# Seaside Transportation System Plan
# Traffic Forecasting and Analysis, Methodology, and Assumptions

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This technical memorandum outlines the proposed process for estimating the existing 30th highest hour traffic volumes, forecasting future traffic volumes, identifying background roadway projects and software assumptions for performing the traffic analysis for the Seaside Transportation System Plan. The resulting analysis will be included in Task 5 (Technical Memorandum 4 – Existing Conditions and Deficiencies) and Task 6 (Technical Memorandum 5 – Future Conditions and Deficiencies) of this project's scope of work.

## 30th Highest Hour Traffic Volume Methodology

Fourteen total intersections will be included in this analysis. Each of the study intersections is located within Seaside, Oregon, and under the jurisdiction of the either the City of Seaside, or the Oregon Department of Transportation (ODOT). The signalized and stop controlled study intersections are shown in Figure 1, and listed as follows:

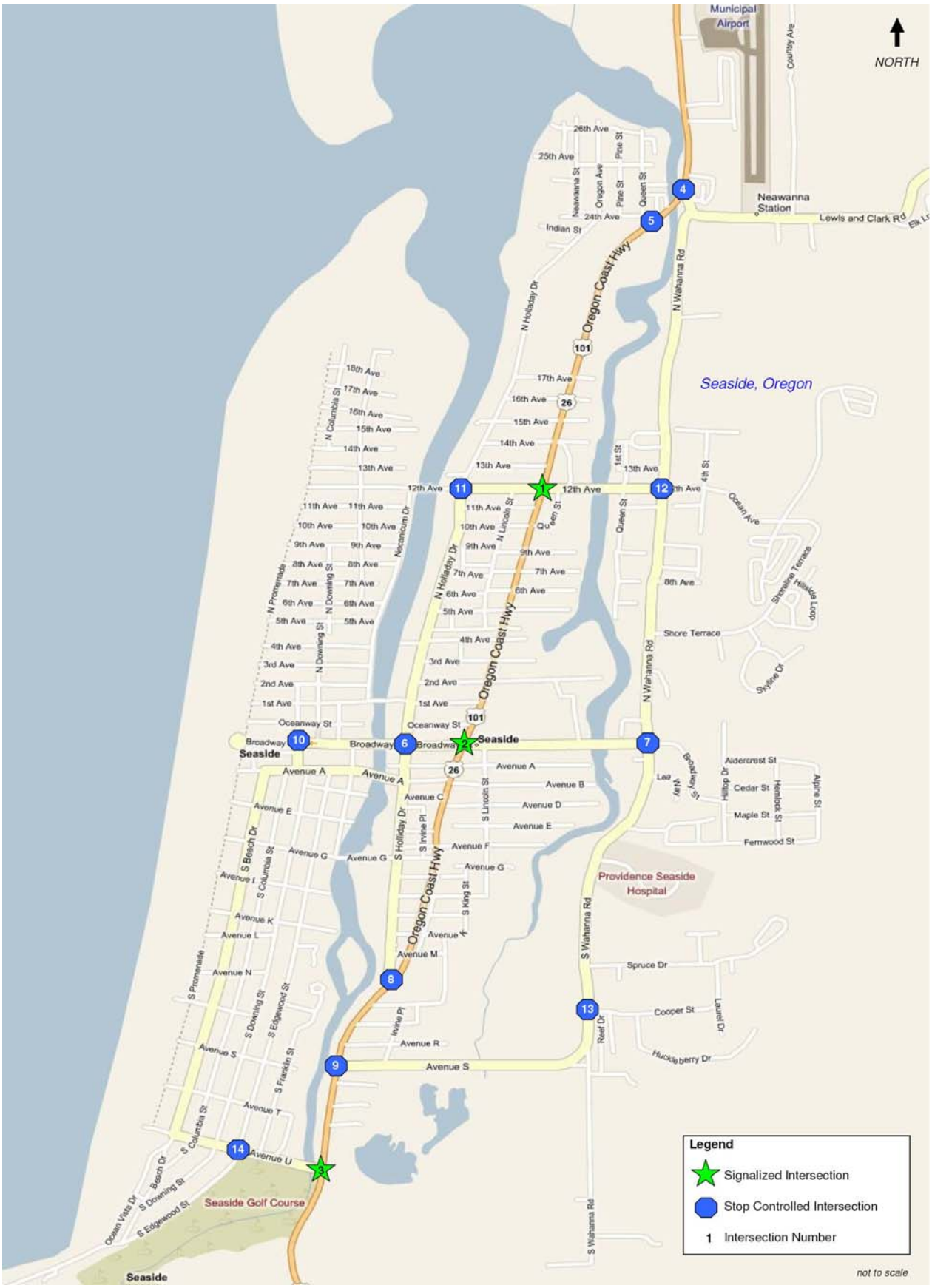
***Signalized Intersections***

1. Highway 101 and 12th Avenue
2. Highway 101 and Broadway Street
3. Highway 101 and Avenue U

***Stop Controlled***

4. Highway 101 and Wahanna Road
5. Highway 101 and 24th Avenue
6. Broadway Street and Holladay Drive
7. Broadway Street and Wahanna Road
8. Highway 101 and Holladay Drive
9. Highway 101 and Avenue S
10. Broadway Street and Columbia Street
11. 12th Avenue and Holladay Drive
12. 12th Avenue and Wahanna Road
13. Wahanna Road and Cooper Road
14. Avenue U and Edgewood Street

Figure 1. Study Intersections (Seaside, Oregon)



Turning movement counts will be taken by ODOT or its traffic counting consultant on a weekday afternoon in April 2008. Sixteen-hour full classification traffic counts will be taken. Turning movement counts at seven (7) of the study intersections will be taken by ODOT or its traffic counting consultant in July 2008. These seven intersections are all located on Highway 101.

Since April and July may be earlier than the peak month for traffic on Highway 101, a seasonal adjustment factor will be applied to count volumes. The closest ATR station to the City of Seaside is station number 04-001 (Gearhart) on Highway 101. The most recent 3 years of average daily traffic (ADT) volumes available (2004-2006) show that approximately 13,800 vehicles were counted at this station. In 2006, average daily traffic volumes in Seaside ranged from approximately 14,600 vehicles at the south end of the project limit to 16,900 vehicles at the north end of the project. Although the ADT through Seaside is between 5 and 15 percent greater than the ADT at the closest ATR location, the proximity of the ATR will provide a reasonable seasonal adjustment factor.

The seasonal adjustment factor for Seaside is based on the ATR site summarized in Table 1 below.

TABLE 1
Summary of ATR Sites Used for Seasonal Adjustment

| Station Name | Station Number | Highway Route Number | 2006 AADT | Peak Month | Count Month | | Seasonal Adj. Factor (April/July) |
|---|---|---|---|---|---|---|---|
| | | | | | APRIL | JULY | |
| Gearhart | 04-001 | OR 9 | 13,800 | *2006: 1.27* | *1.00* | 1.25 | 1.34 / 1.04 |
| | | | | 2005: 1.30 | 0.97 | *1.25* | |
| | | | | 2004: 1.30 | *0.96* | *1.27* | |
| | | | | 2003: 1.31 | 0.97 | 1.25 | |
| | | | | *2002: 1.31* | 0.97 | 1.25 | |

Gray italicized numbers are the high and low monthly count factors removed before calculating the seasonal adjustment factor.

The monthly peak factors from 3 years of ATR station data were averaged to compute the seasonal adjustment factor (the high and low factors were removed). The seasonal adjustment factors are 1.34 and 1.04 for April and July counts respectively.

The April counts will represent a 'typical weekday' condition and will be grown for use in the future year sensitivity test of preferred alternative (Task 6.4 of this project's scope).

## State Mobility Standards

State highway mobility standards were developed for the Oregon Highway Plan (OHP) as a method to gauge reasonable and consistent standards for traffic flow along state highways. These mobility standards consider the classification (e.g., freeway, district) and location (rural, urban) of each state highway. Mobility standards are based on V/C ratios. The 1999 OHP, with amendments adopted by the Oregon Transportation Commission from November 1999 through January 2006, was released on August 23, 2006. This version of the OHP will be used to evaluate the existing and future no build systems. For the future year build scenarios, the mobility standards from the Highway Demand Manual (HDM) will be

used. The 2003 HDM, revised on January 30, 2006, includes 20-year design mobility standards based on future V/C ratios.

There is no Special Transportation Area (STA) designated in the study area. Highway 101 is classified as a statewide highway, a scenic byway, part of the National Highway System, and a truck route for its entire length within the study area. The US 101 intersections are located within the City of Seaside Urban Growth Boundary (UGB), inside an area where the speed limit is 40 MPH or less. State mobility standards are listed in Table 2.

TABLE 2
State Mobility Standards on Highway 101
*Seaside Transportation System Plan*

| Mile Post | Study Intersections | Speed Limit (MPH) | Planning V/C Ratio[1] | Design V/C Ratio[2] |
|---|---|---|---|---|
| 18.80 – 20.41 | Wahanna Road, 24th Avenue, Holladay Drive | 40 | 0.80 | 0.75 |
| 20.41 – 22.38 | 12th Avenue, Broadway Street, Avenue U, Avenue S | 35 | 0.85 | 0.75 |

1 – 1999 Oregon Highway Plan (2006). Applies to existing and future no build analysis.
2 – 2003 Highway Design Manual (2006). Applies to future build analysis.

Based on the functional designation of the state highways and local roadways evaluated with this study, three state mobility standards apply for the existing and no build scenarios. For the three intersections along Highway 101 where the speed limit is greater than 35 MPH, a mobility standard volume to capacity ratio (v/c) of 0.80 will apply. For the four intersections along Highway 101 where the speed limit is equal to or less than 35 MPH, a mobility standard v/c ratio of 0.85 will apply. For the other study intersections on district/local interest roads within Seaside, a v/c ratio mobility standard of 0.90 will apply.

For the 20-year design horizon, a v/c ratio of 0.75 will apply to all intersections on Highway 101. For the other study intersections on district/local interest roads within Seaside, a v/c ratio mobility standard of 0.80 will apply.

## Traffic Forecast Methodology

A 20-year traffic forecast will be prepared using the cumulative analysis method, which incorporates both historical trends and consideration of specific land developments.

An annual growth rate will be applied to the existing 30th Highest Hour traffic volumes to achieve background traffic volumes for the future year scenarios. A forecasting model is not available for the City of Seaside, therefore an annual growth rate will be calculated based upon historical volumes on Highway 101 through the City of Seaside. Trips generated from potential development within and surrounding the project study area will be added to future volumes. These developments will be identified by the City of Seaside and ODOT. Forecasts will be developed for one No Build scenario and three Build alternative scenarios.

The cumulative method process outlined in pages 4-24 through 4-35 of the Analysis Procedures Manual (from ODOT's TPAU) will be followed. Forecasted volumes will be reduced based on these measures so that double counting of future year vehicles does not

occur. It is assumed that the City of Seaside will have two external-external routes (one northbound, and one southbound along US 101 through the City). Also, based on the location of anticipated development, there will be at most four (4) zones within the City of Seaside to calculate external-internal, internal-external, and internal-internal trips.

Trips generated from potential development sites will be added to the No Build traffic volumes. The development sites will be identified in conjunction with the City of Seaside Community Development Department.

All assumptions and questions will be verified with ODOT prior to analysis.

## Baseline Projects

A review of the 2008 through 2011 Draft Statewide Transportation Improvement Program (STIP) identified no projects within the study area. No improvement projects will be included in the future traffic analysis scenarios, unless direction is received from ODOT.

One modernization project was identified north of the project study area along Highway 101 between Camp Rilea (milepost 10) and Surf Pines (milepost 16). Proposed improvements for this project include roadway widening, turn lanes and access management. While this project is not within the study area, it could influence traffic through Seaside by providing increased capacity.

No capacity improvement projects were identified by the City of Seaside within the 20-year horizon.

## Traffic Analysis Software and Input Assumptions

Synchro software, version 7 will be used for the intersection analysis. The reported results will be the level of service, intersection delay, and v/c ratios generated by the HCM report. Analysis assumptions are listed in Table 3.

TABLE 3
Synchro Operations Parameters/Assumptions

| | Condition | |
|---|---|---|
| **Arterial Intersection Parameters** | **Existing (2008)** | **Future Year (2030)** |
| Peak Hour Factor | From April or July counts, otherwise 0.90. | Same as Existing. |
| Conflicting Bikes and Pedestrian per Hour | Assume 10 peds/bikes per approach. | Same as Existing. |
| Area Type | Other | Same as Existing. |
| Ideal Saturation Flow Rate (for all movements) | 1,800 passenger cars per hour green per lane | Same as Existing. |
| Lane Width | From ODOT Inventory Report, otherwise 12 feet. | Same as Existing. |
| Percent Heavy Vehicles | From traffic counts, otherwise 5%. | Same as Existing. |
| Percent Grade | From ODOT Vertical Grade Report. | Same as Existing. |
| Parking Maneuvers per Hour | None. | Same as Existing. |
| Bus Blockages | None. | Same as Existing. |
| Intersection signal phasing and coordination | From ODOT | Same as Existing. |

TABLE 3

Synchro Operations Parameters/Assumptions

| | Condition | |
|---|---|---|
| **Arterial Intersection Parameters** | **Existing (2008)** | **Future Year (2030)** |
| Intersection signal timing optimization limits | Maximum cycle length = 120 sec. | Same as Existing. |
| Minimum Green time | From ODOT, otherwise 8 sec. | Same as Existing. |
| Yellow and all-red time | From ODOT, otherwise yellow = 4 sec, all-red = 1 sec. | Same as Existing. |
| 95th percentile vehicle queues<br>Use SimTraffic report (the average of 5 runs of 1 hour length with 10-min seed time). | Calculated based on an average of 25 feet per vehicle | Same as Existing. |
| Mobility standards | For intersections on Highway 101, use 0.80 (>35MPH) or 0.85(<=35MPH). For local intersections, use 0.90. [1] | For intersections on Highway 101, use 0.75(<=45MPH). For local intersections, use 0.80. [2] |

1 – From Oregon Highway Plan, Policy Element, Table 6: Maximum V/C ratios for peak hour operating conditions

2 – From Oregon Highway Design Manual, Special Design Elements, Table 10-1: 20 year Design-Mobility Standards V/C ratio