in recent years to help combat this deficit is to strengthen Oregon's longstanding "Needed Housing Statutes."

Specifically, the legislature required in 2017 that local governments adopt and apply only "clear and objective standards, conditions and procedures regulating the development of housing." ORS 197.307(4). The statutes further provide that such regulations "may not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay." Moreover, the standards must be clear and objective on the face of the ordinance. ORS 227.173 (2).

HBA is concerned that the City of Sandy ("City") Municipal Code and Development Code ("Codes") contain standards, conditions and procedures that regulate the development of housing, which are not clear and objective. Development Code certainty is a large factor in the ability to acquire, finance, develop and construct housing. The degree with which the development community can rely on predictable code standards can determine whether a housing proposal moves beyond a concept and through each subsequent phase of development review. To increase the reliability of its code, with the view toward housing, HBA urges the City to adopt and apply only clear and objective standards regulating the development of housing.

[1] *Implementing a Regional Housing Needs Analysis Methodology in Oregon: Approach, Results, and Initial Recommendations.* August 2020. Prepared for Oregon Housing and Community Services. Technical Report.

HBA understands that many local governments have had to wrestle with unclear, subjective, and/or discretionary codes written before the amended Needed Housing Statutes. HBA understands that the City is currently grappling with this very issue as it regards the Deer Meadows subdivision, and appreciates that it may require the City to not apply certain land use standards that it may have applied in the past, or is used to applying.

However, HBA encourages the City to abide by the letter and spirit of the Needed Housing Statutes by imposing only clear and objective development code standards, including land use regulations, to this and other applications subject to City approval. At the same time, HBA encourages the City to adopt revised clear and objective standards that regulate the development of housing, to address development issues currently regulated by subjective standards.

The City's attention to clear and objective development standards for housing can help ensure that development proceeds toward construction without unnecessary delays, while meeting specified conditions of approval. In June, pursuant to HB2001, Sandy refined its zoning code, applying clear and objective siting and design standards to allow both attached and detached duplexes on all lots and parcels that allow for the development of single detached dwellings. By adopting and applying clear and objective land use and other standards regulating the development of all housing, the City can support more efficient housing production, in order to accommodate the current and future needs of Sandy residents.

Respectfully,

Roseann Johnson
Assistant Director of Government Affairs

Cc: Steven Hook, Commissioner
Jan Lee, Commissioner
Ron Lesowski, Commissioner
Hollis MacLean-Wenzel
Chris Mayton, Commissioner
City Recorder

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October 11, 2021

EXHIBIT NN

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
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mrobinson@schwabe.com

VIA E-MAIL TO PLANNING@CI.SANDY.OR.US;
SUBMITTED ON MONDAY, OCTOBER 11, 2021 BEFORE 4:00 P.M.

Mr. Jerry Crosby, Chair
Sandy Planning Commission
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy File No. 21-014 SUB/TREE; Applicant's First Open Record Period Submittal

Dear Chair Crosby and Planning Commission Members:

This office represents Roll Tide Properties Corp., the Applicant. This seven-page letter and its eight exhibits are part of the Applicant's first open record period submittal timely submitted on Monday, October 11, 2021 before 4:00 p.m.

1. Introduction and Schedule.

A. Status of Application Review.

The Planning Commission opened the initial evidentiary hearing on September 27, 201. No one objected to the Planning Commission's jurisdiction to hear the Application nor to the *ex parte* disclosures. Following the Staff Report, public and Applicant testimony and Applicant rebuttal, the Applicant asked the Planning Commission to close the public hearing and leave the written record open on the schedule contained in the Applicant's October 6, 2021 letter. The Planning Commission granted the Applicant's request and the Applicant extended the 120-day period in ORS 227.178(1) for a final decision on the Application by the City until January 5, 2022.

The next events in the review of the Application are:

- The second open record period ends on October 18, 2021 at 4:00 p.m. for argument and evidence as those words are defined in ORS 197.763(9)(a) and (b);
- The Applicant's final written argument without new evidence is due on October 25, 2021 at 4:00 p.m.; and

- Planning Commission deliberation to a tentative decision without new evidence or public testimony on November 8, 2021 at 6:30 p.m.

B. Response to Second City Transportation Engineer Memorandum.

The Applicant's argument and evidence responding to the City Consulting Transportation Engineer Memorandum submitted October 7, 2021 will be part of the second open record period submittal.

C. Applicable Approval Criteria are Those in Effect on March 31, 2021.

The applicable appeal criteria in the Sandy Development Code ("SDC"), subject to statutory requirements, are those in effect on March 31, 2021, the date the Applicant submitted the Application because it made the Application complete within 180 days of the submittal date. The SDC amendments and Parks Master Plan adopted by the Sandy City Council after March 31, 2021 are not applicable approval criteria for the Application. ORS 227.178(3) ("Goal Post Rule" providing that applicable approval criteria are those in effect on Application submittal date).

D. Characterization of Application.

The Application is both a "Limited Land Use" application as defined in ORS 197.015(12) because it is a tentative residential subdivision within the City's Urban Growth Boundary (the "UGB") and a "Needed Housing" application as defined in ORS 197.303(1)(a). The City's procedures and any conditions of approval are subject to ORS 197.307(4) and (7). None of the exceptions in ORS 197.303(5) and (6) and 197.307(5) and (7) apply. A zoning map, comprehensive plan map amendment or variance is not included in the Application. As a Limited Land Use application, the Application is subject only to properly incorporated and applicable Comprehensive Plan (the "Plan"), including Transportation System Plan (the "TSP"), provisions. As a Needed Housing application, the Application is subject to only clear *and* objective standards that do not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay.

3. Introductory Arguments.

The Applicant respects the City and its residents, the staff, the Planning Department and the City Council. The differences between the Application and the Staff Report are the result of differing views of applicable approval criteria related to state law. Nothing in the Applicant's evidence and argument is directed to any person or decision maker but state law requires the Applicant to present its argument and evidence and raise its issues (the "raise it or waive it" requirement in ORS 197.763).

The Applicant will reserve most of its responses to the written and oral staff reports for its final written argument, as allowed by ORS 197.763(6)(e); *Buffalo Bend Associates, LLC v. Clackamas County*, _____ Or LUBA _____ (LUBA No. 2019-090/091, January 31, 2020). However, there

are a few issues from those Staff Reports, especially the oral Staff Report, and two Planning Commissioner comments, that are addressed here.

- Neither the Applicant nor its lawyers nor their motivation have anything to do with the Planning Commission's task in this quasi-judicial proceeding, which is deciding if the Applicant has met its legal burden of proof to show that the applicable approval criteria, as consistent with relevant statutes, are met by substantial evidence. This is not a contest of wills between individuals. The Applicant will make its case with due respect for all of the participants.

- Why are three Schwabe lawyers involved? The Applicant values the insight of others than just Mr. Robinson and the City has the services of two very competent lawyers. The Director's comment about the number of lawyers is irrelevant to the approval criteria.

- Why did the Applicant make a public records request? The request was not, as suggested by the Director, because the Applicant does not believe in its case but because the Applicant wants to understand the Director's direction, if any, to agencies and departments that might have influenced their comments.

- How is the Bailey Meadows Subdivision relevant to the Application? It is not relevant to whether the approval criteria are met but it is worth noting the difference between the two applications. In Bailey Meadows, the City and the Applicant worked together to find solutions to many of the issues – providing a second street to the subdivision by expanding the City's Urban Growth Boundary (the "UGB"), providing land for a needed public park and giving the City jurisdiction over part of Oregon Highway 211. In contrast, the City has not desired to find solutions for this Application acceptable to both parties and as the public record disclosures show, has desired to deny the Application without addressing the state law issues that are at the center of the issues in this Application. In fact, the Applicant emailed the Oregon Department of Transportation ("ODOT") after an August 25, 2021 telephone call with Mr. O'Neill, Jr. and Mr. Orem to talk about the Dubarko Road extension but ODOT never responded.

- Why did the Applicant submit its letters so close to the public hearing? The Applicant did so because it took that long to respond to the long Staff Report issued seven days before the public hearing and because the Planning Commission would have time during the open record period to review the letters.

- Are the Needed Housing and incorporation issues new to the City? No. ORS 197.195(1) became effective in 1991 and directs the City to comply within two years of September 29, 1991, over thirty years ago. The Oregon Court of Appeals decided *Paterson v. City of Bend* in 2005 and the Oregon Land Use Board of Appeals ("LUBA") decided *Oster v. City of Silverton* in 2019 and Bailey

Meadows raised the issue the same year. The Needed Housing statutes became effective in 1981 and Statewide Planning Goal 10, "Housing," has included Needed Housing for many years. The Applicant is not at fault for raising issues that have long been state law requirements for the City to satisfy. The City must comply with state law and the Applicant appropriately raised the issue.

- Is the parkland dedication requirement clear and objective? As Planning Commissioner Don Carlton observed in the hearing, the dedication standards in SDC 17.86.10 can be construed as clear and objective but the *choice* between dedication and fee in lieu in SDC 17.86.40 does *not* involve clear and objective standards or procedures, which means the decision to require parkland dedication is subject to a subjective procedure and unknown considerations that are neither clear nor objective as required by ORS 197.307(4).

- Why did the Applicant agree to provide a parkland dedication and the extension of Dubarko Road in the prior application but not in this Application? The Applicant did so then because that Application was a different application subject to different standards. The prior application does not control the Application and different Applications do not require the same results.

4. Applicant's Evidence.

A. Mike Ard Memorandum dated October 9, 2021 (Exhibit 1).

Mr. Ard's memorandum contains trip counts and demonstrates that the local streets will operate within required trip levels when considering vehicle trips generated by the subdivision.

B. Dave Vandehey letter dated October 11, 2021 (Exhibit 2).

ORS 197.307(4) requires that even clear and objective standards, conditions and procedures not have the effect, either in themselves or cumulatively, of discouraging Needed Housing through unreasonable cost or delay. Mr Vandehey's letter explains that the cost of the parkland dedication, the Dubarko Road extension and the U.S. Highway 26 frontage improvements will impose an unreasonable cost on the Needed Housing application. His letter also explains that the Dubarko Road extension will impose an unreasonable delay on the needed housing application. As a matter of evidence only, TSP Table 8, page 36, notes that the Dubarko Road extension (Project M20) is expected to cost $3.2 million.

The City wants Dubarko Road to be connected to U.S. Highway 26, a State highway. As the Planning Commission learned in the prior Bull Run Subdivision application, ODOT required a "Grant of Access" for the connection under OAR 734-051-2010(2) because no right of access exists at the proposed connection location. U.S. Highway 26 is an access controlled highway at the connection location and a connection is not allowed without ODOT approval through a "Grant of Access." OAR 734-051-1070(1). A Grant of Access for a public approach like Dubarko Road is subject to the approval criteria in OAR 734-051-2020(4)-(14), including the

requirement that the property owner be the applicant for the Grant of Access. OAR 734-051-2020(6). U.S. Highway 26 is classified as a "Statewide Highway" at this location. 1999 Oregon Highway Plan, "State Highway Classification System Map," PDF page 294. There is no legal right for Dubarko Road to connect to U.S. Highway 26 without the Applicant's approval and without a Grant of Access approval, which is subject to highly discretionary approval criteria and for which no evidence exists to show it can or will be approved, or how long it will take to issue a decision on a Grant of Access request. Even if the City had property incorporated a specific TSP policy into the SDC so that it could require the Dubarko Road connection, it has no legal right to make the connection.

But none of this matters because SDC 17.100.100.G.2, an exception to the street standards in SDC 17.100.100, expressly provides that *"standards for street connections do not apply to freeways and other highways with full access control."* It is undisputed that U.S. Highway 26 has full access control where Dubarko Road would connect. Thus, the City cannot require the extension of Dubarko Road to U.S. Highway 26.

C. Erin Forbes' Memorandum Concerning Attorney Fee Awards dated October 11, 2021 (Exhibit 3).

City Attorney David Doughman discussed the issue of attorney fees awards to prevailing Needed Housing applicants with the Planning Commission at the September 27, 2021 public hearing under ORS 197.835(10)(b) requiring award of attorney fees when a local government's decision is reversed. Ms. Forbes' memorandum provides two recent examples of such mandatory awards.

D. Erin Forbes' Memorandum Analyzing SDC Under Incorporation and Clear and Objective Requirements (Exhibit 4).

Ms. Forbes' memorandum explains how the SDC standards relied upon in the Staff Report fail to satisfy the incorporation and clear and objective requirements.

The City cannot rely on the Plan, the TSP, the Transit Master Plan or the old Parks Master Plan because they are not properly incorporated into the applicable SDC standards. Even if they were, they all contain standards that are neither clear *nor* objective.

SDC 17.100.20.E.3 refers to the "Official Street Plan" and the Staff Report relies on this as a basis for requiring the Dubarko Road extension. Consistent with *Paterson* and *Oster*, the Official Street Plan, whatever it is, is not properly incorporated into the SDC. The term "Official Street Plan" is not defined in the SDC. The 2011 TSP is not described as the "Official Street Plan." The term "Official Street Plan" does not appear in the 2011 TSP Chapter 3, "Motor Vehicle System Plan," nor in any of the fifteen figures in TSP Chapter 3. An applicant is left to guess what the "Official Street Plan" is, what it requires and nothing leads from the "Official Street Plan" to any documents incorporated into the SDC.

Even if the "Official Street Plan" were incorporated, simply having the document incorporated is insufficient under ORS 197.195(1) to require the Dubarko Road extension. Both *Paterson* and

Oster require an incorporated Plan document to specify what specific policies, action items or standards apply as approval criteria.

E. Erin Forbes' Memorandum Providing Recent Incorporation and Clear and Objective LUBA Decisions (Exhibit 5).

Ms. Forbes' memorandum lists recent examples of LUBA reversing local government decisions relying on improper incorporation or subjective approval standards or affirming local government decisions properly applying the relevant statutes.

F. Michael Robinson's Letter Providing Excerpts of Public Documents Obtained from the City (Exhibit 6).

This letter contains excerpts of public documents obtained from the City. The main point of these documents is their lack of a desire to determine if the approval standards comply with state law. The Parks Master Plan, for example, is not incorporated into the SDC and cannot be a basis for either the Dubarko Road extension or the U.S. Highway 26 frontage improvements.

G. Tracy Brown Memorandum Dated October 8, 2021 (Exhibit 7).

Mr. Brown's memorandum addresses several of the issues raises in the Staff Report.

H. Sandy Parks and Trials Advisory Board August 11, 2021 Staff Report (Exhibit 8).

The Staff Report acknowledges that the City cannot rely on the previous Parks Master Plan because it was not properly incorporated into the SDC as required by ORS 197.195.(1).

5. Conclusion.

The record before the Planning Commission shows that the City cannot apply its previous Parks Master Plan, its Transit Master Plan, its TSP or its Plan because they have not been properly incorporated into the SDC as applicable approval criteria. The record also shows that various SDC standards relied upon to recommend denial are not clear *or* objective but even if they were, they impose unreasonable cost and delay on the Application.

While the Planning Commission will hear more evidence and argument before its November 8, 2021 deliberation, the record as of today demonstrates that the Application satisfies by substantial evidence all of the applicable approval criteria and can be approved.

The Applicant respectfully requests that the Planning Commission approve the Application.

Very truly yours,

Michael C. Robinson

MCR/jmhi
Enclosures

cc: Mr. Dave Vandehey (*via email*) (*with enclosures*)
Mr. Carey Sheldon (*via email*) (*with enclosures*)
Mr. Alex Reverman (*via email*) (*with enclosures*)
Mr. Ray Moore (*via email*) (*with enclosures*)
Mr. Tyler Henderson (*via email*) (*with enclosures*)
Mr. Tracy Brown (*via email*) (*with enclosures*)
Mr. Mike Ard *(via email) (w/enclosures)*
Ms. Erin Forbes *(via email) (w/enclosures)*
Mr. Garrett H. Stephenson (*via email*) (*with enclosures*)
Mr. David Doughman *(via email) (w/enclosures)*
Mr. Kelly O'Neill, Jr. (*via email*) (*with enclosures*)

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EXHIBITS

Exhibit 1	October 9, 2021 Memorandum from Mike Ard, P.E.
Exhibit 2	October 8, 2021 Letter from Dave Vandehey
Exhibit 3	October 11, 2021 Memorandum from Erin Forbes Concerning Attorney Fee Awards
Exhibit 4	October 11, 2021 Memorandum from Erin Forbes Analyzing the SDC Under Incorporation and Clear and Objective Requirements
Exhibit 5	October 11, 2021 Memorandum from Erin Forbes Providing Recent Incorporation and Clear and Objective LUBA Decisions
Exhibit 6	October 11, 2021 Letter from Michael Robinson Providing Excerpts of Public Documents Obtained from the City
Exhibit 7	October 8, 2021 Memorandum form Tracy Brown
Exhibit 8	August 11, 2021 Staff Report to the Sandy Parks and Trails Advisory Board

Pacwest Center | 1211 SW 5th | Suite 1900 | Portland, OR | 97204 | **M** 503-222-9981 | **F** 503-796-2900 | schwabe.com

EXPIRES: 12/31/2021

ARD ENGINEERING
21370 SW Langer Farms Pkwy
Suite 142, Sherwood, OR 97140

Technical Memorandum

To: Dave Vandehey, Roll Tide Properties Corporation

From: Michael Ard, PE

Date: October 9, 2021

Re: **Deer Meadows Subdivision – Local Street Traffic Volumes**

The updated traffic impact study prepared for the Deer Meadows Subdivision dated September 27, 2021 contained a new analysis section addressing daily traffic volumes on the impacted local streets in the site vicinity (page 19). The analysis underlying this report section was based on trip generation and distribution estimates for both the existing residential development in the site vicinity and the projected future volumes associated with the proposed Deer Meadows Subdivision. Although the procedures used were appropriate, the most accurate way to determine existing traffic volumes on local streets is through direct measurement. Since 24-hour count data was not available at the time the prior report was issued, the analysis provided represented the most accurate assessment that could be made at the time. However, 24-hour tube counts were subsequently collected at the west end of Therese Street, at the south end of Antler Avenue, and at the south end of Meadow Avenue to verify the assumptions used in the prior report.

This memorandum provides detailed data and analysis refining the prior local street traffic volume estimates. Based on the updated data and analysis, the conclusions of the prior report remain valid. All local streets in the site vicinity currently operate with traffic volumes of less than 1,000 average daily trips, and they will continue to operate with traffic volumes of less than 1,000 daily trips in the future either with or without the addition of site trips from the proposed Deer Meadows development.

Data Collection and Analysis

Existing daily traffic volumes on the impacted local streets in the site vicinity were determined based on 24-hour tube counts collected at three locations:

- On Therese Street immediately east of SE Langensand Road;
- On Antler Avenue immediately north of Dubarko Road; and
- On Meadow Avenue immediately north of Dubarko Road.

Traffic volumes were measured for the first two locations from 12:00 PM on Tuesday October 5, 2021, to 12:00 PM on Wednesday October 6, 2021. Traffic volumes for the third location were measured from 1:00 PM on Wednesday October 6, 2021, to 1:00 PM on Thursday October 7, 2021.

The detailed traffic count data collected on each local street is reported in the attached technical appendix. It should be noted that the tube count data collected on Antler Avenue and Meadow Avenue was collected on the north side of the two southernmost driveways on each roadway. Accordingly, the projected twenty

trips per day associated with these two homes was manually added to the observed count data to more accurately reflect the highest total traffic volumes experienced on these roadways.

Since traffic count data was collected during the COVID-19 pandemic and the total number of trips observed using these three roadways was lower than the total volume that would normally be projected for the 100 homes served by these streets, the count data was used to determine the actual distribution of existing site trips to and from the local area, while the more conservative ITE Trip Generation data was used to determine the number of trips that would be expected under normal conditions.

Overall, the data showed that 63 percent of site trips to and from the local area utilized Therese Street. An additional 18 percent of site trips were observed to use Antler Avenue, and the remaining 19 percent of site trips were observed to use Meadow Avenue.

Based on the ITE Trip Generation data, the 100 homes served by these three local street access locations would be projected to generate 944 average daily trips.

Conservatively assuming that all homes located north of Dubarko Road within the proposed Deer Meadows subdivision will utilize Fawn Street to connect to one of these three points of access, Fawn Street will carry up to 230 vehicles per day east of Meadow Avenue, and up to 270 vehicles per day east of Antler Avenue.

The average daily traffic volumes based on the observed travel patterns and the conservative trip generation estimate of existing and future daily traffic volumes are detailed in Table 1 below.

Table 1 - Existing and Future Local Street Traffic Volumes

	Existing Daily Traffic (ADT)	Deer Meadows Site Trips (ADT)	**Future Daily Traffic (ADT)**
Therese Street	594	130	**724**
Antler Avenue	171	38	**209**
Meadow Avenue	179	40	**219**

Conclusions

Based on the observed travel patterns and the updated analysis, all local streets are projected to operate with average daily volumes well below the 1,000-trip threshold allowable on local streets per City of Sandy Standards. The prior conclusions from the Deer Meadows Subdivision Traffic Impact dated September 27, 2021 remain valid, and no additional mitigation is recommended in conjunction with the proposed development.

Appendix

Daily Volume Count Report

Study Name Therese Street at West End
Location 45.390451676168354 /-122.24944115113888
Roadway Orientation West /East
Site Code 6197414110
Study Date 10/5/2021
Direction

Start	10-4-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
Time	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West	East
12:00 AM						2									0	2
01:00						1									0	1
02:00															0	0
03:00					4	1									4	1
04:00					8										8	0
05:00					9										9	0
06:00					12	4									12	4
07:00					25	9									25	9
08:00					25	11									25	11
09:00					14	11									14	11
10:00					19	9									19	9
11:00					21	11									21	11
12:00 PM			8	15											8	15
01:00			10	14											10	14
02:00			14	14											14	14
03:00			13	22											13	22
04:00			13	35											13	35
05:00			13	27											13	27
06:00			7	15											7	15
07:00			8	14											8	14
08:00			5	8											5	8
09:00			2	4											2	4
10:00				3											0	3
11:00			1												1	0
Lane	0	0	94	171	137	59	0	0	0	0	0	0	0	0	230	230
Day	0		265		196		0		0		0		0		461	
AM Peak					08:00	08:00									08:00	08:00
Vol.					25	11									25	11
PM Peak			02:00	04:00											02:00	04:00
Vol.			14	35											14	35

Daily Volume Count Report

Study Name Antler Avenue at South End
Location 45.390127381061774 /-122.24708957295321
Roadway Orientation North /South

Site Code 3772865912
Study Date 10/5/2021
Direction

Start	10-4-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
Time	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South
12:00 AM															0	0
01:00															0	0
02:00															0	0
03:00															0	0
04:00						1									0	1
05:00					1	1									1	1
06:00						5									0	5
07:00					1	2									1	2
08:00					4	4									4	4
09:00					6	5									6	5
10:00					6	4									6	4
11:00					6	7									6	7
12:00 PM			1	3											1	3
01:00			1												1	0
02:00			6	6											6	6
03:00			3	8											3	8
04:00			9	2											9	2
05:00			3	5											3	5
06:00			4	2											4	2
07:00			2	2											2	2
08:00			2												2	0
09:00			1												1	0
10:00															0	0
11:00															0	0
Lane	0	0	32	28	24	29	0	0	0	0	0	0	0	0	56	57
Day	0		60		53		0		0		0		0		113	
AM Peak					11:00	11:00									11:00	11:00
Vol.					6	7									6	7
PM Peak			04:00	03:00											04:00	03:00
Vol.			9	8											9	8

Daily Volume Count Report

Study Name Meadow Avenue at South End
Location 45.390044087921844 /-122.24620506924413
Roadway Orientation North /South

Site Code 8339814368
Study Date 10/6/2021
Direction

Start	10-4-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
Time	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South
12:00 AM																
01:00																
02:00																
03:00								4								4
04:00																
05:00							1	5							1	5
06:00							1	2							1	2
07:00							7	9							7	9
08:00							2	4							2	4
09:00							2	4							2	4
10:00							2	6							2	6
11:00							2	4							2	4
12:00 PM							3	1							3	1
01:00					8	7									8	7
02:00					8	4									8	4
03:00					6	3									6	3
04:00					3	4									3	4
05:00					4	2									4	2
06:00					2										2	
07:00					6	3									6	3
08:00																
09:00																
10:00																
11:00																
Lane	0	0	0	0	37	23	20	39	0	0	0	0	0	0	57	62
Day	0		0		60		59		0		0		0		119	
AM Peak							07:00	07:00							07:00	07:00
Vol.							7	9							7	9
PM Peak					02:00	01:00									02:00	01:00
Vol.					8	7									8	7

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 100 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

100 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	19	55	74
PM Peak Hour	62	37	99
Weekday	472	472	944

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 22 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

22 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	4	12	16
PM Peak Hour	14	8	22
Weekday	104	104	208

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Exhibit 1
Page 8 of 8

ROLL TIDE PROPERTIES CORPORATION

October 8, 2021

Michael C. Robinson
Schwabe Williamson & Wyatt
mrobinson@schwabe.com

Michael:

I represent the ownership of the property known as Deer Meadows Subdivision in Sandy, OR. I am writing to inform you that under the current application for this property it is not financially feasible to dedicate a park or extend Dubarko Rd. and connect it to Highway 26. The loss of dwelling units due to the parkland and ROW dedication and cost of Dubarko Rd. and Hwy 26 frontage improvements will discourage this project through unreasonable cost. Also, including the connection of Dubarko Rd. to Highway 26 extends our projects timeline adding to the unfeasibility of it. The delay is unreasonable because connecting to Dubarko requires a grant of access and there is no timeline for acquiring it or whether it can be acquired.

Sincerely,

Dave Vandehey

Vice President
Roll Tide Properties Corporation

PO Box 703
Cornelius, OR 97113
503-327-6084

Memorandum

VIA E-MAIL

To: Mike Robinson

From: Erin M. Forbes

Date: October 11, 2021

Subject: Decisions on Attorney Fee Awards in Needed Housing LUBA Cases

File No.: 126769-255102

ORS 197.835(10)(b) provides that if LUBA reverses a local government decision on a development application on the basis that the local government's decision was outside the range of discretion allowed, and subsequently orders the local government to grant approval of the application, then LUBA "shall award attorney fees to the applicant and against the local government." In other words, an award of attorney fees in this situation is mandatory.

The following is a list of 2021 LUBA orders where motions for attorney fees were awarded after a denial of a needed housing application was reversed and approval of the application ordered.

- *Legacy Development Grp. v. City of the Dalles*, LUBA No. 2020-099 (May 17, 2021) (awarding $18,039.50 in attorney fees to the applicant after reversing denial of needed housing application)

- *Nieto v. City of Talent*, LUBA No. 2020-100 (May 10, 2021) (awarding $15,387.50 in attorney fees to the applicant after reversing denial of needed housing application)

The above orders are attached to this memorandum as **Exhibits 1** and **2**, respectively.

EMF

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BEFORE THE LAND USE BOARD OF APPEALS
OF THE STATE OF OREGON

LEGACY DEVELOPMENT GROUP, INC.,
Petitioner,

vs.

CITY OF THE DALLES,
Respondent,

and

DENISE LYNNE DIETRICH-BOKUM,
ROBERT CLAYTON BOKUM,
GARY GINGRICH, TERRI JO JESTER GINGRICH,
DAMON ROLLA HULIT, and
ROBERTA KAY WYMORE-HULIT,
Intervenors-Respondents.

LUBA No. 2020-099

ORDER

BACKGROUND

In *Legacy Development Group, Inc. v. City of The Dalles*, ___ Or LUBA ___ (LUBA No 2020-099, Feb 24, 2021), petitioner appealed the city council's denial of its application for a 72-lot subdivision to include 83 dwellings and a community park. Petitioner argued that the four provisions of The Dalles Municipal Code (TDMC) on which the city council relied to deny its application failed to satisfy the statutory requirement in ORS 197.307(4) that the city apply only "clear and objective" standards to an application for housing. We agreed with petitioner that none of the four TDMC provisions on which the city council

relied to deny the application satisfied the ORS 197.307(4) requirement that the city apply only "clear and objective" standards.

In the petition for review, petitioner requested that LUBA reverse the decision and order the city to approve the application. Petition for Review 32. We agreed with petitioner that the city's decision to deny the application was outside the range of discretion allowed the city under its comprehensive plan and implementing ordinances, and we reversed the city's decision and ordered it to approve the application. ORS 197.835(10)(a)(A). Because we sustained petitioner's first assignment of error and reversed the decision, we did not address the second assignment of error that argued that the city committed a procedural error that prejudiced petitioner's substantial rights or the third assignment of error that argued that the city's decision violated the Fifth Amendment to the United States Constitution.

MOTION FOR ATTORNEY FEES

ORS 197.835(10)(b) provides, "If the board * * * reverse[s] the decision and orders the local government to grant approval of the application, the board shall award attorney fees to the applicant and against the local government." Petitioner moves for an award of attorney fees in the amount of $28,460. An award of attorney fees under ORS 197.835(10)(b) is mandatory. If LUBA reverses a local government decision to deny an application and orders the local government to approve the application under ORS 197.835(10)(a), LUBA must award attorney fees to the applicant against the local government.

In awarding attorney fees pursuant to ORS 197.835(10)(b), although the award is mandatory, LUBA is afforded the discretion to determine the amount of attorney fees that is reasonable under the specific facts of the case. *Young v. City of Sandy*, 33 Or LUBA 817, 819 (1997). Intervenors-respondents (intervenors) and the city each object to petitioner's motion.

A. Intervenors Are Not Liable for an Attorney Fee Award under ORS 197.835(10)(b)

Intervenors respond to the motion for attorney fees, noting that city did not participate to defend its decision on appeal and observing that any award of attorney fees under ORS 197.835(10)(b) is "against the local government." Thus, intervenors argue that they may not be held liable for any award of fees under ORS 197.835(10)(b). We agree. The statute is clear that an award of fees under ORS 197.835(10)(b) is "against the local government."

B. Amount of Fees

The city objects to the amount of fees sought in petitioner's motion.

1. Fees for Non-Attorney Services

The fees sought by petitioner include $20,295 in fees for 73.8 hours of services that were provided by a land use planner who is not an attorney. The city argues that those fees should be reduced by $11,467.50 because fees incurred by engaging the services of a land use planner are not fees for "legal services" and are therefore not recoverable under the plain meaning of the phrase "attorney

fees" in ORS 197.835(10)(b), as construed by the Court of Appeals in *Stewart v. City of Salem*, 240 Or App 466, 247 P3d 763 (2011).[1]

We agree. In *Stewart*, citing the Oregon Supreme Court's decision in *Colby v. Gunson*, 349 Or 1, 238 P3d 374 (2010), the Court of Appeals reviewed the meaning of the phrase "attorney fees," as used in ORS 197.830(10)(b), and concluded that it means "the reasonable value of legal services provided by an attorney that are related to the applicant's appeal." *Stewart*, 240 Or App at 473. Accordingly, the land use planner fees are reduced by the amount requested by the city, $11,467.50.[2]

2. Hourly Rate for Lead Attorney

Next, the city argues that the rate of $465 per hour charged by petitioner's lead attorney is not reasonable because it is "well above" the median rate customarily charged in the Tri-County area (Multnomah, Washington, and Clackamas Counties outside of downtown Portland) for similar services.[3] Response to Cost Bill and Motion for Attorney Fees 5. One of the factors we

[1] The city's response is confusing and includes requests for an award of "not more than $14,867.50" and, in the alternative, "not more than * * * $9,679.50." Response to Cost Bill and Motion for Attorney Fees 7.

[2] The city does not argue that the fees included in petitioner's motion should be reduced by the full $20,295 attributable to the land use planner.

[3] Petitioner's lead attorney is based in Clark County, Washington. The city's response assumes that rates in Clark County, Washington, are similar to rates in the Tri-County area. Response to Cost Bill and Motion for Attorney Fees 5.

consider in determining the amount of an attorney fee award is the fee customarily charged in the locality for similar legal services. *6710 LLC v. City of Portland*, 41 Or LUBA 608, 611 (2002) (citing ORS 20.075(2)(c)).

In its response, the city cites the Oregon State Bar 2017 Economic Survey (the 2017 Survey) and states that the 2017 Survey lists the median rate for an attorney practicing land use and real estate law in the Tri-County area with years of experience comparable to petitioner's lead attorney as $275 per hour. Response to Cost Bill and Motion for Attorney Fees 5. The city argues that, adjusting for inflation after 2017 at an annual rate of five percent, a reasonable rate for attorney services is $335 per hour. We have previously relied on Oregon State Bar economic surveys as an accurate indicator of the fees customarily charged in a community. *Van Dyke v. Yamhill County*, ___ Or LUBA ___, ___ (LUBA Nos 2020-032/033, Order, Apr 1, 2021) (slip op at 17-18); *6710 LLC*, 41 Or LUBA at 612.

The burden is on the party seeking the attorney fees to establish that the requested rates are reasonable, even in the absence of an objection. *6710 LLC*, 41 Or LUBA at 611. Petitioner's statements that $465 per hour is their lead attorney's customary rate and that their lead attorney has chaired the government relations committee for a home builders association do not explain why the rate charged by their lead attorney is reasonable. Absent any assistance from petitioner, we agree with the city that petitioner has not established that a rate that is nearly 40 percent higher than the median rate for an attorney practicing land

use and real estate law in the Tri-County area is reasonable.[4] Accordingly, petitioner is awarded fees for the 13.2 hours that their lead attorney spent on the appeal, at a rate of $335 per hour.[5]

In sum, petitioner's motion for attorney fees is partially granted, as follows:

Lead Attorney	$4,422.00 (13.2 hours at $335 per hour)
Other Attorney	$162.50
Other Attorney	$105.00
Paralegal	$4,522.50[6]
Land Use Planner	$8,827.50 ($20,295 minus $11,467.50)
Total	$18,039.50

[4] Petitioner asserts that "[t]he total fees are $31,223 for 108 billable hours, for an average rate of $289" and argues that that average rate is "consistent with the Portland metro area." Cost Bill and Motion for Attorney Fees 2. However, petitioner does not otherwise develop that argument or argue that the average rate for all attorney and non-attorney services in an appeal is relevant to LUBA's assessment of the reasonableness of the rate that petitioner's lead attorney actually charged for services.

[5] Petitioner's detailed statement of attorney fees includes $267.50 for the services of two other attorneys in the law firm, to which the city does not object.

[6] Although the city's response includes a request for a reduction in the fees for paralegal services based on its argument that the *total* amount of time spent by petitioner's law firm on the appeal (108 hours) is unreasonable, the city does not assert any independent basis for us to reject or reduce the amount of fees incurred for paralegal services or argue that 20.10 hours for paralegal services is an unreasonable amount of time for the appeal.

COST BILL

Petitioner, the prevailing party in this appeal, filed a cost bill seeking an award of its filing fee in the amount of $200. Petitioner is awarded the cost of its filing fee in the amount of $200, payable by the city and intervenors. The Board will return petitioner's $200 deposit for costs.

Dated this 17th day of May 2021.

_____
Melissa M. Ryan
Board Member

BEFORE THE LAND USE BOARD OF APPEALS
OF THE STATE OF OREGON

TONY NIETO and TORY NIETO,
Petitioners,

vs.

CITY OF TALENT,
Respondent,

and

VERNON J. DAVIS, MARY A. TSUI,
LAURIE E. CUDDY, and FOREST L. DAVIS,
Intervenors-Respondents.

LUBA No. 2020-100

ORDER

BACKGROUND

In *Nieto v. City of Talent*, ___ Or LUBA ___ (LUBA No 2020-100, Mar 10, 2021), petitioners appealed the city's denial of their application to subdivide their 26.58-acre property into a 49-lot residential subdivision. Petitioners argued that the single basis for the hearings officer's denial of its subdivision application, failure to satisfy Talent Municipal Code (TMC) 17.10.060(F), was barred by ORS 197.307(4), a portion of the needed housing statute that prohibits the city from applying standards that are not "clear and objective" to applications for the development of housing. We agreed with petitioners that the city's decision was

barred by ORS 197.307(4) because TMC 17.10.060(F) is not a "clear and objective" standard.

Petitioners requested that LUBA "reverse the Decision and order the City to approve the Subdivision as presented in the Application and as recommended by City Staff." Petition for Review 37. Pursuant to ORS 197.835(10)(a)(A), we reversed the city's decision as "outside the range of discretion allowed the [city] under its comprehensive plan and implementing ordinances" and ordered the city to approve the application.[1] In doing so, we did not address petitioners' other assignments of error, some of which argued that the city's decision was an unconstitutional taking of petitioners' property.

[1] ORS 197.835(10) provides, in relevant part:

> "(a) The board shall reverse a local government decision and order the local government to grant approval of an application for development denied by the local government if the board finds:
>
> "(A) Based on the evidence in the record, that the local government decision is outside the range of discretion allowed the local government under its comprehensive plan and implementing ordinances; or
>
> "* * * * *
>
> "(b) If the board does reverse the decision and orders the local government to grant approval of the application, the board shall award attorney fees to the applicant and against the local government."

MOTION FOR ATTORNEY FEES

Petitioners move for an award of attorney fees in the amount of $18,269.75. An award of attorney fees under ORS 197.835(10)(b) is mandatory. If LUBA reverses a local government decision denying an application and orders the local government to approve the application under ORS 197.835(10)(a), LUBA must award attorney fees to the applicant against the local government.

In awarding attorney fees pursuant to ORS 197.835(10)(b), although the award is mandatory, LUBA is afforded the discretion to determine the amount of attorney fees that is reasonable under the specific facts of the case. *Young v. City of Sandy*, 33 Or LUBA 817, 819 (1997). LUBA will look to the factors listed in ORS 20.075(2) for guidance in determining the amount of an attorney fee award. *Schaffer v. City of Turner*, 37 Or LUBA 1066, 1072 (2000). We identify the relevant facts and legal criteria on which we rely in determining what award of attorney fees is reasonable. *See McCarthy v. Oregon Freeze Dry, Inc.*, 327 Or 84, 96, *adh'd to on recons*, 327 Or 185, 957 P2d 1200 (1998) (so stating).

The city objects to petitioners' motion on procedural and substantive grounds.[2]

[2] Some of the city's objections argue that petitioners failed to properly plead reversal of the city's decision under ORS 197.835(10)(a)(A). Response to Motion for Attorney Fees and Cost Bill 4-7. We reject those objections for two reasons.

First, as noted, petitioners requested that that LUBA "reverse the Decision and order the City to approve the Subdivision as presented in the Application and

A. Timing of Motion

First, the city argues that LUBA should deny petitioners' motion for attorney fees because it was not filed within the time set in OAR 661-010-0075(1)(a), which provides that a motion for attorney fees must be filed within 14 days of the Board's final opinion and order.

Petitioners concede that the motion was filed one day late but respond that LUBA should treat the untimeliness as a "technical violation" pursuant to OAR 661-010-0005 and allow the motion.[3] We agree with petitioners. *See Schatz v.*

as recommended by City Staff." Petition for Review 37. Using the operative language of ORS 197.835(10)(a)(A) is sufficient to plead and request the remedy of reversal of the decision with an order to the city to approve the application.

Second, the objections are, in essence, an impermissible collateral attack on our final opinion and order that determined that the city's decision was outside the range of discretion allowed it under the TMC. Our decision was not appealed, and it is the law of the case. *Beck v. City of Tillamook*, 313 Or 148, 831 P2d 678 (1992) *see also Walter v. City of Eugene*, 74 Or LUBA 671 (2016) (rejecting a city's objection to a motion for attorney fees under ORS 197.835(10)(b) that was, in essence, an impermissible collateral attack on LUBA's final opinion and order).

[3] OAR 661-010-0005 provides:

> "These rules are intended to promote the speediest practicable review of land use decisions and limited land use decisions, in accordance with ORS 197.805-197.855, while affording all interested persons reasonable notice and opportunity to intervene, reasonable time to prepare and submit their cases, and a full and fair hearing. The rules shall be interpreted to carry out these objectives and to promote justice. Technical violations not affecting the substantial rights of parties shall not interfere with the review of a land use decision or limited land use decision."

City of Jacksonville, 21 Or LUBA 571, 571 n 1 (1991) (accepting motion for attorney fees filed two days late); *Jones v. Lane County*, 29 Or LUBA 573, 573-74 (1995) (accepting cost bill filed eight days late). The city's substantial rights include the right to respond to petitioners' motion, which it has done. Therefore, petitioners' violation of OAR 661-010-0075(1)(a) does not affect our review.

B. Amount of Fees

The burden is on the party seeking the attorney fees to establish that the requested rates are reasonable. *6710 LLC v. City of Portland*, 41 Or LUBA 608, 611 (2002). We understand the city to argue that the amount of attorney fees sought is not reasonable for three reasons.

First, according to the city, petitioners' counsel may not recover fees for time spent developing arguments in the petition for review and reply brief that LUBA ultimately did not reach in its final opinion and order.[4] Petitioners respond that whether LUBA reached the merits of an argument included in petitioners' brief has no relevance to whether the amount of attorney fees sought is reasonable. We agree. As the Court of Appeals explained in *Stewart v. City of Salem*, "'attorney fees,' under ORS 197.835(10)(b), means the reasonable value of legal services provided by an attorney that are related to the applicant's appeal of a local government decision to LUBA." 240 Or App 466, 473, 247 P3d 763

[4] As noted, LUBA sustained petitioners' first assignment of error and did not reach the remaining assignments of error that argued, in part, that the city's decision was an unconstitutional taking of petitioners' property.

(2011). Nothing in the statute limits attorney fees to only those that are related to issues that LUBA actually addressed in its final opinion and order. We reject the city's argument.

Second, we understand the city to argue that petitioners' fee statement lacks sufficient detail to justify the amount of fees sought. OAR 661-010-0075(1)(e)(A) requires that a motion for attorney fees include a "detailed statement of the amount of attorney fees sought." This argument is largely derivative of the city's first argument that petitioners may not be awarded fees for arguments made in connection with issues that LUBA did not reach and, for the reasons explained above, we reject it.

Moreover, we agree with petitioners that their statement satisfies OAR 661-010-0075(1)(e)(A). Petitioners' statement includes entries such as "Work with [redacted] to outline brief and develop strategy (1.5);" "Continue drafting brief (1.5);" and "Review and Analyze Response Brief and provide summary to client team regarding same (1.5)." Motion for Attorney Fees and Cost Bill, Attachment 1 at 5-6. Such entries are more than sufficient to meet the requirements of the rule.

Third, the city objects to the following charges included in the motion for attorney fees: (1) petitioners' $400 filing fee and deposit for costs and (2) charges that seek reimbursement for "computer legal research." Petitioners respond that the total amount of attorney fees requested, $18,269.75, does not include the $400

filing fee and deposit for costs. Based on that response, we reject the city's argument.

Petitioners also respond that charges for computer legal research are a reasonable and typical part of the legal services provided by an attorney and petitioners should be able to be reimbursed for those charges. However, we agree with the city that ORS 197.835(10)(b) does not authorize recovery of charges incurred for "computer legal research."

ORS 197.835(10)(b) authorizes recovery of "attorney fees" and does not mention expenses. In this respect, it is unlike ORS 197.830(15)(b), which explicitly authorizes recovery of "reasonable attorney fees *and expenses*." (Emphasis added.) Further, ORCP 68A, cited by the Court of Appeals in *Stewart* as context for interpreting ORS 197.835(10)(b), also distinguishes between "attorney fees" and "costs and disbursements." Accordingly, we deduct $2,882.25 for "computer legal research" from the stated total of $18,269.75, for a total award of $15,387.50.

COSTS

Petitioners, the prevailing parties in this appeal, filed a cost bill seeking an award of their filing fee in the amount of $200. Petitioners are awarded the cost of their filing fee in the amount of $200, payable by the city and intervenors-respondents. The Board shall return petitioners' $200 deposit for costs.

Dated this 10th day of May 2021.

_____

Melissa M. Ryan
Board Member

Schwabe
WILLIAMSON & WYATT®

Memorandum

VIA E-MAIL

To: Mike Robinson

From: Erin M. Forbes

Date: October 11, 2021

Subject: Analysis of Staff Report Bases for Denial as Relate to Limited Land Use and Needed Housing Requirements

File No.: 126769-255102

This memorandum sets forth the reasons why the Planning Director's analysis of the Sandy Development Code ("SDC") as relates to Oregon's Limited Land Use and Needed Housing Statutes is insufficient and why denial based on the identified sections of the SDC is improper.

1. Limited Land Use Statute / Proper Incorporation of Plan

ORS 197.195(1) provides that, for limited land use decisions, "[i]f a city or county does not incorporate its comprehensive plan provisions into its land use regulations, the comprehensive plan provisions may not be used as a basis for a decision by the city or county or on appeal from that decision."

Under *Oster v. City of Silverton*, LUBA No. 2018-103 (May 7, 2019), whether comprehensive plan (or related plan, such as a TSP) provisions have been "incorporate[d]" into a city's land use regulations does not depend on whether the standard is "clear in the TSP or 'codified' in the [development code]; instead, the question is whether the [development code] provisions that the city concluded incorporated the [plan] standard make clear what *specific policies or standards in the TSP apply to a limited land use decision as approval criteria*." *Oster*, Slip Op. at p. 12. Standards that merely "generally 'incorporate[] by reference the city's public facility master plans, including plans for domestic water, sanitary sewer, storm drainage, parks, and transportation'" do not meet the requirement of ORS 197.195(1). "Incorporation by reference of the entirety of each of the city's public facilities plans falls far short of satisfying the incorporation standard in ORS 197.195(1)." *Id.*

In *Oster*, the Silverton Development Code was found to improperly incorporate the TSP where it provided that "[g]eneral street improvement requirements are provided in SDC 3.4.100, *with more specific requirements provided in the city of Silverton transportation system plan and the city's public works design standards.*" *Oster*, Slip Op. at p. 11.

Similarly, in *Paterson v. City of Bend*, 118 P.3d 842, 846 (Or. App. 2005), the Oregon Appeals Court affirmed LUBA's holding that certain provisions of the Bend Subdivision Ordinance did not properly incorporate the Bend General Plan. LUBA found that the City of Bend's code provision that required "compliance with the Bend Area General Plan and implementing land use ordinances and policies" did not meet the incorporation requirement of ORS 197.195(1). *Paterson v. City of Bend*, LUBA No. 2004-115, Slip. Op. at p. 5 (April 5, 2005). LUBA held that "ORS 197.195(1) contemplates more than a broad injunction to comply with unspecified portions of the comprehensive plan" and that a local government must "at least amend its land use regulations to make clear what *specific* policies or other provisions of the comprehensive plan apply to a limited land use decision as approval criteria." *Id.*, Slip Op. at pp. 5-6 (emphasis added). The Oregon Appeals Court agreed and held that "by its terms, ORS 197.195(1) provides that, if a local government does not incorporate specific plan provisions into its enactments, the 'plan standards' set out in those provisions are not applicable." *Paterson*, 118 P.3d at 846.

The chart below shows that the Planning Director improperly applied the City of Sandy's Transportation System Plan and Parks Master Plan to the Application, and subsequently recommended denial of the Application on that improper basis, because the Sandy Development Code does not incorporate that Plan into its development code as described in *Oster* and *Paterson*.

SDC Code Provision Relied Upon	**Reason Why Plan Cited is Not Properly Incorporated**
SDC 17.84.30.C Where a development site is traversed by or adjacent to a future trail linkage identified within the **Transportation System Plan**, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with 17.84.90.D.	Staff found that the standards of Section 17.84.50(B) was not met. *See, e.g.*, Staff Report at p. 16. But this standard only includes a "broad injunction to comply with unspecified portions of" the TSP, and does not "make clear what specific policies or other provisions" apply. *See Paterson*, Slip Op. at p. 6. This standard improperly "generally incorporat[es] by reference the" TSP. *See Oster*, Slip Op. at pp. 11-12.
SDC 17.84.50.B 5. If the study identifies level-of-service conditions less than the minimum standard established in the development code or the **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 or fails to meet the Oregon	Staff found that the standards of Section 17.84.50(B) were not met in numerous instances. *See, e.g.*, Staff Report at p. 13. But this standard only includes a "broad injunction to comply with unspecified portions of" the Sandy Comprehensive Plan and the Sandy official street plan, and does not "make clear what specific policies or other provisions" apply. *See Paterson*, Slip Op. at p. 6. This standard improperly

Department of Transportation's mobility standard, the applicant shall propose improvements and funding strategies for mitigating identified problems or deficiencies that will be implemented concurrent with the proposed development.	"generally incorporat[es] by reference the" referenced plans. *See Oster*, Slip Op. at pp. 11-12.
SDC 17.84.90 – Land for Public Purposes D. Where a development is traversed by, or adjacent to, a future trail linkage identified within the **Transportation System Plan**, dedications of suitable width to accommodate the trail linkage shall be provided. This width shall be determined by the City Engineer, considering the type of trail facility involved.	SDC 17.84.90.C only includes a "broad injunction to comply with unspecified portions of" the TSP, and does not "make clear what specific policies or other provisions" apply. *See Paterson*, Slip Op. at p. 6. This standard improperly "generally incorporat[es] by reference the" TSP. *See Oster*, Slip Op. at pp. 11-12.
SDC 17.86.40 – Cash in Lieu of Dedication A.3 Compatibility with the **Parks Master Plan**, Public Facilities element of the Comprehensive Plan, and the City of Sandy Capital Improvements Program in effect at the time of dedication	SDC 17.86.40.A.3 only includes a "broad injunction to comply with unspecified portions of" the Parks Master Plan, and does not "make clear what specific policies or other provisions" apply. *See Paterson*, Slip Op. at p. 6. This standard improperly "generally incorporat[es] by reference the" Parks Master Plan. *See Oster*, Slip Op. at pp. 11-12.
SDC 17.100.60.E – Approval Criteria 3. The proposed street pattern is connected and consistent with **the Comprehensive Plan** or **official street plan for the City of Sandy**.	SDC 17.100.60.E.3 only includes a "broad injunction to comply with unspecified portions of" the Sandy Comprehensive Plan and the Sandy official street plan, and does not "make clear what specific policies or other provisions" apply. *See Paterson*, Slip Op. at p. 6. This standard improperly "generally incorporat[es] by reference the" referenced plans. *See Oster*, Slip Op. at pp. 11-12.
SDC 17.100.60.E – Approval Criteria 5. Adequate public facilities are available or can be provided to serve the proposed subdivision.	The Staff Report relies upon the TSP and the Parks Master Plan as a basis for determining the Application did not meet these criteria. But neither the TSP nor the Parks Master Plan are mentioned in these approval criteria. Even if they were, to be applied as approval

6. All proposed improvements meet City standards.	criteria, more than just a "broad injunction to comply with unspecified portions of" the TSP and Parks Master Plan is required. Even the Staff Report fails to specify what portions of those Plans apply to these criteria. *See* Staff Report at pp. 7-8 (paragraph 21(A) and (B) and paragraph 22).
SDC 17.100.100 – Streets Generally A. *Street Connectivity Principle.* The pattern of streets established through land divisions should be connected 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 many streets so that key streets (particularly U.S. 26) are not overburdened.	The Staff Report relies upon the TSP as a basis for determining the Application did not meet this criterion. But the TSP is not mentioned in this approval criterion. Even if it were, to be applied as an approval criterion, more than just a "broad injunction to comply with unspecified portions of" the TSP is required. Even the Staff Report fails to specify what portions of the TSP applies to this criteria. *See, e.g.*, Staff Report at p. 5 (paragraph 18(B)) & p. 12 (paragraph 37(C)(vi)).

2. <u>Needed Housing Statute / Clear and Objective Criteria & Procedures Required</u>

ORS 197.307(4) provides that, for regulating housing applications, including needed housing applications, "a local government may adopt and apply only clear and objective standards, conditions and procedures," which standards "[m]ay not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay." ORS 227.173(2) further provides that "[w]hen an ordinance establishing approval standards is required under ORS 197.307 to provide clear and objective standards, the standards must be clear and objective on the face of the ordinance."

If a standard or procedure applicable to a needed housing or housing application is not clear and objective, it cannot be applied to the application. *Nieto v. City of Talent*, LUBA No. 2020-100, Slip Op. at p. 7 (Mar. 10, 2021). Approval standards and procedures are not clear and objective if they impose "subjective, value-laden analyses that are designed to balance or mitigate impacts of the development on (1) the property to be developed or (2) the adjoining properties or communities." *Id.* at p. 9 (quoting *Rogue Valley Assoc. of Realtors v. City of Ashland*, 35 Or LUBA 139, 158 (1998), *aff'd*, 158 Or App 1, *rev den*, 328 Or 594 (1999)); *see also Legacy Dev. Grp. v. City of the Dalles*, LUBA No. 2020-099, at p. 14 (Feb. 24, 2021). Further, the needed housing statutes require that the standards, conditions, and procedures that apply to needed housing are "*both* 'clear' *and* 'objective.'" *Nieto*, Slip Op. at p. 9.

The chart below shows that the Planning Director improperly applied approval criteria and procedures that are not clear and objective to the Application, and subsequently recommended denial of the Application based on subjective and unclear criteria and standards.

SDC Code Provision Relied Upon	**Reason Why Provision is Not Clear and Objective**
SDC 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.	All of the bolded terms and phrases identified in SDC 17.82.00 are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to what is "convenient, direct, and accessible" and what is "safe, pleasant and enjoyable"; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9.
SDC 17.82.20 – Building Orientation 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 pedestrian route shall consist of materials such as concrete, asphalt, stone, brick, permeable pavers, **or other materials 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 feet in depth**.	All of the bolded terms and phrases identified in SDC 17.82.20 are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to what is "clearly marked, convenient, safe and lighted" and what is "architecturally emphasized"; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. The allowance for the Director to approve "other materials" and "a comparable subsurface" do nothing other than allow for the Director to make a "subjective, value-laden analysis" as to what may be allowed. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev.*

	Grp., Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Subsection C omits the number of feet in depth the "covered porch" must be, making the criterion impossible to apply in any clear and objective way.
SDC 17.84.30 – Pedestrian and bicyclist requirements A.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. 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. A.3 Sidewalk improvements shall be made **according to City standards**, **unless the 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, requiring **undue** grading, or requiring modification to an existing building. . . .	All of the bolded terms and phrases identified in SDC 17.84.30.A are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to what is "necessary," what is "a severe adverse impact," what an "other significant feature" is, what is "undue"; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Further, the standard allows the City to "determine that the public benefit in the particular case does not warrant imposing a severe adverse impact," but it does not describe what the City must analyze or consider, or how to do that, in making such a determination. This is neither clear nor objective because it allows for complete discretion by the City.
SDC 17.84.30 – Pedestrian and bicyclist requirements 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	While "safe and convenient" is defined by this subsection, the definition itself includes phrases that are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to what "the extent practicable" means, what is "reasonably free," what "hazards" are being discussed," how something may "discourage" travel, what a "short" trip is, what are "travel needs," and how "destination and length of trip" are considered, what is considered "unusually

neighborhood activity centers such as schools and parks, as follows: 1. For the purposes of this section, "safe and convenient" means pedestrian and bicyclist facilities that: are **reasonably free** from **hazards** which 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**. 2. To meet the intent of B., above, 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. 3. Twelve feet wide pathways shall be provided in areas with **high** bicycle **volumes** or multi-use by bicyclists, pedestrians, and joggers. 4. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing **convenient** pedestrian ways. . . .	long or oddly shaped," what the city considers "high" volume or "convenient"; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9.
SDC 17.84.40 – Transit and school bus transit requirements A. Development sites located along existing or planned transit routes shall, **where appropriate**, incorporate bus pull-outs and/or shelters into the site design. These improvements shall be installed **in accordance with the guidelines and standards 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	All of the bolded terms and phrases identified in SDC 17.84.40 are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to when something is "appropriate," what specific "guidelines and standards of the transit agency" apply and how an applicant can be "in accordance" with them, what a "large number" of children is, what distance is considered "near," what is "safe, convenient access," and what makes an entrance "prominent"; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate

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, 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 shall provide **safe, convenient** pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of 17.84.30.B.	impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9.
SDC 17.84.50 – Street Requirements 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: 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**. 2. Local streets should typically intersect in "T" configurations rather than four-way intersections to **minimize conflicts and discourage through traffic**. Adjacent "T"	All of the bolded terms and phrases identified in SDC 17.84.50.E are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to what is "designed to discourage through traffic," what is "practical," what may "minimize conflicts" and what is considered a "conflict"; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Further, the standard allows for undefined and unidentified "other designs intended to discourage traffic," but does not explain how those designs are reviewed or chosen, or how it is determined that they are "intended to discourage traffic."

intersections shall maintain a minimum of 150 feet between the nearest edges of the two rights-of-way.	
SDC 17.84.50 – Street Requirements 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.	All of the bolded terms and phrases identified in SDC 17.84.50.H are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to whether to require public street improvements and what a "logical extension" is; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9.
SDC 17.84.50.J 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. 5. Streets shall be designed to intersect at angles **as near as practicable** to right angles and shall comply with the following:	All of the bolded phrases identified in SDC 17.84.50.J are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to whether something is done "as far as practical" or "as near as practicable"; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9.
SDC 17.84.60.D **As necessary** to provide for **orderly** development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).	All of the bolded phrases identified in SDC 17.84.60.D are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to whether something is "necessary" and what "orderly development" is; and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed

	to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9.
SDC 17.86.40 – Cash in lieu of dedication **At the city's discretion only**, the city **may accept** payment of a fee in lieu of land dedication. The city **may require** payment in lieu of land when the park land to be dedicated is less than three acres. A payment in lieu of land dedication is separate from Park Systems Development Charges, and is not eligible for a credit of Park Systems Development Charges. The amount of the fee in lieu of land dedication (in dollars per acre) shall be set by City Council Resolution, and it shall be based on the typical market value of developed property (finished lots) in Sandy net of related development costs. A. The following factors shall be used in the choice of whether to accept land or cash in lieu: 1. The **topography, geology, access to, parcel size, and location of land** in the development available for dedication; 2. **Potential adverse/beneficial effects** on environmentally sensitive areas; 3. **Compatibility with** the **Parks Master Plan, Public Facilities element of the Comprehensive Plan, and the City of Sandy Capital Improvements Program** in effect at the time of dedication; 4. **Availability** of previously acquired property; and 5. The **feasibility** of dedication.	All of the bolded terms and phrases identified in SDC 17.86.40 are subjective and unclear because they are undefined and / or allow the decision maker to make a "subjective, value-laden analysis" as to what those terms and phrases (i.e., "adverse/beneficial effects," "compatibility with" and "feasibility") mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. The phrase "at the city's discretion only" is wholly subjective because it literally allows the city to use "discretion" in determining whether it will accept payment of a fee in lieu of parkland dedication. The factors used in the choice of whether to accept land or cash in lieu do not explain what about the "topography, geology, access to, parcel size, and location of land" would make cash in lieu versus dedication an appropriate option. They do not explain how much of a beneficial or adverse effect must occur, nor what such effects even are. They require compatibility with various plans, but do not explain what must be compatible with those plans and what parts of those plans are relevant to the decision. They do not explain how "availability" of previously acquired property is relevant, what that means, who must have acquired said property, or how to apply it to the decision. And they do not describe how the feasibility of dedication is determined.

	These factors are unclear and subjective, as is the process for determining whether to accept cash in lieu of dedication versus requiring dedication.
SDC 17.100.60.E 1. The proposed subdivision is **consistent with** the density, setback and dimensional standards of the base zoning district. 2. The proposed subdivision is **consistent with the design standards** set forth in this chapter. 5. **Adequate** public facilities are available or can be provided to serve the proposed subdivision. 6. All proposed improvements meet **City standards**.	The phrase "consistent with" is neither clear nor objective because it does not define how the proposed subdivision can be "consistent with" the stated standards, and it allows for the decision maker to make a "subjective, value-laden analysis" "designed to balance or mitigate impacts of the development." *See Legacy Dev. Grp.*, Slip Op. at p. 14 (holding that terms such as "consistent" are designed to balance or mitigate impacts from development and are therefore not objective); *Nieto*, Slip Op. at p. 9. The term "adequate" is neither clear nor objective because it is undefined and it allows the decision maker to make a "subjective, value-laden analysis" "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at p. 14; *Nieto*, Slip Op. at p. 9. The phrases "design standards" and "City standards" are not clear nor objective because the criteria do not define what design standards or City standards should be applied, and therefore they allow the decision maker to make a "subjective, value-laden analysis" "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at p. 14; *Nieto*, Slip Op. at p. 9.
SDC 17.100.100 A. *Street Connectivity Principle.* The pattern of streets established through land divisions should be connected to: (a) provide **safe and convenient options** for cars, bikes and pedestrians; (b) create a **logical, recognizable pattern** of circulation; and (c) spread traffic	All of the bolded terms identified in SDC 17.100.100.A, D & E are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to what is "safe and convenient," what is a "logical, recognizable pattern," how many streets is "many" streets, which streets are "key," how to determine

over **many** streets so that **key** streets (particularly U.S. 26) are not **overburdened**. D. *Street Spacing.* Street layout shall **generally** use a rectangular grid pattern with **modifications as appropriate** to adapt to topography or natural conditions. E. *Future Street Plan.* Future street plans are conceptual plans, street extensions and connections on acreage adjacent to land divisions. They assure access for future development and promote a **logical, connected** pattern of streets. It is in the interest of the city to promote a **logical, connected** pattern of streets. All applications for land divisions shall provide a future street plan that shows the pattern of existing and proposed future streets within the boundaries of the proposed land divisions, proposed connections to abutting properties, and extension of streets to adjacent parcels within a 400 foot radius of the study area where development may **practically** occur.	whether something is "overburdened," what "generally" means, what "modifications" are allowed and when they are "appropriate," what a "logical, connected pattern of streets" is, and how "practical[ ]" something may be; they are not clear and objective, but rather are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9.
SDC 17.100.120 A. *Blocks.* Blocks shall have **sufficient width** to provide for two tiers of lots at **appropriate depths**. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features. B. *Residential Blocks.* Blocks fronting local streets shall not exceed 400 feet in length, **unless topographic, natural resource, or other similar physical conditions justify** longer blocks. D. *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 or tract shall be	All of the bolded terms and phrases identified in SDC 17.100.120are subjective and unclear because they are undefined and allow the decision maker to make a "subjective, value-laden analysis" as to what is "sufficient," "appropriate"; what specific features from the general list supplied in part B would justify longer blocks; and how "public convenience and mobility" could be "enhance[d]" and what those terms mean. *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9. Such terms and phrases are "designed to balance or mitigate impacts of the development." *Legacy Dev. Grp.*, Slip Op. at pp. 12 - 14; *Nieto*, Slip Op. at p. 9.

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 or through greenway systems.	

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Memorandum

VIA E-MAIL

To: Mike Robinson

From: Erin M. Forbes

Date: October 11, 2021

Subject: LUBA Decisions on Limited Land Use Applications (proper incorporation of plans) and Needed Housing Applications (clear and objective standards & procedures)

File No.: 126769-255102

This memorandum sets forth the LUBA opinions issued between January 1, 2019 and the present where LUBA substantively discussed and decided on (1) the proper incorporation of comprehensive plans, transportation system plans and the like, as required by the Limited Land Use statutes; and (2) whether standards, conditions, and procedures applied to Needed Housing applications are clear and objective as required by the Needed Housing statutes.

1. Proper Incorporation / Limited Land Use Applications

ORS 197.195(1) provides that "[i]f a city or county does not incorporate its comprehensive plan provisions into its land use regulations, the comprehensive plan provisions may not be used as a basis for a decision by the city or county or on appeal from that decision."

The following is a list of LUBA opinions issued between January 1, 2019 and the present where LUBA reversed or remanded a local government's decision to deny a needed housing application.

Oster v. City of Silverton, LUBA No. 2018-103 (May 7, 2019) (reversing)

The above-listed case is the only LUBA case published during this time period addressing the proper incorporation requirement of the limited land use decision statute.

2. Clear and Objective Standards & Procedures / Needed Housing Applications

ORS 197.307(4) provides that "a local government may adopt and apply only clear and objective standards, conditions and procedures regulating the development of housing, including needed housing." ORS 227.173(2) further provides that "[w]hen an ordinance establishing approval

standards is required under ORS 197.307 to provide only clear and objective standards, the standards must be clear and objective on the face of the ordinance."

The following is a list of LUBA opinions issued between January 1, 2019 and the present where LUBA reversed or remanded a local government's decision to deny a needed housing application, or where LUBA affirmed a local government's approval of an application and did not apply subjective standards.

- *Legacy Development Grp. v. City of the Dalles*, LUBA No. 2020-099 (Feb. 24, 2021) (reversing)
- *Nieto v. City of Talent*, LUBA No. 2020-100 (Mar. 10, 2021) (reversing)
- *Buffalo-Bend Associates, LLC v. Clackamas County*, LUBA No. 2019-091 (Jan. 31, 2020) (remanding for failure to apply needed housing statutes and failure to analyze whether applicable criteria are clear and objective)
- *Knoell v. City of Bend*, LUBA No. 2021-037 (Aug. 20, 2021) (affirming approval of subdivision application that was approved after city declined to apply approval criteria that were not clear and objective based on needed housing rules)

Only one decision since 2019 has been issued where LUBA found that challenged standards were clear and objective, contrary to the applicant's objections. *See Piculell Living Trust v. City of Eugene*, LUBA No. 2019-067 (Nov. 19, 2019) (affirming city's decision to impose conditions of approval that were appealed by the applicant on basis that the relevant approval criteria were not clear and objective under the needed housing statutes).

* * *

As stated above, the cases listed above were found through a search of LUBA opinions issued between 2019 and the present. With the exception of *Piculell*, all the cases cited support that LUBA is looking carefully at whether local governments are analyzing their development standards with the requirements of the limited land use and needed housing statutes in mind (that is, whether the standards properly incorporate the identified plans and whether the standards and procedures are clear and objective).

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Schwabe
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October 11, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL

Mr. Jerry Crosby, Chair
Sandy Planning Commission
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy File No. 21-014 SUB/TREE; Applicant's Submittal of Materials Received Pursuant to Public Record Request

Dear Chair Crosby and Planning Commission Members:

This office represents the Applicant in the above referenced Application. The Applicant requested, via public records request, correspondence relating to this Application. Several of those emails are relevant to the Director's decision-making process as relates to his recommendation for denial of the Application, and they are attached to this letter.

As you know, Mr. O'Neill's Staff Report for the September 27, 2021 public hearing noted that the Applicant made a public records request. The Applicant made the request, which Mr. O'Neill acknowledged is proper under Oregon law, to make sure it has all of the information allowing it to respond to the issues in this Application. The materials submitted with this letter are relevant to the arguments in support of the Director's recommendation to deny the Application.

The Applicant appreciates that the Director has an obligation to recommend either approval or denial of any application. However, even though here the Director has recommended denial of the Application, the email correspondence between the Director and the agencies asked to review the Application shows a lack of analysis of the needed housing statutes and whether the Commission may rely on the Comprehensive Plan, Transportation System Plan, Transit Master Plan, or Parks Plan in making its decision to approve or deny the Application. Indeed, there appears to have been no discussion between the Director and those agencies of the fact that the Application is both a needed housing application (which requires the application of only clear and objective approval criteria, standards, and procedures) and a limited land use decision (which allows reliance on the City's Comprehensive, Transportation System, Transit Master Plan, and Parks Plans *only if* those plans are properly incorporated into the approval criteria).

The attached correspondence shows that no consideration was given to the fact that the Applicant's second Application was no longer requesting a Plan amendment, and that as submitted now, it was subject to different approval criteria and different state laws (namely, the needed housing and limited land use decision statutes) when analyzing the Applicant's submission materials.

Please place this letter and the enclosed attachments before the Planning Commission prior to its meeting on November 8, 20201, and in the official Development Services Department file for the above-referenced Application.

Very truly yours,

Michael C. Robinson

MCR/jmhi
Enclosures

cc: Mr. Dave Vandehey (*via email*) (*with enclosures*)
Mr. Carey Sheldon (*via email*) (*with enclosures*)
Mr. Alex Reverman (*via email*) (*with enclosures*)
Mr. Ray Moore (*via email*) (*with enclosures*)
Mr. Tyler Henderson (*via email*) (*with enclosures*)
Mr. Tracy Brown (*via email*) (*with enclosures*)
Mr. Garrett H. Stephenson (*via email*) (*with enclosures*)
Ms. Erin M. Forbes (*via email*) (*with enclosures*)
Mr. Kelly O'Niell (*via email*) (*with enclosures*)
Mr. David Doughman (*via email*) (*with enclosures*)

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From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Monday, August 16, 2021 12:10 PM
To: Shelley Denison
Subject: Re: Video for 21-014

I think if you use a combination of the notice I created and the applicant narrative that should do the trick. We should stay factual about the parkland and Dubarko Road extension, and state that certain plans (i.e. the Parks Master Plan and TSP) required additional parkland dedication and the road connection, but not hint at those two items leading to any sort of denial. If you can use the site plan and plat as visuals in the video that would be great also. Thanks!

On Mon, Aug 16, 2021 at 8:46 AM Shelley Denison <sdenison@ci.sandy.or.us> wrote:

> Hey Kelly,
>
> I'm gonna make this video today. Are there certain things I should focus on?
>
> I'm also thinking about directing folks to watch the development process video as well.
>
> --
> **Shelley Denison**
> **Associate Planner**
>
> City of Sandy
> Development Services Department
> 39250 Pioneer Blvd
> Sandy, OR 97055
> 503-783-2587
> sdenison@ci.sandy.or.us
>
> *"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody." - Jane Jacobs*

--
Kelly O'Neill Jr.
Development Services Director

City of Sandy
Development Services Department
39250 Pioneer Blvd
Sandy, OR 97055
(503) 489-2163
koneill@ci.sandy.or.us

From: BRUMLEY Seth A <Seth.A.BRUMLEY@odot.state.or.us>
Sent: Monday, August 16, 2021 2:58 PM
To: Kelly O'Neill Jr.
Cc: BOLEN Glen A
Subject: RE: Deer Meadows

Hi Kelly,
I am meeting with our planning manager tomorrow morning to discuss this. We have a new process for engaging with DOJ. I hope to be able to provide more information at our meeting tomorrow.

Thanks,
Seth

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Monday, August 16, 2021 2:33 PM
To: BRUMLEY Seth A <Seth.A.BRUMLEY@odot.state.or.us>
Subject: Re: Deer Meadows

Seth - Can you get me the DOJ attorney contact information so that I can forward to our city attorney?

On Sun, Aug 15, 2021 at 2:12 PM BRUMLEY Seth A <Seth.A.BRUMLEY@odot.state.or.us> wrote:

> I can try, but it may be difficult to get somebody by Tuesday. I will talk to our manager Monday morning.

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Saturday, August 14, 2021 10:41 PM
To: BRUMLEY Seth A <Seth.A.BRUMLEY@odot.state.or.us>
Subject: Re: Deer Meadows

Can an attorney from ODOT make our meeting on Tuesday? I have engaged the City land use attorney on this project and believe the ODOT attorney needs to be involved also.

On Wed, Aug 11, 2021, 4:19 PM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:

> How about Tuesday the 17th at 11:30 am?

On Wed, Aug 11, 2021, 2:54 PM BRUMLEY Seth A <Seth.A.BRUMLEY@odot.state.or.us> wrote:

> Hi Kelly,
>
> ODOT received the land use application for Deer Meadows and I have been asked to help coordinate the ODOT response since it is very important to the TSP implementation. Do you have time tomorrow afternoon or early next week to meet and discuss the Dubarko Rd extension? It looks like Monday afternoon after 3:00 and most times on Tuesday would work for me and Avi.
>
> Thanks,
>
> Seth

--
Kelly O'Neill Jr.
Development Services Director

City of Sandy
Development Services Department
39250 Pioneer Blvd
Sandy, OR 97055
(503) 489-2163
koneill@ci.sandy.or.us

This e-mail is a public record of the City of Sandy and is subject to the State of Oregon Retention Schedule and may be subject to public disclosure under the Oregon Public Records Law. This e-mail, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please send a reply e-mail to let the sender know of the error and destroy all copies of the original message.

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Friday, August 27, 2021 8:28 AM
To: BRUMLEY Seth A
Cc: TAYAR Abraham * Avi
Subject: Re: Deer Meadows

Great. I want to hear from Mike Walker and our attorney as well.

On Fri, Aug 27, 2021 at 8:27 AM BRUMLEY Seth A <Seth.A.BRUMLEY@odot.state.or.us> wrote:

> Sounds good. We can make that recommendation and let the City negotiate from there as needed. I will make that change.
>
> **From:** Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
> **Sent:** Friday, August 27, 2021 8:13 AM
> **To:** BRUMLEY Seth A <Seth.A.BRUMLEY@odot.state.or.us>
> **Cc:** TAYAR Abraham * Avi <Abraham.TAYAR@odot.state.or.us>
> **Subject:** Re: Deer Meadows
>
> This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.
>
> John Replinger said, " I think the “not preclude “ language is far from ideal. I say construct it."
>
> On Thu, Aug 26, 2021 at 1:37 PM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
>
> > Thanks Seth and Avi. I will review and also get feedback from Replinger, Mike Walker and our attorney.
> >
> > On Thu, Aug 26, 2021, 1:26 PM BRUMLEY Seth A <Seth.A.BRUMLEY@odot.state.or.us> wrote:
> >
> > > Hi Kelly,
> > >
> > > Here is a draft ODOT comment letter for Deer Meadows. I am still working with our manager to try and a arrange a discussion between our DOJ attorney and the City attorney, but I don’t think it would significantly change our comments. Please take a look and let me know if anything needs clarification before I submit a final version.

> Thanks,
>
> Seth

--

Kelly O'Neill Jr.

Development Services Director

City of Sandy

Development Services Department

39250 Pioneer Blvd

Sandy, OR 97055

(503) 489-2163

koneill@ci.sandy.or.us

--
Kelly O'Neill Jr.
Development Services Director

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(503) 489-2163
koneill@ci.sandy.or.us

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Monday, August 30, 2021 11:41 AM
To: Andi Howell
Cc: Marisol Martinez
Subject: Re: Deer Meadows

Andi - Do you have a timeline for a revised memo? I need it ASAP. Thanks

On Thu, Aug 26, 2021 at 4:09 PM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
That said, if you want to expand on the importance it would help.

On Thu, Aug 26, 2021 at 4:08 PM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
This is great, thank you!

On Thu, Aug 26, 2021 at 3:36 PM Andi Howell <ahowell@ci.sandy.or.us> wrote:

Hi there, attached is a memo regarding Deer Meadows Subdivision. I briefly referenced the Transit Master Plan in this memo.

If you would like me to expand on the importance of transit amenities with a village development, include the pages of the Transit Master Plan and/or the importance of planned developments with access to major arterial road/highways to reduce costs of operations and greatly improve transit's ability to serve the development, please let me know.

Thank you,

Andi

Andi Howell
Transit Director

City of Sandy
16610 Champion Way
Sandy, OR 97055
503-489-0925
ahowell@ci.sandy.or.us

Sandy Transit Web and Trip Planner

--
Kelly O'Neill Jr.
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--
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--
Kelly O'Neill Jr.
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koneill@ci.sandy.or.us

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Tuesday, August 31, 2021 10:20 AM
To: MW
Subject: Re: PW comments file no. 21-014 Deer Meadows

Also, Street C is a public access lane so I think your comment that the ROW has to be at least 50 feet is not applicable.

On Tue, Aug 31, 2021 at 9:39 AM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:

Thanks Mike. How about water and sanitary sewer? You had comments on both with Bull Run Terrace but I do not see anything in this memo. Do you want either utility extended east in HIghway 26 to the furthest extent of the property boundary?

On Tue, Aug 31, 2021 at 9:13 AM MW <mwalker@ci.sandy.or.us> wrote:

Kelly,

attached please find my comments. Let me know if questions.

--

Mike Walker

Director of Public Works

City of Sandy

39250 Pioneer Blvd.

Sandy, OR 97055

503-489-2162 V

503-668-8714 F

www.ci.sandy.or.us

--
Kelly O'Neill Jr.
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--
Kelly O'Neill Jr.
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koneill@ci.sandy.or.us

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Tuesday, August 31, 2021 10:59 AM
To: MW
Subject: Re: PW comments file no. 21-014 Deer Meadows

here are some examples:

1. The applicant shall install all water lines and fire hydrants in compliance with the applicable standards in Section 17.100.230, which lists requirements for water facilities. According to the Public Works Director the existing 8-inch diameter water line resides in an easement granted to the City of Sandy recorded at 2004-110340. **The applicant shall replace the existing waterline with an 8-inch diameter water line at a depth approved by the City Engineer.** There will be no compensation or credits for replacement of the existing water line. This pipe is a standard pressure line and will be used to provide domestic water service to the development. The City's water master plan shows an 18-inch diameter water line in Dubarko Road south of Highway 26. **The applicant shall install an 18-inch water line in Dubarko Rd. connected to the existing 18-inch water line at the west end of the site and the existing 12-inch line on Highway 26.** Due to the elevation of the site relative to the existing water reservoirs on Vista Loop Drive this line will be a low-pressure, high-volume line and will be used for fire protection. The cost difference between a standard diameter water line and the required 18-inch water line is eligible for Water System Development Charge (SDC) credits. The amount of the credit provided will be based on the Water System Construction Cost Credit table in the Water System Development Charge Methodology adopted by City Council motion on September 5, 2017. Section 17.84.60D SMC states: "As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies)". **The applicant shall extend the existing 12-inch water main in Highway 26 east from the proposed intersection of Dubarko Road and Highway 26 to the east boundary of the site.** The cost difference between a standard diameter (8 inch) water line and the required 12-inch water line is eligible for Water System Development Charge (SDC) credits. The amount of the credit provided will be based on the Water System Construction Cost Credit table in the Water System Development Charge Methodology adopted by City Council motion on September 5, 2017.

2. The applicant intends to install sanitary sewer lines in compliance with applicable standards in Section 17.100.240. [Add MW comments] All lots except Lot 7 are designed to gravity drain to the sanitary sewer line in Dubarko Road. Due to grade, Lot 7 is not able to drain to the line in Dubarko Road but is proposed to connect to the existing sanitary sewer line at the north end of the park property. According to the Public Works Director the recently adopted Wastewater System Facilities Plan (2019) identified a capacity deficiency in the Southeast pump station and force main as well as several conveyance lines downstream. The City will adopt a Sanitary Sewer SDC surcharge on each Equivalent Residential Unit developed in the basin served by the Southeast pump station. The surcharge amount will be calculated by dividing the estimated cost of the required capacity improvements by the estimated number of dwelling units that can be built in the pump station drainage basin. The surcharge will be collected with each building permit issued in the basin.

3. Section 17.100.250(A) details requirements for stormwater detention and treatment. A public stormwater quality and detention facility is proposed as Tract C to be located at the northwest corner of the proposed development. [Add MW comments] This facility has been sized and located to accommodate the water quality and stormwater detention needs of all streets in addition to Lots 1-4. The applicant submitted a revised utility plan (Exhibit M) detailing a second stormwater facility identified as Tract C in the SW corner

of the property. The revised utility plan also removed the 15-foot-wide public stormwater easement and utilities along the west lot line of Lots 1, 2, and 4. The water quality and detention needs of Lots 5-7 will be accommodated on each of those lots and stormwater from Lots 5 and 6 will be routed to flow through Tract B. After onsite detention and water quality treatment, stormwater from Lot 7 will be piped and connected to the existing storm line in the park. **All site runoff shall be detained such that post-development runoff does not exceed the predevelopment runoff rate for the 2, 5, 10 and 25 year storm events. Stormwater quality treatment shall be provided for all site drainage per the standards in the City of Portland Stormwater Management Manual (COP SWMM).**

On Tue, Aug 31, 2021 at 10:56 AM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
Ok, thanks. I want to deny this application on a number of things...previously we required sanitary sewer extended in the Highway 26 ROW. Please add anything applicable for water and sanitary sewer also.

On Tue, Aug 31, 2021 at 10:55 AM MW <mwalker@ci.sandy.or.us> wrote:
I wondered about that but since they identified it as a street I added the comment. I will edit the comments and re send them.

On Tue, Aug 31, 2021 at 10:20 AM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
Also, Street C is a public access lane so I think your comment that the ROW has to be at least 50 feet is not applicable.

On Tue, Aug 31, 2021 at 9:39 AM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
Thanks Mike. How about water and sanitary sewer? You had comments on both with Bull Run Terrace but I do not see anything in this memo. Do you want either utility extended east in HIghway 26 to the furthest extent of the property boundary?

On Tue, Aug 31, 2021 at 9:13 AM MW <mwalker@ci.sandy.or.us> wrote:
Kelly,

attached please find my comments. Let me know if questions.

--

Mike Walker

Director of Public Works

City of Sandy

39250 Pioneer Blvd.

Sandy, OR 97055

503-489-2162 V

503-668-8714 F

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koneill@ci.sandy.or.us

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Thursday, September 02, 2021 2:53 PM
To: MW
Subject: Re: revised comments 21-014

Thank you! Sorry for all the back and forth but I want to raise these issues now especially with my recommendation being a denial.

On Thu, Sep 2, 2021, 2:42 PM MW <mwalker@ci.sandy.or.us> wrote:
Thanks Kelly,

I dropped references to Street "C" as a street in this version. However they can't have it both ways... if its a street it doesn't meet the intersection spacing standard, if its a public access lane it doesn't meet the 150 ft. minimum separation between an 'access' to a collector (Street "B") and an arterial street (Dubarko). This version addresses that.

On Thu, Sep 2, 2021 at 2:29 PM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
I modified the date to Sep. 2 and changed the highlighted section to just reference 17.100.160. See attachment. Good?

On Thu, Sep 2, 2021 at 2:12 PM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
In Section 17.100.160 of the narrative, Tracy says:

"Due to the configuration of the subject property and the location
and access limitations to Dubarko Drive and Street B, Street C is proposed
as a Public Access Lane as detailed below."

On Thu, Sep 2, 2021 at 2:05 PM MW <mwalker@ci.sandy.or.us> wrote:
Kelly,

Here you go... Check the italicized and highlighted comments and delete or edit as you see fit.

On Thu, Sep 2, 2021 at 12:17 PM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
Mike - Any updates?

On Wed, Sep 1, 2021 at 9:36 AM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
Mike - If you can get the revised letter to me today that would be much appreciated. Thanks

On Tue, Aug 31, 2021 at 3:42 PM Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:
Received, thank you.

On Tue, Aug 31, 2021 at 3:32 PM MW <mwalker@ci.sandy.or.us> wrote:
Kelly,

My revised comments are attached - Take a look at the discussion in italics regarding Street C.

--

Mike Walker

Director of Public Works

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Date: October 11, 2021
To: Sandy Planning Commission
From: Tracy Brown, Tracy Brown Planning Consultants, LLC
Subject: Deer Meadows Subdivision (File No. 21-014) Staff Recommended Conditions

The purpose of this memo is to provide additional written testimony regarding items identified in the September 17, 2021 staff report in bold type. It is our understanding items identified in bold type are staff recommended Conditions of Approval. As detailed below, the applicant is requesting modifications to a few of these Conditions.

1. Finding 30 - This Condition lists Lots 9-16, 20, and 21 as requiring shared driveways. *Response: A review of the submitted plan and the listed lots reveals that it is not feasible to require all of these lots to share driveways. Driveways are typically shared in pairs only. With this in mind, we request this Condition be modified to only require shared driveways for Lots 9/10 and 14/15. After reviewing this Condition we have determined it is not feasible to require Lot 11 to share a driveway, Lots 12/13 already share a private drive (Tract B), there is no lot for Lot 16 to share access with, and Lots 20/21 already share a private drive (Tract A).*

2. Finding 34 - This Condition requires all residential structures on lots abutting Highway 26, Dubarko Road, and Street B to have their primary entrances oriented towards these streets. *Response: As noted in the narrative submitted with this application, the submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "primary entrances" and "oriented toward" as used in Section 17.82.20(A) are subjective words. The applicant is fine with complying with this Condition for homes located abutting Dubarko Road and Street B, but because of the grade separation between Highway 26 and the lots abutting this road, the applicant is opposed to this Condition for Lots 13, 21, 22, 25, and 26 abutting Highway 26. The applicant requests this Condition be modified.*

3. Finding 54 requires a transit pad and bench adjacent to Lot 1 and 5. *Response: The lot numbers in this recommendation are confusing in that Lots 1 and 5 are located along Street A, a local street, not a transit street. In addition, the applicant does not propose extending Dubarko Road to intersect with Highway 26 as stated in this Finding. The applicant requests this Condition be removed.*

4. Finding 69 requires the applicant to replace the existing 8-inch waterline and install an 18-inch waterline. *Response: The recommendations in this Condition are addressed in the applicant's attorney's 9/24/21 letter.*

5. Finding 70 requires the applicant to extend the existing 12-inch waterline to the eastern boundary of the site. *Response: The recommendation in this Condition is addressed in the applicant's attorney's 9/24/21 letter.*

6. Finding 88 requires the applicant to update the Street Tree Plan and install trees 30 feet on center along Street C and Highway 26 with the trees along Street C to be located behind the sidewalk and the trees along Highway in a planter strip. *Response: The applicant is fine with installing trees along Street C but since no improvements including a planter strip are proposed along Highway 26, the applicant requests this Condition be revised to require trees to be planted at the back of those lots (Lots 13, 21, 22, 25, 26) abutting Highway 26. The applicant requests this Condition be modified accordingly.*

City of Sandy
39250 Pioneer Blvd.,
Sandy, OR 97055

Agenda Date: August 11, 2021

To: Parks and Trails Advisory Board

From: Kelly O'Neill Jr., Development Services Director

Sarah Richardson, Staff Liaison Parks and Trails Advisory Board

Subject: Deer Meadows Subdivision

Attachments: None

Background:

Deer Meadows is a proposed 32 lot subdivision located at 40808 Hwy. 26, Sandy, OR which is 15.91 acres.

The developer originally proposed a subdivision known as Bull Run Terrace with a zoning map amendment. The Bull Run Terrace proposal was denied by the City Council on 12/29/20.

The current application is a new land use application and does not include a zoning map amendment. The board discussed the previous land use application at meetings in June, July, and November of 2020. Minutes from those meetings can be accessed from the Public Meeting portal on the city's website: https://sandy.civicweb.net/Portal/

The proposed site is adjacent to the Deer Pointe subdivision, and to 1.40 acres of land designated for park development that was dedicated with the plat of Deer Pointe. Based on the 1997 Parks Master Plan, a neighborhood park is two to seven acres. Therefore, additional land dedication is needed to provide adequate area for the planned park. Additional land would provide capacity for desired community amenities and for the conceptual park as designed by ESA, the consultant for the Parks and Trails Master Plan.

According to the developer's narrative the Low Density Residential (R-1) zoned land will have 30 single family home lots (these could also be duplexes per House Bill 2001), and the Medium Density Residential (R-2) zoned land will have between 38 multifamily dwelling units and 66 multifamily dwelling units. The Village Commercial (C-3) land could also include multifamily dwelling units, but the number of units is unknown at this time. If multifamily dwelling units are proposed on the C-3 land the City of Sandy will collect parks fee in lieu.

Based on the subdivision proposal the calculation for the parkland is as follows:
R-1: 30 units x 3 x 0.0043 = 0.39 acres
R-2 minimum: 38 units x 2 x 0.0043 = 0.33 acres
R-2 maximum: 66 units x 2 x 0.0043 = 0.57 acres

Total minimum = 0.72 acres of parkland
Total maximum = 0.96 acres of parkland

NOTE: The number of dwelling units could be modified if conditions of approval require additional right-of-way dedication or parkland dedication.

The board can recommend that the developer dedicate land or pay a Fee in Lieu of land dedication.

Municipal Code 17.86.10 MINIMUM PARKLAND DEDICATION REQUIREMENTS

***Parkland Dedication**: New residential subdivisions, planned developments, multi-family or manufactured home park developments shall be required to provide parkland to serve existing and future residents of those developments.*

Calculation of Required Dedication: The required parkland acreage to be dedicated is based on a calculation of the following formula rounded to the nearest 1/100 (0.00) of an acre: Required parkland dedication (acres) = (proposed units) x (persons/unit) x 0.0043 (per person park land dedication factor).

To read the entire Municipal Code related to Parkland and Open Space visit the Municipal Code Library:

https://library.municode.com/or/sandy/codes/code_of_ordinances?nodeId=TIT17DECO_CH17.86PAOPSP_S17.86.50MISTOPSPDE

However, pursuant to ORS 197.195, the City cannot rely on the adopted parks master plan (i.e. the 1997 Parks Master Plan) to require the dedication of land or impose other standards in the plan because the standards are not incorporated into the development code. Further, because the master plan does not apply, the City might have difficulty in requiring the parkland to be dedicated at a particular location.

Staff Recommendation: Require parkland dedication with the Deer Meadows subdivision plat.

Staff Contact:
Sarah Richardson
503-489-2150
srichardson@cityofsandy.com

EXHIBIT OO

Marisol Martinez <mmartinez@ci.sandy.or.us>

New deer park development

Christy Veselik <christy@beeingkind.com> Sat, Oct 16, 2021 at 7:09 PM
To: planning@ci.sandy.or.us

Good evening,

I wanted to give my objection to the proposed new deer park development.

I've lived in Sandy my entire life, as did my mom, and my grandma. I've seen it grow now to a level that is just too much.

Traffic backs all the way back to Fred's RV and pulling out at Shorty's corner has become increasingly dangerous. The amount of fatalities in that intersection alone should show the issues with our current traffic flow, and the lack of any better options to make it improved.
The traffic in Sandy is a nightmare. Lights backing up all through town.. issues with the school bus lines and overfilled classrooms…
Not to mention all the new crime in the area. They're are just too many people for our area.

I strongly oppose ANY more new houses/apartments until the above issues are fixed.

Thank you,

Christy Veselik
c/o Beeingkind
503-312-0198
Beeingkind.com

Beeingkind to your body by using all natural ingredients.

Beeingkind to the earth by using reusable and recyclable packaging.

Beeingkind to YOU by creating a great tasting product!

Schwabe
WILLIAMSON & WYATT®

Exhibit PP

October 18, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL TO PLANNING@CI.SANDY.OR.US;
SUBMITTED ON MONDAY, OCTOBER 18, 2021 BEFORE 4:00 P.M.

Mr. Jerry Crosby, Chair
Sandy Planning Commission
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy File No. 21-014 SUB/TREE; Applicant's Second Open Record Period Submittal

Dear Chair Crosby and Planning Commission Members:

This office represents Roll Tide Properties Corp., the Applicant. This letter and its exhibit constitutes the Applicant's second open record period submittal and is timely submitted on Monday, October 18, 2021 before 4:00 p.m.

A. Testimony Schedule.

The Planning Commission opened the initial evidentiary hearing on September 27, 2021. The Planning Commission closed the public hearing and left the written record open until October 11, 2021 for any person to submit new evidence or argument. The Planning Commission allowed a second open record period until October 18, 2021 at 4:00 PM for any person to rebut argument and evidence submitted during the first open record period. The Applicant's final written argument is due on October 25, 2021 at 4:00 p.m. This letter constitutes the Applicant's second open record period response.

B. Items Submitted During the First Open Record Period.

Seven discrete documents were submitted into the record during the first open record period:

1. A letter dated October 11 from Michael Robinson on behalf of the Applicant, with eight exhibits (Exhibit NN).

2. A memorandum dated October 11 from Michael Robinson on behalf of the applicant, enclosing two excerpts from the Staff Report for the prior Bull Run application (Exhibit LL).

3. An email dated October 6 from Michael Robinson enclosing an email between Mr. Robinson and ODOT staff (Exhibit HH).

4. A letter dated October 6 from Michael Robinson granting an extension of the City's 120-day decision deadline to January 5, 2022 (Exhibit II).

5. A letter from Portland Metro Homebuilder's Association (Exhibit MM).

6. A memo dated October 6, 2021 from the City's transportation engineer, Replinger Associates (Exhibit JJ, the "Replinger Memo") commenting on updated traffic analysis provided by Mark Ard, the Applicant's transportation engineer.

7. An email dated October 7, 2021 between planning director Kelly O'Neil and Oregon Department of Land Conservation and Development Staff (Exhibit KK, the "DLCD Email") regarding applicability of Oregon Fire Code access requirements to duplexes allowed under HB 2001.

This letter responds to the last two submittals, the DLCD Email and the Replinger Memo.

C. Response to Exhibit KK, the DLCD Email.

The Oregon Fire Code requires two separate fire access roads into a "development" that includes more than 30 dwelling units. The Application includes two fire access routes: Dubarko Road and Fawn Street, and a third fire access will be created if and when "Street B" is extended to the south.

Exhibit KK is an email between the Planning Director and DLCD staff in which the Planning Director speculates about the impact of Oregon Fire Code accessibility requirements if the proposed lots were developed with duplexes. As explained in the application, the proposed subdivision is anticipated to provide 30 single-family dwelling units. While these lots could allow duplexes under HB 2001 (commonly known as the "Middle Housing Bill"), duplexes are not currently proposed on the lots. Therefore, whether the proposed fire access system is amendable to duplexes is not before the Commission. Regardless, as explained above, the Application includes two fire access points. Moreover, DLCD staff indicates that whether some of the lots could be developed with duplexes is not a basis upon which the City should deny the Application.

D. Response to Exhibit JJ, the Replinger Memo.

As noted above, John Replinger's October 6 memorandum responds to additional transportation analysis submitted by Mike Ard on September 27, 2021. Mr. Ard's September 27 memorandum addressed the Project's potential traffic impacts on the intersection of Highway 211 and Dubarko Road, provides additional information about traffic safety, and examines the impact of the project on existing and proposed local streets.

Mr. Replinger's response generally concurred with Mr. Ard's conclusions, including the following points:

- The Applicant's traffic counts for the AM and PM peak hours are based on the correct methodology and appear reasonable.
- The Applicant's trip generation estimate appears reasonable.
- The Applicant's trip distribution analysis "seems reasonable" on a "city-wide scale."
- The Applicant's background traffic-growth assumptions are reasonable.
- The Applicant's analysis of local street impacts is correct.
- Mr. Replinger concurs with the Applicant's proposal to provide a four-way stop control at the Highway 211 and Dubarko Road intersection to address potential safety issues there.
- Mr. Replinger found that "sight distance is unlikely to be a problem and can be dealt with during design of the streets."

The only disagreement that Mr. Replinger appears to have with Mr. Ard relates to the proposed mitigation for the Highway 211 and Dubarko Road intersection. Mr. Replinger concedes that the Applicant's "proposed mitigation (conversion to all-way stop control) has some benefits or potential benefits," but goes on to speculate that the proposed four-way stop at the Highway 211 and Dubarko Road intersection could increase delays in the northbound and southbound direction. However, Mr. Replinger does not appear to disagree that the four-way stop would increase safety at that intersection and would address level of service concerns in the eastbound and westbound direction. Ultimately, Mr. Replinger concludes that "I leave it to others to asses those opinions."

Mr. Replinger's discussion of the lack of a Dubarko Road extension is a transportation planning issue not directly related to the transportation impacts of the Application. Stated simply, the Applicant is not required, as a matter of law or transportation engineering, to analyze street extensions and other development that is not proposed.

In **Exhibit 1**, Mr. Ard provides a comprehensive response to the transportation engineering aspects of Mr. Replinger's analysis. As explained therein, the only contested transportation engineering issue—the level of service at the Highway 211 and Dubarko Road intersection—is adequately addressed by the Applicant's transportation impact study. This is because the City's adopted method of transportation analysis relies on the "most recent edition of the Transportation Research Board's Highway Capacity Manual"; as explained in Exhibit 1, following conversion to all-way stop control, intersection performance is improved when measured in accordance with the procedures described in the Highway Capacity Manual.

Regardless, even if the mitigation did not satisfy the City's level of service standard, under ORS 197.195(1) it could not be a basis for denial because that standard has not been incorporated into the City's land use regulations.

E. Conclusion.

For the reasons stated in the Application, the hearing, and post-hearing testimony, the Applicant respectfully requests that the Planning Commission approve the Application.

Very truly yours,

Michael C. Robinson

MCR/jmhi
Enclosures

cc: Mr. Dave Vandehey (*via email*) (*with enclosures*)
Mr. Carey Sheldon (*via email*) (*with enclosures*)
Mr. Alex Reverman (*via email*) (*with enclosures*)
Mr. Ray Moore (*via email*) (*with enclosures*)
Mr. Tyler Henderson (*via email*) (*with enclosures*)
Mr. Tracy Brown (*via email*) (*with enclosures*)
Mr. Mike Ard *(via email) (w/enclosures)*
Ms. Erin Forbes *(via email) (w/enclosures)*
Mr. Garrett H. Stephenson (*via email*) (*with enclosures*)
Mr. David Doughman *(via email) (w/enclosures)*
Mr. Kelly O'Neill, Jr. (*via email*) (*with enclosures*)

PDX\126769\255102\GST\31990207.1

EXPIRES: 12/31/2021

ARD ENGINEERING
21370 SW Langer Farms Pkwy
Suite 142, Sherwood, OR 97140

Technical Memorandum

To: Dave Vandehey, Roll Tide Properties Corporation

From: Michael Ard, PE

Date: October 15, 2021

Re: **Deer Meadows Subdivision – Review Comment Responses**

Following submittal of the updated traffic impact study prepared for the Deer Meadows Subdivision dated September 27, 2021 we have received review comments from the city's transportation engineer, John Replinger, PE. This memorandum is written in response to his review comments dated October 6, 2021.

In his review, Mr. Replinger agrees with nearly all of the assumptions, methodologies and analysis provide in the traffic impact study. However, he maintains a few concerns which are further addressed herein.

- Concerns regarding the elimination of the Dubarko Road extension to intersect Highway 26 and the proposed new north/south collector roadway

Mr. Replinger expressed concern that the applicant does not propose extending Dubarko Road to connect with Highway 26 opposite SE Vista Loop Drive (West), and instead proposes that Dubarko Road will terminate at a new north/south collector roadway.

The TSP has not been properly incorporated into the city's development code. Accordingly, the proposed development cannot lawfully be evaluated based on whether Dubarko Road is extended to intersect Highway 26. However, a north/south collector is actually a feature described in the city's TSP. Providing a north/south collector roadway establishes a logical and useful connection which facilitates future development to the south of the subject property and could even ultimately facilitate an alternative connection to Highway 26 south of the Dubarko Road alignment.

- Concerns regarding future development within the C3 zone

Mr. Replinger expressed concerns that future traffic volumes associated with potential development within the C3 zone were not assessed in the traffic impact study.

No development is proposed on the commercially zoned property. This results in several unknowns which make a near-term analysis impossible. First, we cannot assess the expected volume of traffic that would be generated by development within the C3 zone without knowing the nature and intensity of the land use. Second, we cannot be confident that the trip distribution assumptions made for the residential uses in the current development plan would equally apply to unknown future commercial uses within the C3 zone. Third, we cannot know when future development might occur within the C3 zone.

This third element, project timing, is critical to evaluation of a proposed development. When preparing a traffic impact study, the year of project completion is used to project background traffic levels (absent the development) and make comparisons to traffic volumes with the addition of site trips from the development. This comparison is what allows a determination of whether the transportation system will meet established mobility standards and is the framework within which appropriate mitigation can be determined. Since nothing is currently proposed within the C3 zone, we cannot reasonably expect that this portion of the property will develop in the near future and cannot even be sure that it will develop even within the long-range planning horizon.

In this instance, the property already has appropriate zoning and no changes to the zoning are proposed. Accordingly, a long-range planning horizon analysis is not required for the proposed development. The provisions of Oregon's Transportation Planning Rule do not apply to the outright permitted use currently being proposed. The analysis provided properly accounts for the development currently being proposed, and any future development application will require its own analysis based on the actual characteristics and timing of the future development.

- Concerns that the distribution of site trips assumed in the TSP may be impacted by the elimination of the Dubarko Road extension

Mr. Replinger expressed concerns that travel patterns in the site vicinity may be impacted by deletion of the Dubarko Road extension as measured at the planning horizon.

Since no Dubarko Road connection exists currently, near term impacts on traffic distribution patterns will be minimally impacted by the proposed development. Since the proposed development is in conformance with the underlying zoning and no zone change is proposed for the property, our obligation is to analyze conditions at the time of project completion with and without the addition of site trips from the proposed development. That analysis was provided in the Traffic Impact Study prepared for the project, and appropriate safety and operational mitigations were recommended. Trip distribution patterns will remain similar to existing conditions upon completion of the proposed development.

Any analysis beyond the year of the current project completion will need to be conducted in conjunction with future development applications and/or the city's ongoing update to its Transportation System Plan. However, such an analysis cannot be required in conjunction with a permitted use, particularly one that provides needed housing.

- Concerns regarding the adequacy of the proposed mitigation at Highway 211 and Dubarko Road

Mr. Replinger indicated that "It is somewhat misleading to describe the intersection [of Highway 211 at Dubarko Road] as operating 'better than under background conditions.'"

The city's development code contains no operational standards directly applicable to intersections in the City of Sandy. Instead, the code merely states, "*The study must demonstrate that the transportation impacts from the proposed development will comply with the City's level-of-service and average daily traffic standards and the Oregon Department of Transportation's mobility standard"* (Sec. 17.84.50.B.4). Although not stated explicitly in this code section, the city's operational standards are found in the Transportation System Plan, which has not been properly incorporated into the development code. Accordingly, these standards cannot lawfully be applied.

However, it should be noted that even if the city's standards had applied to this application, the assertion that intersection operation is improved remains accurate as defined by the City of Sandy. The city's Transportation System Plan provides:

> *Mobility standards are established to delineate the maximum level of congestion that will be accepted on a given facility or within a specified area. The road authority – City, State or County – sets and applies specific standards for their facilities.*
>
> *The City of Sandy mobility standard requires a minimum level of service (LOS) D for signalized, as well as unsignalized intersections. Level of service shall be based on the most recent edition of the Transportation Research Board's Highway Capacity Manual.*

From this text, two things are made clear.

First, the text provides that the applicable road authority sets and applies the specific standards for their facilities. Accordingly, the analyzed state highway intersections would be subject to the mobility standards established in the Oregon Highway Plan based on intersection volume-to-capacity ratios, while the intersections operating under City of Sandy jurisdiction would be subject to the city's level-of-service based mobility standards.

Second, the text describes that signalized and unsignalized intersections operating under the jurisdiction of the City of Sandy should operate at level of service "D" or better based on the methodology described in the Highway Capacity Manual (HCM).

In the Traffic Impact Study dated November 27, 2021 the intersection of Highway 211 at Dubarko Road is described as operating at level of service F under year 2023 background conditions and level of service E under year 2023 background plus site trips conditions following conversion of the intersection to all-way

stop control. These results were reported based on evaluation of the worst approach movement in order to provide an "apples to apples" comparison between the two scenarios in which both background traffic conditions and future background plus site trips mitigated conditions are compared using the same metric.

However, most jurisdictions evaluate the level of service for all-way stop control based on the average intersection delay (similar to a signalized intersection), rather than the average delay for the worst approach movement. This is because all-way stop control intersections alternate between serving the different approach movements and no individual movement is subject to indefinite delays where the driver needs to constantly remain vigilant in looking for a safe gap in the traffic flow. Using the Synchro analysis output worksheet previously provided in the November 27th traffic impact study, the average intersection delay during the morning peak hour with conversion to all-way stop control is 17.4 seconds (level of service C), and the average intersection delay during the evening peak hour is 27.2 seconds (level of service D). Accordingly, if future intersection operation is evaluated based on average intersection delay it is projected to meet the city's level of service standard.

Regardless of which option is used to assess intersection operation, the level of service is improved following implementation of our proposed mitigation. Since intersection level of service is the city's explicitly defined metric for evaluating compliance with the mobility standard, intersection operation is improved per the city's own definition.

If the City wishes to pursue alternative improvements to the intersection of Highway 211 at Dubarko Road, it may be possible to achieve operation at level of service "D" for all approach movements under year 2023 background plus site trips conditions. One potential mitigation that could achieve this goal would be the installation of all-way stop control along with construction of a new northbound right-turn lane from Highway 211 onto Dubarko Road. With both improvements in place, the worst intersection approach would operate at level of service "D" or better during the peak hours. Detailed analysis worksheets showing the results of this potential mitigation are provided in the attached technical appendix.

Appendix

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	48	44	53	86	27	297	13	17	197	2
Future Vol, veh/h	7	11	48	44	53	86	27	297	13	17	197	2
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	62	56	68	110	35	381	17	22	253	3
Number of Lanes	0	1	1	0	1	1	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	10.1	11.3	21.2	14.5
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	8%	0%	39%	0%	45%	0%	8%	0%
Vol Thru, %	92%	0%	61%	0%	55%	0%	92%	0%
Vol Right, %	0%	100%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	324	13	18	48	97	86	214	2
LT Vol	27	0	7	0	44	0	17	0
Through Vol	297	0	11	0	53	0	197	0
RT Vol	0	13	0	48	0	86	0	2
Lane Flow Rate	415	17	23	62	124	110	274	3
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.698	0.025	0.047	0.11	0.243	0.187	0.476	0.004
Departure Headway (Hd)	6.047	5.297	7.36	6.445	7.034	6.09	6.241	5.491
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	598	673	484	552	509	587	576	648
Service Time	3.801	3.05	5.147	4.231	4.805	3.86	4.003	3.252
HCM Lane V/C Ratio	0.694	0.025	0.048	0.112	0.244	0.187	0.476	0.005
HCM Control Delay	21.7	8.2	10.5	10	12.1	10.3	14.6	8.3
HCM Lane LOS	C	A	B	A	B	B	B	A
HCM 95th-tile Q	5.6	0.1	0.1	0.4	0.9	0.7	2.6	0

Intersection	
Intersection Delay, s/veh	21.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	48	60	40	40	51	72	345	71	54	376	20
Future Vol, veh/h	7	48	60	40	40	51	72	345	71	54	376	20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	2	2	2
Mvmt Flow	7	49	62	41	41	53	74	356	73	56	388	21
Number of Lanes	0	1	1	0	1	1	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	11	11.5	22.1	25.4
HCM LOS	B	B	C	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	17%	0%	13%	0%	50%	0%	13%	0%
Vol Thru, %	83%	0%	87%	0%	50%	0%	87%	0%
Vol Right, %	0%	100%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	417	71	55	60	80	51	430	20
LT Vol	72	0	7	0	40	0	54	0
Through Vol	345	0	48	0	40	0	376	0
RT Vol	0	71	0	60	0	51	0	20
Lane Flow Rate	430	73	57	62	82	53	443	21
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.736	0.109	0.121	0.119	0.179	0.1	0.761	0.031
Departure Headway (Hd)	6.164	5.366	7.699	6.913	7.827	6.855	6.181	5.407
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	585	662	468	521	461	526	581	656
Service Time	3.948	3.149	5.403	4.618	5.531	4.555	3.965	3.191
HCM Lane V/C Ratio	0.735	0.11	0.122	0.119	0.178	0.101	0.762	0.032
HCM Control Delay	24.4	8.8	11.5	10.6	12.2	10.3	26.2	8.4
HCM Lane LOS	C	A	B	B	B	B	D	A
HCM 95th-tile Q	6.3	0.4	0.4	0.4	0.6	0.3	6.8	0.1

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EXHIBIT QQ

October 25, 2021

Michael C. Robinson
Admitted in Oregon
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VIA E-MAIL TO PLANNING@CI.SANDY.OR.US;
SUBMITTED ON MONDAY, OCTOBER 25, 2021 BEFORE 4:00 P.M.

Mr. Jerry Crosby, Chair
Sandy Planning Commission
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy File No. 21-014 SUB/TREE (the "Applications"); Applicant's Final Written Argument

Dear Chair Crosby and Planning Commission Members:

This office represents the Applicant. This letter is the Applicant's final written argument without new evidence as those terms are defined in ORS 197.763(9)(a) and (b). Final written argument is the Applicant's summary of its arguments in support of the Application and can include new issues. ORS 197.763(1) and ORS 197.763(6)(c) (Issues may be raised until the close of the record and final written argument is part of the record).

1. Summary of Arguments.

This letter summarizes the reasons why the Sandy Planning Commission (the Planning Commission") should approve the Application with any necessary conditions of approval. The Planning Commission can find the following.

A. The Application requests tentative subdivision approval and is both a Limited Land Use Application and a Needed Housing Application. The Application does not request any variances nor are any of the Needed Housing exceptions applicable. State law provisions limit the approval criteria and discretion that the City may apply to the Application, unlike other kinds of Applications.

B. The requested park dedication cannot be based on the previous Parks Master Plan, as acknowledged in the Staff Report to the Parks and Trails Advisory Board nor can the City meet its *Nollan* and *Dolan* burden of proof to require the dedication without resorting to a standardless choice that is not clear and objective. The new Parks Master Plan was not effective on the date that this Application was submitted.

C. None of the Plans – the Transit Plan, the Comprehensive Plan the Parks Plan and the Transportation System Plan (the "TSP") – referenced in the Staff Report can be used by the Planning Commission in making its decision on the Application because they are not properly incorporated into the land use regulations and contain standards and guidelines that are not clear and objective, contain non-clear and objective procedures and encourage non-clear and objective conditions, all of which result in unreasonable coast and delay in the provision of housing.

Most importantly, there is no effective legal rebuttal to the Applicant's arguments so far. While the Planning Director asked for the Oregon Department of Transportation ("ODOT") to have the Oregon Justice Department participate (it did not), the Planning Director did not ask for the Oregon Department of Land Conservation and Development ("DLCD") to comment on the Application's Needed Housing and incorporation arguments.

D. The requested extension of Dubarko Road cannot be based on the TSP because the TSP is not incorporated into the City's land use regulations and even if it were, the relevant standards are not clear and objective. The same is true for the requested U.S. Highway 26 frontage improvements.

E. The standards that can be applied to the Application are satisfied by substantial evidence, including the Application narrative and evidence included in the Applicant's two open record period letters.

F. The procedures applied by the Planning Commission to the Application must be clear and objective. The Director elevated this Type II Application to a Type III procedure based on a standard that is not clear and objective and which prejudiced the Applicant's rights to a full and fair hearing by subjecting it to a procedure it was not required to undergo and by adding unreasonable cost and delay to the processing of the Application.

G. While some nearby residents to the west opposed the Application, the number of opponents was relatively small. Moreover, the neighbors will not experience cut-through traffic between U.S. Highway 26 and Oregon Highway 211 if Dubarko Road connected the two highways. In any event, the Application proposes a residential subdivision on land that has long been zoned for residential development.

H. Issues associated with matters that are not part of the Application – duplexes and development of the C-3 zoned property – are not a basis for the decision on the Application.

I. ORS 197.522 directs the Planning Commission to approve the Application if it is consistent with applicable land use regulations and Comprehensive Plan policies. If the Application is not consistent, then the Applicant is entitled to offer an amendment or to propose a condition of approval that would make the Application consistent with the standards, considering the requirements of incorporation and clear and objective standards, conditions and procedures. In the even this statute is invoked, the Planning Commission, which could make the final decision in the event its decision is not appealed, can extend the 120-day period in ORS

227.178(1) in order to set forth a new time limitation for final action on the consideration of an amendment or condition of approval.

J. The Planning Director stated at the September 27, 2021 public hearing that the City has approved many applications in the past without the issues raised by the Applicant. While that is undoubtedly true, if those decisions were not challenged, those past decisions cannot substitute for correctly applying law to this Application.

K. The evidentiary record is closed, so additional public testimony may not be provided. The Application would not object to answering questions based on the record without new facts and would not object to others answering questions as long as the Applicant has the last word and new facts are not added to the record.

2. Conclusion.

The Applicant appreciates the Planning Commission's consideration of its argument and evidence. The Applicant respectfully requests that the Planning Commission approve the Application with clear and objective conditions of approval because it satisfies the clear and objective and properly incorporated approval standards and that it provide the Applicant the opportunity under ORS 197.522, if it tentatively determines to deny the Application.

Very truly yours,

Michael C. Robinson

MCR/jmhi

cc: Mr. Dave Vandehey (*via email*)
Mr. Alex Reverman (*via email*)
Mr. Carey Sheldon (*via email*)
Mr. Tracy Brown (*via email*)
Mr. Ray Moore (*via email*)
Mr. Tyler Henderson (*via email*)
Mr. Mike Ard *(via email)*
Mr. David Doughman *(via email)*
Mr. Kelly O'Neill, Jr. (*via email*)

PDX\126769\255102\MCR\32081872.1

Beery Elsner & Hammond LLP

ATTORNEYS AT LAW

MEMORANDUM

TO: Chair Crosby
Sandy Planning Commission

FROM: David Doughman, City Attorney's Office

SUBJECT: Deer Meadows Subdivision Application

DATE: November 1, 2021

On November 8, 2021, the Sandy Planning Commission ("PC") will conduct deliberations for the Deer Meadows application. The PC held an initial evidentiary hearing on September 27. That evening, the PC closed the hearing but left the record open for additional written testimony. The record closed on Monday, October 25. The city asked us to provide a memo for the record with respect to some of the legal issues that relate to the application. In addition, we want to note a couple procedural matters for the November 8 deliberation.

Procedural Considerations

The deliberation on November 8 is for the PC to discuss the application and, based on the testimony and evidence presented, determine whether the application should be approved, approved with conditions or denied. The purpose is not to consider additional testimony or evidence from the applicant or members of the public. However, as part of deliberating, the PC may ask questions of staff or the city attorney.

In its final written argument dated October 25, the applicant noted two possible ways the PC could take additional testimony on (or after) November 8. These are addressed in paragraphs (I) and (K) of that letter. I want to briefly respond to both of those points.

- In paragraph (K), the applicant states it would not object to answering any questions the PC may have of the applicant while it deliberates. I did speak with Mike Robinson, the applicant's lawyer, about this. As I said to him, while the PC could technically do this, it can create procedural problems (particularly in a remote environment) and potentially entitle other parties an opportunity to respond. To avoid procedural concerns, I would recommend the PC not ask questions of the applicant during its deliberation.

- In paragraph (I), the applicant refers to ORS 197.522, a statute that applies to housing applications. The statute says that before denying an application, the local government must allow an applicant the opportunity to either propose an amendment to its application or propose a condition of approval. If an applicant decides to offer an amendment or a condition of approval, the local government may then extend the 120-day deadline in order to study the

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applicant's proposal and determine whether it resolves the basis for the denial. Although local governments must offer this opportunity to an applicant, an applicant is not required to take any action.

- Although I do not believe the PC has experience with this process, it was required and implemented during a hearing in 2020 before the Sandy City Council on the Bailey Meadows application.

- If it appears the PC will deny the application, before voting on a motion the PC will need to offer the applicant one opportunity to amend its application or propose a condition of approval. Our office would guide the PC through the particulars. If the applicant were to offer an amendment or a condition, we would need to work out the details of that on November 8. It would likely result in an additional open record period narrowly focused on the proposed amendment/condition and a subsequent rescheduling of the deliberation. As indicated above, the statute authorizes the city to establish a new 120-day deadline if an applicant proposes an amendment or a condition.

Finally, with respect to procedure, we would remind PC members at the start of the deliberation to declare any ex-parte contacts that may have occurred between September 27 and November 8. We will also want to allow for any party to challenge a disclosure through the appropriate mechanism on Zoom. For example, after the declarations, we should pause briefly to allow people to use the "raise hand" function or dial *9 if they are on the phone. Parties may also use the same raise hand or *9 functions if they believe they have a legal basis to object to some aspect of the PC's deliberation (for example, if they believe the PC is considering evidence that is not in the record).

Substantive Considerations

The primary legal issues involved in this application relate to two Oregon statutes. One of them, ORS 197.307(4), is specific to applications that propose housing, regardless of the cost of the housing or type of housing. It requires local governments to apply only "clear and objective" criteria, conditions and procedures to an application for housing. The other one, ORS 197.195, is applicable to subdivisions. It says comprehensive plan provisions that serve as a basis to approve or deny subdivisions must be incorporated into the development code. Both have existed for years. However, over the past few years and for a variety of reasons, the two statutes now often play a significant role in applications for housing. This has been true in Sandy and in many other cities and counties throughout the state.

Under ORS 197.307(4), "a local government may adopt and apply only clear and objective standards, conditions and procedures regulating the development of housing, including needed housing." While seemingly straightforward, this is easier said than done. The Land Use Board of Appeals ("LUBA") itself once remarked that "few tasks are *less* clear or *more* subjective than attempting to determine whether a particular land use approval criterion is clear and objective."[1] Nevertheless, LUBA and the courts will generally find standards that require "subjective, value-laden analyses that are designed to

[1] *Rogue Valley Association of Realtors v. City of Ashland*, 35 Or LUBA 139, 155 (1998) (emphasis in original).

balance or mitigate impacts of the development" to violate ORS 197.307(4).[2] Examples have included:

- A criterion allowing a decision maker to impose conditions "if it is deemed necessary to mitigate any potential negative impact caused by the development."
- A criterion requiring development to have a "minimal adverse impact on the livability, value and appropriate development" of other properties in a neighborhood.
- A standard requiring development to "minimize" possible conflicts between pedestrians and vehicles, "where necessary for traffic circulation."

However, based on other cases that have considered ORS 197.307(4), it is very difficult to draw "bright lines" that readily distinguish criterion that are clear and objective from those that are not. In our opinion, simply because a decision maker must exercise some discretion does not result per se in a violation of the statute.

In a recent case from Cannon Beach, LUBA stated that a standard may be "clear and objective" and comply with ORS 197.307(4) even *if* an interpretation is required to apply it.[3] In that case, the Board said: "[t]he fact that some interpretation is required does not make a term not clear and objective. Instead, a standard is not clear and objective if it is capable of being applied in multiple ways in a manner that allows the city to exercise significant discretion in choosing which interpretation it prefers." Sometimes, it will be fairly easy to conclude that a standard requires a "value-laden" analysis and allows for significant discretion. Many other times, it is difficult to draw that conclusion.

In the interest of time and cost, we cannot respond in this memo to every specific argument the applicant makes regarding whether applicable code criteria are clear and objective, whether certain comprehensive plan standards are sufficiently incorporated into the code, etc. Of course, we will discuss these issues with the PC during its deliberation and advise the PC accordingly. One example we do wish to highlight concerns the dispute over whether the city can require the applicant to dedicate park land.

While not free of doubt, we believe the relevant law would permit the city to require a dedication of park land in accordance with the formula provided in Chapter 17.86 of the city's code. The dedication requirement clearly applies to subdivisions. Determining the amount of land an applicant must dedicate does not involve any discretion. Rather, the amount is determined through a mathematical formula clearly stated in the code. The city does retain the discretion to require a fee-in-lieu of dedication. However, that discretion amounts to a binary choice between requiring land or requiring cash in-lieu, in an amount set by resolution. The criteria do not require a value-laden analysis that is susceptible to multiple different interpretations or that may be applied in a variety of ways to various applications.

As usual, we will participate in the PC's deliberations on November 8. In the meantime, please let us know if we can answer any questions.

[2] *Id*. at 158.
[3] *Roberts v. City of Cannon Beach* (LUBA No. 2020-116, July 23, 2021)

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EXHIBIT SS

PLANNING COMMISSION STAFF REPORT
TYPE III LAND USE PROPOSAL

This proposal was reviewed concurrently as a Type III subdivision with tree removal. The following exhibits and findings of fact explain the proposal and support the staff recommendation.

DATE: September 17, 2021

FILE NO.: 21-014 SUB/TREE

PROJECT NAME: Deer Meadows Subdivision

APPLICANT/OWNER: Roll Tide Properties, Corp.

PHYSICAL ADDRESS: 40808 and 41010 Highway 26

LEGAL DESCRIPTION: T2 R5E Section 18CD, Tax Lots 900 and 1000

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EXHIBITS

Applicant's Submittals:

A. Land Use Application
B. Project Narrative (dated June 17, 2021)
C. Civil Plan Set
   - Sheet C1 - Cover Sheet and Future Street Plan
   - Sheet C2 - Preliminary Plat Map
   - Sheet C3 - Existing Conditions and Tree Retention Plan
   - Sheet C4 - Tree Tables
   - Sheet C5 - Master Street and Utility Plan
   - Sheet C6 - Preliminary Street Tree and Parking Plan
   - Sheet C7 - Preliminary Grading and Erosion Control Plan
   - Sheet C8 - Slope Analysis
D. Preliminary Stormwater Report
E. Traffic Impact Study (dated June 14, 2021)
F. Arborist Report
G. Wetland Determination
H. DSL Offsite Determination
I. Geotechnical and Slope Stability Investigation
J. Geotechnical Supplemental Review Letter
K. Letter from Michael Robinson (dated March 31, 2021)
L. Letter from Michael Robinson (dated June 11, 2021)

Agency Comments:

M. Fire Marshal (dated August 10, 2021)
N. ODOT (dated September 1, 2021)
O. Parks and Trails Advisory Board (dated September 1, 2021)
P. City Transportation Engineer (dated August 30, 2021)
Q. City Transit Director (dated August 30, 2021)
R. City Public Works Director (dated September 2, 2021)

Public Comments:

S. Gary and Val Roche (received August 16, 2021)
T. Dave and Nancy Allan (received August 23, 2021)
U. Ashley Yukich (received August 23, 2021)
V. Marilyn Euteneier (September 8, 2021)
W. Scott Ruehrdanz (September 13, 2021)

FINDINGS OF FACT

GENERAL FINDINGS

1. These findings are based on the applicant's submittals received on March 31, 2021, and other information on June 11 and June 17, 2021. In a letter dated June 11, the applicant agreed to toll the 120-day clock until July 27, 2021. Therefore, absent any further extensions, this application has a 120-day deadline of November 24, 2021.

2. This report is based upon the exhibits listed in this document, including the applicant's submittals, agency comments, and public testimony.

3. The subject site is approximately 15.91 acres. The site is located at 40808 and 41010 Highway 26.

4. The parcel has a Comprehensive Plan Map designation of Village and a Zoning Map designation of R-1, Low Density Residential; R-2, Medium Density Residential; and C-3, Village Commercial.

5. The applicant, Roll Tide Properties Corp., requests to develop a 32-lot subdivision at 40808 and 41010 Highway 26. The development is proposed to include two partial street extensions and the creation of two new streets. The applicant proposes 30 lots of Low Density Residential (R-1) that will contain single family homes or duplexes, one small lot (9,023 square feet) of Medium Density Residential (R-2), and one large lot (7.35 acres) with a combination of Medium Density Residential (R-2) and Village Commercial (C-3). The 30 lots of R-1 land range in size from 5,500 square feet to 32,189 square feet. The applicant proposes to retain 48 existing trees and proposes to remove the remainder of the trees from the site.

6. The exact number of multifamily units will be determined with a subsequent design review application, but the applicant claims the number of multifamily dwelling units on the R-2 zoned land will be between 38 dwelling units and 66 dwelling units. The C-3 zoned land will likely contain a mix of commercial and residential development.

7. Due to the interest in the previous proposal at the subject site, the Development Services Director elevated this application to a Type III decision to be heard and considered by the Planning Commission. The notice labels provided by the applicant were for the properties within 300 feet of the subject property consistent with a Type II land use application.

8. Throughout the project narrative (Exhibit B) the applicant failed to submit required information. Instead, on 14 occasions in the narrative the applicant states that the development code is subjective (i.e., not clear and objective) and because the subdivision constitutes a needed housing application the subjective development code language is not applicable. Staff does not agree with the applicant's interpretation of what constitutes and does not constitute subjectivity.

9. Per the Comprehensive Plan a specific area plan (SAP) is required for development in a Village. The applicant did not submit an SAP with submission of this application.

10. The applicant previously proposed a development at the site that was denied by the City Council (File No. 19-050 CPA/ZC/SUB/SAP/TREE Bull Run Terrace). This application is substantively different from that prior proposal. The applicant is not proposing a Comprehensive Plan amendment or Zone Change. The applicant does not propose to expand Deer Pointe Park or connect Dubarko Road to Highway 26. The existing parks master plan details the Deer Pointe neighborhood to have a Community Park. The existing transportation system plan classifies Dubarko Road as a minor arterial and shows it connecting to Highway 26. This subject property was previously approved for an 88-lot subdivision known as Vista Loop South (File No. 05-029). Vista Loop South received a few tentative plat extensions and one plat reinstatement, but the subdivision was never constructed, and the approval expired in 2015.

11. The City of Sandy completed the following notices:

    A. A transmittal was sent to agencies asking for comment on August 2, 2021.
    B. Notification of the proposed application was mailed to affected property owners within 300 feet of the subject property on August 10, 2021.
    C. A supplemental notice regarding the Planning Commission meeting was mailed to affected property owners within 300 feet of the subject property on August 24, 2021.
    D. A legal notice was published in the Sandy Post on September 15, 2021.

12. At publication of this staff report five (5) written public comments were received. The main concerns expressed by residents include the following:

    A. Dubarko Road is not proposed to intersect with Highway 26.
    B. More housing will increase congestion and exacerbate parking issues.
    C. Deer Pointe Park is not proposed to be expanded.
    D. Multifamily housing should not be approved.

13. As explained in this staff report, staff agrees with concerns regarding the lack of extension of Dubarko Road and lack of proposed parkland dedication. Regarding multifamily housing, the subject property includes R-2 and C-3 zoned land both of which allow multi-family housing. Therefore, the City of Sandy cannot preclude multifamily housing from the subject property.

LAND DIVISION CRITERIA – Chapter 17.100

14. This land use application is for the subdivision of land and therefore is reviewed in compliance with Chapter 17.100.

15. Submittal of preliminary utility plans and street plans is solely to satisfy the requirements of Section 17.100.60. **Preliminary plat approval does not connote utility or public improvement plan approval which will be reviewed and approved separately upon submittal of public improvement construction plans.**

16. On page 1 of the project narrative (Exhibit B) the applicant states that in accordance with ORS 197.307 (4) a local government may apply only clear and objective standards, conditions, and procedures regulating the creation of needed housing. The analysis of land division criteria as follows has been conducted through review of clear and objective standards. Staff's assessment of this subdivision proposal meets ORS 197.307 (4).

17. Section 17.100.60(E)(1) requires subdivisions to be consistent with the density, setback, and dimensional standards of the base zoning district, unless modified by a Planned Development approval. Each base zoning district requires that residential development comply with Chapter 17.82. First, Preliminary Plat Map (Exhibit C, Sheet C2) details setbacks for Lots 2, and 27-31 showing the front setback facing the local street or public access lane, instead of the Transit Street as required by Chapter 17.82. Second, Sheet C2 does not identify that lots abutting Highway 26 shall face Highway 26 as required by Chapter 17.82, nor does the plan set detail frontage improvements along Highway 26 as required by Chapter 17.86. Third, by not proposing the extension of Dubarko Road to connect with Highway 26 the lots that would otherwise abut Dubarko Road do not have the required frontage to Dubarko Road as required by Chapter 17.82. Fourth, by not proposing Dubarko Road or parkland dedication, some of the proposed lots are in the required right-of-way for Dubarko Road and also located across required parkland. Therefore, this proposal does not meet approval criteria 17.100.60 (E)(1).

18. Section 17.100.60(E)(2) requires subdivisions to be consistent with the design standards set forth in this chapter. The proposal is not consistent with Section 17.100.70, Section 17.100.100 (A)(E) or (F). The proposal does not meet approval criteria 17.100.60 (E)(2) as explained in A. through E., below:

    A. In accordance with Section 17.100.70 the design standards in Chapter 17.100 are not met as the proposed subdivision does not follow the City of Sandy Transportation System Plan by providing the connection of Dubarko Road to Highway 26.

    B. In accordance with Section 17.100.100 (A) the proposed subdivision does not meet the Street Connectivity Principle. By not connecting Dubarko Road to Highway 26 the subdivision does not provide safe and convenient options for cars, bikes, and pedestrians; does not create a logical, recognizable pattern of circulation; and does not spread traffic over many streets so that key streets such as Langensand Road and Highway 211 are not overburdened.

C. In accordance with Section 17.100.100 (E), by not connecting Dubarko Road to Highway 26 the proposed subdivision does not provide a future street plan that promotes a logical, connected pattern of streets.

D. In accordance with Section 17.100.100 (F) the proposed subdivision does not include the continuation of Dubarko Road and proposes two cul-de-sacs and one dead-end public access lane, all of which do not provide connectivity to other streets within the development and to existing and planned streets outside the development.

E. The applicant did not submit any information on block lengths or information regarding single tier vs double tier blocks. Instead, the applicant stated the block length standards in Section 17.100.120 are subjective (i.e., not clear and objective) and because the subdivision constitutes a needed housing application the block length standards are not applicable. The applicant failed to submit information into the record regarding block lengths and therefore staff does not have enough information to determine block lengths.

19. Section 17.100.60(E)(3) requires the proposed street pattern to be connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy. The proposed street pattern is not consistent with the Comprehensive Plan and the city's standards, including connecting Dubarko Road to Highway 26. The 2011 Sandy Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan. Exhibit A of Ordinance 2011-12 is the TSP. The TSP is referenced by ordinance as 'the transportation element of the City of Sandy Comprehensive Land Use Plan'. The 2011 TSP includes the official street plan for the City of Sandy. Project M20 in the TSP is the connection of Dubarko Road to Highway 26. On pages 9, 10, and 14 of the project narrative (Exhibit B) the applicant references the City's TSP and states that the TSP identifies Dubarko Road as a minor arterial. On page 32 of the project narrative (Exhibit B) the applicant claims that subdivision approval criteria 17.100.60 (E)(3) is not clear and objective and therefore the subdivision does not need to meet the Comprehensive Plan or official street plan for the City of Sandy. However, in the narrative for Bull Run Terrace (File No. 19-050) for the same subject site the same applicant stated, "*As illustrated on the submitted Future Street Plan (Sheet C1), the proposed street system is consistent with the City's Transportation System Plan and Comprehensive Plan*." So, with the Bull Run Terrace land use application the applicant conceded that the street system had to be consistent with the City's Transportation System Plan and Comprehensive Plan to meet criteria 17.100.60 (E)(3). The applicant's inconsistent understanding of what is the official street plan (i.e., the City's TSP) is illogical and inconsistent even in the applicant's project narrative. Additionally, in a previous TIS from Ard Engineering (dated September 28, 2020) on page 24 the applicant's traffic engineer references the requirement for the Dubarko Road connection by stating, "it is the completion of the city's planned connection of Dubarko Road to Highway 26." Furthermore, the proposal is not consistent with OAR 660-012-0045, which requires that local governments implement their TSP. By not providing the connection of Dubarko Road to Highway 26 in the proposal the subdivision request does not meet approval criteria 17.100.60 (E)(3).

20. Section 17.100.60(E)(4) requires that traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions. The applicant's project narrative (Exhibit B) and the applicant's Traffic Impact Study (Exhibit E) do not evaluate ADT on local streets. The applicant's project narrative on page 32 states, "As detailed in the submitted Traffic Study traffic volumes on local streets are not projected to exceed ADT standards. This criterion is met." Staff cannot find an evaluation of ADT standards in the submitted TIS. Based on incomplete ADT analysis of the surrounding local streets the subdivision request does not meet approval criteria 17.100.60 (E)(4).

21. Section 17.100.60(E)(5) requires that adequate public facilities are available or can be provided to serve the proposed subdivision. City water, sewer and stormwater are available or will be constructed by the applicant to serve the subdivision. However, the proposal does not meet approval criteria 17.100.60 (E)(5) as explained in A through C, below:

    A. Dubarko Road. As thoroughly explained in this staff report the proposal does not propose the continuation of Dubarko Road to connect with Highway 26. This is inconsistent with the 2011 TSP and will create a safety concern by increasing trips to other streets in Sandy that are not designed to accommodate additional traffic without the connection of Dubarko Road to Highway 26. As stated by the City of Sandy Transportation Engineer (Exhibit P), the Deer Meadows subdivision application should be denied based on the inadequacy of the TIS and because the applicant does not propose the connection of Dubarko Road to Highway 26. By not providing the Dubarko Road connection to Highway 26 the subdivision fails to incorporate a key project from the 2011 TSP and therefore fails to provide adequate public facilities for transportation. Furthermore, the proposal is not consistent with OAR 660-012-0045, which requires that local governments implement their TSP.

    B. Parkland Dedication. Pursuant to 17.86.10 of the Development Code, new residential subdivisions "shall be required to provide parkland to serve existing and future residents of those developments." As thoroughly explained in this staff report the proposal does not include dedication of 0.96 acres of parkland as the Code requires. Directly west of the subject property is undeveloped land owned by the City of Sandy that has long been reserved for the eventual development of Deer Pointe Park. The 1997 Parks Master Plan designated Deer Pointe Park as a community park, and the Location and Development Polices section of the Plan states that community parks should be 20 acres or more. Because the Deer Meadows subdivision does not propose parkland dedication abutting Deer Pointe Park the proposed subdivision is inconsistent with the 1997 Parks Master Plan. Staff recognizes that outside of the City of Sandy purchasing land, there are practical and legal impediments to requiring an applicant to dedicate enough acreage to accommodate a 20-acre community park. Staff finds that a neighborhood park would be a more reasonable solution. Based on the 1997 Parks Master Plan, a neighborhood park is two to seven acres. The existing land the City owns for Deer Point Park is 1.40 acres. When coupled with the .96 acres required by this application, the result would be an approximately 2.4 acre neighborhood park.

C. Highway 26 frontage improvements. As explained by the Public Works Director (Exhibit R) the site plan does not depict frontage improvements (curbs, sidewalks, street lighting, street trees, storm drainage, etc.) on the Highway 26 frontage of the site. Frontage improvements along Highway 26 are required by Section 17.84.50(F)(1) and Section 17.84.30(A). Section 17.84.50(F)(1) states, "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."

22. Section 17.100.60(E)(6) requires all proposed improvements to meet City standards. A detailed review of proposed improvements is contained throughout this staff report. Staff has identified a few aspects of the proposed subdivision improvements requiring additional information or modification by the applicant. Some of the required improvements could be satisfied with conditions of approval, but several of the required improvements can only be satisfied by a substantial modification to the subdivision proposal. The proposed subdivision lacks the following substantial improvements: 1) Dubarko Road connecting to Highway 26; 2) Highway 26 frontage improvements; and 3) Parkland dedication. The proposal does not meet approval criteria 17.100.60 (E)(6).

23. Section 17.100.60(E)(7) strives to ensure that a phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops. The applicant is not requesting a phased development. That said, the applicant is proposing that the design of the multifamily dwellings and commercial land occurs at a future date. The proposal meets approval criteria 17.100.60 (E)(7).

DENSITY CALCULATIONS – Chapter 17.30

24. The total gross acreage for the entire property is 15.91 acres. After removal of the proposed right-of-way and proposed stormwater tract, the net site area (NSA) for the subject property is reduced to 13.22 net acres with three zoning districts. The area zoned as R-1 is 5.64 net acres, the area zoned as R-2 is 4.74 net acres, and the area zoned as C-3 is 2.84 net acres.

    NOTE: The density calculations on the subject site do not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the calculations related to density are based on unreliable assumptions.

25. For the area zoned R-1, a minimum of 5 and a maximum of 8 units per acre are allowed. The minimum density for the subject area is 5.64 net acres x 5 units/net acre = 28.2 rounded down to 28 units. The maximum density for the subject area is 5.64 net acres x 8 units/net acre = 45.12 rounded down to 45 units. The applicant identifies 30 lots, within the density range.

26. For the area zoned R-2, a minimum of 8 and a maximum of 14 units per acre are allowed. The minimum density for the subject area is 4.74 net acres x 8 units/net acre = 37.92 rounded up to 38 units. The maximum density for the subject area is 4.74 net acres x 14 units/net acre = 66.36 rounded down to 66 units. The applicant has not identified the exact number of units which will be built in the subject area. In the project narrative (Exhibit B) on page 5 the applicant states that the exact number of multi-family dwelling units will be determined with a future land use application. **Multi-family housing development on this site shall be reviewed in a future design review process.**

27. For the area zoned C-3, the Sandy Development Code does not define a minimum or maximum density, but does prescribe use requirements, height requirements, minimum setbacks, landscaping percentage requirements, and parking requirements. The combination of these requirements will dictate the maximum number of residential multi-family housing units. The property zoned C-3 will also need to contain a commercial use. **This will be reviewed in a future design review process.**

ZONING DISTRICTS – Chapters 17.36, 17.38, and 17.46

Chapter 17.36 – Low Density Residential (R-1)

28. The applicant proposes constructing 30 single-family dwellings or duplexes as permitted in this zoning district. Section 17.36.30 contains the design standards for this zone. As shown on Sheet C2 of the plan set (Exhibit C), all lots in the proposed subdivision contain at least 5,500 square feet, have at least 20 feet of street frontage or access along a private drive (i.e., Lot 12), and contain an average lot width of at least 50 feet as required.

29. Section 17.36.40(A) requires that water service be connected to all dwellings in the proposed subdivision. Section 17.36.40(B) requires that all proposed dwelling units be connected to sanitary service if currently within 200 feet from the site, which it is. Section 17.36.40(C) requires that the location of any real improvements to the property must provide for a future street network to be developed. Section 17.36.40(D) requires that all dwelling units must have frontage or approved access to public streets. The applicant proposes to meet all these requirements.

30. Section 17.36.50(B) requires that lots with 40 feet or less of street frontage shall be accessed by a rear alley or shared private driveway. Lots 9-16 proposed to access the cul-de-sac at the east terminus of Fawn Street all have less than 40 feet of lot frontage along Fawn Street, therefore, all 8 of these lots shall include shared driveways. Lots 20 and 21 share a private drive, Tract A, that accesses Street A, therefore these two lots shall include a shared driveway. **Lots 9-16, 20, and 21 shall have shared driveways.**

Chapter 17.38 – Medium Density Residential (R-2)

31. The R-2 zoning district allows for all residential use types, including but not limited to single family dwellings, duplexes, row houses, and multifamily dwelling units. The applicant is proposing three lots, Lots 27, 31, and 32, to include R-2 zoned land. Both lots 27 and 32 are proposed as split zoned lots. Lot 27 is split zoned between R-1 and R-2 zoned land, while Lot 32 is split zoned between R-2 and C-3 zoned land. Lot 31 is proposed to be entirely zoned R-2. Staff anticipates that Lot 31 will likely contain a single-family home or duplex, and Lot 32 will likely contain multi-family dwellings. As noted above, the applicant will be allowed to develop between 38 and 66 dwelling units on the R-2 zoned land, unless additional public land dedications are required. The R-2 zone does not include a minimum lot area. **The future design review application will include a review of development standards and requirements.**

Chapter 17.46 – Village Commercial (C-3)

32. While the C-3 zoning district will have to contain some commercial development there is a decent chance the C-3 land will also contain residential dwelling units. The exact number of potential residential units is not known at this time. If residential units are proposed on the C-3 land the dwelling units will be assessed in a future design review. **Any future development on the land zoned C-3 will require a design review in accordance with the development standards found in Section 17.46.30 and the Sandy Municipal Code.**

ADDITIONAL SETBACKS AND SPECIAL SETBACKS – Chapters 17.80 and 17.82

33. Chapter 17.80 requires all residential structures to be setback at least 20 feet to collector and arterial streets. Highway 26 is classified as an arterial, Dubarko Road is classified as a minor arterial, and Street B is classified as a collector. **All structures on lots abutting Highway 26, Dubarko Road, and Street B shall be setback at least 20 feet.**

34. Section 17.82.20(A) requires that all residential dwellings shall have their primary entrances 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. Highway 26, Dubarko Road, and Street B are all transit streets. **All residential structures on lots abutting Highway 26, Dubarko Road, and Street B shall have their primary entrances oriented to Highway 26, Dubarko Road, or Street B. If a lot abuts two or more of these streets the residential structure shall be oriented to the highest classification of street. This means for example that Lot 30 shall be oriented to Dubarko Road.**

35. The applicant references ORS to claim that Chapter 17.82 is not clear and objective and therefore the design standards in Chapter 17.82 do not have to be followed, but the project narrative goes on to state that Lots 2, and 27-31 can be designed in compliance with the standards of Chapter 17.82. Section 17.82.20(B) requires that dwellings shall have a primary entrance connecting directly between the street and building interior and outlines requirements for the pedestrian route. Section 17.82.20(C) requires that primary dwelling entrances shall be architecturally emphasized and visible from the street and shall include a covered porch at least 5 feet in depth. **The adherence to Chapter 17.82 for residential design standards shall be required.**

36. Section 17.82.20(D) requires that if the site has frontage on more than one transit street, the dwelling shall provide one main entrance oriented to a transit street or to a corner where two transit streets intersect. **If a lot abuts two or more of these streets the residential structure shall be oriented to the highest classification of street. This means for example that Lot 30 shall be oriented to Dubarko Road. The orientation of the future multi-family units that have frontage on both Highway 26 and Dubarko Road will be determined in a future design review process.**

TRANSPORTATION – Chapters 17.84 and 17.100

37. This finding analyzes the Traffic Impact Study (Exhibit E).
    A. The applicant submitted a Traffic Impact Study (Exhibit E) from Ard Engineering, dated June 14, 2021. The study did identify some required mitigation. According to the Traffic Impact Study (TIS), the proposed residential development (not including the commercial lot) would generate up to 79 site trips during the morning peak hour, 99 trips during the evening peak hour, and 1,180 daily site trips.
    B. The TSP states that Highway 211 at Dubarko Road has a high historical crash rate. Ard Engineering also states that no operational mitigations are necessary or recommended in conjunction with the proposed subdivision.
    C. The City Transportation Engineer (Exhibit P) states that the development plan ignores the TSP and does not propose extending Dubarko Road, currently a stub street, to connect with Highway 26 opposite SE Vista Loop (West) as specified in the TSP. The City Transportation Engineer also includes the following concerns:
        i. The TIS addresses some of the city's requirements but does not provide an adequate basis to evaluate impacts of the proposed development. Key deficiencies include a failure to provide for the extension of Dubarko Road to connect with Highway 26 as specified in the TSP and a failure to account for development of or access to the commercially zone land (approximately 3 acres) that comprises a portion of Lot 32 in the proposed development.
        ii. The engineer's use of pre-COVID-19 counts is understandable, but new analyses needed to address the full impact of the development should be based on new traffic counts.
        iii. The applicant appears to be assuming that the commercially zoned portion of Lot 32 would have direct driveway access to Highway 26, though this appears to conflict with ODOT access control policies. Alternatively, the applicant may be assuming some type of cross-easements or shared driveway connections involving the residentially zoned portion of Lot 32 would be acceptable. Neither option appears viable.
        iv. Since the TIS did not examine the impact of development of the commercially zoned portion of the site, it is not clear that LOS D would be achieved with full development of the subject property. It appears that only a little more development in Sandy would push the Dubarko Road and Highway 211 intersection to LOS E and cause the need for mitigation.
        v. The proposed elimination of Dubarko Road results in localized impacts in the immediate vicinity that will result in different travel patterns than anticipated in the TSP.
        vi. The applicant's traffic engineer failed to explain how the site would be developed to serve all uses in the absence of the Dubarko Road extension identified in the TSP. The City Traffic Engineer recommends delaying any approvals until access issues are resolved and street connectivity meets the TSP.

38. The City Transportation Engineer (John Replinger) recommends denial of the application based on the inadequacy of the TIS. Mr. Replinger states that the applicant has two paths to approval. The first involves submitting a new application that provides for the extension of Dubarko Road to Highway 26 as specified in the TSP. The second involves seeking a TSP

amendment with an alternative arterial and collector street network that allows the regional needs to be met without the section of Dubarko Road that is proposed to be eliminated.

39. This finding analyzes the necessity for Dubarko Road to intersect with Highway 26.
    A. The proposed street pattern in Deer Meadows is not consistent with the Comprehensive Plan and the city's street plan, including connecting Dubarko Road to Highway 26. The 2011 Sandy Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan. Exhibit A of Ordinance 2011-12 is the TSP. The TSP is referenced by ordinance as 'the transportation element of the City of Sandy Comprehensive Land Use Plan'. The 2011 TSP includes the official street plan for the City of Sandy. Project M20 in the TSP is the connection of Dubarko Road to Highway 26.
    B. The proposal is not consistent with OAR 660-012-0045, which requires that local governments implement their TSP.
    C. ODOT (Exhibit N) recommends that the City require the applicant to construct Dubarko Road as shown in the adopted Transportation System Plan (TSP). Consistent with OAR 660-012-0045, completing this connection would implement the adopted road network in the TSP. The extension of this arterial would provide increased connectivity for the proposed development as well as for other residents of the City. This would help reduce motor vehicle congestion and provide more options for those walking, biking, and using transit. Planning within the City of Sandy has assumed the Dubarko Road connection for over a decade. For example, the Sandy Area Metro Transit Master Plan identifies this connection as a way to provide increased service on the east side of Sandy and to more efficiently serve residents along Vista Loop Road.
    D. Dubarko Road shall continue in a northeast direction to connect with Highway 26. Dubarko Road shall include features consistent with the minor arterial street section in the 2011 Sandy TSP. The widening of Dubarko Road to accommodate the street section in the TSP is eligible for Transportation System Development Charge credits. The difference in cost between the required minor arterial improvements and a standard local street section is eligible for credits.
    E. The extension of Dubarko Road is classified as a minor arterial street and shall meet the standards of Section 17.84.50(B) which states that arterial streets should generally be spaced in one-mile intervals and traffic signals should generally not be spaced closer than 1,500 ft for reasonable traffic progression.
    F. Per the 2020 Transit Master Plan, the extension of Dubarko Road to intersect with Highway 26 is a future transit route.

40. Street B (defined as 'New Road' in the TSP) is classified as a collector street and does not need to adhere to the standards in Section 17.84.50(B).

41. The applicant's project narrative (Exhibit B) and the applicant's Traffic Impact Study (Exhibit E) do not evaluate ADT on local streets. The applicant's project narrative on page 32 states, "As detailed in the submitted Traffic Study traffic volumes on local streets are not projects to exceed ADT standards. This criterion is met." Staff cannot find an evaluation of ADT standards in the submitted TIS. As explained earlier in this staff report, based on

incomplete ADT analysis of the surrounding local streets the subdivision request does not meet approval criteria 17.100.60 (E)(4).

42. Section 17.84.50(E) requires that public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property. The proposed street layout results in one temporary dead-end street (Street B) that will be stubbed to the southern property line of the subject property. The proposal also includes two cul-de-sacs and one public access lane. The proposed subdivision does not propose the extension of Dubarko Road which is inconsistent with the City of Sandy 2011 TSP and thus fails to install the public street extension of Dubarko Road concurrent with development of the site. The proposed subdivision does not meet the standards of Section 17.84.50 (E).

43. The proposed development includes the need to name Street A, Street B, and Street C. Street A and Street B are one continuous street running north to south and therefore should be one street name. **The street shall be related to the deer theme in the development to the west and shall be an 'avenue' as it runs north/south. Staff recommends the name Velvet Avenue. The public access lane, Street C shall be related to the deer theme in the development to the west and shall be a 'street' as it runs east/west.**

44. Proposed streets do not meet the requirements of 17.84.50(H) as public street improvements (i.e., Dubarko Road) do not provide for the logical extension of an existing street network. The proposed streets also do not meet Section 17.100.100(E) as the subdivision proposal does not promote a logical, connected pattern of streets. The future street plan (Exhibit C, Sheet C1) does not adhere to the adopted 2011 TSP. Both Dubarko Road and Street B are identified in the TSP; however, the applicant is not proposing the connection of Dubarko Road to Highway 26. Therefore, the future street plan is incomplete and inconsistent with the TSP which is adopted by the City of Sandy and recognized by the State of Oregon as the official street plan for the city of Sandy.

45. Dubarko Road and Street "C" create "T" intersections at their connection to Street "A" and Street "B" respectively. The Code at 17.84.50(E)(2) states that adjacent "T" intersections "shall maintain a minimum of 150 feet between the nearest edges of the two rights-of-way." The distance between the two nearest edges of the right-of-way between Dubarko Road (an arterial) and Street C (a local street) is less than the minimum 150 ft. dimension in Sections 17.84.50(E)(2) and 17.84.50(J)(3).

46. Based on the submitted site plan it does not appear that that the minimum 100 feet of tangent alignment required in Section 17.84.50(J)(5)(a) is provided at the intersection of Street "B" (a collector) and Dubarko Road (an arterial) or at the intersection of Dubarko Road and Street "B".

47. While Section 17.100.100(C) calls for a rectangular grid pattern the proposed street layout is not a rectangular grid pattern as it incorporates cul-de-sacs and does not include the required extension of Dubarko Road to Highway 26. Staff finds that the proposed street layout does not represent a logical street pattern.

48. The applicant did not submit any information on block lengths or information regarding single tier vs double tier blocks. Instead, the applicant stated the block length standards in Section 17.100.120 are subjective (i.e., not clear and objective) and because the subdivision constitutes a needed housing application the block length standards are not applicable. The applicant failed to submit information into the record regarding block lengths and therefore staff does not have enough information to determine block lengths.

PEDESTRIAN IMPROVEMENTS – Chapters 17.84 and 17.100

49. Section 17.84.20(A)(1) requires that all improvements shall be installed concurrently with development or be financially guaranteed. **All lots in the proposed subdivision will be required to install public and franchise utility improvements or financially guarantee these improvements prior to final plat approval.**

50. Section 17.84.30(A)(1) requires that all proposed sidewalks on the local streets will be five feet wide as required by the development code and separated from curbs by a tree planting area that is a minimum of five feet in width.

51. As required by Section 17.84.30(A)(2), six-foot sidewalks shall be constructed along Highway 26, Dubarko Road, and Street B. These frontages shall include planter strips as required. ODOT (Exhibit N) recommends that the City require frontage improvements consistent with City, ODOT, and ADA standards. The applicant does not propose to install frontage improvements along Highway 26 and therefore does not meet the requirements of Section 17.84.30(A)(4).

52. As required by Section 17.84.30(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. Subsection 17.84.30(B)(2) goes on to elaborate that right-of-way connecting cul-de-sacs passing through unusually long or oddly shaped blocks shall be a minimum of 15 feet wide with eight (8) feet of pavement. The applicant proposes two cul-de-sacs but does not propose a pedestrian connection to streets beyond the cul-de-sacs as required by Section 17.84.30. Furthermore, the Street A cul-de-sac is in the parkland expansion area for Deer Pointe Park.

53. In relation to Sections 17.84.30(B), 17.84.30(C), 17.84.30(D), and 17.84.30(E), no pedestrian or bicycle facilities other than sidewalks have been identified or proposed in the subdivision. The plan set (Exhibit C, Sheet C5) does not identify bicycle lanes on Dubarko Road or Street B. **The applicant shall revise the plan set to include bicycle lanes on Dubarko Road and Street B.**

54. Section 17.84.40(A) requires the developer to construct adequate public transit facilities. Per the 2020 Transit Master Plan, the extension of Dubarko Road to intersect with Highway 26 is a future transit route. With extension of Dubarko Road to intersect with Highway 26 two transit amenities are required along the completed extension of Dubarko Road. **The applicant shall install two concrete bus shelter pads and green benches (Fairweather model PL-3, powder coated RAL6028). The required pad size is 7 feet by 9 feet 6 inches and the amenities should be located adjacent to Lot 1 and Lot 5.**

PARKING, LOADING, AND ACCESS REQUIREMENTS – Chapter 17.98

55. Section 17.98.10(M) requires that the developer provide a Residential Parking Analysis Plan. This plan identifying the location of parking for the 30 R-1 zoned lots is included in Exhibit C, Sheet C6.

56. Section 17.98.20(A) requires that each single-family dwelling unit or duplex is required to provide at least two off-street parking spaces. **Compliance with this requirement will be evaluated during building plan review. Parking for the proposed multi-family units will be evaluated as part of a future design review application.**

57. Section 17.98.60 has specifications for parking lot design and size of parking spaces. Lot 32 is proposed to gain access from an arterial or collector street and therefore is required to comply with Section 17.98.80.

58. Section 17.98.100 has specifications for driveways. The minimum driveway width for a single-family dwelling is 10 feet. The Public Works driveway approach standard detail specifies a maximum of 24 feet wide for a residential driveway approach. Additionally, all driveways shall meet vertical clearance, slope, and vision clearance requirements. Staff has concerns with the following lots:

    A. The driveway on Lot 3 and its proximity to the intersection of Dubarko Road as it's within 150 feet of the intersection of Dubarko Road and Highway 26. **Driveway access for Lot 3 shall be reviewed and approved by the City Public Works Director and City Engineer prior to issuance of a building permit.**
    B. There is no driveway identified for Lot 32. **Driveway access for Lot 32 shall be reviewed and approved by the City Public Works Director and City Engineer concurrently with land use review of Lot 32.**

59. The Public Works Director (Exhibit R) stated that no dimensional information is detailed in the plan set about driveway widths. **The location, number, and width of all driveway approaches in cul-de-sacs shall not exceed the dimensional standards in Section 17.98.100.** The applicant's statement indicating that "Both of the proposed cul-de-sacs have less than 50% of their circumference covered by driveway drops" is not sufficient.

60. Section 17.98.110 outlines the requirements for vision clearance. **The requirements of this section will be considered in placing landscaping in these areas with construction of homes and will be evaluated with a future design review application for the multi-family units.**

61. Section 17.98.130 requires that all parking and vehicular maneuvering areas shall be paved with asphalt or concrete. As required by Section 17.98.130, **all parking, driveway, and maneuvering areas shall be constructed of asphalt, concrete, or other approved material.**

62. Section 17.98.200 contains requirements for providing on-street parking spaces for new residential development. Per 17.98.200, one on-street parking space at least 22 feet in length

has been identified within 300 feet of each of the 30 lots zoned as R-1 as required. Exhibit C, Sheet C6 shows that 47 on-street parking spaces have been identified in compliance with this standard. No parking courts are proposed by the applicant.

NOTE: The locations of the lots on the subject site do not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the distances and locations of on-street parking spaces is based on unreliable assumptions.

UTILITIES – Chapters 17.84 and 17.100

63. Section 17.84.60 outlines the requirements of public facility extensions. The applicant submitted a utility plan (Exhibit C, Sheet C5) which shows the location of proposed public water, sanitary sewer, and stormwater drainage facilities. **Broadband fiber service shall be detailed with construction plans.**

64. Franchise utilities will be provided to all lots within the proposed subdivision as required in Section 17.84.80. The location of these utilities will be identified on construction plans and installed or guaranteed prior to final plat approval. The applicant does not anticipate extending franchise utilities beyond the site. All franchise utilities other than streetlights will be installed underground. The developer will make all necessary arrangements with franchise utility providers. **The developer shall install underground conduit for street lighting.**

65. Section 17.84.90 outlines requirements for land for public purposes. The application includes dedication of right-of-way and land for a stormwater detention pond. The proposal does not include land dedicated for parkland as required by the Sandy Development Code nor does the proposal include land dedicated for the continuation of Dubarko Road to intersect with Highway 26. Eight-foot-wide public utility easements will be required along all lots adjacent to street rights-of-way, including Highway 26, for future franchise utility installations. **All easements and dedications shall be identified on the final plat.**

66. As required by 17.100.130, eight-foot-wide public utility easements (PUE) are required along all property lines abutting a public right-of-way. The applicant did not propose a PUE along Highway 26. **The applicant shall add a PUE along all lots abutting Highway 26.**

67. Chapter 15.30 contains the City of Sandy's Dark Sky Ordinance. A lighting plan will be coordinated with PGE and the City as part of the construction plan process and prior to installation of any fixtures as required by Section 17.100.210. The applicant will need to install street lights along all street frontages wherever street lighting is determined necessary. **The locations of these fixtures shall be reviewed in detail with construction plans. Full cut-off lighting shall be required. Lights shall not exceed 4,125 Kelvins or 591 nanometers to minimize negative impacts on wildlife and human health.**

68. Section 17.84.100 outlines the requirements for mail delivery facilities. **The location and type of mail delivery facilities shall be coordinated with the City Engineer and the Post Office as part of the construction plan process.**

69. The applicant shall install all water lines and fire hydrants in compliance with the applicable standards in Section 17.100.230, which lists requirements for water facilities. According to the Public Works Director the existing 8-inch diameter water line resides in an easement granted to the City of Sandy recorded at 2004-110340. **The applicant shall replace the existing waterline with an 8-inch diameter water line at a depth approved by the City Engineer.** There will be no compensation or credits for replacement of the existing water line. This pipe is a standard pressure line and will be used to provide domestic water service to the development. The City's water master plan shows an 18-inch diameter water line in Dubarko Road south of Highway 26. **The applicant shall install an 18-inch water line in**

Dubarko Rd. connected to the existing 18-inch water line at the west end of the site and the existing 12-inch line on Highway 26. Due to the elevation of the site relative to the existing water reservoirs on Vista Loop Drive this line will be a low-pressure, high-volume line and will be used for fire protection. The cost difference between a standard diameter water line and the required 18-inch water line is eligible for Water System Development Charge (SDC) credits. The amount of the credit provided will be based on the Water System Construction Cost Credit table in the Water System Development Charge Methodology adopted by City Council motion on September 5, 2017. The applicant's proposal does not clearly define if they propose to replace the 8-inch diameter water line and/or install an 18-inch water line in conformance with the Water Master Plan.

70. Section 17.84.60D states, "As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies)." The applicant does not propose to extend the existing 12-inch water main in Highway 26 east from the required intersection of Dubarko Road and Highway 26 to the east boundary of the site. **The existing 12-inch water line in Highway 26 shall be extended to the eastern boundary of the site per the requirements of Sections 17.84.60 (C) and (D).** The extension of the waterline is eligible for SDC credits for the difference in cost between the minimum required 8-inch diameter line and a 12-inch diameter line.

71. The applicant intends to install sanitary sewer lines in compliance with applicable standards in Section 17.100.240. The sanitary sewer plans will be reviewed by the City Engineer and Public Works Director. **Preliminary plat approval does not connote utility or public improvement plan approval which will be reviewed and approved separately upon submittal of public improvement construction plans.**

72. Section 17.100.250(A) details requirements for stormwater detention and treatment. A public stormwater quality and detention facility is proposed as Tract C to be located at the northwest corner of the proposed development. The proposed 10-foot-wide public storm drainage easements depicted between Lots 27 and 28 and at the rear of Lots 9-13 do not meet the minimum dimensional requirement for public facility easements in Section 17.84.90(A)(2). **All site runoff shall be detained such that post-development runoff does not exceed the predevelopment runoff rate for the 2, 5, 10 and 25 year storm events. Stormwater quality treatment shall be provided for all site drainage per the standards in the City of Portland Stormwater Management Manual (COP SWMM).**

73. Section 17.100.260 states that all subdivisions shall be required to install underground utilities. **The applicant shall install utilities underground with individual service to each lot.**

PARKLAND DEDICATION – Chapter 17.86

74. The applicant is not proposing any parkland dedication. Directly west of the subject property is undeveloped land owned by the City of Sandy that has long been reserved for the eventual development of Deer Pointe Park. The 1997 Parks Master Plan designated Deer Pointe Park as a community park, and in the Location and Development Polices section of the Plan states that community parks should be 20 acres or more. Because the Deer Meadows subdivision does not propose parkland dedication abutting Deer Pointe Park the proposed subdivision is inconsistent with the 1997 Parks Master Plan.

75. Section 17.86.10 contains a clear and objective formula for determining the amount of land required to be dedicated. The formula is acres = proposed units x (persons/unit) x 0.0043. For the 30 single family homes, acres = 30 x 3 x 0.0043 = 0.39 acres. For the maximum development of 66 multifamily units, acres = 66 x 2 x 0.0043 = 0.57 acres. Combined, this totals 0.96 acres. The dedication of 0.96 acres could expand the Deer Pointe Park to 2.36 acres if the parkland dedication abuts Deer Pointe Park. However, if the applicant does not propose abutting parkland, then the additional 0.96 acres would not be contiguous to the existing parkland.

    NOTE: The number of dwelling units on the subject site does not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the calculations related to parkland dedication and fee in-lieu of payment are based on unreliable assumptions.

76. The Parks and Trails Advisory Board (Board) met on August 11, 2021. The Board recommended that conditions of approval include the dedication of land for expansion of Deer Pointe Park (Exhibit O). The vision for this currently undeveloped park parcel has always included adjacent parkland dedication from the subject property. Additionally, a conceptual design has been prepared and has been through an initial public comment period as part of the updated Parks and Trails Master Plan.

77. The parks dedication requirement, and therefore any fee in-lieu payment under Section 17.86.40, is based on the impact from the number of people anticipated to live in the units in the subdivision, and a duplex includes two dwelling units, each of which can be occupied by a family (or a number of unrelated persons). Accordingly, each unit of a duplex is treated the same as a separate single-family dwelling for purposes of calculating the amount of land dedicated under Section 17.86.10 or a fee in-lieu payment under Section 17.86.40. However, the City of Sandy is not aware of any duplexes being proposed at this time. Also, the City is not aware of how many multifamily units will be proposed on the land zoned as C-3. **If any lot includes a duplex or additional multifamily dwelling units are proposed on the C-3 zoned land the applicant shall be required to pay a fee in-lieu of parkland dedication in accordance with Section 17.86.40.**

78. Section 17.86.20 has a requirement that all homes must front on the parkland. The purpose of having homes front the parkland is to provide eyes on the park and increase safety for park users. Since the applicant is not proposing parkland dedication there is nothing in the applicant's submission detailing that any houses will face Deer Pointe Park.

79. Section 17.86.30 lists the requirements of the developer prior to acceptance of required parkland dedications. Since the applicant is not proposing parkland dedication this section was not reviewed for compliance.

URBAN FORESTRY – 17.102

80. Section 17.102.20 contains information on the applicability of Urban Forestry regulations. An Arborist Report is included as Exhibit F. The arborist inventoried all trees eleven inches and greater diameter at breast height (DBH) as required in 17.102.50. The inventory of trees proposed to be retained is included in Exhibit C, Sheet C3 and the proposed retention trees are shown in Exhibit C, Sheet C4.

81. The property contains 15.91 acres requiring retention of 48 trees, 11 inches and greater DBH (15.91 x 3 = 47.73). The applicant is proposing to retain all 48 trees on Lots 13, 14, and 21. One tree proposed for retention is a Grand fir and the other 47 trees are all Douglas fir. The trees range in size from 11 inches DBH to 30 inches DBH, and are in good condition as identified by the arborist.

82. Most of the proposed retention trees are located along Highway 26 on Lot 13, which is proposed to be zoned R-1, Low Density Residential. As indicated on the Preliminary Plat (Exhibit C, Sheet C2), the applicant is proposing to place a conservation easement over an area that encompasses the retention trees on Lots 13, 14, and 21 totaling 21,939 square feet. Staff believes there could be a future conflict between retention trees in this conservation easement and development of Lot 13.

83. The Arborist Report (Exhibit F) provides recommendations for protection of retained trees including identification of the recommended tree protection zone for these trees. The requirements of 17.102.50(B) shall be complied with prior to any grading or tree removal on the site. **The applicant shall install tree protection fencing at the critical root zone of 1 foot per 1-inch DBH to protect the 48 retention trees on the subject property as well as all trees on adjacent properties and shall not relocate or remove the fencing prior to certificates of occupancy. The tree protection fencing shall be 6-foot-tall chain link or no-jump horse fencing and the applicant shall affix a laminated sign (minimum 8.5 inches by 11 inches) to the tree protection fencing indicating that the area behind the fence is a tree retention area and that the fence shall not be removed or relocated. 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. The applicant shall request an inspection of tree protection measures prior to any tree removal, grading, or other construction activity on the site. Up to 25 percent of the area between the minimum root protection zone of 0.5 feet per 1-inch DBH and the critical root zone of 1 foot per 1-inch DBH may be able to be impacted without compromising the tree, provided the work is monitored by a qualified arborist. The applicant shall retain an arborist on site to monitor any construction activity within the critical root protection zones of the retention trees or trees on adjacent properties that have critical root protection zones that would be impacted by development activity on the subject property.**

84. The Tree Preservation Plan (Exhibit C, Sheet C3) details several trees being removed right next to the trees proposed for retention. **The trees proposed for removal that are adjacent to retention trees shall be removed in in a way that does not harm or damage adjacent trees.** The Arborist Report (Exhibit F) from Teragan and Associates, Inc. includes

recommendations for tree removal. The arborist also identifies options for stumps, including retention or careful surface grinding. Staff recommends that the applicant not fully remove all the trees adjacent to the retention trees but rather leave snags. **Tree removal and/or snag creation shall be completed without the use of heavy equipment in the tree protection zone; trunks and branches of adjacent trees shall not be contacted during tree removal or snag creation. The applicant shall submit a post-construction report prepared by the project arborist or other TRAQ qualified arborist to ensure none of the retention trees were damaged during construction.**

85. **To ensure protection of the required retention trees, the applicant shall record a tree protection covenant specifying protection of trees on the subject property and limiting removal without submittal of an Arborist's Report and City approval.**

LANDSCAPING AND SCREENING – Chapter 17.92

86. Section 17.92.10 contains general provisions for landscaping. As required by Section 17.92.10 (C), trees over 25-inches circumference measured at a height of 4.5 feet above grade are considered significant and should be preserved to the greatest extent practicable and integrated into the design of a development. A 25-inch circumference tree measured at 4.5 feet above grade has roughly an eight-inch diameter at breast height (DBH). Based on the Planning Commission interpretation from May 15, 2019, Subsection 17.92.10(C) does not apply to residential subdivisions. Tree protection fencing and tree retention is discussed in more detail in the Urban Forestry, Chapter 17.102 section of this document. **Per Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.**

87. Section 17.92.20 lists the requirements for minimum landscaping improvements. **The details of this section will be considered with submittal of a design review application for the proposed multi-family units and commercial property.**

88. Section 17.92.30 specifies that street trees shall be chosen from the City-approved list. As required by Section 17.92.30, the development of the subdivision requires medium trees spaced 30 feet on center along all street frontages. Planter strips will be provided along all frontages as required in Section 17.100.290. The current street tree plan (Exhibit C, Sheet C6) does not show the distance between trees, but most trees measure approximately 30 feet on center. The applicant does not detail street trees along Street C, nor along Highway 26. **The applicant shall update the Street Tree Plan to detail trees at 30 feet on center along Street C and Highway 26. The trees along street C can be behind back of sidewalk, but the street trees along Highway 26 shall be in a planter strip per Section 17.100.290.**

    The applicant is proposing to mass grade the buildable portion of the site. This will remove topsoil and heavily compact the soil. To maximize the success of the required street trees, **the applicant shall aerate and amend the soil in the planter strips to a depth of 3 feet prior to planting street trees. The applicant shall either amend and aerate the planter strip soil at the subdivision stage and install fencing around the planter strips to protect the soil from compaction or shall aerate and amend the soil at the individual home construction phase. The applicant shall submit a letter from the project landscaper confirming that the soil in the planter strips has been aerated and amended prior to planting the trees.**

    If the plans change in a way that affects the number of street trees (e.g., driveway locations), the applicant shall submit an updated street tree plan for staff review and approval. Street trees are required to be a minimum caliper of 1.5-inches measured 6 inches from grade and shall be planted per the City of Sandy standard planting detail. Trees shall be planted, staked, and the planter strip shall be graded and backfilled as necessary, and bark mulch, vegetation, or other approved material installed prior to occupancy. Tree ties shall be loosely tied twine or other soft material and shall be removed after one growing season (or a maximum of 1 year).

89. Section 17.92.40 requires that all landscaping shall be irrigated, either with a manual or automatic system. **As required by Section 17.92.140, the developer and lot owners shall be required to maintain all vegetation planted in the development for two (2) years from the date of completion, and shall replace any dead or dying plants during that period.**

90. Section 17.92.50 specifies the types and sizes of plant materials that are required when planting new landscaping. Street trees are typically required to be a minimum caliper of 1.5-inches measured 6 inches from grade. **All street trees shall be a minimum of 1.5-inches in caliper measured 6 inches above the ground and shall be planted per the City of Sandy standard planting detail. The applicant shall submit proposed trees specifies to City staff for review and approval concurrent with construction plan review.**

91. Section 17.92.60 requires revegetation in all areas that are not landscaped or remain as natural areas. The applicant did not submit any plans for re-vegetation of areas damaged through grading/construction, although most of the areas affected by grading will be improved. **Exposed soils shall be covered by mulch, sheeting, temporary seeding or other suitable material following grading or construction to maintain erosion control for a period of two (2) years following the date of recording of the final plat associated with those improvements.**

92. Section 17.92.90 has details on screening of unsightly views or visual conflicts. While the proposed lots are not unsightly, they are a large contrast from the existing view of the existing forest. This contrast was identified at a Planning Commission hearing for Bull Run Terrace in August of 2020 and the applicant was asked to look at some additional screening measures to protect existing trees or add additional landscaping. The applicant took the comments seriously and proposed additional landscaping along the common property line with the Deer Pointe subdivision. However, in this proposed subdivision for Deer Meadows the applicant is not proposing any tree retention nor is the applicant proposing any additional landscaping along the common property line with the Deer Pointe subdivision.

93. Section 17.92.130 contains standards for a performance bond. The applicant has the option to defer the installation of street trees and/or landscaping for weather-related reasons. Staff recommends the applicant utilize this option rather than install trees and landscaping during the dry summer months. Consistent with the warranty period in Section 17.92.140, staff recommends a two-year maintenance and warranty period for street trees based on the standard establishment period of a tree. **If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the street trees/landscaping, assuring installation within 6 months. The cost of the street trees shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a two-year maintenance and warranty period.**

HILLSIDE DEVELOPMENT AND EROSION CONTROL – Chapters 17.56, 15.44, and 17.74

94. The applicant submitted a Geotechnical and Slope Stability Investigation (Exhibit I) showing that the subject site contains a small area of slope exceeding 25 percent. The geotechnical investigation was completed by Redmond Geotechnical Services on November 23, 2020. **All recommendations in the Geotechnical and Slope Stability Investigation (Exhibit I) shall be conditions for development.**

95. Grass seeding shall be completed as required by Section 17.100.300. The submitted preliminary Grading and Erosion Control Plan (Exhibit C, Sheet C7) provides additional details to address erosion control concerns. A separate Grading and Erosion Control Permit will be required prior to any site grading. Erosion control requirements are defined in greater detail in Chapter 15.44 of this document. Section 15.44.50 contains requirements for maintenance of a site including re-vegetation of all graded areas. **The applicant's Erosion Control Plan shall be designed in accordance with the standards of Section 15.44.50.**

96. **All the work within the public right-of-way and within the paved area should comply with American Public Works Association (APWA) and City requirements as amended. The applicant shall submit a grading and erosion control permit and request an inspection of installed devices prior to any additional grading onsite.** The grading and erosion control plan shall include a re-vegetation plan for all areas disturbed during construction of the subdivision. **All erosion control and grading shall comply with Section 15.44 of the Municipal Code. The proposed subdivision is greater than one acre which typically requires approval of a DEQ 1200-C Permit.**

97. Recent development has sparked unintended rodent issues in surrounding neighborhoods. Prior to development of the site, **the applicant shall have a licensed pest control agent evaluate the site to determine if pest eradication is needed.**

98. Section 17.74.40 specifies, among other things, retaining wall and fence height in front, side, and rear yards. Retaining walls in residential zones shall not exceed 4 feet in height in the front yard, 8 feet in height in rear and side yards abutting other lots, and 6 feet inside and rear yards abutting a street. The submitted plan set (Exhibit C, Sheet C5) details a 3-foot retaining wall at the west terminus of Street C, a 4-foot retaining wall between Tract C and Lot 26, and an 8-foot retaining wall to the west of Street A and north of Fawn Street. These three retaining walls are proposed as Keystone block and Ultra-block, and all three include notes that the heights are plus/minus the stated height on the plan set. The plan set does not detail the height of the retaining wall in Tract C for the stormwater facility. **The applicant shall submit additional details on the proposed retaining walls, including height, material, and information on the architectural finish, for staff review and approval.**

RECOMMENDATION

Staff recommends the Planning Commission **deny** the subdivision request primarily due to the following issues:

1) The subdivision proposal does not meet subdivision Criteria 17.100.60 (E)(1), (2), (3), (4), (5), and (6).
2) The applicant's statement indicating that "Both of the proposed cul-de-sacs have less than 50% of their circumference covered by driveway drops" is not sufficient as there were no dimensional specifications submitted by the applicant to support this statement.
3) The applicant proposes two cul-de-sacs but does not propose a pedestrian connection to streets beyond the cul-de-sacs as required by Section 17.84.30.
4) The distance between the two nearest edges of the right-of-way between Dubarko Road (an arterial) and Street C (a local street) is less than the minimum 150 ft. dimension in Sections 17.84.50(E)(2) and 17.84.50(J)(3).
5) The minimum 100 feet of tangent alignment required in Section 17.84.50(J)5(a) is not provided at the intersection of Street "B" (a collector) and Dubarko Road (an arterial) or at the intersection of Dubarko Road and Street "B".
6) The applicant does not propose to extend Dubarko Road to intersect with Highway 26 consistent with the requirements of the Sandy Development Code or the 2011 Transportation System Plan.
7) The applicant does not include highway frontage improvements along Highway 26 consistent with the Sandy Development Code.
8) The applicant's proposal does not clearly define if they propose to replace the 8-inch diameter water line and/or install an 18-inch water line in conformance with the Water Master Plan.
9) The applicant does not propose to extend the existing 12-inch water main in Highway 26 east from the required intersection of Dubarko Road and Highway 26 to the east boundary of the site consistent with the Sandy Development Code.
10) The proposed 10-foot-wide public storm drainage easements depicted between Lots 27 and 28 and at the rear of Lots 9-13 do not meet the minimum dimensional requirement for public facility easements in Section 17.84.90(A)(2).
11) This subdivision proposal does not propose to dedicate 0.96 acres of parkland as required by Chapter 17.86. The additional .96 acres could expand Deer Pointe Park consistent with the Parks and Trails Master Plan that was adopted in 1997.

Staff Report

EXHIBIT TT

Meeting Date:	November 8, 2021
From	Kelly O'Neill, Development Services Director
SUBJECT:	Deer Meadows Subdivision Deliberation

BACKGROUND / CONTEXT:
On September 27, 2021 the Planning Commission held a public hearing on the Deer Meadows Subdivision and decided to create an open record period prior to deliberating on the subdivision request at a special meeting scheduled for November 8, 2021. The first open record period closed on Monday, October 11 at 4 pm. During the first open record period, anyone could submit additional written information for the Planning Commission to consider. The second open record period closed on Monday, October 18 at 4 pm. During the second open record period, parties could only submit information that rebutted or responded to information that was submitted during the first open record period. The third open record period closed on Monday, October 25 at 4 pm. This third open record period was reserved solely for the applicant to submit their final written argument.

The updated exhibits list contains all information that is part of the record, including the 10 items (Exhibits HH. - QQ.) received during the open record period. This report is also supplemented by a letter from the City Attorney, David Doughman (Exhibit RR.). All exhibits through GG. were previously presented to the Planning Commission on September 27.

RECOMMENDATION:
Staff recommends the Planning Commission **deny** the subdivision request due to the reasons outlined in the staff report.

SUGGESTED MOTION LANGUAGE:
I move that the Planning Commission deny the Deer Meadows Subdivision for the reasons outlined in the staff report.

LIST OF ATTACHMENTS/EXHIBITS:
Attachment 1: Staff Report
Attachment 2: Exhibits A. and B.
Attachment 3: Exhibit C.
Attachment 4: Exhibits D. and E.
Attachment 5: Exhibits F. - J.
Attachment 6: Exhibits K. and L.

Attachment 7: Exhibits M. - R.
Attachment 8: Exhibits S. - W.
Attachment 9: Exhibits X. - Z.
Attachment 10: Exhibits AA. - GG.
Attachment 11: Exhibits HH. - NN. Items from Open Record Period #1
Attachment 12: Exhibits OO. - PP. Items from Open Record Period #2
Attachment 13: Exhibit QQ. Item from Open Record Period #3
Attachment 14: Exhibit RR. Letter from City Attorney

WHERE INNOVATION MEETS ELEVATION

39250 Pioneer Blvd
Sandy, OR 97055
503-668-5533

EXHIBIT UU

FINDINGS OF FACT and FINAL ORDER
TYPE III DECISION

DATE: November 18, 2021

FILE NO.: 21-014 SUB/TREE

PROJECT NAME: Deer Meadows Subdivision

APPLICANT/OWNER: Roll Tide Properties, Corp.

PHYSICAL ADDRESS: 40808 and 41010 Highway 26

LEGAL DESCRIPTION: T2 R5E Section 18CD, Tax Lots 900 and 1000

FINDINGS OF FACT

GENERAL FINDINGS

1. These findings are based on the applicant's submittals and other evidence and testimony presented to the Planning Commission. In a letter dated June 11, the applicant agreed to toll the 120-day clock until July 27, 2021. The original 120-day clock was November 24, 2021.

2. On September 27, 2021 the Planning Commission held a public hearing on the Deer Meadows Subdivision and decided to create an open record period prior to deliberating on the subdivision request at a special meeting scheduled for November 8, 2021. The first open record period closed on Monday, October 11 at 4 pm. During the first open record period, anyone could submit additional written information for the Planning Commission to consider. The second open record period closed on Monday, October 18 at 4 pm. During the second open record period, parties could only submit information that rebutted or responded to information that was submitted during the first open record period. The third open record period closed on Monday, October 25 at 4 pm. This third open record period was reserved solely for the applicant to submit their final written argument.

3. With the creation of the open record period the applicant agreed to extend the 120-day clock by an additional 42 days. The existing 120-day clock is January 5, 2022.

4. The subject site is approximately 15.91 acres. The site is located at 40808 and 41010 Highway 26.

5. The parcel has a Comprehensive Plan Map designation of Village and a Zoning Map designation of R-1, Low Density Residential; R-2, Medium Density Residential; and C-3, Village Commercial.

6. The applicant, Roll Tide Properties Corp., seeks approval for a 32-lot subdivision at 40808 and 41010 Highway 26. The development proposal included two partial street extensions and the creation of two new streets. The applicant proposed 30 lots of Low Density Residential (R-1) that would contain single family homes or duplexes, one small lot (9,023 square feet) of Medium Density Residential (R-2), and one large lot (7.35 acres) with a combination of Medium Density Residential (R-2) and Village Commercial (C-3). The proposed 30 lots with R-1 zoning range in size from 5,500 square feet to 32,189 square feet. The applicant proposed to retain 48 existing trees and proposed to remove the remainder of the trees from the site.

7. The exact number of multifamily units was not determined at the time of the subdivision request as the applicant wanted to process the multi-family development in a subsequent design review application. However, the applicant claimed the number of multifamily dwelling units on the R-2 zoned land would have been between 38 dwelling units and 66 dwelling units. The C-3 zoned land would have likely contained a mix of commercial and residential development.

8. Due to the interest in the previous proposal at the subject site, the Development Services Director elevated this application to a Type III decision to be heard and considered by the Planning Commission.

9. Throughout the project narrative (Exhibit B) the applicant failed to submit required information. Instead, on 14 occasions in the narrative the applicant stated that the development code is subjective (i.e., not clear and objective) and because the subdivision is a housing application the alleged subjective development code language is not applicable. Staff explained at the Planning Commission meetings that they did not agree with the applicant's interpretation of what constitutes and does not constitute subjectivity.

10. The applicant previously proposed a development at the site that was denied by the City Council (File No. 19-050 CPA/ZC/SUB/SAP/TREE Bull Run Terrace). This application was substantively different from that prior proposal. The applicant did not propose a Comprehensive Plan amendment or Zone Change amendment. The applicant chose not to expand Deer Pointe Park or connect Dubarko Road to Highway 26. The existing parks master plan details the Deer Pointe neighborhood to have a Community Park. The existing transportation system plan classifies Dubarko Road as a minor arterial and shows it connecting to Highway 26.

11. The City of Sandy provided the following notices:
    A. A transmittal was sent to agencies asking for comment on August 2, 2021.
    B. Notification of the proposed application was mailed to affected property owners within 300 feet of the subject property on August 10, 2021.

C. A supplemental notice regarding the Planning Commission meeting was mailed to affected property owners within 300 feet of the subject property on August 24, 2021.
D. A legal notice was published in the Sandy Post on September 15, 2021.

BASIS FOR DENIAL 1: The application does not meet subdivision criteria 17.100.60(E)(1)

12. Section 17.100.60(E)(1) requires subdivisions to be consistent with the density, setback, and dimensional standards of the base zoning district, unless modified by a Planned Development approval. Each base zoning district requires that residential development comply with Chapter 17.82. First, the Preliminary Plat Map (Exhibit C, Sheet C2) details setbacks for Lots 2, and 27-31 showing the front setback facing the local street or public access lane, instead of the Transit Street as required by Chapter 17.82. Second, Sheet C2 does not identify that lots abutting Highway 26 shall face Highway 26 as required by Chapter 17.82, nor does the plan set detail frontage improvements along Highway 26 as required by Chapter 17.86. Third, by not proposing the extension of Dubarko Road to connect with Highway 26, the lots that would otherwise abut Dubarko Road do not have the required frontage to Dubarko Road as required by Chapter 17.82. Fourth, by not proposing Dubarko Road or parkland dedication, some of the proposed lots are in the required right-of-way for Dubarko Road and also located across required parkland. Therefore, this proposal does not meet approval criteria 17.100.60 (E)(1).

BASIS FOR DENIAL 2: The application does not meet subdivision criteria 17.100.60(E)(3)

13. Section 17.100.60(E)(3) requires the proposed street pattern to be connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy. The proposed street pattern is not consistent with the Comprehensive Plan and the city's standards, including connecting Dubarko Road to Highway 26.

14. The 2011 Sandy Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan. Exhibit A of Ordinance 2011-12 is the TSP. The TSP is referenced by ordinance as 'the transportation element of the City of Sandy Comprehensive Land Use Plan.' The 2011 TSP includes the official street plan for the City of Sandy. Project M20 in the TSP is the connection of Dubarko Road to Highway 26.

15. On pages 9, 10, and 14 of the project narrative (Exhibit B) the applicant references the City's TSP and states that the TSP identifies Dubarko Road as a minor arterial. On page 32 of the project narrative (Exhibit B) the applicant claims that subdivision approval criteria 17.100.60 (E)(3) is not clear and objective and therefore the subdivision does not need to meet the Comprehensive Plan or official street plan for the City of Sandy. The applicant also asserts that if the official street plan is in the TSP, it is not sufficiently incorporated into the development code for the purposes of limited land use decisions. However, in the narrative for Bull Run Terrace (File No. 19-050) for the same subject site the same applicant stated, "*As illustrated on the submitted Future Street Plan (Sheet C1), the proposed street system is consistent with the City's Transportation System Plan and Comprehensive Plan*." So, with the Bull Run Terrace land use application the applicant conceded that the street system had to be consistent with the City's Transportation System Plan and Comprehensive Plan to meet criteria 17.100.60 (E)(3). The applicant's inconsistent understanding of what is the official street plan (i.e., the City's TSP) is illogical and conflicting even in the applicant's project

narrative. Additionally, in a previous TIS from Ard Engineering (dated September 28, 2020) on page 24 the applicant's traffic engineer referenced the requirement for the Dubarko Road connection by stating, "it is the completion of the city's planned connection of Dubarko Road to Highway 26." Furthermore, the proposal is not consistent with OAR 660-012-0045, which requires that local governments implement their TSP. By not providing the connection of Dubarko Road to Highway 26 in the proposal the subdivision request does not meet approval criteria 17.100.60 (E)(3).

BASIS FOR DENIAL 3: The application does not meet the parkland dedication requirements in Chapter 17.86

16. The applicant did not propose any parkland dedication as required by Chapter 17.86 of the Sandy Development Code. Directly west of the subject property is undeveloped land owned by the City of Sandy that has long been reserved for the eventual development of Deer Pointe Park. The Parks and Trails Advisory Board (Board) met on August 11, 2021. The Board recommended that conditions of approval were included that required dedication of land for expansion of Deer Pointe Park. The 1997 Parks Master Plan designated Deer Pointe Park as a community park, and in the Location and Development Polices section of the Plan states that community parks should be 20 acres or more. Because the Deer Meadows subdivision did not propose parkland dedication abutting Deer Pointe Park, the proposed subdivision is inconsistent with the 1997 Parks Master Plan.

17. Section 17.86.10 contains a clear and objective formula for determining the amount of land required to be dedicated. The formula is acres = proposed units x (persons/unit) x 0.0043. For the 30 single family homes, acres = 30 x 3 x 0.0043 = 0.39 acres. For the maximum development of 66 multifamily units, acres = 66 x 2 x 0.0043 = 0.57 acres. Combined, this totals 0.96 acres. The dedication of 0.96 acres was required to meet the clear and objective criteria in Chapter 17.86. NOTE: The number of dwelling units on the subject site does not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the calculations related to parkland dedication are based on unreliable assumptions.

DECISION: For the reasons stated above, the Planning Commission **denies** the Deer Meadows subdivision application.

Jerry Crosby

Jerry Crosby
Planning Commission Chair

RIGHT OF APPEAL

A decision on a land use proposal or permit may be appealed to the City Council by an affected party by filing an appeal with the Director within twelve (12) calendar days of notice of the decision. Any person interested in filing an appeal should contact the city to obtain the form, *"Notice of Appeal,"* and Chapter 17.28 of the Sandy Development Code regulating appeals. All applications for an appeal shall indicate the nature of the interpretation that is being appealed and the matter at issue will be a determination of the appropriateness of the interpretation of the requirements of the Code.

An application for an appeal shall contain:

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 Chapter 17.28.50; and,
5. Payment of required filing fees.

EXHIBIT VV

From: Robinson, Michael C. <MRobinson@SCHWABE.com>
Sent: Wednesday, November 24, 2021 5:16 AM
To: David Doughman
Cc: Forbes, Erin M.; Stephenson, Garrett H.; 'Dave Vandehey'
Subject: RE: Deer Meadows; 120-Day Period [IWOV-pdx.FID4511155]

Good morning, David. Shown below is the revised Applicant's extension of the 120-day period in ORS 227.178(1)based on our telephone conversation yesterday.

Michael C. Robinson
Shareholder
Direct: 503-796-3756
Mobile: 503-407-2578
mrobinson@schwabe.com

Schwabe Williamson & Wyatt
Please visit our COVID-19 Resource page

From: Robinson, Michael C.
Sent: Tuesday, November 23, 2021 9:10 AM
To: 'David Doughman' <david@gov-law.com>
Cc: Forbes, Erin M. <EForbes@SCHWABE.com>; Stephenson, Garrett H. <GStephenson@SCHWABE.com>; 'Dave Vandehey' <dave.vandehey@rolltideproperties.com>
Subject: Deer Meadows; 120-Day Period [IWOV-pdx.FID4511155]

Good morning, David. The applicant's first open record period letter extended the 120-day period to 1/5/22. The applicant proposes to extend the 120-day period another 27 days, or until 2/1/22, to allow the City Council to hold the appeal hearing on 1/18/22 and to issue a final decision. If the applicant invokes ORS 197.522, the statute allows the City to extend the 120-day period. If the Applicant wants to submit final written argument under ORS 197.763(6)(e), the Applicant will extend the 120-day period to allow for the final written argument.

Michael C. Robinson
Shareholder
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Schwabe Williamson & Wyatt
Please visit our COVID-19 Resource page

Schwabe
WILLIAMSON & WYATT®

EXHIBIT WW

November 30, 2021

Michael C. Robinson
Admitted in Oregon
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VIA E-MAIL (PLANNING@CI.SANDY.OR.US) AND UPS

Mayor Stan Pulliam
City of Sandy City Council
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: Appeal of Sandy Planning Commission (the "Planning Commission") Final Order in Type III Decision (the "Decision") on November 30, 2021, City of Sandy File No. 21-014 SUB/TREE (the "Application")

Dear Mayor Pulliam and City Council Members:

This office represents Roll Tide Properties Corp. ("Roll Tide;" the "Applicant"). This letter and its exhibit are Roll Tide's appeal of the Decision.

1. Introduction.

This letter addresses the requirements for the appeal of the Decision in Sandy Development Code (the "SDC") 17.28.10 and 17.28.20. **Exhibit A** to this letter explains why the Decision is incorrect and must be reversed in order to properly apply only clear and objective provisions of the SDC, including the prohibition on the extension of Dubarko Road to a connection with U.S. Highway 26, a "highway with full access control," which is an exemption in SDC 17.100.100.G.2 to the street connection requirement in SDC 17.100.100.F; the application of parkland dedication requirements in SDC 17.86.10 through a standardless and subjective procedure choosing between dedication and fee-in-lieu payments, a fact ignored by the Decision, in violation of ORS 197.307(4); the proper application of mandatory state law requirements that the City properly incorporate Comprehensive Plan provisions, including the Transportation System Plan (the "TSP"), under ORS 197.195(1) into the SDC in order to apply the Plan and TSP to limited land use decisions, a requirement in effect for thirty years but not yet satisfied by the City; and to properly apply only clear and objective standards, conditions and procedures to residential applications under ORS 197.307(4) and 227.175(2) in order to avoid the effect of discouraging needed housing through unreasonable cost or delay where no clear and objective approval process is available to the Applicant under ORS 197.307(6).

2. Compliance with SDC 17.28.10.

A. SCD 17.28.10.A. The Decision being appealed is Sandy File No. 21-014 SUB/TREE, the Deer Meadows Subdivision Application.

B. SDC 17.28.10.B. The Appeal is timely filed within twelve calendar days of the Notice of Decision. The Notice of Decision is dated November 18, 2021. Twelve calendar days from the Notice date is November 30, 2021. The Appeal is timely filed on November 30, 2021.

3. Compliance with SDC 17.28.20.

A. SCD 17.28.20.A.1. The Decision being appealed is Sandy File No. 21-014 SUB/TREE. The date of the Decision is November 18, 2021.

B. SDC 17.28.20.A.2. Roll Tide is the person seeking review. Roll Tide's interest is that of the Applicant. Roll Tide was a party to the initial proceedings.

C. SDC 17.28.20.A.3. The specific grounds for appeal are contained in the Applicant's oral and written testimony to the Planning Commission, this letter and **Exhibit A** to this letter.

D. SDC 17.28.20.A.4. The Applicant does not request *de novo* review. The factors for *de novo* review in SDC 17.28.20 are not clear and objective and selection of a *de novo* review violates the requirement of ORS 197.307(4)(a) that procedures be clear and objective.

E. SDC 17.28.20.A.5. The required filing fee is $785.00 (City of Sandy Master Fee Schedule, July 1, 2021; "Planning Charges," Page 2, G. Appeal; Type II to Type IV, $785.00 City Council Appeal"). The Applicant paid the full appeal fee in November 24, 2021 by credit card (**Exhibit C**, evidence of payment).

F. SDC 17.28.20.A.6. The name and mailing address of the entity being appealed is:

Roll Tide Properties Corp.
P.O. Box 703
Cornelius, OR 97113

G. The City's "Appeal" form is attached as **Exhibit D**.

4. Other Issues.

A. The Applicant does not waive ORS 197.522(3).

B. The Applicant does not waive final written argument under ORS 197.763(6)(e).

C. The Applicant objects to a *de novo* review by the City Council in the even the City Council elects to conduct a *de novo* review.

D. The only applicable clear and objective SDC standards and criteria are those in effect on the submittal date of the Application under ORS 227.178(3)(a).

E. The Applicant has extended the 120-day period in ORS 227.178(1) to February 1, 2022.

F. The Applicant is not waiving any needed housing arguments.

G. The Appeal addresses each basis for the Decision.

5. Conclusion.

The Applicant respectfully requests that the City Council reverse the Decision and approve the Application with only clear and objective conditions of approval.

Very truly yours,

Michael C. Robinson

MCR:jmhi
Enclosures: **Exhibit A** – Reasons for Appeal
Exhibit B – Decision
Exhibit C – Appeal Fee Receipt
Exhibit D – Appeal Form

cc: Mr. Dave Vandehey (*via email) (w/enclosures*)
Mr. Carey Sheldon (*via email) (w/enclosures*)
Mr. Alex Reverman (*via email) (w/enclosures*)
Mr. Ray Moore (*via email) (w/enclosures*)
Mr. Tracy Moore (*via email) (w/enclosures*)
Mr. Tyler Henderson (*via email) (w/enclosures*)
Mr. Mike Ard (*via email) (w/enclosures*)
Mr. Garrett Stephenson (*via email) (w/enclosures*)
Ms. Erin Forbes (*via email) (w/enclosures*)
Mr. David Doughman (*via email) (w/enclosures*)
Mr. Kelly O'Neill, Jr. (*via email) (w/enclosures*)

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EXHIBIT A

Notice of Appeal Statement; Reasons that the City Council Must Reverse the Planning Commission Decision and Approve the Application with Clear and Objective Conditions of Approval (Sandy File No. 21-014 SUB/TREE).	))))))	**STATEMENT OF SPECIFIC GROUNDS FOR APPEAL AS REQUIRED BY SANDY DEVELOPMENT CODE 17.28.20.A.3**

1. Introduction.

This firm represents Roll Tide Properties Corp., the Applicant in the above-referenced file. This Letter serves as the Applicant's notice of appeal of the Sandy Planning Commission's (the "Commission") denial (the "Decision") of the proposed Deer Meadows Subdivision, which is to be located at 40808 and 41010 Highway 26 and consists of 32 lots (the "Project"). The Applicant's specific bases for appeal are set forth below. This appeal is timely submitted within 12 calendar days of the Commission's Decision, which was rendered on November 18, 2021.

2. <u>Legal Framework</u>.

Before responding to the Commission's specific reasons for denial, we provide the Council with an overview of the legal framework that is relevant in this case, which makes this appeal a bit different from those the Council may have considered before. As the Decision explains, in 2019 the Applicant proposed a comprehensive plan/zone amendment and related subdivision application, known as "Bull Run Terrace," in which the Applicant proposed an extension of Dubarko Road to Highway 26. However, because that prior application included a Comprehensive Plan Amendment, the Applicant was required to address the goals and policies of the Comprehensive Plan, including the City's Transportation System Plan ("TSP").

The Planning Commission recommended approval of the Bull Run Terrace application but the Council later denied it. The Applicant then filed a new application for a subdivision, *without* a concurrent plan amendment or zone change. Unlike the Bull Run Terrace application, a subdivision by itself is considered a "limited land use decision" under Oregon law and is subject to two statutes that were not at issue in Bull Run Terrace. First, the Application is subject to the "Needed Housing Statutes" of ORS 197.307(4). In simple terms, these provide that any application for the development of housing is subject only to clear and objective criteria and procedures. Second, the Application is subject to ORS 197.195(1), which provides that the goals and policies of the Comprehensive Plan, including the TSP, do not apply to limited land use decisions unless they have been specifically incorporated into the Sandy Development Code ("SDC").

A. The City may apply only clear and objective standards, conditions, and procedures to the Application.

ORS 197.307(4) provides that local governments may "adopt and apply only clear and objective standards, conditions, and procedures regulating the development of housing, including needed housing, and precludes governments from unreasonably increasing the cost of housing or causing unreasonable delay." ORS 227.173(2) provides that "when an ordinance establishing approval standards is required under ORS 197.307 to provide only clear and objective standards, the standards must be clear and objective on the face of the ordinance." (Emphasis added.) ORS 197.307(6) allows a local government to use a subjective review process only if it also allows a "clear and objective" review procedure as an alternative.

Land use regulations are not clear and objective if they impose "subjective, value-laden analyses that are designed to balance or mitigate impacts of the development on (1) the property to be developed or (2) the adjoining properties or community."[1] And, regardless of whether a given regulation is "designed to balance or mitigate impacts," it must also be *both* clear *and* objective.[2] More fundamentally, standards that are susceptible to multiple interpretations are not clear and objective.[3]

ORS 197.522(2) and ORS 197.522(4) require local governments to approve applications for housing that are consistent with applicable land use regulations or can be made consistent with those regulations through reasonable conditions of approval. Relatedly, ORS 197.522(3),[4] allows an applicant to amend its application or to propose reasonable conditions to make its application consistent with the comprehensive plan and applicable land use regulations. What this means is that, if the Applicant proposes a condition of approval that would satisfy a given approval criterion that the Application does not otherwise meet, the City has a legal obligation to impose the condition in lieu of denying the Application.

Many of the reasons set forth in the Decision do not stand up to Oregon's needed housing statutes. Many standards in the SDC are not clear and objective on their face or even when interpreted, and as such, cannot be applied to the Application under Oregon's needed housing rules. Further, the City does not offer a clear and objective approval process for subdivisions as required under ORS 197.307(6).

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[1] *Rogue Valley Assoc. of Realtors v. City of Ashland*, 35 Or LUBA 139, 158 (1998), *aff'd*, 158 Or App 1, 970 P2d 685, *rev den*, 328 Or 594 (1999).
[2] *Id.* at 155–56 ("Dictionary definitions of 'clear' and 'objective' suggest that the kinds of standards frequently found in land use regulations lack the certainty of application required to qualify as 'clear' or 'objective.'").
[3] *Parkview Terrace Development, LLC v. City of Grants Pass*, 70 Or LUBA 37, 52–53 (2014); *see also Walter v. City of Eugene*, 73 Or LUBA 356, 360–64 (2016) (citing a standard's "multiple possible interpretations" as a basis to find it not clear and objective).
[4] **"**If an application is inconsistent with the comprehensive plan and applicable land use regulations, the local government, prior to making a final decision on the application, shall allow the applicant to offer an amendment or to propose conditions of approval that would make the application consistent with the plan and applicable regulations."

B. The Transportation System Plan and Parks Master Plan are not adequately incorporated into the land use regulations; therefore, the City cannot require an extension of Dubarko Road or parkland required by the Parks Master Plan.

As explained above, a subdivision is a limited land use decision as defined by ORS 197.015(12). Under ORS 197.195(1), cities are required to incorporate all comprehensive plan standards applicable to limited land use decisions into their land use regulations. This requirement extends to standards set forth in the TSP, parks master plan, and other elements of a city's comprehensive plan as well.[5] The Oregon Land Use Board of Appeals ("LUBA") has explained that adequate incorporation of a standard turns on whether the relevant land use regulations "make clear what *specific policies or standards* in the TSP [or other identified plan] apply to a limited land use decision as approval criteria."[6] LUBA has also explained that "ORS 197.195(1) contemplates more than a broad injunction to comply with unspecified portions of the comprehensive plan [or other identified plan]."[7] Rather, "[i]n order to 'incorporate' a comprehensive plan [or other plan] standard into a local government's land use regulations within the meaning of ORS 197.195(1), the local government must *at least* amend its land use regulations to make clear what specific policies or other provisions of the comprehensive plan [or other plan] apply to a limited land use decision as approval criteria."[8]

The City of Sandy's approval criteria governing review of a tentative plat for a subdivision fail to adequately incorporate the Sandy Comprehensive Plan or TSP. Specifically, SDC 17.100.60(E)(3) requires a showing that the "proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy." This is not sufficient to meet the incorporation requirements of ORS 197.195(1) because it merely refers generally to the Comprehensive Plan and the City's official street plan.[9] It does not "make clear what specific policies, action items, or performance standards contained in the TSP apply as approval criteria for a limited land use decision."[10] Therefore, the Application may not be denied for lack of an extension of Dubarko Road.

The Decision also cites as a basis for denial the fact that the Application does not propose to dedicate parkland adjacent to Deer Point Park, as that park is designated on the 1997 Parks Master Plan. The Decision is incorrect in this regard because the Parks Master Plan is not applicable to the Application. This is because, as explained above, the Application is a limited land use decision, and not subject to comprehensive plans or their elements unless such provisions are expressly incorporated into a city's land use regulations. The Parks Master Plan is not incorporated into the Sandy Development Code, the City's land use regulations; nor does the

[5] *See Oster v. City of Silverton*, LUBA No. 2018-103, at pp. 9-10 (Or LUBA May 7, 2019).
[6] *Id.* at p. 12.
[7] *Paterson v. City of Bend*, LUBA No. 2004-155, at p. 6 (Or. LUBA 2005).
[8] *Id.* at pp. 6-7.
[9] *See Oster* at 12.
[10] *Id.*

Decision assert that it is. Therefore, the Parks Master Plan may not be a basis for requiring dedication of parkland adjacent to Deer Point Park.

C. The City cannot require dedication of parkland because the Development Code's procedures for such requirement are not clear and objective.

Contrary to the Decision, the regulatory scheme created for park dedication is not clear and objective, and therefore is not applicable under ORS 197.307(4). SDC 17.86.10 includes a requirement that all residential development dedicate a certain amount of parkland based on the formula in SDC 17.86.10.B. Alternatively, an applicant may pay a fee-in-lieu for required parkland under SDC 17.86.40. While the Commission found that the formula for parkland dedication is clear and objective, that is not all that ORS 197.307(4) requires. It also requires that local governments "… apply only clear and objective … procedures regulating the development of housing," and that the "standards, conditions and procedures" "may not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay." (Emphasis added.)

The SDC is without any clear and objective guideposts as to whether a developer must provide a fee-in-lieu payment or parkland dedication, and neither decision can be made without consideration of the other option because SDC Chapter 17.86 provides for both. Thus, the decision maker must exercise discretion in deciding to require one or the other, and it is the required exercise of discretion that makes the parkland dedication requirement untenable under ORS 197.307(4).

D. In order to require an extension of Dubarko Road and dedication of parkland, the City must demonstrate that those requirements have an essential nexus and are roughly proportional to the project's impacts on those facilities.

The Decision contends that the Applicant should be required to extend Dubarko Road to Highway 26 and to dedicate certain land as parkland to expand Deer Pointe Park. Such dedications are subject to the Takings Clause of the Fifth Amendment of the U.S. Constitution.

Requiring a landowner to convey its private property rights in exchange for development approval is an unconstitutional condition unless there is an "essential nexus" between the condition and the government interest. *Nollan v. California Coastal Com.*, 483 U.S. 825, 836-37 (1987). Additionally, to withstand a legal challenge, the condition must be "roughly proportional" to the expected impacts caused by the proposed development. *Dolan v. City of Tigard*, 512 U.S. 374, 391-395 (1994). The *Nollan* and *Dolan* takings analysis must be done on a case-by-case basis, and the City carries the burden of demonstrating in the first instance that any exaction has a nexus to and is roughly proportional to the nature and degree of the projected impacts of the project. The City is required to make an "individualized determination" and "some effort to quantify" evidence in the findings to support a conclusion of rough proportionality. *Dolan*, 512 U.S. at 391. The *Nollan/Dolan* analysis applies to requirements to

pay money or make public improvements in addition to requirements to dedicate property. *Koontz v. St. Johns River Water Management District*, 570 U.S. 595 (2013).

There is no demonstration in the record that the requirements for the Dubarko Road extension and parkland dedication have a nexus to any governmental interest other than the City's general policies showing the street extension and parkland dedications. However, such policies do not constitute the required nexus; rather, a local government must show that "the proposed project's impacts, either alone or in combination with other construction, are ones that 'substantially impede' the interest identified by the government." *Hill v. City of Portland*, 293 Or App 283, 290-291 (2018).

During the proceedings before the Commission, City staff made no attempt to identify the essential nexus between the impact of the Project on the City's park system and the dedication requirement, and no attempt to explain how the requirement is roughly proportional to the project's impacts. Instead, the Decision cites the City's parkland dedication formula as a basis for the dedication requirement. However, relying on a broadly-applicable dedication formula is insufficient because such a determination must be *individualized*. *Dolan*, 512 U.S. at 391. What is more, simply imposing the same level of exaction on all housing projects does not prove there actually is a nexus between that housing and the parks dedication requirement itself. *Hill*, 293 Or. App. at 290-291.

Finally, there is nothing in the record or the Staff Report even approaching a showing that the Dubarko Road extension and parkland dedication are "roughly proportional" to the impacts of the proposed subdivision.

E. SDC 17.100.100.G.2 prohibits the City from require an extension of Dubarko Road through the site.

SDC 17.100.100 governs street requirements for subdivisions. SDC 17.100.100.G provides exemptions from otherwise-applicable street requirements. Subsection G.2 provides:

> ***"Standards for street connections do not apply to freeways and other highways with full access control."***

As explained in ODOT's September 1, 2021 letter (which is listed as Exhibit N to the Staff Report), Highway 26 is access controlled. Therefore, the City unambiguously lacks the authority to require a connection of Dubarko Road to Highway 26.

3. <u>Response to Specific Findings for Denial</u>.

The following responds to the specific findings for denial in the Decision.

A. SDC 17.100.60 (E)(1)

The Decision's finding that the Application fails to satisfy SDC 17.100.60(E)(1) is incorrect for the following reasons.

- ***17.100.60.E.1. "The proposed subdivision is consistent with the density, setback and dimensional standards of the base zoning district, unless modified by a Planned Development approval."***

    - This criterion is not clear and objective as required by ORS 197.307(4) because the phrase "consistent with" is not clear and objective.

    - The Decision is incorrect that the Application fails to meet frontage and orientation requirements along Dubarko Road for the simple reason that the Application does not *propose* an extension of Dubarko Road. There is no logic in the conclusion that such setbacks and frontages to Dubarko Road could be required without the road itself having been proposed; as a practical matter, it would be impossible for the Applicant to meet such a requirement. In this regard the Decision does not make sense; one cannot plausibly argue that a plan does not meet setback requirements adjacent to a new road that is not proposed. As explained above, the City may not require an extension of Dubarko Road; therefore, the City cannot deny the Application because the proposed lots do not have a sufficient amount of frontage or orientation to a road that does not and will not exist.

    - SDC Chapter 82 requirement that homes "face a transit street" is not applicable because, as noted above, the City's Transportation System Plan and Pedestrian Mater Plans are not incorporated into the City's Land Use Regulations. ORS 197.195.

    - Pursuant to ORS 197.522(3), if the transit street orientation requirement in SDC 17.82.20.A did apply, it could be met with the following condition:

        "All residential structures on lots abutting Highway 26, Dubarko Road, and Street B shall have their primary entrances oriented to Highway 26, Dubarko Road, or Street B. If a lot abuts two or more of these streets the residential structure shall be oriented to the highest classification of street."

        This condition was proposed in paragraph 34 of the Staff Report to the Commission. Under ORS 197.522(3), the City is required to impose this condition in lieu of denial because it would ensure satisfaction the frontage orientation requirement.

    - The Decision is also incorrect that some of the proposed lots are located in the required right-of-way for Dubarko Road and located across required parkland.

As discussed above, the Application does not propose an extension of Dubarko Road or the dedication of parkland. Without such an extension or dedication proposed, there is no right-of-way or parkland on or across which the proposed lots can be located. Indeed, no lots are proposed to be located on any right-of-way or parkland, and as such, the conclusion that the Application improperly proposes lots to be located on or across such is illogical. As explained above, the City may not require an extension of Dubarko Road nor a dedication of parkland; therefore, the City cannot deny the Application because some of the proposed lots are in the required right-of-way for Dubarko Road or across required parkland.

B. SDC 17.100.60 (E)(3)

The Decision's finding that the Application fails to satisfy SDC 17.100.60(E)(3) is incorrect for the following reasons.

- ***17.100.60.E.3. "The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy."***
    - As explained above, this criterion is not applicable because the City's Comprehensive Plan and Transportation System Plan have not been incorporated into the City's land use regulations as required by ORS 197.195.
    - The statement made in Paragraph 14 of the Decision ("The 2011 Sandy Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan. Exhibit A of Ordinance 2011-12 is the TSP. The TSP is referenced by ordinance as 'the transportation element of the City of Sandy Comprehensive Land Use Plan.' The 2011 TSP includes the official street plan for the City of Sandy. Project M20 in the TSP is the connection of Dubarko Road to Highway 26.") is not evidence that the Comprehensive Plan and TSP have been properly incorporated into the City's land use regulations as contemplated by ORS 197.195 and as further explained by *Oster* and *Paterson*. To be properly incorporated, the City's land use regulations (i.e. the Sandy Development Code) must make clear which specific sections of the Comprehensive Plan and TSP apply to the relevant approval criteria. General references to those Plans such as those made by the SDC are not sufficient. Mere adoption of the Plan by ordinance is also not enough. Further, the only mention of the "official street plan" in the SDC is a general reference to it in SDC 17.100.60.E.3, which does not specify where the official street plan is found or what portions of it are relevant to the approval criteria.

      Moreover, Ordinance 2011-12 is not in the Planning Department record for this Application and as such, it cannot be a basis for the Commission's Decision.

- Even if applicable, this criterion is not clear and objective as required by ORS 197.307(4) because the phrase "consistent with" is not clear and objective.

- As explained above, the City has not demonstrated the required essential nexus and rough proportionality required by *Nollan* and *Dolan*.

- The fact that a Dubarko Road extension was proposed in the prior Bull Run Terrace application is irrelevant, Likewise, Ard Engineering's September 28, 2020 reference to "the requirement for the Dubarko Road connection," made as part of the prior Bull Run Terrace application, is also irrelevant . That was a different proposal and different type of application, and the City denied it. There is no legal obligation in state or local law that requires a new application for a given property to include the same elements as a prior denied application.

- The Applicant is not required to extend Dubarko Road under SDC 17.100.100.G.2 because Highway 26 is access controlled by ODOT.

- OAR 660-012-0045 does not apply to the proposed development. The Decision cites to OAR 660-012-0045 as a basis for denial. This is improper for at least two reasons. For one, this administrative rule is not an approval criterion and as such cannot be the basis for denial of the Application. Moreover, it establishes obligations for a local government's plan and land use regulations; it does not apply directly to review of subdivision application. Even if it did, it establishes obligations that the *City* must meet, not the Applicant. As such, it cannot be used as a basis to deny the Application.

C. Parkland Dedication Requirements in SDC 17.86.

As explained in detail above, the City cannot require dedication of 0.96 acres to add to Deer Pointe Park for the following reasons:

- The City's Parks and Trail Master Plan is not incorporated into the City's land use regulations as required by ORS 197.195, and is therefore inapplicable to the Application.

- The process by which the City can require parkland dedication as opposed to a fee-in-lieu is not clear and objective; therefore, the parkland dedication requirement cannot apply under ORS 197.307(4).

- Staff has made no attempt to demonstrate an essential nexus or rough proportionality of the parkland dedication requirement, as required by *Nollan* and *Dolan*.

4. <u>Conclusion</u>.

For the above reasons, the City Council cannot require a dedication of parkland adjacent to Deer Pointe Park and may not require an extension of Dubarko Road. The City Council must approve the Application because the Decision's stated bases for denial are not permissible under applicable law.

MCR:jmhi

PDX\126769\255102\MCR\32346720.1

WHERE INNOVATION MEETS ELEVATION

39250 Pioneer Blvd
Sandy, OR 97055
503-668-5533

FINDINGS OF FACT and FINAL ORDER
TYPE III DECISION

DATE: November 18, 2021

FILE NO.: 21-014 SUB/TREE

PROJECT NAME: Deer Meadows Subdivision

APPLICANT/OWNER: Roll Tide Properties, Corp.

PHYSICAL ADDRESS: 40808 and 41010 Highway 26

LEGAL DESCRIPTION: T2 R5E Section 18CD, Tax Lots 900 and 1000

FINDINGS OF FACT

GENERAL FINDINGS

1. These findings are based on the applicant's submittals and other evidence and testimony presented to the Planning Commission. In a letter dated June 11, the applicant agreed to toll the 120-day clock until July 27, 2021. The original 120-day clock was November 24, 2021.

2. On September 27, 2021 the Planning Commission held a public hearing on the Deer Meadows Subdivision and decided to create an open record period prior to deliberating on the subdivision request at a special meeting scheduled for November 8, 2021. The first open record period closed on Monday, October 11 at 4 pm. During the first open record period, anyone could submit additional written information for the Planning Commission to consider. The second open record period closed on Monday, October 18 at 4 pm. During the second open record period, parties could only submit information that rebutted or responded to information that was submitted during the first open record period. The third open record period closed on Monday, October 25 at 4 pm. This third open record period was reserved solely for the applicant to submit their final written argument.

3. With the creation of the open record period the applicant agreed to extend the 120-day clock by an additional 42 days. The existing 120-day clock is January 5, 2022.

4. The subject site is approximately 15.91 acres. The site is located at 40808 and 41010 Highway 26.

5. The parcel has a Comprehensive Plan Map designation of Village and a Zoning Map designation of R-1, Low Density Residential; R-2, Medium Density Residential; and C-3, Village Commercial.

6. The applicant, Roll Tide Properties Corp., seeks approval for a 32-lot subdivision at 40808 and 41010 Highway 26. The development proposal included two partial street extensions and the creation of two new streets. The applicant proposed 30 lots of Low Density Residential (R-1) that would contain single family homes or duplexes, one small lot (9,023 square feet) of Medium Density Residential (R-2), and one large lot (7.35 acres) with a combination of Medium Density Residential (R-2) and Village Commercial (C-3). The proposed 30 lots with R-1 zoning range in size from 5,500 square feet to 32,189 square feet. The applicant proposed to retain 48 existing trees and proposed to remove the remainder of the trees from the site.

7. The exact number of multifamily units was not determined at the time of the subdivision request as the applicant wanted to process the multi-family development in a subsequent design review application. However, the applicant claimed the number of multifamily dwelling units on the R-2 zoned land would have been between 38 dwelling units and 66 dwelling units. The C-3 zoned land would have likely contained a mix of commercial and residential development.

8. Due to the interest in the previous proposal at the subject site, the Development Services Director elevated this application to a Type III decision to be heard and considered by the Planning Commission.

9. Throughout the project narrative (Exhibit B) the applicant failed to submit required information. Instead, on 14 occasions in the narrative the applicant stated that the development code is subjective (i.e., not clear and objective) and because the subdivision is a housing application the alleged subjective development code language is not applicable. Staff explained at the Planning Commission meetings that they did not agree with the applicant's interpretation of what constitutes and does not constitute subjectivity.

10. The applicant previously proposed a development at the site that was denied by the City Council (File No. 19-050 CPA/ZC/SUB/SAP/TREE Bull Run Terrace). This application was substantively different from that prior proposal. The applicant did not propose a Comprehensive Plan amendment or Zone Change amendment. The applicant chose not to expand Deer Pointe Park or connect Dubarko Road to Highway 26. The existing parks master plan details the Deer Pointe neighborhood to have a Community Park. The existing transportation system plan classifies Dubarko Road as a minor arterial and shows it connecting to Highway 26.

11. The City of Sandy provided the following notices:
    A. A transmittal was sent to agencies asking for comment on August 2, 2021.
    B. Notification of the proposed application was mailed to affected property owners within 300 feet of the subject property on August 10, 2021.

C. A supplemental notice regarding the Planning Commission meeting was mailed to affected property owners within 300 feet of the subject property on August 24, 2021.
D. A legal notice was published in the Sandy Post on September 15, 2021.

BASIS FOR DENIAL 1: The application does not meet subdivision criteria 17.100.60(E)(1)

12. Section 17.100.60(E)(1) requires subdivisions to be consistent with the density, setback, and dimensional standards of the base zoning district, unless modified by a Planned Development approval. Each base zoning district requires that residential development comply with Chapter 17.82. First, the Preliminary Plat Map (Exhibit C, Sheet C2) details setbacks for Lots 2, and 27-31 showing the front setback facing the local street or public access lane, instead of the Transit Street as required by Chapter 17.82. Second, Sheet C2 does not identify that lots abutting Highway 26 shall face Highway 26 as required by Chapter 17.82, nor does the plan set detail frontage improvements along Highway 26 as required by Chapter 17.86. Third, by not proposing the extension of Dubarko Road to connect with Highway 26, the lots that would otherwise abut Dubarko Road do not have the required frontage to Dubarko Road as required by Chapter 17.82. Fourth, by not proposing Dubarko Road or parkland dedication, some of the proposed lots are in the required right-of-way for Dubarko Road and also located across required parkland. Therefore, this proposal does not meet approval criteria 17.100.60 (E)(1).

BASIS FOR DENIAL 2: The application does not meet subdivision criteria 17.100.60(E)(3)

13. Section 17.100.60(E)(3) requires the proposed street pattern to be connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy. The proposed street pattern is not consistent with the Comprehensive Plan and the city's standards, including connecting Dubarko Road to Highway 26.

14. The 2011 Sandy Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan. Exhibit A of Ordinance 2011-12 is the TSP. The TSP is referenced by ordinance as 'the transportation element of the City of Sandy Comprehensive Land Use Plan.' The 2011 TSP includes the official street plan for the City of Sandy. Project M20 in the TSP is the connection of Dubarko Road to Highway 26.

15. On pages 9, 10, and 14 of the project narrative (Exhibit B) the applicant references the City's TSP and states that the TSP identifies Dubarko Road as a minor arterial. On page 32 of the project narrative (Exhibit B) the applicant claims that subdivision approval criteria 17.100.60 (E)(3) is not clear and objective and therefore the subdivision does not need to meet the Comprehensive Plan or official street plan for the City of Sandy. The applicant also asserts that if the official street plan is in the TSP, it is not sufficiently incorporated into the development code for the purposes of limited land use decisions. However, in the narrative for Bull Run Terrace (File No. 19-050) for the same subject site the same applicant stated, "*As illustrated on the submitted Future Street Plan (Sheet C1), the proposed street system is consistent with the City's Transportation System Plan and Comprehensive Plan*." So, with the Bull Run Terrace land use application the applicant conceded that the street system had to be consistent with the City's Transportation System Plan and Comprehensive Plan to meet criteria 17.100.60 (E)(3). The applicant's inconsistent understanding of what is the official street plan (i.e., the City's TSP) is illogical and conflicting even in the applicant's project

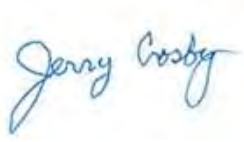
narrative. Additionally, in a previous TIS from Ard Engineering (dated September 28, 2020) on page 24 the applicant's traffic engineer referenced the requirement for the Dubarko Road connection by stating, "it is the completion of the city's planned connection of Dubarko Road to Highway 26." Furthermore, the proposal is not consistent with OAR 660-012-0045, which requires that local governments implement their TSP. By not providing the connection of Dubarko Road to Highway 26 in the proposal the subdivision request does not meet approval criteria 17.100.60 (E)(3).

BASIS FOR DENIAL 3: The application does not meet the parkland dedication requirements in Chapter 17.86

16. The applicant did not propose any parkland dedication as required by Chapter 17.86 of the Sandy Development Code. Directly west of the subject property is undeveloped land owned by the City of Sandy that has long been reserved for the eventual development of Deer Pointe Park. The Parks and Trails Advisory Board (Board) met on August 11, 2021. The Board recommended that conditions of approval were included that required dedication of land for expansion of Deer Pointe Park. The 1997 Parks Master Plan designated Deer Pointe Park as a community park, and in the Location and Development Polices section of the Plan states that community parks should be 20 acres or more. Because the Deer Meadows subdivision did not propose parkland dedication abutting Deer Pointe Park, the proposed subdivision is inconsistent with the 1997 Parks Master Plan.

17. Section 17.86.10 contains a clear and objective formula for determining the amount of land required to be dedicated. The formula is acres = proposed units x (persons/unit) x 0.0043. For the 30 single family homes, acres = 30 x 3 x 0.0043 = 0.39 acres. For the maximum development of 66 multifamily units, acres = 66 x 2 x 0.0043 = 0.57 acres. Combined, this totals 0.96 acres. The dedication of 0.96 acres was required to meet the clear and objective criteria in Chapter 17.86. NOTE: The number of dwelling units on the subject site does not account for the additional land required to be dedicated for Dubarko Road to connect to Highway 26 or the parkland dedication, therefore the calculations related to parkland dedication are based on unreliable assumptions.

DECISION: For the reasons stated above, the Planning Commission **denies** the Deer Meadows subdivision application.



Jerry Crosby
Planning Commission Chair

RIGHT OF APPEAL

A decision on a land use proposal or permit may be appealed to the City Council by an affected party by filing an appeal with the Director within twelve (12) calendar days of notice of the decision. Any person interested in filing an appeal should contact the city to obtain the form, *"Notice of Appeal,"* and Chapter 17.28 of the Sandy Development Code regulating appeals. All applications for an appeal shall indicate the nature of the interpretation that is being appealed and the matter at issue will be a determination of the appropriateness of the interpretation of the requirements of the Code.

An application for an appeal shall contain:

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 Chapter 17.28.50; and,
5. Payment of required filing fees.

From: noreply@openedgepay.com
To: Hicks, Jane M.
Subject: City of Sandy-Sandy
Date: Tuesday, November 23, 2021 10:50:47 AM

Batch # 000097 Trans ID 000000000961 Order ID 1637693293755 Trans Type Purchase Date/Time 2021-11-23 10:50:09 Card Type Visa Card Number XXXXXXXXXXXX4414 Entry Method MANUAL Approval Code 00279D Total Amount USD$785.00 Approved - Thank You

X_____ Cardholder Signature Buyer agrees to pay total amount above according to cardholder's agreement with issuer. Please do not reply to this message. Replies to this message are routed to an unmonitored mailbox.

Exhibit C
Page 1 of 1

Notice of Intent to Appeal

1 page

Name of Appellant:	Roll Tide Properties Corp.	Phone Number:	503.327.6084
Email:	dave.vandehey@rolltideproperties.com	Address:	PO Box 703 Cornelius, OR 97113

Map & Tax Lot #:	T: T2	R: R5E	Section: 18CD	Tax Lot(s) 900 & 1000

BASIS FOR STANDING APPEAL (please check all that apply)

Submitted written evidence during the initial review ☑
Testified orally at the hearing ☑
Participated through?

Grounds for the Appeal: Attach separate page(s) stating the ground for the appeal. The appeal must be based upon issues raised during the decision-making process or hearing. You must identify the issue with sufficient information so that the reviewing body understands under what the criteria within the Sandy Development Code, the Comprehensive Plan, or Statewide Land Use Goals you are appealing.

Relevant Code Sections: Attach separate page(s) listing the relevant code sections, which relate to the appeal application.

Please note:

* If the notice fails to confirm to the above requirements or is not actually received by the City (delivered to the City Manager, Development Services Director, City Recorder or their staff) within the timelines specified, the appeal is void and shall be dismissed.

* An appeal stays an approval until resolution of the appeal.

Staff Use Only

Appeal Filed within 12 calendar days of Written Decision: Yes ☐ No ☐
Application complete: Yes ☐ No ☐
Scheduled for review before the: Planning Commission ☐ City Council ☐

File No.:		Date of Decision:		Date Notice of Decision Mailed:	
Appeal Fee:		Date Appeal Filed:		Date Set for Hearing:	

Development Services Department, 39250 Pioneer Blvd, Sandy, OR 97055, 503.489.2160

Exhibit D
Page 1 of 1

Beery Elsner & Hammond LLP

ATTORNEYS AT LAW

EXHIBIT XX

MEMORANDUM

TO: Mayor Pulliam
Sandy City Council Members

FROM: David Doughman, City Attorney's Office

SUBJECT: Scope of Review for Deer Meadows Appeal

DATE: December 21, 2021

On January 18, 2022, the Sandy City Council will hear an appeal of the Deer Meadows subdivision, which the Sandy Planning Commission denied in November. At its January 3, 2022 meeting, the council must determine the scope of its review for the appeal.

Section 17.28.30 of the Sandy Municipal Code says:

> Except where a de novo hearing is required for review of Type II (Limited Land Use) decisions, an appeal is limited to a review of the record and a hearing for receipt of oral arguments regarding the record. At its discretion and if good cause has been demonstrated by the appellant or City staff, the hearing body may allow an appeal to include new evidence based upon circumscribed issues relevant to the appeal, or it may allow a de novo hearing.

Roll Tide Properties is the applicant/appellant. The appellant has requested the council limit its review to the record of the planning commission.

Historically, the council has heard appeals "de novo." Under the city's code, a de novo hearing is one where the council is able to consider new evidence and written testimony, in addition to the evidence and testimony presented to the planning commission. When an appeal is heard "on the record," the city's code says parties may only present oral argument regarding evidence and testimony in the record. In addition, if an appeal is limited to the record, the council may not accept new evidence and may not consider any new issue that someone may raise.

In my experience, local governments are not well equipped to handle appeals on the record. It makes sense for appellate bodies such as LUBA and appellate courts to limit appeals to the record. However, in those instances, rules govern the contents of the record; parties have an opportunity to object to the contents; and, prior to the hearing, each party files written briefs that must cite to relevant portions of the record in order to demonstrate they have preserved an issue for appeal.

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

Local governments are not appellate courts. Without similar procedures in place, appeals on the record can lead to arguments between parties about what issues may or may not be asserted on appeal, who may assert them and what evidence in the record supports those assertions. Significant amounts of time can be spent sorting through and making decisions concerning these issues, which then results in potential procedural errors. These potential problems are exacerbated by hybrid/remote hearings, which Oregon law will effectively require as of January 1, 2022.

RECOMMENDATION: For these reasons, I recommend the council choose to hold a de novo hearing for the Deer Meadows appeal on January 18, 2022.

Schwabe
WILLIAMSON & WYATT®

January 3, 2022

EXHIBIT YY

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL

Mr. Stan Pulliam, Mayor
Sandy City Council
Sandy City Hall
39250 Pioneer Boulevard
Sandy, OR 97055

RE: Sandy City Council January 3, 2022 Meeting Agenda Item 8.1; Deer Meadows Appeal Hearing Scope of Review

Dear Mayor Pulliam and Sandy City Council Members:

This office represents the Applicant in the above-referenced matter. This letter addresses the City Council's consideration of the scope of the appeal hearing.

The City Council may consider this letter because it is argument only and contains no new evidence. City Attorney David Doughman confirmed that the Applicant may submit this letter.

The Applicant requests that the City Council hold an "on the record" appeal hearing as anticipated by Sandy Development Code ("SDC") 17.28.30 for the following reasons:

First, the "good cause" standard in SDC 17.28.30 is not a clear and objective procedural standard and is prohibited by ORS 197.307(4).

Second, while the Applicant generally agrees with the City Attorney's comments in his December 21, 2021 memorandum, the Applicant does not agree that these comments rise to "good cause" in this Application because the evidentiary record is not complex and even if it were, the comments do not show good cause where no application-specific reason for holding a *de novo* hearing has been provided.

Third, a *de novo* hearing prejudices the Applicant's substantial rights to a full and fair hearing by violating ORS 197.307(4).

Finally, ORS 197.522 allows the Applicant to modify the application or to offer a condition of approval, so a *de novo* hearing is unnecessary for the purpose of addressing relevant clear and objective approval criteria.

Thank you for considering the Applicant's arguments.

Very truly yours,

Michael C. Robinson

MCR:jmhi

cc: Mr. Dave Vandehey *(via email)*
Mr. Alex Reverman *(via email)*
Mr. Carey Sheldon *(via email)*
Mr. Tracy Brown *(via email)*
Mr. Ray Moore *(via email)*
Mr. Mike Ard *(via email)*
Mr. Tyler Henderson *(via email)*
Mr. Garrett Stephenson *(via email)*
Ms. Erin Forbes *(via email)*
Mr. Kelly O'Neill, Jr. *(via email)*
Mr. David Doughman *(via email)*
Mr. Chris Crean *(via email)*

PDX\126769\255102\MCR\32628020.1

Marisol Martinez <mmartinez@ci.sandy.or.us>

Fwd: Deer Meadows extension request

1 message

Kelly O'Neill Jr. <koneill@ci.sandy.or.us> Tue, Jan 11, 2022 at 11:11 AM
To: Planning <planning@ci.sandy.or.us>

FYI...

---------- Forwarded message ---------
From: **Robinson, Michael C.** <MRobinson@schwabe.com>
Date: Tue, Jan 11, 2022 at 10:59 AM
Subject: RE: Deer Meadows extension request
To: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Cc: Stephenson, Garrett H. <GStephenson@schwabe.com>, Chris Crean <Chris@gov-law.com>, Jeff Aprati <japrati@ci.sandy.or.us>, Hicks, Jane M. <JHicks@schwabe.com>, Robinson, Michael C. <MRobinson@schwabe.com>

Kelly, please find attached a letter authorized by the applicant to extend the 120-day period in ORS 227.178(1)in order to allow the Sandy City Council public hearing to be continued from January 18, 2022 to February 22, 2022. Please confirm receipt of this letter and that it is satisfactory.

Thanks. Mike

Michael C. Robinson

Shareholder

Direct: 503-796-3756

Mobile: 503-407-2578

mrobinson@schwabe.com

Schwabe Williamson & Wyatt

From: Kelly O'Neill Jr. <koneill@ci.sandy.or.us>
Sent: Tuesday, January 11, 2022 10:20 AM
To: Robinson, Michael C. <MRobinson@SCHWABE.com>

Cc: Stephenson, Garrett H. <GStephenson@SCHWABE.com>; Chris Crean <Chris@gov-law.com>; Jeff Aprati <japrati@ci.sandy.or.us>
Subject: Deer Meadows extension request

Mike and Garrett - The City Manager is willing to move the hearing to February 22, 2022 as long as you submit a formal request with a 120-day extension (i.e. toll the clock) by 1:00 PM today. Thanks.

--

Kelly O'Neill Jr.

Development Services Director

City of Sandy

Development Services Department

39250 Pioneer Blvd

Sandy, OR 97055

(503) 489-2163

koneill@ci.sandy.or.us

--

Kelly O'Neill Jr.
Development Services Director

City of Sandy
Development Services Department
39250 Pioneer Blvd
Sandy, OR 97055
(503) 489-2163
koneill@ci.sandy.or.us

1.11.2022 Letter to Sandy Development Services Director O_Neill.PDF
24K

EXHIBIT AAA

COMMENT SHEET for File No. 21-061 AP:

To protect our neighborhood we feel it is important to make Dubarko a thru street to Route 26. This would allow residents to enter the new subdivision from 26 and help reduce the traffic on Dubarko.

RECEIVED
JAN 11 2022
City of Sandy

Thanks

Dave & Nancy Allan

Your N

Addres.

David and Nancy Allan
18417 Meadow Ave
Sandy, OR 97055

Phone Number
503-826-0282

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.20 Public Hearings; 17.22 Notices; 17.28 Appeals; 17.30 Zoning District Amendments; 17.36 Low Density Residential (R-1); 17.38 Medium Density Residential (R-2); 17.46 Village Commercial (C-3); 17.56 Hillside Development; 17.74 Accessory Development; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.100 Land Division; 17.102 Urban Forestry; 15.30 Dark Sky; and, 15.44 Erosion Control Regulations.

EXHIBIT BBB

COMMENT SHEET for File No. 21-061 AP:

The city of Sandy has done admirable work on planing for the future, their transportation plan has Debarko terminating at Hwy 26. This will assure for public safty needs and growth in the future.

RECEIVED
JAN 19 2022
City of Sandy

Dave Carter — 503 724 5472
Your Name — Phone Number

41248 SE Vista Loop dr 97055
Address

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.20 Public Hearings; 17.22 Notices; 17.28 Appeals; 17.30 Zoning District Amendments; 17.36 Low Density Residential (R-1); 17.38 Medium Density Residential (R-2); 17.46 Village Commercial (C-3); 17.56 Hillside Development; 17.74 Accessory Development; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.100 Land Division; 17.102 Urban Forestry; 15.30 Dark Sky; and, 15.44 Erosion Control Regulations.

EXHIBIT CCC

COMMENT SHEET for File No. 21-061 AP:

RECEIVED
JAN 20 2022
CITY OF SANDY

The most important thing for us is that Dubarko needs to be a through street to 26. This will reduce the traffic thru our neighborhood by allowing people to enter the new subdivision at the new entrance.

David & Nancy Allan 503-826-0282

Your Name Phone Number

Nancy Allan & David Allan
18417 Meadow Ave
Sandy, OR 97055

Address

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.20 Public Hearings; 17.22 Notices; 17.28 Appeals; 17.30 Zoning District Amendments; 17.36 Low Density Residential (R-1); 17.38 Medium Density Residential (R-2); 17.46 Village Commercial (C-3); 17.56 Hillside Development; 17.74 Accessory Development; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.100 Land Division; 17.102 Urban Forestry; 15.30 Dark Sky; and, 15.44 Erosion Control Regulations.

EXHIBIT DDD

Dear Planning Commission, City Planning Staff, and City Councilors:

I have lived in the Deer Pointe neighborhood for the past 10 years. I moved to the City of Sandy because of its small town feel and the lower population compared to many other cities in the Urban Growth Boundary. We, as a community, have seen more and more cars and homeless people moving into the area. The traffic in this area has gotten severely worse over the last few years. There are times when you have to wait several minutes just to get onto 26. This is not acceptable and is only going to get worse when you add in more neighborhoods like the proposed one at the Deer Meadows Subdivision. You all need to think about the ramifications on the residents that currently live here and not the ones that will be moving here. I have no problem with the city growing, but make sure it is done correctly. Please make sure that the builders will adhere to the original plans and not build any apartment complexes. I have no problems with single family dwellings or low density housing.

Also, when we built here, we were told that the park across the street was going to be doubled in size. There was a plan to have a walking path, basketball courts, and a playground in the park. The new plans by the builders don't have a park at all and have houses built there instead. With every other neighborhood in the area, there is a park in the middle of it for the kids and families to use. The original plans should still be intact and not be replaced by more houses.

I don't understand why the citizens of the City of Sandy have to argue against building new subdivision housing areas. The amount of traffic that is going to be in the neighborhood of Deer Pointe is going to be at dangerous levels. The cars in the neighborhoods across the city are already packing the side streets to get away from Highway 26. With the new proposal of Deer Meadows it is going to be a problem with no outlet to Highway 26. All the houses in that neighborhood will have to all go through Deer Pointe. This is going to increase the traffic to an already congested neighborhood. There is no outlet on Dubarko because of the expense that the builders will have to incur. There has to be other outlets out of the neighborhood. Please take in consideration the citizens and their concerns and not just focus on the money that will be coming into the city.

Scott Ruehrdanz
40498 Fawn Street
Sandy, Oregon
715-703-0839

Staff Report

Meeting Date:	February 22, 2022
From	Tyler Deems, Deputy City Manager / Finance Director
SUBJECT:	Hoodview Disposal & Recycling Rate Increase Request

DECISION TO BE MADE:
Whether to approve the rate increase requested by Hoodview Disposal & Recycling.

BACKGROUND / CONTEXT:
Hoodview Disposal & Recycling holds an exclusive franchise with the City of Sandy to provide the collection and transportation of solid waste, recyclable materials, and yard debris within city boundaries. Per Article 7 of the franchise agreement, the franchisee is entitled to an annual rate review. Rates are set by City Council resolution. The Council previously received information regarding this request at the February 7, 2022 meeting.

The franchisee has requested a work session with the City Council to present the rate increase request, which would become effective in March 2022. The request is attached to this staff report, and discusses the current circumstances and status of the recycling markets. The rate increase is equal to approximately 3.78%, and would be $1.21 per month for the 35 gallon cart service.

This requested rate increase is driven by a 12.26% increase on disposal at the Troutdale Transfer Station, as well as 2.29% increase on operating costs, as identified using the formula prescribed in the franchise agreement. The formula to calculate the operating component of the fee is based on 80% of the annual change in CPI-U or 5%, whichever is less. The period used for this CPI measurement was the first half of 2020 versus the first half of 2021. CPI has continued to rising steadily since this time.

Hoodview Disposal & Recycling also has plans to bring forward another rate increase request in September 2022, and if approved, would become effective in January 2023. This increase would likely reflect the continued rise in CPI and will be explored more thoroughly when the request is brought before the Council later this year.

At the February 7th meeting the question was asked whether or not the Council must approve this rate request increase since it falls outside of the standard request timeline as identified in the franchise agreement. After consulting with the City's legal counsel, it was determined that: "If the Company does not submit their request for an annual adjustment by September 1, Council still “shall adjust rates” pursuant to section 7.4, the only difference is when the new rates take effect: “the first month of the next billing cycle following approval by the City Council.” (P.59, lines 22-23)."

RECOMMENDATION:
Consider adoption of Resolution 2022-01, which would authorize Hoodview Disposal's proposed rate increase.

SUGGESTED MOTION LANGUAGE:
"I move to approve Resolution 2022-01, a resolution approving an increase to solid waste collection rates."

LIST OF ATTACHMENTS/EXHIBITS:

- Rate increase request letter
- Resolution 2022-01, which also includes the new proposed rate schedule

December 9, 2021

HOODVIEW
DISPOSAL & RECYCLING, INC.

Mr. Jordan Wheeler
City Manager
City of Sandy
39250 Pioneer Boulevard
Sandy, Oregon 97055

Re: Proposed March 1, 2022 Rate Adjustment - City of Sandy Solid Waste and Recycling Services

Dear Mr. Jordan,

As a result of increases in tipping fees and inflation, Hoodview Disposal & Recycling, Inc. proposes to make rate adjustments for solid waste and recycling services delivered to Sandy customers effective March 1, 2022. The net effect of these cost increases to the average single family customer in Sandy is $1.21 per month.

On July 1, 2014, the City of Sandy, and Hoodview Disposal & Recycling, Inc. entered into a franchise agreement for the provision of solid waste and recycling services within the jurisdictional boundaries of the City. Section 7.3 of the above referenced agreement lays out the formulas and time lines that are to be used to arrive at future rate increases. The agreement specifies the process that is to be followed in the calculation of the rates for both solid waste collection and recycling services. Each rate includes an "operating component" and a "tipping fee component". The following table lays out the calculation sequence that is itemized in the franchise agreement. We have applied this methodology for the development of the new monthly rate for the standard level of residential service (i.e., the 35 gallon roll-cart weekly service). A complete schedule of the proposed rates as of March 1, 2022 is attached to this letter.

Post Office Box 1110 + Canby, Oregon 97013 + ☎ (503) 668-8300 (503) 659-2107

HOODVIEW
DISPOSAL & RECYCLING, INC.

Analysis of Proposed Rate Increases for Average Single Family Customer Using the 35 Gallon Roll Service
Effective March 1, 2022

	Current Rate	Increase	New Rate
Operating Component	$ 19.58	$ 0.45	$ 20.03
Tipping Fee Components:			
Solid Waste Disposal	6.18	0.76	6.94
Recyclable Materials Processing	3.00	-	3.00
Yard Debris Processing	3.27	-	3.27
	$ 32.03	$ 1.21	$ 33.24

Calculation of Component Increase Percentages:

Operating Component - Section 7.3.2; Adjustment of the Operating Component; based on 80% of the annual change in the CPI-U or 5.00%, whichever is less

CPI U 2021 1st Half	290.781	
CPI U 2020 1st Half	282.685	
80% of annual change in CPI U		2.29%

Solid Waste Disposal - Section 7.3.3; Adjustment of the Tipping Fee Component; pass through of actual tipping fee increases from regulatory agencies

January 1, 2022 tip fee at Troutdale ($/ton)	$ 120.90	
Current Troutdale tip fee in contract ($/ton)	$ 107.70	
Percent increase in net tip fee at Troutdale		12.26%

Recyclable Materials Processing - Section 7.3.3; There shall be no adjustment to the Recyclables Materials Processing tipping Fee Component of each rate over the Term of the Agreement.

Yard Debris Processing - Section 7.3.3; Adjustment of the Tipping Fee Component; pass through of actual tipping fee increases from regulatory agencies

January 1, 2022 tipping fee ($/CY)	$ 11.00	
Current tipping fee in contract ($/CY)	$ 11.00	
Percent increase in yard debris tipping fee		0.00%

The table indicates that the 12.26% increase on disposal at the Troutdale Transfer Station is the principal driver of this rate increase. This increase is commensurate with similar disposal adjustments throughout the Metro region. The contract methodology, which is based upon 80% of the CPI-U West(A) index, also calculates a 2.29% increase on operating costs. The combination of these two factors increases the 35 Gallon Weekly Cart service by 3.78%. Other rates increase similarly; however the exact percentage varies by the ratio of disposal expense to operating expense in each rate.

While we are currently experiencing intense wage and expense pressures, the rate adjustment formula relies on CPI statistics from the first half of 2020 when we saw less inflation. When approved to be effective March 1, 2022, this increase will occur one year after we completed our special rate review increase that was implemented in two phases in September 2020 and March 2021. Beyond this filing, our

intention is to resume the regular annual increases specified in our contract, with an application in September 2022 and an effective date of January 1 2023.

If you have any questions concerning this matter, please feel free to contact me at your earliest convenience. My office telephone number is 503.668.8300.

Very truly yours,

Cory Hansen
Site Manager

Attachments: Proposed Rates, Effective March 1, 2022

NO. 2022-01

A RESOLUTION APPROVING AN INCREASE TO SOLID WASTE COLLECTION RATES

Whereas, the City of Sandy has awarded an exclusive franchise to Hoodview Disposal & Recycling for solid waste collection, container service, and certain other services; and

Whereas, in accordance with Article 7 of the Franchise Agreement between the City and Hoodview Disposal & Recycling, the Council reviewed a proposal for adjusting solid waste collection rates within the City at their February 7, 2022 meeting; and

Whereas, the Council finds that the proposed rates and ratemaking methodology comply with the process in Sections 7.3 through 7.8 of the Franchise Agreement; and

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Sandy that the solid waste collection rates and phased implementation schedule proposed in Exhibit A are hereby approved.

This resolution is adopted by the Common Council of the City of Sandy and approved by the Mayor this 22 day of February 2022

_____
Stan Pulliam, Mayor

ATTEST:

_____
Jeff Aprati, City Recorder

#2022-01

EXHIBIT A

City of Sandy
Proposed Residential Rates Effective March 1, 2022

Hoodview Disposal & Recycling, Inc.

Regularly Scheduled Curbside Collection Services

Basic Service

Size of Solid Waste Receptacle	Service Frequency	Operating and Solid Waste Components Rate Factor	Tipping Fee Component: Operating Component	Tipping Fee Component: Solid Waste Disposal	Tipping Fee Component: Recyclable Materials Processing	Tipping Fee Component: Yard Debris Processing	Total Rate
20-gal cart	1 pick-up/wk	0.84	$16.83	$5.83	$2.52	$2.74	$27.92
35-gal cart	1 pick-up/wk	1.00	$20.03	$6.94	$3.00	$3.27	$33.24
60-gal cart	1 pick-up/wk	1.60	$32.05	$11.11	$4.80	$5.23	$53.18
90-gal cart	1 pick-up/wk	1.78	$35.66	$12.36	$5.34	$5.82	$59.17
32-gal can	1 pick-up/month	0.56	$11.22	$3.89	$1.68	$1.83	$18.61

Yard Debris

Size of Yard Debris Receptacle	Service Frequency	Operating and Solid Waste Components Rate Factor	Tipping Fee Component: Operating Component	Tipping Fee Component: Solid Waste Disposal	Tipping Fee Component: Recyclable Materials Processing	Tipping Fee Component: Yard Debris Processing	Total Rate
65-gal cart	1 pick-up/wk	N.A.	$4.43	N.A.	N.A.	$3.27	$7.70

City of Sandy
Proposed Residential Rates Effective March 1, 2022

Hoodview Disposal & Recycling, Inc.

Regularly Scheduled Curbside Collection Services (Continued)

Recyclable Materials (Customers that do not subscribe to weekly solid waste service can receive recyclable materials collection service

Size of Recyclable Materials Receptacle	Service Frequency	Operating and Solid Waste Components Rate Factor	Operating Component	Tipping Fee Component: Solid Waste Disposal	Tipping Fee Component: Recyclable Materials Processing	Tipping Fee Component: Yard Debris Processing	Total Rate
95-gal cart for commingled materials and 14-gallon bin for glass	1 pick-up/wk	N.A.	N.A.	N.A.	N.A.	N.A.	$0.00

Extra Pick-Ups/On-Call Collection Services

Type of Service	Size of Receptacle	Operating and Solid Waste Components Rate Factor	Operating Component	Tipping Fee Component: Solid Waste Disposal	Tipping Fee Component: Recyclable Materials Processing	Tipping Fee Component: Yard Debris Processing	Total Rate
Extra can or bag of Solid Waste collected on customer's regularly scheduled collection day	32-gal can or bag	Ops Component = basic service rate for weekly 35-gallon cart	$6.87	$1.60	N.A.	N.A.	$8.47
Extra can or bag of Yard Debris collected on customer's regularly scheduled collection day	32-gal can, 32-gal bag, or 2 foot x 2 foot bundle	Op Component = rate for weekly yard debris	$2.23	N.A.	N.A.	$1.51	$3.74

Backyard/Sideyard Service

Description	Distance from Curb to Receptacle	Operating and Solid Waste Components Rate Factor	Operating Component	Tipping Fee Component: Solid Waste Disposal	Tipping Fee Component: Recyclable Materials Processing	Tipping Fee Component: Yard Debris Processing	Total Rate
Extra monthly fee paid by able-bodied customers for backyard or sideyard Collection of all Customer Receptacles (including Solid Waste, Recyclable Materials, and Yard Debris Receptacles)	Walk-In or Drive-In Service:						
	50 feet or less	N.A.	$53.02	N.A.	N.A.	N.A.	$53.02
	Drive In Service:						
	51 - 100 feet	N.A.	$56.99	N.A.	N.A.	N.A.	$56.99
	101 - 200 feet	N.A.	$60.92	N.A.	N.A.	N.A.	$60.92
	201 - 400 feet	N.A.	$68.85	N.A.	N.A.	N.A.	$68.85
	401 - 600 feet	N.A.	$76.78	N.A.	N.A.	N.A.	$76.78
	601 feet or more	N.A.	$84.71	N.A.	N.A.	N.A.	$84.71

City of Sandy
Proposed Residential Rates Effective March 1, 2022

Hoodview Disposal & Recycling, Inc.

Miscellaneous Charges

Service Type	Description	Operating and Solid Waste Components Rate Factor	Tipping Fee Component: Operating Component	Tipping Fee Component: Solid Waste Disposal	Tipping Fee Component: Recyclable Materials Processing	Tipping Fee Component: Yard Debris Processing	Total Rate
Call back charge	Extra fee paid if customer did not set Receptacles Curbside for Collection before Company's vehicle passes customer's house and customer requests Company to return to Premises to pick-up materials	N.A.	$8.06	N.A.	N.A.	N.A.	$8.06
Restart service	Extra fee paid if customer stops and than restarts Collection services more than once during the year or when service is reinstated after it has	N.A.	$14.12	N.A.	N.A.	N.A.	$14.12
Cart delivery/pick-up	Extra fee paid if customer requests a change in Cart size more than once per	N.A.	$18.87	N.A.	N.A.	N.A.	$18.87
Cart replacement	Extra fee paid if customer requires Cart replacement (one replacement per year at no cost)	N.A.	$70.00	N.A.	N.A.	N.A.	$70.00
Hourly fee for services	Truck and one person	N.A.	$84.63	Actual costs billed to customer	N.A.	N.A.	$84.63
Hourly fee for services	Truck and two persons	N.A.	$114.30	Actual costs billed to customer	N.A.	N.A.	$114.30
Tire collection	Fee per tire for 18" and under rim size, tire off the rim	N.A.	$10.09	$2.50	N.A.	N.A.	$12.59
Tire collection	Fee per tire for 18" and under rim size, tire on the rim	N.A.	$10.09	$4.69	N.A.	N.A.	$14.77
Furniture and recyclable appliances	Fee per item Collected		$6.00 to $40.00 based on weight and need for special handling. If item not easily accessible, hour rate applies. Freon removal charged for air conditions and refrigerators will be added onto rate.				

City of Sandy
Proposed Commercial Rates Effective March 1, 2022

Hoodview Disposal & Recycling, Inc.

Type of Service	Receptacle	Service Frequency (Pick-Ups/Week)	Rate Factor	Operating Component	Tipping Fee Component: Solid Waste Disposal	Tipping Fee Component: Recyclable Materials Processing	Total Rate
Regularly Scheduled Cart Services*							
Solid Waste	One 35-gallon cart	1	1.00	$22.66	$6.94	$3.00	$32.60
Solid Waste	Two 35-gallon carts	1	2.00	$45.32	$13.88	$6.00	$65.20
Solid Waste	One 60-gallon cart	1	1.62	$36.61	$11.21	$4.85	$52.67
Solid Waste	Two 60-gallon carts	1	3.10	$70.28	$21.53	$9.30	$101.11
Solid Waste	One 90-gallon cart	1	1.75	$39.60	$12.13	$5.24	$56.98
Solid Waste	Two 90-gallon carts	1	3.36	$76.03	$23.29	$10.07	$109.39
Solid Waste	Additional 90 gallon cart	1	1.67	$37.76	$11.57	$5.00	$54.33
Regularly Schedule Container Services*							
Solid Waste	1 cubic yard container	1	1.00	$106.04	$32.72	$15.00	$153.76
Solid Waste	1 cubic yard container	2	1.90	$201.47	$62.17	$28.50	$292.14
Solid Waste	1 cubic yard container	3	2.85	$302.21	$93.25	$42.75	$438.21
Solid Waste	1 cubic yard container	4	3.80	$402.95	$124.33	$57.00	$584.28
Solid Waste	1 cubic yard container	5	4.75	$503.68	$155.41	$71.25	$730.35
Solid Waste	1 cubic yard container	6	5.70	$604.42	$186.50	$85.50	$876.42
Solid Waste	1.5 cubic yard container	1	1.39	$146.93	$45.33	$20.78	$213.05
Solid Waste	1.5 cubic yard container	2	2.58	$273.74	$84.46	$38.72	$396.92
Solid Waste	1.5 cubic yard container	3	3.81	$404.15	$124.70	$57.17	$586.03
Solid Waste	1.5 cubic yard container	4	5.04	$534.51	$164.93	$75.61	$775.05
Solid Waste	1.5 cubic yard container	5	6.26	$663.57	$204.75	$93.87	$962.18
Solid Waste	1.5 cubic yard container	6	7.90	$837.49	$258.41	$118.47	$1,214.37
Solid Waste	2 cubic yard container	1	1.68	$177.88	$54.88	$25.16	$257.92
Solid Waste	2 cubic yard container	2	3.22	$341.13	$105.26	$48.26	$494.65
Solid Waste	2 cubic yard container	3	4.76	$504.28	$155.60	$71.33	$731.21
Solid Waste	2 cubic yard container	4	6.30	$667.54	$205.97	$94.43	$967.93
Solid Waste	2 cubic yard container	5	7.83	$830.74	$256.33	$117.51	$1,204.58
Solid Waste	2 cubic yard container	6	9.56	$1,013.89	$312.84	$143.42	$1,470.15
Solid Waste	3 cubic yard container	1	2.30	$244.33	$75.39	$34.56	$354.28
Solid Waste	3 cubic yard container	2	4.39	$465.22	$143.55	$65.81	$674.58
Solid Waste	3 cubic yard container	3	6.61	$701.26	$216.38	$99.20	$1,016.84
Solid Waste	3 cubic yard container	4	8.85	$938.19	$289.48	$132.71	$1,360.39
Solid Waste	3 cubic yard container	5	11.08	$1,175.01	$362.55	$166.21	$1,703.77
Solid Waste	3 cubic yard container	6	13.13	$1,392.66	$429.71	$197.00	$2,019.38

City of Sandy
Proposed Commercial Rates Effective March 1, 2022

Hoodview Disposal & Recycling, Inc.

Type of Service	Receptacle	Service Frequency (Pick-Ups/Week)	Rate Factor	Operating Component	Tipping Fee Component: Solid Waste Disposal	Tipping Fee Component: Recyclable Materials Processing	Total Rate
Solid Waste	4 cubic yard container	1	2.97	$315.16	$97.24	$44.58	$456.98
Solid Waste	4 cubic yard container	2	5.15	$545.87	$168.43	$77.22	$791.52
Solid Waste	4 cubic yard container	3	7.68	$814.11	$251.20	$115.16	$1,180.47
Solid Waste	4 cubic yard container	4	10.21	$1,082.16	$333.90	$153.08	$1,569.15
Solid Waste	4 cubic yard container	5	12.74	$1,350.46	$416.69	$191.03	$1,958.18
Solid Waste	4 cubic yard container	6	16.94	$1,796.40	$554.28	$254.11	$2,604.80
Solid Waste	6 cubic yard container	1	4.22	$447.06	$137.94	$63.24	$648.23
Solid Waste	6 cubic yard container	2	8.17	$866.24	$267.28	$122.54	$1,256.06
Solid Waste	6 cubic yard container	3	12.12	$1,285.37	$396.60	$181.82	$1,863.79
Solid Waste	6 cubic yard container	4	16.07	$1,704.49	$525.93	$241.11	$2,471.53
Solid Waste	6 cubic yard container	5	20.03	$2,123.62	$655.25	$300.40	$3,079.27
Solid Waste	6 cubic yard container	6	24.03	$2,548.22	$786.26	$360.46	$3,694.94
Solid Waste	8 cubic yard container	1	5.62	$596.07	$183.92	$84.32	$864.31
Solid Waste	8 cubic yard container	2	10.89	$1,154.99	$356.37	$163.38	$1,674.74
Solid Waste	8 cubic yard container	3	16.16	$1,713.82	$528.80	$242.43	$2,485.06
Solid Waste	8 cubic yard container	4	21.43	$2,272.65	$701.23	$321.48	$3,295.37
Solid Waste	8 cubic yard container	5	26.70	$2,831.49	$873.66	$400.54	$4,105.69
Solid Waste	8 cubic yard container	6	32.04	$3,397.62	$1,048.35	$480.62	$4,926.58

*Note that the rates provided herein shall be for basic collection services; and therefore, shall include collection of solid waste at the service level noted and collection of recyclable materials in receptacles selected by customer.

Other Services

Compacted Container Service	1 to 8 cubic yard container	1 to 6 pick-ups per week	N.A.	Rates for compacted containers shall equal 3 times the container rate listed above.			
Extra can or bag of Solid Waste collected on customer's regularly scheduled collection day	32-gal can or bag	Per occurrence	N.A.	$6.87	$1.60	N.A.	$8.47
Extra pick-up for on-call service or overage pick-up service for regular container customers	1 to 8 cubic yard container	Per cubic yard per occurrence	N.A.	$22.96	$7.56	N.A.	$30.51
Push/pull	N.A.	Per Month	N.A.	$16.14	N.A.	N.A.	$16.14
Lock/unlock	N.A.	Per Month	N.A.	$16.14	N.A.	N.A.	$16.14
Steam cleaning	N.A.	Per occurrence	N.A.	$80.67	N.A.	N.A.	$80.67

Note: Miscellaneous charges listed on the residential rate sheet apply to commercial customers as appropriate

City of Sandy

Proposed Drop Box Rates Effective March 1, 2022

Hoodview Disposal & Recycling, Inc.

Type of Service	Receptacle	Service Frequency	Operating Component	Tipping Fee Component	Total Rate
Regularly Scheduled Collection Service (Monthly Rate not including rental & delivery fees which are charge					
All Material Types	10 cubic yard drop box	1 pickup/week	$136.36	Company to bill customer actual tipping cost	$136.36
All Material Types	20 cubic yard drop box	1 pickup/week	$136.36		$136.36
All Material Types	30 cubic yard drop box	1 pickup/week	$166.36		$166.36
All Material Types	40 cubic yard drop box	1 pickup/week	$166.36		$166.36
On-Call Collection Service (Per Pick-Up Rate not including rental and delivery fees which are charged separ					
All Material Types	10 cubic yard drop box	On-call pickup	$175.03	Company to bill customer actual tipping cost	$175.03
All Material Types	20 cubic yard drop box	On-call pickup	$175.03		$175.03
All Material Types	30 cubic yard drop box	On-call pickup	$213.54		$213.54
All Material Types	40 cubic yard drop box	On-call pickup	$213.54		$213.54
Rental Service					
Rental	All drop box sizes	Per day**	$10.70	N.A.	$10.70
Rental	All drop box sizes	Per month**	$107.00	N.A.	$107.00
** Customer receives two days of drop box use at no cost; rental fee charged per day for each day in excess of the first two days of use. Total charge shall be based on the per-day rate or per-month rate whichever is less.					
Delivery Service					
Delivery	All drop box sizes	Initial delivery to collection site	$33.83	N.A.	$33.83

Staff Report

Meeting Date:	February 22, 2022
From	Jenny Coker, Public Works Director
SUBJECT:	Award Contract for Design Services for Basins 6 & 7 Collection System Rehabilitation Project

DECISION TO BE MADE:
Whether to award a contract for design and construction management services for for rehabilitation of Basins 6 & 7 of the City's wastewater collection system

PURPOSE / OBJECTIVE:
To design and manage additional projects to reduce inflow & infiltration into the City's wastewater system

BACKGROUND / CONTEXT:
Staff solicited proposals on January 11th for firms to provide design, construction management and related services for the Basin 6 & 7 Collection System Rehabilitation Project. Proposals were due on Tuesday, January 25th. We received one proposal from Leeway Engineering Solutions. Basins 6 is located north of Hwy 26 roughly between Bluff Rd. and Ten Eyck Rd. Basin 7 is located south of Hwy 26 and is roughly bounded by University Ave. on the west, Hwy 211 on the east and Miller St. on the south. Maps showing the extent of each basin are attached.

These two basins were identified as the third and fourth largest sources of Inflow & Infiltration (I&I) during collection system flow monitoring performed in 2018 as part of the facilities planning effort.

KEY CONSIDERATIONS / ANALYSIS:
Leeway Engineering Solutions performed these same services for the City on the Basins 2 & 8 Collections System Rehabilitation Project last summer. This project is wrapping up now and the partnership between the City, Leeway and the contractor was very successful.

Leeway's proposed fee for the desired services is $226,634. Staff has reviewed the proposal and fee estimate and found it to be in line with the work they performed for the Basins 2 & 8 project and reasonable for the quantity and quality of services to be provided. Getting the design underway at this time of year will allow us to solicit proposals for a Construction Manager/General Contractor in May (the Council will review the staff recommendation and award a contract for construction services at that time). This should allow us to begin construction as early as July 2022.

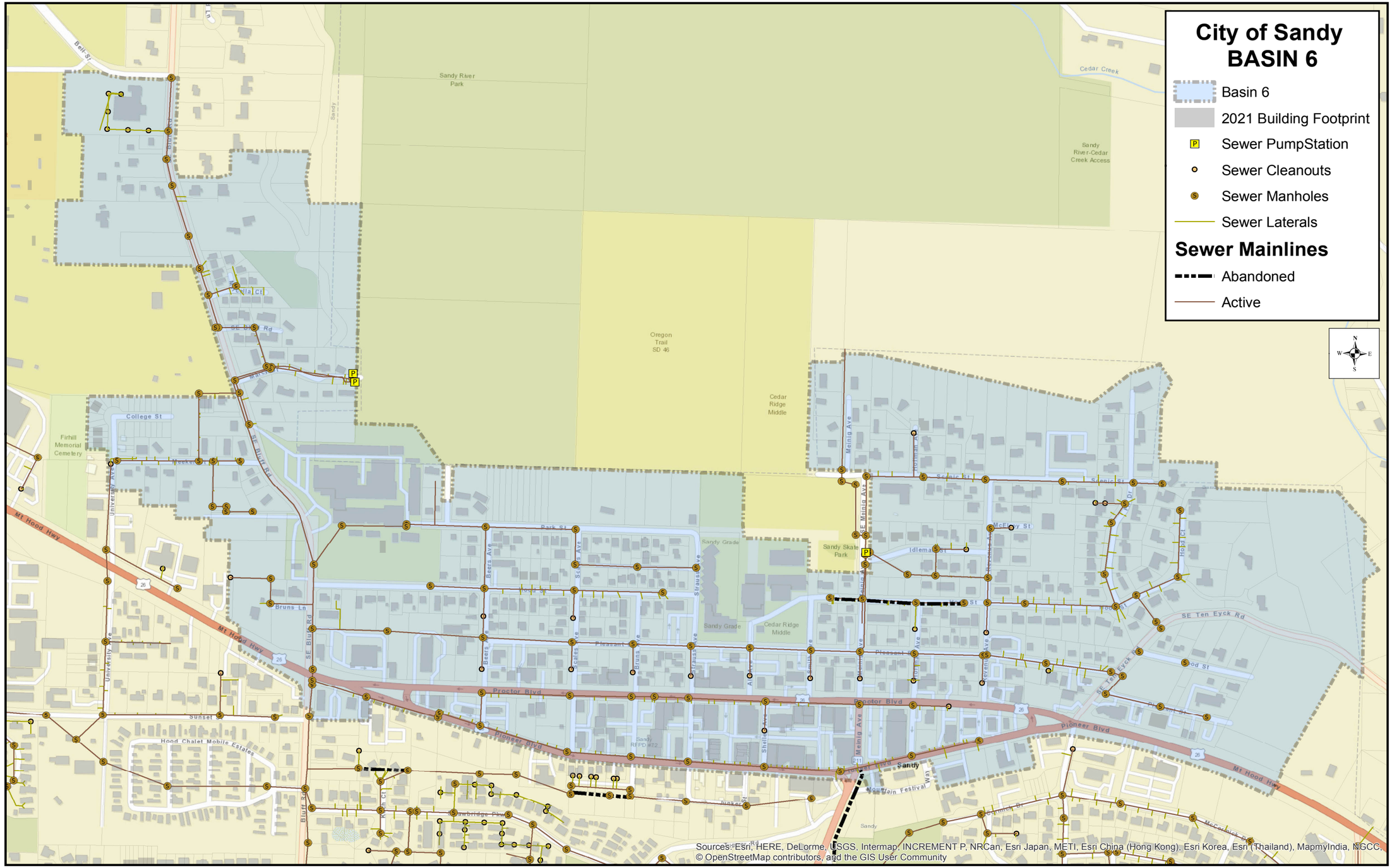
The services include updating and calibrating the City's existing collection system model and comparing pre and post-rehabilitation flows to determine the effectiveness of the work and the extent of I&I reduction. This information will be important in the ongoing negotiations with regulators regarding system capacity.

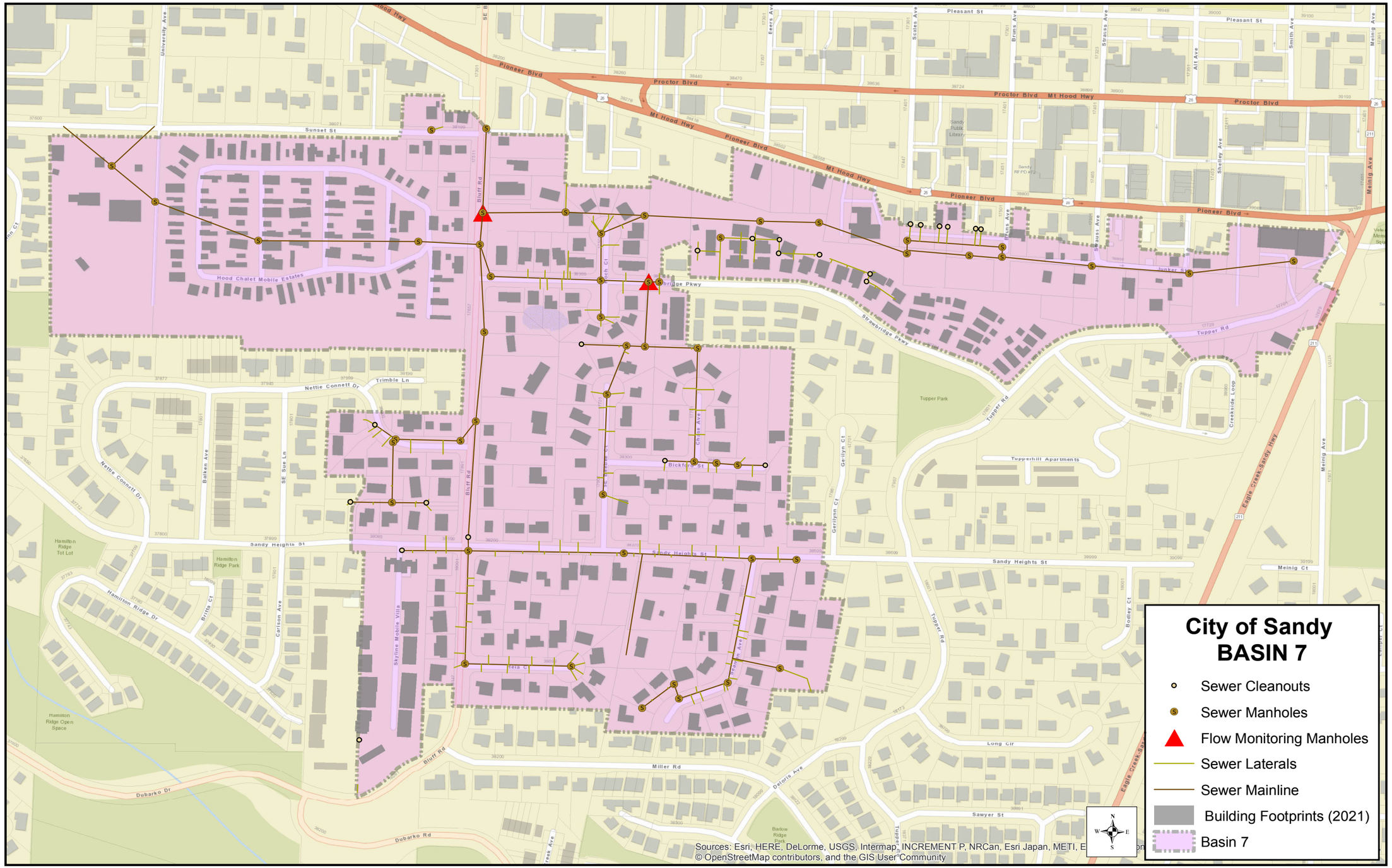
RECOMMENDATION:
Award the contract and authorize the City Manager to enter into an agreement with Leeway Engineering Solutions for an amount not to exceed $226,634.

BUDGETARY IMPACT:
There are sufficient funds in the current fiscal year budget.

SUGGESTED MOTION LANGUAGE:
"I move to award the contract for design, construction management, and related services for the Basins 6 & 7 Collections System Rehabilitation Project to Leeway Engineering Solutions and authorize the City Manager to enter into an agreement with Leeway Engineering Solutions for an amount not to exceed $226,634."

LIST OF ATTACHMENTS/EXHIBITS:
- Maps of Basins 6 & 7
- Leeway proposal and fee estimate


City of Sandy
BASIN 6
Basin 6
2021 Building Footprint
Sewer PumpStation
Sewer Cleanouts
Sewer Manholes
Sewer Laterals
Sewer Mainlines
Abandoned
Active
N
W
E
S
Sandy River Park
Cedar Creek
Sandy River-Cedar Creek Access
Oregon Trail SD 46
Cedar Ridge Middle
Firhill Memorial Cemetery
College St
Mt Hood Hwy
Proctor Blvd
Pioneer Blvd
Sandy Skate Park
Sandy Grade
Sandy RFPD #72
Hood Chalet Mobile Estates
Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community


City of Sandy
BASIN 7
Sewer Cleanouts
Sewer Manholes
Flow Monitoring Manholes
Sewer Laterals
Sewer Mainline
Building Footprints (2021)
Basin 7
Pioneer Blvd
Proctor Blvd
Mt Hood Hwy
Pleasant St
Sunset St
Bluff Rd
Strawbridge Pkwy
Tupper Rd
Meinig Ave
Sandy Heights St
Miller Rd
Dubarko Dr
Dubarko Rd
Hood Chalet Mobile Estates
Tupper Park
Tupperhill Apartments
Hamilton Ridge Tot Lot
Hamilton Ridge Park
Hamilton Ridge Open Space
Skyline Mobile Villa
Barlow Ridge Park
Sandy Public Library
Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,
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LEEWAY
engineering solutions

Proposal for the City of Sandy, Oregon

ENGINEERING CONSULTING SERVICES FOR THE SANDY WASTEWATER COLLECTIONS SYSTEM BASINS 6&7 REHABILITATION PROJECT

January 25, 2022

LEEWAY
engineering solutions

Section A
Cover Letter

January 25, 2022

Mike Walker, Director of Public Works
39250 Pioneer Blvd, Sandy, OR 97055

RE: **PROPOSAL FOR ENGINEERING CONSULTING SERVICES FOR THE SANDY WASTEWATER COLLECTIONS SYSTEM BASINS 6&7 REHABILITATION PROJECT**

Dear Mr. Walker:

The City of Sandy (City), as part of the largest public works project to date, is seeking a firm to creatively and efficiently provide design and construction management services to assist the City with the next phase of their collection system rehabilitation project, aimed at reducing infiltration and inflow (I/I) which is exacerbating issues at the existing wastewater treatment plant (WWTP). Building on the innovative approach we developed for Basins 2 and 8, the Leeway team is the right team to provide these services because we will bring:

PROVEN APPROACH TO I/I SOURCE IDENTIFICATION AND REMOVAL BOTH NATIONALLY AND SPECIFICALLY HERE IN WESTERN OREGON. Leeway has several successfully completed I/I programs that have demonstrated that I/I reduction is not just possible, but cost-effective and can satisfy regulatory requirements. Rob Lee's participation and leadership resulted in the successful reduction of I/I for a number of NW Oregon communities. As a result, St. Helens and Sweet Home both fulfilled the requirements of their DEQ MAOs after successfully demonstrating 80% reduction in wet-weather volumes and 50% in peak flow at the WWTP (with up to 79% reduction in targeted basins), respectively. This proven boots-on-the-ground experience will be leveraged to the City of Sandy's project.

INNOVATIVE APPROACH TO DESIGN AND CONSTRUCTION. For Basins 2 and 8, Leeway proposed utilizing the Construction Manager/ General Contractor delivery method which resulted in design being completed several months faster than a traditional Design-Bid-Build process and remained under budget despite unprecedented inflation in 2021. We propose a similar approach again, focusing on what we know is a proven approach to obtain actual I/I reductions in a compressed time frame. We understand that I/I reduction must holistically address all components of the collection system, but appropriate use of trenchless methods will minimize disruption to the community. We will do the same for Basins 6 and 7.

INTEGRATION OF THE PROJECT INTO THE LARGER CLEAN WATERS PROGRAM. There are numerous components to the program, and many of the program requirements will apply to each component. Regulatory targets, funding requirements, and downstream impacts to the existing WWTP construction will all need to be considered and quickly incorporated to the Basins 6 and 7 project without impacting schedule. Leeway's engagement will foster seamless communication of these requirements.

Thank you for providing us with the opportunity to submit our qualifications to support this important vital project. We are deeply invested in the program, the involved players, and the City's future, and we look forward to continuing to provide innovative and cost-effective services. I am authorized to represent Leeway in any negotiations and sign any contract that may result. Please contact me at (503) 828-7542 if you would like to further discuss our qualifications or require any clarifications regarding our proposal.

Sincerely,
LEEWAY ENGINEERING SOLUTIONS, LLC

Rob Lee, PE, PMP | Principal Engineer

rob.lee@leewayengineeringsolutions.com
12597 NW Majestic Sequoia Way
Portland, Oregon 97229
p: 503-828-7542
f: 503-716-4752

Section B

Project Understanding and Approach

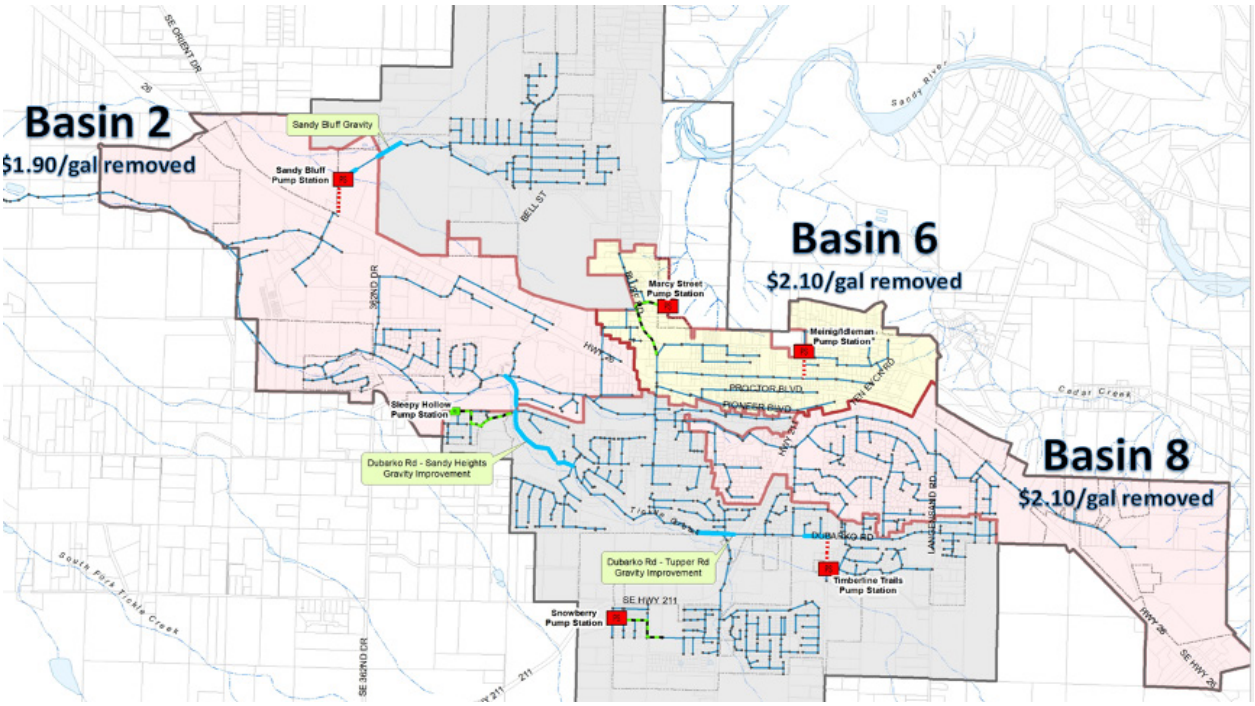
PROJECT UNDERSTANDING

The City of Sandy (City) is in the midst of a multi-year program to address deficiencies in their wastewater system. The City's collection system allows an extremely high rate of infiltration and inflow (I/I) during wet-weather events, overwhelming the wastewater treatment plant (WWTP) and leading to permit violations. This has been an issue both during peak winter storm events but also during the "shoulder season" when the City is not permitted to discharge treated effluent into Tickle Creek. Therefore, as a result of the 2019 Facility Planning effort, the City is taking a balanced approach by addressing both the aging WWTP and the leakiest portions of its collection system.

Traditionally, sewer rehabilitation has focused on structural repair of deteriorating assets, but in the Pacific Northwest, the consultant community has lacked the opportunity to develop an understanding of how to most cost-efficiently reduce excessive I/I. Additionally, many of the contractors who focus on pipelines lack the understanding of how to appropriately apply technologies and focus on watertight repairs.

The City is finalizing a successful project in the design and construction of Basins 2 and 8 using a non-traditional approach to collection system work. Since trenchless rehabilitation work utilizes the existing system as a "form", time-consuming field data such as topographic survey was not needed. At Leeway's recommendation, the City fast-tracked a design using GIS files as the basemap and helped the City procure services for a Construction Manager / General Contractor (CM/GC) in order to bring a rehabilitation contractor into the design effort. This resulted in an extremely successful project, with a streamlined and right-sized design effort and contractor input into the most appropriate construction technologies for the pipes. Additionally, this approach was the perfect fit to handle the complexities of addressing and rehabilitating the private laterals.

FIGURE 1. **BASIN 6 AND 7 ARE THE NEXT HIGHEST PRIORITY BASINS FOR I/I REDUCTIONS**



As the City progresses with their complex and multi-faceted program, the City is directing their attention to the next two leakiest basins, Basins 6 and 7. These basins consist of some of the oldest pipe in the City, a portion of which has already been rehabilitated with cured-in-place pipe (CIPP). In addition, the work in Basins 6 and 7 will be impactful of commercial properties, within ODOT right-of-way, and manufactured home parks (MHPs).

PROJECT APPROACH

Leeway is excited about the prospect of building on the success of Basins 2 and 8 and applying lessons learned to Basins 6 and 7 and beyond. Based on our extensive history on the City's program, our understanding of the needs of this project, and our expertise in successful I/I programs in Oregon, we have identified three primary objectives for this project. We have identified the major challenges facing successful completion of these objectives, and we have identified unique approaches to overcome these challenges. These are listed in Table 1 below:

TABLE 1. **PROJECT OBJECTIVES, CHALLENGES, AND APPROACHES**

BASIN 6 AND 7 PROJECT GOALS	CHALLENGE	APPROACH
Meaningful I/I Reductions	Inexperienced I/I design firms often rely on a "find-and-fix" approach	Holistic approach to sewer system rehabilitation (public and private) leads to attainable and cost-effective reductions
Fast-tracked design that results in completion of construction by October 2022	Traditional sewer rehabilitation design requires time-intensive field investigations (CCTV, survey)	Innovative use of GIS for plan development and proven experience with CM/GC streamlines design efforts and leads to early construction start date
Integration of project into greater "Clean Waters" wastewater program	Multi-faceted program requires significant amount of limited City staff time	Leeway team acting essentially as "extension of staff" will ensure seamless integration of Basin 6 and 7 into overall program, such as WIFIA and ARPA disbursements, DEQ/EPA interactions, and coordination with WWTP improvements

Approach to Goal 1:
HOLISTIC REHABILITATION TO GAIN MEANINGFUL I/I REDUCTIONS

Leeway team members have worked on I/I projects and programs for the last 25 years. Three of these programs were able to achieve the I/I reductions that were required by federal consent decrees or state orders. Through these programs and extensive research examining successful programs nationally, a holistic rehabilitation approach is by far the most important method of attaining meaning I/I reductions. This means addressing not only the public component of the collection systems (i.e., manholes, sewer mains, and laterals in the right-of-way), but also the private portion of the laterals. It has been consistently shown that including the private laterals will result in significantly more cost-effective reductions, and the early results indicate the same for Basins 2 and 8.

FIGURE 2. **ADDRESSING LATERAL CONNECTIONS IS A KEY TO EFFECTIVE I/I REDUCTIONS**

Our approach will evaluate the entirety of both Basins 6 and 7 during the predesign (30%) stage and ensure all pathways for I/I are addressed in a cost-effective manner, including the private sources of I/I. We will work hand-in-hand with City staff such as Ryan Wood and Thomas Fisher to identify and design solutions including private I/I sources from commercial properties and MHPs, as we did for Basins 2 and 8. This is the same approach our team members have done for other successful I/I programs, such as in Sweet Home and New Castle County . We know what is at stake for the City, and I/I reductions are critical for the longevity and sustainability of the program.

Approach to Goal 2:

COMPLETE CONSTRUCTION BY OCTOBER 2022 THROUGH RIGHT-SIZED DESIGN AND CM/GC CONTRACTOR ENGAGEMENT

As stated previously, trenchless rehabilitation utilizes the existing pipe as a form and therefore can be designed and constructed without the need for topographic survey and, in most cases, without the need for geotechnical investigations. Leeway proposes to utilize the same GIS-based approach to design drawings as was done for Basins 2 and 8. However, Basins 6 and 7 construction will be complicated by work on private property and additional coordination will be needed with other stakeholders such as ODOT. In order to meet the October 2022 deadline, the design of Basins 6 and 7 must be closely coordinated with the construction contractor so that the correct construction methods are selected, permitted, and approved prior to construction.

We will help develop the CM/GC RFP and we will help the City select the most qualified construction contractor to make this project a success. This will provide multiple benefits to the City:

- Procure construction materials early via the CM/GC contractor, which has been particularly problematic with current supply chain issues
- Reduce of the possibility of construction changes in the field, reducing any additional permitting or third-party agency coordination
- Inspect laterals and confirm methodology during design to reduce any surprises to private property owners during construction

FIGURE 3. **REMOVAL OF I/I IN BASINS 6 AND 7, SUCH AS THIS LEAKING CATCH BASIN, WILL REQUIRE CLOSE COORDINATION WITH OTHER STAKEHOLDERS, LIKE ODOT**

Leeway's team has a reputation for working closely, collaboratively, and fairly with construction firms, and this working style is essential for successful CM/GC.

> *My experience working with Rob Lee has always been positive. This is echoed by my colleagues at Michels who also have had the opportunity to work with him over the years. We consider Rob to be the gold standard of design engineers in the cured-in-place pipe industry. His experience and knowledge of the CIPP technology allow him to apply common sense solutions to challenging problems.*
>
> **Sam Rogers,** Michels Corporation,
> Sr. Project Manager, West Region

Approach to Goal 3:

LEVERAGE OTHER LEEWAY PROGRAMMATIC WORK TO ENSURE SEAMLESS INTEGRATION OF BASIN 6 AND 7 INTO THE LARGER PROGRAM

During the same time as the design and construction work on Basins 6 and 7, the Clean Waters program will continue to move forward. Leeway will ensure that this project, which will have so many overlapping aspects, will be integrated into the full program. There are a number of reasons why this will be beneficial:

- Construction expenditures during the summer of 2022 will be significant with both Collection System and WWTP construction occurring, and Leeway will help ensure that reimbursements from other agencies (e.g., ARPA, WIFIA, CWSRF, etc.) are expedited to help manage the City's cashflow.
- Communication to both internal City residents and third-party stakeholders will be increasingly important, particularly as the NPDES permitting process accelerates and Phase 1A nears completion.
- Building confidence with regulators such as DEQ and EPA, who already are engaging with the City in an unprecedented manner and asking for bi-weekly updates.

Leeway is proposing to a design team that is engaged but distinct from the Owner's Representation team. This will allow the fast-track design effort while having a team that also can focus on Owner's Representation services. Zach Swartzendruber will be the design lead, leveraging his 10 years of sewer design and rehab experience to the team while Rob Lee focuses on project management and serving as a technical advisor for the Basin 6 and 7 project. Yarrow Murphy will continue to provide hydraulic modeling and GIS support, and Brittany Park will continue to lead the coordination with reimbursements and communication.

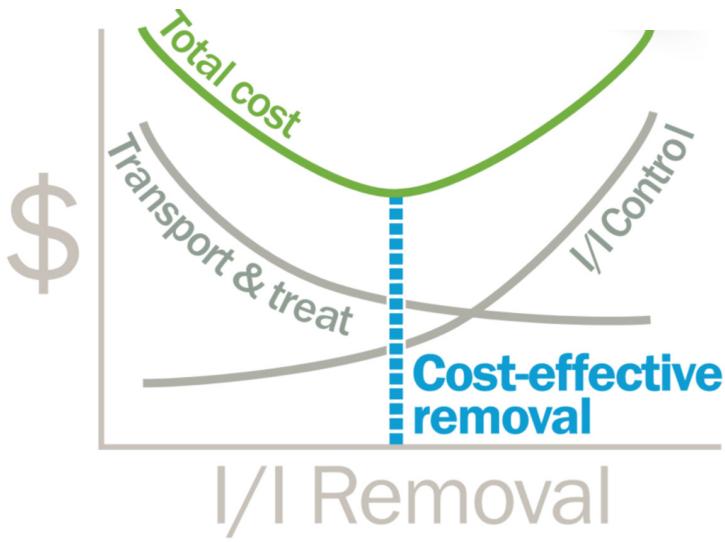
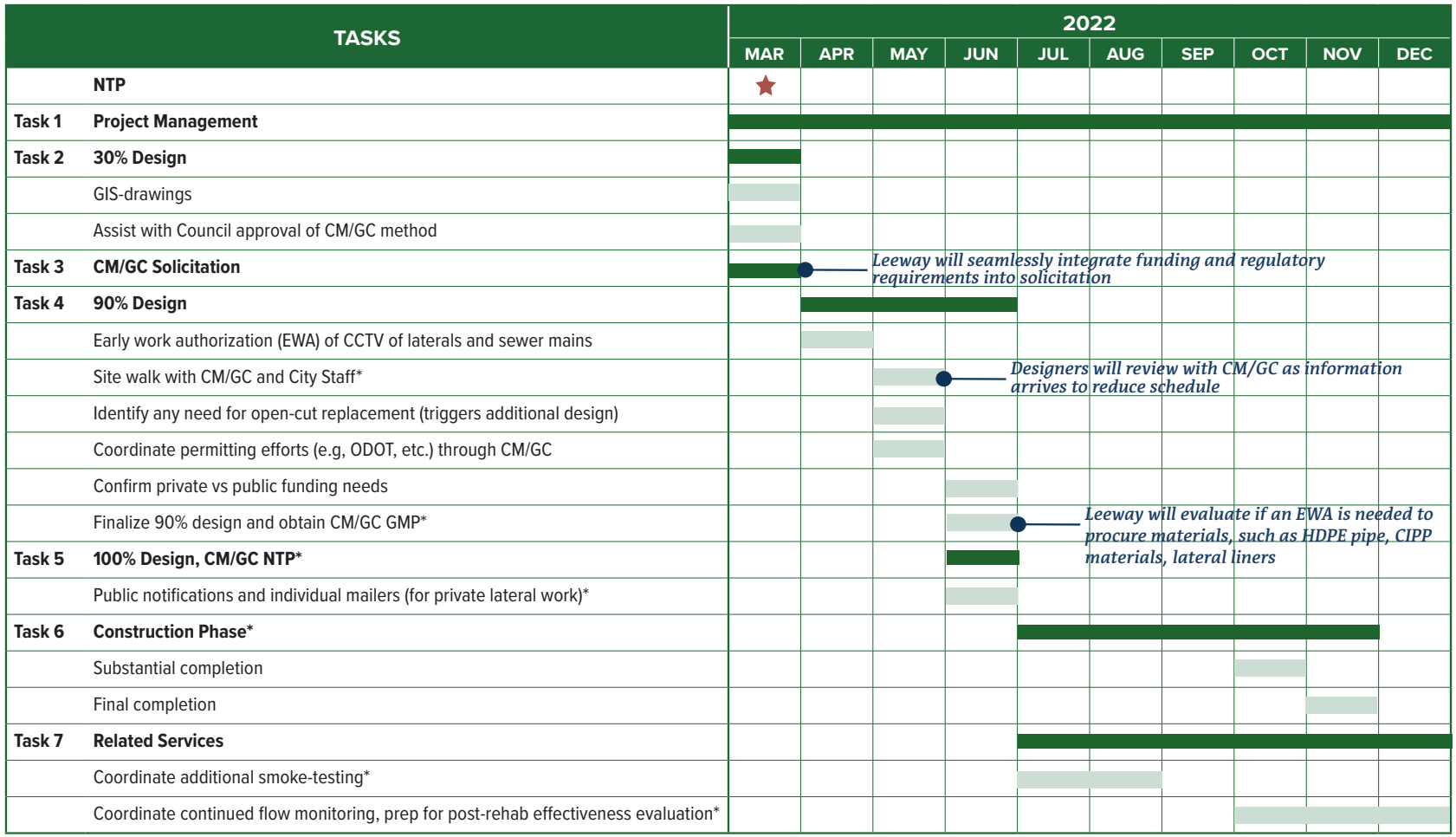


FIGURE 4. **OUR TEAM RECOGNIZES THAT A SUCCESSFUL PROGRAM REQUIRES A BALANCED APPROACH THAT FOCUSES ON I/I REMOVAL AND TREATMENT**

By providing this type of team structure, we are uniquely positioned to help the City deliver a successful Basin 6 and 7 project while also continuing to provide the guidance and support the City needs to complete Phase 1A of the Clean Waters program.

PROPOSED PROJECT SCHEDULE

Our team has developed a schedule that highlights the above approach to the project. The schedule has been developed assuming approval for a CM/GC approach by City Council and rapid approvals by outside approvers (e.g., DEQ, etc.). We are excited to discuss and customize this schedule to meet the City's needs and constraints.

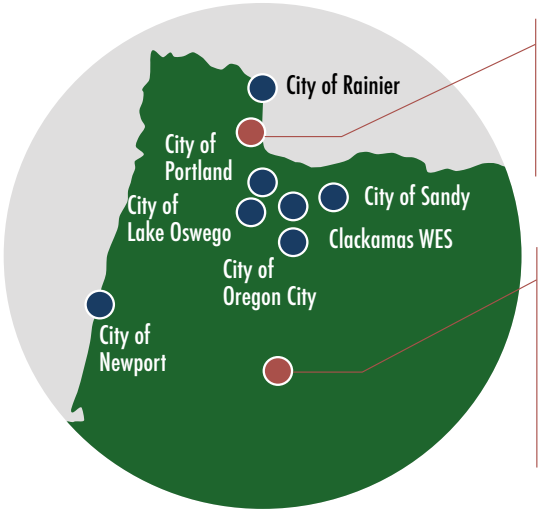


** Denotes City Staff Involvement*

Section C

Firm Profile

Leeway Engineering Solutions (Leeway) was founded in 2019 on decades of experience in the public works consulting sector. Our staff of 7 professionals have successfully delivered projects and programs for the water and wastewater agencies in the Pacific Northwest (PNW), including large agencies such as the City of Portland, Seattle Public Utilities, and Clackamas Water Environment Services and smaller communities such as the City of Sandy, the City of St. Helens, and the City of Rainier. Leaning on technical expertise and management skills obtained from working for national consulting firms, Leeway provides the highest level of technical expertise with an emphasis on client-attentiveness and cost-effective delivery.



City of St. Helens

Completed requirements of DEQ MAO, 80% reduction in wet-weather volumes

City of Sweet Home

Completed requirements of DEQ MAO, 50% reduction in peak wet-weather flows at WWTP, up to 77% reduction in individual basins

In the last two years, Leeway has or is currently working on a number of I/I projects and programs, all in the Willamette Valley. These projects are for clients such as Oregon City, the City of Rainier, Clackamas WES and Gladstone, Roseburg Urban Sanitary Authority, and the City of Salem. The Leeway team will lean on lessons learned from numerous successful recently completed or ongoing I/I programs and sewer collection system rehabilitation projects to bring the best technical solutions for the City of Sandy's Basins 6 and 7 Rehabilitation Project. I/I projects and programs are tremendously exciting, because they can result in real results that often seem unattainable during the planning stage. Table 2 below illustrate that success.

TABLE 2. **SUCCESSFULLY COMPLETED I/I PROJECTS AND PROGRAMS**

PROJECT NAME	PROJECT ELEMENTS: TARGETED I/I REDUCTION PROJECT	MULTI-YEAR/ MULTI-PHASE PROJECT	SEWER MAIN REHAB	MANHOLE REHAB	PUBLIC LATERAL REHAB	PRIVATE PROPERTY LATERAL OR OTHER WORK	STORMWATER IMPROVEMENT	USE OF TRENCHLESS TECHNOLOGIES	I/I REDUCTION
Sweet Home I/I Program*	■	■	■	■	■	■	■	■	50% to 77% reduction of peak flow
St. Helens I/I Program*	■	■	■	■	■	■	■	■	80% reduction of wet-weather volumes
New Castle County I/I Program*	■	■	■	■	■	■	■	■	55% of peak wet-weather flow; 73% of wet-weather volumes
BES Large Scale Sewer Rehab	■	■	■	■	■	■		■	71% reduction of peak flow in Hillsdale subbasin

** Led by Rob Lee with previous firm*

Our firm has the qualifications and ability to provide the required professional services to complete the Basin 6 and 7 rehabilitation project. Table 3 highlights our firm's experience and qualifications for this project.

TABLE 3. **FIRM EXPERIENCE AND QUALIFICATIONS FOR I/I REHABILITATION PROJECTS**

	PROJECT ELEMENTS											
PROJECT NAME	**SMOKE TESTING**	**FLOW MONITORING**	**CCTV AND CONDITION ASSESSMENT**	**MANHOLE REHABILITATION**	**PRIVATE LATERALS**	**PUBLIC INVOLVEMENT**	**ROW AND ENVIRONMENTAL PERMITTING**	**DESIGN**	**ALTERNATIVE DELIVERY**	**CONSTRUCTION SUPPORT**	**POST-REHAB EFFECTIVENESS EVALUATION**	**REGULATORY COMPLIANCE SUPPORT**
Sandy Basin 2 and 8	■	■	■	■	■	■	■	■	■	■	■	■
Clackamas WES Mt. Talbert and Gladstone I/I Project	■	■	■	■		■	■					■
BES Large Scale Sewer Rehabilitation Program		■	■	■	■	■	■	■	■	■	■	
Rainier I/I Study	■	■	■	■		■	■					■
Oregon City I/I Program Support	■	■	■		■	■	■				■	
Sweet Home I/I Program*	■	■	■	■	■	■	■	■		■	■	■
St. Helens I/I Program*		■	■	■	■	■	■	■		■	■	■
New Castle County CSO Elimination Program*	■	■	■	■	■	■	■	■		■	■	■

** Led by Rob Lee with previous firm*

Leeway will leverage our extensive experience with I/I and wastewater planning projects, collection system predesign and design efforts, and commitment from the highest level of ownership and leadership to deliver a tremendously successful project for the City.

> *Rob provided valuable leadership to the BES LSSRP Program. His mixture of solid technical abilities combined with his collaborative and communicative approach was a tremendous asset in reenergizing this vital $250M+ program. He is an asset on any public works project and we look forward to working with him again.*
>
> **James Allison**, Large Scale Sewer Rehabilitation Program Manager,
> Bureau of Environmental Services, City of Portland, Oregon

Section D

Project Team Qualifications

Delivering the City's Basins 6 and 7 Rehabilitation Project will require skilled execution of several unique elements. As Section C – Firm Profile illustrates, our firm has the qualifications to help successfully complete all aspects of this project for the City. However, more than the firm, it is the key members assigned to the project that need to be able to deliver the project. Our proposed team members have the expertise, capacity, and flexibility to think outside the box, have boots on the ground during design and construction to ensure quality and address private homeowner concerns, and properly develop solutions to reduce I/I and extend collection system life.

The Leeway team was developed to bring the perfect mix of skills, the right level of resources, as well as the client-focus and attention to make the project a success. Our proposed project manager, Rob Lee, will provide the leadership necessary to allocate the right resources for your project in a highly responsive manner. His unmatched I/I expertise and firsthand knowledge of I/I reduction in Oregon means that you will have a plan to maximize identification of I/I sources within the City's schedule and budget. Even though alternative delivery projects have traditionally been utilized on vertical public works projects (e.g., buildings, treatment plants, etc.), our team members have worked on several horizontal alternative delivery projects.

EXAMPLES OF OUR TEAM MEMBERS ALTERNATIVE DELIVERY EXPERIENCE INCLUDES:

- **City of Sandy Basin 2 and 8 Rehabilitation Project, CM/GC** *(Rob Lee and Brittany Park)*
- **City of Sandy Existing WWTP Condition Assessment Improvements Project, CM/GC** *(Rob Lee and Brittany Park)*
- **City of Portland Downtown-Old Town Sewer Rehabilitation Project, CM/GC** *(Rob Lee and Zach Swartzendruber)*
- **City of Salem Cured-in-Place Pipe Contracts, IDIQ** *(Rob Lee)*
- **Fairfax County Storm Sewer Rehabilitation Contracts, IDIQ** *(Rob Lee)*
- **City of Bend, Solids Handling Improvements Project, CM/GC** *(Brittany Park)*

ORGANIZATION CHART

Presented herein is the proposed organizational chart for our team. Because of the fast-tracked nature of the project and our agreement that the City would be best served by having the project be delivered using CM/GC, we are proposing a nimble team that will meet the project goals.

No subconsultants are proposed.

KEY PERSONNEL BIOS

The following are brief bios of our key team members for the project. Abbreviated resumes are include in Appendix. Full resumes are available upon request.

ROB LEE, PE, PMP | *Project Manager* | *Availability: 20%*

"It is a pleasure working with Rob. His expertise .. and his ability to listen to the client and produce quality bid documents that address project constraints and team concerns was outstanding."

M. Patty Nelson, PE,
Senior Engineer,
City of Portland

Rob has almost 25 years of experience, all on the private consulting focused on municipal projects and programs. He is a nationally recognized expert in collection system rehabilitation who focuses his attention locally in the Pacific Northwest. Rob served as project manager for the Sweet Home I/I Abatement Program (per DEQ, the most successful I/I Program in Oregon).

Prior to returning to his Oregon roots, Rob worked for a large, national firm on the east coast as assistant program manager on a 24-year $250M consent degree program reducing SSOs, predominately through SSES prioritization and I/I abatement. He has supported a number of rehabilitation programs in Oregon, including assisting the City of Oregon City in developing their I/I program and the City of Portland Large-Scale Sewer Rehabilitation Program, which is Oregon's largest and most aggressive sewer rehabilitation program.

RELEVANT PROJECT EXPERIENCE

- Mt Talbert and Gladstone I/I Project, Clackamas County WES, OR, Project Manager
- 2021 I/I Rehabilitation Project, City of Sandy, OR - Project Manager and Design Lead
- 2020 I/I Program Support, Clackamas County WES, OR - Project Manager
- I/I Abatement Program, City of Sweet Home, OR - Project Manager
- I/I Program Development, City of Oregon City, OR - Project Manager
- I/I Characterization, City of St. Helens, OR - Technical Lead
- Large-Scale Sanitary Sewer Rehabilitation Program, City of Portland BES, OR - Technical Lead
- South Brandywine I/I Reduction Program, New Castle County, DE - Assistant Program Manager

ZACH SWARTZENDRUBER, PE | *Design Lead* | *Availability: 40%*

Zach is a 10-year engineer who has spent a majority of his career focused on sewer system rehabilitation design. Zach has worked on over a dozen sewer rehabilitation and new installation design projects, including being the primary designer on the design team for the Portland BES Main-Taylor CM/GC sewer rehabilitation project. Zach will lend his familiarity with rehabilitation technologies, his understanding of the capabilities and limitations of the local contracting community, and his collaborative style to lead a fast-tracked design effort on this project.

RELEVANT PROJECT EXPERIENCE

- Lining Project 21-2, Seattle Public Utilities – Leeway Project Manager
- Large Scale Sewer Rehabilitation Program, City of Portland BES, OR – Design Lead
- Middle Hillsdale Subbasin I/I, City of Portland, OR – Project Engineer
- Franklin / McVay Sanitary Sewer Line Extension, City of Springfield, OR – Staff Engineer

YARROW MURPHY, PE | *Hydraulics and GIS Lead* | *Availability: 35%*

Yarrow will provide support on the collection system and I/I reduction aspects of Phase 1A. She was the mastermind behind using GIS files to efficiently and expediently create the Basins 2 and 8 plan set, and she'll do the same on this subsequent project. As the lead collection system modeler on the City's 2019 Facility Plan, Yarrow will work with City staff to efficiently recalibrate the model after the completion of the Phase 1A collection system rehabilitation work in Basins 2 and 8. The updated model will demonstrate effectiveness of the I/I work as well as project peak flows that will need to be handled by future aspects of the program.

RELEVANT PROJECT EXPERIENCE

- Basin 2 and 8 Rehabilitation Project, City of Sandy – Task Lead
- Large Scale Sewer Rehabilitation Program, City of Portland BES, OR – Hydraulics Lead
- Mt. Talbert and Gladstone I/I Reduction Project, Clackamas WES, OR – Hydraulics and Implementation Lead
- I/I Program Development, City of Rainier, OR – Project Manager

BRITTANY PARK, PE | *CM/GC RFP and Funding Coordination* | *Availability: 15%*

Brittany has the perfect skill set and experience for leading the development of the CM/GC solicitation and selection, and for streamlining and coordinating funding requirements and reimbursements during construction. Having been the initial author of the CM/GC solicitations for Basins 2 and 8 and the work at the existing WWTP, Brittany will be able to leverage past documents and quickly assist the City through this process. Her familiarity and experience working federally-funded projects will be a tremendous benefit to the City.

RELEVANT PROJECT EXPERIENCE

- Basin 2 and 8 Rehabilitation Project, City of Sandy – CM/GC Lead
- Clean Waters Program Owner's Representation Services, City of Sandy – WWTP Improvements Lead

PROJECT MANAGER REFERENCES

James Allison,
Program Manager
City of Portland, OR

1120 SW Fifth Avenue, Suite 613
Portland, OR 97204

P: 503-823-4921
E: james.allison@portlandoregon.gov

Jessica Rinner,
Project Manager
Clackamas Water Environment Services, OR

150 Beavercreek Rd,
Oregon City, OR 97045

P: 503.742.4551
E: jrinner@clackamas.us

Greg Springman,
Public Works Director
City of Sweet Home, OR

1400 24th Avenue
Sweet Home, OR 97386

P: 541-367-6359
E: gspringman@sweethomeor.gov

> *The Brandywine Hundred Sewer Rehabilitation Program… was aimed at reducing wet weather overflows, primarily through a comprehensive I/I elimination. With Rob's involvement, we were able to complete the program and gain regulatory compliance seven years ahead of schedule and $80M under budget. Rob was instrumental in field investigations, flow analysis, planning, prioritization, project engineering, and program management, which was an essential early component that led to this program's ultimate success. I highly recommend him for any similar program.*

David A. Hofer, PE,
WEF Fellow, former Brandywine Hundred, Program Manager, New Castle County, DE

Section E

Sample Projects

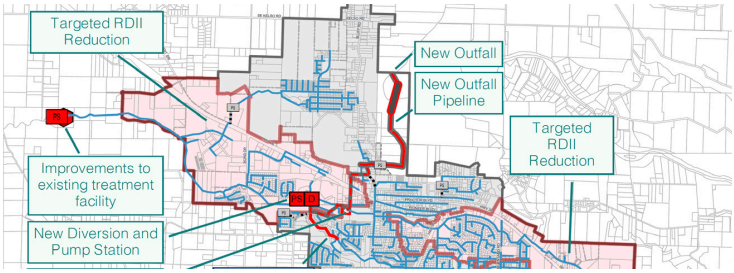
Our team understands that in order to meet the project goals, the City needs a team that has the experience with right rehabilitation techniques, a proven approach to I/I reductions, and familiarity with the innovative approaches required for this project. The following five sample projects illustrate that our team is perfectly suited for the Basin 6 and 7 Rehabilitation project.

I/I STUDY AND REHABILITATION DESIGN, CLEAN WATERS PROGRAM

City of Sandy, OR

REFERENCE

Mike Walker, Director of Public Works
p: 503.668.5533, e: mwalker@ci.sandy.or.us



PROJECT DESCRIPTION

Leeway team members have been intimately engaged in the City's collection system planning and implementation of recommended projects. Rob Lee and Yarrow Murphy were a part of the 2019 Facility Plan, identifying the extreme I/I issues and targeting the leakiest basins. More recently, Rob recommended the use of a simplified design approach to Basins 2 and 8 under a CM/GC construction delivery method, which is just wrapping up. Leeway's team led the design effort and provided construction support services during construction, which appears to have real tangible impacts on I/I reductions. Leeway also wrote the request for proposals for the CM/GC contractor and participated in the selection, and as a CWSRF-funded project, Leeway has been leading the review and submittal of funding reimbursement requests to DEQ.

Part of the success of the project was the close collaboration of the design team with the CM/GC contractor in the selection of rehabilitation construction methods, how to best address the private laterals, and how to distribute the work to complete the majority of the work on a tight schedule. 2021 saw tremendous challenges in supply-chain issues, worker shortages, and unprecedented inflation and price increases, but the use of alternative delivery led to a project that will be finishing under budget.

Leeway will be updating the hydraulic and hydrologic model to assess the true effectiveness and actual I/I reductions gained by this project.

PROJECT DELIVERY METHOD: CM/GC
PROJECT DURATION: 2019 to 2022
PROJECT COMPLETION: February 2022 (anticipated)

KEY PERSONNEL:

- **Rob Lee,** Project Manager
- **Yarrow Murphy,** Hydraulics Task Lead
- **Brittany Park,** CM/GC and Funding Task Lead

MOUNT TALBERT AND GLADSTONE I/I REDUCTION

Clackamas County Water Environment Services and the City of Gladstone, OR

REFERENCE

Jessica Rinner, Civil Engineering Supervisor
p: 503.742.4551 | e: JRinner@clackamas.us

PROJECT DESCRIPTION

Leeway recently completed a project helping Clackamas Water Environment Services (WES) to determine the type and extent of excessive I/I in the Mt. Talbert project area and within the portion of the City of Gladstone that sends flows to WES' regional system. WES and the City of Gladstone (under DEQ MAO) is targeting a 65% reduction in their peak wet-weather flows in the these two project areas. The project involved numerous field investigations, including smoke-testing, flow-monitoring, and CCTV, and making recommendations on the corrective actions needed to reduce I/I.

Together, these project areas contain over 100 miles of sewer pipe, 7,500 homes, a hospital, and numerous commercial and industrial users. Leeway managed every component of the project, which spans multiple county and city jurisdictions, utilized 4 different subconsultants and investigation firms, and resulted in tangible recommendations to address I/I.

PROJECT DELIVERY METHOD: Planning
PROJECT DURATION: 2020 to 2021
PROJECT COMPLETION: December 2021

KEY PERSONNEL:

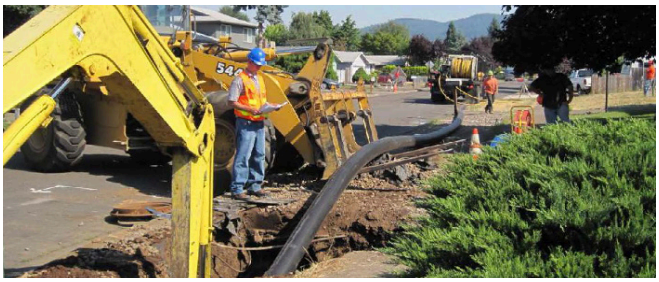
- **Rob Lee,** Project Manager
- **Yarrow Murphy,** Planning Lead
- **Chizuru Pritchard,** Staff Engineer

I/I ABATEMENT PROGRAM

City of Sweet Home, OR

REFERENCE

Greg Springman, Public Works Director
p: 541-367-635, e: gspringman@ci.sweet-home.or.us



PROJECT DESCRIPTION

Under Oregon Department of Environmental Quality Mutual Agreement and Order, the City of Sweet Home was required to address excessive wet-weather flows and sanitary sewer overflows. After a decade of work, the City was able to reduce their peak wet-weather flows by 50% through a committed I/I abatement program. Bringing his national experience to the program, Rob led the fourth and final phase of the Sweet Home I/I Abatement Program which included SSES, design, construction, post-rehabilitation modeling, and flow projection effort. Rob Lee served as Project Manager for the largest and most successful program phase and continues to support the City's ongoing rehabilitation program.

PROJECT HIGHLIGHTS

- Detailed evaluation survey that identified and prioritized the leakiest basins in the City.
- Development of private lateral policy that allowed for rehabilitation of 30% of the City's laterals.
- Rehabilitation of 35% of some of the oldest and structurally worst sewers in the system, thereby extending useful life and reducing risk.
- Achieved up to 77% reduction in peak flows at the basin level and 50% of the overall peak wet-weather flows to the WWTP from 22 MGD to 11.5 MGD and dry weather flows from 1 MGD to 0.7 MGD.
- Eliminated need for upsizing of 24-inch diameter trunk sewer that was under capacity prior to the I/I program.

PROJECT DELIVERY METHOD: Design-Bid-Build

PROJECT DURATION: 2002 to 2014, 2022-2025 (upcoming new phase)

PROJECT COMPLETION: 2025 (anticipated)

KEY PERSONNEL:

- **Rob Lee,** Design Lead
- **Zach Swartzendruber,** Design Project Engineer

I/I PROGRAM DEVELOPMENT

City of Oregon City, OR

REFERENCE

Bob Balgos, PE, Project Engineer
p: 503.974.5518, e: bbalgos@orcity.org

PROJECT DESCRIPTION

After completing a sanitary sewer master plan (SSMP) update, the City of Oregon City undertook efforts to develop an I/I program and implement initial steps. Rob utilized the findings and model from the SSMP to make recommendations for both field investigations, basin prioritization, and design recommendations. Rob Lee led the development of the I/I characterization, including flow monitoring, initial basin delineation, and smoke testing planning. He most recently led the identification and selection of capital projects to reduce I/I and development of new City policy around private source I/I.

PROJECT HIGHLIGHTS

- Flow monitoring site selection and deployment in support of master planning and I/I basin delineation; development of a smoke-testing plan that identified 59 direct inflow sources to the sanitary system.
- Fine resolution flow monitoring revealed 50% of the peak RDII originated from 30% of the sewered area and identified high inflow areas.
- CCTV results, SSO and customer complaint records, and other O&M issues layered on maps to create holistic I/I picture.
- Development of a long-term I/I program and associated CIP project list.

PROJECT DELIVERY METHOD: Planning

PROJECT DURATION: 2012 to present

PROJECT COMPLETION: 2026 (anticipated)

KEY PERSONNEL: Rob Lee, Project Manager (early phase) and Technical Lead (current work)

DOWNTOWN-OLD TOWN SEWER REHABILITATION

Bureau of Environmental Services, City of Portland, OR

REFERENCE

James Allison, Large Scale Sewer Rehab Program Manager
p: 503-823-4921 | e: james.allison@portlandoregon.gov

PROJECT DELIVERY METHOD: CM/GC

PROJECT DURATION: 2020 to present

PROJECT COMPLETION: 2022 (anticipated)

KEY PERSONNEL:

- **Rob Lee,** CM/GC Quality Manager
- **Zach Swartzendruber,** Design Project Engineer
- **Yarrow Murphy,** Hydraulic Modeling Task Lead

PROJECT DESCRIPTION

Leeway is supporting BES in its effort to extend the life of the oldest pipes in its collection system, which also happen to serve the downtown area, a major economic center for the state of Oregon. Since this is an area with dense development and a long history of utility work, there are many challenges to excavating and replacing pipe. Our roles in this project are both to support construction and advise on pipeline capacity. Rob Lee is providing support to the construction contractor to ensure that they deliver a top-notch project. He will help them to review work products, offer guidance on procedures, value engineering. During construction, he will develop and coordinate testing plans in collaboration with BES and the construction team and guide the contractor in addressing deficiencies. Yarrow Murphy is providing guidance to BES on capacity deficiencies in the existing collection system and recommended sizes for project pipes. The hydraulic recommendations are based on hydrodynamic models that Yarrow has been involved in developing for several years.

Section F

References

PROJECT	CLIENT	YEAR COMPLETED	REFERENCE
Wastewater Program Collection System Design Services	City of Sandy, OR	2017-present	**Mike Walker**, **Public Works Director** P: 503-489-2162 E: mwalker@ci.sandy.or.us
Large Scale Sewer Rehabilitation Program (LSSRP)	City of Portland, OR	2009-present	**James Allison,** **Program Manager** P: 503-823-4921 E: james.allison@portlandoregon.gov
Mt. Talbert I/I Reduction Project	Clackamas Water Environment Services, OR	2020-present	**Jessica Rinner,** **Project Manager** P: 503.742.4551 E: jrinner@clackamas.us

Additional project, firm, and project manager references available upon request.

Section G

Signature Page

This proposal is valid for 90 days. Leeway Engineering Solutions is licensed to perform engineering services in the State of Oregon. Leeway is a certified Minority-Owned Business Enterprise, an Emerging Small Business, and Disadvantaged Business Enterprise through the Oregon Certification Office for Business Inclusion and Diversity (COBID).
Leeway Engineering Solutions has never been the subject of any claim or lawsuit, and the firm is not disbarred, suspended, or otherwise prohibited from professional practice by any federal, state or local agency.

AUTHORIZED BY:

Authorized Person: 

(signature)

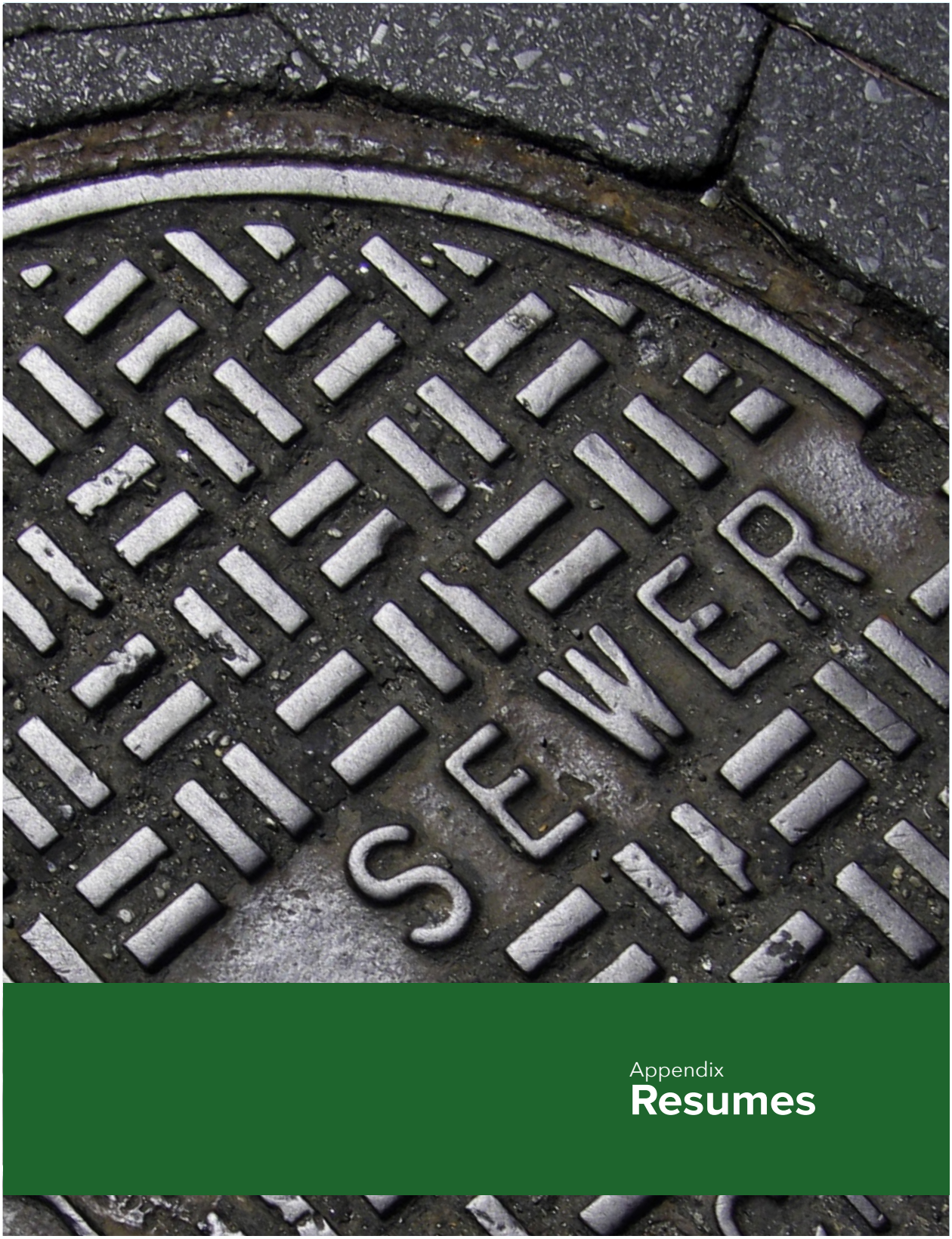
Rob Lee, PE, PMP | Principal Engineer

(printed name)

Date:
January 25, 2022

Company Name:
LEEWAY ENGINEERING SOLUTIONS

Mailing Address:
12597 NW Majestic Sequoia Way
Portland, Oregon 97229



Appendix

Resumes

ROB LEE, PE, PMP

Project Manager

Rob is known in the Pacific Northwest as one of the foremost authorities on I/I. Rob has 23 years of experience, with a major focus on large wastewater conveyance projects and programs, including several multiyear, multimillion dollar I/I programs in the Pacific Northwest. Rob has served as Assistant Program Manager on a $170M I/I program, the project manager on the Sweet Home I/I program which DEQ calls the most successful I/I program in Oregon, and numerous other I/I projects and programs. Rob's experience setting up I/I programs, evaluating data, and design cost-effective solutions will be leveraged to benefit the City of Hood River to explore I/I reduction possibilities. Data collection and evaluating sewer data.

Rob has led the data collection phase of a half-dozen I/I programs, including three here in the Pacific Northwest. He has personally conducted flow-monitoring, smoke-testing, dye-testing, maintenance hole inspections, and stream corridor walks. He has led the flow monitoring and modeling phases for I/I programs, both in the planning/predesign and post-construction evaluation phases. Rob was the primary author of an ASCE Pipelines paper on how to evaluate flow monitoring data to determine proper SSES techniques. Rob's experience has resulted in the successful completion of four I/I programs under regulatory decrees to reduce wet weather flows (three communities in Oregon, 1 on the East Coast) through I/I reduction.

SELECT PROJECT EXPERIENCE

I/I ABATEMENT PROGRAM, CITY OF SWEET HOME, SWEET HOME, OR; Project Manager/Design Lead. Rob led the most recent and largest phase of the City of Sweet Home's I/I program, aimed at reducing flows. The program involved predesign activities to evaluate the system and identify where it would be most cost-effective in reducing I/I. This work was driven by a regulatory order from the Oregon DEQ. The City has retained Leeway as part of a team to continue providing collection system rehabilitation solutions. The project successfully helped reduce peak wet weather flows at the WWTP by 50% through repairs made to the upstream collection system and private laterals. Reduction of peak wet weather flows also eliminated the need to upsize the City's main trunk sewer.

I/I PROGRAM DEVELOPMENT AND MT. TALBERT AND GLADSTONE INFILTRATION AND INFLOW PROJECT, CLACKAMAS WES, CLACKAMAS COUNTY, OR; Project Manager. Rob is managing a team to help the Clackamas WES, as the regional wastewater provider, identify the types and locations of I/I exacerbating their regional system. The program development involved analysis of flow monitoring data, coordination with upstream "member communities" contributing flows to the regional system, selection of field investigation techniques, and recommendations of projects to remove I/I from the system.

BRANDYWINE HUNDRED RDII ABATEMENT PROGRAM, NEW CASTLE COUNTY, DE; Assistant Program Manager/Design Lead. Completed in 2019 (seven years early and $80M under budget), this program reduced I/I across a 385-mile collection system serving mostly residential areas. Rob was instrumental in setting up the program, including managing the 66-flow meter network, conducting field investigations, identifying the highest-priority projects, and management and oversight of over a dozen projects that included small-diameter rehabilitation, private source I/I removal, and pump station and interceptor replacement and upsizing. Performed gamut of design and construction techniques, including full suite of private lateral rehabilitation options. Over three dozen projects designed and constructed as part of the program. This multiyear, regulatory-driven program addressed conveyance capacity due

TITLE
Principal Engineer

YEARS OF EXPERIENCE
24

EDUCATION

- MEng, Environmental Engineering, Cornell University, 1999
- BS, Environmental Engineering, Cornell University, 1997

LICENSES

- Professional Engineer – WA #44969
- Professional Engineer – OR #82099
- Project Management Professional - #2308673

PROFESSIONAL AFFILIATIONS

- Pacific Northwest Clean Water Association, Board of Directors, President (2019-present)

KEY EXPERTISE

- Pipeline Condition Assessment
- Trenchless Rehabilitation
- Project Leadership
- Wastewater, Water, and Stormwater Design
- Construction Support
- Asset Management

to heavy wet weather influences. Rob led efforts to install 66 flow monitors, conducted smoke-testing and CCTV, inspected maintenance holes, and compiled and managed the SSES data.

I/I ABATEMENT PROGRAM, CITY OF ST. HELENS, ST. HELENS, OR; Civil Lead/Project Manager. Rob led predesign evaluation to develop the framework for the City's I/I program. Flow monitoring site selection, modeling, and field investigations such as CCTV, smoke-testing, and maintenance hole inspection resulted in the identification of project areas for addressing I/I. The implementation of the projects, which included rehabilitation of private I/I sources, resulted in an 80% reduction of wet weather volumes and compliance with Oregon DEQ's regulatory requirements. Proper identification of locations of I/I and successful implementation resulted in 80% I/I reduction of flow volumes in targeted basins and reduced overflow events from 2.5 per year to less than one per year.

HILLSDALE I/I REDUCTION PILOT PROJECT, CITY OF PORTLAND, PORTLAND, OR; Project Advisor. As part of the Large-Scale Sewer Rehabilitation Program, Rob provided technical advisory services for one of the City's first I/I reduction projects. The City performed work on private laterals to reduce I/I into overcapacity trunk sewers. Post-project flow monitoring and modeling revealed over 70% reduction in peak wet weather flows. The project involved I/I repairs on private property, including creative ways to conduct work on private property without the need for formal easements.

LARGE-SCALE SEWER REHABILITATION PROGRAM, CITY OF PORTLAND, PORTLAND, OR; Design Lead/Program Advisor/Interim Project Manager. Rob helped reinvigorate this critical $250M+ ongoing program to address sewer risk in the City of Portland's collection system. Rob also served as technical lead for two different consulting teams on this program, coordinating and delivering the designs for over a dozen project areas. This large, multiyear, task order-driven program addressed needs in large collection and conveyance system and used all available trenchless technologies to address small- and large-diameter sewer rehab needs.

SEWER RELINING PROGRAM, SEATTLE PUBLIC UTILITIES, SEATTLE, WA; Design Lead/Technical Lead: Rob led five work assignments under this multiyear contract, including development of a large-diameter and ultraviolet light-cured project, a project that included 179 sites, and providing technical assistance to develop standard operating procedures and training guidance for in-house spot repair and lateral lining crews. Rob provided technical guidance to the work assignment teams, contacted potential lining contractors, conducted QA/QC reviews, and provided detailed comments and suggested revisions to the City's lining specifications and bid forms. Rob developed bid packages to enhance understanding of SPU's design process, standards, and specifications.

SANDY WASTEWATER SYSTEM IMPROVEMENTS PROJECT, SANDY, OR; OWNER'S REPRESENTATIVE. The City of Sandy is in the early stages of multiple projects to improve its wastewater systems; upgrading treatment facilities, reducing excessive I/I in the collection system and expanding treatment capacity at a secondary site. As Owner's Representative, Rob is providing services to assist this multi-year program with improvements to the existing WWTP and flow reduction in the collection system, aimed at achieving regulatory compliance on an aggressive schedule and represent the City to design consultants, construction contractors, regulators, and stake-holders.

CERTIFICATIONS

- Certified NASSCO Pipeline Assessment Certification Program (PACP) U-203-551
- Certified Construction Documents Technologist (CSI)
- Confined-Space Entry 29 CFR 1910.146(g) OSHA
- Construction Safety Awareness 29 CFR 1926.21 (b) OSHA

ZACH SWARTZENDRUBER, PE

Design Lead

Zach has 10 years of experience providing engineering services for projects involving wastewater and stormwater collection and conveyance. Zach's experience includes trenchless rehabilitation and condition assessment, inflow/infiltration and infrastructure evaluations, wastewater conveyance design, preparation of contract drawings and specifications, preparation of as-built plans, shop drawing, and submittal reviews, and construction oversight and management. Zach has recently led the sewer rehabilitation design of multiple projects for the City of Portland's BES Large Scale Rehab program and is currently leading multiple projects for SPU and the City of St Helens. Zach's extensive experience of pipeline design utilizing a variety of trenchless methods will be leveraged to quickly and effectively develop solutions for the City of Sandy.

SELECT PROJECT EXPERIENCE

2022 SEWER FULL LINE REPLACEMENTS, SEATTLE PUBLIC UTILITIES (SPU), WA; Project Manager and Design Lead. Zach is serving as the project manager and design lead for a sewer replacements project with Seattle Public Utilities. The project is currently in 60% design.

SEWER LINING WORK ASSIGNMENT #1, (SPU), WA; Project Manager and Design Lead. Zach is serving as the project manager and design lead for a sewer lining project with Seattle Public Utilities. The project consists of 8,500 feet of 8- to 15-inch diameter sanitary sewer. The project is currently in 60% design.

DOWNTOWN OLD TOWN MAIN-TAYLOR SEWER REHAB, CITY OF PORTLAND BUREAU OF ENVIRONMENTAL SERVICES (BES), OR; Design Lead. Zach served as the design lead for a CMGC project with BES to replace approximately 9,000 feet of 6- to 30-inch diameter critical sewer mainlines in the heart of Downtown Portland.

HILLSDALE SEWER REHABILITATION, BES, OR; Design Lead. Zach served as the design lead on the small diameter rehabilitation project for BES in the west Hills of the Hillsdale neighborhood.

S 1ST AND STRAND STREETS ROAD AND UTILITY EXTENSIONS, CITY OF ST HELENS, OR; Utility Extensions Project Manager and Design Lead. Zach is serving as the project manager and the design lead of the force main, sanitary main, and water main for the City. The project is currently in final design and includes over 6,000 feet of utility extensions.

12TH STREET REHABILITATION, CITY OF MCMINNVILLE OR; Project Manager. Zach led and supported the design of over 17,000 feet of sanitary rehabilitation. This included rehabilitating 13 pipe segments going along the backyard fence line between properties or going under buildings and moving one pipe segment out of backyards rerouting 15 laterals to the street. The project included Open-cut along with multiple trenchless technologies including CIPP, Horizontal Directional Drilling, and Pipe-bursting. 58 Manholes were replaced as part of the project.

LARGE SCALE SEWER REHABILITATION PROGRAM (2013–2021), BES, OR; Project Engineer. Zach worked on the design of nine projects in the Large Scale Sewer Rehab program with BES. Reviewed the CCTV inspection and evaluated the condition of the pipes and design rehabilitation methods of approximately 100,000 feet of sanitary and combined sewers in the City. Sewers ranged in sizes from 6- to 39 inches in diameter and included monolithic concrete sewers, Vitrified Clay Sewers egg-shaped concrete sewers, and arched brick sewers. Rehabilitation methods included open-cut, CIPP, pipe-bursting, horizontal directional drilling, jack and bore, and pipe reaming.

TITLE
Project Engineer

YEARS OF EXPERIENCE
10

EDUCATION
- BS, Civil Engineering, Oregon State University, 2012

LICENSES
Professional Engineer – OR #86411

KEY EXPERTISE
- Pipeline Condition Assessment
- Trenchless Rehabilitation
- Water, Wastewater, and Stormwater Design
- Construction Support
- Asset Management

YARROW MURPHY, PE

Hydraulics and GIS Lead

Yarrow is a civil engineer with expertise in gravity pipeline hydraulics and design. She spent the first 10 years of her career working for City of Portland, Bureau of Environmental Services, where she specialized in hydrodynamic modeling and analysis of Oregon's largest combined sewer system. She entered the private sector about three years ago, looking to diversify her experience and serve a wider range of clients in the Pacific Northwest region. Recent projects include supporting design and implementation of capital improvements of combined and stormwater systems, master planning combined, sanitary and stormwater systems, rainfall-derived inflow and infiltration analysis with recommendations for strategic flow reductions, and asset management focused on cost effective prioritization of investments. She particularly enjoys working with clients to determine their individual goals and finding the right solution for each unique problem.

SELECT PROJECT EXPERIENCE

DOWNTOWN OLD TOWN SEWER REHABILITATION, CITY OF PORTLAND, OR; Engineer. Yarrow has supported several major rehabilitation projects for the City of Portland, Bureau of Environmental Services. One of these major projects, the Downtown Old Town structural rehabilitation program is a $60 million in-vestment in Portland's oldest sewer pipes, which also serve the economic center of the state. Her involvement with this project started with structural risk evaluation and system planning for the entire area. During design she has evaluated hydraulic capacity of each phased design project. Most of the pipes in the project area have multiple utility conflicts and other complications that make full re-placement with open trench difficult and expensive. Yarrow has worked closely with the design project manager to quantify capacity risks, develop creative solutions and make judicious decisions about system capacity improvements.

SANDY COLLECTION SYSTEM RDII REDUCTION PROGRAM, SANDY, OR; Engineer. This project is an early action recommended in the 2019 Sandy Wastewater System Master Plan. As the lead author and engineer on the collection system portion of the master plan, Yarrow's familiarity with the system and understanding of the specific needs of the City allows her to efficiently implement the RDII reduction predesign. Yarrows role in the predesign is evaluating and recommending alternative delivery methods to accelerate the project schedule and to produce preliminary design drawings, which can serve as the basis for later design phase drawings.

BASALT AND COFFEE CREEK INDUSTRIAL AREA CONCEPT PLAN, CITY OF WILSONVILLE, OR; Lead Engineer. Yarrow worked with the City of Wilsonville to design the gravity system layout and profiles of a future sanitary conveyance system to serve a planned major industrial area, including options for 2 MGD of wet industry. The final product included an alternatives analysis considering capital and equivalent uniform annual costs and operational preferences for four different system alternatives and plan and profile drawings for the recommended alternative.

STORM AND SANITARY SYSTEM ASSESSMENT, OREGON STATE UNIVERSITY, CORVALLIS, OR; Project Engineer. Oregon State University (OSU) is implementing a proactive program to manage its sanitary and storm systems. This project involved developing a consequence of failure rating that prioritized the inspections, followed by the inspection and evaluation of approximately 30% of the storm and sanitary sewers. The result is recommended maintenance operations and capital improvements to protect OSU's assets over the long term. Yarrow's role in the project is operations scheduling and co-authoring the master plan report.

TITLE
Civil Engineer

YEARS OF EXPERIENCE
15

EDUCATION
- MSc, Water Resources Engineering, Oregon State University, 2009
- BA, Russian Language and Literature, University of Oregon, 1999

LICENSES
Professional Engineer – OR #84389
Professional Engineer – WA (pending)

KEY EXPERTISE
- Asset management
- Hydrodynamic Modeling
- Concept Planning
- Alternatives Evaluation
- Stormwater Solutions
- RDII Reduction

BRITTANY PARK, PE

CM/GC RFP and Funding Coordination

Brittany is a chemical and environmental engineer specializing in project management, troubleshooting, and operations of wastewater treatment facilities. In the beginning of her career, she managed industrial water systems, including a 28 MGD treatment plant. Later, she managed wastewater capital improvement projects at the City of Bend. Through her experience managing multi-disciplinary teams for projects, Brittany has developed a collaborative approach to design and project management. This results in projects that are built to perform for the whole life cycle. From the start of design through project startup and operation, she will deliver projects that are cost effective and sensible to build and maintain.

SELECT PROJECT EXPERIENCE

SANDY WASTEWATER SYSTEM IMPROVEMENTS PROJECT, SANDY, OR; Owner's Representative. The City of Sandy is in the early stages of multiple projects to improve its wastewater systems; upgrading treatment facilities, reducing excessive infiltration and inflow in the collection system and expanding treatment capacity at a secondary site. As Owner's Representative, Brittany is overseeing the design of the improvements to the existing plant and flow reduction in the collection system. Her role is to facilitate completion of the design on an aggressive schedule and represent the City to the design consultant, construction contractors, regulators, and stake-holders.

PUMP STATION DE-COMMISSIONING PROJECT, CITY OF BEND, OR; Project Manager and Construction Manager. Decommissioning sewer pump stations by installing gravity sewer reduced the City of Bend's operation and maintenance costs for collections systems. Brittany led the project to decommission ten different pump stations. She oversaw the engineering design and construction for a combined 3,000 LF of gravity mains. She successfully completed the project months ahead of schedule and millions under budget.

SOLIDS HANDLING IMPROVEMENTS PROJECT, CITY OF BEND, OR; Project Manager. Brittany led the interdisciplinary team through the predesign analysis, project design, and GMP approval. The project had many elements. It was a Construction Management/General Contractor procurement, funded by ODEQ CWSRF program, and included an electrical utility upgrade to the treatment plant. Brittany's management style puts an emphasis on open communication and inclusion of all voices. Because of this approach, the City's operations, maintenance, and instrumentation/controls teams were regularly involved and provided input every step of the way. This ensured that all internal and external stakeholders had their project needs met while balancing value engineering.

PLANT INTERCEPTOR PROJECT, CITY OF BEND, OR; Project Engineer. This project involved the rehabilitation of 13,000 LF of the City of Bend's primary means of wastewater conveyance to the Water Reclamation Facility (WRF). Brittany led the acquisition of easements and provided engineering support through-out the design of the Plant Interceptor. The project resulted in a structural renewal of the PI that will provide long-term reliable wastewater conveyance.

GEORGIA-PACIFIC WAUNA MILL, CLATSKANIE, OR; Treatment Plant Technical Manager. Brittany oversaw the system and worked with operators to make sure the process was working properly and optimized. She was the compliance system owner and conducted all compliance related activities, including NPDES reporting and sampling. She led troubleshooting of process issues, operator training, environmental systems projects, and all emergency response efforts. One of her larger projects was to reduce the treatment plant carbon load by utilizing dissolved oxygen monitoring to optimize aeration. The project resulted in an over-all 30% reduction in treatment plant energy consumption, while continuing to maintain healthy biological life.

TITLE
Project Engineer

YEARS OF EXPERIENCE
10

EDUCATION

- MSc, Infrastructure Engineering and Management, University of Surrey, 2016
- BSc, Chemical Engineering, Oregon State University, 2012

REGISTRATION

- Professional Engineer – OR #86191

ASSOCIATIONS/ AFFILIATIONS

- Pacific Northwest Clean Water Association, Member Services Committee Chair

KEY EXPERTISE

- Project Management
- Facility and Treatment design, construction, operation and troubleshooting
- Owner's Representative Services
- Alternative delivery method (CM/GC)

LEEWAY
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LEEWAY engineering solutions

CITY OF SANDY WASTEWATER PROGRAM
COLLECTION SYSTEM BASIN 6 & 7
PROPOSED LEVEL OF EFFORT

	LABOR CLASSIFICATION (HOURS)						Estimated Fees		
	Principal Engineer $221.00	Senior Engineer $174.00	Design Lead $160.00	Staff Engineer $120.00	Admin Specialist $93.00	Hours	Labor	Expenses	Total
Phase 1 - Task Management									
Monthly Invoices and Progress Reports	2	8	16	0	8	34	$ 5,051	$ -	$ 5,051
Internal Team Meetings	12	6	16	16	0	50	$ 8,176	$ -	$ 8,176
Program Coordination	8	8	16	0	0	32	$ 5,720	$ -	$ 5,720
Phase 1 Subtotal	**22**	**22**	**48**	**16**	**8**	**116**	**$ 18,947**	**$ -**	**$ 18,947**
Phase 2 - Design and Construction Contracting Services									
30% Documents	16	0	50	86	0	152	$ 21,856	$ 173	$ 22,029
CWSRF/ARPA/WIFIA support	10	32	8	40	0	90	$ 13,858	$ -	$ 13,858
CM/GC RFP solicitation and selection	18	20	24	0	0	62	$ 11,298	$ -	$ 11,298
Phase 2 Subtotal	**44**	**52**	**82**	**126**	**0**	**304**	**$ 47,012**	**$ 173**	**$ 47,185**
Phase 3 - Basins 6 and 7 Design									
60% Design, CM/GC Meetings	32	12	60	72	0	176	$ 27,400	$ 519	$ 27,919
90%, CM/GC Meetings and GMP	20	20	40	86	0	166	$ 24,620	$ -	$ 24,620
Final	12	12	28	56	0	108	$ 15,940	$ -	$ 15,940
Phase 3 Subtotal	**64**	**44**	**128**	**214**	**0**	**450**	**$ 67,960**	**$ 519**	**$ 68,479**
Phase 4 - Engineering Support During Construction									
Submittal Reviews	12	0	16	0	0	28	$ 5,212	$ -	$ 5,212
Progress Meetings	24	0	40	24	0	88	$ 14,584	$ -	$ 14,584
Pay Request reviews	12	8	8	24	0	52	$ 8,204	$ -	$ 8,204
Closeout Documentation and As-Builts	10	6	24	20	4	64	$ 9,866	$ -	$ 9,866
Phase 4 Subtotal	**58**	**14**	**88**	**68**	**4**	**232**	**$ 37,866**	**$ -**	**$ 37,866**
Phase 5 - Related Services									
Post-Rehabilitation assessment of Basins 6 & 7	4	44	0	80	0	128	$ 18,140	$ -	$ 18,140
Flow monitoring support	12	24	0	16	0	52	$ 8,748	$ 173	$ 8,921
Rainfall analysis	2	16	0	20	0	38	$ 5,626	$ -	$ 5,626
Inflow dishes, smoke-testing, other investigation support	8	8	8	8	0	32	$ 5,400	$ 173	$ 5,573
Planning for next priority basins	12	24	8	0	0	44	$ 8,108	$ -	$ 8,108
CMOM Next Steps	20	12	8	0	0	40	$ 7,788	$ -	$ 7,788
Phase 5 Subtotal	**58**	**128**	**24**	**124**	**0**	**334**	**$ 53,810**	**$ 1,039**	**$ 54,156**
TOTAL - ALL PHASES	***246***	***260***	***370***	***548***	***12***	***1436***	***$ 225,595***	***$ 1,039***	***$ 226,634***