PINE CROSSING
TRAFFIC IMPACT ANALYSIS
FLORENCE, Oregon

BEI Project 22-312

Prepared for:
Coastal Development Partners LLC
2824 N Power Rd #113-278
Mesa, Arizona 85215

Branch ENGINEERING inc
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310 5th Street
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May 12, 2023

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EXECUTIVE SUMMARY

Description

The subject site is within the City of Florence, Oregon and is generally located northeast of the intersection of US Highway 101 (US 101) at Munsel Lake Road, at the east side of Spruce Street and north of 52nd Street. The site is identified as tax lot 00203 of assessor's map 18-12-14-20 and is composed of approximately 7.61 acres of land. The current development proposal includes construction of 36 single family attached duplex/duet dwelling units and eight (8) detached dwelling units. The existing medium density residential zoning of the land supports attached and detached single family residential development.

Safety

A review of the intersection crash histories revealed that there was not a significantly high crash frequency occurring over the most recent and applicable 5-year period of complete available crash data. Additional traffic loading from build-out of the proposed development will not be added to any known facilities within the study area with identified significant safety concerns.

Traffic

Traffic generated by the site is planned to access the local transportation system at a new public street connection located at the east side of Spruce Street, north of 52nd Street. The new public street connection will provide a local through street connection between Spruce Street and Versant Drive that will provide access to the local transportation system for the proposed new dwelling units via Munsel Lake Road. The development plan includes extending Versant Drive north from its existing north terminus at the south Pine Crossing Site property line, north through the site to the north property line.

The site is expected to generate a total of 299 average daily trips (ADT), with 26 of those trips expected to occur during the transportation system's PM peak hour. The provided trip generation assumes the site will be developed with 44 single family dwelling units at full build-out, with 36 of the units developed as duplex or duets (attached single family dwellings) and eight (8) units developed as single family detached dwellings. Since the site will add more than 25 single family dwellings that generate greater than 250 ADT in total, a Traffic Impact Analysis (TIA) is required by the City of Florence per Florence City Code (FCC) Title 10-1-1-4-D.

Intersection operational performance was evaluated for the PM peak hour traffic conditions to be consistent with the design hour and Analysis Methodology and Performance Standards section of the current City of Florence Transportation System Plan (2012). The anticipated full site build-out year (2026) design hour conditions were evaluated with and without the proposed development occurring as one single master phase, although the construction sequencing will likely include permit applications that occur in phases between the current year and the anticipated full build-out year. A single full build-out master phase for this traffic analysis was considered appropriate because the scale of the proposed development overall is not considered large-scale in terms of traffic generated with incremental development and occupancy of potential construction phases that will not add significant levels of new site generated traffic. The 2026 year of opening analysis year scenario is consistent with the ODOT Development Review Guidelines pertaining to Traffic Impact Analyses (May 4, 2017) for a single phase of development with up to 999 ADT. A TIA is not required by ODOT since the site does not have direct access to a state highway and build-out will

not result in adding 50 or more peak hour trips to an existing intersection on a state highway, however, the City of Florence Traffic Impact Analysis review standards do not provide caveats for horizon years and other specific details for assessing development impacts.

Results

In summary, the proposed development will not cause significant adverse impact to the performance of a transportation facility as defined per city of Florence, Lane County and ODOT standards. No mitigation is required to accommodate the potential traffic generated by the proposed development.

1.0 INTRODUCTION

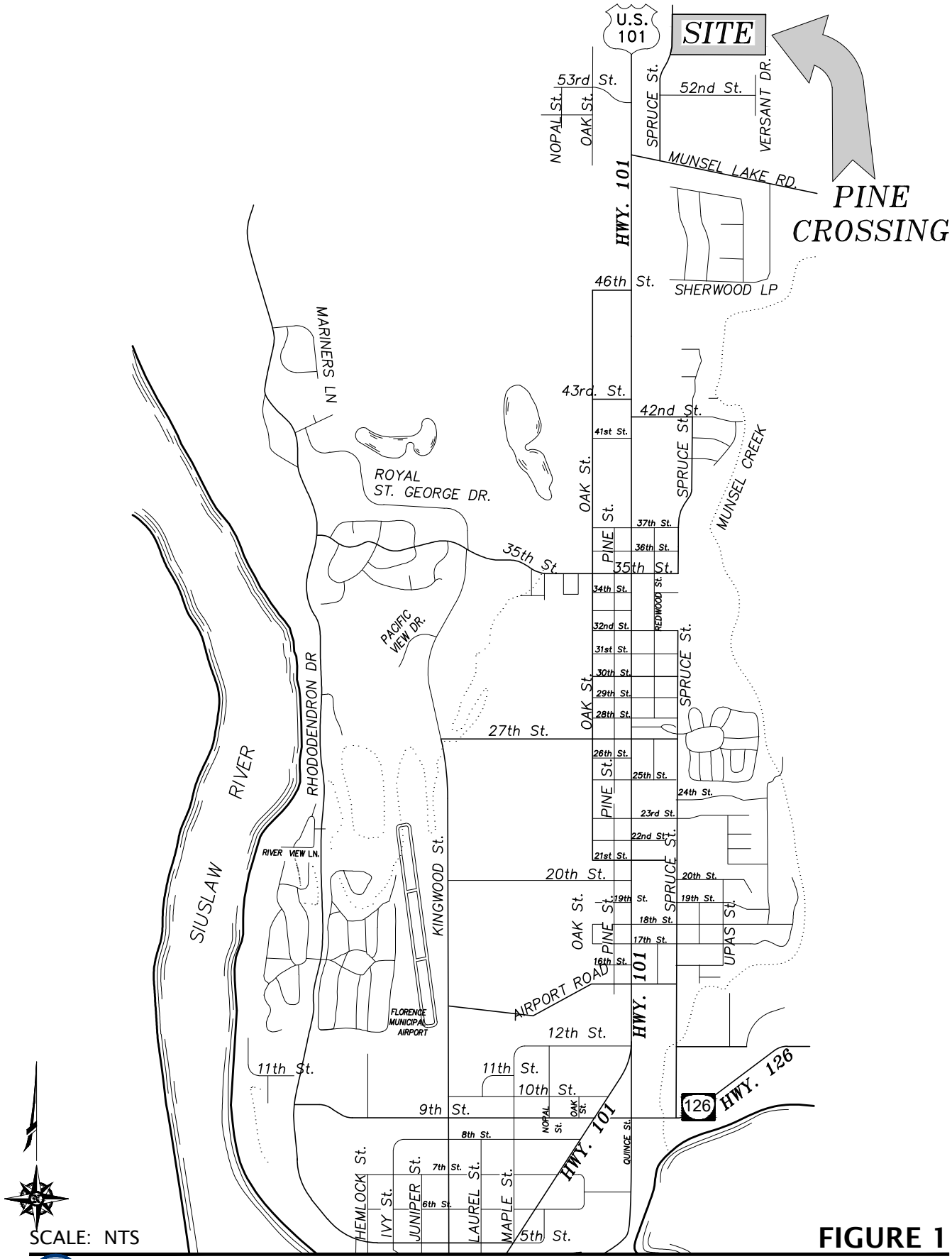
Branch Engineering Inc. has been retained by Coastal Development Partners, LLC to evaluate post development traffic conditions associated with the proposed Pine Crossing Subdivision and development applications. This report is intended to meet the traffic analysis requirements and objectives identified by the City of Florence's current development code, section 10-1-1-4E, as well as the Lane County Code pertaining to traffic impact analysis review contained within LC 15.697. Included in the analyses are summaries of existing and proposed transportation infrastructure, documentation of design hour traffic volumes without the proposed development's traffic, projected post development 'build' traffic volumes, an intersection performance evaluation for the identified intersections, and an evaluation of crash history for the existing public street intersections in the study area. A site plan for development is included as Appendix A.

As agreed upon in scoping the traffic impact analysis with the City of Florence and Lane County Transportation Planning, the analyses provided herein will include the PM peak hour traffic conditions for the following years:

- Year 2023 'Existing' conditions;
- Year 2026 'No-Build'/Background design hour conditions, and;
- Year 2026 'Build' design hour conditions';

Scoping e-mails exchanged with Lane County and the City of Florence are provided in Appendix B. The Oregon Department of Transportation (ODOT) was provided with a proposed scope for the traffic impact analysis in an e-mail, but ODOT replied that they do not specifically require a traffic impact analysis to be provided for their review for the proposed development, since the project will not increase traffic volumes by 50 or more vehicle trips at a public street intersection within their jurisdiction and the site does not propose direct access to an ODOT facility.

A vicinity map with the site's location is provided on the following page as Figure 1.



SCALE: NTS

FIGURE 1

Vicinity Map

PINE CROSSING

TRAFFIC IMPACT ANALYSIS

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Project No: 22-312

2.0 EXISTING CONDITIONS

2.1 Project Site

The Pine Crossing Site is identified as Lot 3 of the 2007 Morales Subdivision Plat, and is currently identified as tax lot 203 on Lane County Assessor's Map 18-12-14-20. The site property currently consists of approximately 7.61 acres of undeveloped land. In 2007, Spruce Street was extended north from Munsel Lake Road abutting the site's western property boundary frontage as part of a Local Improvement District (LID) project sponsored by the City of Florence that improved the right-of-way of Spruce Street with City water, sewer, stormwater and transportation infrastructure. As part of the 2007 LID project, future development at the site was considered, and as such, curb return radii for a future street connection was constructed on the site frontage on the Spruce Street extension. Another subdivision to the south, that was previously identified as Lot 4 of the Morales Subdivision Plat, has been re-platted with 37 individual parcels of land as Spruce Village and is fully built-out with single family residences.

2.2 Roadway Network

The relevant roadways receiving traffic from development included in this study include:

- US Highway 101 (Oregon Coast Highway);
- Munsel Lake Road, and;
- Spruce Street.

The studied intersections include:

- US Highway 101 at Munsel Lake Road;
- Munsel Lake Road at Spruce Street, and;
- Spruce Street at the site entrance.

Details of the study area roadways and intersections are included in the following table:

Table 1: Roadway Network

Roadway	Jurisdiction	Functional Classification	Lanes	Sidewalks	Bike Lanes	Posted Speed
US 101	ODOT	Major Arterial[1]	3	No[1]	Yes (wide shoulders)	40
Munsel Lake Road	Lane County	Minor Arterial[2]	2	No	No	35
Spruce Street	Florence	Collector	2	East Side Only	Yes	25

[1]ODOT's functional classification of US 101 is Principal Arterial – Other. US 101 is also called the Oregon Coast Highway and is additionally classified as: a scenic by-way (All American Road), a statewide highway, and is part of the National Highway System (NHS). Sidewalks are present on west side, south of Munsel Lake Road
[2]ODOT and Lane County classify Munsel Lake Road as an Urban Major Collector

A diagram showing the existing Lane Configurations and Intersection Controls is provided on Figure 2 on page 7.

US Highway 101

US Highway 101 (also known as the Oregon Coast Highway, US 101 and Highway 101) is an Oregon Department of Transportation (ODOT) owned and maintained principal arterial roadway that provides the main thoroughfare throughout the City of Florence. Highway 101 stretches through the state from Washington to California and is the State of Oregon's primary coastal route.

Highway 101 at Munsel Lake Road has one northbound and one southbound travel lane and a continuous center two-way left-turn lane. Immediately south of Munsel Lake Road, Highway 101 develops a second southbound auxiliary lane that continues throughout the City limits of Florence to near the Siuslaw River bridge. A second northbound auxiliary lane that starts near the Siuslaw River Bridge and the south City limit extents, ends about 800 feet south of 42nd Street, or approximately six tenths of a mile south of Munsel Lake Road. Starting south of Munsel Lake Road and southbound, there is sidewalk, curb and gutter and a designated bike lane at the west side of Highway 101 for several hundred feet on the Fred Meyer frontage, then a gap before continuous features are provided south of 37th Street. Curb and gutter, continuous sidewalk, and designated bike lanes are generally present at the east side of US 101 throughout City limits to approximately 335 feet north of 37th Street, which is approximately seven tenths of a mile south of Munsel Lake Road. The through travel lanes are marked with 8-inch wide white lane striping and the existing wide shoulders (and designated bike lanes where applicable) are marked with bike lane stencils on both sides of US 101, north and south of Munsel Lake Road. The southbound center two-way left-turn lane develops into a southbound left-turn lane at Munsel Lake Road, with a marked left-turn lane that features approximately 105 feet of 8" wide white lane striping. The center two-way left-turn lane extends north of Munsel Lake Road for over half of a mile to north of the intersection of Heceta Beach Road, where the section transitions to have no median.

The intersection of US 101 at Munsel Lake Road is a two-way stop-controlled intersection with free movements north and south on Highway 101. The approach at the east leg (westbound) on Munsel Lake Road is required to stop. There is a private driveway approach on the west side of the intersection, but no existing public street connection. The westbound and northbound approach legs have approach flares, similar to a channelized right-turn lane with little storage and no channelizing delineation. The flared approaches feature a shoulder that is widened enough near the intersection that it allows refuge for right turning vehicles out of the travel lane. The northbound approach flare allows some of the deceleration (braking) distance to be accommodated out of the travel lane, while the eastbound approach flare allows for storage of up to two vehicles simultaneously when there is a left-turning vehicle, or vehicles, in queue waiting to turn left onto US 101. The eastbound flare allows right turning vehicles to execute a right-turns without waiting in queue for a left-turning vehicle to accept gaps in both directions, which is similar to a signalized intersection with a right-turn on red condition. The eastbound approach's stop bar on Munsel Lake Road is approximately 35 feet long, overall, with a bent portion that serves a perpendicular alignment for right-turning vehicles at the approach flare taking up 15 feet of the striped length. At the north end of the bent portion of the stop bar, there is approximately ten (10) feet of additional unmarked paving to the edge of the asphalt surfacing. The 2012 Transportation System Plan calls for an intersection improvement at Munsel Lake Road and US 101 when traffic signal warrants are met and the traffic signal can be funded.

The intersection of US 101 at Munsel Lake Road has a private driveway at the eastbound approach, where the 2012 City of Florence Transportation System Plan calls for a future extension of Munsel Lake Road between the existing US 101 intersection and a future extension of Oak Street, to the west. Oak Street currently terminates at 46th Street, south of the Fred Meyer site. There is another short segment of Oak Street that is either constructed and in place, or has been platted with right-of-way dedicated to the City for the future street. The right-of-way that has been dedicated and improved includes 53rd Street, that was constructed through the public improvement process for the Three Mile Prairie Development Site's main entrance on the west side of Highway 101. As the Three Mile Prairie development builds-out, it is likely that Oak Street will be extended south from 53rd Street to approximately where the future Munsel Lake Road extension will be aligned to complete a connection.

It is anticipated that as property develops or redevelops north from the existing US 101 street section currently developed with urban surface infrastructure improvements, US 101 will be improved incrementally with modern urban infrastructure improvements, including sidewalks, curb and gutter and more appropriately designated bike lanes. The Cannery Station development site in the southeast quadrant of the intersection at Munsel Lake Road, is one such pending development project that has initial approvals from the City of Florence for development. As Cannery Station is built-out, public frontage improvements at the east side of US 101 will be provided proportionately as development occurs. The Cannery Station project's public improvements are also expected to include an RRFB (activated flashing warning lights/beacon) equipped pedestrian crossing north of the proposed 47th Street intersection across US 101 to where there is commercial development at the west side of the highway that also serves as a transit stop for the local Rhody Express transit service. The RRFB crossing features will likely include stop bars in advanced of striped continental crosswalks, and a raised center median island for pedestrian refuge.

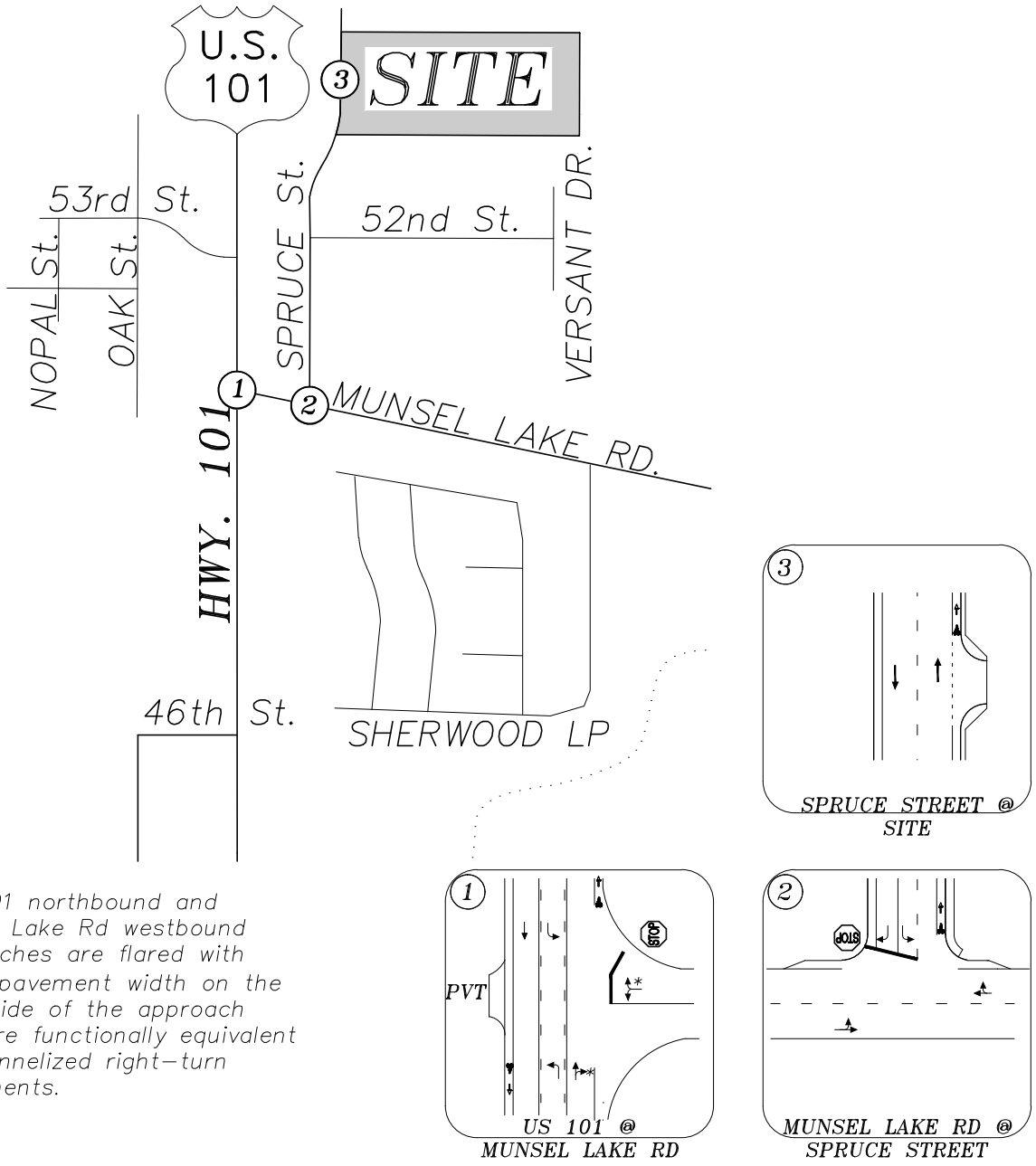
Munsel Lake Road

Munsel Lake Road is a Lane County owned and maintained major collector roadway (minor arterial per City of Florence Transportation System Plan) that provides east-west connectivity between North Fork Road and US Highway 101. Munsel Lake Road also provides access to Munsel Lake, where there is a boat launch facility, and for local area residents, that includes the north entrance to Florentine Estates (age restricted 55+ retirement living in a gated community). There is a future public street connection, Redwood Street, proposed and planned to be constructed with public improvements for Cannery Station, between the existing intersection of Spruce Street and US 101 on the south side of Munsel Lake Road. The future Redwood Street connection will provide access to future phases of Cannery Station that are anticipated to be completed in 2028. Munsel Lake Road currently has narrow shoulders, and no sidewalks or bike lanes. As development occurs at the Cannery Station site abutting Munsel Lake Road, the Cannery Station frontage on Munsel Lake Road will be improved with modern urban improvements, which are anticipated to include a bike lane and sidewalk at the south side of the road.

Spruce Street

Spruce Street is a City of Florence owned and maintained collector street that currently stubs north from Munsel Lake Road and provides local access for existing undeveloped parcels and surrounding development. As described previously, when the City of Florence's Spruce Street LID project was constructed, there were future street connections (four) that were planned for in the construction that included installing curb return radii at the east side of the roadway where future

local street connections were anticipated to be located as development of vacant land on the frontage is anticipated to occur. The existing Spruce Village subdivision described previously, was one such development. With Spruce Village, an additional north-south parallel local street segment was dedicated and constructed as Versant Drive, near the east boundary of Spruce Village. Spruce Street currently dead ends about ¼ mile north of Munsel Lake Road. The City of Florence's 2012 TSP calls for a future street extension of Spruce Street from its existing north terminus to the intersection of US 101 at Heceta Beach Road as development of abutting parcels occurs.



*US 101 northbound and Munsel Lake Rd westbound approaches are flared with addt'l pavement width on the right side of the approach that are functionally equivalent to channelized right-turn movements.

SCALE: NTS

FIGURE 2

PINE CROSSING

TRAFFIC IMPACT ANALYSIS

Existing Lane Configs & Int. Controls

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2.3 Transit and Non-Motorized Facilities

There is currently a Rhody Express bus route that stops at the Fred Meyer commercial development site, at the west side of US 101, south of the intersection at Munsel Lake Road. Rhody Express is a subsidiary of Lane Transit District. Rhody Express makes two route loops in Florence, with one north loop and one south loop that originate and terminate at/near the Grocery Outlet site located near 21st Street and US 101. Rhody express operates on a 60-minute circuit around each loop Monday through Friday from 10:00AM through 6:00PM. The routes provide public transportation to key parts of Florence, including retail centers, schools, food share, the Old Town district, the hospital and several city parks. The availability of transit, pedestrian and bicycle facilities can help to reduce the reliance on single occupant motorized vehicles.

2.4 Existing Year 2023 Traffic Volumes

Existing year 2023 turning movement peak hour traffic volumes were developed from turning movement traffic count data collected in June 2021 by Quality Counts, LLC and reported by Kittlesen and Associates, Inc. in Tech Memo #3B for the current City of Florence Transportation System Plan (TSP) Update project expected to be completed in 2023. The count data was collected for 16-hours, between 6:00AM and 10:00PM on June 3, 2021. Development of the June 2021 traffic count data to represent the current year 2023 PM peak hour/design hour traffic volumes required calculating and applying adjustment factors for background traffic growth for two years, seasonal fluctuation/variation and a special factor relating to travel trend impacts associated with the COVID-19 pandemic. These adjustment factors will be discussed in the following sections.

The standard ODOT procedure for traffic data collection used for analyzing the PM peak hour for a traffic impact analysis is for a three-hour count period and for the period to occur between 3:00PM and 6:00PM. Turning movement traffic count data collected by Quality Counts, LLC was input into a spreadsheet to determine the PM peak hour that occurs between 3:00PM and 6:00PM, the turning movement volumes during that hour, and the appropriate peak hour factor for that peak hour. The data collected by Quality Counts, LLC identified a peak hour that occurred between 12:15PM to 1:15PM (midday) and considered all 16-hours of the count data collection period. A midday time period was not required to be included with this analysis, and is not consistent with available trip generation data and rates for residential development that will be used to analyze potential impacts to the transportation system with the proposed development during the evening PM peak hour. The PM peak hour is typically a contiguous one-hour period when the peak trip demand occurs between 4:00PM and 6:00PM, which is also the most common time period that trip generation data are generally available for.

Although the trip generation rates are typically applicable for one contiguous hour occurring between 4:00 and 6:00 PM, since ODOT requires the traffic count to include the hour between 3:00 and 4:00 PM, the peak hour used for this analysis will be the hour occurring between 3:45PM and 4:45PM, which included 50 more trips than the second highest evening PM peak hour period between 4:00PM and 5:00PM. The current Transportation System Plan update project's Tech Memo 3B identifies a global peak hour of the entire transportation system between 4:00 and 5:00PM. The TSP Update project includes analysis of 20 intersections located throughout the City of Florence.

To approximate the traffic that currently utilizes the southbound approach on Spruce Street at Munsel Lake Road, a trip generation exercise was performed to determine the amount of traffic that is generated by the 36 existing single family detached dwellings currently constructed at the

Spruce Village site on 52nd Street, and the remaining traffic volumes were balanced as through movements between Munsel Lake Road at Spruce Street and US 101 at Munsel Lake Road.

Traffic count data collected by Quality Counts, LLC used for the TSP update and in this analysis are provided in Appendix C.

2.5 Seasonal Adjustment

Calculation of a seasonal adjustment factor was necessary to adjust traffic count volumes to represent PM peak design hour traffic conditions. The preferred ODOT procedure for calculating seasonal adjustments to be applied to collected traffic count data on state highways is to utilize an ODOT Automatic Traffic Data Recorder (ATR) when there is one available nearby and the characteristics of the roadway where the ATR is located are a relatively close match to the relevant intersection/facilities within the analysis area. If/when the ATR is outside the study area, the ODOT Analysis Procedures Manual (APM) has specific criterion for when use of the ATR data for seasonal adjustment is or can be acceptable. ATR 20-026 is the nearest ATR station to the site and is located 0.77 miles north of Heceta Beach Road on US 101 (1.33 miles north of the intersection at Munsel Lake Road), which is outside of the City's current Urban Growth Boundary (UGB). Per the most current available ATR information, (year 2021) the traffic trend at ATR station 20-026 is identified as Coastal Destination Route. However, the traffic volumes and other characteristics (center two-way left turn lane present at the site) are not similar enough to the study area to use the ATR data directly to calculate a seasonal adjustment factor to apply to the raw traffic count data. Therefore; the ATR data collected at ATR Station 20-026 should not be used to calculate a seasonal adjustment factor at the intersection of US 101 at Munsel Lake Road.

US 101 has a significant decline in approaching average daily traffic volumes between Munsel Lake Road and ATR Station 20-026, with a major street connection at Heceta Beach Road, and it is expected that a significant portion of the traffic that is served at the intersection of Munsel Lake Road has more influence due to employment and residential trip origins and destinations (commute traffic) than ATR Station 20-026, which is identifies US 101 as a coastal destination route. Traffic with that is significantly influenced by employment and residential traffic is more consistent with a commuter seasonal trend. Because the traffic on US 101 in the study area is a combination of commuter and coastal destination route seasonal trends, collected raw traffic count inflows and outflows were seasonally adjusted utilizing ODOT's most recent (2021) Seasonal Trend Method, per Section 5.5.4 of the current ODOT Analysis Procedures Manual (APM), which involves calculating commuter and coastal destination trends seasonal factors for the count date and averaging them for a single seasonal adjustment factor. Using an average of the coastal destination route and commuter trends' seasonal factors is consistent with recent traffic studies performed in the area that have been approved for phase 1 of development at each the nearby Cannery Station development site and the Three Mile Prairie site to adjust collected traffic data to represent design hour conditions. The calculated average seasonal adjustment factor was 1.0943 for the June 3rd, 2021 data collection date utilizing the 2021 ODOT Seasonal Trend Table and the provided peak seasonal factors for each applicable seasonal trend type.

The calculated count date seasonal adjustment factors were applied to collected turning movement traffic count volumes at all approaches and the through street approaches to Spruce Street on Munsel Lake Road, to develop design hour traffic conditions. The traffic inflows and

outflows on Spruce Street is due to residential traffic and is not subject to significant seasonal variation, so additional seasonal adjustment was not required nor applied to turning movements to/from Spruce Street. ODOT's Seasonal Trend Table and seasonal adjustment factor calculations are provided as Appendix D.

Because the ODOT traffic data collection methodology requires traffic count data to be collected when seasonal variation does not require an adjustment to the collected data by 30 percent or more, traffic count data that was located for use in the City of Florence Transportation System Plan Update were utilized instead of collecting data during February 2023, at the time of this TIA preparation. The seasonal variation on US 101 for a February data collection date would likely require collected traffic count data to be adjusted for seasonal variation by greater than 30 percent, because US 101 is partially affected by the Coastal Destination Route seasonal trend.

2.6 Special Transportation Trend Adjustment

On March 23rd, 2020 the Oregon Governor issued Stay Home Stay Safe (SHSS) guidelines that were implemented due to concerns about spreading of the Corona Virus/COVID-19. Between March 2020 and July 2021, ODOT utilized Automatic Traffic Recorders installed around the state on certain significant state highway locations to monitor and track transportation impacts associated with the COVID-19 pandemic that significantly affected traffic volume levels throughout the state and nationally. The standard procedure for utilizing traffic volume data collected during the time period between March 2020 and July 2021 has been to calculate and utilize an additional adjustment factor from the ODOT collected COVID-19 data and reports that is applied to the collected turning movement count data to develop design hour conditions for traffic analyses. ODOT ceased weekly reporting on traffic trends with their last, July 9, 2021 COVID-19 report, that covered the week ending July 4th, 2021. ODOT's last report included a statement that the traffic levels were back to close to pre-covid conditions. ODOT Weekly COVID-19 Traffic Trend Reports are available online at ODOT's Traffic Counting website. The ODOT compiled data was reviewed for ATR Stations that data were compared for on US 101, and it was calculated that the Week of May 31, 2021 to June 6, 2021 was five (5) percent greater than the same week in 2019 for average weekday traffic. For the specified week, the weekend average daily traffic was two (2) percent lower in 2021 when compared to 2019. Since the traffic count data were collected on a weekday, the data would typically only need to be adjusted with the previously described seasonal adjustment factor to represent the expected PM peak design hour conditions.

The previously described Tech Memo 3B and the associated Analysis Methodology and Assumptions Memo by Kittlesen and Associates prepared for the City of Florence TSP Update project reported the calculated COVID-19 Special Traffic Trend Adjustment factor utilized to develop existing conditions traffic volumes for the TSP Update analysis was 1.06, which represents a six (6) percent increase over data collected in 2021. The TSP update efforts included concurrent with City of Florence and ODOT recommendations, where traffic count data collected on Rhododendron Drive and 35th Street for other traffic analysis endeavors prior to the COVID-19 pandemic were compared to count date data collected in 2021 for the TSP update. Since the TSP update project includes the same turning movement traffic count data that is utilized for this traffic analysis, the 1.06 special adjustment factor is assumed to be appropriate and conservative to be applied to the turning movement traffic count data that will be utilized to develop year 2023 existing traffic volumes for this analysis. Page 7 from the Analysis Methodology and Assumptions

Memo provided for the TSP Update and Table 1 from the July 9, 2021 COVID-19 Report is included in Appendix D with the collected traffic count data and seasonal adjustment factor calculations.

2.7 Traffic Growth and Future Year Traffic Volumes

The final step in adjusting the turning movement traffic count data from June 2021 to represent existing year 2023 and future year PM peak/design hour conditions was to calculate and apply an appropriate growth rate, since there have been nearly 2-years of growth since the traffic count data were collected. To calculate a growth rate to apply to the collected traffic count data, reference was made to the Kittlesen and Associates Tech Memos 3B and 4, prepared for the current City of Florence Transportation System Plan Update project. Per the TSP Update, the future year 2042 traffic volume growth is calculated from growth projections in transportation analysis zones (TAZs) within the Urban Growth Boundary (UGB), that include several of the largest undeveloped/underdeveloped individual parcels within the City located on or near the Munsel Lake Road corridor, east of US 101 and west of North Fork Road. The TSP Update Tech Memo 4 assumes a year 2042 horizon analysis year and assumes build-out of undeveloped and underdeveloped land within the UGB. The land use assumptions in Tech Memo 4 appear to assume a full future build scenario where specific development density (dwelling units/acre, e.g.) is applied to the undeveloped and underdeveloped parcels within the TAZs and the development scenario is based on the codified uses (i.e. min and max densities) and development standards identified in the zone/plan designation and the City development code.

The TSP Update Tech Memo #4 - *Future Land Use and Transportation Conditions* assumed that these large tracts of land are fully developed and built-out by the year 2042 horizon year and are significant contributors to traffic growth that is analyzed at the intersection of US 101 at Munsel Lake Road approaches, reflected in the westbound approach traffic volumes and the turning movements from US 101. Specifically, these large tracts of land are located within the TSP's TAZs 5, 8 and 9. Transportation Analysis Zone 5 also includes the subject site, which assumes a certain density there as well as the undeveloped property to the north on Spruce Street, including north from the north terminus of Spruce Street, where there is not any existing frontage to the northern parcels in the TAZ. A large portion of the land assumed to be "buildable" in TAZ 8 is located within the UGB, but is currently not within City limits or the City's current zoning jurisdiction. Another significant portion of the land is identified as the existing Ocean Dunes Golf Course, which is owned by the Confederated Tribes of the Coos, Lower Umpqua & Siuslaw Indians and part of the Three River Casino Resort. The TAZ Map from Kittlesen's Tech Memo #4 is included with the growth rate calculations in Appendix D. It is assumed that any significant land use applications for development on these large tracts of land will need to prepare a traffic impact analysis and potentially zone change(s) for development on those properties, which would likely occur after the subject Pine Crossing site is fully developed in 2026.

To develop appropriate growth rates to apply to the adjusted year 2021 PM peak/design hour turning movement traffic volumes already adjusted for seasonal and the special transportation impact trends described previously to represent existing year 2023 traffic volumes, a growth rate was calculated from the through movement traffic volumes on US 101 reported in Kittlesen's Tech Memo #4, Figure 4 and Tech Memo #3, Figure 2. The growth rate was calculated based on the ODOT Analysis Procedures Manual's (APM's) linear growth method (APM Chapter 6) by summing the northbound and southbound through movement volumes at US 101 and Munsel Lake Road for

the year 2042 horizon year design hour conditions reported in Tech Memo #4 and the year 2022 base year (Tech Memo #3B) and dividing the difference between the sums by the base year sum. The result is the overall growth (as a percentage) that is then divided by the number of years between the base year and the horizon year (20) to get an average annual growth rate (AAGR).

The calculated AAGR was determined to be 1.026 percent per year. To represent the current year 2023 PM peak/design hour conditions, the 1.026 AAGR was factored for 2 years to get a growth factor of 1.02 (1+0.01026 x 2) that was applied to the adjusted 2021 design hour turning movement traffic volumes. This factor was applied to all approaches at the intersection at Munsel Lake Road and US 101 and to the through movements on Munsel Lake Road at Spruce Street. The turning movements to/from Spruce Street on Munsel Lake Road were developed from trip generation for the existing residential development located on 52nd Street (Spruce Village), which is the only current developed site with primary access to Spruce Street, and as such, trip generation is not subject to growth. The remaining undeveloped parcels to the north of the site on Spruce Street are located on large tracts of land and/or will require a street extension for access and are expected to be required to provide a traffic impact analysis if/when future development occurs that will be required to account for their share of traffic growth as actual development occurs there.

The site's anticipated completion of build-out is expected to occur by the end of the year 2026. In developing the scope of analysis required for the proposed Pine Crossing development, references were made to the Oregon Department of Transportation's (ODOT's) Development Review Guidelines (DRG - May 4, 2017), which includes guidelines for projects that involve ODOT in scoping traffic impact analyses, when ODOT requires a land use application to provide a TIA for their review. Although ODOT does not specifically require this development proposal to provide a Traffic Impact analysis for ODOT's review purposes, the City of Florence does not have any formal detailed TIA scoping included in their development code. The identified standard for future year analysis is provided in Table 3.3 of the DRG, and is based on the site's average daily trip generation (ADT). For development proposals that will generate 999 or fewer ADT trips, only the anticipated year of completion is necessary for analysis. The analysis year at the year of opening of Pine Crossing was assumed adequate in scoping the TIA with the City of Florence and Lane County Transportation Planning. To develop the background year 2026 traffic volumes, the previously described AAGR was also factored for three years of growth, with a growth factor of 1.03 (1+0.01026 x 3) that was applied to the current year 2023 design hour traffic volumes.

The unadjusted PM peak hour turning movement traffic count data collected by Quality Counts, LLC included in this traffic analysis is presented as Figure 3 on page 14.

The current year 2023 PM Peak Hour Traffic Volumes are provided on Figure 4 on page 15.

Future Year 2026 Background Traffic Volumes are provided on Figure 5 on page 16.

2.8 Pipeline Traffic Volumes

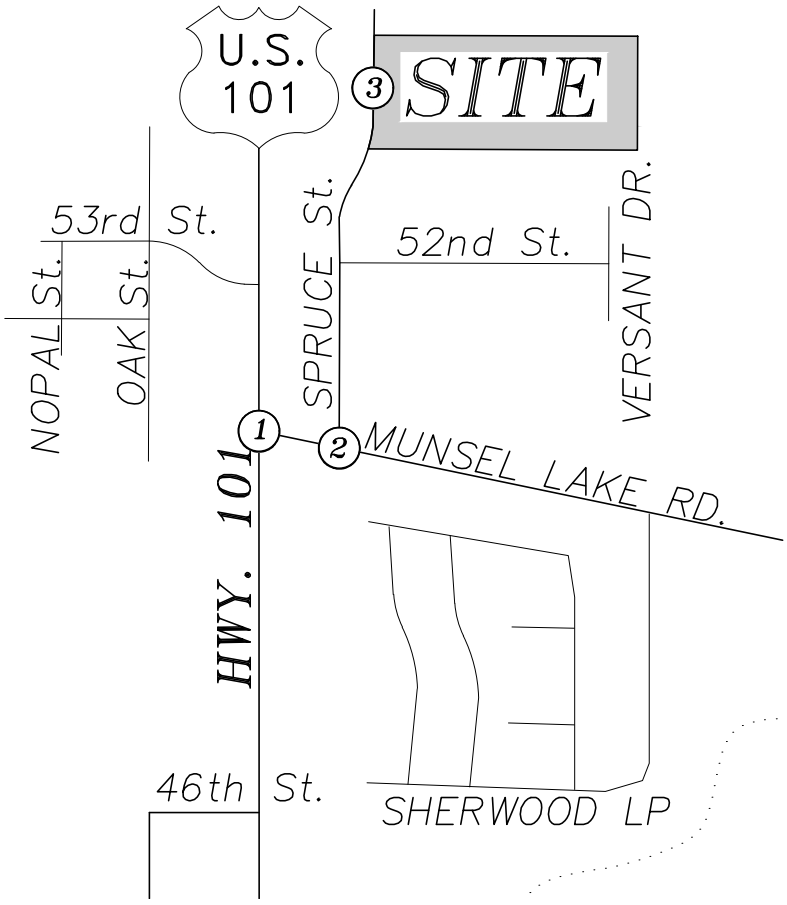
In addition to preparing existing and future year design hour background traffic volumes from anticipated growth for analysis, pending local area land use development projects with construction underway or expected to be underway soon that have been approved by the City of Florence but were not yet issued occupancy when traffic count data were collected were considered. Development traffic contributions that have been accounted for on the transportation system with approved traffic studies but are not reflected in traffic count data collected, are known

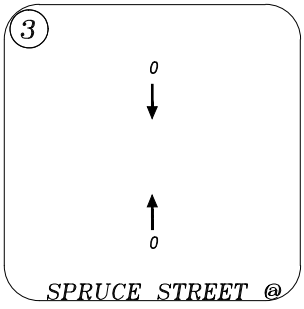
as pipeline traffic/trips (aka accruals). Unlike background traffic growth, pipeline trips are not subject to growth, since the contribution of development trips is based on the development's trip generation rate, and growth rates are not applied to constant trip generation rates.

In coordinating with the City of Florence's Public Works and Land Use Planning, it was determined that two such development approvals that are expected to add traffic to the intersection of US 101 at Munsel Lake Road prior to or in the anticipated build year of Pine Crossing (year 2026) include the first phase of development of each Cannery Station and Three Mile Prairie. Because these developments have approved traffic impact analyses and are expected to be open when the Pine Crossing development is complete and occupied in the year 2026, their contribution to approaching traffic volumes need to be accounted for by adding their trip distributions from their approved traffic studies to the background design hour traffic discussed in the previous section, and represented on Figure 4, to represent the Background No-build and build total traffic conditions for the Pine Crossing analysis year design hour traffic volumes. Because these developments have Phase 1 approval, the available capacity of the existing facilities has already been accounted for in the future year background traffic conditions when Pine Crossing will build-out, anticipated to be in year 2026. Future phases of Cannery Station and Three Mile Prairie are expected to provide additional traffic analysis documentation if/when future phases of development are built-out.

Pipeline trips from Cannery Station and Three Mile Prairie Traffic Impact Analyses are displayed on Figure 6 on page 17. Actual development trip figures from the Cannery Station and Three Mile Prairie Sites, as reported in their TIAs, are provided in Appendix E.

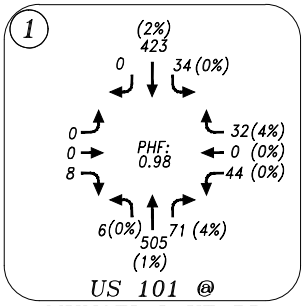
Future Year 2026 Design Hour No-Build Traffic Volumes are provided on Figure 7 on page 18.

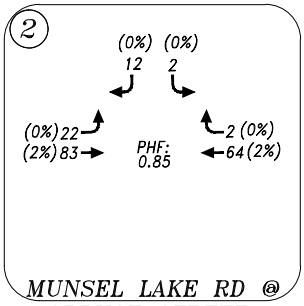




LEGEND
xx = PM PEAK HOUR
PHF = PEAK HOUR FACTOR
(%)TRUCKS

*TRAFFIC VOLUMES FROM TRIP GENERATION USED FOR SPRUCE ST. IN AND OUTFLOWS. THROUGH MOVEMENTS ARE THEN BALANCED TO US 101 @ MLR IN & OUT FLOWS





SCALE: NTS

FIGURE 3

PINE CROSSING
TRAFFIC IMPACT ANALYSIS

Year 2021 Traffic Count Volumes from TSP Update
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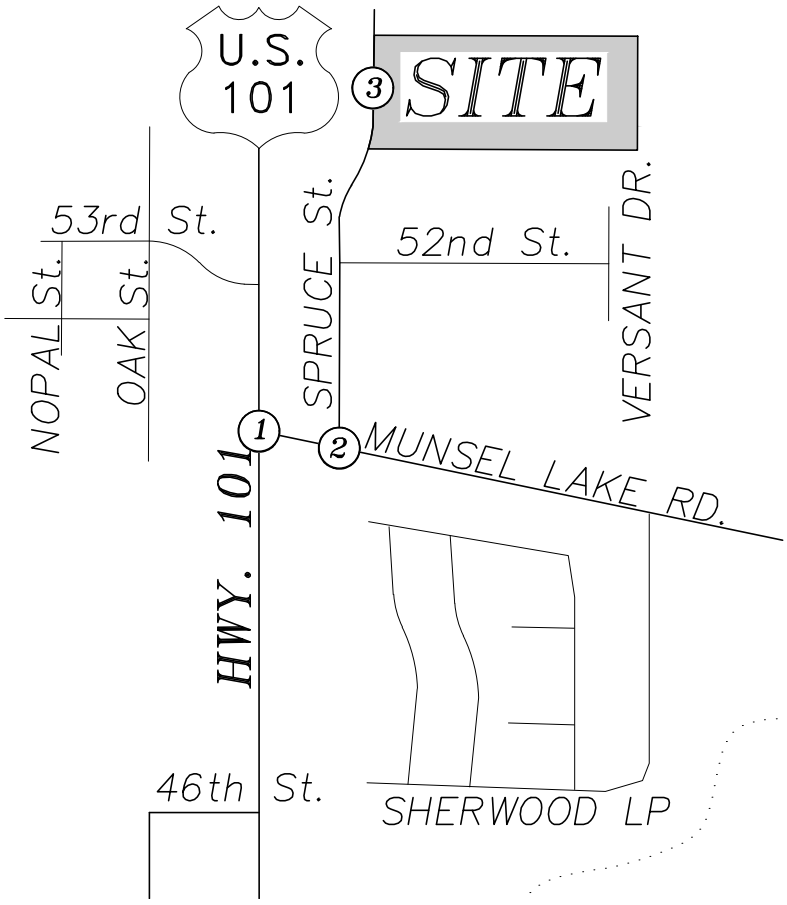
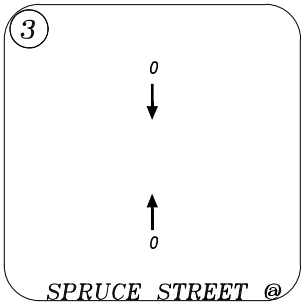
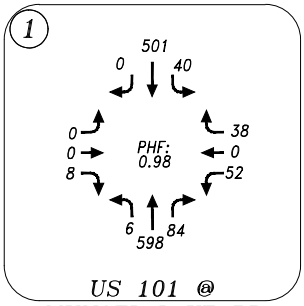




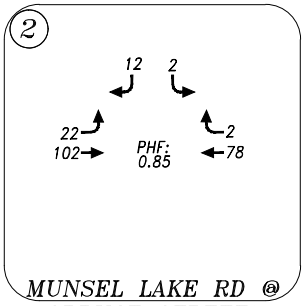
SPRUCE STREET @ SITE

LEGEND
xx = PM PEAK HOUR
PHF = PEAK HOUR FACTOR

*TRAFFIC VOLUMES FROM TRIP GENERATION USED FOR SPRUCE ST. IN AND OUTFLOWS. THROUGH MOVEMENTS ARE THEN BALANCED TO US 101 @ MLR IN & OUT FLOWS



US 101 @ MUNSEL LAKE RD



MUNSEL LAKE RD @ SPRUCE STREET*

SCALE: NTS

FIGURE 4

PINE CROSSING

Current Year 2023 Design Hour Traffic

TRAFFIC IMPACT ANALYSIS

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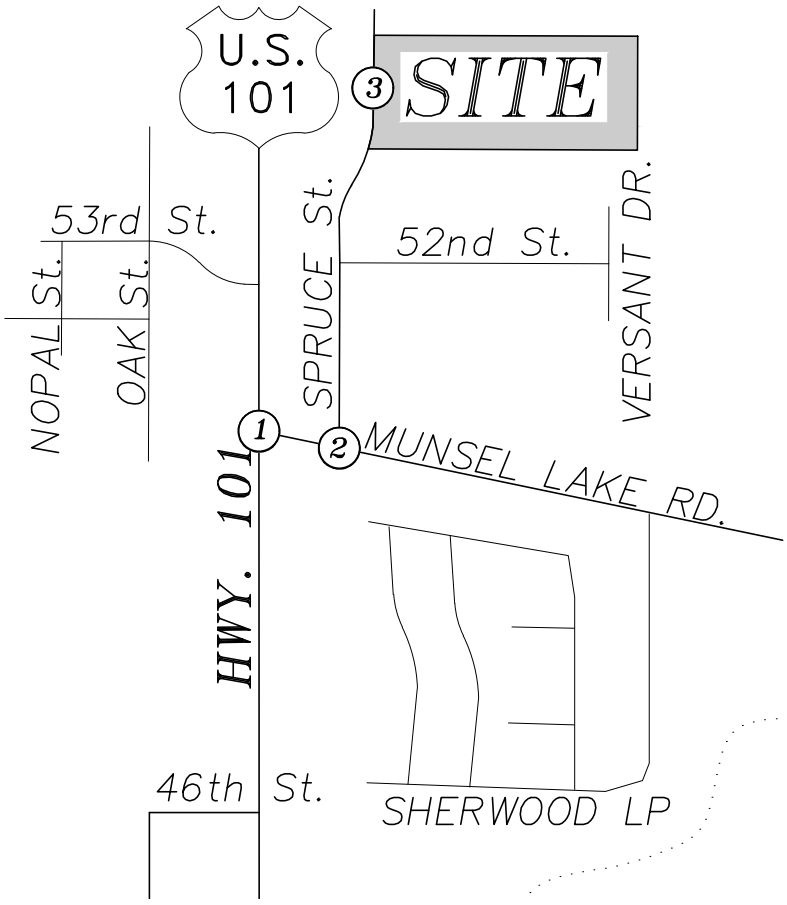
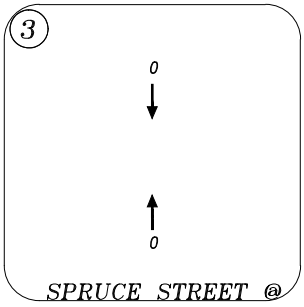


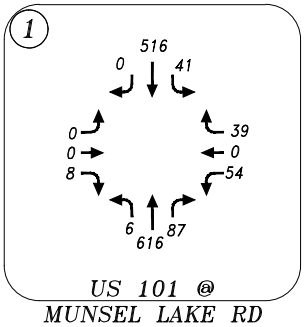


SPRUCE STREET @ SITE

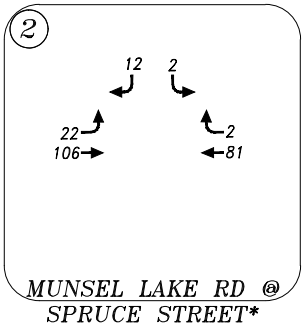
LEGEND

xx = PM PEAK HOUR

*TRAFFIC VOLUMES FROM TRIP GENERATION USED FOR SPRUCE ST. IN AND OUTFLOWS (GROWTH NOT REQUIRED). THROUGH MOVEMENTS ARE THEN BALANCED TO US 101 @ MLR IN & OUT FLOWS



US 101 @ MUNSEL LAKE RD



MUNSEL LAKE RD @ SPRUCE STREET*

SCALE: NTS

FIGURE 5

PINE CROSSING

Year 2026 PM Peak Hour 'Background' Traffic

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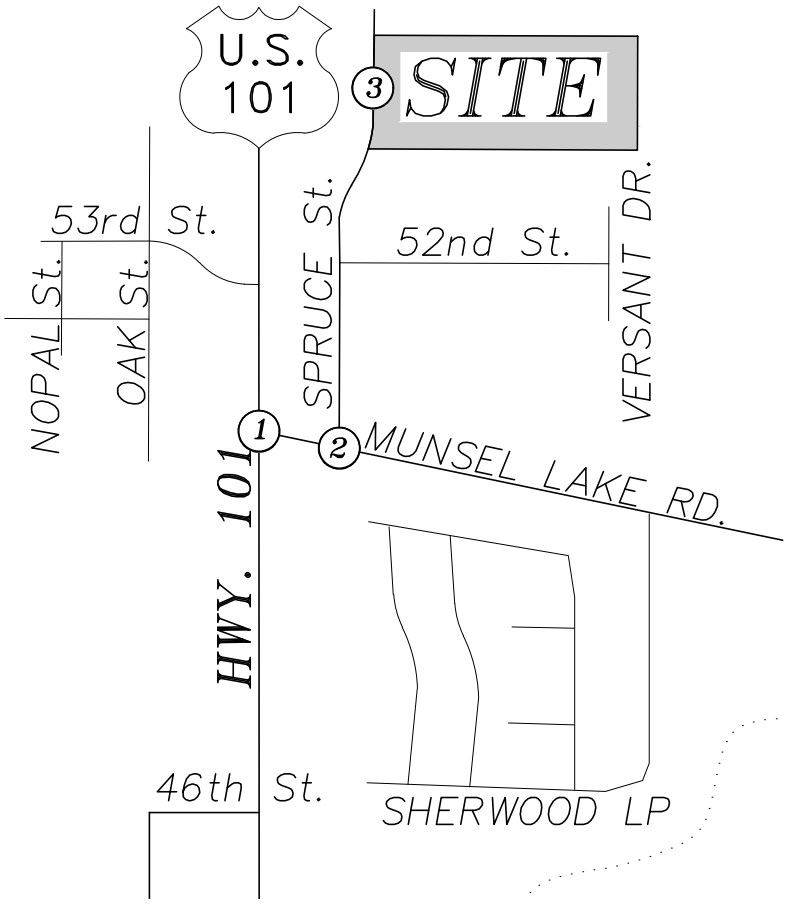
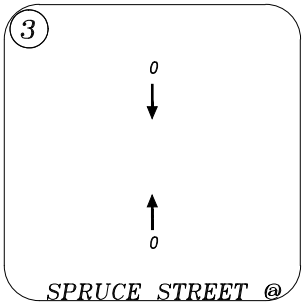
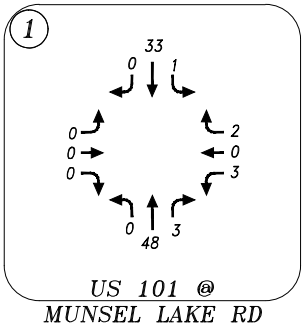


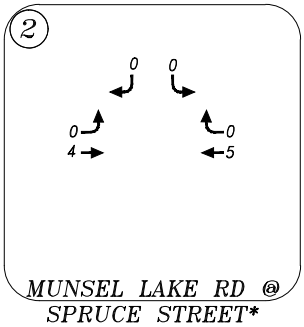
LEGEND
xx = PM PEAK HOUR



SPRUCE STREET @ SITE



US 101 @ MUNSEL LAKE RD



MUNSEL LAKE RD @ SPRUCE STREET*

SCALE: NTS

FIGURE 6

PINE CROSSING Pipeline Trips: Cannery Sta. & Three Mile Prairie Ph. 1

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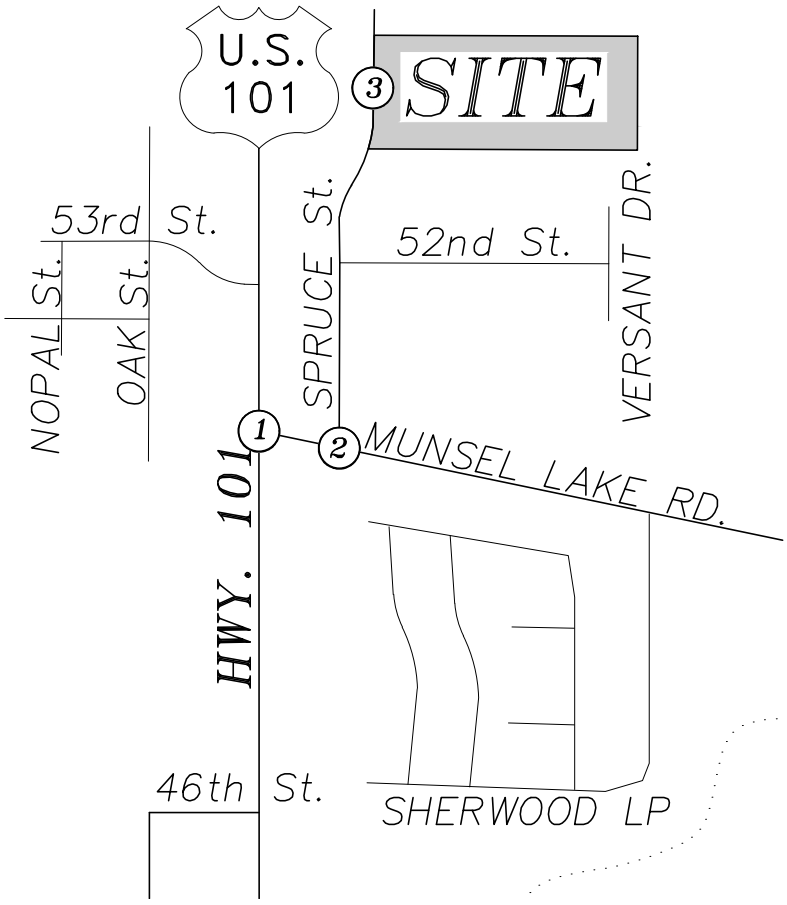
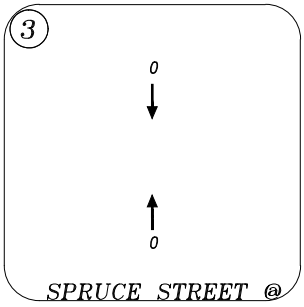
Z:\2022\22-312 Pine Crossing (formerly Spruce Village) Subdivision\Traffic\VMAP.dwg 3/17/2023 4:47 PM DANH

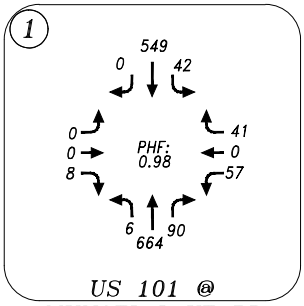




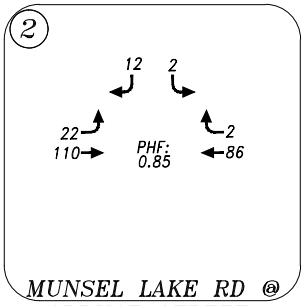
SPRUCE STREET @ SITE

LEGEND
xx = PM PEAK HOUR
PHF = PEAK HOUR FACTOR

*TRAFFIC VOLUMES FROM TRIP GENERATION USED FOR SPRUCE ST. IN AND OUTFLOWS. THROUGH MOVEMENTS ARE THEN BALANCED TO US 101 @ MLR IN & OUT FLOWS



US 101 @ MUNSEL LAKE RD



MUNSEL LAKE RD @ SPRUCE STREET*

SCALE: NTS

FIGURE 7

PINE CROSSING

Year 2026 Design Hour 'No-Build' Traffic

TRAFFIC IMPACT ANALYSIS

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2.9 Crash Analysis

To investigate existing operational safety of study area intersections, the most recent five years of complete available crash data were downloaded from the ODOT Crash Analysis and Reporting Unit's (CARU's) Transviewer Data System (TDS). The downloaded crash data indicated that there were five (5) crashes reported at the intersection of US 101 at Munsel Lake Road for the five (5) year period of analysis occurring from January 1, 2015 through December 31, 2019. There was no data available to extract for any crashes reported at the intersection of Munsel Lake Road at Spruce Street, indicating that if there were any crashes occurring there, ODOT did not have a record of it/them.. ODOT has recently recommended that year 2020 crash data not be used for crash analyses, due to COVID-19 pandemic and associated traffic conditions. Additionally, year 2021 crash data were not complete at the time of this analysis, which was indicated by message located at the top of the ODOT TDS extraction website. A summary of the crashes occurring at US 101 and Munsel Lake Road is provided in the following table. Detailed crash data obtained from ODOT is provided in Appendix F.

Table 2: Intersection Crashes at US 101 and Munsel Lake Road

AADT Volume[1]	Head-On	Ped	Angle/ SS	Turn Mvmts	Rear End	Fixed Object/Other	Total Crashes	Crash Rate[2]	Critical Rate[3]
10,140	0	0	1	3	1	0	0	0.27	0.293

[1.] AADT averaged from ODOT Traffic Volumes Tables (TVT), 2015-2019 for Station 1170; 0.03 mi south of Munsel Lake Road on US 101
[2.] Crash Rate (Crashes per Million Entering Vehicles = CPMEV) = (total 5-year crashes x 1,000,000)/(5 x ADT x 365)
[3.] Critical rate per Highway Safety Manual (HSM) methodology

As shown in the table, the 90th percentile average statewide crash rate (the critical rate) for a three-legged intersection with stop sign controls in an urban setting is not exceeded by crashes occurring at the intersection of US 101 and Munsel lake Road over the five (5) year period of analysis reviewed that would warrant further investigation for potential safety improvements.

3.0 DEVELOPMENT LEVEL TRAFFIC CONDITIONS

3.1 Development

The Pine Crossing Subdivision site contains approximately 7.61 acres of land that is identified as Lot 3 of the 2007 Morales Subdivision Plat. The 2007 Morales Plat also included the property to the south that was identified as Lot 4. Lot 4 from the Morales Plat has been replatted and is fully developed as Spruce Village. The current development plan for Pine Crossing includes land use applications that include making an application to the City of Florence for PUD approval to divide the parcel into 46 individual parcels that will be developed with 36 duet units (duplexes – attached single family dwelling units) on 36 of the parcels and eight (8) single family dwelling units (detached dwelling units) with each single family detached dwelling located on their own parcels without common/shared walls or driveways. The remaining three (3) parcels will remain

unoccupied as common areas or community lots. The current site plan for development includes each adjacent attached duet dwelling unit sharing a driveway curb cut and a common wall with one other dwelling unit. The anticipated year of completion of build-out is by the end of the year 2026. A site plan for the proposed development is included as Appendix A.

As described previously, access to the site is planned to utilize existing curb returns that are in place and were constructed with the Spruce Street LID street extension in the late 2000's. The curb returns were constructed with the intent that there would be a future street connection at the site frontage, as is currently planned. The new public street will be extended from Spruce Street into the site and will be improved to the City of Florence's local street standards. The streetscape that will be provided with the site's public improvements will include continuous sidewalks on both sides of the new street connecting to existing sidewalks on Spruce Street. An additional street extension on Versant Drive will be provided through the site from its existing north terminus at Spruce Village that will be included with the public improvements plans, and will provide a connection to the new east-west public street that will connect to Spruce Street. Versant Drive will also be constructed to the City of Florence's local street standards and will have continuous sidewalks on either side.

3.2 Trip Generation

To determine the level of traffic generated by the site during average conditions, a reference was made to the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 11th Edition*, 2021. Trip generation during the PM peak hour of adjacent street traffic for the proposed development scenario was determined utilizing rates from ITE Land Use Codes (LUCs) 210 (single family detached dwelling units) and LUC 215 (attached single family), which were determined to be the most appropriate trip generators per the proposed uses of the site after development is completed. The current City of Florence Transportation System Plan (year 2012) and the forthcoming TSP update identify analyses during the PM peak hour period. The referenced ITE trip generation data that were utilized for the proposed uses are included as Appendix G. The following table summarizes the estimated ADT and PM peak hour trip generation of the site.

Table 3: Pine Crossing Trip Generation						
Land Use/ ITE Land Use Code	**Ind. Variable**	**Units (QTY)**	**TG Rate Trips/Unit**	**Trips**	**Trips IN (%/#)**	**Trips OUT (%/#)**
PM Peak Hour of Adjacent Street Traffic						
210 – Single Family Detached Dwellings	Dwelling Units	8	0.94[1]	8	63%/5	37%/3
215 – Single Family Attached Dwellings	Dwelling Units	36	T=0.60(X)-3.93	18	59%/10	41%/8
			Totals:	26	15	11
Average Daily Trips (ADT)						
210 – Single Family Detached Dwellings	Dwelling Units	8	9.43[1]	75	50%/38	50%/37
215 – Single Family Attached Dwellings	Dwelling Units	36	T=7.62(X)-50.48	224	50%/112	50%/112
			Totals:	299	145	145
[1] Equation not used due to large small independent variable outside of data cluster						

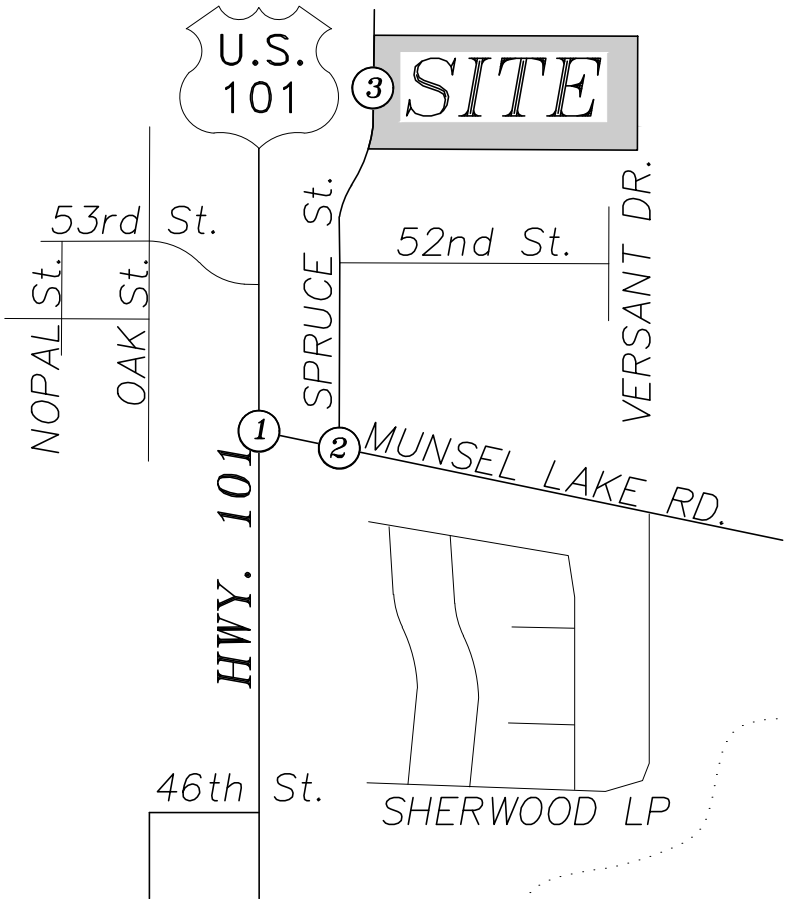
As shown in the table, the proposed development can reasonably be expected to generate 299 average daily trips, with 26 of those trips occurring during the PM peak/design hour.

3.3 Trip Distribution and Assignment

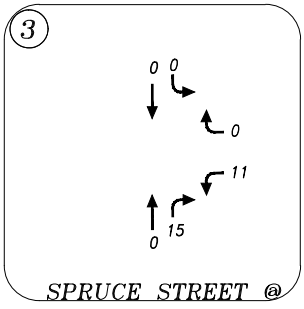
Primary access between the site and the local public transportation system is proposed via the new street connection on Spruce Street and via the existing street intersection on Munsel Lake Road at Spruce Street. Most traffic generated by the site is expected to flow through the existing intersection at US 101 and Munsel Lake Road for trip origins and destinations throughout the City. In developing the anticipated trip distribution and assignment, references were made to recently approved traffic impact analyses for the Cannery Station and Three Mile Prairie development sites and to the reported approaching traffic volumes directional distribution provided in Tech Memo #3 of the previously described City of Florence Transportation System Update project. The trip distribution for the site generated traffic also considered likely trip origin and destination pairs from surrounding and nearby area land uses and development patterns.

New trips generated by build-out of the site are included on Figure 8 on the following page.

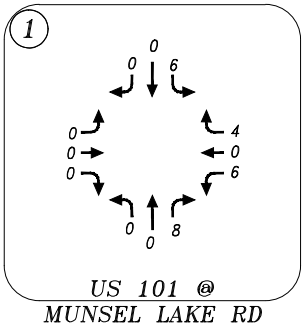
Figure 9 showing design hour 'build' total traffic volumes is provided on page 23. Figure 9 is the sum of the background “no-build” traffic volumes displayed on Figure 7 and the site’s trip distribution displayed on Figure 8.



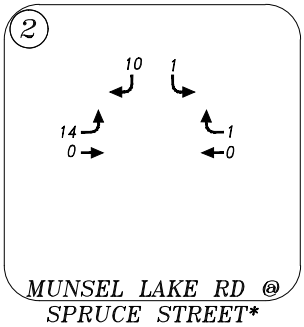
LEGEND
xx = PM PEAK HOUR



SPRUCE STREET @ SITE



US 101 @ MUNSEL LAKE RD



MUNSEL LAKE RD @ SPRUCE STREET*

SCALE: NTS

FIGURE 8

Pine Crossing Trip Distribution

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PINE CROSSING
TRAFFIC IMPACT ANALYSIS

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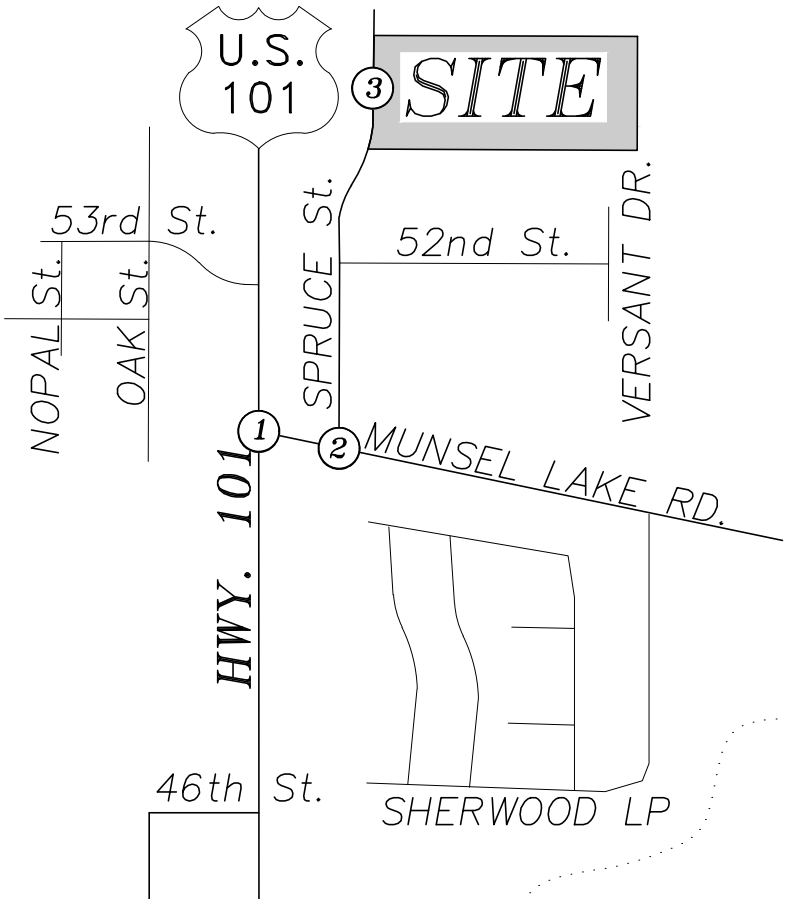
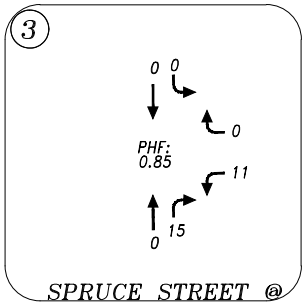
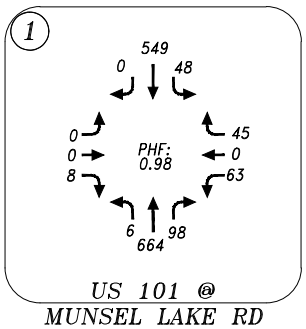




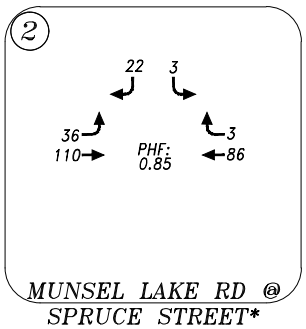
SPRUCE STREET @ SITE

LEGEND
xx = PM PEAK HOUR
PHF = PEAK HOUR FACTOR

*TRAFFIC VOLUMES FROM TRIP GENERATION USED FOR SPRUCE ST. IN AND OUTFLOWS. THROUGH MOVEMENTS ARE THEN BALANCED TO US 101 @ MLR IN & OUT FLOWS



US 101 @ MUNSEL LAKE RD



MUNSEL LAKE RD @ SPRUCE STREET*

SCALE: NTS

FIGURE 9

PINE CROSSING

TRAFFIC IMPACT ANALYSIS

Year 2026 Design Hour 'Build' Total Traffic

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3.4 Intersection Performance

Relevant intersections were evaluated to determine Volume-to-Capacity (v/c) ratio and Level of Service (LOS) based on average delay. Calculations of intersection performances were made utilizing the computer program SYNCHRO 11, by TrafficWare.

The PM peak hour period is consistent with the Analysis Methodology and Performance Standards of the current City of Florence Transportation System Plan (2012 TSP) and the TSP update process, as well as the agreed upon scoping proposed to the City of Florence and Lane County Transportation Planning. The anticipated build-out analysis year 2026 is consistent with the ODOT recommendations for a single phase of development with up to 999 average daily trips, per Table 3.3 of the ODOT *Development Review Guidelines* (DRG) document, (May 4, 2017). A TIA is not required by the Oregon Department of Transportation, since the site does not have direct access to a state highway and will not generate 50 or more peak hour trips nor 1,000 or more average daily trips (for 3-lane highway) at an intersection on a state highway. The ODOT DRG was deferred to because the City of Florence Traffic Impact Analysis requirements contained within FDC 10-1-1-4E do not contain codified caveats that prescribe any post-development analysis year scenarios to be included in a TIA, when a TIA is required. Because the Site will generate 25 or more trips at a facility within the jurisdiction of Lane County (Munsel Lake Road at Spruce Street), Lane County requires a traffic impact analysis per Lane Code, Chapter 15.697.

Study area intersections were evaluated to determine Level of Service (LOS) based on average delay. Level of service is classified by a letter scale from 'A' to 'F'. LOS 'A' represents optimum operating conditions and minimal delay. LOS 'F' indicates over capacity conditions causing unacceptable delay. The current transportation system plan identifies with LOS 'E' as the minimum acceptable mobility performance standard at signalized and stopped controlled intersections. LOS 'F' is sometimes allowed in situations where a traffic signal is not warranted and it is shown that the addition of development traffic does not worsen the performance to a performance that does not meet the mobility performance standard of other jurisdiction(s) who's facilities might be impacted. Mitigation measures may be necessary when level of service falls below these thresholds at intersections under city or county jurisdiction, as the result of a development, or when a failing facility is projected to be further degraded by a development involving a zone change or plan amendment. The following table lists the applicable criteria for determining LOS, based on the current edition of the Highway Capacity Manual (HCM), 6th Edition.

Table 4: HCM 6 Level of Service Criteria

Level of Service	Unsignalized Intersections	Signalized Intersections
A	< 10 sec	< 10 sec
B	>10 and ≤ 15 sec	>10 and ≤ 20 sec
C	>15 and ≤ 25 sec	>20 and ≤ 35 sec
D	>25 and ≤ 35 sec	>35 and ≤ 55 sec
E	>35 and ≤ 50 sec	>55 and ≤ 80 sec
F	>50 sec	>80 sec

Volume to capacity (v/c) ratio is another measurement of congestion and is estimated by dividing the number of vehicles utilizing a transportation facility by the calculated capacity of the facility.

Based on the 1999 Oregon Highway Plan, Policy 1F, the mobility standard for statewide highways outside of an MPO area and within an urban growth boundary with a non-freeway speed limit greater than 35 MPH and less than 45 MPH, is 0.85, and is applicable to the uncontrolled Highway 101 approaches to Munsel Lake Road, as well as the side street stopped approaches on Munsel Lake Road at US 101. The Lane County operational performance standard for two-way stop-controlled intersections within Lane County's jurisdiction is for all public street approaches with 20 or more peak hour trips to operate with LOS E, or better (A-E) and with a v/c of 0.95, when the intersection is within an Urban Growth Boundary.

Copies of ODOT and Lane County's Performance Mobility Standards and a reference to the City of Florence's Performance Mobility Standard from the TSP are included as Appendix H. As described previously, the City of Florence Code pertaining to Traffic Impact Analyses (TIAs) and reviews of TIAs do not contain a specifically called-out standard.

As discussed previously, the intersection at US 101 and Munsel Lake Road currently has flared approaches where the paving widths approaching the intersection at the westbound and northbound approaches are widened adjacent to the roadway and functionally operate similar to having channelized right-turns. The westbound right-turn flare accommodates approximately two (2) vehicles in queue simultaneously when there are vehicles in queue at the the westbound through-left. The westbound right-turn flare has between a 75- and a 100-foot radius at the edge of paving that effectively widens the approach enough to accommodate two vehicle lengths of storage. As indicated previously, the approach flare is accommodated at the stop bar, where the stop bar features a bend, with approximately 20-feet of the stop bar aligned perpendicular to the through- left queuing area and approximately 15-feet aligned perpendicular for the channelized right-turn. To simulate this condition accurately in SYNCHRO, the estimated approximate curb radius of 87-feet (measured from aerial imagery in CAD software) was input to all SYNCHRO models for the curb radius with the westbound approach modeled as a stop controlled shared left-through-right approach with right-turn channelization, including 50 feet of storage for right-turning vehicles but no designated right-turn lane.

The northbound right turn flare on US 101 approaching Munsel Lake Road allows some of the deceleration distance to be accommodated in advanced of right-turns at Munsel Lake Road, with refuge out of the northbound through travel lane. The northbound approach flare begins approximately 200 feet south of centerline at Munsel Lake Road with a gentle widening taper from the typical section with existing shoulder/bike lane features. At 100 feet south of Munsel lake Road, the flare of the approach has approximately 13 feet of width, and near the intersection, the edge of paving at the east side (inside of the turn) of the northbound approach is constructed on approximately a 75-foot radius to match into Munsel Lake Road. The northbound flare condition was modeled in all SYNCHRO models with the northbound approach modeled as a shared through-right lane (no designated right-turn lane), with an uncontrolled channelized right-turn without storage (not a lane).

Results of the intersection performance analysis calculations are documented in Appendix I, and are summarized in the following table.

Table 5: Design Hour Intersection Performances					
Intersection	Controlling Movement	Mobility Standard	2023 'Existing Conditions'	2026 'Background No-Build Conditions'	2015 'Build' Total Traffic Conditions
US 101 at Munsel Lake Road	WB	v/c 0.85	v/c = 0.35 LOS D[1]	v/c = 0.47 LOS E	v/c = 0.54 LOS E
Munsel Lake Road at Spruce Street	SBR	V/C 0.95 LOS E	LOS A[2] 0.02 v/c	LOS A[2] 0.02 v/c	LOS A[2] 0.02 v/c
Spruce Street at Site	WB	LOS E	LOS A	LOS A	LOS A

LOS= Level of Service of stopped movement at unsignalized intersection
EB= eastbound, SB= southbound, NB=northbound
[1] ODOT Standard for intersections in ODOT jurisdiction is v/c
[2] SB approach: SBL operates at LOS B, but with lower v/c of 0.003 for 2023 Ex and 2026 No-Build and 0.005 for 2026 Build

As shown in the table, the intersection performances during the design highest hour with the additional traffic from the proposed Pine Crossing development continue to meet the minimum level of service and volume to capacity ratio criteria for unsignalized intersections within the study area during the anticipated year 2026 build-out, and no mitigation is required to improve intersection performance(s) as a result of the projected post development traffic conditions.

3.5 Vehicle Queuing

To simulate and evaluate vehicle queuing with the additional traffic from development, the software program SimTraffic 11, by TrafficWare was utilized to determine pre- and post-development vehicle queue lengths. The results of the simulations at stopped controlled approaches and signalized intersections are provided in the following table. Queue length calculations are provided as Appendix J. Queues reported at unstopped approaches are not shown.

Table 6: Design Hour Vehicle Queue Lengths								
			2023 Ex PM Peak		2026 No-Build Design Hour		2026 Build Design Hour	
Intersection	Link*	Avail. Storage	Average Queue	95th Queue	Average Queue	95th Percentile Queue	Average Queue	95th Percentile Queue
US 101 @ Munsel Lake Road	EBLTR	50+/-	25	50	25	50	25	50
	WBLTR	500+	50	75	50	100	50	125
	NBL	300+	25	25	25	25	25	25
	SBL	100+/-	25	50	25	50	25	50
Munsel Lake Road @ Spruce Street	EBLT	500+	25	25	25	25	25	25
	SBL	200+	25	25	25	25	25	25
	SBR	60+	25	50	25	50	25	50
Spruce St. @ Pine Crossing	WB	200+	-	-	0	0	25	50

*EB= Eastbound, WB=Westbound, SB= Southbound, NB=Northbound
L=Left, T=Through, R=Right
**Longest queue shown for SBT and NBT, including reported shared lane queue lengths

As shown in the table, existing available queue storages at study area intersection approaches are adequate to accommodate additional traffic from post development conditions during the design hour conditions, and the Pine Crossing development's added post development intersection traffic does not significantly increase no-build/background vehicle queue lengths.

3.6 Non-Vehicular Traffic Generation

The current 11th Edition of ITE's *Trip Generation* does not contain trip generation information for pedestrian and other non-motor vehicle related trip making characteristics for residential uses that are proposed at the Pine Crossing Site to forecast trip generation for non-vehicular modes of travel. The traffic count data collected for the TSP update in June 2021 indicated that there was minimal pedestrian activity during the 16-hour count period at the intersection of US 101 at Munsel Lake Road. As frontage at the Cannery Station site at the south side of Munsel Lake Road and the parcel on the north side, between Spruce Street and US 101, are developed in the future, there will be frontage improvements required with development to bring Munsel Lake Road up to City of Florence and/or Lane County urban collector or minor arterial standards. The frontage improvements will likely include curb and gutter, sidewalk and widening the roadway to include designated bike lanes. As discussed previously, the City of Florence classifies Munsel Lake Road as a minor arterial roadway, and Lane County and ODOT consider the roadway an urban major collector.

4.0 RECOMENDATIONS AND CONCLUSION

4.1 Safety

Crash history was reviewed and evaluated at the study area intersections to determine if there were any identifiable safety deficiencies that need mitigation prior to increasing traffic loading from proposed development of the site. The evaluation of crash history revealed that the statewide 90th percentile crash rates for the intersection types and locations are not exceeded, and that there do not appear to be need for additional analysis or mitigation.

4.2 Performance Analysis

An analysis of the projected design hour traffic conditions with and without post-development traffic from the Pine Crossing site revealed that the additional traffic in post-development conditions with full occupancy will not significantly degrade the level of service (LOS) or volume to capacity ratios calculated at the study area intersection approaches to a level below the City of Florence's, ODOT's, or Lane County's acceptable mobility/performance standards.

Intersection queuing was evaluated and it was verified that existing available storages at stopped controlled movements at intersection approaches and designated turn and shared through lanes were adequate for post development traffic conditions. The site's additional approaching traffic contribution at existing intersection approaches was shown not to significantly increase vehicle queue lengths.

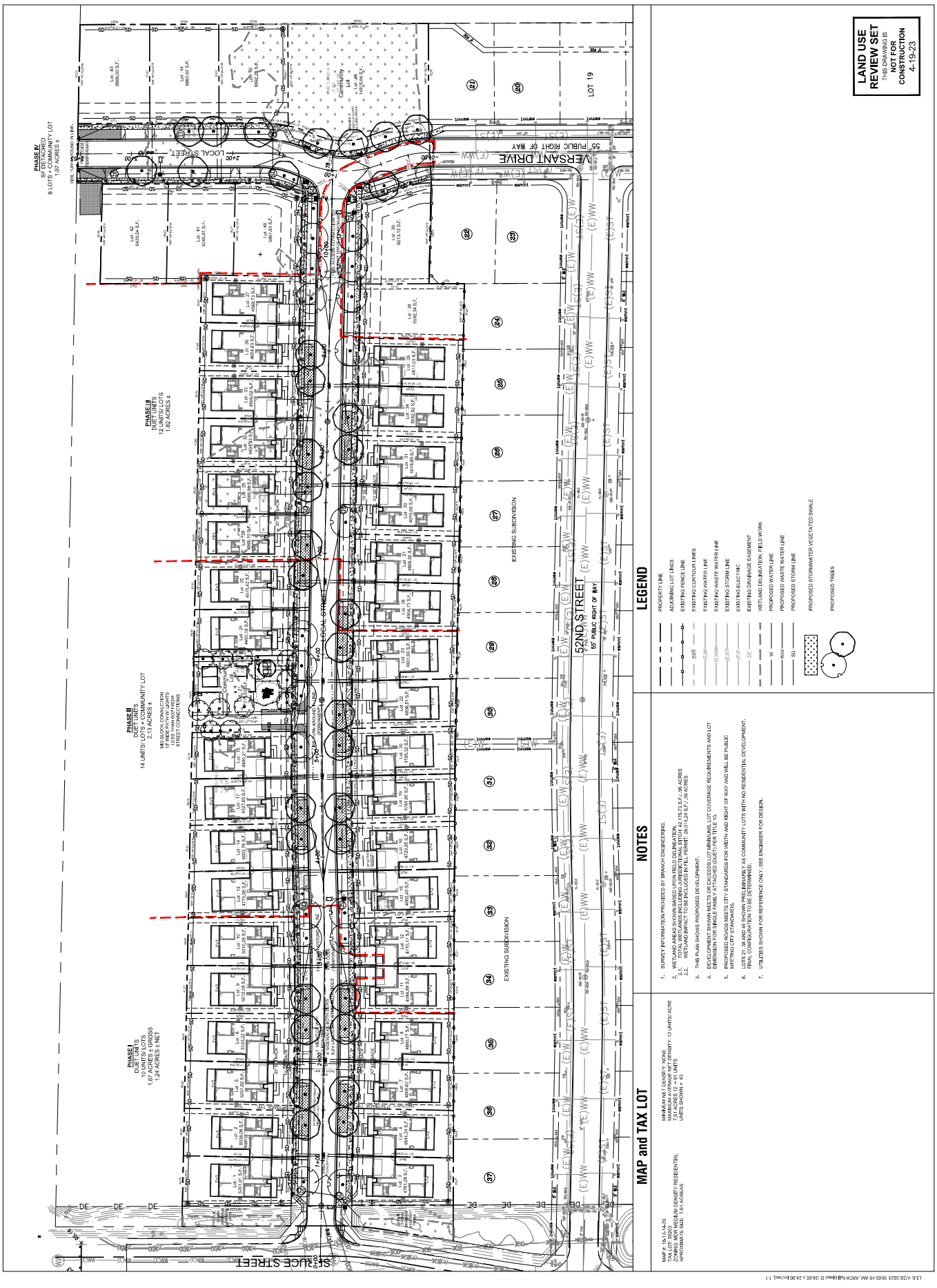
4.3 Conclusion

In summary, the result of this analysis indicates the increase in traffic loading resulting from development at the Pine Crossing Subdivision site will not have a significant impact to the existing adjacent or nearby roadway or intersection capacities or other applicable transportation system facilities.

APPENDIX A

PINE CROSSING SUBDIVISION SITE PLAN

PINE CROSSING APPENDIX A: SITE PLAN



APPENDIX B

TRAFFIC STUDY SCOPING E-MAILS

PINE CROSSING APPENDIX B: SCOPING E-MAILS

Dan H

From: Wendy Farley-Campbell <wendy.farleycampbell@ci.florence.or.us>
Sent: Monday, March 6, 2023 11:25 AM
To: Mike Miller; Planning Department; Dan H; BAUMGARTNER Douglas G; BAJRACHARYA Shashi
Subject: RE: Pine Crossing TIA
Attachments: Exhibit J- ThreeMilePrairie-TIA.pdf; Exhibit L- Referral - Revised SOTE TIA Comments03-7-2021.pdf

Dan Et al.,

Please see attached TIA for Three Mile Prairie (53rd St. area) and the referral comments from our peer review of the same. The analysis looked at more than they were proposing. They only have Phase 1 reviewed and approved for their tentative plat (page 18 eastern purple area).

Regards,

Wendy FarleyCampbell, AICP
Planning Director | City of Florence
O: 541.997.8237
250 Highway 101, Florence OR 97439
Follow Us! City Website | Vimeo | Facebook | Twitter

From: Mike Miller <mike.miller@ci.florence.or.us>
Sent: Monday, February 13, 2023 2:42 PM
To: Wendy Farley-Campbell <wendy.farleycampbell@ci.florence.or.us>; Planning Department <PlanningDepartment@ci.florence.or.us>
Subject: FW: Pine Crossing TIA

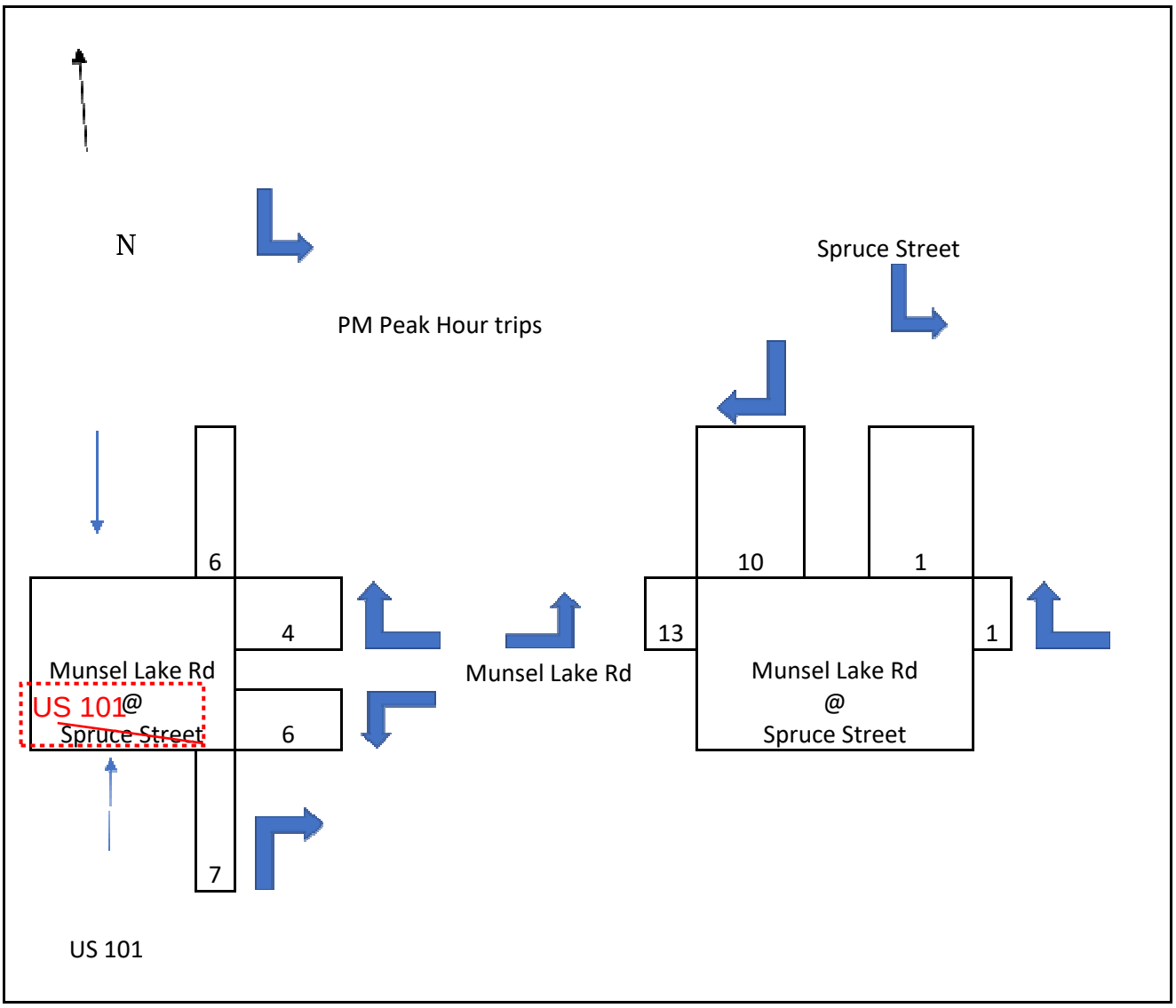
FYI

From: Dan H <danh@branchengineering.com>
Sent: Monday, February 13, 2023 1:57 PM
To: Doug Baumgartner (odotr2planmgr@odot.state.or.us) <odotr2planmgr@odot.state.or.us>; BAJRACHARYA Shashi <shashi.bajracharya@lanecountyor.gov>
Cc: Mike Miller <mike.miller@ci.florence.or.us>
Subject: FW: Pine Crossing TIA

HI Doug and Shashi,
I sent the first e-mail below (bottom on my screen in Outlook) out to Mike Miller at the City of Florence regarding a forthcoming TIA for a site that is located off of Spruce Street northeast of the intersection of Munsel Lake Rd and US101 in Florence (Pine Crossing - Site Plan attached). With the City's TIA threshold based on 25 (or more) new single-family

residences or a daily trip generation [increase] of 250 ADT (or more), the proposal requires a traffic impact analysis from the City. In Mike's response, he advised me to make adjustments to the trip distribution I had previously included below, based on the Cannery Station TIA (Updated with comments addressed in 2019). I don't know what the current status of the Cannery Station site, but it sounds like the latest TIA for that site had it rolling out in two phases, with the first phase to be completed in 2021 and the latter anticipated to be complete in 2028. As far as I know there isn't anything built at that site yet. Per Mike's comments, we will add that trip distribution to the site's in the forthcoming analysis as needed. The proposed Pine Crossing site is anticipated to be built-out in 2026. Mike also mentioned another site at 53rd Street (northwest of Munsel Lake Rd), but I don't know if that site's development was required to have a TIA, or if it already has occupancy, and would be expected to be included in the background as existing count data, if new counts need to be collected at Munsel Lake Rd.

Based on the traffic count data and trip distribution for the Cannery Station TIA, the anticipated distribution would place a demand for ~40% -45% trip origins/destinations to the north, ~50-55% trip origins/destinations to the south via Munsel Lake Rd and US101, and ~5% trip origins and destinations to the east. I would anticipate the demand to include at least one trip in and one trip out for the OD paring between the existing Casino via Munsel Lake Rd east and the proposed residential component at the site for the PM peak hour. Here's what the trip distribution looks like for the PM peak hour (fingers crossed that the table don't get jumbled when sent):



Per the ODOT DRG, it looks like when ODOT requires a TIA, the trip generation from the site would only trigger the anticipated year of completion of the proposed development (ODOT DRG, Page 140, Table 3.3), with an ADT less than

999, which is currently assumed to be completed in the year 2026. Since 2026 is prior to the completion of Cannery Station Phase 2, we would likely only need to include Cannery Station Phase 1 traffic as pipeline trips to be included with grown background traffic as for the design hour condition without the proposed development traffic. With the Pine Crossing's site trip generation being 25 for the PM peak hour and <20 for the AM peak hour, the analysis is proposed to include the PM peak hour at completion only, consistent with the approved Cannery Station TIA, which also included an analysis of only the PM peak hour.

Can you confirm if this e-mail scope sounds adequate for the proposed forthcoming Pine Crossing TIA, or if you need something more formal and/or additional in a memo? As usual, we will include growth per the TSP or FVT volumes and include a safety analysis (omitting the 2020 crashes as recently discussed for other projects). The analysis will look at the PM peak hour operations at Munsel Lake Rd and US 101 and at Munsel Lake Rd at Spruce. Also, can you forward me any leads you may have to more recent count data from other studies you may know of with traffic data that you may have in pdf you can share? I was able to locate traffic volumes at the OTMS Traffic Counts website, but they were collected in June 2021, when I believe ODOT was still requiring adjustments for COVID trends. Those counts were used in the 2021 TSP update process, which I could use and grow to existing and background conditions, if nothing else is available. We're not at an ideal time of year to collect traffic data, considering the seasonal trend associated with US 101 and the tourism component of the seasonal fluctuation on US101 through movements.

Sorry for the long e-mail.

Thank You,

DAN HAGA, P.E.
Project Engineer

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Springfield OR | Albany-Corvallis OR

From: Dan H
Sent: Wednesday, February 8, 2023 11:28 AM
To: Mike Miller <mike.miller@ci.florence.or.us>
Cc: Nathan Patterson <nathanp@branchengineering.com>; John Schmidt <john@satregroup.com>; Wendy Farley-Campbell <wendy.farleycampbell@ci.florence.or.us>
Subject: RE: Pine Crossing TIA

Thanks Mike,
I located an updated Sandow TIA (2019) for Cannery Station on the City's website (hopefully it finally gets built- I worked on a TIA for that site when I was with JRH back in 2009-2010). I didn't find a TIA with trip distribution for the Three Mile Prairie site. Most of the traffic from Three Mile Prairie will likely be through movements north and south at Munsel Lake Rd, which shouldn't have a notable effect on the intersection operation at Munsel Lake Rd, since it isn't a large-scale trip generator (it looks like 21 SF lots?). I noticed a while back that the Sand Ranch was redeveloped with Three Mile Prairie and the new street connection on Highway 101 at 53rd Street.

For Cannery Station, it looks like they are planning two phases, with build-out of phase 2 in 2028. I think we are anticipating completion of Pine Crossing in 2026. Per the proposed scoping below (previous e-mail I sent) based on the ODOT Development Review Guidelines, with build out in 2026 and the ODOT recommended scoping including only the build-out year for the analysis based on the site's trip generation, would including the Cannery Station phase 1 traffic from the Sandow TIA update be sufficient for the pipeline trips, or do we need to extend the analysis year out to 2028 and include Cannery Station Phase 2? It looks like the Addendum TIA addresses comments regarding the northbound right-turn pocket at Munsel lake Rd and states that future phases of the Cannery Station will be accommodated with a right-turn warrant analysis in a TIA, but there may be more to this than I was able to locate in the responses and materials I found online. Please let me know if we should plan including a right-turn lane warrant analysis with the TIA, or assume there is already one there, or if not necessary.

Also, should I plan on sending the scoping to the County and/or ODOT, or will you provide them with a referral? Thanks Again,

DAN HAGA, P.E.
Project Engineer

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From: Mike Miller <mike.miller@ci.florence.or.us>
Sent: Wednesday, February 8, 2023 10:05 AM
To: Dan H <danh@branchengineering.com>
Cc: Nathan Patterson <Nathanp@branchengineering.com>; John Schmidt <john@satregroup.com>; Wendy Farley-Campbell <wendy.farleycampbell@ci.florence.or.us>
Subject: RE: Pine Crossing TIA

We do need to keep accruals. We have Cannery Station in the mix and this is how we handled them.

- Cannery looked at just the first two phases which have 110 residential units.
- Cannery looked at counts at Highway 101 and Munsel Lake Road. While they are a corner lot, Pine Crossing is not but has no other has no other western exit option north of MLR. So yes, you will need to at the intersection of Hwy 101 and Munsel Lake Road. Three Mile Prairie (west side of Hwy 101 at 53rd) also had to include Munsel Lake Road/Hwy 101 in their TIA.
- Cannery has 6% of their traffic from Redwood going east on Munsel Lake Road and the rest going to Hwy 101. So 25% heading east on Munsel Lake Road from the Spruce development is likely an large overestimate since Cannery has commercial uses attracting from Munsel Lake Road area and Florentine Estates.
- Cannery then has 52% of Hwy 101 origins turning into Redwood from Munsel Lake Road and Hwy 101. Granted, it is a mixed use development so it is different. Page 9 has their trip distribution by land use and in/out
- Cannery's peer review identified the alignment on Munsel Lake Road as inadequate. They were not triggering improvements until later but it is already called out.

Thank you,

Mike

From: Dan H <danh@branchengineering.com>
Sent: Monday, February 6, 2023 1:40 PM
To: Mike Miller <mike.miller@ci.florence.or.us>
Cc: Nathan Patterson <Nathanp@branchengineering.com>; John Schmidt <john@satregroup.com>
Subject: RE: Pine Crossing TIA

Hi Mike,
I was looking through my queue/to do list, and I was wondering if you've had a chance to look through the e-mail below yet with the rough proposed scope of work for the forthcoming Traffic Impact Analysis for the Pine Crossing Site, northeast of Munsel Lake Road at Spruce Street? Sorry to be persistent on this, when I spoke to you in early January, it sounded like you might have been doing some catch-up from the holidays and hadn't got to it yet. I just wanted to make sure it didn't get lost or forgot about in the meantime.
Thanks,

DAN HAGA, P.E.
Project Engineer

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Springfield OR | Albany-Corvallis OR

From: Dan H
Sent: Friday, December 16, 2022 4:08 PM
To: ' (mike.miller@ci.florence.or.us)' <mike.miller@ci.florence.or.us>
Cc: Nathan Patterson <nathanp@branchengineering.com>; John Schmidt <john@satregroup.com>
Subject: Pine Crossing TIA

Hi Mike,
It looks like we got the go ahead to start a TIA for the Pine Crossing site on Spruce Street north of 52nd Street. Per the information I have, it looks like full build-out would occur in or around 2026. It looks like they are talking about phasing construction, but for the intent and purpose of the required TIA, it could be simplified with just looking at the full-build-out background and build traffic conditions. The attached preliminary plan shows 36 Single Family Attached Dwelling Units ("Duets") and 7 single family detached dwelling units.
For this proposal's trip generation, I get:

ITE Code	Units	ADT	AM	PM
215 – Attached Single Family	36	224	13	18
210 – Detached Single Family	7	66	5	7
Totals:	**43**	**290**	**18**	**25**

Per Florence Title 10, Section 10-1-1-4: E, with a projected ADT of greater than 250, the development as currently proposed would require a Traffic Impact Analysis from the City.
The Site plan shows the primary access connection at Spruce Street via Munsel Lake Road, and I would expect in the neighborhood of 75%, or more of the site's traffic to utilize the intersection at Munsel Lake Rd and HWY101. I don't know if ODOT will be interested in scoping a TIA for the proposal, since the proposed development is not likely to generate 50 or more vehicle trips at that intersection (ODOT Development Review Guidelines attached). Similarly, Lane County may or may not be interested in a TIA, as per LC 15.697(1)(a) a TIA is required when a proposed development

would generate 100 or more trips inside of an urban growth boundary, and per LC 15.697(1)(g) the proposal would not likely result in an increase of 25 or more trips at Munsel Lake Rd and Highway 101. All 25 PM peak hour trips would, however, be via the intersection of Spruce Street and Munsel Lake Rd, so the County may require a TIA, and the TIA would be expected to include at least this intersection.

The analysis proposed would include at least the year of opening and the intersection of Spruce and Munsel Lake Rd, unless you have any particular interest in future year post-development analysis scenarios and/or additional intersections to be studied. The year of opening analysis year is consistent with the ODOT Development Review Guidelines, Table 3.3 for ADT up to 999.

Could you tell me if this will suffice for scoping the TIA, or if you would like something more formal, and if you would prefer us to coordinate with the other agencies on their interest in scoping a TIA for this proposal?
Here's a link to the ODOT Development Review Guidelines that I referenced above:
https://www.oregon.gov/odot/Planning/Documents/Development-Review-Guidelines.pdf.
Thank You,

DAN HAGA, P.E.
Project Engineer

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PINE CROSSING APPENDIX B: SCOPING E-MAILS

Dan H

From: BAJRACHARYA Shashi <shashi.bajracharya@lanecountyor.gov>
Sent: Friday, February 17, 2023 11:03 AM
To: Dan H; Doug Baumgartner (odotr2planmgr@odot.state.or.us)
Cc: ' (mike.miller@ci.florence.or.us)'; VARTANIAN Sasha L; DEVONEY Mark A
Subject: RE: Pine Crossing TIA

This intersection is controlled by ODOT; I assume this is included on ODOT list.

Thank you.

Shashi Bajracharya
Cell: (541) 525-1822
Desk:(541) 682-8510

From: Dan H <danh@branchengineering.com>
Sent: Friday, February 17, 2023 10:37 AM
To: BAJRACHARYA Shashi <shashi.bajracharya@lanecountyor.gov>; Doug Baumgartner (odotr2planmgr@odot.state.or.us) <odotr2planmgr@odot.state.or.us>
Cc: ' (mike.miller@ci.florence.or.us)' <mike.miller@ci.florence.or.us>; VARTANIAN Sasha L <sasha.vartanian@lanecountyor.gov>; DEVONEY Mark A <Mark.DEVONEY@lanecountyor.gov>
Subject: RE: Pine Crossing TIA

[EXTERNAL ⚠]

Thanks Shashi,
I just noticed that I made an error in the diagrammatic trip distribution with the left turns in my e-mail. The box on the left was supposed to represent HWY 101 at Munsel Lake Rd. (13 in/10 out for PM trips). Do we need to include this location as well?

DAN HAGA, P.E.
Project Engineer

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Springfield OR | Albany-Corvallis OR

From: BAJRACHARYA Shashi <shashi.bajracharya@lanecountyor.gov>
Sent: Friday, February 17, 2023 10:33 AM
To: Dan H <danh@branchengineering.com>; Doug Baumgartner (odotr2planmgr@odot.state.or.us) <odotr2planmgr@odot.state.or.us>
Cc: ' (mike.miller@ci.florence.or.us)' <mike.miller@ci.florence.or.us>; VARTANIAN Sasha L

<sasha.vartanian@lanecountyor.gov>; DEVONEY Mark A <Mark.DEVONEY@lanecountyor.gov>
Subject: RE: Pine Crossing TIA

Hi Dan,
Thanks for including Lane County in the scoping discussion. The estimated trip generation of 25 veh/hour triggers LC TIA requirement in LC 15.697(10(g). LC TP requests safety and performance analyses at the intersection of Spruce St and Munsel Lake Rd. The safety analysis should include lane blockage, sight distance, crash history, pedestrian safety, roadway geometry reviews at the intersection and recommendations for improvements if any. We will accept an analysis methodology that is acceptable to the other reviewing jurisdictions.

Thank you.

Shashi Bajracharya
Cell: (541) 525-1822
Desk:(541) 682-8510

From: Dan H <danh@branchengineering.com>
Sent: Monday, February 13, 2023 1:57 PM
To: Doug Baumgartner (odotr2planmgr@odot.state.or.us) <odotr2planmgr@odot.state.or.us>; BAJRACHARYA Shashi <shashi.bajracharya@lanecountyor.gov>
Cc: ' (mike.miller@ci.florence.or.us)' <mike.miller@ci.florence.or.us>
Subject: FW: Pine Crossing TIA

[EXTERNAL ⚠]

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Based on the traffic count data and trip distribution for the Cannery Station TIA, the anticipated distribution would place a demand for ~40% -45% trip origins/destinations to the north, ~50-55% trip origins/destinations to the south via Munsel Lake Rd and US101, and ~5% trip origins and destinations to the east. I would anticipate the demand to include at least one trip in and one trip out for the OD paring between the existing Casino via Munsel Lake Rd east and the proposed residential component at the site for the PM peak hour. Here's what the trip distribution looks like for the PM peak hour (fingers crossed that the table don't get jumbled when sent):

Circumstances under which ODOT is more likely to ask that the local government request or require a TIA include:

- When the proposed development is within a quarter mile of the terminal of an interchange ramp;
- When the local development code requires that there are "adequate facilities" to serve the proposed development (often applies to "change of use" applications);
- When ODOT preliminary review identifies operational or safety issues related to increased traffic or highway access at the development site; and/or
- When an approach to the state highway will be the development's only, or primary, access to the roadway network.

Table 3.2: TIA Thresholds and Analysis Areas

	Transportation Planning Rules	Local Land Use (Will vary by jurisdiction)	ODOT approach permit
Traffic Impact Analysis Required (Unless Waived)	When greater than existing provides. OHP (Policy 1F.5) >1000 ADT >400 ADT - <1000 ADT (Hwy Sec/ADT)	Example: 20 peak hour trips and/or 200 ADT at subject site or intersection	Public Approach if agreed to in coordination with local jurisdiction Request for Deviation from the spacing, sight distance and channelization standards per OAR 734-051-4020 Whenever site trips relative to highway ADT exceed thresholds in (OAR 734-051 3030(4)(b)[25] May be used to affirm whether a Change of Use of a Highway Approach (COU) has occurred.
Analysis Area	The analysis area is the area significantly affected (i.e. affected intersections), within reason. For example, in rural areas without	Examples: Within 1 Mile radius of the subject property; or Area including all	(Not regulatory – based on past practice) Area including all intersections where traffic is increased by 50 peak hour trips;

[25] Rule section included in Highway Approach Permitting section below.

	Transportation Planning Rules	Local Land Use (Will vary by jurisdiction)	ODOT approach permit
	street networks, a measurable effect can be felt far beyond the local area.	arterials and collectors experiencing peak hour increase of XX trips.	300 ADT; and/or 10% TEV[26] increase (most likely to occur on low volume and/or rural roads)

In some cases, ODOT staff may work to persuade an applicant that it is in their best interest to have traffic analysis information in their applications even if there is not a specific requirement to do so. Remember that land use applicants have a responsibility (supported strongly by case law in Oregon) to provide adequate information to demonstrate that they satisfy all local land use criteria, and that maintaining adequate transportation facilities is a general requirement of all local plans and most codes.

The information that comes from good analysis will be valuable in all three elements of land development applications considered here: plan and zoning amendments, site development review and approach permitting. Development review planners work closely with ODOT access management staff and local planners to recognize when analysis is needed and coordinate the scoping of a TIA to ensure that it answers questions for all three review processes as needed.

Local Land Use Review

In basic development review, ODOT's role is as a party to a local land use decision that will be based upon the local development code. The local jurisdiction may require a TIA as part of a land use application. If it does not, the development review planner may recommend that a TIA be required, but unless the local code enables a TIA requirement or requires applicants to demonstrate that transportation facilities are adequate[27] to serve the type of proposal under review, a decision to require traffic analysis will be at the will of the local jurisdiction.

Where local development codes do require traffic impact analysis, the traffic volume or other type of thresholds that trigger a TIA requirement will often be different from the thresholds used in the access management rules. Where an application hits one threshold and not the other, the jurisdiction with authority related to that threshold will be the one requiring the TIA.

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[26] Total Entering Vehicles
[27] Discussed further in section 3.3.03, below

development can generate a significant percent increase in volume on a lightly traveled highway without an adverse effect on the highway. No specific formula will result in a sensible study area for all cases. Base the TIA study area upon the extent of the direct impacts of the proposed development on transportation facilities and on areas around the facilities most at risk of failure or unsafe conditions due to the projected traffic impacts.

Identify Future Year(s) for Analysis:

Table 3.3: Future Year Analysis: Suggested Time Lines

Proposed Development Daily Trip Generation	Single-Phase Development Horizon Years	Multi-Phased Development Horizon Years
Up to 999 ADT	Year of Opening	Year of Each Phase Opening
1,000 - 2,999 ADT	Year of Opening and at 5 Years	Year of Each Phase Opening and 5 Years Beyond Buildout
3,000 – 4,999	Year of Opening and 10 Years	Year of Each Phase Opening and 10 Years Beyond Buildout
5,000 or More	Year of Opening and Year of Planning Horizon for the Transportation System Plan or 15 Years, Whichever is Greater	Year of Each Phase Opening and Year of Planning Horizon for the Transportation System Plan or 15 Years, Whichever is Greater
Plan Amendments and Zone Changes[34]	Year of Planning Horizon for Transportation System Plan or 15 Years, Whichever is Greater	Year of Planning Horizon for Transportation System Plan or 15 Years, Whichever is Greater

[34] This is policy – ***OHP Action 1F.2. . .*** When evaluating highway mobility for amendments to transportation system plans, acknowledged comprehensive plans and land use regulations, use the planning horizons in adopted local and regional transportation system plans or a planning horizon of 15 years from the proposed date of amendment adoption, whichever is greater. To determine the effect an amendment to a transportation system plan, acknowledged comprehensive plan or land use regulation has on a state facility, the capacity analysis shall include the forecasted growth of traffic on the state highway due to regional and intercity travel and to full development according to the applicable acknowledged comprehensive plan over the planning period.

APPENDIX C

TRAFFIC COUNT DATA

PINE CROSSING APPENDIX C: TRAFFIC COUNT DATA

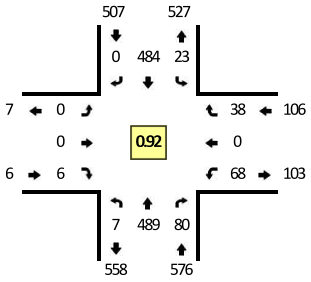
Type of peak hour being reported: Intersection Peak

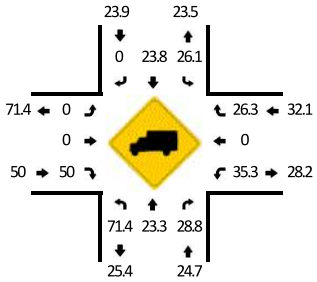
Method for determining peak hour: Total Entering Volume

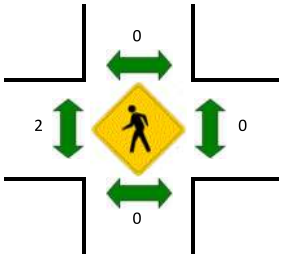
LOCATION: US 101 -- Munsel Lake Rd
CITY/STATE: Florence, OR

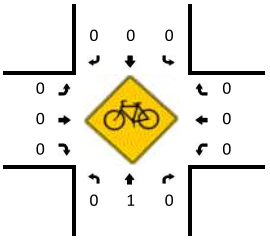
QC JOB #: 15890302
DATE: Thu, Jun 3 2021

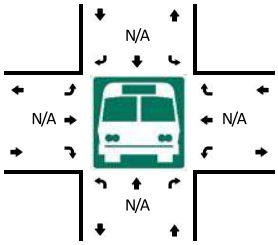
Peak-Hour: 12:15 PM -- 1:15 PM
Peak 15-Min: 12:45 PM -- 1:00 PM

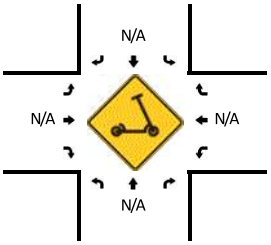












15-Min Count Period Beginning At	US 101 (Northbound)				US 101 (Southbound)				Munsel Lake Rd (Eastbound)				Munsel Lake Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	4	1	0	2	16	0	0	0	0	0	0	2	0	0	0	25	
6:15 AM	0	13	1	0	2	20	0	0	0	0	0	0	4	0	1	0	41	
6:30 AM	0	17	2	0	4	31	0	0	0	0	0	0	7	0	0	0	61	
6:45 AM	0	22	6	0	3	43	0	0	0	0	0	0	4	0	2	0	80	207
7:00 AM	0	23	9	0	6	45	0	0	0	0	0	0	10	0	2	0	95	277
7:15 AM	0	31	4	0	6	56	0	0	0	0	0	0	12	0	8	0	117	353
7:30 AM	0	45	7	0	9	67	1	0	0	0	1	0	23	0	8	0	161	453
7:45 AM	0	50	7	0	6	84	0	0	0	0	0	0	13	0	7	0	167	540
8:00 AM	0	57	11	0	5	78	0	0	0	0	0	0	14	0	4	0	169	614
8:15 AM	0	53	12	0	8	81	1	0	0	0	0	0	10	0	3	0	168	665
8:30 AM	0	67	7	0	12	80	0	0	0	0	1	0	9	0	3	0	179	683
8:45 AM	1	49	13	0	8	69	1	0	1	0	0	0	11	0	7	0	160	676
9:00 AM	0	61	6	0	5	74	0	0	1	0	0	0	10	0	9	0	166	673
9:15 AM	0	66	21	0	10	88	0	0	0	0	0	0	10	0	8	0	203	708
9:30 AM	0	76	15	0	7	106	0	0	0	0	0	0	13	0	3	0	220	749
9:45 AM	0	73	21	0	14	89	0	0	0	0	0	0	14	0	8	0	219	808
10:00 AM	1	76	18	0	9	79	1	0	0	0	1	0	11	1	5	0	202	844
10:15 AM	1	83	18	0	6	109	1	0	1	0	0	0	7	0	9	0	235	876
10:30 AM	0	93	10	0	5	81	0	0	0	0	1	0	9	0	9	0	208	864
10:45 AM	0	109	14	0	9	119	0	0	0	0	0	0	10	0	5	0	266	911
11:00 AM	1	103	12	0	9	111	0	0	0	0	1	0	13	0	8	0	258	967
11:15 AM	1	114	19	0	10	130	1	0	0	0	0	0	20	0	6	0	301	1033
11:30 AM	1	101	8	0	8	112	1	0	1	0	1	0	19	0	4	0	256	1081
11:45 AM	1	110	15	0	13	129	0	0	0	2	0	0	10	0	7	0	287	1102
12:00 PM	0	113	16	0	13	114	0	0	0	0	1	0	14	0	9	0	280	1124
12:15 PM	1	125	22	0	5	114	0	0	0	0	0	0	14	0	6	0	287	1110
12:30 PM	2	117	18	0	6	131	0	0	0	0	1	0	19	0	9	0	303	1157
12:45 PM	3	124	20	0	6	132	0	0	0	0	4	0	20	0	14	0	323	1193
1:00 PM	1	123	20	0	6	107	0	0	0	0	1	0	15	0	9	0	282	1195
1:15 PM	1	124	21	0	12	100	1	0	0	0	3	0	15	0	7	0	284	1192
1:30 PM	1	121	26	0	8	119	2	0	0	0	3	0	17	0	9	0	306	1195
1:45 PM	1	103	17	0	15	111	1	0	0	0	1	0	12	0	17	0	278	1150
2:00 PM	0	122	19	0	10	127	0	0	0	0	1	0	17	1	11	0	308	1176
2:15 PM	0	130	17	0	7	116	0	0	0	0	1	0	17	0	7	0	295	1187
2:30 PM	1	129	11	0	6	124	4	0	0	0	2	0	17	0	11	0	305	1186
2:45 PM	3	126	20	0	6	106	1	0	0	0	4	0	11	0	5	0	282	1190
3:00 PM	1	126	15	0	9	103	0	0	1	0	2	0	17	0	6	0	280	1162
3:15 PM	0	109	9	0	4	102	0	0	0	0	0	0	15	0	6	0	245	1112

PINE CROSSING APPENDIX C: TRAFFIC COUNT DATA

15-Min Count Period Beginning At	US 101 (Northbound)				US 101 (Southbound)				Munsel Lake Rd (Eastbound)				Munsel Lake Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:30 PM	0	133	15	0	9	91	0	0	0	0	1	0	17	1	8	0	275	1082
3:45 PM	2	119	20	0	10	114	0	0	0	0	2	0	12	0	7	0	286	1086
4:00 PM	3	126	21	0	7	112	0	0	0	0	3	0	8	0	8	0	288	1094
4:15 PM	0	131	18	0	6	90	0	0	0	0	3	0	14	0	6	0	268	1117
4:30 PM	1	129	12	0	11	107	0	0	0	0	0	0	10	0	11	0	281	1123
4:45 PM	0	116	16	0	6	74	1	0	0	0	0	0	13	0	10	0	236	1073
5:00 PM	0	129	18	0	7	86	0	0	1	0	1	0	9	0	11	0	262	1047
5:15 PM	0	93	18	0	4	77	0	0	0	0	0	0	7	0	7	0	206	985
5:30 PM	0	105	18	0	5	88	0	0	0	0	1	0	4	0	7	0	228	932
5:45 PM	2	78	10	0	5	65	0	0	0	0	1	0	7	0	8	0	176	872
6:00 PM	1	83	9	0	2	72	0	0	1	0	1	0	4	0	5	0	178	788
6:15 PM	0	74	8	0	3	64	0	0	0	0	0	0	9	0	8	0	166	748
6:30 PM	1	89	8	0	5	70	0	0	0	0	1	0	8	0	5	0	187	707
6:45 PM	0	67	10	0	6	70	0	0	0	0	0	0	7	0	5	0	165	696
7:00 PM	0	45	8	0	4	38	1	0	0	0	0	0	5	0	4	0	105	623
7:15 PM	0	52	6	0	4	54	0	0	0	0	0	0	2	0	4	0	122	579
7:30 PM	0	59	4	0	2	47	0	0	0	0	1	0	2	1	11	0	127	519
7:45 PM	0	51	6	0	4	44	0	0	0	0	0	0	3	0	4	0	112	466
8:00 PM	0	28	9	0	6	44	0	0	0	0	1	0	7	0	7	0	102	463
8:15 PM	0	37	3	0	7	50	0	0	0	0	0	0	2	0	2	0	101	442
8:30 PM	0	24	5	0	2	25	0	0	0	0	0	0	2	0	4	0	62	377
8:45 PM	0	46	5	0	3	38	0	0	0	0	0	0	4	0	4	0	100	365
9:00 PM	0	22	1	0	2	32	0	0	0	0	1	0	2	0	3	0	63	326
9:15 PM	0	25	3	0	2	26	0	0	0	0	0	0	1	0	3	0	60	285
9:30 PM	1	22	5	0	1	16	0	0	1	0	0	0	1	0	1	0	48	271
9:45 PM	0	22	4	0	4	12	0	0	0	0	0	0	0	0	3	0	45	216

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	496	80	0	24	528	0	0	0	0	16	0	80	0	56	0	1292
Heavy Trucks	12	136	24		12	104	0		0	0	8		36	0	12		344
Buses																	
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 7/24/2022 12:23 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

US 101 @ Munsel Lake Road — 3-Jun-21

			SBL	SBT	SBR	PED	Approach Total	WBL	WBT	WBR	PED	Approach Total	NBL	NBT	NBR	PED	Approach Total	EBL	EBT	EBR	PED	Approach Total	15-Min Total	Hour Total	Hour		
3:00 PM	to	3:15 PM	9	103	0		112	17	0	6		23	1	126	15		142	1	0	2		3	280	1086	3:00 PM	to	4:00 PM
3:15 PM	to	3:30 PM	4	102	0		106	15	0	6		21	0	109	9		118	0	0	0		0	245	1094	3:15 PM	to	4:15 PM
3:30 PM	to	3:45 PM	9	91	0		100	17	1	8		26	0	133	15		148	0	0	1		1	275	1117	3:30 PM	to	4:30 PM
3:45 PM	to	4:00 PM	10	114	0		124	12	0	7		19	2	119	20		141	0	0	2		2	286	1123	3:45 PM	to	4:45 PM
4:00 PM	to	4:15 PM	7	112	0		119	8	0	8		16	3	126	21		150	0	0	3		3	288	1073	4:00 PM	to	5:00 PM
4:15 PM	to	4:30 PM	6	90	0		96	14	0	6		20	0	131	18		149	0	0	3		3	268	1047	4:15 PM	to	5:15 PM
4:30 PM	to	4:45 PM	11	107	0		118	10	0	11		21	1	129	12		142	0	0	0		0	281	985	4:30 PM	to	5:30 PM
4:45 PM	to	5:00 PM	6	74	1		81	13	0	10		23	0	116	16		132	0	0	0		0	236	932	4:45 PM	to	5:45 PM
5:00 PM	to	5:15 PM	7	86	0		93	9	0	11		20	0	129	18		147	1	0	1		2	262	872	5:00 PM	to	6:00 PM
5:15 PM	to	5:30 PM	4	77	0		81	7	0	7		14	0	93	18		111	0	0	0		0	206				
5:30 PM	to	5:45 PM	5	88	0		93	4	0	7		11	0	105	18		123	0	0	1		1	228				
5:45 PM	to	6:00 PM	5	65	0		70	7	0	8		15	2	78	10		90	0	0	1		1	176				
		2021 Count Volumes	34	423	0	0	457	44	0	32	0	76	6	505	71	0	582	0	0	8	0	8	1123				
		Peak Hour Factor	0.773	0.928	0.000	0.000	0.921	0.786	0.000	0.727	0.000	0.905	0.500	0.964	0.845	0.000	0.970	0.000	0.000	0.667	0.000	0.667	0.975				
		COVID 19 Factor	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060				
		Seasonal adjustment factor	1.094318	1.094318	1	1.094318	1.094318	1.094318	1.094318	1.094318	1.094318	1.094318	1	1.094318	1.094318	1.094318	1.094318	1.094318	1.094318	1	1.094318	1.094318	1.094318				
		Seasonally Adjusted TV - 2021	39	491	0	0	530	51	0	37	0	88	6	586	82	0	675	0	0	8	0	9	1303				
		2-Years Growth Factor to 2023	1.0205	1.0205	1	1.0205	1.0205	1.0205	1.0205	1.0205	1.0205	1.0205	1	1.0205	1.0205	1.0205	1.0205	1.0205	1.0205	1	1.0205	1.0205	1.0205				
		2023 Peak Hour TVS	40	501	0	0	541	52	0	38	0	90	6	598	84	0	689	0	0	8	0	9	1330				
		3 year factor 2023 to 2026	1.03077	1.03077	1	1.03077	1.03077	1.03077	1.03077	1.03077	1.03077	1.03077	1	1.03077	1.03077	1.03077	1.03077	1.03077	1.03077	1	1.03077	1.03077	1.03077				
		2026 TVS	41	516	0	0	558	54	0	39	0	93	6	616	87	0	710	0	0	8	0	9	1371				
		Cannery Station Phase 1	0	18	0	0	18	3	0	0	0	3	0	24	3	0	27	0	0	0	0	0	48				
		Three Mile Prairie Phase 1	1	15	0	0	16	0	0	2	0	2	0	24	0	0	0	0	0	0	0	0	42				
		2026 No-Build Traffic	42	549	0	0	592	57	0	41	0	98	6	664	90	0	737	0	0	8	0	9	1461				
		Pine Crossing Traffic	6	0	0	0	6	6	0	4	0	10	0	0	8	0	7	0	0	0	0	0	24				
		2026 Build TVs	48	549	0	0	598	63	0	45	0	108	6	664	98	0	744	0	0	8	0	9	1485				

From 2022 Florence TSP Update Tech Memos #3B and #4
Kittlesen and Associates
Highway 101
GROWTH RATE CALCULATION

	Northbound	Southbound	Totals
2021	638	488	1126
2042	759	598	1357

20 Years Growth 2022 - 2042
AAGR =[(1357-1126)/1126]/20
= 0.010258
= 1%

EXTG Spruce Street in and out flows Trip Generation

In	OUT	Total
24	14	38

ITE 210 36 Detached Dwelling Units
PM Peak Hour: LN(T)=0.94LN(X)+0.27

Peak Hour Factor from Munsel Lake Rd inflows and Outflows = 0.926 use 0.85 default from APM at Spruce Street, since inflows and outflows are estimated from ITE Trip Generation instead of count data at Spuce Street

PINE CROSSING APPENDIX C: TRAFFIC COUNT DATA

Figure 3 2021 TSP Raw Traffic Count Data 6/3/23

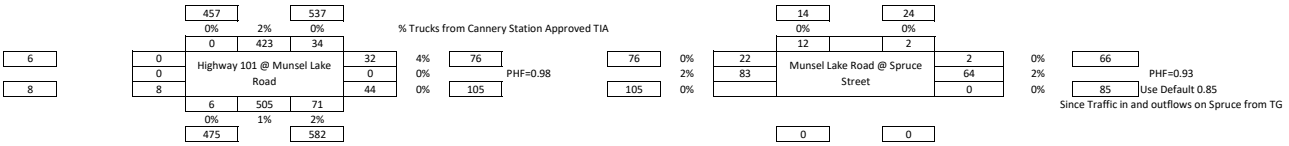


Figure 4 2023 PM Peak Hour TVs

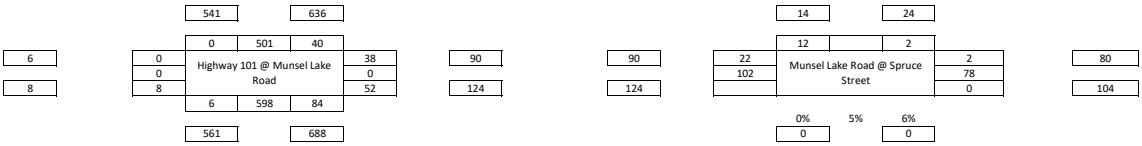


Figure 5 2026 PM Peak Hour Grown TVs - No Pipeline Trips

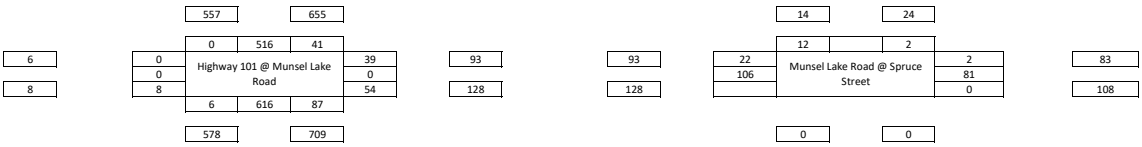


Figure 6 Pipeline Trips from Cannery Sta and 3 Mile Prairie

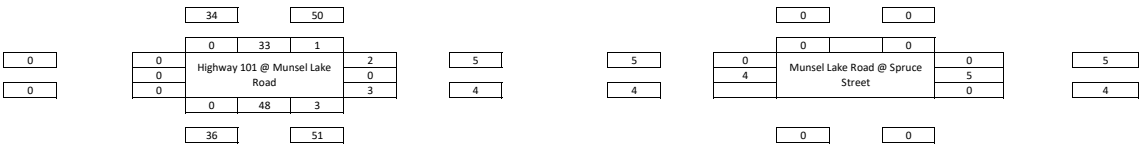


Figure 7: 2026 PM Peak Hour Background TVs - Inc. Pipeline Trips

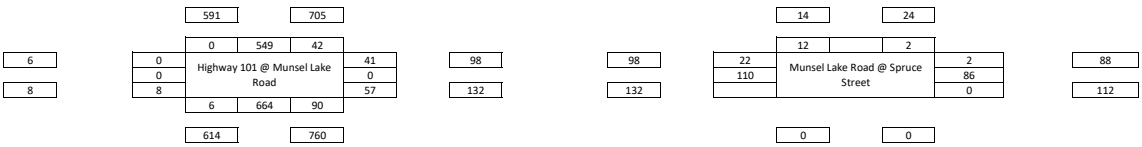


Figure 8: Pine Crossing Trips

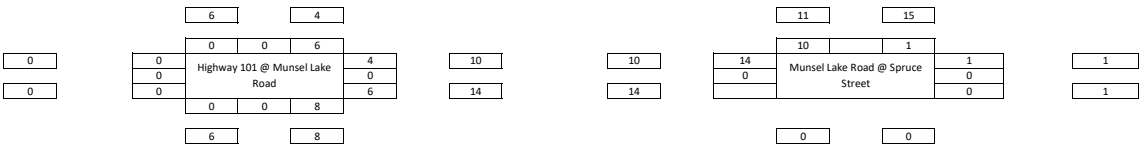
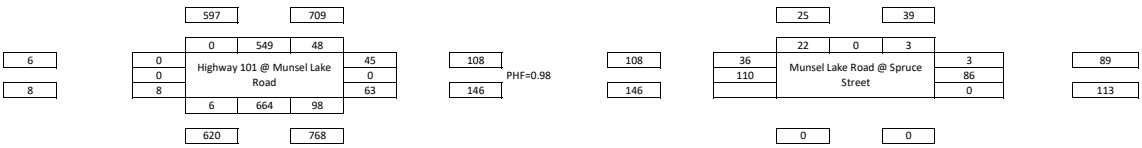


Figure 9: 2026 PM Peak Hour Build Traffic



Intersection: 1: Highway 101 @ Lake Munsel Road City: Florence, OR

Counter: Sandow Engineering Date: Thursday, February 1, 2018

Total of All Vehicles

Time Period		Southbound				Westbound				Northbound				Eastbound				15 Minute Volume	Hourly Volume	Pedestrians			
		Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total			SB	WB	NB	EB
3:30 PM	3:45 PM	0	94	13	107	6	0	7	13	19	115	0	134	0	0	0	0	254		1	1	0	0
3:45 PM	4:00 PM	0	75	5	80	7	0	8	15	22	104	0	126	0	0	1	1	222		0	0	2	0
4:00 PM	4:15 PM	0	76	8	84	11	0	8	19	20	91	0	111	0	0	0	0	214		0	0	0	0
4:15 PM	4:30 PM	0	86	4	90	0	0	11	11	30	72	0	102	0	0	0	0	203	893	0	0	0	0
4:30 PM	4:45 PM	0	73	5	78	6	0	17	23	18	97	0	115	0	0	0	0	216	855	0	0	0	0
4:45 PM	5:00 PM	0	75	5	80	10	0	6	16	16	79	0	95	1	0	0	1	192	825	0	0	0	0
5:00 PM	5:15 PM	1	88	3	92	8	0	6	14	22	78	0	100	0	0	0	0	206	817	0	0	0	0
5:15 PM	5:30 PM	0	69	6	75	6	0	18	24	10	82	0	92	0	0	0	0	191	805	0	0	0	0
5:30 PM	5:45 PM	0	61	4	65	5	0	9	14	12	83	0	95	0	0	0	0	174	763	0	0	4	0
5:45 PM	6:00 PM	0	46	3	49	3	0	7	10	12	63	0	75	0	0	0	0	134	705	0	0	0	0
6:00 PM	6:15 PM	0	54	3	57	5	0	6	11	11	75	1	87	0	0	0	0	155	654	0	0	0	0
6:15 PM	6:30 PM	0	52	5	57	3	0	9	12	7	84	0	91	0	0	1	1	161	624	0	0	0	0
Count Period Total		**1**	**849**	**64**		**70**	**0**	**112**		**199**	**1023**	**1**		**1**	**0**	**2**		**2322**		**1**	**1**	**6**	**0**

PM Peak Hour Count Summary

		Southbound				Westbound				Northbound				Eastbound						Pedestrians			
		Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total			SB	WB	NB	EB
Peak Volumes		**0**	**331**	**30**	**361**	**24**	**0**	**34**	**58**	**91**	**382**	**0**	**473**	**0**	**0**	**1**	**1**	**893**		**0**	**0**	**0**	**0**
Seasonal Adjustment		1.00	1.29	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.29	1.00	1.00	1.00	1.00	1.00	0.00	**0.88**					
Seasonally Adjusted Volumes		**0**	**428**	**30**		**24**	**0**	**34**		**91**	**493**	**0**		**0**	**0**	**1**		**Intersection PHF**					
Trucks		0	8	0		1	0	0		2	4	0		0	0	0							
% Trucks		0%	2%	0%		4%	0%	0%		4%	1%	0%		0%	0%	0%							

Cannery Station Truck Percentages Used in Pine Crossing Analysis with Quality Counts Traffic Count Data.

QC Count data is missing hourly truck percentages

APPENDIX D

TRAFFIC VOLUME AND GROWTH ADJUSTMENT FACTOR CALCULATIONS

HISTORICAL GROWTH ADJUSTMENT

All traffic counts were conducted in 2021. Therefore, historical growth factors will be developed in accordance with the methodologies identified in the APM to adjust volumes to 2022. The methodology utilizes future volumes tables that are updated annually and based on long-term 20-year trends at traffic count sites on Oregon highways. Future volume trends are based on linear regression best-fit trends. The traffic volumes for the Florence ATR (#20-026) were selected due to the proximity to the study area. Based on the future volume tables the annual growth rate along US 101 is 1.45%. The annual growth rate will be applied to the study intersections to adjust counts to 2022.

COVID ADJUSTMENT

An additional adjustment factor of 6 percent will be applied to all the counts to account for changes in traffic volumes related to the COVID-19 pandemic. This adjustment factor was determined based on a review of historical traffic counts conducted along Rhododendron Drive and 35th Street. The counts, which were conducted in 2019, showed higher turning movement volumes at the intersections than the counts conducted in 2021, particularly to/from the minor street. The differences in the turning movement volumes ranged from 4.5 to 5.2 percent; however, based on discussion with the City and ODOT an adjustment factor of 6 percent was selected for the analysis.

FUTURE YEAR VOLUMES

COVID Factor of 1.06 applied to Count Data for Pine Crossing TIA

Forecast traffic volumes will be developed for the study intersections in accordance with the Zonal Cumulative Analysis methodology described in the APM. This methodology is suggested when analyzing entire cities of up to 10,000 residents. This methodology combines growth in regional traffic volumes with growth in local traffic volumes associated with projected household and employment growth in the city. The traffic volume projection process includes three steps (trip generation, trip distribution, and trip assignment). The process accounts for the following four categories of vehicle trips:

1. *External-External (through trips):* vehicles with an origin and destination outside the UGB. An example of an external-external trip is someone traveling from Reedsport to Newport through Florence.
2. *External-Internal (inbound trips):* vehicles with an origin outside the UGB and a destination inside the UGB. An example of an external-internal trip is someone who works in Eugene but returns home to Florence.
3. *Internal-External (outbound trips):* vehicles with an origin inside the UGB and a destination outside the UGB. An example of an internal-external trip is someone who works in Florence but returns home to Waldport.
4. *Internal-Internal (local trips):* vehicles with an origin and destination inside the UGB. An example of an internal-internal trip is someone who travels from their home to the grocery store without leaving Florence.

Using these vehicle trip types, the basic steps for a zonal cumulative analysis are:

1. Identify the study area and divide into transportation analysis zones (TAZ).
2. Identify vacant lands, in-process developments, comprehensive plan allowed land uses/densities, and development rates using Census data and GIS data from the City.

Table 1 provides traffic volumes by corridor for weekdays and weekends for the last five weeks of available data, May 31 to July 4, 2021[5]. Corridor volumes are prepared by summing traffic volumes from ATRs across 13 corridors for years 2019, 2020 and 2021[6].

Overall statewide traffic volumes are close to pre-COVID traffic volumes. For the month of June, statewide average weekday traffic volumes ranged between 5% below and 5% above 2019 pre-COVID conditions, while weekend volumes ranged between 9% below and equal to 2019 levels. Recent forecast news from the Oregon DAS Office of Economic Analysis indicates economic recovery is expected to move faster than past recessions [7]

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

		2021 Volumes		2020 Volumes		2019 Volumes		2021 as % of 2020	
Date	Corridor	Average Weekday	Average Weekend	Average Weekday	Average Weekend	Average Weekday	Average Weekend	Weekday Diff	Weekend Diff
Week 23 May 31- June 6, 2021	I-5	558,510	483,914	466,638	356,866	588,873	519,086	20%	36%
	I-205	244,436	204,969	210,138	158,028	269,797	235,467	16%	30%
	I-405	121,681	101,902	103,291	66,692	143,769	119,357	18%	53%
	I-84	367,455	323,293	308,732	238,313	371,031	343,419	19%	36%
	US 97	158,986	135,404	146,823	118,339	168,151	143,367	8%	14%
	US197	3,578	3,120	2,959	2,583	3,325	2,777	21%	21%
	US20	28,808	24,285	23,669	19,012	25,683	24,331	22%	28%
	US26	54,746	48,449	45,634	41,742	52,260	55,722	20%	16%
	US30	13,271	11,148	10,584	9,625	11,896	11,960	25%	16%
	US395	27,000	22,600	25,703	19,130	29,165	21,212	5%	18%
	OR18	20,746	20,537	17,111	19,026	16,663	21,557	21%	8%
	OR22	31,732	25,749	28,307	20,870	31,838	27,314	12%	23%
	US101	89,221	76,993	69,722	62,523	85,138	78,636	28%	23%
Statewide Average		341,488	295,401	287,606	220,203	359,073	318,941	19%	34%
Week 24 June 7-13, 2021	I-5	563,778	506,995	482,153	403,769	604,078	557,050	17%	26%
	I-205	254,111	216,643	217,082	173,873	274,976	241,338	17%	25%
	I-405	130,579	103,765	106,251	67,900	138,162	111,721	23%	53%
	I-84	373,222	336,902	317,742	265,804	371,513	350,983	17%	27%
	US 97	162,982	143,270	151,426	128,987	167,322	144,049	8%	11%
	US197	3,279	3,081	2,875	2,874	3,300	2,984	14%	7%
	US20	26,872	24,396	23,035	21,125	27,478	26,848	17%	15%
	US26	49,816	50,297	44,922	46,867	54,733	59,844	11%	7%
	US30	11,968	11,572	10,544	10,341	12,629	12,870	14%	12%
	US395	28,230	24,050	25,522	19,638	27,868	21,759	11%	22%
	OR18	17,979	20,422	15,673	20,177	18,915	25,441	15%	1%
	OR22	32,004	25,896	27,696	23,442	32,686	29,214	16%	10%
	US101	90,358	75,148	68,825	67,046	90,295	84,241	31%	12%
Statewide Average		346,835	308,995	296,567	246,468	365,312	335,096	17%	25%

See Calculations for Comparison of 2021 to 2019

[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/

PINE CROSSING APPENDIX D:
TRAFFIC VOLUME ADJUSTMENTS AND GROWTH

COVID-19 Report Data from Page July 9, 2021
Week of May 31 - June 6, 2021
Percents are relative to 2019 Traffic Volumes

US 101 Data

	Weekday			Weekend			All Traffic	
2021	89,221	5%		76,993	-2%		166,214	1%
2020	69,722	-18%		62,523	-20%		132,245	-19%
2019	85,138	0%		78,636	0%		163,774	0%

Weekday traffic from May 31 - June 6, 2021 was 5% higher than the same week in 2019.
Weekend traffic from May 31 - June 6, 2021 was 2% lower than the same week in 2019.

PINE CROSSING APPENDIX D:

TRAFFIC VOLUME ADJUSTMENTS AND GROWTH

SEASONAL TREND TABLE (Updated: 11/10/2022)																									Seasonal Trend Peak Period Factor
TREND	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	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	1.0937	1.1592	1.1547	1.1502	1.0841	1.0180	0.9963	0.9746	0.9815	0.9885	0.9625	0.9366	0.9211	0.9056	0.9175	0.9295	0.9470	0.9645	0.9721	0.9796	0.9885	0.9973	1.0384	1.0794	0.9056
INTERSTATE NONURBANIZED	1.2128	1.3303	1.3475	1.3647	1.2141	1.0634	1.0236	0.9838	0.9687	0.9536	0.9130	0.8724	0.8404	0.8084	0.8293	0.8501	0.8889	0.9276	0.9583	0.9889	1.0037	1.0185	1.1007	1.1830	0.8084
COMMUTER	1.1005	1.1479	1.1341	1.1204	1.0651	1.0099	0.9836	0.9574	0.9663	0.9752	0.9544	0.9336	0.9338	0.9341	0.9453	0.9566	0.9608	0.9649	0.9693	0.9736	0.9935	1.0134	1.0465	1.0796	0.9336
COASTAL DESTINATION	1.1584	1.2243	1.2052	1.1862	1.1005	1.0149	0.9887	0.9625	0.9672	0.9720	0.9181	0.8642	0.8386	0.8130	0.8299	0.8468	0.8926	0.9384	0.9940	1.0496	1.0999	1.1502	1.1960	1.2419	0.8130
COASTAL DESTINATION ROUTE	1.2909	1.3694	1.3728	1.3763	1.2315	1.0867	1.0419	0.9972	0.9581	0.9191	0.8590	0.7989	0.7607	0.7225	0.7389	0.7554	0.8235	0.8916	0.9820	1.0724	1.1507	1.2291	1.3629	1.4967	0.7225
AGRICULTURE	1.4312	1.4915	1.4980	1.5046	1.3605	1.2164	1.1152	1.0141	0.9356	0.8572	0.8266	0.7960	0.8137	0.8315	0.8448	0.8581	0.8336	0.8092	0.8496	0.8901	0.9684	1.0467	1.2566	1.4666	0.7960
RECREATIONAL SUMMER	1.4118	1.5326	1.6112	1.6898	1.4761	1.2623	1.1772	1.0921	0.9752	0.8582	0.7947	0.7311	0.7197	0.7082	0.7395	0.7708	0.8006	0.8304	0.8977	0.9651	1.0781	1.1910	1.4205	1.6501	0.7082
RECREATIONAL SUMMER WINTER	0.7518	0.8394	0.9654	1.0914	1.0422	0.9930	1.0357	1.0785	1.0310	0.9834	0.9358	0.8882	0.7824	0.6767	0.7712	0.8658	0.9973	1.1289	1.2850	1.4412	1.5833	1.7254	1.3952	1.0650	0.6767
RECREATIONAL WINTER	0.5086	0.5112	0.5988	0.6864	0.7354	0.7845	0.9435	1.1025	1.2219	1.3414	1.2723	1.2032	1.0545	0.9058	1.0033	1.1007	1.2108	1.3209	1.4791	1.6373	2.0741	2.5110	1.7317	0.9524	0.5086
SUMMER	1.2166	1.2914	1.2738	1.2563	1.1530	1.0496	1.0061	0.9625	0.9423	0.9220	0.8906	0.8591	0.8435	0.8279	0.8550	0.8821	0.9088	0.9355	0.9732	1.0109	1.0420	1.0731	1.1534	1.2337	0.8279
SUMMER < 2500	1.2683	1.3194	1.3010	1.2826	1.1889	1.0952	1.0262	0.9573	0.9119	0.8664	0.8549	0.8434	0.8442	0.8451	0.8727	0.9003	0.9080	0.9157	0.9406	0.9654	1.0279	1.0903	1.1996	1.3089	0.8434

*** 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%**

June 3, 2021 Count Date
Per Comments on other TIAs (Cannery Station and Three Mile Prairie, Average of Coastal Destination Route and Commuter Trend

	1-Jun	15-Jun	Lin. Interp 3-Jun	Peak Seas.	SAF
Coastal Destination Route	0.8590	0.7989	0.846106	0.7225	1.171141
Commuter	0.9544	0.9336	0.949921	0.9336	1.017494
					1.094318 Avg

PINE CROSSING APPENDIX D:
TRAFFIC VOLUME ADJUSTMENTS AND GROWTH

From 2022 Florence TSP Update Tech Memos #3B and #4
Kittlesen and Associates

Highway 101

GROWTH RATE CALCULATION

	Northbound	Southbound	Totals
2021	638	488	1126
2042	759	598	1357

20 Years Growth 2022 - 2042

AAGR =[(1357-1126)/1126]/20

= 0.010258

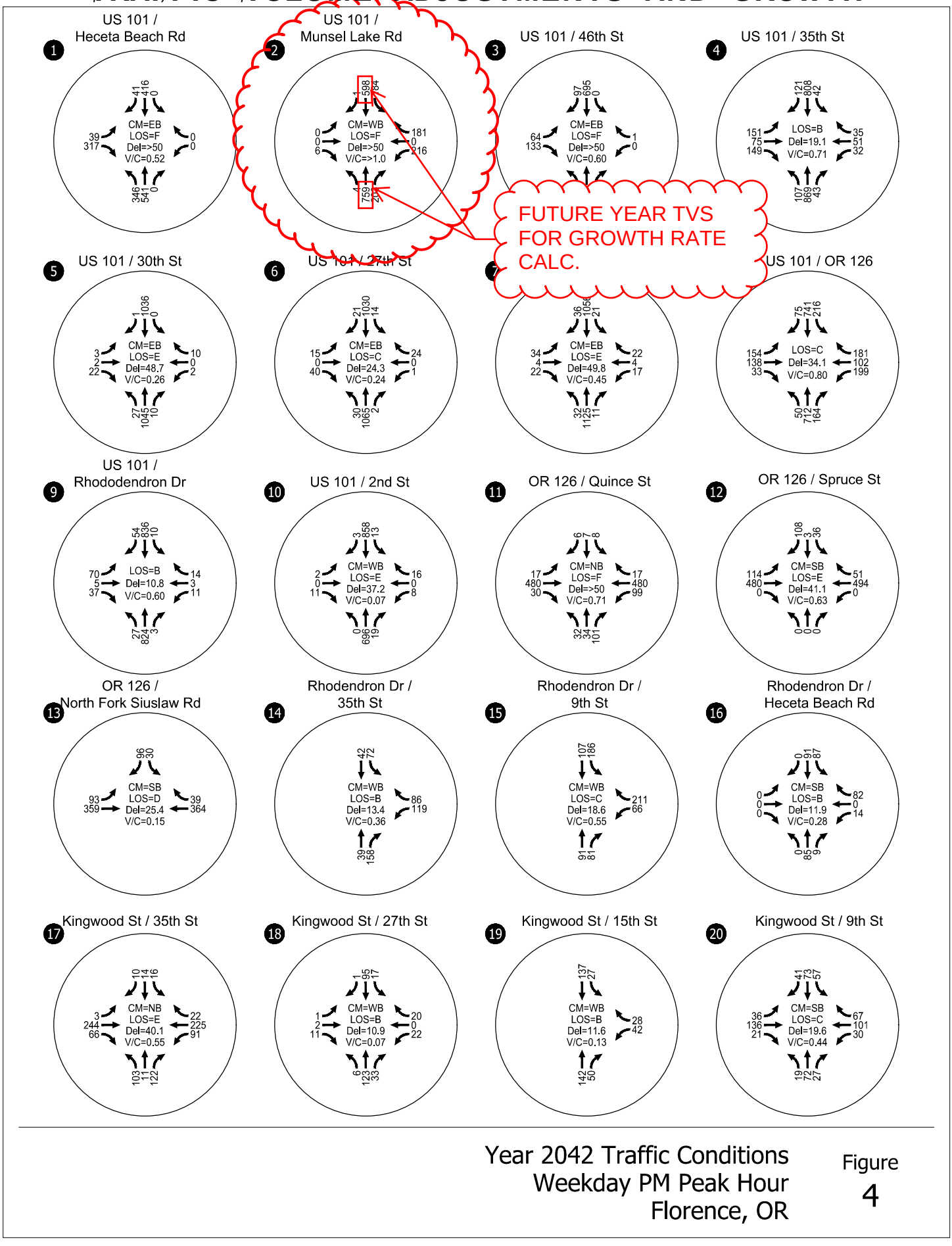
= 1%

PINE CROSSING APPENDIX D: TRAFFIC VOLUME ADJUSTMENTS AND GROWTH

Existing Traffic Conditions
Weekday PM Peak Hour
Florence, OR

Figure 3

PINE CROSSING APPENDIX D: TRAFFIC VOLUME ADJUSTMENTS AND GROWTH



Year 2042 Traffic Conditions
Weekday PM Peak Hour
Florence, OR

Figure 4

PINE CROSSING APPENDIX D: TRAFFIC VOLUME ADJUSTMENTS AND GROWTH

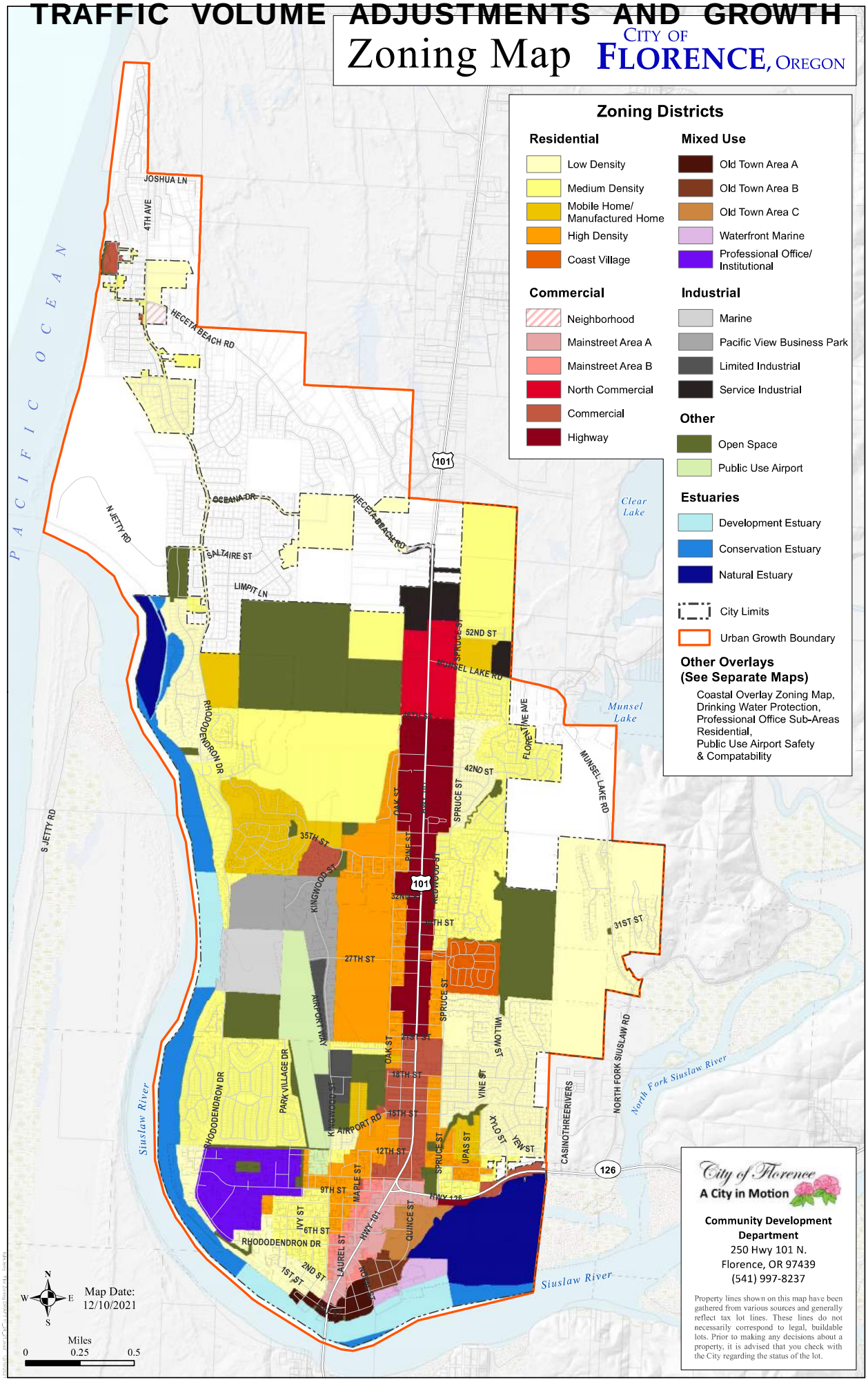
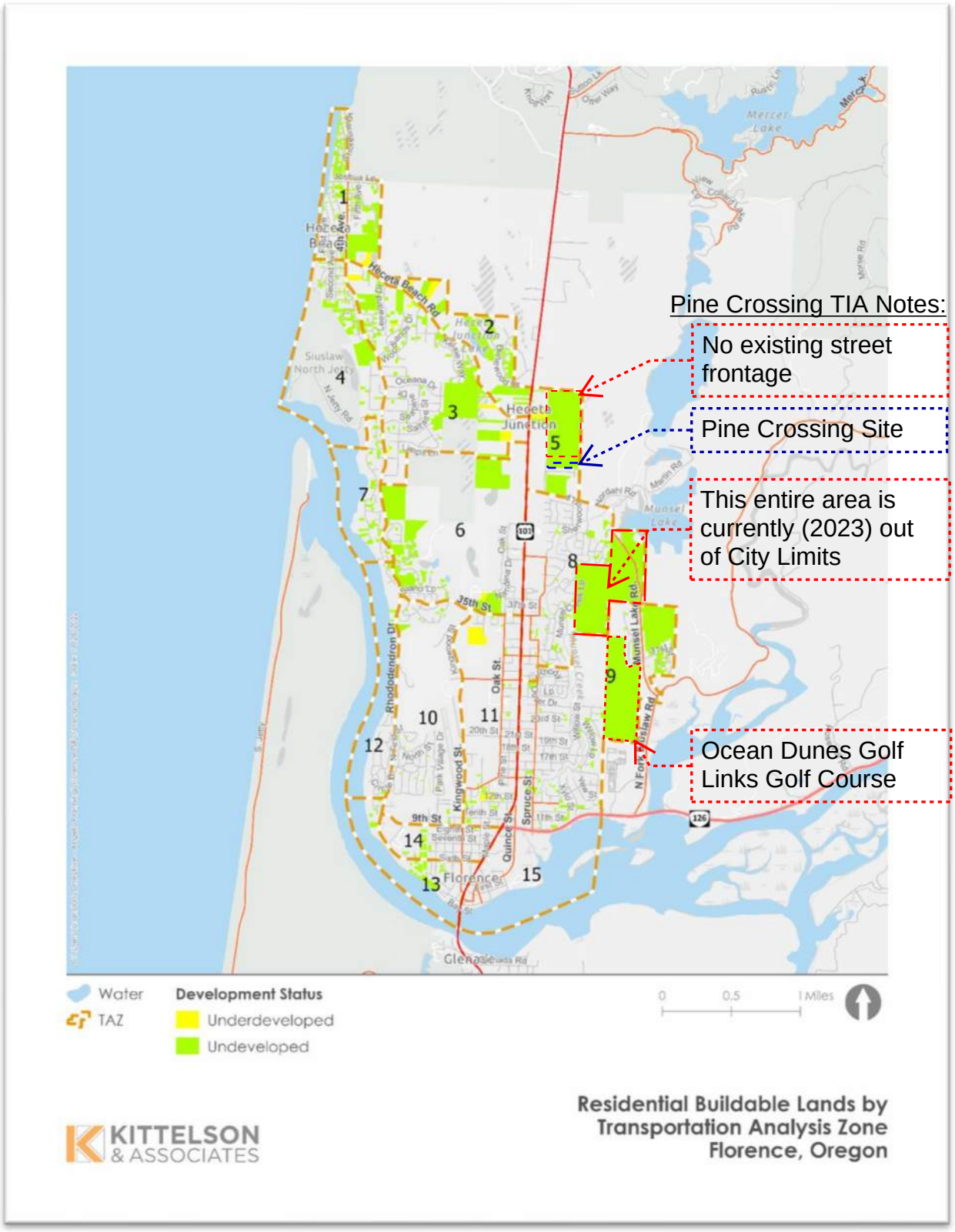


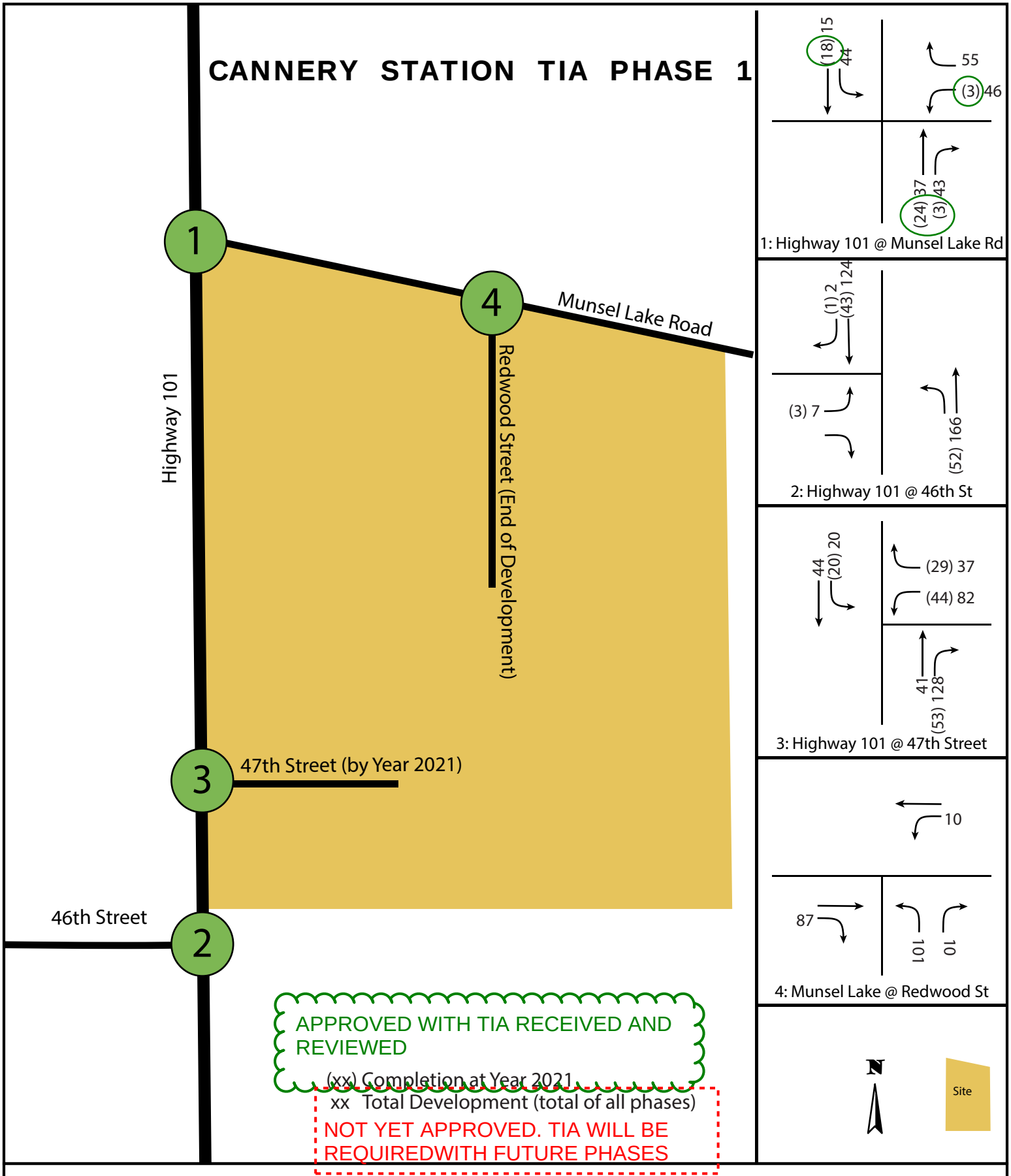
Figure 1 Buildable Residential Lots by TAZ in Florence



APPENDIX E

PIPELINE TRIPS: CANNERY STATION AND THREE MILE PRAIRIE PHASE 1

PINE CROSSING APPENDIX E: PIPELINE TRIPS



Cannery Station Florence, Oregon

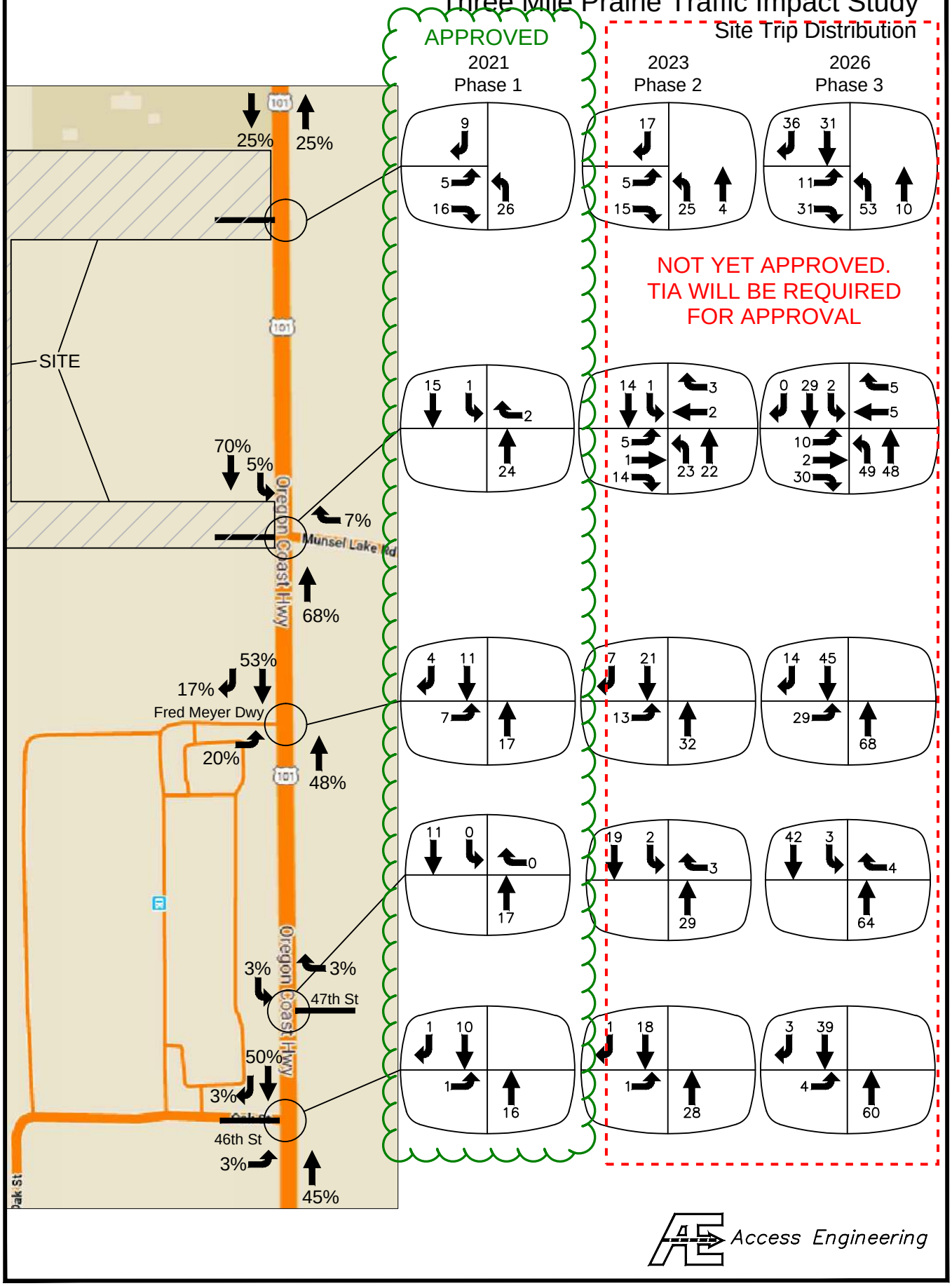
Figure 2: PM Peak Hour Trip Distribution

SANDOWENGINEERING
160 Madison Street Suite A Eugene, Oregon 97402 - 541.513.3376 - sandowengineering.com

THREE MILE PRAIRIE TIA PHASE 1 Figure 4

Three Mile Prairie Traffic Impact Study

Site Trip Distribution



Access Engineering

APPENDIX F

ODOT CRASH DATA

PINE CROSSING APPENDIX F: CRASH DATA

General & Site Information	
Analyst:	DNH
Agency/Company:	Branch Engineering, Inc
Date:	3.14.23
Project Name:	Pine Crossing TIA

Intersection Crash Data

Intersection	Intersection Type	Year 2015	2016	2017	2018	2019	Total
US 101 @ MLR	Urban 3ST	0	0	3	2	0	5
							0
							0
							0
							0
							0
							0
							0
							0
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							0
							0
							0
							0
							0
	Total	0	0	3	2	0	5

PINE CROSSING APPENDIX F: CRASH DATA

Intersection Population Type Crash Rate				
Average Crash Rate per intersection type				
Intersection Pop. Type	Sum of Crashes	Sum of 5-year MEV	Avg Crash Rate for Ref Pop.	INT in Pop
Rural 3SG	0	0		
Rural 3ST	0	0		
Rural 4SG	0	0		
Rural 4ST	0	0		
Urban 3ST	5	19	0.2702	1
Urban 3SG	0	0		
Urban 4ST	0	0		
Urban 4SG	0	0		

Critical Rate Calculation								
Intersection	AADT Entering Intersection	5-year MEV	Crash Total	Intersection Population Type	Intersection Crash Rate	Reference Population Crash Rate	Critical Rate	Over Critical
US 101 @ MLR	10,140	18.5	5	Urban 3ST	0.27	APM Exhibit 4-1	0.29	Under

2015 TVT	2016 TVT	2017 TVT	2018 TVT	2019 TVT	0.03 Mi S. of Munsel Lake Road	
2015	**2016**	**2017**	**2018**	**2019**	**SUM**	**AVG Annual**
10400	**10600**	**10800**	**9500**	**9400**	**50700**	**10140**
					18505500	18.5055 MEV

US101

9032 2021 Per ODOT TransGIS

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
00	PDO	NOT COLLECTED FOR PDO CRASHES
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

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

CITY OF FLORENCE, LANE COUNTY

OREGON COAST HY at MUNSEL LAKE RD, City of Florence, Lane County, 01/01/2015 to 12/31/2019

1 - 2 of 5 Crash records shown.

SER# / INVEST RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
00593	N	N	N	# Error	N	N	02/28/2018	14	N MUNSEL LAKE RD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										02,07,27
CITY							WE		OREGON COAST HY	UN		STOP SIGN	N	WET	REAR		N/A	E -W									000	00
N							11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							44 0 36.6	-124 6 5.74	000900100S00		(02)													UNK				
				# Error												02	NONE 9	STOP										
																	N/A	E -W									013	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
03357	N	N	N	# Error	N	N	09/20/2017	14	N MUNSEL LAKE RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							WE		OREGON COAST HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	S -N									000	00
N							2P			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	50	F	OR-Y		000	000	00
N							44 0 36.6	-124 6 5.74	000900100S00															OR<25				
				# Error												02	NONE 0	TURN-L										
																	PRVTE	E -S									015	00
																	PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000	00
																								OR<25				
03659	N	N	N	# Error	N	N	10/11/2017	14	N MUNSEL LAKE RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
CITY							WE		OREGON COAST HY	CN		STOP SIGN	N	DRY	TURN		N/A	E -W									015	00
N							1P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							44 0 36.6	-124 6 5.74	000900100S00															UNK				

PINE CROSSING APPENDIX F: CRASH DATA

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

CITY OF FLORENCE, LANE COUNTY

OREGON COAST HY at MUNSEL LAKE RD, City of Florence, Lane County, 01/01/2015 to 12/31/2019

3 - 5 of 5 Crash records shown.

SER# / INVEST / UNLOC?	S P E D	D R A L C	M J U G S	S C I N V	W O H L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
				#Error											02	NONE 9	STRGHT										
																N/A	S -N									000	00
																MOTRHOME		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
03774	N	N N	#Error		10/18/2017		14	N MUNSEL LAKE RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 9	TURN-L										02
STATE					WE			OREGON COAST HY	CN		STOP SIGN	N	WET	TURN		N/A	E -S									015	00
N					1P				01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N					44 0 36.6	-124 6 5.74		000900100S00															UNK				
			#Error												02	NONE 9	TURN-L										
																N/A	N -E									000	00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
01176	N	N N	#Error		04/25/2018		14	OREGON COAST HY	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-L										02
NO RPT					WE			N MUNSEL LAKE RD	CN		STOP SIGN	N	DRY	TURN		N/A	E -S									015	00
N					1P				02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N					44 0 36.61	-124 6 5.72		000900100S00															UNK				
			#Error												02	NONE 9	TURN-L										
																N/A	N -E									000	00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
014	EMR V PKD	EMERGENCY VEHICLE LEGALLY PARKED IN THE ROADWAY
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED OR DISABLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING
055	SPRAY	BLINDED BY WATER SPRAY

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHIN
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER
51	FAIL LN	FAILED TO MAINTAIN LANE
52	OFF RD	RAN OFF ROAD

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1 L-TURN	FROM OPPOSITE DIRECTION-ONE LEFT TURN,ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED
4	EXP	EXPIRED
8	N-VAL	OTHER NON-VALID LICENSE
9	UNK	UNKNOWN IF DRIVER WAS LICENSED AT TIME OF CRASH

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAY ON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHI(
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY
134	TORRENTIAL	TORRENTIAL RAIN (EXCEPTIONALLY HEAVY RAIN)

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN MAJOR COLLECTOR
18	URBAN MINOR COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE
9	NONE	PARTICIPANT UNINJURED, OVER THE AGE OF 4

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY
9	PARKNG	PARKING MANEUVER

NON-MOTORIST LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH OR PARKING LANE
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
14	NOT AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
16	NOT AT INTERSECTION - IN PARKING LANE
18	OTHER, NOT IN ROADWAY
99	UNKNOWN LOCATION

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING
095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
00	PDO	NOT COLLECTED FOR PDO CRASHES
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

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

CITY OF FLORENCE, LANE COUNTY

MUNSEL LAKE RD and Intersectional Crashes at MUNSEL LAKE RD, City of Florence, Lane County, 01/01/2015 to 12/31/2019

1 - 2 of 5 Crash records shown.

SER# / INVEST RD DPT / UNLOC?	S P E D	D R A L C	M A U G S	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
00593	N	N	N	# Error	N	N	02/28/2018	14	N MUNSEL LAKE RD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										02,07,27
CITY							WE		OREGON COAST HY	UN		STOP SIGN	N	WET	REAR		N/A	E -W									000	00
N							11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							44 0 36.6	-124 6 5.74	000900100S00		(02)													UNK				
				# Error												02	NONE 9	STOP										
																	N/A	E -W									013	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
03357	N	N	N	# Error	N	N	09/20/2017	14	N MUNSEL LAKE RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							WE		OREGON COAST HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	S -N									000	00
N							2P			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	50	F	OR-Y		000	000	00
N							44 0 36.6	-124 6 5.74	000900100S00															OR<25				
				# Error												02	NONE 0	TURN-L										
																	PRVTE	E -S									015	00
																	PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000	00
																								OR<25				
03659	N	N	N	# Error	N	N	10/11/2017	14	N MUNSEL LAKE RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
CITY							WE		OREGON COAST HY	CN		STOP SIGN	N	DRY	TURN		N/A	E -W									015	00
N							1P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							44 0 36.6	-124 6 5.74	000900100S00															UNK				

PINE CROSSING APPENDIX F: CRASH DATA

CITY OF FLORENCE, LANE COUNTY

MUNSEL LAKE RD and Intersectional Crashes at MUNSEL LAKE RD, City of Florence, Lane County, 01/01/2015 to 12/31/2019

3 - 5 of 5 Crash records shown.

SER# / INVEST RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S C N V #	W O H L Error	DATE / DAY / TIME / LAT	CLASS / DIST FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
															02	NONE 9	STRGHT										
																N/A	S -N									000	00
																MOTRHOME		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
03774	N N N			#		10/18/2017	14	N MUNSEL LAKE RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 9	TURN-L										02
STATE						WE		OREGON COAST HY	CN		STOP SIGN	N	WET	TURN		N/A	E -S									015	00
N						1P			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
N						44 0 36.6	-124 6 5.74	000900100S00																			
				#											02	NONE 9	TURN-L										
																N/A	N -E									000	00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
01176	N N N			#		04/25/2018	14	OREGON COAST HY	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-L										02
NO RPT						WE		N MUNSEL LAKE RD	CN		STOP SIGN	N	DRY	TURN		N/A	E -S									015	00
N						1P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
N						44 0 36.61	-124 6 5.72	000900100S00																			
				#											02	NONE 9	TURN-L										
																N/A	N -E									000	00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00

APPENDIX G

ITE TRIP GENERATION DATA

Land Use: 210
Single-Family Detached Housing

Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing -- single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

For 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077,1078, 1079

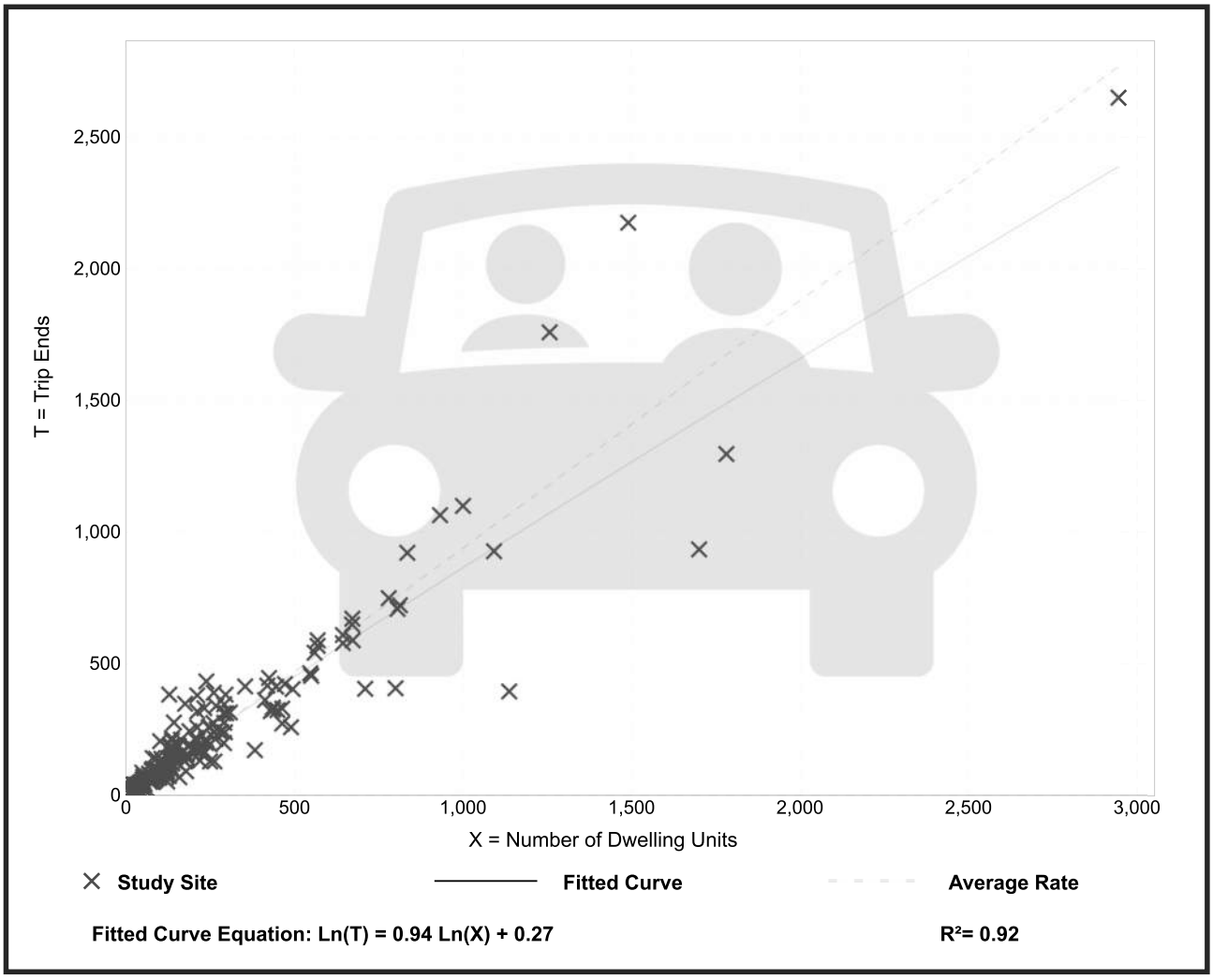
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Detached Housing
(210)

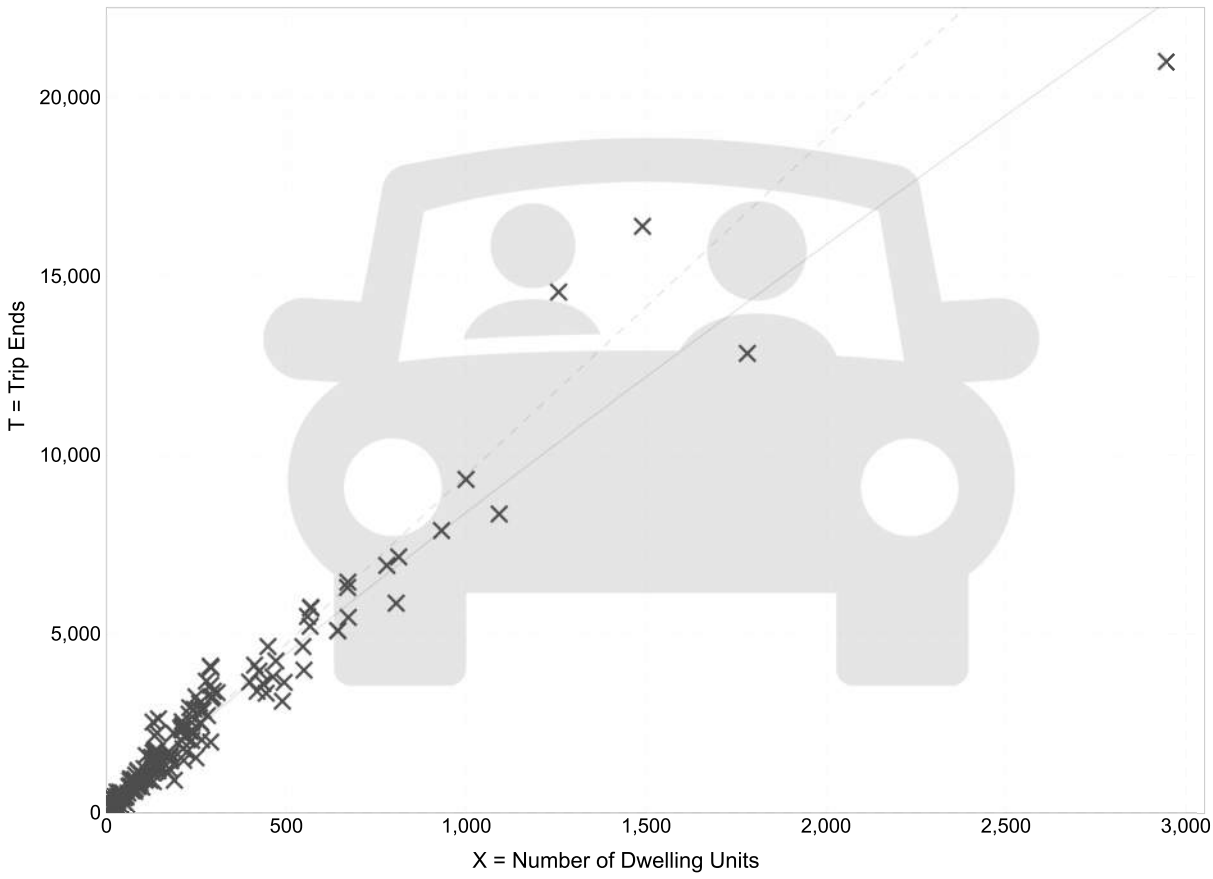
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Land Use: 215
Single-Family Attached Housing

Description

Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Additional Data

The database for this land use includes duplexes (defined as a single structure with two distinct dwelling units, typically joined side-by-side and each with at least one outside entrance) and townhouses/rowhouses (defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance).

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Utah, Virginia, and Wisconsin.

Source Numbers

168, 204, 211, 237, 305, 306, 319, 321, 357, 390, 418, 525, 571, 583, 638, 735, 868, 869, 870, 896, 912, 959, 1009, 1046, 1056, 1058, 1077

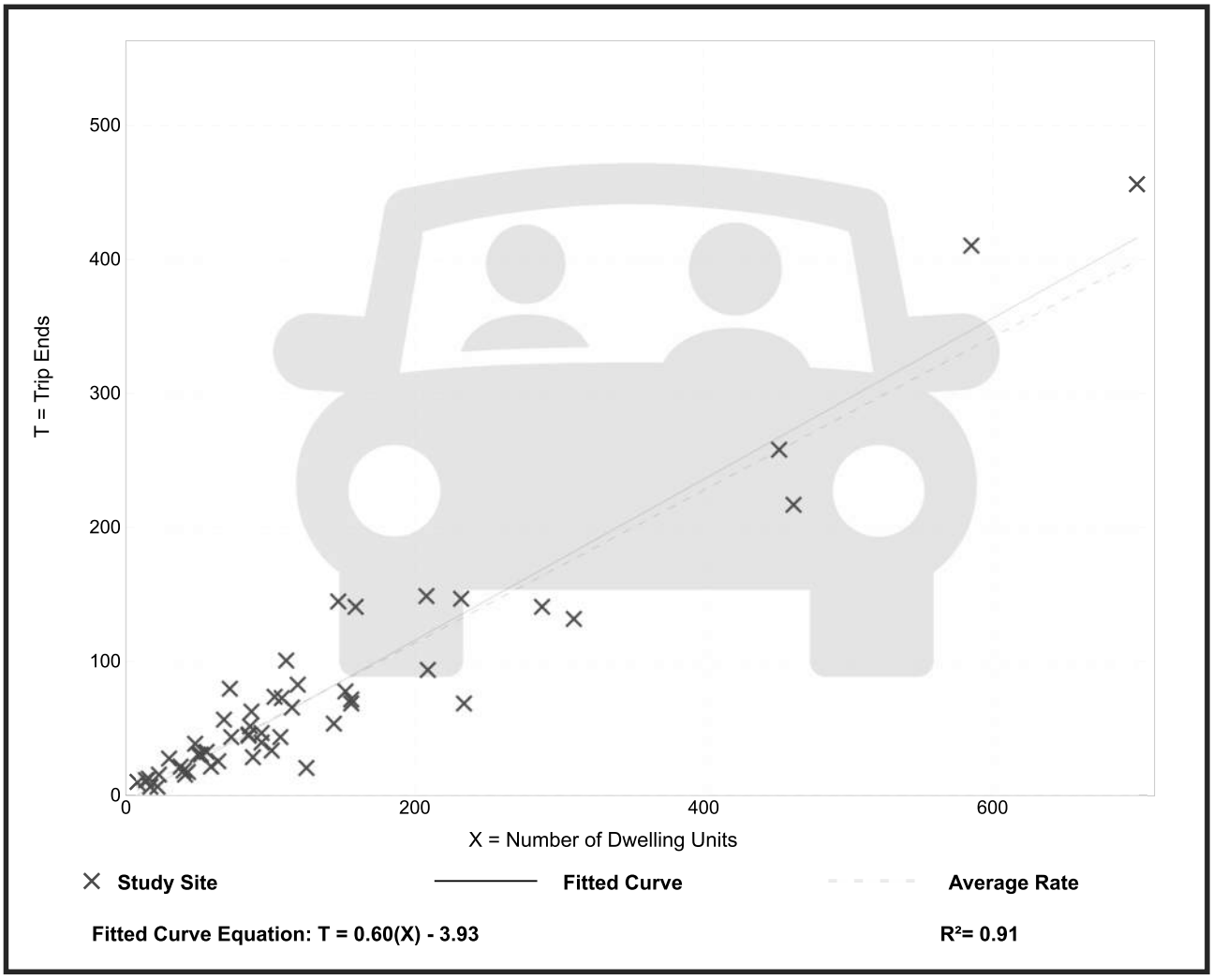
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



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Single-Family Attached Housing
(215)

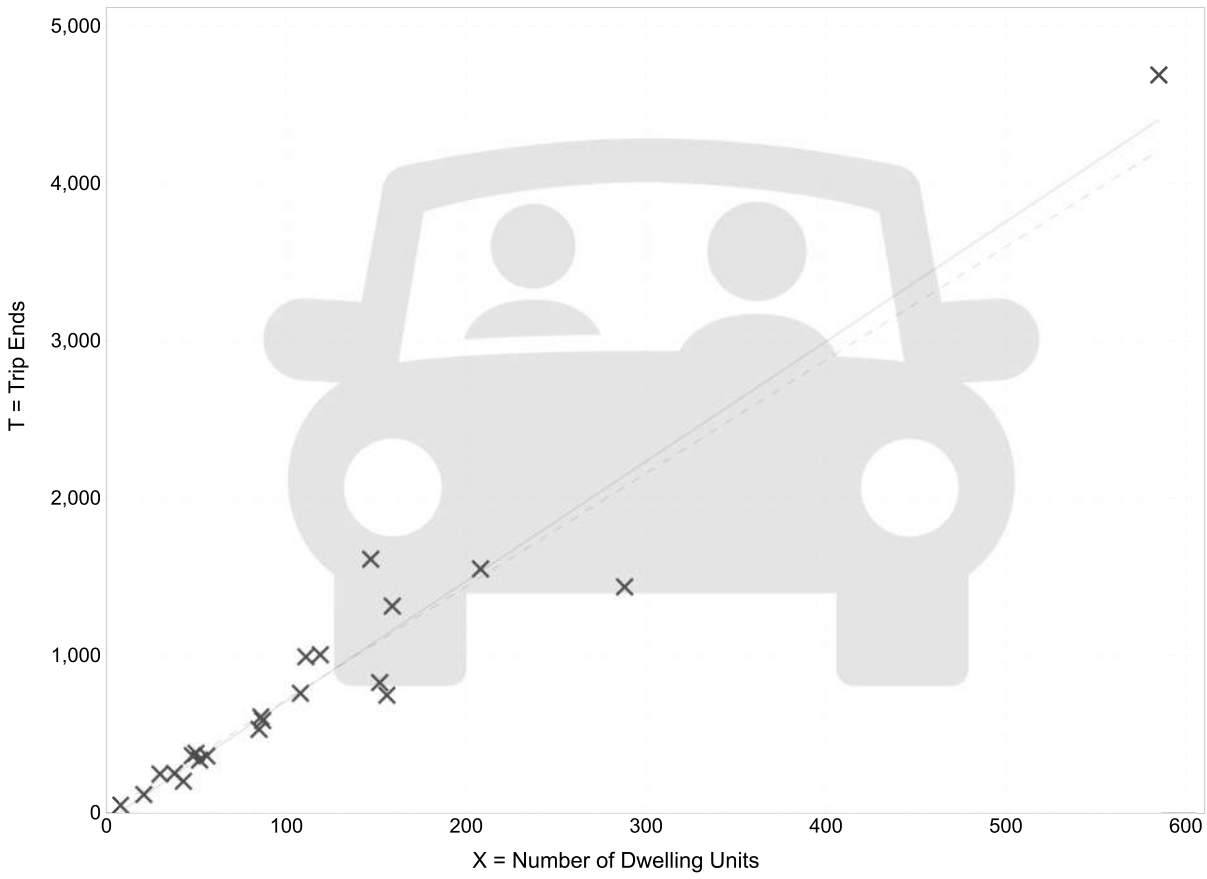
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



Fitted Curve Equation: T = 7.62(X) - 50.48

R^2= 0.94

APPENDIX H

PERFORMANCE MOBILITY STANDARDS

City Intersections

The City of Florence plans to adopt level-of-service (LOS) or volume-to-capacity (V/C) ratio standards for signalized or unsignalized intersections as part of this TSP update and as required by the Oregon Transportation Planning Rule (TPR).

Therefore, the following proposed minimum operating standards were applied to City intersections:

- LOS "D" is considered acceptable at signalized and all-way stop controlled intersections if the V/C ratio is not higher than 1.0 for the sum of critical movements.
- LOS "E" is considered acceptable for the poorest operating approach at two-way stop intersections. LOS "F" is allowed in situations where a traffic signal is not warranted.

A summary of the performance standards at each of the study intersections under City jurisdiction is included in Table 4-5. *A description of level of service and the criteria by which they are determined is presented in Attachment "E" of Technical Memorandum #4 in Volume II of the Technical Appendix. Attachment "E" also indicates how level of service is measured and what is generally considered the acceptable range of level of service.*

Table 4-5 Performance Standards for City Intersections

Intersection	Traffic Control	Performance Standard
Rhododendron Drive/35th Street	TWSC[1]	LOS "D"
Rhododendron Drive/9th Street	TWSC	LOS "D"
Kingwood Street/15th Street	TWSC	LOS "D"
Kingwood Street/9th Street	TWSC	LOS "D"

[1] TWSC: Two-way stop-controlled (unsignalized)

The operational analysis results shown later in this report were compared with the mobility standards used by ODOT and the City to assess performance and potential areas for improvement.

Traffic Volumes

Manual turning-movement counts were conducted at 12 study intersections in late August and early September 2009. Supplemental counts were conducted at four study intersections in early August 2010. All counts were conducted on a typical summertime mid-week day and include vehicle turning movements, pedestrian movements, bicycle movements, and heavy vehicle percentages. *Attachment "F" of Technical Memorandum #4 in Volume II of the Technical Appendix contains the traffic count worksheets used in the TSP update.*

(i) The property will be assessed for a minimum frontage of 100 feet. The costs for the remaining frontage may be deferred,

(ii) The deferred assessment will be a lien against the abutting property, and

(iii) The deferral will be terminated upon initiation of a land division of the property.

(c) Upon termination of a deferral pursuant to LC 15.636(5)(b)(iii), the owner of the property is required to pay to Lane County the full amount of the original deferred assessment plus accrued interest. Interest is calculated from the date of the original assessment at the rate established by the Board for those assessments. Any assessment deferred under this section will be waived and the lien will be extinguished 20 years from the date of certification.

(d) The deferral provisions under LC 15.636(5)(a) through (c) are in addition to, but do not supersede the provisions of ORS 311.702 through 311.735 for Deferral of Special Assessments on Senior Citizens' Residential Property. *(Revised by Ordinance No. 11-73, Effective 9.28.73; 7-82, 7.9.82; 20-87, 10.14.87; 8-94, 11.25.94; 5-97, 5.16.97; 10-04, 6.4.04; 20-09, 12.10.20)*

15.640 Intersections.
For assessment projects, the cost of street improvements located within street intersections and railroad intersections will be paid by the County or other participating public agencies or railroads and will not be assessed to property owners. *(Revised by Ordinance No. 10-04, Effective 6.4.04; 20-09, 12.10.20)*

15.645 Foreclosure.
The Director of the Department of Assessment and Taxation has the duty and responsibility of the Board established in ORS 371.650(3) and ORS 371.660 and the general responsibility for record keeping and collection of ORS Chapter 371 assessments made under the authority of ORS Chapter 371 and this subchapter. *(Revised by Ordinance No. 11-73, Effective 9.28.73; 7-82, 7.9.82; 20-09, 12.10.20)*

ROAD SYSTEM DEVELOPMENT

15.695 Specific Road Improvements.
Proposed development may require road improvements to ensure that streets in the vicinity of the development function safely pursuant to Sections 15.696 and 15.697. The Director will specify any required improvements, which will be in addition to other requirements of this chapter. *(Revised by Ordinance No 7-82, Effective 7.9.82; 10-04, 6.4.04; 20-09, 12.10.20)*

15.696 Roadway Performance Standards.
(1) A local agency may choose to apply its adopted operational standards to County Roads within a UGB, provided that such standards do not allow for a lesser degree of mobility. All roadways and intersections under the jurisdiction of Lane County must meet the following standards.

(a) Signalized, All-way Stop, or Roundabout Controlled Intersections: The intersection as a whole must operate with a Level of Service (LOS) "E" or better and a volume to capacity (v/c) ratio not higher than 0.85 if inside and UGB, or with a LOS "D" or better and a v/c ratio not higher than 0.80 outside and UGB during the highest one-hour period on an average weekday (typically, but not always the evening peak period between 4 p.m. and 6 p.m. during the spring or fall).

(b) Two-way Stop and Yield Controlled Intersections: All public street intersection approaches serving more than 20 vehicles during the highest one-hour period on an average weekday (typically, but not always the evening peak period between 4 p.m. and 6 p.m. during the spring or fall) must operate with a LOS "E" or better and a v/c ratio not higher than 0.95 if inside and UGB, or with a LOS "D" or better and a v/c ratio not higher than 0.80 outside the UGB. Operational standards do not apply to approaches at intersections serving 20 vehicles or fewer during the peak hour or private driveways.

(2) When analyzing County roads within UGBs, the applicable performance standards of the respective city apply. In the absence of city standards for such roads, the County's road performance standards apply. Traffic study requirements should be coordinated with cities and ODOT when development proposals affect facilities under the jurisdiction of these agencies.

(3) When analyzing signalized intersections, locations where signal warrants may be met, or intersections with all-way stop control (AWSC), the primary objective is to maintain the performance of the overall intersection. The overall intersection v/c must meet the applicable standard. If level of service analysis is required, the level of service standard must also be met.

(4) If a traffic study determines that nearby public or private roads, streets, or driveways do not meet the standards, the applicant must recommend mitigation measures.

(5) Operational standards do not apply to unsignalized intersection approaches serving 20 vehicles or fewer during the peak hour or to private driveways. *(Revised by Ordinance 10-04, Effective 6.4.04; 17-06, 1.11.18; 20-09, 12.10.20)*

15.697 Traffic Impact Analysis Requirements.

(1) A traffic impact analysis (TIA) may be required as part of a land use application or other development when the proposal is expected to involve one or more of the following:

(a) A development proposal that if approved, will result in an increase of peak hour traffic flow of 50 or more automobile trips outside an urban growth boundary, or 100 or more automobile trips inside an urban growth boundary. The increase in number of trips will be calculated based upon the methodology in the Institute of Traffic Engineers' *Trip Generation* manual for the year of publication specified in LM Chapter 15.450 and associated handbook and user's guide;

(b) A Development proposals that will affect county roads where congestion or safety problems have been identified by previous traffic engineering analysis;

(c) A plan amendment or zone change proposal, unless waived by the County Engineer as specified below;

(d) A proposed development that will generate or receive traffic by single or combination vehicles with gross weights greater than 26,000 pounds as part of the development's daily operations. "Daily operations" includes delivery to or from the site of materials or products manufactured, processed, or sold by the business on the site. "Daily operations" does not include routine services provided to the site by others, such as mail delivery, solid waste pickup, or bus service; o

(e) An existing or proposed access driveway, the location of which does not meet minimum spacing or sight distance requirements, and where vehicles are expected to queue or hesitate at an approach or access connection, thereby creating a safety hazard;

(f) Any potential impacts to pedestrian and bicycle routes, including, but not limited to school routes and multimodal roadway improvements identified in the TSP;

(g) A project development that would increase intersection or driveway volumes by 25 peak hour vehicle trips or greater on roadways classified as minor collector, major collector, minor arterial or principal arterial; or

(h) A development for which a TIA is required by ODOT pursuant with OAR 734-051

(2) The County Engineer or designee may waive TIA requirements specified in LC 15.697(1) above, when:

(a) Previous analysis has determined that the development proposal will not result in congestion, safety, or pavement structure impacts that exceed the standards of the agency that operates the affected transportation facilities; or

(b) In the case of a plan amendment or zone change, the scale and size of the proposal is insignificant, eliminating the need for detailed traffic analysis of the performance of roadway facilities for the 20-year planning horizon. Whether the scale and size of a proposal may be considered insignificant may depend on the existing level of service on affected roadways. Generally, a waiver to a TIA will be approved when:

(i) The plan designation or zoning that results will be entirely a resource designation; or

(ii) The plan designation or zoning that results will be entirely residential and the allowed density is not likely to result in creation of more than 50 lots; and

(iii) There is adequate information for the County Engineer or designee to determine that a transportation facility is not significantly affected as defined in OAR 660-12-0060 and the associated Transportation Planning Rule.

(3) Traffic impact analyses must document compliance with the requirements and guidelines in LC 15.696 and must:

(a) Be prepared by a Professional Engineer licensed in the State of Oregon with expertise in traffic engineering; and

(b) Document compliance with:

(i) The Road Design Standards in LC 15.700 through 15.708; and

(ii) The Access requirements specified in LC 15.130 through 15.139; and

(iii) The goals and policies of the applicable transportation system plan; and

(iv) Statewide Planning Goal 12.

(c) Evaluate all road facilities where direct access is proposed, including proposed access points, nearby intersections, and the nearest major intersection with a traffic signal;

(d) Address the requirements for pavement structure analysis in LC 15.707 if the analysis is required pursuant to LC 15.697(1)(d); and

(e) Be approved as to scope prior to proceeding with the analysis, as specified in the TIA Guidelines of the County Engineering Department. The County Engineer may alter the study requirements based upon the anticipated impact of the proposal. For example, a queue length analysis (based upon 95% probability) may be required.

(4) The TIA must demonstrate the following:

(a) For plan amendments and zone changes, that the performance standard specified in LC 15.696(1) for the affected road(s) will not be exceeded as a result of the plan amendment or zone change, within 20 years from the date the analysis was completed;

(b) For other development, that the performance standard specified in LC 15.696(1) for the affected road(s) will be achieved immediately and for the next five years.

Circumstances under which ODOT is more likely to ask that the local government request or require a TIA include:

- When the proposed development is within a quarter mile of the terminal of an interchange ramp;
- When the local development code requires that there are "adequate facilities" to serve the proposed development (often applies to "change of use" applications);
- When ODOT preliminary review identifies operational or safety issues related to increased traffic or highway access at the development site; and/or
- When an approach to the state highway will be the development's only, or primary, access to the roadway network.

Table 3.2: TIA Thresholds and Analysis Areas

	Transportation Planning Rules	Local Land Use (Will vary by jurisdiction)	ODOT approach permit
Traffic Impact Analysis Required (Unless Waived)	When greater than existing provides. OHP (Policy 1F.5) >1000 ADT >400 ADT - <1000 ADT (Hwy Sec/ADT)	Example: 20 peak hour trips and/or 200 ADT at subject site or intersection	Public Approach if agreed to in coordination with local jurisdiction Request for Deviation from the spacing, sight distance and channelization standards per OAR 734-051-4020 Whenever site trips relative to highway ADT exceed thresholds in (OAR 734-051 3030(4)(b)[25] May be used to affirm whether a Change of Use of a Highway Approach (COU) has occurred.
Analysis Area	The analysis area is the area significantly affected (i.e. affected intersections), within reason. For example, in rural areas without	Examples: Within 1 Mile radius of the subject property; or Area including all	(Not regulatory – based on past practice) Area including all intersections where traffic is increased by 50 peak hour trips;

[25] Rule section included in Highway Approach Permitting section below.

	Transportation Planning Rules	Local Land Use (Will vary by jurisdiction)	ODOT approach permit
	street networks, a measurable effect can be felt far beyond the local area.	arterials and collectors experiencing peak hour increase of XX trips.	300 ADT; and/or 10% TEV[26] increase (most likely to occur on low volume and/or rural roads)

In some cases, ODOT staff may work to persuade an applicant that it is in their best interest to have traffic analysis information in their applications even if there is not a specific requirement to do so. Remember that land use applicants have a responsibility (supported strongly by case law in Oregon) to provide adequate information to demonstrate that they satisfy all local land use criteria, and that maintaining adequate transportation facilities is a general requirement of all local plans and most codes.

The information that comes from good analysis will be valuable in all three elements of land development applications considered here: plan and zoning amendments, site development review and approach permitting. Development review planners work closely with ODOT access management staff and local planners to recognize when analysis is needed and coordinate the scoping of a TIA to ensure that it answers questions for all three review processes as needed.

Local Land Use Review

In basic development review, ODOT's role is as a party to a local land use decision that will be based upon the local development code. The local jurisdiction may require a TIA as part of a land use application. If it does not, the development review planner may recommend that a TIA be required, but unless the local code enables a TIA requirement or requires applicants to demonstrate that transportation facilities are adequate[27] to serve the type of proposal under review, a decision to require traffic analysis will be at the will of the local jurisdiction.

Where local development codes do require traffic impact analysis, the traffic volume or other type of thresholds that trigger a TIA requirement will often be different from the thresholds used in the access management rules. Where an application hits one threshold and not the other, the jurisdiction with authority related to that threshold will be the one requiring the TIA.

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[26] Total Entering Vehicles
[27] Discussed further in section 3.3.03, below

development can generate a significant percent increase in volume on a lightly traveled highway without an adverse effect on the highway. No specific formula will result in a sensible study area for all cases. Base the TIA study area upon the extent of the direct impacts of the proposed development on transportation facilities and on areas around the facilities most at risk of failure or unsafe conditions due to the projected traffic impacts.

Identify Future Year(s) for Analysis:

Table 3.3: Future Year Analysis: Suggested Time Lines

Proposed Development Daily Trip Generation	Single-Phase Development Horizon Years	Multi-Phased Development Horizon Years
Up to 999 ADT	Year of Opening	Year of Each Phase Opening
1,000 - 2,999 ADT	Year of Opening and at 5 Years	Year of Each Phase Opening and 5 Years Beyond Buildout
3,000 – 4,999	Year of Opening and 10 Years	Year of Each Phase Opening and 10 Years Beyond Buildout
5,000 or More	Year of Opening and Year of Planning Horizon for the Transportation System Plan or 15 Years, Whichever is Greater	Year of Each Phase Opening and Year of Planning Horizon for the Transportation System Plan or 15 Years, Whichever is Greater
Plan Amendments and Zone Changes[34]	Year of Planning Horizon for Transportation System Plan or 15 Years, Whichever is Greater	Year of Planning Horizon for Transportation System Plan or 15 Years, Whichever is Greater

[34] This is policy – ***OHP Action 1F.2. . .*** When evaluating highway mobility for amendments to transportation system plans, acknowledged comprehensive plans and land use regulations, use the planning horizons in adopted local and regional transportation system plans or a planning horizon of 15 years from the proposed date of amendment adoption, whichever is greater. To determine the effect an amendment to a transportation system plan, acknowledged comprehensive plan or land use regulation has on a state facility, the capacity analysis shall include the forecasted growth of traffic on the state highway due to regional and intercity travel and to full development according to the applicable acknowledged comprehensive plan over the planning period.

State Highway	Begin MP	End MP	Route Number	SCS	NHS	NN	OHP Freight Route	RRR	Scenic Byway	Express-way	Bypass	Highway Segment Designation
009	118.05	120.69	US-101	Statewide	NHS	NN		RRR	SB			
009	120.81	127.31	US-101	Statewide	NHS	NN		RRR	SB			
009	127.31	127.58	US-101	Statewide	NHS	NN		RRR	SB			STA
009	127.58	140.37	US-101	Statewide	NHS	NN		RRR	SB			
009	140.37	155.90	US-101	Statewide	NHS				SB			
009	155.90	156.18	US-101	Statewide	NHS				SB			STA
009	156.18	164.12	US-101	Statewide	NHS				SB			
009	164.12	164.46	US-101	Statewide	NHS				SB			STA
009	164.46	177.83	US-101	Statewide	NHS				SB			
009	177.88	188.97	US-101	Statewide	NHS	Munsel Lk Rd @ MP 187.76			SB			
009	188.97	190.23	US-101	Statewide	NHS				SB			UBA
009	190.23	190.84	US-101	Statewide	NHS	NN	FR	RRR	SB			STA
009	190.84	239.89	US-101	Statewide	NHS	NN	FR	RRR	SB			
009	239.89	244.27	US-101	Statewide	NHS	NN	FR	RRR	SB	EXP		
009	244.27	261.57	US-101	Statewide	NHS	NN		RRR	SB			
009	273.36	289.13	US-101	Statewide	NHS	NN		RRR	SB			
009	289.18	300.24	US-101	Statewide	NHS	NN		RRR	SB			
009	300.41	300.66	US-101	Statewide	NHS	NN		RRR	SB			
009	300.66	301.37	US-101	Statewide	NHS	NN		RRR	SB			STA
009	301.37	301.48	US-101	Statewide	NHS	NN		RRR	SB			
009	301.48	337.97	US-101	Statewide	NHS			RRR	SB			
009	337.97	339.71	US-101 OR-255	Statewide	NHS			RRR	SB			
009	339.71	357.08	US-101	Statewide	NHS			RRR	SB			
009	357.08	357.57	US-101	Statewide	NHS			RRR	SB			STA
009	357.57	363.11	US-101	Statewide	NHS			RRR	SB			
WALLOWA LAKE												
010	0.00	0.22	OR-82	District	NHS				SB			
010	0.22	0.82	OR-82	District	NHS							
010	0.82	0.98	OR-82	Statewide	NHS							
010	0.98	1.61	OR-82	Statewide	NHS				SB			
010	1.61	2.81	OR-82	Statewide	NHS				SB			UBA
010	2.81	12.13	OR-82	Statewide	NHS				SB			
010	12.13	12.34	OR-82	Statewide	NHS				SB			STA
010	12.34	19.44	OR-82	Statewide	NHS				SB			

KEY: Z- Overlap Mileage after Reroute, SCS - State Classification System, NHS - National Highway System, NN - National Network (Federally Designated Truck Route), RRR - Reduction Review Route, Scenic Byway - State and/or Federal Scenic Byway, Highway Segment Designation: (CC - Commercial Center, STA - Special Transportation Area, UBA - Urban Business Area).

VOLUME TO CAPACITY RATIO TARGETS OUTSIDE METRO[17A, B, C, D]							
Highway Category	**Inside Urban Growth Boundary**					**Outside Urban Growth Boundary**	
	STA[E]	**MPO**	**Non-MPO Outside of STAs where non-freeway posted speed <= 35 mph, or a Designated UBA**	**Non-MPO outside of STAs where non-freeway speed > 35 mph but < 45 mph**	**Non-MPO where non-freeway speed limit >= 45 mph**	**Unincorporated Communities[F]**	**Rural Lands**
Interstate Highways	N/A	0.85	N/A	N/A	0.80	0.70	0.70
Statewide Expressways	N/A	0.85	0.85	0.80	0.80	0.70	0.70
Freight Route on a Statewide Highway	0.90	0.85	0.85	0.80	0.80	0.70	0.70
Statewide (not a Freight Route)	0.95	0.90	0.90	0.85	0.80	0.75	0.70
Freight Route on a regional or District Highway	0.95	0.90	0.90	0.85	0.85	0.75	0.70
Expressway on a Regional or District Highway	N/A	0.90	N/A	0.85	0.85	0.75	0.70
Regional Highways	1.0	0.95	0.90	0.85	0.85	0.75	0.70
District/Local Interest Roads	1.0	0.95	0.95	0.90	0.90	0.80	0.75

Table 6: Volume to Capacity Ratio Targets for Peak Hour Operating Conditions

Notes for Table 6:

[A] Unless the Oregon Transportation Commission has adopted an alternative mobility target for the impacted facility, the mobility targets in Tables 6 are considered standards for purposes of determining compliance with OAR 660-012, the Transportation Planning Rule.

[B] For the purposes of this policy, the peak hour shall be the 30th highest annual hour. This approximates weekday peak hour traffic in larger urban areas. Alternatives to the 30th highest annual hour may be considered and established through alternative mobility target processes.

[C] Highway design requirements are addressed in the Highway Design Manual (HDM).

[D] See Action 1F.1 for additional technical details.

[E] Interstates and Expressways shall not be identified as Special Transportation Areas.

[F] For unincorporated communities inside MPO boundaries, MPO mobility targets shall apply.

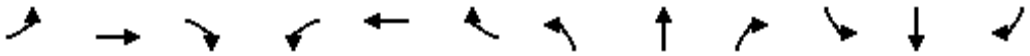
[17] Table 6 was replaced in August 2005, part of OHP Amendment 05-16.

APPENDIX I

SYNCHRO INTERSECTION PERFORMANCE CALCULATIONS

Lanes, Volumes, Timings

1: US 101 & PVT/Munsel Lake Rd 03/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	8	52	0	38	6	598	84	40	501	0
Future Volume (vph)	0	0	8	52	0	38	6	598	84	40	501	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		50	50		0	105		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	100			100			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.943			0.981				
Flt Protected					0.972		0.950			0.950		
Satd. Flow (prot)	0	1514	0	0	1577	0	1662	1694	0	1662	1716	0
Flt Permitted					0.972		0.950			0.950		
Satd. Flow (perm)	0	1514	0	0	1577	0	1662	1694	0	1662	1716	0
Link Speed (mph)		30			35			40			40	
Link Distance (ft)		244			675			1520			1516	
Travel Time (s)		5.5			13.1			25.9			25.8	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	1%	4%	0%	2%	0%
Adj. Flow (vph)	0	0	8	53	0	39	6	610	86	41	511	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	92	0	6	696	0	41	511	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		12			12			12			12	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	8	52	0	38	6	598	84	40	501	0
Future Vol, veh/h	0	0	8	52	0	38	6	598	84	40	501	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	4	0	1	4	0	2	0
Mvmt Flow	0	0	8	53	0	39	6	610	86	41	511	0

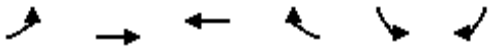
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1215	1215	511	1219	1215	610	511	0	-	610	0	0
Stage 1	593	593	-	622	622	-	-	-	-	-	-	-
Stage 2	622	622	-	597	593	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.24	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.336	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	160	183	567	159	183	491	1065	-	0	979	-	-
Stage 1	496	497	-	478	482	-	-	-	0	-	-	-
Stage 2	478	482	-	493	497	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	142	174	567	151	174	491	1065	-	-	979	-	-
Mov Cap-2 Maneuver	142	174	-	151	174	-	-	-	-	-	-	-
Stage 1	493	476	-	475	479	-	-	-	-	-	-	-
Stage 2	438	479	-	466	476	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	26.1	0.1	0.7
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1065	-	567	261	979	-	-
HCM Lane V/C Ratio	0.006	-	0.014	0.352	0.042	-	-
HCM Control Delay (s)	8.4	-	11.4	26.1	8.8	-	-
HCM Lane LOS	A	-	B	D	A	-	-
HCM 95th %tile Q(veh)	0	-	0	1.5	0.1	-	-

Lanes, Volumes, Timings

2: Munsel Lake Rd & Spruce Street 03/17/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	22	102	78	2	2	12
Future Volume (vph)	22	102	78	2	2	12
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0			0	0	80
Storage Lanes	0			0	1	1
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997			0.850
Flt Protected		0.991			0.950	
Satd. Flow (prot)	0	1706	1711	0	1662	1488
Flt Permitted		0.991			0.950	
Satd. Flow (perm)	0	1706	1711	0	1662	1488
Link Speed (mph)		30	35		25	
Link Distance (ft)		675	2312		1113	
Travel Time (s)		15.3	45.0		30.4	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	26	120	92	2	2	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	146	94	0	2	14
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		12	12		12	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	102	78	2	2	12
Future Vol, veh/h	22	102	78	2	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	26	120	92	2	2	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	94	0	-	0	265	93
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	172	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1513	-	-	-	728	970
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	863	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1513	-	-	-	715	970
Mov Cap-2 Maneuver	-	-	-	-	715	-
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	863	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1513	-	-	-	715	970
HCM Lane V/C Ratio	0.017	-	-	-	0.003	0.015
HCM Control Delay (s)	7.4	0	-	-	10.1	8.8
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0

Lanes, Volumes, Timings

3: Spruce Street & Pine Crossing 03/17/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1750	0	1750	0	0	1750
Flt Permitted						
Satd. Flow (perm)	1750	0	1750	0	0	1750
Link Speed (mph)	25		25			25
Link Distance (ft)	923		1113			255
Travel Time (s)	25.2		30.4			7.0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	12		12			12
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 0.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	1027	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1028	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1027	-	-	-	-	-
Mov Cap-2 Maneuver	1027	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1028	-	-	-	-	-

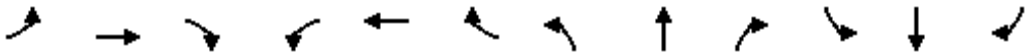
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	-	-

PINE CROSSING APPENDIX I: SYNCHRO CALCULATIONS

Lanes, Volumes, Timings

1: US 101 & PVT/Munsel Lake Rd 03/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	8	57	0	41	6	664	90	42	549	0
Future Volume (vph)	0	0	8	57	0	41	6	664	90	42	549	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		50	50		0	105		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	100			100			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.943			0.982				
Flt Protected					0.972		0.950			0.950		
Satd. Flow (prot)	0	1514	0	0	1578	0	1662	1695	0	1662	1716	0
Flt Permitted					0.972		0.950			0.950		
Satd. Flow (perm)	0	1514	0	0	1578	0	1662	1695	0	1662	1716	0
Link Speed (mph)		20			35			40			40	
Link Distance (ft)		244			675			1520			1516	
Travel Time (s)		8.3			13.1			25.9			25.8	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	1%	4%	0%	2%	0%
Adj. Flow (vph)	0	0	8	58	0	42	6	678	92	43	560	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	100	0	6	770	0	43	560	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		12			12			12			12	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.4%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	8	57	0	41	6	664	90	42	549	0
Future Vol, veh/h	0	0	8	57	0	41	6	664	90	42	549	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	4	0	1	4	0	2	0
Mvmt Flow	0	0	8	58	0	42	6	678	92	43	560	0

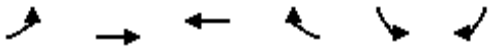
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1336	1336	560	1340	1336	678	560	0	-	678	0	0
Stage 1	646	646	-	690	690	-	-	-	-	-	-	-
Stage 2	690	690	-	650	646	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.24	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.336	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	132	155	532	131	155	449	1021	-	0	923	-	-
Stage 1	464	470	-	439	449	-	-	-	0	-	-	-
Stage 2	439	449	-	461	470	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	115	147	532	124	147	449	1021	-	-	923	-	-
Mov Cap-2 Maneuver	115	147	-	124	147	-	-	-	-	-	-	-
Stage 1	461	448	-	436	446	-	-	-	-	-	-	-
Stage 2	396	446	-	433	448	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.9	36	0.1	0.6
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1021	-	532	213	923	-	-
HCM Lane V/C Ratio	0.006	-	0.015	0.469	0.046	-	-
HCM Control Delay (s)	8.5	-	11.9	36	9.1	-	-
HCM Lane LOS	A	-	B	E	A	-	-
HCM 95th %tile Q(veh)	0	-	0	2.3	0.1	-	-

Lanes, Volumes, Timings

2: Munsel Lake Rd & Spruce Street 03/17/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	22	110	86	2	2	12
Future Volume (vph)	22	110	86	2	2	12
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0			0	0	80
Storage Lanes	0			0	1	1
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997			0.850
Flt Protected		0.992			0.950	
Satd. Flow (prot)	0	1708	1711	0	1662	1488
Flt Permitted		0.992			0.950	
Satd. Flow (perm)	0	1708	1711	0	1662	1488
Link Speed (mph)		30	35		25	
Link Distance (ft)		675	2312		1113	
Travel Time (s)		15.3	45.0		30.4	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	26	129	101	2	2	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	155	103	0	2	14
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		12	12		12	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	110	86	2	2	12
Future Vol, veh/h	22	110	86	2	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	26	129	101	2	2	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	103	0	-	0	283	102
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	181	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1502	-	-	-	711	959
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	855	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1502	-	-	-	697	959
Mov Cap-2 Maneuver	-	-	-	-	697	-
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	855	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1502	-	-	-	697	959
HCM Lane V/C Ratio	0.017	-	-	-	0.003	0.015
HCM Control Delay (s)	7.4	0	-	-	10.2	8.8
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0

Lanes, Volumes, Timings

3: Spruce Street & Pine Crossing 03/17/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1750	0	1750	0	0	1750
Flt Permitted						
Satd. Flow (perm)	1750	0	1750	0	0	1750
Link Speed (mph)	25		25			25
Link Distance (ft)	923		1113			255
Travel Time (s)	25.2		30.4			7.0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	12		12			12
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 0.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	1027	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1028	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1027	-	-	-	-	-
Mov Cap-2 Maneuver	1027	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1028	-	-	-	-	-

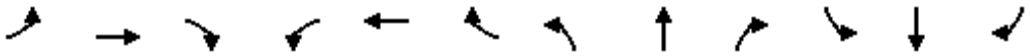
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	-	-

PINE CROSSING APPENDIX I: SYNCHRO CALCULATIONS

Lanes, Volumes, Timings

1: US 101 & PVT/Munsel Lake Rd 03/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	8	63	0	45	6	664	98	48	549	0
Future Volume (vph)	0	0	8	63	0	45	6	664	98	48	549	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	50		0	105		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	100			100			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.944			0.981				
Flt Protected					0.972		0.950			0.950		
Satd. Flow (prot)	0	1514	0	0	1579	0	1662	1693	0	1662	1716	0
Flt Permitted					0.972		0.950			0.950		
Satd. Flow (perm)	0	1514	0	0	1579	0	1662	1693	0	1662	1716	0
Link Speed (mph)		30			35			40			40	
Link Distance (ft)		244			675			1520			1516	
Travel Time (s)		5.5			13.1			25.9			25.8	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	1%	4%	0%	2%	0%
Adj. Flow (vph)	0	0	8	64	0	46	6	678	100	49	560	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	110	0	6	778	0	49	560	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		12			12			12			12	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.5%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	8	63	0	45	6	664	98	48	549	0
Future Vol, veh/h	0	0	8	63	0	45	6	664	98	48	549	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	4	0	1	4	0	2	0
Mvmt Flow	0	0	8	64	0	46	6	678	100	49	560	0

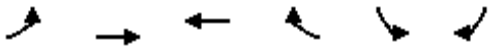
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1348	1348	560	1352	1348	678	560	0	-	678	0	0
Stage 1	658	658	-	690	690	-	-	-	-	-	-	-
Stage 2	690	690	-	662	658	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.24	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.336	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	129	152	532	128	152	449	1021	-	0	923	-	-
Stage 1	457	464	-	439	449	-	-	-	0	-	-	-
Stage 2	439	449	-	454	464	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	111	143	532	120	143	449	1021	-	-	923	-	-
Mov Cap-2 Maneuver	111	143	-	120	143	-	-	-	-	-	-	-
Stage 1	454	439	-	436	446	-	-	-	-	-	-	-
Stage 2	392	446	-	423	439	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.9	40.9	0.1	0.7
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1021	-	532	206	923	-	-
HCM Lane V/C Ratio	0.006	-	0.015	0.535	0.053	-	-
HCM Control Delay (s)	8.5	-	11.9	40.9	9.1	-	-
HCM Lane LOS	A	-	B	E	A	-	-
HCM 95th %tile Q(veh)	0	-	0	2.8	0.2	-	-

Lanes, Volumes, Timings

2: Munsel Lake Rd & Spruce Street 03/17/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	36	110	86	3	3	22
Future Volume (vph)	36	110	86	3	3	22
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0			0	0	80
Storage Lanes	0			0	1	1
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995			0.850
Flt Protected		0.988			0.950	
Satd. Flow (prot)	0	1703	1708	0	1662	1488
Flt Permitted		0.988			0.950	
Satd. Flow (perm)	0	1703	1708	0	1662	1488
Link Speed (mph)		30	35		25	
Link Distance (ft)		675	2312		1113	
Travel Time (s)		15.3	45.0		30.4	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	42	129	101	4	4	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	171	105	0	4	26
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		12	12		12	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	110	86	3	3	22
Future Vol, veh/h	36	110	86	3	3	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	42	129	101	4	4	26

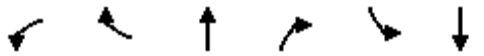
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	105	0	-	0	316	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	213	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1499	-	-	-	681	957
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	827	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1499	-	-	-	661	957
Mov Cap-2 Maneuver	-	-	-	-	661	-
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1499	-	-	-	661	957
HCM Lane V/C Ratio	0.028	-	-	-	0.005	0.027
HCM Control Delay (s)	7.5	0	-	-	10.5	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0.1

Lanes, Volumes, Timings

3: Spruce Street & Pine Crossing 03/17/2023



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	0	0	15	0	0
Future Volume (vph)	11	0	0	15	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected	0.950					
Satd. Flow (prot)	1662	0	1514	0	0	1750
Flt Permitted	0.950					
Satd. Flow (perm)	1662	0	1514	0	0	1750
Link Speed (mph)	25		25			25
Link Distance (ft)	923		1113			255
Travel Time (s)	25.2		30.4			7.0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	0	0	18	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	18	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	12		12			12
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	0	0	15	0	0
Future Vol, veh/h	11	0	0	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	0	0	18	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	10	9	0	0	18	0
Stage 1	9	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	1015	1079	-	-	1612	-
Stage 1	1019	-	-	-	-	-
Stage 2	1028	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1015	1079	-	-	1612	-
Mov Cap-2 Maneuver	1015	-	-	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	1028	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1015	1612	-
HCM Lane V/C Ratio	-	-	0.013	-	-
HCM Control Delay (s)	-	-	8.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

APPENDIX I

SIMTRAFFIC QUEUE LENGTH CALCULATIONS

PINE CROSSING APPENDIX J: SIMTRAFFIC QUEUING CALCULATIONS

SimTraffic Simulation Summary

Pine Crossing 2023 PM Peak Hour Ex Cond's 03/17/2023

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	1322	1320	1329	1351	1286	1322
Vehs Exited	1324	1326	1333	1371	1285	1328
Starting Vehs	24	17	24	37	18	23
Ending Vehs	22	11	20	17	19	17
Travel Distance (mi)	796	798	801	826	783	801
Travel Time (hr)	23.2	23.2	23.3	24.3	23.0	23.4
Total Delay (hr)	2.1	2.0	2.1	2.4	2.1	2.2
Total Stops	121	138	136	175	178	150
Fuel Used (gal)	22.7	22.8	22.9	23.8	22.8	23.0

Interval #0 Information Seeding

Start Time	6:57
End Time	7:07
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording1

Start Time	7:07
End Time	7:22
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	330	339	331	361	336	338
Vehs Exited	335	338	330	367	329	340
Starting Vehs	24	17	24	37	18	23
Ending Vehs	19	18	25	31	25	23
Travel Distance (mi)	202	201	199	221	201	205
Travel Time (hr)	5.9	5.8	5.7	6.7	5.9	6.0
Total Delay (hr)	0.5	0.4	0.4	0.8	0.5	0.5
Total Stops	32	27	35	40	41	34
Fuel Used (gal)	5.8	5.7	5.8	6.4	5.7	5.9

SimTraffic Simulation Summary

Pine Crossing 2023 PM Peak Hour Ex Cond's 03/17/2023

Interval #2 Information Recording2

Start Time	7:22
End Time	8:07
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	992	981	998	990	950	982
Vehs Exited	989	988	1003	1004	956	987
Starting Vehs	19	18	25	31	25	23
Ending Vehs	22	11	20	17	19	17
Travel Distance (mi)	593	597	601	605	582	596
Travel Time (hr)	17.3	17.4	17.6	17.5	17.1	17.4
Total Delay (hr)	1.6	1.6	1.7	1.6	1.6	1.6
Total Stops	89	111	101	135	137	116
Fuel Used (gal)	16.9	17.1	17.2	17.4	17.0	17.1

Queuing and Blocking Report
Pine Crossing 2023 PM Peak Hour Ex Cond's 03/17/2023

Intersection: 1: US 101 & PVT/Munsel Lake Rd

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	34	92	33	86	44
Average Queue (ft)	8	32	3	6	14
95th Queue (ft)	32	72	19	38	40
Link Distance (ft)	212	606		1492	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		105
Storage Blk Time (%)			0	0	
Queuing Penalty (veh)			0	0	

Intersection: 2: Munsel Lake Rd & Spruce Street

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	26	24	34
Average Queue (ft)	2	2	8
95th Queue (ft)	15	13	32
Link Distance (ft)	606		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			80
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Spruce Street & Pine Crossing

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

PINE CROSSING APPENDIX J: SIMTRAFFIC QUEUING CALCULATIONS

SimTraffic Simulation Summary
Pine Crossing 2026 No Build 03/17/2023

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	1580	1521	1536	1446	1516	1520
Vehs Exited	1581	1525	1528	1446	1522	1520
Starting Vehs	27	26	18	22	32	24
Ending Vehs	26	22	26	22	26	24
Travel Distance (mi)	959	918	917	871	915	916
Travel Time (hr)	29.2	27.8	27.2	25.7	27.3	27.4
Total Delay (hr)	3.8	3.4	3.0	2.7	3.1	3.2
Total Stops	237	159	173	170	168	180
Fuel Used (gal)	28.3	26.7	26.5	25.2	26.6	26.7

Interval #0 Information Seeding

Start Time	6:57
End Time	7:07
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.
No data recorded this interval.

Interval #1 Information Recording1

Start Time	7:07
End Time	7:22
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	401	411	413	370	405	399
Vehs Exited	402	407	408	360	406	396
Starting Vehs	27	26	18	22	32	24
Ending Vehs	26	30	23	32	31	26
Travel Distance (mi)	244	249	242	217	245	239
Travel Time (hr)	7.3	7.8	7.2	6.3	7.5	7.2
Total Delay (hr)	0.9	1.2	0.8	0.5	0.9	0.9
Total Stops	42	51	41	38	50	44
Fuel Used (gal)	7.0	7.4	7.0	6.1	7.3	7.0

SimTraffic Simulation Summary
Pine Crossing 2026 No Build 03/17/2023

Interval #2 Information Recording2

Start Time	7:22
End Time	8:07
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1179	1110	1123	1076	1111	1120
Vehs Exited	1179	1118	1120	1086	1116	1124
Starting Vehs	26	30	23	32	31	26
Ending Vehs	26	22	26	22	26	24
Travel Distance (mi)	715	669	675	655	670	677
Travel Time (hr)	21.9	19.9	20.0	19.4	19.8	20.2
Total Delay (hr)	3.0	2.2	2.2	2.1	2.1	2.3
Total Stops	195	108	132	132	118	137
Fuel Used (gal)	21.2	19.3	19.6	19.1	19.3	19.7

Queuing and Blocking Report
Pine Crossing 2026 No Build

03/17/2023

Intersection: 1: US 101 & PVT/Munsel Lake Rd

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	35	136	32	89	58
Average Queue (ft)	9	46	5	9	18
95th Queue (ft)	33	99	25	48	50
Link Distance (ft)	212	606		1492	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		105
Storage Blk Time (%)			0	0	
Queuing Penalty (veh)			0	0	

Intersection: 2: Munsel Lake Rd & Spruce Street

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	27	12	38
Average Queue (ft)	2	1	14
95th Queue (ft)	13	9	42
Link Distance (ft)	606		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			80
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Spruce Street & Pine Crossing

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

PINE CROSSING APPENDIX J: SIMTRAFFIC QUEUING CALCULATIONS

SimTraffic Simulation Summary
Pine Crossing 2026 Build PM PH

03/17/2023

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	1481	1504	1523	1495	1546	1511
Vehs Exited	1485	1500	1523	1511	1548	1514
Starting Vehs	32	28	21	36	30	28
Ending Vehs	28	32	21	20	28	26
Travel Distance (mi)	897	906	924	914	939	916
Travel Time (hr)	27.4	26.9	27.9	27.9	28.6	27.7
Total Delay (hr)	3.3	2.8	3.2	3.4	3.5	3.2
Total Stops	221	217	230	197	253	224
Fuel Used (gal)	26.4	26.4	26.9	26.7	27.2	26.7

Interval #0 Information Seeding

Start Time	6:57
End Time	7:07
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.
No data recorded this interval.

Interval #1 Information Recording1

Start Time	7:07
End Time	7:22
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	380	398	413	370	410	394
Vehs Exited	382	390	399	381	418	394
Starting Vehs	32	28	21	36	30	28
Ending Vehs	30	36	35	25	22	27
Travel Distance (mi)	230	240	245	231	256	240
Travel Time (hr)	6.9	7.3	7.5	6.9	8.0	7.3
Total Delay (hr)	0.7	0.8	0.9	0.7	1.1	0.9
Total Stops	40	59	70	57	83	61
Fuel Used (gal)	6.6	7.0	7.1	6.7	7.6	7.0

SimTraffic Simulation Summary
Pine Crossing 2026 Build PM PH

03/17/2023

Interval #2 Information Recording2

Start Time	7:22
End Time	8:07
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1101	1106	1110	1125	1136	1115
Vehs Exited	1103	1110	1124	1130	1130	1119
Starting Vehs	30	36	35	25	22	27
Ending Vehs	28	32	21	20	28	26
Travel Distance (mi)	668	667	680	684	683	676
Travel Time (hr)	20.5	19.7	20.4	20.9	20.6	20.4
Total Delay (hr)	2.5	2.0	2.3	2.7	2.4	2.4
Total Stops	181	158	160	140	170	161
Fuel Used (gal)	19.7	19.4	19.8	20.0	19.6	19.7

Queuing and Blocking Report
Pine Crossing 2026 Build PM PH

03/17/2023

Intersection: 1: US 101 & PVT/Munsel Lake Rd

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	34	139	32	99	52
Average Queue (ft)	8	48	2	14	21
95th Queue (ft)	32	108	16	60	48
Link Distance (ft)	212	606		1492	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		105
Storage Blk Time (%)			0	1	
Queuing Penalty (veh)			0	0	

Intersection: 2: Munsel Lake Rd & Spruce Street

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	35	24	34
Average Queue (ft)	5	2	19
95th Queue (ft)	24	15	46
Link Distance (ft)	606	1052	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			80
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Spruce Street & Pine Crossing

Movement	WB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	12
95th Queue (ft)	39
Link Distance (ft)	898
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0