

**OR 42 Expressway Management Plan:  
Lookingglass Road to I-5 Exit 119**

**DRAFT Technical Memorandum #4  
Future Baseline Conditions Analysis**

**Prepared for**

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## 4. FUTURE BASELINE CONDITIONS ANALYSIS

This technical memorandum provides a summary of the 2035 Future Baseline (no-build) transportation conditions through the OR 42 corridor. The analysis examines conditions where the transportation system has been improved by projects with likely funding sources and population and employment in the region surrounding the corridor and traffic volumes continue to grow. The long-range regional growth forecasts are consistent with current land use zoning. The analysis identifies anticipated operational deficiencies and serves as the basis for later evaluation to compare concepts that address deficiencies.

### 4.1. Future Traffic Volume Development

Future Baseline traffic volume forecasts were developed using the Roseburg travel demand forecasting model, which is based on long-range land use assumptions. The travel demand forecasting process and resulting traffic forecasts are briefly described below.

#### 4.1.1. Travel Demand Forecasting Model

Future Baseline traffic volumes were developed using a travel demand forecasting model for the Roseburg area maintained by the Transportation Planning and Analysis Unit (TPAU) at ODOT. The model relies on socioeconomic data (e.g., households and employment) to determine travel demand and system attributes (e.g., roadway capacity, speeds, and distances) to represent the transportation supply. The long-range regional growth forecasts are consistent with current land use zoning.

The forecasting model was updated in 2010 for an analysis of the Highway 138E Corridor. TPAU used the transportation network from the model base year of 2000 and the future year of 2025, and incorporated base year (2009) and forecast year (2035) land use levels (housing and employment) for the model. These data were derived from existing available census and employment data, aerial surveys of development, assessments of vacant and buildable lands, and discussions with the City of Roseburg and Douglas County planning staff.

#### 4.1.2. Traffic Forecasts

Traffic forecasts for the study area intersections were developed from the 2009 and 2035 forecasting models and the 2011 existing traffic data for the future baseline scenario. The process followed the procedures from ODOT's Analysis Procedures Manual (APM)<sup>1</sup>. The forecast year for this corridor study is 2035; thus, model volumes were extrapolated to 2035.

Traffic volumes for the future baseline scenario and the future baseline scenario are presented in Figure 4-1. The detailed volume development worksheets are presented in

Appendix A.

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<sup>1</sup> Analysis Procedures Manual, Oregon Department of Transportation, Transportation Development Division Planning Section, Transportation Planning and Analysis Unit, Salem, Oregon, April, 2006, Section 4.3.

## 4.2. Future Transportation Network

The network used in the forecasts for the OR 42 expressway is a future network that includes improvement projects that are expected to occur by year 2035. These projects have known funding sources or are likely to be funded in the next 20 years. Other planned projects that do not have identified funding sources are addressed in the alternatives analysis portion of this project. Table 4-1 summarizes the projects assumed in the baseline scenario analysis. Some of these improvements may not be reflected in the travel demand model because travel mode choices are assumed outside of the traffic volume assignment process. However, this corridor plan examines all modes of travel; thus they are appropriate assumptions that should be included for analysis purposes.

**Table 4-1. Planned and Funded Projects Assumed for Future Baseline**

Project Number	Location	Description
1	OR 42: Grant Smith Road to I-5 NB on-ramp	Add a second through lane on OR 42
2	OR 42 at Rolling Hills Road	Signalize intersection
3	OR 99: Happy Valley Road to OR 42	Add center turn lane, bike lane, and sidewalks

*Source: State Transportation Improvement Program (STIP), OR 42 Corridor Plan: Reedsport to I-5*

## 4.3. Future Traffic Operations

Traffic operations were evaluated at the 11 corridor intersections. Operations are described below and the detailed analysis worksheets are presented in Appendix B.

Table 4-2 summarizes the results of the traffic operations analysis and compares findings to the Oregon Highway Plan (OHP) mobility standards. Figure 4-2 presents the v/c ratios and LOS performance by lane group for the corridor intersections.

These findings reflect optimized signal timing plans at all signalized corridor intersections.

**Table 4-2. Future Baseline (2035) Design Hour Intersection Operations**

Intersection	Critical <sup>1</sup> Movement	2035 PM Peak Hour			Operational Standards <sup>3</sup>
		V/C Ratio <sup>2</sup>	LOS <sup>2</sup>	Delay <sup>2</sup> (sec.)	
1. OR 42 @ Lookingglass Road	SB L	0.72	E	168	0.70
2. OR 42 @ Umpqua Safari RV Park	NB L/R	0.04	C	19	0.70
3. OR 42 @ Pepsi Road	WB L	0.13	B	13	0.70
4. OR 42 @ Helweg Road / Winston Section Road	SB L/R	0.03	D	37	0.70
5. OR 42 @ Rolling Hills Road / Andorra Drive (Signalized)	Overall	0.64	A	10	0.70
6. OR 42 @ Landers Avenue	SB L	0.49	E	93	0.70
7. OR 42 @ Emils Way / SW Grange Road	NB L/T/R	>2.0	F	>300	0.70
8. OR 42 @ Carnes Road/Roberts Creek Road (Signalized)	Overall	0.98	D	46	0.70
9. OR 42 @ Art Mill Lane	NB L/R	0.02	C	20	0.70
10. OR 42 @ Winery Lane	WB L	0.01	B	23	0.70
11. OR 42 @ OR 99/Grant Smith Road (Signalized)	Overall	0.90	C	43	0.70

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:

1. The critical movement at a signalized intersection is the overall operation of the intersection. The critical movement at an unsignalized intersection is the stopped (or yield) movement with the worst v/c ratio.
2. The v/c ratio and LOS are provided from Synchro HCM Intersection Analysis Reports, while delay values are from SimTraffic.
3. Mobility standards are drawn from Table 6 of the 1999 OHP. Study area intersections are non-MPO, outside of an STA, and have a non-freeflow speed limit greater than 45 mph. Intersections 1-4 are within the City of Winston UGB, while study area intersections 5-11 are outside the UGB.

**SHADED** – results indicate where operational standards are not met

Vehicular traffic operations would meet mobility standards under future baseline, with three exceptions. The unsignalized intersection of OR 42 at Emils Way/Grange Road would exceed mobility standards with a v/c ratio of greater than 2.0 and LOS F on the northbound side street approach. Although Emils Way is expected to have a relatively small increase in vehicular volume at the northbound approach, the left turns would experience long delays as volumes grow on OR 42. The signalized intersection of OR 42 at Carnes Road would exceed mobility standards with a v/c ratio of 0.98 and LOS D. The signalized intersection of OR 42 at Grant Smith Road would exceed mobility standards with an overall v/c of 0.90 and LOS C.

As noted in Table 4-1, several baseline improvements were assumed for the future conditions. Although operations would exceed operational standards, the second through-lane on OR 42 in the eastbound direction, from OR 99/Grants Smith Road to the I-5 NB On Ramp, would improve v/c ratios and reduce queuing from OR 99/Grants Smith Road to Carnes Road/Roberts Creek Road. A more equal distribution of vehicles between the left and right through-lanes is expected. At Rolling Hills Road/Andora Drive, delay for side-street vehicles will be reduced by the assumed signalization of this intersection.

Six intersections would experience queuing that either exceeds available storage or extends past the nearest public intersection. Table 4-3 summarizes the intersection movements where

these queues are expected. Three of the locations with queuing issues are at signalized intersections, and the other three are at unsignalized intersections.

**Table 4-3. Future Baseline (2035) 95<sup>th</sup> Percentile Queues Exceeding Available Storage**

Intersection	Approach & Movement	95 <sup>th</sup> Percentile Queue (ft.)	Available Storage (ft.)	Percent Time Blocked <sup>1</sup>
1. OR 42 @ Lookingglass Road	SB R	75	25 <sup>3</sup>	25
3. OR 42 @ Pepsi Road	NB R	75	25 <sup>3</sup>	10
5. OR 42 @ Rolling Hills Road / Andorra Drive (Signalized)	NB L/T/R	400	100 <sup>2</sup>	-
7. OR 42 @ Emils Way	NB L/T/R	350	200 <sup>2</sup>	-
8. OR 42 @ Carnes Road/Roberts Creek Road (Signalized)	EB L	475	375 <sup>3</sup>	8
	WB L	375	225 <sup>3</sup>	4
	NB L/T/R	275	250 <sup>3</sup>	-
	SB L	300	250 <sup>3</sup>	7
11. OR 42 @ OR 99/Grant Smith Road (Signalized)	EB L	475	300 <sup>3</sup>	18
	WB R	475	175 <sup>3</sup>	2
	SB L	275	150 <sup>3</sup>	12

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:

1. Percent time block reflects the percentage of time when the queue either extends out of a storage bay and interferes with the adjacent through travel lane or extends past the next upstream intersection.
2. Storage distance reflects spacing to the next public access point.
3. Storage distance reflects length of travel lane or turn bay.

Many of the expected queuing issues are associated with travel lanes or turn bays that would have inadequate storage in the future. The intersections of Lookingglass Road and Pepsi Road at OR 42 have shoulders that vehicles making right-turns may use for storage, but there are no striped turn lanes. More significant queuing would occur at the signalized intersections of Carnes Road and OR 99/Grant Smith Road at OR 42. Both intersections would have queues that spill out of the available storage in turn lanes which would impact flow in the adjacent through travel lanes. These conditions would be present on multiple approaches at these intersections.

The nearness of Grange Road on the south side of OR 42 also creates some queuing concerns. The northbound approach of Rolling Hills Road at OR 42 would have queues that extend well past Grange Road as would the northbound approach at Emils Way.

#### 4.4. Future Traffic Safety Considerations

The future baseline analysis reveals several long-term traffic safety issues that need consideration. In general, long delays and extensive queues may cause drivers to engage in riskier actions, such as running lights or traveling longer distances in the center refuge to go around queues, which could result in more turning, angle, and sideswipe collisions. On unsignalized side streets, longer delays may increase the likelihood that drivers would accept

shorter gaps in the mainline traffic putting them at risk for turning or angle collisions. Where congestion is expected to worsen, it is safe to assume that current safety concerns would be exacerbated.

The existing conditions analysis identified frequency, severity, rate, and type of reported crashes along the study corridor and at each study intersection for a five-year analysis period (January 1, 2005, and December 31, 2009). The data is summarized in Table 3-8 of the Existing Conditions Memo. There is one (1) segment identified in the top 10% of the most recent (2010) SPIS rankings within the corridor. This top 10% SPIS location is at Carnes Road/Roberts Creek Road. In addition, the entire study corridor is identified as a SIP category 3 rating. This analysis revealed multiple mainline segments/intersections with specific crash trends. The areas of concern are primarily focused at:

- Intersection of OR 42 and Carnes Road/Roberts Creek Road
- Intersection of OR 42 and OR 99/Grant Smith Road
- Segment from Rolling Hills Road/Andora Drive to Emils Way/Grange Road (including intersections)

Pedestrian collisions occurred at two locations during the five-year analysis period: one at Emils Way/Grange Road and one at Grant Smith Road. There were no bicycle-related collisions.

#### **4.5. Conclusions**

Vehicular traffic operations are expected to exceed OHP mobility standards at three locations: OR 42 at Emils Way / SW Grange Road, OR 42 at Carnes Road/Roberts Creek Road (Signalized), and OR 42 at OR 99/Grant Smith Road (Signalized). Furthermore, five locations are expected to have vehicular queues either exceed available storage or extend past the nearest public intersection. Assumed improvements would provide some relief for the system, but further improvements are required to meet operational standards.

The Future Baseline scenario would not provide improvements to mitigate the frequency or severity of crashes at several problematic locations, and may generally result in an increased crash rate as drivers are provided smaller gaps due to increased traffic volumes.

#### *Attachments:*

*Figure 4-1. Future (2034) Baseline Scenario – Design Hour Traffic Volumes*

*Figure 4-2. Future (2034) Baseline Scenario – Lane Configurations & Traffic Operations*

*Appendix A. Future Baseline Traffic Volume Development Worksheets*

*Appendix B. Traffic Analysis Worksheets*