## TECHNICAL MEMORANDUM

Date: December 13, 2022
Project \#: 23021.050
To: Technical Advisory Committee
From: Kittelson \& Associates, Inc.
Project: Curry County Transportation System Plan Update
Subject: Final Methodology \& Assumptions Memorandum (Task 3.4)

## INTRODUCTION

This memorandum presents the methodology and assumptions associated with the existing and future transportation conditions analyses for the Curry County Transportation System Plan (TSP) update. The methodology and assumptions are based on guidance provided in the Oregon Department of Transportation (ODOT) Transportation System Plan Guidelines (Reference 1), the ODOT Analysis Procedures Manual (APM - Reference 2), and direction provided by Curry County (County) and ODOT staff. They will help identify potential gaps and deficiencies in the County's transportation system, including:

- Existing and future traffic operations at key study intersections,
- Traffic safety at the study intersections and along study area roadways,
- Gaps and deficiencies in the roadway, bicycle, and pedestrian network, and
- Gaps and deficiencies in the transit service.

This information will serve as a baseline for identifying a comprehensive list of transportation needs to be addressed as part of the TSP update, including evaluating potential solutions and developing a prioritized list of improvements.

## STUDY AREA

The study area for the TSP update spans the unincorporated regions of Curry County, which generally excludes the incorporated cities of Brookings, Port Orford, and Gold Beach. However, the focus of the TSP update is on the County's arterial and collector roadways. Therefore, to the extent the County owns facilities within the incorporated areas, the TSP update will assess conditions within these areas as well. Figure 1 illustrates the study area.

## STUDY INTERSECTIONS

The study intersections and segments for the TSP update were determined by the County and ODOT and include eight unsignalized intersections located along US 101 and one study segment, Jerry's Flat Road (Agness Road). Figure 1 also illustrates the location of these study intersections and segment.

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The study intersections include:

1. US 101 / Floras Creek Road (MP 288.32)
2. US 101 / Sixes River Road (MP 295.56)
3. US 101 / Cape Blanco Highway (OR 250) (MP 296.48)
4. US 101 / Ophir Road (to Euchre Creek Road; MP 316.96)
5. US 101 / Edson Creek Road-Nesika Road (MP 322.12)
6. US 101 / Pistol River Road (connection to Carpenterville Highway (OR 255); MP 339.71)
7. US 101 / Cape Ferrelo Road (MP 351.13)
8. US 101 / Winchuck River Road

## VOLUME DEVELOPMENT

The following sections provide information related to the traffic counts conducted at the study intersections and segment and identify how they will be used to develop existing and future traffic volumes.

## Traffic Counts

Manual turning movement counts were conducted at the study intersections on Wednesday, September 28, 2022 and tube counts were collected on Jerry's Flat Road during the same period. The counts were conducted on a typical weekday during the early fall season while school was in session. All intersection counts were conducted over a 2-hour period (4:00 to 6:00 p.m.) and the tube counts were conducted over a 48 -hour period.

All intersection counts include the total number of pedestrians, bicyclists, and motor vehicles that entered the intersections in 15 -minute intervals throughout the study periods. Table 1 summarizes the currently available information on the traffic counts. The traffic count worksheets will be provided in Attachment A.

Table 1: Traffic Count Summary

| $\begin{aligned} & \text { Map } \\ & \text { ID } \end{aligned}$ | Name | Count Date | Count Type | Duration |
| :---: | :---: | :---: | :---: | :---: |
| Intersections |  |  |  |  |
| 1 | US 101 / Floras Creek Rd | September 2022 | 2-Hour | 4:00 to 6:00 p.m. |
| 2 | US 101 / Sixes River Rd | September 2022 | 2-Hour | 4:00 to 6:00 p.m. |
| 3 | US 101 / Cape Blanco Hwy | September 2022 | 2-Hour | 4:00 to 6:00 p.m. |
| 4 | US 101 / Ophir Rd | September 2022 | 2-Hour | 4:00 to 6:00 p.m. |
| 5 | US 101 / Edson Creek Rd-Nesika Rd | September 2022 | 2-Hour | 4:00 to 6:00 p.m. |
| 6 | US 101 / Pistol River Rd | September 2022 | 2-Hour | 4:00 to 6:00 p.m. |
| 7 | US 101 / Cape Ferrelo Rd | September 2022 | 2-Hour | 4:00 to 6:00 p.m. |
| 8 | US 101 / Winchuck River Rd | September 2022 | 2-Hour | 4:00 to 6:00 p.m. |
| Segments |  |  |  |  |
| 9 | Jerry's Flat Rd-Agness Rd | September 2022 | 48-Hour | 12:00 to 12:00 a.m. |

[^1]
## Peak Hour Development

The traffic counts were reviewed to determine if the intersection operational analysis should evaluate a system-wide peak hour or if individual intersection peak hours would better represent peak period traffic operations. The traffic counts show that the system-wide peak hour occurs from 4:00 to 5:00 p.m., which coincides with the individual peak hours at the following intersections:

- US 101 / Cape Blanco Highway (\#3)
- US 101 / Pistol River Road (\#6)
- US 101 / Cape Ferrelo Road (\#7)
- US 101 / Winchuck River Road (\#8)

The remaining study intersections have individual peak hours that begin between 4:05 p.m. and 4:20 p.m. For this reason, the total entering volume (TEV) during the individual peak hour of each study intersection was compared to the TEV during the system-wide peak hour to determine if a system-wide peak hour is appropriate. This comparison indicates that use of the system-wide peak hour would represent a zero to six percent difference in TEV for the intersections with peak hours outside of the system-wide peak hour. The US 101 / Ophir Road (\#4) and US 101 / Edson Creek Road-Nesika Road (\#5) intersections exhibit the largest percent difference. As this represents a fairly minor difference in traffic volumes, a system-wide peak hour of 4:00 to 5:00 p.m. is recommended.

Table 2 summarizes the study intersections, the individual intersection peak hours, the system peak hour selected for the operational analyses, the TEV during the peak hours, and the percent difference in TEV during individual intersection peak hours and the system peak hour.

Table 2: Study Intersection Peak Periods and TEV

| Map ID | Intersection | PM Peak Hour |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Individual Peak Hour | TEV during Individual Peak Hour | TEV during System Peak Hour (4:00 to 5:00 PM) | \% Difference Bełween Individual and System Peak Hour TEV |
| 1 | US 101 / Floras Creek Rd | 4:05 to 5:05 PM | 414 | 407 | -1.7\% |
| 2 | US 101 / Sixes River Rd | 4:10 to 5:10 PM | 410 | 406 | -1.0\% |
| 3 | US 101 / Cape Blanco Hwy | 4:00 to 5:00 PM | 427 | 427 | 0.0\% |
| 4 | US 101 / Ophir Rd | 4:15 to 5:15 PM | 239 | 231 | -3.4\% |
| 5 | US 101 / Edson Creek Rd-Nesika Rd | 4:20 to 5:20 PM | 324 | 306 | -5.7\% |
| 6 | US 101 / Pistol River Rd | 4:00 to 5:00 PM | 358 | 358 | 0.0\% |
| 7 | US 101 / Cape Ferrelo Rd | 4:00 to 5:00 PM | 482 | 482 | 0.0\% |
| 8 | US 101 / Winchuck River Rd | 4:00 to 5:00 PM | 922 | 922 | 0.0\% |

[^2]
## Seasonal Factors

Thirtieth Hour Volumes ( 30 HV ) will be developed at the study intersections by applying seasonal adjustment factors to the traffic counts, consistent with the methodology established in the APM. The APM provides three methods for identifying seasonal adjustment factors for highway traffic volumes. All three methods utilize information provided by Automatic Traffic Recorders (ATRs). ATRs are positioned in select locations throughout the State Highway System to collect traffic data 24 hours a day, 365 days a year. Each method was evaluated to determine which is mos $\dagger$ appropriate method for the study intersections.
Below is a summary of each seasonal adjustment method.

- On-Site ATR Method: Calculates seasonal adjustment factors based on local ATR locations. This method requires that no major intersections be located within the ATR and the project area and Average Annual Daily Traffic (AADT) collected by the ATR be within 10 percent of the AADT within the project area.
- Characteristics Table: Calculates seasonal adjustment factors based on representative ATR locations from around the state that share similar characteristics with the study area, such as AADT, seasonal traffic trends, area type, number of travel lanes, etc.
- Seasonal Trends Table: Calculates seasonal adjustment factors based seasonal variation trends from representative travel patterns (e.g., summer, commuter, weekend, etc.).

US 101 has two ATRs within Curry County: the Winchuck ATR (\#08-005) south of Brookings and the Port Orford ATR (\#08-009) south of Port Orford. Although traffic volumes near most of the study intersections do not fall within 10 percent of the traffic volumes recorded at these ATRs - except for Winchuck River Road - and there are intersecting rural arterials and collectors located between them, these ATRs will be used to calculate seasonal adjustment factors for the Curry County TSP for the following reasons:

- US 101 is the only arterial in all of Curry County;
- The primary routes to travel east out of Curry County are US 199 and OR 42, which are located outside of Curry County in California and Coos County, making US 101 the primary connection to enter and exit Curry County; and,
- These ATRs exhibit coastal highway seasonal traffic trends, which are unique compared to other seasonal traffic trends across the state.

In general, the seasonal fluctuations in traffic at these US 101 ATRs are likely to best represent the seasonal fluctuations of US 101 intersections in Curry County.

Table 3 presents values that represent the percent of Average Daily Traffic (ADT) at these ATRs from the past five years during their average peak month and the month when traffic counts were collected, which result in their respective seasonal adjustment factors. As shown, seasonal adjustment factors based on these stations range from 1.13 to 1.24 with an average of 1.19 when adjusting for data collected in September.

Table 3: Season Adjustment Factor Calculation

| Year | 2017 | 2018 | 2019 | 2020 | 2021 | Average | Seasonal Adjustment |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ATR 08-005 (US 101, Winchuck) |  |  |  |  |  |  |  |
| Peak Month (July) | 124 | 125 | 122 | 125 | 120 | 123.67 | N/A |
| Count Month (September) | 111 | 110 | 108 | 112 | 105 | 109.67 | 1.13 |
| ATR 08-009 (US 101, Port Orford) |  |  |  |  |  |  |  |
| Peak Month (July) | 151 | 154 | 149 | 147 | 148 | 149.33 | N/A |
| Count Month (September) | 116 | 123 | 121 | 137 | 116 | 120.00 | 1.24 |
|  |  |  |  |  |  | Average | 1.19 |

Note: Shaded values are dropped from average calculation per ODOT methodology. Calculations are based on the percentage of ADT from the peak month divided by the percentage of ADT from the count month.

## Forecast Traffic Volumes

The planning horizon for the Curry County TSP Update is the year 2045. Forecast traffic volumes for the study intersections will be developed based on the existing traffic volumes and information provided in the Statewide Integrated Model (SWIM) and/or ODOT's Future Volume Tables (FVT), as described in the following sections. Forecasting traffic volumes will also include engineering judgment and knowledge of the project study area.

## SWIM

SWIM provides base and forecast year traffic volume projections that reflect anticipated land use changes and planned transportation improvements. This model has been kept up-to-date and is readily available, with base year 2019 and future year 2045 traffic volume projections. This model will be used for the remaining six study intersections, so long as traffic growth estimates are available and reasonable.

Forecast traffic volumes will be developed at these study intersections by applying the postprocessing methodology identified in the National Cooperative Highway Research Program (NCHRP) Report 765, Analytical Travel Forecasting Approaches for Project-Level Planning and Design (Reference 3), which is the update to NCHRP Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design. The methodology derives forecast traffic volumes based on the existing traffic volumes and base and future year traffic volume model projections.

If traffic growth estimates are not available or reasonable for any of the remaining six study intersections, future traffic volumes will be developed using information provided in ODOT's FVTs.

ODOT FVTs
For study intersections located outside the Brookings SWIM model boundaries, or where traffic volume projections are not reasonable, forecast traffic volumes will be developed based on the existing traffic counts and information provided in ODOT's FVTs. The tables provide base year 2018 and forecast year 2040 traffic volume projections for ODOT facilities located throughout Curry County. If this forecasting tool becomes necessary, growth rates will be confirmed with ODOT.

## TRAFFIC ANALYSIS

The traffic analysis will evaluate peak hour traffic operations of the study intersections under existing conditions and through the TSP planning horizon to identify potential capacity constraints and alternatives. This section summarizes the traffic analysis methodology including applicable intersection operational standards and analysis parameters and assumptions.

## Intersection Operational Standards

All study intersections are located along US 101, and therefore, are subject to ODOT intersection operating standards. ODOT uses volume-to-capacity (V/C) ratios to assess intersection operations. Table 6 of the Oregon Highway Plan (OHP - Reference 4) and Table 1200-1 of the Oregon Highway Design Manual (HDM - Reference 5) provide maximum V/C ratios for all signalized and unsignalized intersections located outside the Portland metropolitan area. The OHP ratios are used to evaluate existing and future no-build conditions, while the HDM ratios are used in evaluating future alternatives along state highways.

The following parameters help to determine applicable V/C ratio targets for the study intersections.

- The study intersections are not located within the Port Orford, Gold Beach, or Brookings Urban Growth Boundaries (UGBs);
- Curry County is not associated with a Metropolitan Planning Organization (MPO); and,
- US 101 is classified as a Statewide Highway but is not designated as an OHP Freight Route within Curry County.

Additional details needed to identify $\mathrm{V} / \mathrm{C}$ ratio targets for the study intersections are summarized below.

- US 101 / Floras Creek Road - This intersection is located near the unincorporated community of Langlois where the posted speed on US 101 changes from 55 miles-perhour (MPH) to 40 MPH just north of the intersection. Further, the east leg of the intersection is a local road. ODOT's Statewide (not a Freight Route) V/C ratio target for unincorporated communities will be applied to US 101 and ODOT's District/Local Interest Road V/C ratio target for unincorporated communities will be applied to Floras Creek Road.
- US 101 / Sixes River Road - This intersection is not located within an unincorporated community. The east leg of the intersection is a local road. ODOT's Statewide (not a Freight Route) V/C ratio target for rural lands will be applied to US 101 and ODOT's District/Local Interest Road V/C ratio target for rural lands will be applied to Sixes River Road.
- US 101 / Cape Blanco Highway (OR 250) - This intersection is not located within an unincorporated community. The west leg of the intersection is classified as a District Highway but is not a designated OHP freight route. ODOT's Statewide (not a Freight Route) V/C ratios target for rural lands will be applied to US 101 and ODOT's District/Local Interest Road V/C ratio target for rural lands will be applied to Cape Blanco Highway.
- US 101 / Ophir Road - This intersection is not located within an unincorporated community. The east leg of the intersection is a local road. ODOT's Statewide (not a Freight Route) V/C ratio target for rural lands will be applied to US 101 and ODOT's District/Local Interest Road V/C ratio target for rural lands will be applied to Ophir Road.
- US 101 / Edson Creek Road-Nesika Road - This intersection is not located within an unincorporated community. The east and west legs of the intersection are local roads. ODOT's Statewide (not a Freight Route) V/C ratio target for rural lands will be applied to US 101 and ODOT's District/Local Interest Road V/C ratio target for rural lands will be applied to Edson Creek Road and Nesika Road.
- US 101 / Pistol River Road (connection to Carpenterville Highway, OR 255) - This intersection is not located within an unincorporated community. The east leg of the intersection is classified as a District Highway but is not a designated OHP freight route. ODOT's Statewide (not a Freight Route) V/C ratios target for rural lands will be applied to US 101 and ODOT's District/Local Interest Road V/C ratio target for rural lands will be applied to Pistol River Road.
- US 101 / Cape Ferrelo Road - This intersection is not located within an unincorporated community. The east leg of the intersection is a local road. ODOT's Statewide (not a Freight Route) V/C ratio target for rural lands will be applied to US 101 and ODOT's District/Local Interest Road V/C ratio target for rural lands will be applied to Cape Ferrelo Road.
- US 101 / Winchuck River Road - This intersection is not located within an established unincorporated community but does provide immediate access to houses and a subdivision adjacent to US 101. The east and west legs of the intersection are local roads. ODOT's Statewide (not a Freight Route) V/C ratio target for unincorporated communities will be applied to US 101 and ODOT's District/Local Interest Road V/C ratio target for unincorporated communities will be applied to Winchuck River Road and Ocean View Drive.

Table 4 summarizes the $\mathrm{v} / \mathrm{c}$ ratios that will be used to identify the existing and potential future operational issues at the ODOT study intersections.

Table 4: ODOT Mobility Targets

| Map ID | Intersection | Traffic Control | OHP Mobility Targe ${ }^{1}$ | HDM Standard ${ }^{1}$ |
| :---: | :---: | :---: | :---: | :---: |
| 1 | US 101 / Floras Creek Rd | Two-Way Stop | 0.75 N-S / O.80 E | 0.60 N-S / 0.75 E |
| 2 | US 101 / Sixes River Rd | Two-Way Stop | 0.70 N-S / 0.75 E | 0.60 N-S / 0.70 E |
| 3 | US 101 / Cape Blanco Hwy | Two-Way Stop | 0.70 N-S / 0.75 W | 0.60 N-S / 0.70 W |
| 4 | US 101 / Ophir Rd | Two-Way Stop | 0.70 N-S / 0.75 E | 0.60 N-S / 0.70 E |
| 5 | US 101 / Edson Creek Rd-Nesika Rd | Two-Way Stop | 0.70 N-S / 0.75 E-W | 0.60 N-S / 0.70 E-W |
| 6 | US 101 / Pistol River Rd | Two-Way Stop | 0.70 N-S / 0.75 E | 0.60 N-S / 0.70 E |
| 7 | US 101 / Cape Ferrelo Rd | Two-Way Stop | 0.70 N-S / 0.75 E | 0.60 N-S / O.70 E |
| 8 | US 101 / Winchuck River Rd | Two-Way Stop | 0.75 N-S / 0.80 E-W | 0.60 N-S / 0.75 E-W |

'State Highway V/C Ratio / Side-Street V/C Ratio

## ANALYSIS MODEL PARAMETERS

The following data sources and methodologies are proposed for conducting the traffic analysis. Analysis of all state facilities will be performed according to the APM, unless otherwise agreed upon by the County and ODOT.

1. Intersection/Roadway Geometry (e.g., number of lanes, lane configurations, crosssection elements, etc.) will be collected through aerial photography and confirmed through a site visit. Available as-built data may also be used to verify existing roadway geometry. The analysis models will be built on scaled roadway line work from GIS or aerial photography.
2. Operational Data (e.g., posted speeds, intersection control, transit stops, etc.) will be collected through aerial photography and confirmed through Oregon digital video log, straight line charts, GIS data, a site visit, and/or local knowledge.
3. Peak Hour Factors (PHF) will be calculated for each intersection with traffic count data and applied to the existing conditions analyses. Per the APM, the following PHFs will be applied for the year 2045 analysis:
a. Arterials: 0.95
b. Collectors: 0.90
c. Local Streets: 0.85

- If the existing PHF is greater than these default future values, the existing PHF will be applied.

4. Traffic Volume Development is described above.
5. Traffic Operations

- The methodologies identified in the Highway Capacity Manual $6^{\text {th }}$ Edition (HCM Reference 6) will be used to analyze traffic operations at the study intersections.
- Vistro is a software tool designed to assist with operations analyses in accordance with HCM $6^{\text {th }}$ Edition methodologies; therefore, Vistro 7 will be used to conduct the traffic operations analyses. Level-of-service (LOS), delay, v/c ratios, and $95^{\text {th }}$ percentile queve lengths will be reported at all intersections (critical movement for unsignalized intersections). Failing unsignalized intersections will be evaluated using Manual on Uniform Traffic Control Devices (MUTCD - Reference 7) traffic signal warrants.
- Microsimulation is not proposed as part of this long-range planning effort.


## TRAFFIC ANALYSIS INPUT ASSUMPTIONS

Table 5 summarizes the Vistro software input assumptions for the traffic analysis.

Table 5: Vistro Operations Parameters/Assumptions

| Arterial Intersection Parameters | Existing Condifions |
| :--- | :--- |
| Peak Hour Factor | From traffic counts |
| Conflicting Bikes and Pedestrian per Hour | From traffic counts (as available) |
| Area Type | Not a Central Business District |
| Ideal Saturation Flow Rate (All Movements) | 1,750 passenger cars per hour per lane |
| Lane Width | 12 (feet unless field observations suggest otherwise) |
| Percent Heavy Vehicles (All Movements) | From traffic counts (as available) |
| Percent Grade | Estimated based on field observations |
| $\mathbf{9 5}$ th-Percentile \& Average Vehicle Queues | Vistro summary output |

## CRASH ANALYSIS

The crash analysis will review the most recent five years of reported crash data at the study intersections, obtained from ODOT's crash database, to identify any potential safety focus locations. Possible crash patterns that may include location, type, characteristics, and/or severity will also be identified. Consistent with the methodologies outlined in the APM, intersection crash rates will be developed and compared with statewide crash rates (APM Exhibit 4-1) and critical crash rates. Reported intersection crashes will also be analyzed with Excess Proportion of Specific Crash Types methodologies to identify crash types in excess. In addition, ODOT's top $10 \%$ ODOT Safety Priority Index System sites for the last three years will be reviewed, as appropriate.

For intersections with crash rates exceeding statewide or critical crash rates or exhibiting an excess proportion of specific crashes, crash patterns will be evaluated for potential countermeasures. Potential countermeasures (and resulting crash percentage reduction) will be taken from the All Roads Transportation Safety (ARTS) Crash Reduction Factors (CRF) listing or CRF Appendix.

Segment crash rates will be compared to Table II in the current ODOT Crash Rate Tables.

## MULTIMODAL ANALYSIS

The multimodal analysis will review the current characteristics of the active transportation network to identify needs and potential facility and service alternatives for people walking, rolling, biking, and taking transit throughout Curry County. The multimodal analysis will perform:

- A Bicycle Level of Traffic Stress (BLTS) analysis for bicycle facilities along arterial and collector roadways;
- A Qualitative Multimodal Assessment (QMA) for pedestrian and transit facilities and services along arterial and collector roadways, including availability and quality of facilities and characteristics of adjacent roadways;
- An evaluation of pedestrian and bicyclist safety risk along state highways.

The BLTS analysis and QMA will be performed in accordance with the methodologies identified in Chapter 14 of the APM.

## Bicycle LTS

Bicycle LTS assesses the level of traffic stress a person might experience while biking within the transportation system and assigns BLTS scores to the arterial and collector network. LTS scores range from little traffic stress (LTS 1) to high traffic stress (LTS 4):

- Facilities with an LTS 1 rating have little to no traffic stress, require less attention, and are suitable for all users.
- Facilities with an LTS 2 rating have little traffic stress, but require more attention and therefore, may not be suitable for small children.
- Facilities with an LTS 3 rating have moderate traffic stress and are suitable for adults.
- Facilities with an LTS 4 rating have high traffic stress and are only suitable for able-bodied adults with limited options.

For state facilities, the BLTS analysis will rely on LTS data that ODOT has developed. For non-state facilities, the BLTS analysis will follow the APM's rural methodology. Depending on the posted speed of a roadway, the rural methodology requires information such as daily traffic volumes, number of travel lanes, roadway functional classification, and/or the presence and width of paved shoulders.

## Pedestrian and Transit QMA

The QMA evaluates roadway characteristics to assign a context-based and subjective "Excellent/Good/Fair/Poor" rating. The pedestrian QMA will consider the following factors for assigning ratings along arterial and collector segments:

1. Outside travel lane width
2. Bicycle lane/shoulder width
3. Presence of buffers
4. Sidewalk/path presence
5. Lighting
6. Travel lanes and speed of motorized traffic.

The transit QMA will consider the following factors for assigning ratings to the current transit services and facilities:

1. Frequency and on-time reliability
2. Schedule speed/travel times
3. Transit stop amenities
4. Connecting pedestrian/bike network

## Pedestrian and Bicycle Safety Risk

The statewide bicycle and pedestrian safety risk assessment focuses on the safety of active transportation modes and their risk of being involved crashes. The State of Oregon has established several factors for determining a facility's safety performance for pedestrians and bicyclists such as roadway classification, number of travel lanes, access density, land use, etc. The state highway risk assessment within the project study area will rely on ODOT analyses and resulting data.

## REFERENCES

1. Oregon Department of Transportation. Transportation System Plan Guidelines, 2008.
2. Oregon Department of Transportation. Analysis Procedures Manual, 2018.
3. Transportation Research Board. NCHRP Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design. 2014.
4. Oregon Department of Transportation. Oregon Highway Plan, 2015.
5. Oregon Department of Transportation. Highway Design Manual, 2023.
6. Transportation Research Board. Highway Capacity Manual, $6^{\text {th }}$ Edition, 2016.
7. Federal Highway Administration. Manual on Uniform Traffic Control Devices. 2009.

## ATTACHMENTS

A. Traffic Counts

## ATTACHMENT A - TRAFFIC COUNTS



Comments:


Comments:


Comments:


Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:25 PM -- 4:40 PM


| 5-Min Count Period Beginning At | US 101 <br> (Northbound) |  |  |  | US 101 <br> (Southbound) |  |  |  | Ophir Rd/Euchre Creek Rd Connector (Eastbound) |  |  |  | Ophir Rd/Euchre Creek Rd Connector (Westbound) |  |  |  | Total | Hourly Totals |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U |  |  |
| 4:00 PM | 0 | 9 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |  |
| 4:05 PM | 0 | 10 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |  |
| 4:10 PM | 0 | 6 | 1 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |  |
| 4:15 PM | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |  |
| 4:20 PM | 0 | 4 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |  |
| 4:25 PM | 0 | 6 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 22 |  |
| 4:30 PM | 0 | 6 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |  |
| 4:35 PM | 0 | 11 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |  |
| 4:40 PM | 0 | 6 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |  |
| 4:45 PM | 0 | 7 | 0 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |  |
| 4:50 PM | 0 | 8 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 17 |  |
| 4:55 PM | 0 | 3 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 14 | 231 |
| 5:00 PM | 0 | 4 | 0 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 228 |
| 5:05 PM | 0 | 3 | 3 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 18 | 230 |
| 5:10 PM | 0 | 12 | 1 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 239 |
| 5:15 PM | 0 | 11 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 20 | 237 |
| 5:20 PM | 0 | 5 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 234 |
| 5:25 PM | 0 | 7 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 230 |
| 5:30 PM | 0 | 3 | 1 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 219 |
| 5:35 PM | 0 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 204 |
| 5:40 PM | 0 | 6 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 202 |
| 5:45 PM | 1 | 2 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 190 |
| 5:50 PM | 0 | 4 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 187 |
| 5:55 PM | 0 | 8 | 0 | 0 | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 19 | 192 |
| 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 | 0 | 92 | 0 | 0 | 0 | 176 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 |  | 76 |
| Heavy Trucks Buses | 0 | 16 | 0 |  | 0 | 40 | 0 |  | 0 | 0 | 0 |  | 0 | 0 | 0 |  |  | 6 |
| Pedestrians |  | 0 |  |  |  | 0 |  |  |  | 0 |  |  |  | 0 |  |  |  | 0 |
| Bicycles Scooters | 0 | 0 | 0 |  | 0 | 0 | 0 |  | 0 | 0 | 0 |  | 0 | 0 | 0 |  |  | 0 |

[^3]

Comments:


Quality Counts
DATA THAT DRNES COMMUNITES


| 5-Min Count Period Beginning At | US 101 <br> (Northbound) |  |  |  | US 101 <br> (Southbound) |  |  |  | Pistol River Rd/Carpenterville Rd Connector (Eastbound) |  |  |  | Pistol River Rd/Carpenterville Rd Connector (Westbound) |  |  |  | Total | Hourly Totals |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U |  |  |
| 4:00 PM | 0 | 10 | 0 | 0 | 1 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |  |
| 4:05 PM | 0 | 12 | 2 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 35 |  |
| 4:10 PM | 0 | 12 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 35 |  |
| 4:15 PM | 0 | 12 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 29 |  |
| 4:20 PM | 0 | 20 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 39 |  |
| 4:25 PM | 0 | 19 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 |  |
| 4:30 PM | 0 | 12 | 1 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |  |
| 4:35 PM | 0 | 12 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 34 |  |
| 4:40 PM | 0 | 19 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 36 |  |
| 4:45 PM | 0 | 16 | 2 | 0 | 1 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 |  |
| 4:50 PM | 0 | 8 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |  |
| 4:55 PM | 0 | 7 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 358 |
| 5:00 PM | 0 | 12 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 354 |
| 5:05 PM | 0 | 5 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 17 | 336 |
| 5:10 PM | 0 | 9 | 0 | 0 | 0 | 13 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 324 |
| 5:15 PM | 0 | 16 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 27 | 322 |
| 5:20 PM | 0 | 9 | 1 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 29 | 312 |
| 5:25 PM | 0 | 14 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 32 | 317 |
| 5:30 PM | 0 | 12 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 328 |
| 5:35 PM | 0 | 11 | 0 | 0 | 2 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 322 |
| 5:40 PM | 0 | 12 | 1 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 29 | 315 |
| 5:45 PM | 0 | 15 | 2 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 301 |
| 5:50 PM | 0 | 5 | 2 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 20 | 303 |
| 5:55 PM | 0 | 11 | 3 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 26 | 315 |
| 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 | 0 | 188 | 8 | 0 | 4 | 232 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 8 | 0 |  | 44 |
| Heavy Trucks Buses | 0 | 28 | 0 |  | 0 | 32 | 0 |  | 0 | 0 | 0 |  | 0 | 0 | 0 |  |  | 0 |
| Pedestrians |  | 0 |  |  |  | 0 |  |  |  | 0 |  |  |  | 0 |  |  |  | 0 |
| Bicycles Scooters | 0 | 4 | 0 |  | 0 | 0 | 0 |  | 0 | 0 | 0 |  | 0 | 0 | 0 |  |  | 4 |

Comments:


Comments:

Location: US 101 -- Winchuck River Rd/Oceanview Dr
Date: 9/28/2022
Site Code: 15952903

|  | $\begin{gathered} \text { US } 101 \\ \text { Southbound } \end{gathered}$ |  |  |  | Winchuck River Rd Westbound |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { Start } \\ & \text { Time } \\ & \hline \end{aligned}$ | Right | Thru | Left | U-Turn | $\begin{gathered} \text { Right Slip } \\ \text { Lane } \end{gathered}$ | Right | Thru | Left | U-Turn |
| 04:00 PM | 0 | 30 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 04:05 PM | 0 | 41 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 04:10 PM | 1 | 40 | 4 | 0 | 5 | 0 | 0 | 2 | 0 |
| 04:15 PM | 1 | 36 | 1 | 0 | 5 | 0 | 1 | 0 | 0 |
| 04:20 PM | 1 | 30 | 2 | 0 | 3 | 0 | 1 | 0 | 0 |
| 04:25 PM | 2 | 36 | 4 | 0 | 2 | 0 | 0 | 0 | 0 |
| 04:30 PM | 2 | 25 | 4 | 0 | 5 | 1 | 0 | 0 | 0 |
| 04:35 PM | 3 | 27 | 5 | 0 | 5 | 0 | 0 | 0 | 0 |
| 04:40 PM | 1 | 37 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:45 PM | 1 | 32 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 04:50 PM | 2 | 23 | 6 | 0 | 3 | 0 | 0 | 1 | 0 |
| 04:55 PM | 4 | 37 | 5 | 0 | 4 | 0 | 0 | 2 | 0 |
| 05:00 PM | 0 | 28 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| 05:05 PM | 2 | 29 | 5 | 0 | 1 | 0 | 1 | 2 | 0 |
| 05:10 PM | 0 | 38 | 2 | 0 | 3 | 1 | 0 | 1 | 0 |
| 05:15 PM | 5 | 42 | 3 | 0 | 2 | 0 | 0 | 0 | 0 |
| 05:20 PM | 1 | 31 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| 05:25 PM | 1 | 26 | 5 | 0 | 0 | 0 | 1 | 0 | 0 |
| 05:30 PM | 2 | 25 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| 05:35 PM | 2 | 30 | 9 | 0 | 3 | 0 | 0 | 0 | 0 |
| 05:40 PM | 0 | 31 | 4 | 0 | 2 | 0 | 0 | 0 | 0 |
| 05:45 PM | 0 | 21 | 3 | 0 | 2 | 0 | 0 | 0 | 0 |
| 05:50 PM | 0 | 13 | 3 | 0 | 3 | 0 | 0 | 1 | 0 |
| 05:55 PM | 1 | 17 | 1 | 0 | 4 | 0 | 1 | 1 | 0 |
| Total | 32 | 725 | 80 | 1 | 58 | 2 | 5 | 10 | 1 |

Peak Hour: 4:00 PM - 5:00 PM
Peak 15: 4:05 PM - 4:20 PM
PHF: 0.922

| US 101 Northbound |  |  |  | Oceanview Dr Eastbound |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn |
| 3 | 38 | 3 | 0 | 1 | 0 | 1 | 0 |
| 1 | 34 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1 | 31 | 3 | 0 | 1 | 0 | 2 | 0 |
| 0 | 31 | 3 | 0 | 2 | 0 | 1 | 0 |
| 0 | 34 | 2 | 0 | 3 | 1 | 1 | 0 |
| 2 | 30 | 1 | 0 | 1 | 0 | 3 | 0 |
| 0 | 21 | 1 | 0 | 1 | 0 | 1 | 0 |
| 1 | 34 | 2 | 0 | 1 | 0 | 0 | 0 |
| 0 | 32 | 4 | 0 | 2 | 0 | 1 | 0 |
| 0 | 31 | 1 | 0 | 2 | 0 | 1 | 1 |
| 2 | 28 | 2 | 0 | 1 | 0 | 0 | 0 |
| 0 | 22 | 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 32 | 1 | 0 | 1 | 0 | 1 | 0 |
| 0 | 29 | 2 | 0 | 1 | 0 | 0 | 0 |
| 0 | 26 | 2 | 0 | 1 | 2 | 0 | 0 |
| 0 | 24 | 1 | 0 | 0 | 3 | 0 | 0 |
| 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 24 | 2 | 0 | 0 | 0 | 0 | 0 |
| 0 | 34 | 1 | 0 | 2 | 0 | 0 | 0 |
| 0 | 8 | 1 | 0 | 1 | 0 | 0 | 0 |
| 0 | 26 | 2 | 0 | 2 | 0 | 0 | 0 |
| 0 | 17 | 1 | 0 | 0 | 1 | 0 | 0 |
| 0 | 17 | 3 | 0 | 0 | 0 | 0 | 0 |
| 1 | 30 | 1 | 0 | 0 | 0 | 1 | 0 |
| 12 | 662 | 40 | 0 | 24 | 7 | 14 | 1 |


[^0]:    1 | Curry County Transportation System Plan | Kittelson \& Associates, Inc.

[^1]:    3 | Curry County Transportation System Plan | Kittelson \& Associates, Inc.

[^2]:    4 | Curry County Transportation System Plan | Kittelson \& Associates, Inc.

[^3]:    Comments:

