

DEER MEADOWS SUBDIVISION TRAFFIC IMPACT STUDY

SANDY, OREGON



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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.

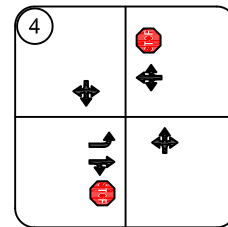
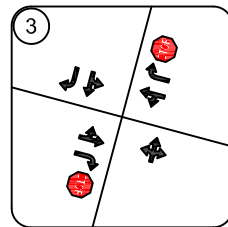
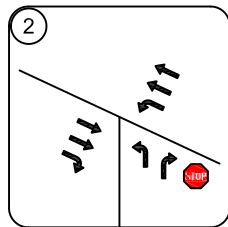
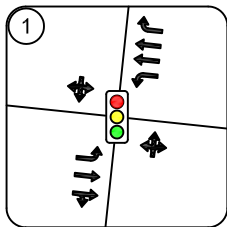
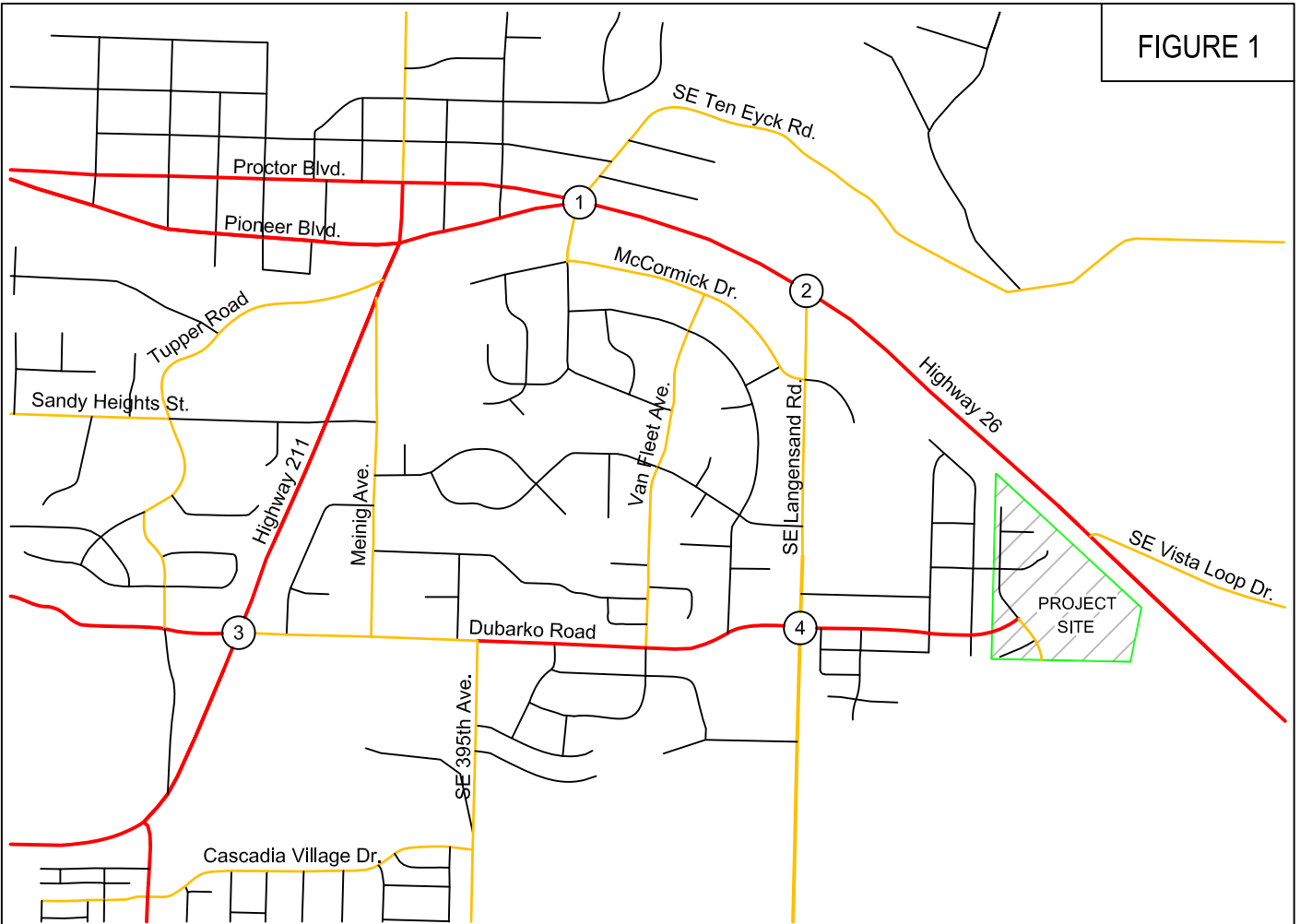
The intersection of US Highway 26 at SE Langensand Road is a T- intersection controlled by a stop sign on the northbound Langensand Road approach. Through traffic traveling along Highway 26 does not stop. The northbound approach has a left-turn lane and a right-turn lane. The eastbound approach has two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





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, since 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.

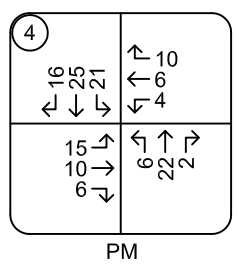
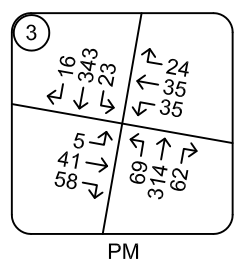
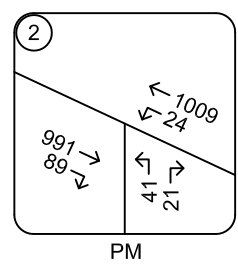
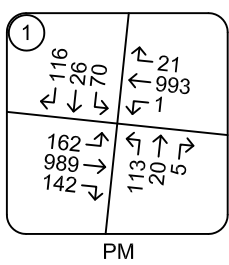
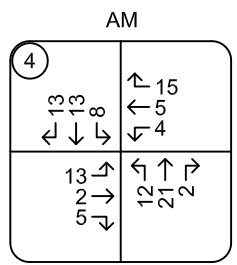
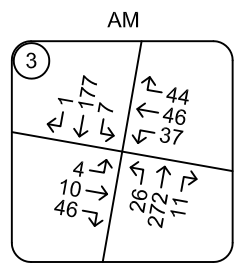
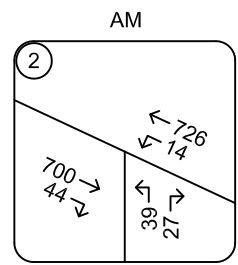
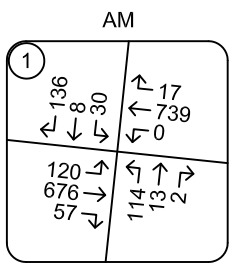
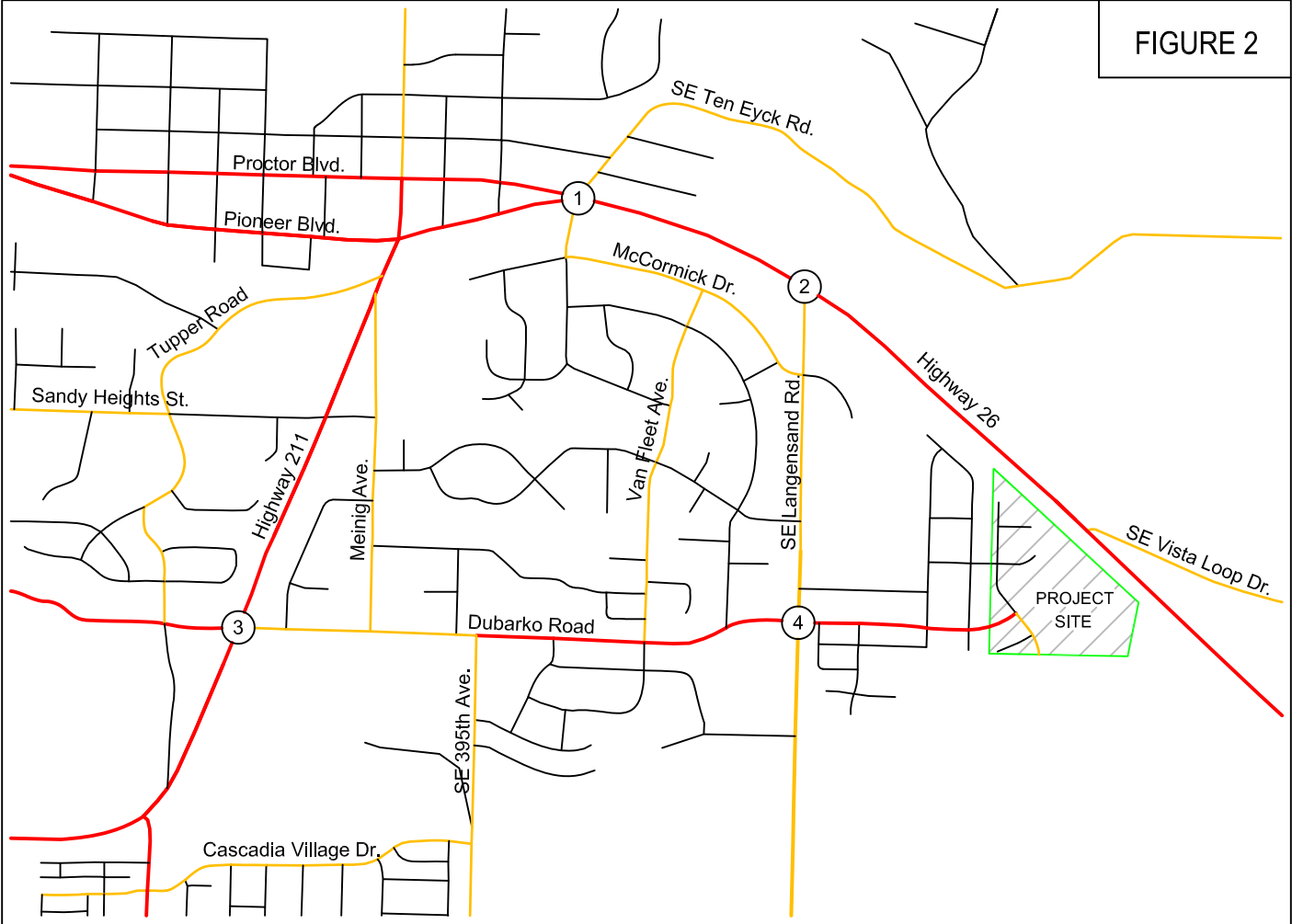
The resulting calculated through traffic volumes represent the anticipated traffic volumes on Highway 26 immediately west of Ten Eyck Road during the 30th-highest hour in July. The morning peak hour through traffic volumes along Highway 26 were then increased by the same overall percentage as the evening 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





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

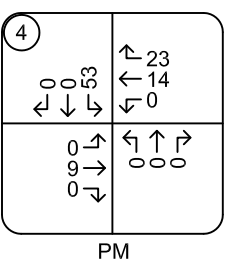
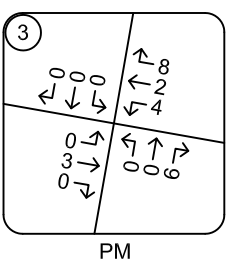
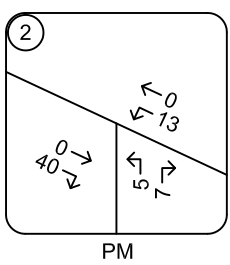
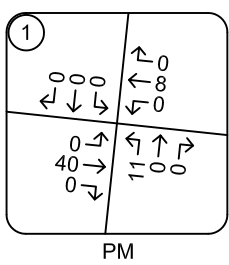
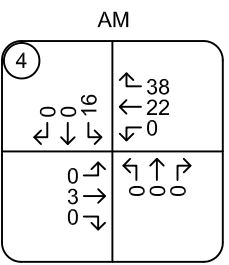
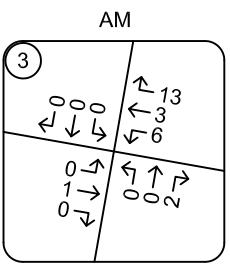
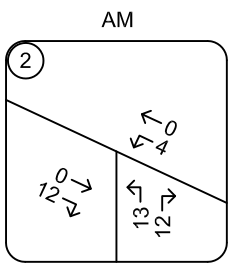
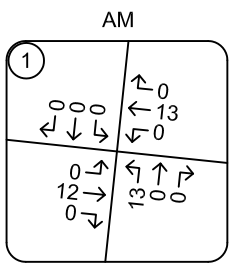
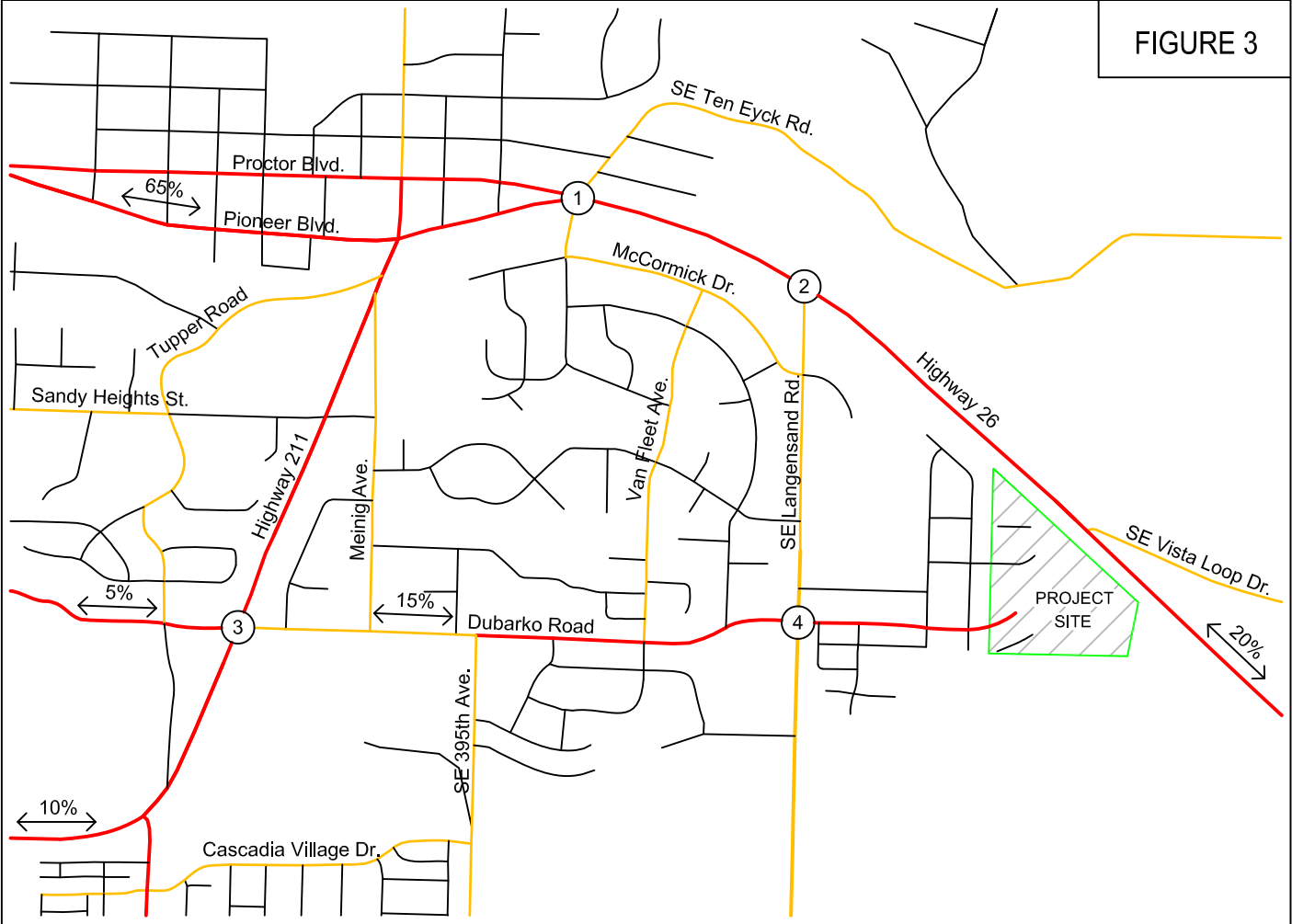
	AM Peak Hour			PM Peak Hour			Daily Total
	In	Out	Total	In	Out	Total	
32 Single-Family Homes	6	18	24	20	12	32	302
120 Multi-Family Dwelling Units	13	42	55	42	25	67	878
Total Site Trips	19	60	79	62	37	99	1,180

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



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

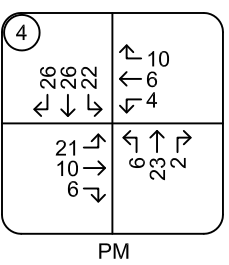
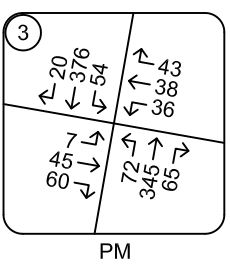
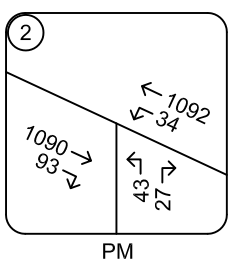
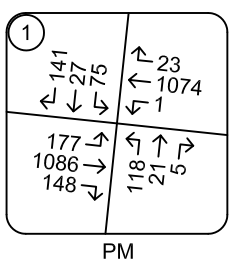
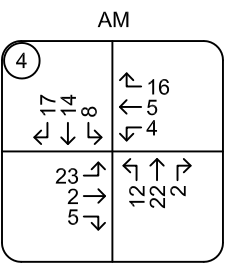
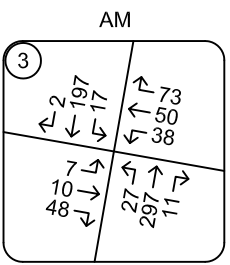
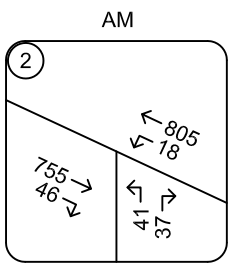
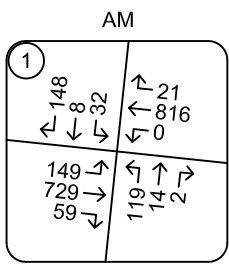
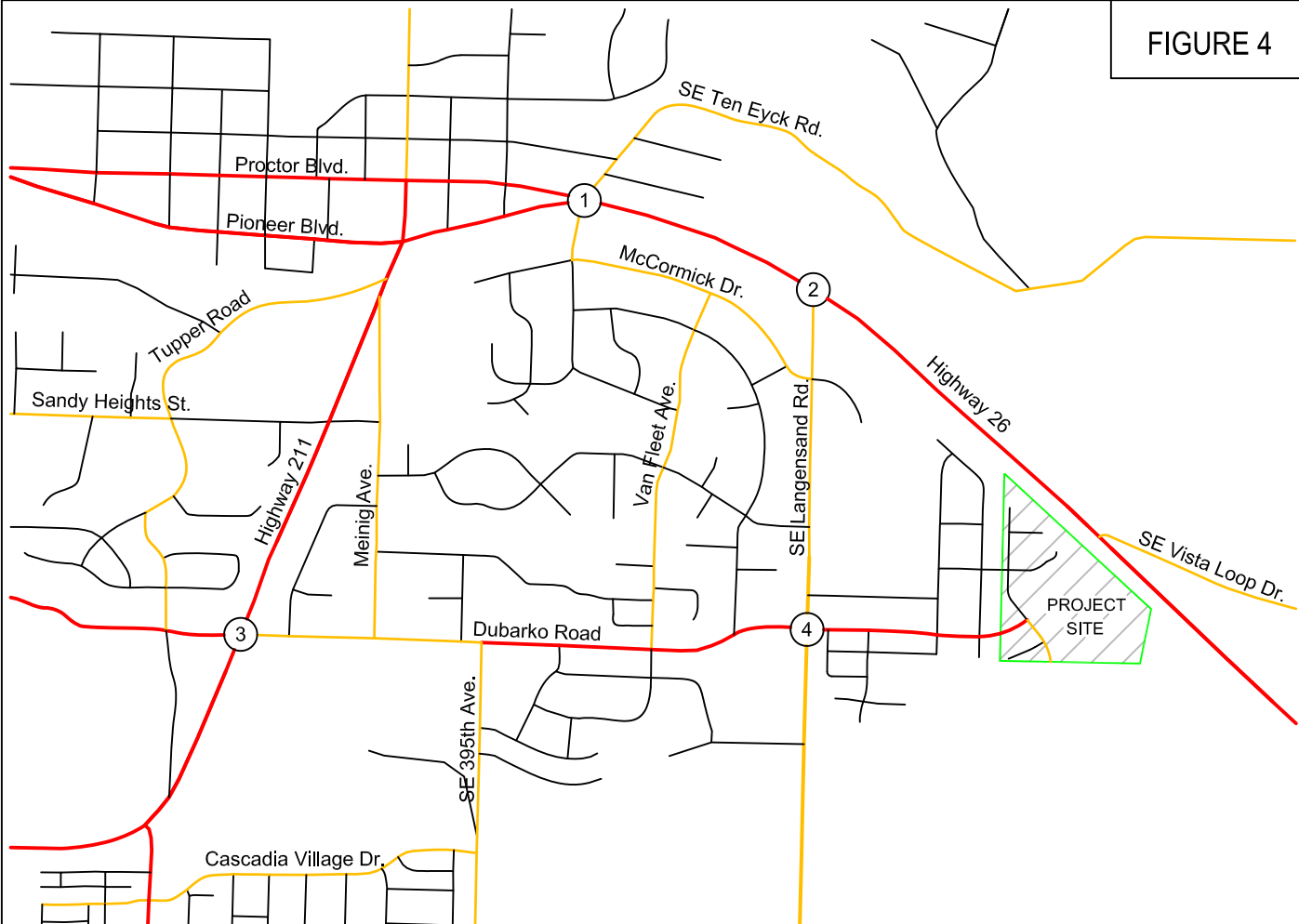
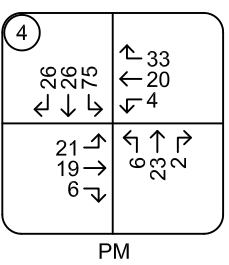
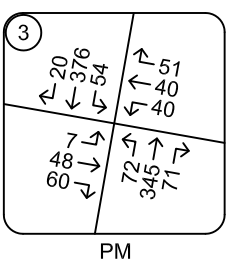
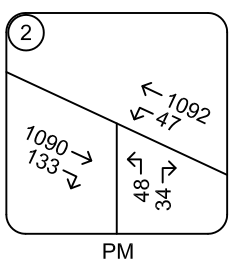
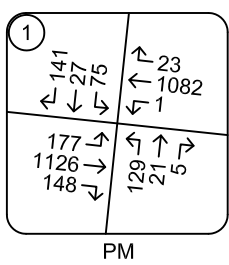
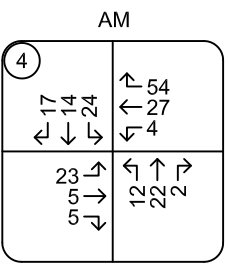
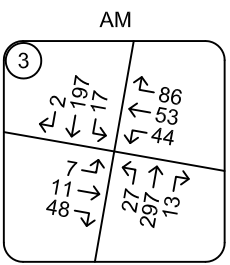
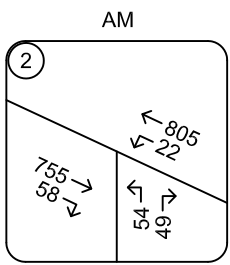
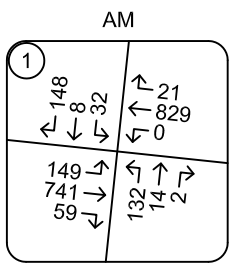
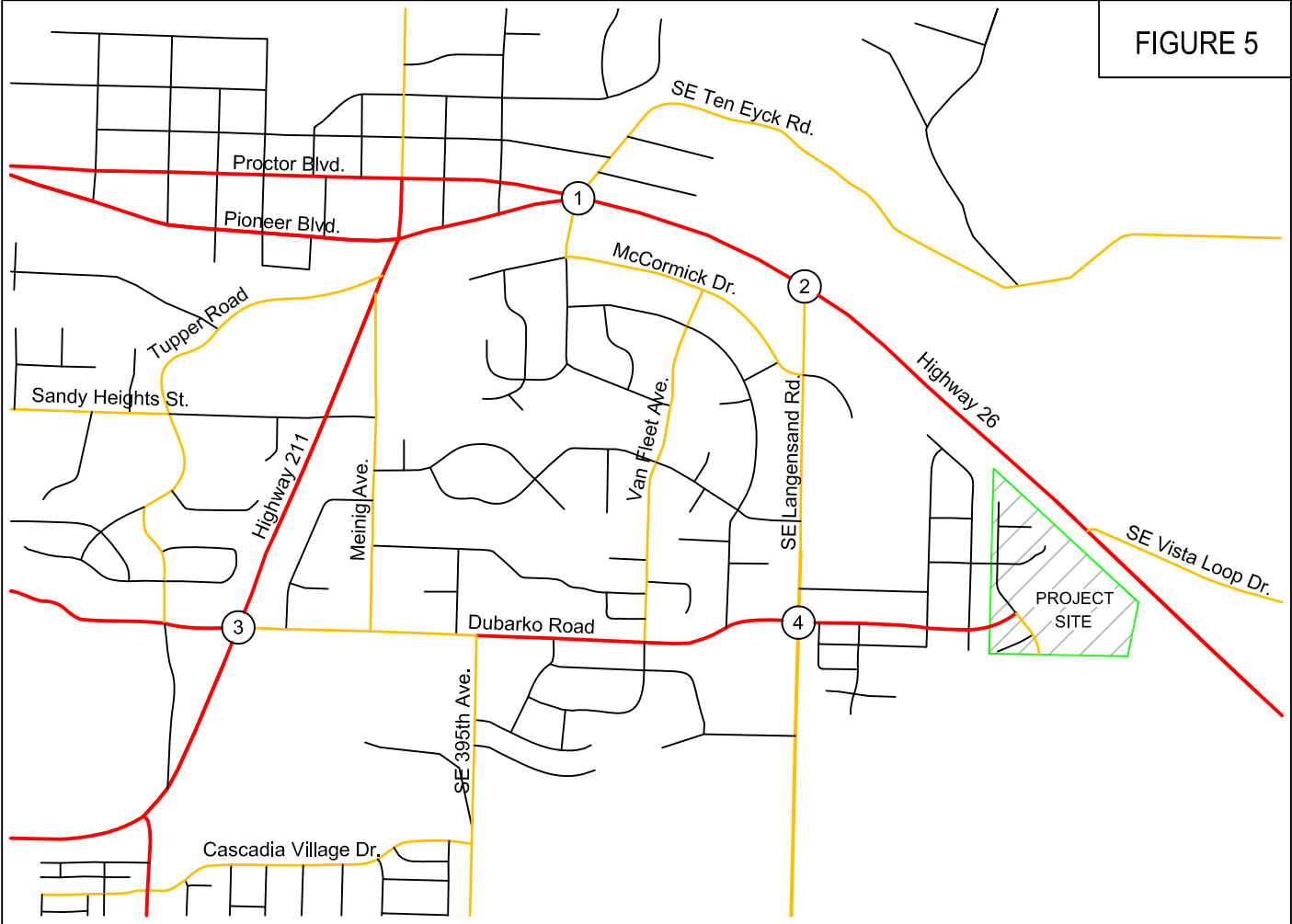


FIGURE 5





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.

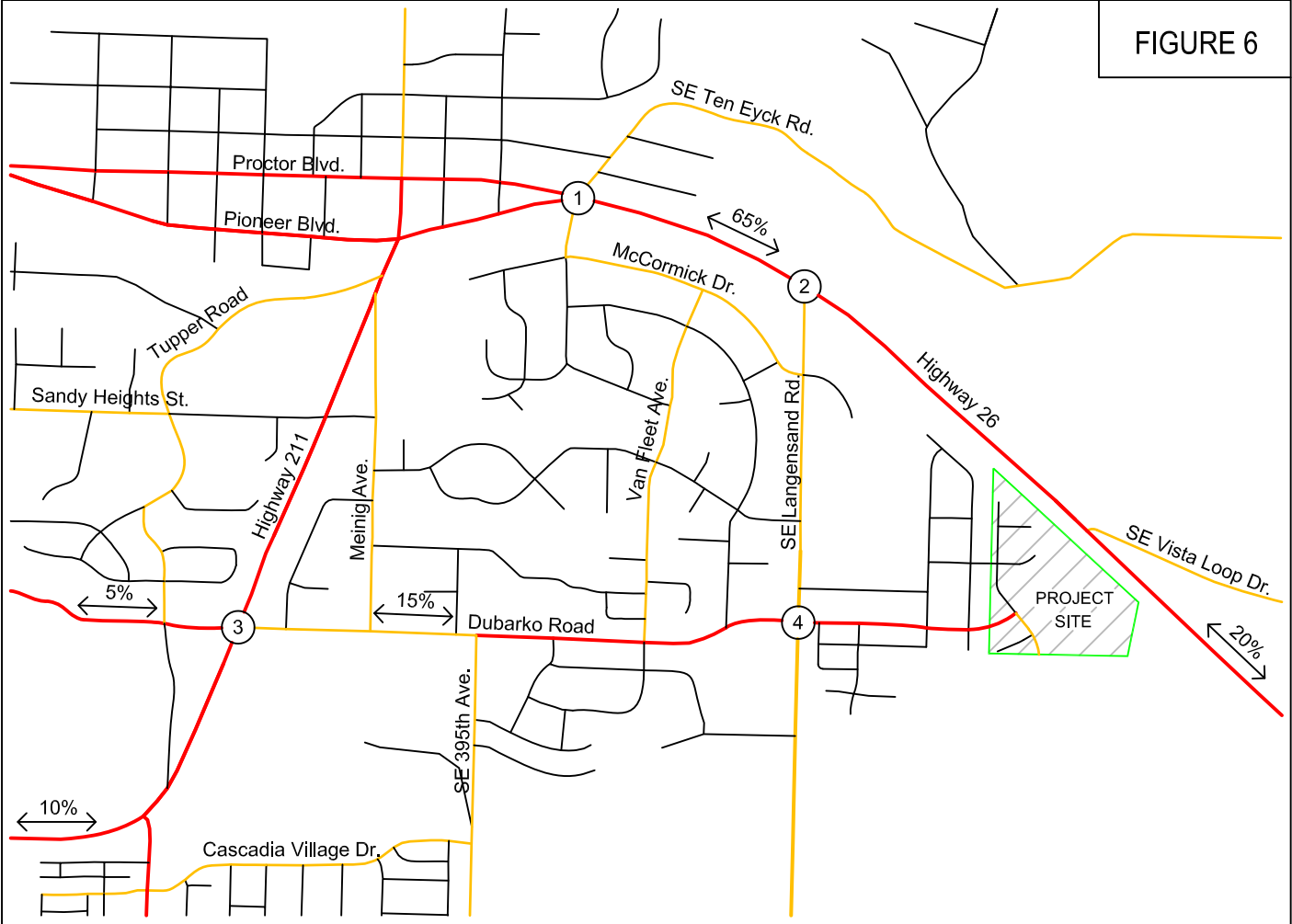
Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. This intersection meets all-way 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



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TRAFFIC VOLUMES
 In-Process Development - Site Trips
 Morning and Evening Peak Hours

Location: 2 Ten Eyck Rd & Hwy 26 AM



ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

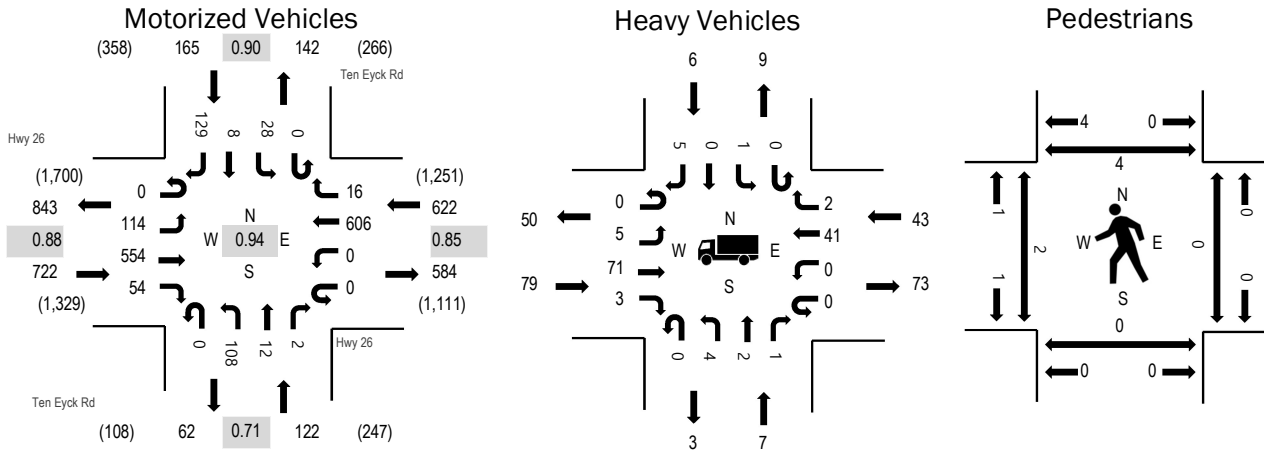
Location: 2 Ten Eyck Rd & Hwy 26 AM

Date: Tuesday, September 21, 2021

Peak Hour: 07:30 AM - 08:30 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour



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				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
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



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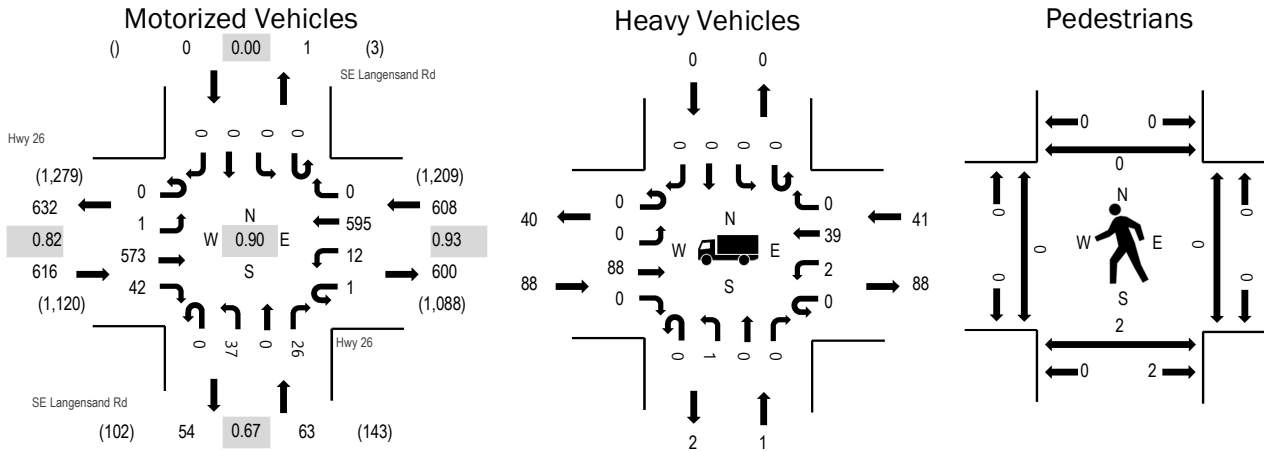
Location: 3 SE Langensand Rd & Hwy 26 AM

Date: Tuesday, September 21, 2021

Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour



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				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
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



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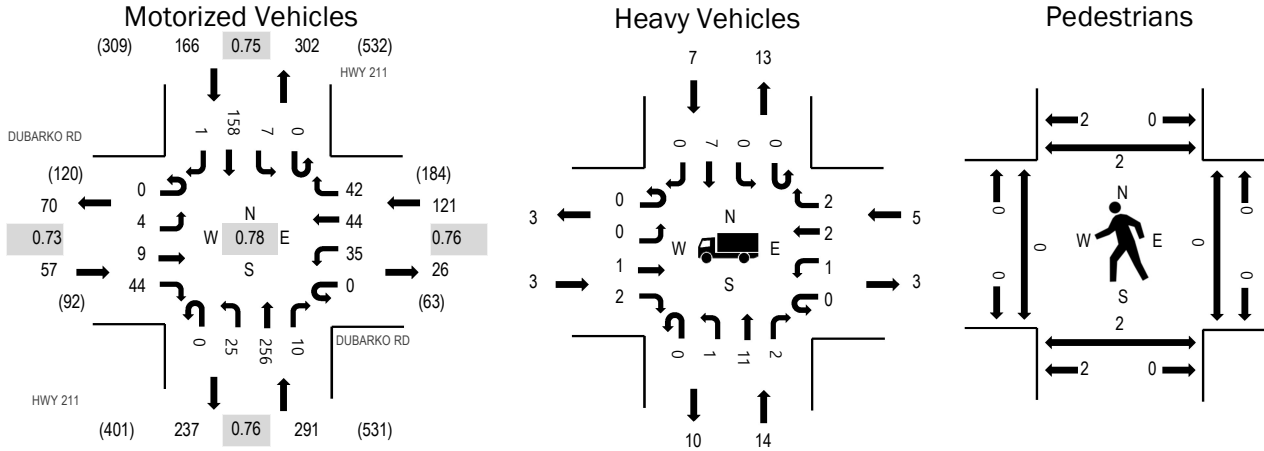
Location: HWY 211 & DUBARKO RD AM

Date: Wednesday, June 9, 2021

Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:25 AM - 07:40 AM

Peak Hour



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				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
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



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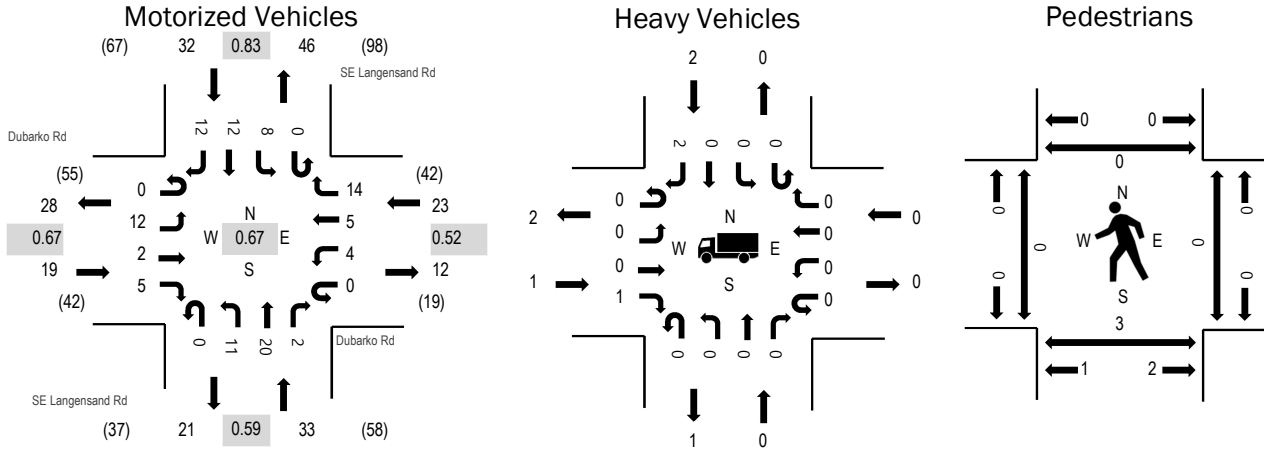
Location: 4 SE Langensand Rd & Dubarko Rd AM

Date: Tuesday, September 21, 2021

Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:15 AM - 08:30 AM

Peak Hour



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				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
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



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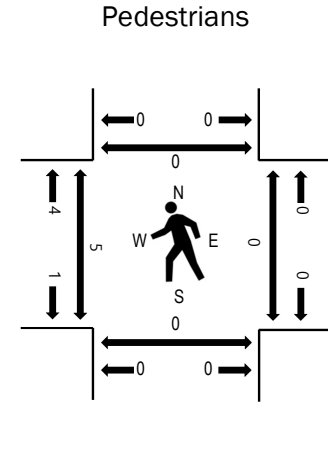
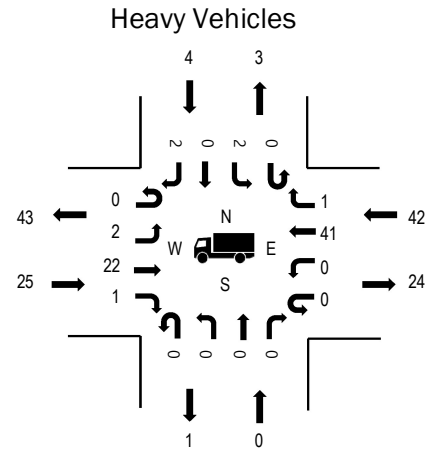
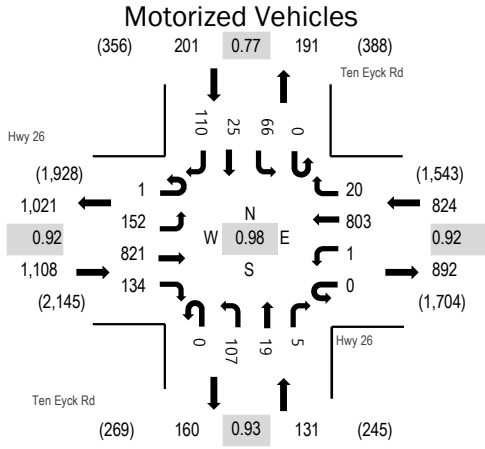
Location: 2 Ten Eyck Rd & Hwy 26 PM

Date: Tuesday, September 21, 2021

Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour



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				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
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



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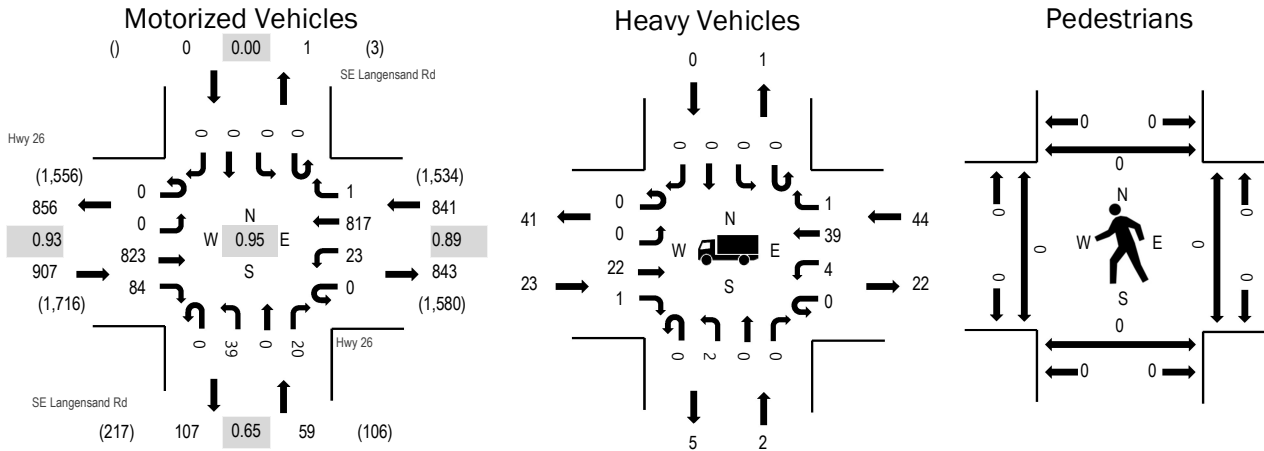
Location: 3 SE Langensand Rd & Hwy 26 PM

Date: Tuesday, September 21, 2021

Peak Hour: 04:25 PM - 05:25 PM

Peak 15-Minutes: 04:25 PM - 04:40 PM

Peak Hour



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				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
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



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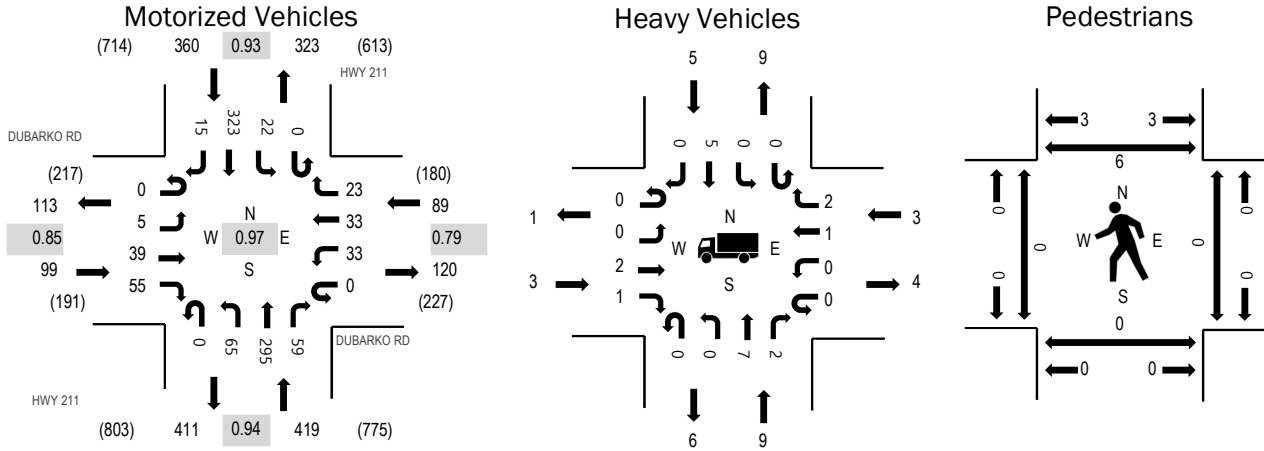
Location: HWY 211 & DUBARKO RD PM

Date: Wednesday, June 9, 2021

Peak Hour: 04:20 PM - 05:20 PM

Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour



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				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
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	967
5:10 PM	0	0	1	7	0	6	4	1	0	4	16	8	0	3	27	1	78	954
5:15 PM	0	2	5	3	0	2	1	2	0	7	24	3	0	1	24	2	76	947
5:20 PM	0	0	4	2	0	4	2	2	0	2	19	7	0	1	30	0	73	934
5:25 PM	0	1	4	4	0	1	3	1	0	11	29	5	0	1	20	0	80	927
5:30 PM	0	2	1	2	0	0	4	6	0	4	19	7	0	2	33	1	81	920
5:35 PM	0	0	1	1	0	1	3	2	0	5	22	3	0	1	24	1	64	913
5:40 PM	0	0	4	8	0	3	6	3	0	4	23	5	0	1	34	4	95	906
5:45 PM	0	1	3	6	0	3	1	3	0	2	15	2	0	1	24	1	62	899
5:50 PM	0	0	2	5	0	0	5	1	0	8	28	3	0	4	23	0	79	892
5:55 PM	0	1	4	5	0	0	5	4	0	4	19	6	0	3	23	2	76	885
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



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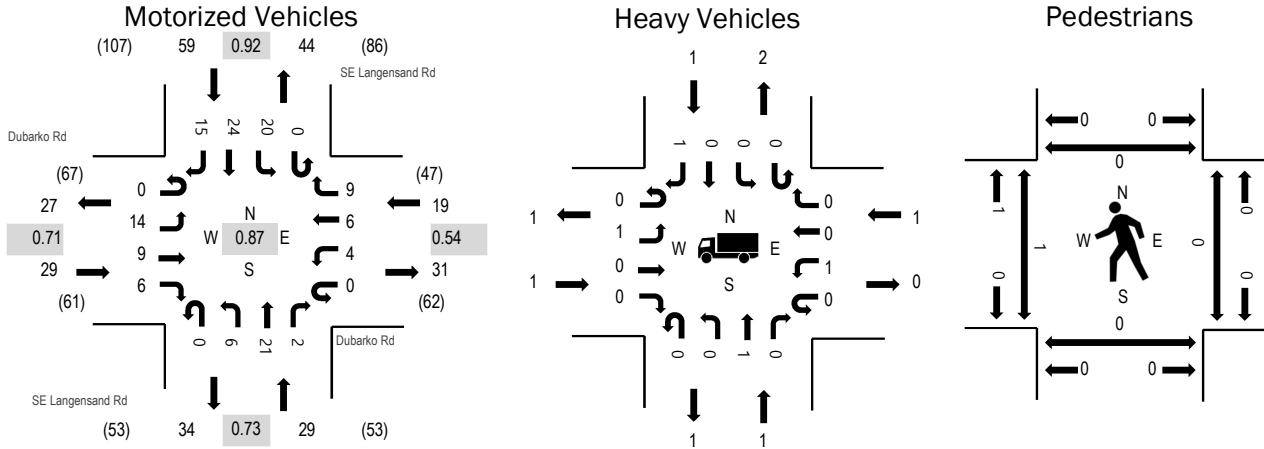
Location: 4 SE Langensand Rd & Dubarko Rd PM

Date: Tuesday, September 21, 2021

Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour



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				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
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	12
5:10 PM	0	0	2	1	0	0	1	0	0	1	0	0	0	2	3	0	10	10
5:15 PM	0	2	1	1	0	2	0	1	0	0	5	0	0	2	1	2	17	17
5:20 PM	0	1	0	0	0	0	0	2	0	0	0	0	0	0	3	0	6	6
5:25 PM	0	0	1	0	0	1	0	0	0	1	1	0	0	1	2	1	8	8
5:30 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	2	3	0	7	7
5:35 PM	0	2	1	0	0	1	0	0	0	3	3	1	0	0	2	2	15	15
5:40 PM	0	1	0	0	0	0	1	2	0	0	2	0	0	3	3	0	12	12
5:45 PM	0	2	3	2	0	0	0	1	0	0	1	0	0	1	2	0	12	12
5:50 PM	0	1	0	1	0	0	1	1	0	0	3	0	0	5	0	2	14	14
5:55 PM	0	1	0	1	0	0	1	0	0	1	3	0	0	2	2	2	13	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 Installed	Rhododendron (03-006) August, 1995
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Year	HISTORICAL ANNUAL TRAFFIC DATA					
	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

Month	2020 SEASONAL TRAFFIC DATA		
	Weekday		Daily
	Average	% AADT	Average
January	8614	91	10821
February	9017	96	10856
March	5718	61	6931
April	4035	43	4233
May	6874	73	7385
June	9094	96	10055
July	12427	132	14166
August	11697	124	13411
September	4654	49	4799
October	8486	90	9334
November	6838	73	8021
December	11615	123	13083

Date	Highest Hour			
	Day	Hours of Day	Rank	%AADT
07/26/2020	Sunday	1:00 - 2:00 pm	1	25.1
12/26/2020	Saturday	2:00 - 3:00 pm	10	23.2
07/26/2020	Sunday	11:00 - 12:00 am	20	22.5
12/31/2020	Thursday	2:00 - 3:00 pm	30	21.7
12/31/2020	Thursday	1:00 - 2:00 pm	40	20.9
07/19/2020	Sunday	11:00 - 12:00 am	50	20.3

Date	Highest Day	
	Day	AADT
12/27/2020	Sunday	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, 2021⁵. Corridor volumes are prepared by summing traffic volumes from ATRs across 13 corridors for years 2019, 2020 and 2021⁶.

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 recessions⁷

Table 1. Observed Year-Over-Year Difference in Traffic Volumes by Corridor 2019-2021

Date	Corridor	2021 Volumes		2020 Volumes		2019 Volumes		2021 as % of 2020	
		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		2020 Volumes		2019 Volumes		2021 as % of 2020	
		Average Weekday	Average Weekend	Average Weekday	Average Weekend	Average Weekday	Average Weekend	Weekday Diff	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%
Week 26 June 21-27, 2021	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%
	US197	3,489	2,961	2,983	2,838	3,225	2,773	17%	4%
	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%
Week 27 June 28-July 4, 2021	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%
	US197	3,272	3,267	3,408	3,325	3,231	3,371	-4%	-2%
	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:

TREND	SEASONAL TREND TABLE (Updated: 7/20/2021) ¹														Seasonal Trend Peak Period Factor
	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	0.9638	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	0.6562	0.6708	0.6864	0.7393	0.7922	0.8898	0.9874	1.1242	1.2610	1.3965	1.5320	0.6562
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	1.812	1.9847	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

¹Seasonal 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	
Frbp, 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			

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)	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								

HCM 6th TWSC
2: Langensand Road & Highway 26

09/26/2021

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	Minor2
Conflicting Flow All	0	0	829	0
Stage 1	-	-	-	780
Stage 2	-	-	-	436
Critical Hdwy	-	-	4.24	6.84
Critical Hdwy Stg 1	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	5.84
Follow-up Hdwy	-	-	2.27	3.52
Pot Cap-1 Maneuver	-	-	767	173
Stage 1	-	-	-	412
Stage 2	-	-	-	619
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	766	169
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	-

HCM 6th TWSC
3: Highway 211 & Dubarko Road

09/26/2021

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	-	-

HCM 6th TWSC
4: Langensand Road & Dubarko Road

09/26/2021

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	
Frbp, 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								

HCM 6th TWSC
2: Langensand Road & Highway 26

09/26/2021

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	Minor2	Minor3
Conflicting Flow All	0	0	1137	0	1624
Stage 1	-	-	-	-	1043
Stage 2	-	-	-	-	581
Critical Hdwy	-	-	4.2	-	6.86
Critical Hdwy Stg 1	-	-	-	-	5.86
Critical Hdwy Stg 2	-	-	-	-	5.86
Follow-up Hdwy	-	-	2.25	-	3.53
Pot Cap-1 Maneuver	-	-	593	-	92
Stage 1	-	-	-	-	298
Stage 2	-	-	-	-	520
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	593	-	88
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	-

HCM 6th TWSC
3: Highway 211 & Dubarko Road

09/26/2021

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	-	-

HCM 6th TWSC
4: Langensand Road & Dubarko Road

09/26/2021

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

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

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	
Frbp, 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

HCM 6th TWSC
2: Langensand Road & Highway 26

09/26/2021

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	Minor2	Minor3
Conflicting Flow All	0	0	892	0	1328
Stage 1	-	-	-	-	841
Stage 2	-	-	-	-	487
Critical Hdwy	-	-	4.24	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	2.27	-	3.52
Pot Cap-1 Maneuver	-	-	725	-	146
Stage 1	-	-	-	-	383
Stage 2	-	-	-	-	583
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	724	-	142
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	-

HCM 6th TWSC
3: Highway 211 & Dubarko Road

09/26/2021

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	-	-

HCM 6th TWSC
4: Langensand Road & Dubarko Road

09/26/2021

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	
Frbp, 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								

HCM 6th TWSC
2: Langensand Road & Highway 26

09/26/2021

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	Minor2	Minor3
Conflicting Flow All	0	0	1245	0	1794
Stage 1	-	-	-	-	1147
Stage 2	-	-	-	-	647
Critical Hdwy	-	-	4.2	-	6.86
Critical Hdwy Stg 1	-	-	-	-	5.86
Critical Hdwy Stg 2	-	-	-	-	5.86
Follow-up Hdwy	-	-	2.25	-	3.53
Pot Cap-1 Maneuver	-	-	539	-	71
Stage 1	-	-	-	-	263
Stage 2	-	-	-	-	480
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	539	-	66
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	-

HCM 6th TWSC
3: Highway 211 & Dubarko Road

09/26/2021

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	-	-

HCM 6th TWSC
4: Langensand Road & Dubarko Road

09/26/2021

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		
Frbp, 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

HCM 6th TWSC
2: Langensand Road & Highway 26

09/26/2021

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	Minor2	Minor3
Conflicting Flow All	0	0	905	0	1336
Stage 1	-	-	-	-	841
Stage 2	-	-	-	-	495
Critical Hdwy	-	-	4.24	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	2.27	-	3.52
Pot Cap-1 Maneuver	-	-	717	-	145
Stage 1	-	-	-	-	383
Stage 2	-	-	-	-	578
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	716	-	140
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	-

HCM 6th TWSC
3: Highway 211 & Dubarko Road

09/26/2021

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	-	-

HCM 6th TWSC
4: Langensand Road & Dubarko Road

09/26/2021

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	
Frbp, 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								

HCM 6th TWSC
2: Langensand Road & Highway 26

09/26/2021

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	Minor2	Minor3
Conflicting Flow All	0	0	1287	0	1820
Stage 1	-	-	-	-	1147
Stage 2	-	-	-	-	673
Critical Hdwy	-	-	4.2	-	6.86
Critical Hdwy Stg 1	-	-	-	-	5.86
Critical Hdwy Stg 2	-	-	-	-	5.86
Follow-up Hdwy	-	-	2.25	-	3.53
Pot Cap-1 Maneuver	-	-	519	-	68
Stage 1	-	-	-	-	263
Stage 2	-	-	-	-	466
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	519	-	62
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	-

HCM 6th TWSC
3: Highway 211 & Dubarko Road

09/26/2021

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	-	-

HCM 6th TWSC
4: Langensand Road & Dubarko Road

09/26/2021

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	-	-

HCM 6th AWSC
3: Highway 211 & Dubarko Road

09/26/2021

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

HCM 6th AWSC
 3: Highway 211 & Dubarko Road

09/26/2021

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

CDS380
05/31/2021

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

TEN EYCK RD at PROCTOR BLVD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019
1 - 4 of 5 Crash records shown.

CITY OF SANDY, CLACKAMAS COUNTY

SER#	INVEST	RD DFT	UNLOC?	D C S V L K LAT	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	LEGS	TRAF-	CONTL	5-LEG	TRF SIGNAL	N	UNK	S-1STOP	0	SPCL USE	TRLR QTY	OWNER	MOVE	FROM	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT. EVENT	CAUSE						
03911	N N N	10/27/2018	17	PROCTOR BLVD	SA	0	SE TEN EYCK RD	NE	INTER	5-LEG	0	TRF SIGNAL	N	UNK	S-1STOP	0	STRGHT	0	STRGHT	0	0	0	0	0	0	0	0	0	0	0	29						
NONE																																					
N	5P	45 23 49.25	-122.15																																		
N	3P	45 23 49.25	-122.15																																		
N	45 23 49.25	-122.15	19.74																																		
03089	N N N	09/03/2018	14	PROCTOR BLVD	MO		SE TEN EYCK RD	SE	INTER	5-LEG	0	TRF SIGNAL	N	CLR	S-1STOP	0	STRGHT	0	STRGHT	0	0	0	0	0	0	0	0	0	0	0	0	0	29				
NONE																																					
N	3P	45 23 49.25	-122.15																																		
N	45 23 49.25	-122.15	19.75																																		
03213	N N N	09/17/2019	14	PROCTOR BLVD	TU		SE TEN EYCK RD	SE	INTER	5-LEG	0	TRF SIGNAL	N	CLR	S-1STOP	0	STRGHT	0	STRGHT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29			
NONE																																					
N	3P	45 23 49.26	-122.15																																		
N	45 23 49.26	-122.15	19.69																																		
05173	N N N	11/08/2016	14	PROCTOR BLVD	TU		SE TEN EYCK RD	W	INTER	5-LEG	0	TRF SIGNAL	N	CLR	ANGL-OTH	01	U-TURN	9	U-TURN	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	06		
NONE																																					
N	5P	45 23 49.25	-122.15																																		
N	45 23 49.25	-122.15	19.74																																		
04335	N N N	11/06/2018	14	PROCTOR BLVD	TU		SE TEN EYCK RD	CN	INTER	5-LEG	0	TRF SIGNAL	N	CLR	ANGL-OTH	01	STRGHT	9	STRGHT	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	02		
NONE																																					
N	2P	45 23 49.25	-122.15																																		
N	45 23 49.25	-122.15	19.72																																		

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CDS380
05/31/2021

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING
TEN BYCK RD at PROCTOR BLVD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019
5 - 5 of 5 Crash records shown.

CITY OF SANDY, CLACKAMAS COUNTY

SER#	INVEST	RD DFT	UNLOC?	D C S V L K LAT	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPL USE	TRLR QTY	MOVE	PH TYPE	INJ	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE
					DIST	FIRST STREET		(MEDIAN)		RNDBT	SURF	COLL	OWNER		FROM								
					LONG	SECOND STREET	DIRECT	LESS	TRAF-	DRVMY	LIGHT	SVRTY	VH TYPE	02 NONE	TO								
						LRS	LOCIN	(#LANES)	CONTL				02 NONE	N/A	TURN-R								
													ESNGR CAR		NE-NW								
																01	DRVR	NONE	00	Unk	UNK	00	00
																					000	000	00

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING

1 - 1 of 1 Crash records shown.
 TEN BYCK RD at PIONEER BLVD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019

SER#	INVEST	RD DFT	UNLOC?	CLASS	DIST	FROM	LONG	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	COLL	SVRTY	VH TYPE	SPCL USE	TRLR QTY	OWNER	MOVE	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT. EVENT	CAUSE	
03787	N	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 BYCK RD	E	TRF SIGNAL	N	DRY	REAR	PRVTE	E -W			01	DRVR	NONE	71	M	OR-Y	OR<25		000	000	00	
N				1P					06	0	N	DAY	INJ	FSNGR CAR															29
N				45 23 49.24			-122 15 19.74	002600100500										02	NONE	0	STOP					011	000	00	
														PRVTE	E -W											000	000	00	
														FSNGR CAR												000	000	00	

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING

1 - 2 of 2 Crash records shown.
 WOLF DR at PIONEER BLVD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019

CITY OF SANDY, CLACKAMAS COUNTY

SER#	INVEST	RD DFT	UNLOC?	D C S V L K LAT	N N N N	N N N N	05/09/2015	14	PIONEER BLVD	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	OWNER	FROM	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT. EVENT	CAUSE		
01741	NONE	SA	6A	45 23 49.25	-122.15	19.74			WOLF DR		04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
00512	NONE	TU	4P	45 23 49.25	-122.15	19.74			WOLF DR		04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING

MT HOOD HY at LANGENSAND RD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019

1 - 4 of 7 Crash records shown.

SER#	P R J S W DATE	CLASS	CITY STREET	INT-TYPE (MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT. EVENT	CAUSE
INVEST	E A U I C O DAY	DIST	FIRST STREET	RD CHAR	LESS TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G E LICNS	PED				
RD DFT	E L G N H R TIME	FROM	SECOND STREET	LOCN	(#LANES)	DRVMY	LIGHT	SVRTY	VH TYPE	TO								
UNLOC?	D C S V L K LAT	LONG	LR	INTER	3-LEG	N	RAIN	PED	01 NONE	0	TURN-R							
05355	N N N	11/18/2016	14 LANGENSAND RD	INTER	3-LEG	N	RAIN	PED	01 NONE	0	TURN-R							19,02
	FR		MT HOOD HY	S		UNKNOWN	N	WET	PRVTE	S-SE							015	00
N	6P			06	0		N	DUSK	PSNGR CAR		01 DRVR	NONE	59 M	OR-Y	OR<25		000	02
N	45 23 44.19	-122 15 .03	002600100500															
05056	N N N	12/01/2017	14 LANGENSAND RD	INTER	3-LEG	N	RAIN	ANGL-STP	01 NONE	0	TURN-R							08
NONE	FR		MT HOOD HY	S		STOP SIGN	N	WET	PRVTE	NW-S							000	00
N	9P			06	0		N	DLIT	PSNGR CAR		01 DRVR	NONE	27 F	OR-Y	OR<25		000	08
N	45 23 44.19	-122 15 .03	002600100500															
									02 NONE	0	STOP						012	00
									PRVTE	S-N							000	00
									PSNGR CAR		01 DRVR	INJC	27 F	OR-Y	OR<25		000	00
																	012	00
									02 NONE	0	STOP						000	00
									PRVTE	S-N							012	00
									PSNGR CAR		02 PSNG	INJC	25 M				000	00
01431	N N N	04/14/2017	14 LANGENSAND RD	INTER	3-LEG	N	CLR	O-1STOP	01 NONE	9	BACK							10
NONE	FR		MT HOOD HY	S		STOP SIGN	N	DRY	N/A	N-S							000	00
N	3P			06	0		N	DAY	PSNGR CAR		01 DRVR	NONE	00	Unk UNK	UNK		000	00
N	45 23 44.19	-122 15 .03	002600100500															
									02 NONE	9	STOP						012	00
									N/A	S-N							000	00
									PSNGR CAR		01 DRVR	NONE	00	Unk UNK	UNK		000	00
00297	N N N	01/24/2015	14 LANGENSAND RD	INTER	3-LEG	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT							02,08
CITY	8A		MT HOOD HY	CN		UNKNOWN	N	DRY	PRVTE	NW-SE							000	00
N	4P			03	0		N	DAY	PSNGR CAR		01 DRVR	NONE	21 M	OR-Y	OR<25		000	00
N	45 23 44.19	-122 15 .03	002600100500															
									01 NONE	0	STRGHT						000	00
									PRVTE	NW-SE							000	00
									PSNGR CAR		02 PSNG	NO<5	01 F				000	00
																	000	00
									02 NONE	0	TURN-L						000	00
									PRVTE	SE-S							000	00
									PSNGR CAR		01 DRVR	INJC	78 F	OR-Y	OR<25		028,004	02,08

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

DUBARKO RD at EAGLE CRK-SANDY HY, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019
1 - 4 of 27 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	OWNER	MOVE	FROM	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE		
INVEST	E	A	I	C	O	D	DIST	FIRST STREET	E	(MEDIAN)	INT-REL	RNDBT	SURF	COLL		A	S		G	E	L	I	C	P				
RD DFT	E	L	G	N	H	R	TIME	SECOND STREET	DIRECT	LESS	TRAF-	DRVMY	LIGHT	SVRTY	VH TYPE													
UNLOC#	D	C	S	V	L	K	LAT	LRS	LOC#N	(#LANES)	CONTL	N	CLR	S-1STOP	01	NONE	9	STRGHT	TO									
02296	N	N	N	N	N	07/06/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	9	STRGHT	NE-SW	01	DRVR	NONE	00	Unk	UNK	000	000	27,29,32
CITY	SA							EAGLE CRK-SANDY HY	N	N/A			DRY	REAR	N/A			NE-SW									00	
N	11A								06	0			DAY	PDO	PSNGR	CAR											00	
N	45 23 22.65	-122.15					48.74	017200100500																			00	
01165	N	N	N	N	N	03/10/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	O-1STOP	01	NONE	0	BACK	W-E							10		
CITY	TH							EAGLE CRK-SANDY HY	E	STOP SIGN			DRY	BACK	PRVTE											000	00	
N	6P								06	0			DAY	INJ	PSNGR	CAR										000	10	
N	45 23 22.76	-122.15					48.39	017200100500																		011	00	
N	45 23 22.76	-122.15					48.39																			000	00	
04008	N	N	N	N	N	11/02/2018	16	DUBARKO RD	INTER	CROSS	N	N	CLD	PED	01	NONE	0	STRGHT	E-W							02		
CITY	FR							EAGLE CRK-SANDY HY	E	STOP SIGN			WET	PED	PRVTE											000	00	
N	7P								06	0			DLIT	INJ	PSNGR	CAR										000	02	
N	45 23 22.54	-122.15					48.5	017200100500																		012	00	
N	45 23 22.54	-122.15					48.5																			000	00	
03026	N	N	N	N	N	07/27/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT	SW-NE							07,29		
CITY	MO							EAGLE CRK-SANDY HY	SW	NONE			DRY	REAR	PRVTE											000	00	
N	8P								06	0			DUSK	INJ	PSNGR	CAR										043,026	000	
N	45 23 22.76	-122.15					48.39	017200100500																		000	07,29	
N	45 23 22.76	-122.15					48.39																			012	00	
N	45 23 22.76	-122.15					48.39																			000	00	
01095	N	N	N	N	N	03/04/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE	0	STRGHT	NE-SW							27,07,32		
CITY	FR							EAGLE CRK-SANDY HY	SW	STOP SIGN			DRY	SS-O	PRVTE											000	00	
N	4P								06	0			DAY	INJ	PSNGR	CAR										016,043,052	010	
N	45 23 22.76	-122.15					48.39	017200100500																		000	27,07,32	
N	45 23 22.76	-122.15					48.39																			000	00	
N	45 23 22.76	-122.15					48.39																			000	00	

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CDS380
05/31/2021

OREGON . . DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS 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
9 - 12 of 27 Crash records shown.

SER#	P R J S W DATE	CLASS	CITY STREET	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE
INVEST	E A U I C O DAY	DIST	FIRST STREET	(MEDIAN)	INT-REL	ANDBT	SURF	COLL	TRLR QTY	FROM	INJ	G E LICNS	PED			
RD DFT	E L G N H R TIME	FROM	SECOND STREET	LESS	TRAF-	DRVMY	LIGHT	SVRTY	OWNER							
UNLOC#	D C S V L K LAT	LONG	LR	(#LANES)	CONTL				VH TYPE							
05614	N N N N N 12/25/2015	16	DUBARKO RD	CROSS	N	N	CLD	ANGL-OTH	01 NONE	0	STRGHT					02
CITY	FR		EAGLE CRK-SANDY HY	INTER	STOP SIGN	N	WET	ANGL	PRVTE	N -S					000	00
N	6P								PSNGR CAR	01 DRVR	NONE	58 M	OR-Y	000	000	00
N	45 23 22.76	-122.15	017200100500	0									OR>25		000	00
		48.39														
02172	N N N N N 06/05/2015	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT					02
CITY	FR		EAGLE CRK-SANDY HY	INTER	STOP SIGN	N	DRY	TURN	PRVTE	W -E					015	00
N	7A								PSNGR CAR	01 DRVR	NONE	24 M	OR-Y	028	000	02
N	45 23 22.76	-122.15	017200100500	0									OR<25		000	00
		48.39														
03589	N N N N N 08/05/2016	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT					02
CITY	FR		EAGLE CRK-SANDY HY	INTER	STOP SIGN	N	DRY	ANGL	PRVTE	E -W					015	00
N	6P								PSNGR CAR	01 DRVR	INJC	77 M	OTH-Y	028	000	02
N	45 23 22.76	-122.15	017200100500	0									N-RES		000	00
		48.39														
03967	N N N N N 08/30/2016	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT					02
CITY	TU		EAGLE CRK-SANDY HY	INTER	STOP SIGN	N	DRY	ANGL	PRVTE	W -E					015	00
N	12P								PSNGR CAR	01 DRVR	INJC	61 F	OTH-Y	028	000	02
N	45 23 22.76	-122.15	017200100500	0									N-RES		000	00
		48.39														
02427	N N N N N 05/31/2016	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01 NONE	9	STRGHT					03,32
CITY	TU		EAGLE CRK-SANDY HY	INTER	STOP SIGN	N	UNK	ANGL	N/A	W -E					000	00
N	11A								PSNGR CAR	01 DRVR	NONE	00	UNK	000	000	00
N	45 23 22.76	-122.15	017200100500	0									UNK		000	00
		48.39														

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

DUBARKO RD at EAGLE CRK-SANDY HY, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019
13 - 17 of 27 Crash records shown.

SER#	INVEST	RD DFT	UNLOC?	D C S V L K LAT	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE
N	N	N	N	N	LONG	FRS	LOCIN	(LANES)	CONTL	DRVMY	LIGHT	SVRTY	02 NONE	02 NONE	02 NONE	01 DRVR	NONE	00	Unk	UNK	000	000
02031	N	N	N	N	05/06/2016	16	DUBARKO RD	INTER	CROSS	N	CLR	ANGL-OTH	01 NONE	9	STRGHT	01 DRVR	NONE	00	Unk	UNK	000	000
CITY							EAGLE CRK-SANDY HY	CN	STOP SIGN	N	DRY	ANGL	N/A		N -S							
N								01	0	N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK	000	000	
N							017200100500						02 NONE	9	STRGHT							
													N/A		E -W							
													PSNGR CAR		01 DRVR	NONE	00	Unk	UNK	000	000	
00805	N	N	N	N	03/01/2017	16	DUBARKO RD	INTER	CROSS	N	CLD	ANGL-OTH	01 NONE	0	STRGHT	01 DRVR	NONE	00	Unk	UNK	000	082,013
CITY							EAGLE CRK-SANDY HY	CN	STOP SIGN	N	DRY	ANGL	PRVTE		W -E							
N								04	0	N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	17	F	OR-Y	028	000	082
N							017200100500						02 NONE	0	STRGHT							
													PRVTE		S -N							
													PSNGR CAR		01 DRVR	INJC	43	M	OR-Y	000	000	013
													03 NONE	0	STOP							
													PRVTE		E -W							
													PSNGR CAR		01 DRVR	INJC	27	F	OR-Y	000	000	022
00846	N	N	N	N	03/04/2017	16	DUBARKO RD	INTER	CROSS	N	RAIN	ANGL-OTH	01 NONE	0	STRGHT	01 DRVR	NONE	00	Unk	UNK	000	000
CITY							EAGLE CRK-SANDY HY	CN	STOP SIGN	N	WET	ANGL	PRVTE		W -E							
N								04	0	N	DLIT	INJ	PSNGR CAR		01 DRVR	NONE	21	M	OR-Y	028	000	02
N							017200100500						02 NONE	0	STRGHT							
													PRVTE		N -S							
													PSNGR CAR		01 DRVR	INJC	21	F	OR-Y	000	000	000
02225	N	N	N	N	06/07/2017	16	DUBARKO RD	INTER	CROSS	N	CLR	ANGL-OTH	01 NONE	0	STRGHT	01 DRVR	NONE	00	Unk	UNK	000	000
CITY							EAGLE CRK-SANDY HY	CN	STOP SIGN	N	DRY	ANGL	PRVTE		S -N							
N								04	0	N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	40	M	OR-Y	000	000	00
N							017200100500						02 NONE	0	STRGHT							
													PRVTE		W -E							
													PSNGR CAR		01 DRVR	INJC	38	M	OR-Y	028	000	015

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CDS380
05/31/2021

OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS 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
18 - 21 of 27 Crash records shown.

SER#	P R J S W DATE	CLASS	CITY STREET	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPL USE	TRLR QTY	OWNER	MOVE	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE		
INVEST	E A U I C O DAY	DIST	FIRST STREET	(MEDIAN)	INT-REL	ANDBT	SURF	COLL	TRUCK	COLL	FROM	TO	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE		
RD DFT	E L G N H R TIME	FROM	SECOND STREET	LESS	TRAF-	DRVMY	LIGHT	SVRTY	VEH TYPE	VEH TYPE	VEH TYPE	VEH TYPE	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE		
UNLOC#	D C S V L K LAT	LONG	LR	(#LANES)	CONTL	CLR	O-1	L-TURN	01	NONE	0	TURN-L	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE		
02958	N N N N N 07/21/2017	16	DUBARKO RD	CROSS	N	STOP SIGN	N	DRY	TURN	TURN	PRVTE	S -W	01	DRVR	NONE	28 M	OR-Y	028	000	02	
CITY	FR		EAGLE CRK-SANDY HY	CN	0		DAY	INJ	PSNGR CAR											00	
N	45 23 22.76	-122.15	017200100500																		02
N	48.39																				00
00647	N N N N N 02/18/2017	16	DUBARKO RD	CROSS	N	STOP SIGN	N	RAIN	ANGL-OTH	01	NONE	9	STRGHT							03	
CITY	SA		EAGLE CRK-SANDY HY	CN	0		WET	ANGL	N/A			W -E									00
N	7P								PSNGR CAR												00
N	45 23 22.76	-122.15	017200100500																		00
N	48.39																				00
03467	N N N N N 08/23/2017	16	DUBARKO RD	CROSS	N	STOP SIGN	N	DRY	ANGL	ANGL	PRVTE	NE-SW									02
CITY	WE		EAGLE CRK-SANDY HY	CN	0		DAY	PDO	PSNGR CAR												00
N	8A																				00
N	45 23 22.76	-122.15	017200100500																		00
N	48.39																				00
03255	N N N N N 09/14/2018	16	DUBARKO RD	CROSS	N	STOP SIGN	N	CLR	ANGL-OTH	01	NONE	0	TURN-L								02
CITY	FR		EAGLE CRK-SANDY HY	CN	0		DRY	TURN	PRVTE			W -N									00
N	9P								PSNGR CAR												00
N	45 23 22.52	-122.15	017200100500																		02
N	48.53																				00
03255	N N N N N 09/14/2018	16	DUBARKO RD	CROSS	N	STOP SIGN	N	CLR	ANGL-OTH	01	NONE	0	TURN-L								02
CITY	FR		EAGLE CRK-SANDY HY	CN	0		DRY	TURN	PRVTE			W -N									00
N	9P								PSNGR CAR												00
N	45 23 22.52	-122.15	017200100500																		02
N	48.53																				00
03255	N N N N N 09/14/2018	16	DUBARKO RD	CROSS	N	STOP SIGN	N	CLR	ANGL-OTH	01	NONE	0	TURN-L								02
CITY	FR		EAGLE CRK-SANDY HY	CN	0		DRY	TURN	PRVTE			W -N									00
N	9P								PSNGR CAR												00
N	45 23 22.52	-122.15	017200100500																		02
N	48.53																				00
03255	N N N N N 09/14/2018	16	DUBARKO RD	CROSS	N	STOP SIGN	N	CLR	ANGL-OTH	01	NONE	0	TURN-L								02
CITY	FR		EAGLE CRK-SANDY HY	CN	0		DRY	TURN	PRVTE			W -N									00
N	9P								PSNGR CAR												00
N	45 23 22.52	-122.15	017200100500																		02
N	48.53																				00
03255	N N N N N 09/14/2018	16	DUBARKO RD	CROSS	N	STOP SIGN	N	CLR	ANGL-OTH	01	NONE	0	TURN-L								02
CITY	FR		EAGLE CRK-SANDY HY	CN	0		DRY	TURN	PRVTE			W -N									00
N	9P								PSNGR CAR												00
N	45 23 22.52	-122.15	017200100500																		02
N	48.53																				00
03255	N N N N N 09/14/2018	16	DUBARKO RD	CROSS	N	STOP SIGN	N	CLR	ANGL-OTH	01	NONE	0	TURN-L								02
CITY	FR		EAGLE CRK-SANDY HY	CN	0		DRY	TURN	PRVTE			W -N									00
N	9P								PSNGR CAR												00
N	45 23 22.52	-122.15	017200100500																		02
N	48.53																				00
03255	N N N N N 09/14/2018	16	DUBARKO RD	CROSS	N	STOP SIGN	N	CLR	ANGL-OTH	01	NONE	0	TURN-L								02
CITY	FR		EAGLE CRK-SANDY HY	CN	0		DRY	TURN	PRVTE			W -N									00
N	9P								PSNGR CAR												00
N	45 23 22.52	-122.15	017200100500																		02
N	48.53																				00

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
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URBAN NON-SYSTEM CRASH LISTING

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.

CITY OF SANDY, CLACKAMAS COUNTY

SER#	INVEST	RD DFT	UNLOC?	S D M	R J S W DATE	CLASS	DIST	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	OWNER	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT. EVENT	CAUSE		
03281	N N N N	N N N N	N N N N	N N N N	09/23/2019	16		DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE	0		STRGHT	NE-SW	01 DRVR	NONE	31 M	OR-Y	OR<25	000	00
								EAGLE CRK-SANDY HY	CN	STOP SIGN	N	N	DRY	ANGL	PRVTE			PSNGR CAR		01 DRVR	NONE	17 F	OR-Y	OR<25	015	00
								017200100500	02	0				INJ	PSNGR CAR			PSNGR CAR		01 DRVR	INJC	17 F	OR-Y	OR<25	000	02
															02 NONE	0		STRGHT	E-W							
															PRVTE			PSNGR CAR		01 DRVR	INJC	17 F	OR-Y	OR<25	015	00
															PSNGR CAR			PSNGR CAR		01 DRVR	INJC	17 F	OR-Y	OR<25	000	02
															02 NONE	0		STRGHT	E-W							
															PRVTE			PSNGR CAR		01 DRVR	INJC	12 F	OR-Y	OR<25	015	00
															PSNGR CAR			PSNGR CAR		01 DRVR	INJC	12 F	OR-Y	OR<25	000	00
00075	N N N N	N N N N	N N N N	N N N N	01/08/2019	16		DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE	0		STRGHT	NE-SW	01 DRVR	NONE	31 M	OR-Y	OR<25	000	00
								EAGLE CRK-SANDY HY	CN	STOP SIGN	N	N	DRY	ANGL	PRVTE			PSNGR CAR		01 DRVR	NONE	17 F	OR-Y	OR<25	000	00
								017200100500	03	0				INJ	PSNGR CAR			PSNGR CAR		01 DRVR	INJC	17 F	OR-Y	OR<25	000	00
															02 NONE	0		STRGHT	E-W							
															PRVTE			PSNGR CAR		01 DRVR	INJC	16 F	OR-Y	OR<25	015	013
															PSNGR CAR			PSNGR CAR		01 DRVR	INJC	16 F	OR-Y	OR<25	000	00
															03 NONE	0		STOP	W-E							
															PRVTE			PSNGR CAR		01 DRVR	NONE	21 M	OR-Y	OR<25	022	00
															PSNGR CAR			PSNGR CAR		01 DRVR	NONE	21 M	OR-Y	OR<25	000	00
00908	N N N N	N N N N	N N N N	N N N N	03/14/2019	16		DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE	0		STRGHT	NE-SW	01 DRVR	NONE	31 M	OR-Y	OR<25	000	02
								EAGLE CRK-SANDY HY	CN	STOP SIGN	N	N	DRY	ANGL	PRVTE			PSNGR CAR		01 DRVR	NONE	17 F	OR-Y	OR<25	000	00
								017200100500	04	0				INJ	SEMI_TOW			PSNGR CAR		01 DRVR	INJC	58 M	OR-Y	OR<25	000	00
															02 NONE	0		STRGHT	W-E							
															PRVTE			PSNGR CAR		01 DRVR	INJC	19 M	OR-Y	OR<25	015	00
															PSNGR CAR			PSNGR CAR		01 DRVR	INJC	19 M	OR-Y	OR<25	000	02
															02 NONE	0		STRGHT	W-E							
															PRVTE			PSNGR CAR		01 DRVR	INJC	18 F	OR-Y	OR<25	015	00
															PSNGR CAR			PSNGR CAR		01 DRVR	INJC	18 F	OR-Y	OR<25	000	00
01291	N N N N	N N N N	N N N N	N N N N	04/22/2019	16		DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01 NONE	0		STRGHT	NE-SW	01 DRVR	NONE	31 M	OR-Y	OR<25	000	02
								EAGLE CRK-SANDY HY	CN	STOP SIGN	N	N	DRY	ANGL	PRVTE			PSNGR CAR		01 DRVR	NONE	17 F	OR-Y	OR<25	000	00
								017200100500	04	0				INJ	PSNGR CAR			PSNGR CAR		01 DRVR	INJC	36 M	OR-Y	OR<25	000	00
															02 NONE	0		STRGHT	W-E							
															PRVTE			PSNGR CAR		01 DRVR	INJC	18 F	OR-Y	OR<25	015	00
															PSNGR CAR			PSNGR CAR		01 DRVR	INJC	18 F	OR-Y	OR<25	000	00

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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 Analysis 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 Analysis 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 Analysis 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)

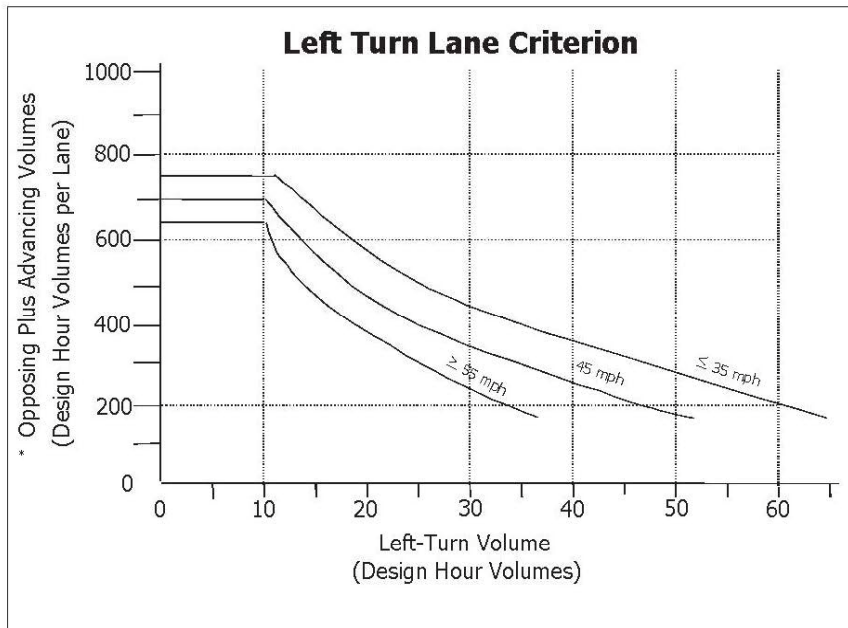


Project Name: Deer Meadows Development
 Approach: Highway 211 NB at Dubarko Road
 Scenario: 2021 Existing Conditions

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

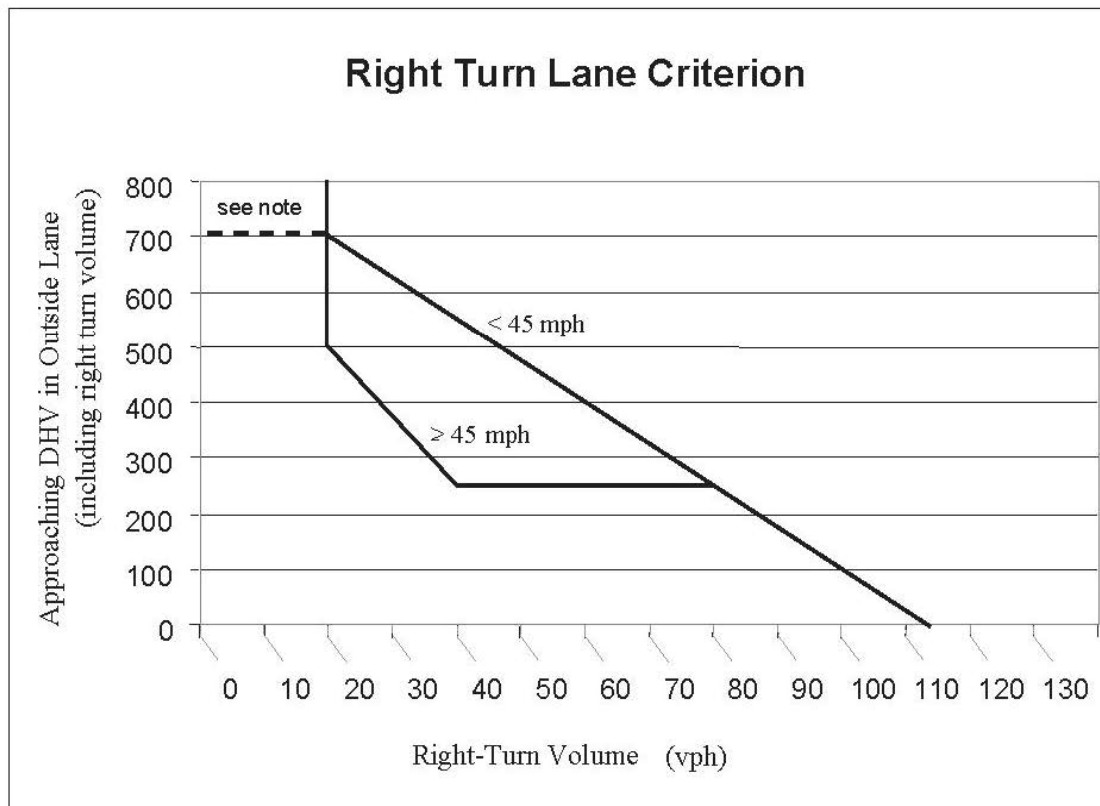
Major-Street Design Speed: 45 mph

	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)

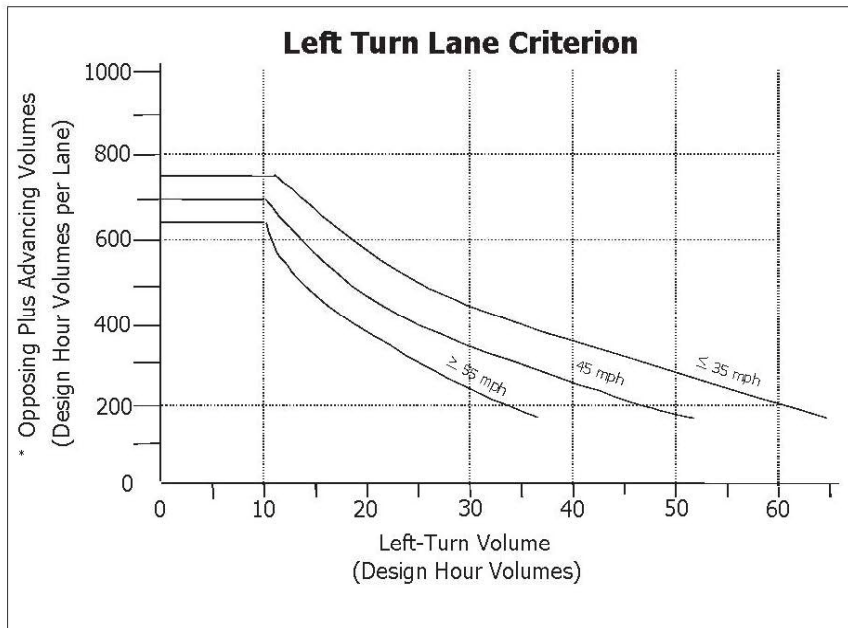


Project Name: Deer Meadows Development
 Approach: Dubarko Road eastbound at Langensand Road
 Scenario: 2023 Background plus Site Trips

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

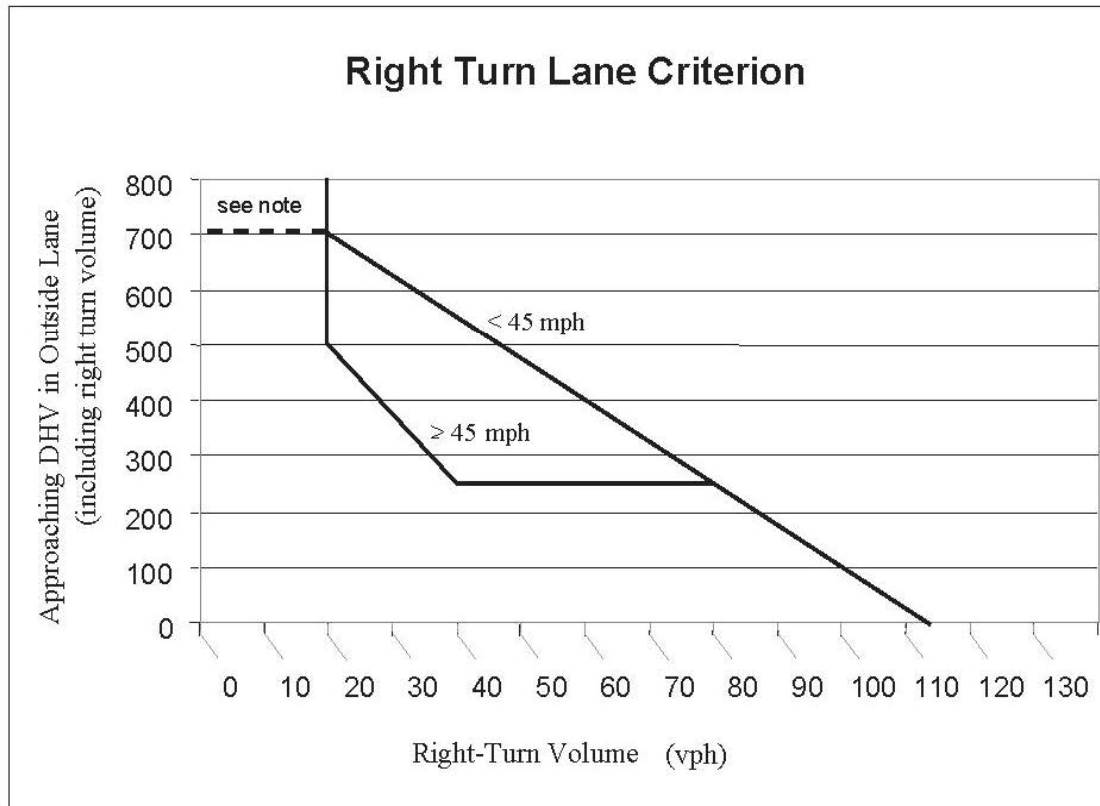
Major-Street Design Speed: 25 mph

	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.