

Technical Report Two: 2030 Regional Intercommunity Trip Forecast and Infrastructure Estimate

COIC Project Manager shall, with the assistance of the TC, integrate regional Comprehensive Plans and TSPs, and deliver information on expected regional intercommunity trips from build out of status quo land use patterns. Technical Report Two must also estimate, based on recent local experience and accepted standards, the cost of accommodating these intercommunity trips via infrastructure improvements, given no changes in land use patterns or mix of trip modes. Technical Report Two must “piggyback” on similar analysis being prepared for TSP and Comprehensive Plan updates across the region, and will rely on data already generated for those processes to the extent possible. COIC shall not perform or request new modeling data. Where existing data is not available, estimates will be used.

Expected Regional Intercommunity Trips

The area encompassed by this Long-Range Strategic Transportation Options Plan was described in Technical Memorandum 1. The area basically encompasses the intercity highways in Deschutes, Crook, and Jefferson counties, connecting the cities of La Pine, Bend, Redmond, Madras, Sisters, Prineville, Culver, and Metolius. This memorandum examines existing data on predicted future intercity trips for the study area, assuming no changes from current adopted comprehensive and transportation plans.

The Transportation System Plans (TSPs) for Crook County and Jefferson County used Oregon Department of Transportation (ODOT) Future Volume (FV) forecasts to 2025 and 2027, respectively. ODOT has updated most of the FV to 2028 through modeling. For the purposes of this study, the 2028 numbers were mathematically extrapolated to 2030 for Segments 2, 3, 6, and 7 to calculate the vehicle miles traveled (VMT) for the intercity highway segments.

Deschutes County is in the process of updating its TSP. The Transportation Planning Analysis Unit (TPAU) of ODOT has created a model for Deschutes County. The forecasted 2030 traffic volumes were made available for this report and were used for Segments 1, 4, and 5.

It is interesting to note that, of these three segments, only Segment 5 has higher traffic volumes forecast by the model than by mathematical extrapolation; therefore, it is reasonable to assume that the extrapolated forecast numbers are within the range of accuracy and may be conservative.

Table 1 summarizes the 2030 regional intercommunity trips and estimated greenhouse gas (GHG) emissions.

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TABLE 1: SUMMARY OF 2030 REGIONAL INTERCOMMUNITY TRIPS & GREENHOUSE GAS EMISSIONS

	Segment	Length	Estimated FV	VMT	Metric Tons GHG
1	126, Sisters-Redmond (ODOT 15)	12.65	10,468	132,420	39
2	126, Redmond to Prineville (ODOT 41)	15.61	15,370	239,926	70
3	97, Madras-Redmond (ODOT 4)	23.52	20,700	486,864	142
4	97, Redmond-Bend (ODOT 4)	12.27	40,541	497,438	145
5	97, Bend-LaPine (ODOT4)	19.49	29,739	404,203	118
6	26, Madras-Prineville (ODOT 360)	25.94	4,171	108,196	32
7	361, Culver & Metolius (ODOT 361)	6.98	5,014	34,998	10

Notes:

- Length of intercity highway segment determined by milepoints located as close as possible to city boundaries
- 2030 Estimated Future Volumes for Segments 2, 3, 6 & 7 were extrapolated from ODOT Future Traffic Volumes 2028. Estimated Future Volumes for Segments 1, 4 & 5 were provided by TPAU for Deschutes County.
- % of cars (FHWA Class 2) and light trucks (FHWA Class 3) is not available for Future Volume forecasts
- Greenhouse Gas (GHG) expressed as metric tons of CO₂, calculated using the following formula:

$$VMT * 0.19 (\text{lb CO}_2 \text{ per mile}) / \text{ave mpg for study year} / 2204.62 = \text{metric tons of CO}_2 \text{ per highway segment}$$
- MPG for study year 2030 obtained from EPA (average passenger car & light trucks) : YR 2030 = 30.1

Estimated Infrastructure Costs of Accommodating 2030 Intercommunity Trips

For the most part, the intercity highway segments examined for this study appear to have sufficient capacity to carry projected traffic volumes to 2030. However, congestion, operational, and safety issues have been identified in some areas.

At intersections, ODOT measures function by each intersection leg’s volume/capacity (v/c) ratio. The v/c ratio is a measure of the percentage of used capacity on a roadway. A value of 0.00 indicates that there is no traffic on the roadway, and a value of 1.00 indicates that the entire capacity of the roadway is being used. For optimum operation, a maximum v/c ratio of 0.85 in rural areas and a v/c ratio of 0.95 in urban or transitional areas during a typical weekday peak hour should be maintained. For unsignalized intersections, the v/c ratio is based on the intersection’s critical movement. For signalized intersections, the ratio is based on the overall intersection operation. The standard v/c ratios were used by Jefferson, Crook, and Deschutes counties. At most intersections of county or city roads with highways, the capacity or operational problems occur on the locally owned road.

For other sections of highway, ODOT measure capacity through the application of highway mobility standards, which analyze factors such as peak hour volumes and crash records.

The following summaries were obtained from the adopted Jefferson and Crook County TSPs, and from the Deschutes County draft TSP, with confirmation via interviews with Planning Staff. The ODOT State Transportation Improvement Plan (STIP) for the 2008-2011 period and the draft 2010-2013 period (adopted by the Oregon Transportation Commission in September) were also consulted to identify relevant projects.

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Crook County

For the Crook County TSP, Highway 126 was analyzed for 2025. Four projects shown in Table 2 were identified as areas where the highway might potentially operate below optimum in 2025.

TABLE 2. CROOK COUNTY TSP CAPACITY-RELATED PROJECTS (2025)

Project	Issue	Est. Cost	Status/Notes
OR 126/Powell Butte Hwy	2025 exceeds v/c	\$5,000,000	\$750,000 allocated in 2008-2011 STIP for EA.
OR 126/Stillman Road SW	2025 exceeds v/c	Add-on to TSP, Cost Unknown	State Hwy Operations COACT needs list
OR 126/Millican Road SW	2025 exceeds v/c	\$5,400,000	Identified in 2008-2011 STIP as 2008 safety project to "improve Millican-W. Butte Rd from US 20 to US126"
OR 126 passing lanes from Milepost 4.00 to 6.00	capacity/safety	\$1,950,000	Unknown

Jefferson County

For the Jefferson County TSP, intersections with Highway 26/Highway 97 were analyzed for 2027 v/c ratios. The projects shown in Table 3 were identified as potentially operating beyond the maximum v/c standard for unsignalized intersections:

TABLE 3. JEFFERSON COUNTY CAPACITY-RELATED TSP PROJECTS (2027)

Project	Issue	Est. Cost	Status
US26/US97 South "Y" Interchange	2027 exceeds v/c	Identified in draft 2010-2013 STIP as intersection alignment modernization project @ \$5,350,000	In preliminary planning;
US97, passing lanes, south of Dover	Capacity & safety	Estimated @ \$1 million per lane mile or \$10/sq.ft.	Not identified in STIP

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Deschutes County

For the draft Deschutes County TSP, a number of highway sections have been identified as having potential capacity and/or safety issues by 2030. The projects shown in Table 3 were identified as potentially operating beyond the maximum capacity by 2039 intersections:

TABLE 3. DESCHUTES COUNTY CAPACITY-RELATED TSP PROJECTS (2030)

Project	Issue	Est. Cost	Status
US. 20: MP 12.26-13.70 (Couch Market Rd to Gerking Market Rd), add travel lanes	Capacity & safety	Not available for several months	Included in updated TSP
US 97: MP 115.91-118.53, add lanes from Terrebonne to Redmond; grade-separation at O'Neil	Capacity & safety	Not available for several months	Included in updated TSP
US 97: MP 153.05-164.17, add lanes; disconnect Pinecrest from US 97 after Deer Run & Huntington Rd are paved	Capacity & safety	Not available for several months	Included in updated TSP
OR 126: MP 99.90-101.91, add east-bound travel lane	Capacity & safety	Not available for several months	Included in updated TSP
OR 126: McKenzie Hwy # 15 MP 107.98-110.27 (Cline Falls Hwy ramps to NW Helmholtz Way): Add travel lanes	Capacity & safety	Not available for several months	Included in updated TSP
OR 126: MP 110.27-110.77 (NW Helmholtz Way to 35 th St), add travel lanes	Capacity & safety	Not available for several months	Included in updated TSP
OR 126 MP 3.05-3.62 (0.73 miles east of Sherman Rd to Crook County line), add lanes	Capacity & safety	Not available for several months	Included in updated TSP

First Intersections within Each City

To be completed....

Note: The following data from the ODOT Draft 2010-2013 STIP is included in Technical Report 2 because it pertains to “first intersection” projects within cities in the Study Area:

- US20-Cascades (Sisters); Improvements are identified as a \$1,000,000 modernization project
- US97-First Street (LaPine); develop intersection improvement identified as a \$397,000 operations project.

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