

Lincoln County Transportation System Plan – Traffic Analysis Methodology

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This technical memorandum outlines the 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 Lincoln County Transportation System Plan.

30th Highest Hour Traffic Volume Methodology

There are 28 intersections that will be analyzed in this study. Refer to Figure 4 from the *Existing Conditions and Deficiencies for the Lincoln County Transportation System Plan* memo for a map of the intersection locations. The intersections are listed in Table 1.

TABLE 1
Study Intersections

No.	Intersection Name	Count Date
1	OR 18 and Bear Creek Road	August 6, 2005
2	OR 18 and Slick Rock Road	August 6, 2005
3	US 101 and Immonen Road	August 6, 2005
4	OR 229 and Pikes Camp Road	August 6, 2005
5	OR 18 and North Bank Road	August 6, 2005
6	OR 18 and Old Scenic Hwy 101	August 6, 2005
7	US 101 and Gleneden Beach Road	August 6, 2005
8	US 101 and Lancer Street	August 6, 2005
9	Otter Crest Lookout and Otter Crest Loop	August 13, 2005
10	US 101 and Otter Crest Loop North	August 13, 2005
11	Otter Crest Loop and 1 st Street	August 13, 2005
12	US 101 and Otter Crest Loop South	August 13, 2005
13	US 101 and North Beaver Creek Road	August 13, 2005
14	US 101 and Wakonda Beach Road	August 13, 2005

TABLE 1
Study Intersections

No.	Intersection Name	Count Date
15	US 101 and Yachats River Road	August 13, 2005
16	US 101 and Lori Lane	August 13, 2005
17	US 20 and Ollala Lake Road	August 13, 2005
18	US 20 and Business 20 (east)	August 13, 2005
19	US 20 and OR 229	August 13, 2005
20	US 20 and Business 20 (west)	August 13, 2005
21	Business 20 (west) and Business 20	August 13, 2005
22	OR 229 and Logsdan Road	August 13, 2005
23	US 101 and Salishan Drive	Previous Study
24	US 101 and Drift Creek Road	Previous Study
25	US 101 and Bay View Road	Previous Study
26	US 20 at Western Loop	Previous Study
27	US 101 and Siletz Highway	Previous Study
28	US 101 and Willow Drive	Previous Study

Turning movement counts for intersections 1 through 22, from Table 1, were taken on the 6th or 13th (Saturdays) of August 2005, between 3 PM and 5 PM. This reflected the month, day of the week, and time of day when the actual 30th highest hour traffic volume was recorded at three Lincoln County ATR sites on US 101 during the 2004 calendar year. After consulting with ODOT's Transportation Planning and Analysis Unit, it was determined that no seasonal adjustment would be needed for these traffic counts. This was decided based on the following findings.

The study intersections can be split into two categories for seasonal adjustment.

1. The first category is study intersections with ATR stations on-site. The available ATRs in Lincoln County (on US 101 and US 20) had August as the peak month of travel. Because the count month and peak month are the same, the interpolation between the 6th and 13th to the 15th of the month would be the only adjustment factor applied. This adjustment would be less than 1.01.

2. The second category is study intersections without ATR stations on-site. Using the 2004 ATR characteristic table, representative ATR stations were found that also had August as the peak travel month. Because the count month and peak month are the same, the interpolation between the 6th and 13th to the 15th of the month would be the only adjustment factor applied. Again, this adjustment would be less than 1.01.

The ATR station data indicates the peak travel month and count month are the same. Therefore, the original count data can be used without making any adjustments and

the difference will be less than 1 percent. Also, rounding and balancing of turning movement counts would likely remove the small interpolation adjustment anyway.

Turning movement counts for intersections 23 through 28, from Table 1, were collected and adjusted to the 30th Highest Hour as a part of the US 101 Existing Conditions Report.

State Highway Mobility Standards

State Highway Mobility Standards were developed for the 1999 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. County facilities do not fall under the same mobility standards as State facilities unless they are adopted as part of the TSP.

Based on the functional designation of the state highways and local roadways evaluated with this study, three state mobility standards apply. These are listed in Table 2 below.

TABLE 2
Mobility Standards Applicable to Operational Analysis

Highway	Highway Category	Land Use	Speed Limit	Applicable V/C Ratio
Inside Urban Growth Boundary				
	Statewide (NHS) Freight Routes	Non-MPO	≤35 mph	0.80
	Statewide (NHS) Non-Freight Routes and Regional or District Expressways	Non-MPO	≤35 mph	0.85
	Local Road, Arterial-Collector	Non-MPO	≤35 mph	0.90
Outside Urban Growth Boundary				
	Statewide (NHS) Freight Routes	Rural Lands	N/A	0.70
	Statewide (NHS) Non-Freight Routes and Regional or District Expressways	Rural Lands	N/A	0.70
	Local Road, Arterial-Collector	Rural Lands	N/A	0.75

Source: Adopted Oregon Highway Plan Amendments, August 17, 2005.

State mobility standards only apply to state highways; however the county does not have adopted standards for intersection performance. For this evaluation, the state standard of a “District/Local Interest Road” with a speed < 45 mph is used – the applicable V/C ratio for this type of facility is 0.75.

Although this project is not analyzing the future build conditions, before being implemented, alternatives would have to comply with the Highway Design Manual standards along ODOT facilities.

Traffic Forecast Methodology

The balanced 2005 30th Highest Hour volumes will be adjusted to future year 2025, using ODOT future volume tables published online, and balanced again.

Baseline Projects

Through discussions with ODOT modeling staff, no future road projects are included within the ODOT transportation demand model¹. This does not signify that there are no expectations of constructing future transportation projects within the study area, but that there are no projects currently identified and funded that would influence the traffic forecasts in the area.

A review of the Final 2006 - 2009 Statewide Transportation Improvement Program list of projects identified no projects that would influence the traffic forecasts or future traffic operations. This does not signify that there are no expectations of constructing future transportation projects.

Traffic Analysis Software and Input Assumptions

Synchro software will be used for the intersection analysis. The reported results will be the V/C ratios from the HCM report. Assumptions are listed in Table 3.

TABLE 3
Synchro Operations Parameters/Assumptions

Arterial Intersection Parameters	Condition	
	Existing (2005)	Future Year (2025) No-Build
Peak Hour Factor	From traffic count.	0.85 for local and collector street approaches; 0.90 for minor arterial approaches; 0.95 for major arterial approaches, unless better information is available, such as for a school or industrial use.
Conflicting Bikes and Pedestrian per Hour	From traffic count, if not provided, 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 As-builts, field visit or ODOT website, otherwise 12 feet.	Same as Existing.
Percent Heavy Vehicles	From traffic count, otherwise 5%.	Same as Existing.
Percent Grade	From As-builts, otherwise 0%.	Same as Existing.
Parking Maneuvers per Hour	From field visit, otherwise assume 0.	Same as Existing.
Bus Blockages	From field visit, otherwise assume 0.	Same as Existing.
Intersection signal phasing and coordination	Current timing plan.	Optimize
Intersection signal timing optimization limits	Current timing plan.	60 seconds for a two-staged signal; 90 seconds for a three-staged signal; 120 seconds for a four- or more staged signal.
Minimum Green time	Current timing plan.	Same as Existing.
Yellow and all-red time	From timing plan, otherwise (Y) = 4	Same as Existing.

¹ Ibid.

TABLE 3
Synchro Operations Parameters/Assumptions

Arterial Intersection Parameters	Condition	
	Existing (2005)	Future Year (2025) No-Build
Right Turn on Red	seconds and (R) = 0 seconds. Allow except where signed to not.	Same as Existing.
95th percentile vehicle queues calculated based on an average of 25 feet per vehicle and: For V/C < 0.70, use Synchro reports and/or the 2-minute rule; For V/C > 0.70, use SimTraffic report (the average of at least 5 runs of 1 hour length with 15-min peak divided out) ² .	No	Same as Existing.
Level of service goals	Highway V/C threshold from the Oregon Highway Plan (OHP).	Highway No-Build V/C threshold from the Oregon Highway Plan (OHP).

² The simulation will be for one hour with the peak 15-minutes in the first 15 minutes. The results from this simulation will be applied to signalized intersections.