Chapter 11 – System Performance

Performance measures in this chapter are forecasts of future travel conditions—specifically traffic congestion. The forecasts are estimates produced by the Grants Pass travel demand model. The model, computer software that performs a series of calculations, is based on information the MRMPO obtained about future population and employment.

Estimates of the numbers of people, jobs and their locations within the region are critical to the model. Also, the transportation network itself is represented in the model.

The current system, including numbers of lanes, locations of intersections, signals, turn lanes and lane widths can be significant to traffic flow and road capacity. Future conditions for all of these factors are estimated in consultation with local, state and federal agencies and governments, and are incorporated into the model for specific future years.

A. Grants Pass Model

The model used for the RTP is the Grants Pass Oregon Small Urban Model (OSUM). The Grants Pass model was developed to address the need for a travel demand forecasting tool that could be used for a variety of purposes including; transportation system planning, subarea transportation studies, the analysis of the transportation system impacts of large-scale development proposals, and the evaluation of the effects of large-scale transportation projects.

The MRMPO will use the OSUM Grants Pass model through the first RTP (spring 2016), and then start building a new model before the second RTP that will cover the larger MRMPO boundary. The model itself, the information and running the software, is a cooperative project between MRMPO and ODOT's Transportation Planning and Analysis Unit (TPAU).

"Estimates of the numbers of people, jobs and their locations within the region are critical to the model."

The model provides answers on a regional level for a variety of analyses. Beyond the generalized, region-scale outputs that are reported in this chapter, the Grants Pass model is the foundation for more detailed analyses that jurisdictions, developers and project managers conduct to estimate fine-grained conditions such as:

- How much traffic will be generated by a particular development, what road will be affected and to what extent?
- How much traffic can be accommodated at a particular location and what happens to traffic conditions if a lane is added, or access points changed?
- How large does a facility such as a freeway interchange have to be in terms of number of lanes and their length to accommodate future anticipated traffic?

In developing the 2015-2040 RTP, the model was asked to provide answers to some basic questions about performance of the transportation system in future years, given the plan's forecasts for growth. Results are described in the following sections.

B. Future Congestion

Generally, travel demand modeling shows that the region can expect congestion to increase. Table 11.1 below shows that in 2010, there were five (5) congested lane miles. By 2040, the number of congested lane miles increases to twenty-two (22), which is 3% of the total lane miles in model area.

Table 11.1

Grants Pass RTP 2010-2040
Percentage of Congested Lane-Miles*
P.M. Peak Hour

SCENARIOS MEASURED	Reference 2010	No-Build 2015	No-Build 2020	No-Build 2040	RTP 2040
Total Lane Miles	643	NA	NA	643	648
Congested Lane Miles	5	NA	NA	24	22
% of Congested Lane Miles	1%	NA	NA	4%	3%

* Congestion defined as model links with demand/capacity ratio ≥ 0.90

Planned roadway capacity projects alone are not expected to keep pace with the region's anticipated growth. Through 2040, this plan anticipates an expansion of the regional transportation system of 5 lane miles.

Meanwhile, population is expected to increase by nearly 28 percent (from about 68,973 to 89,004), and employment by 45 percent (from 20,765 jobs to 30,030). These modeled estimates are based on existing local plans and coordination with the City of Grants Pass.

As Table 11.1 shows, with implementation of the 2040 RTP the amount of congested roadways will increase from about 5 lane miles today to 22 lane miles in 2040. If no improvements were made to roads (none of the RTP projects implemented), congested lane miles would increase to 24 by 2040.

Traffic ebbs and flows given the time of day. Locally, most roads at most times of the day are – and will continue to be – fairly clear and free-flowing. To look at congestion, the times of highest, or peak, travel are isolated. Traffic counts are taken continuously over multiple days, show that the peak hour in most cases is late afternoon to very early evening – the evening commute hours. Because of this travel pattern, many transportation demand management programs seek to offer travel alternatives so that fewer motorists are driving at the peak hours.

Table 11.2

Grants Pass RTP 2010-2040 Other Evaluation Measures					
SCENARIOS MEASURED	**Reference 2010**	**No-Build 2015**	**No-Build 2020**	**No-Build 2040**	**RTP-Build 2040**
P.M. Peak Hour Mean Travel Time	8.96	N/A	N/A	8.97	8.96
P.M. Peak Hour VMT	116,751	N/A	N/A	155,731	155,613
P.M. Peak Hour VHT*	2,535	N/A	N/A	3,577	3,572
Daily Transit Mode Split	N/A	N/A	N/A	N/A	N/A

*VHT - vehicle hours traveled is a function of both travel time and total volume.

Table 11.2 shows that in 2010, the P.M. peak hour mean travel time was 8.96 minutes, and in 2040 the travel time is the same even though VMT increased by 33% between 2010 & 2040. VHT is the number of hours that vehicles spend in the traffic during the peak hour. In terms of VHT, Table 11.2 shows that in 2040 without the RTP the VHT will increase by 1,042 hours from the base year, but with the RTP the VHT will increase by 1,037 hours from the base year. In other words, there are 5 VHT reductions during the PM peak hour in the 2040 RTP Scenario.

C. Performance Comparison

Table 11.3 shows the year 2040 forecast volume-to-capacity ratios for freeways, principal arterials, minor arterials and collectors within the Grants Pass area per lane mile. The 72 miles of freeways within the MRMPO area in 2040 show little congestion (V/C of 0 – 0.59). Whereas, the 83 miles of principal arterials in the MRMPO area in 2040 show increased congestion ranging from 0 – 0.59 to 9.99.

Table 11.3

2040 RTP 2010-2040 Peak Lane Miles				
Volume/Capacity Ratio Range	**Freeway**	**Principal Arterial**	**Minor Arterial**	**Collector**
0 - 0.59	71.72	48.05	72.84	342.56
0.59 - 0.69	0.00	5.75	2.52	4.05
0.69 - 0.79	0.00	6.13	1.23	3.67
0.79 - 0.89	0.00	6.47	1.84	0.93
0.89 - 0.99	0.00	5.24	1.22	0.71
0.99 - 9.99	0.00	11.82	1.48	0.98
TOTAL	**71.72**	**83.46**	**81.13**	**352.90**

D. Congested Roads

Travel conditions on several key roads were examined with the model. The analysis includes selected principal and minor arterial roadways identified by staff as key travel routes within the

model area. Results on Table 11.4 and 11.5 show estimated base year 2010 and future conditions. Travel conditions expressed are peak hour conditions, which are calculated to be typical conditions a motorist is likely to encounter at the late afternoon-early evening hours – the time of the greatest amount of travel in the MRMPO region.

Table 11.4

2010 Reference Peak Lane Mile Percentages

Demand/Capacity Ratio Range	Rogue River Hwy (OR99)	Redwood Hwy (OR199)	Jacksonville Hwy (OR238)	Highland Ave	Redwood Ave	G St	A St	Allen Creek Rd	Bridge St	E St	F St	M St	Parkdale Drive
0 – 0.59	76%	70%	92%	100%	70%	69%	98%	100%	82%	100%	100%	85%	37%
0.59 – 0.69	16%	2%	4%	0%	3%	0%	0%	0%	5%	0%	0%	3%	24%
0.69 – 0.79	2%	15%	2%	0%	11%	18%	2%	0%	0%	0%	0%	0%	5%
0.79 – 0.89	2%	9%	2%	0%	6%	8%	0%	0%	0%	0%	0%	0%	0%
0.89 – 0.99	0%	2%	0%	0%	5%	4%	0%	0%	0%	0%	0%	0%	29%
0.99 – 9.99	4%	2%	0%	0%	4%	0%	0%	0%	13%	0%	0%	12%	5%
No Congestion	94%	87%	98%	100%	84%	87%	100%	100%	87%	100%	100%	88%	66%
Congestion	2%	11%	2%	0%	12%	12%	0%	0%	0%	0%	0%	0%	29%
High Congestion	4%	2%	0%	0%	4%	0%	0%	0%	13%	0%	0%	12%	5%
Total Lane Miles	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 11.5

2040 $RTP_{10\text{-}40}$ Peak Lane Mile Percentages

Demand/Capacity Ratio Range	Rogue River Hwy (OR99)	Redwood Hwy (OR199)	Jacksonville Hwy (OR238)	Highland Ave	Redwood Ave	G St	A St	Allen Creek Rd	Bridge St	E St	F St	M St	Parkdale Drive
0 – 0.59	61%	60%	82%	100%	66%	69%	93%	100%	76%	100%	100%	85%	0%
0.59 – 0.69	8%	3%	8%	0%	0%	0%	2%	0%	7%	0%	0%	0%	16%
0.69 – 0.79	14%	1%	4%	0%	8%	13%	3%	0%	0%	0%	0%	0%	0%
0.79 – 0.89	9%	8%	1%	0%	8%	14%	2%	0%	5%	0%	0%	3%	21%
0.89 – 0.99	2%	8%	3%	0%	8%	4%	0%	0%	0%	0%	0%	0%	9%
0.99 – 9.99	6%	20%	2%	0%	9%	1%	0%	0%	13%	0%	0%	12%	55%
No Congestion	83%	64%	94%	100%	75%	81%	98%	100%	82%	100%	100%	85%	16%
Congestion	11%	16%	4%	0%	16%	18%	2%	0%	5%	0%	0%	3%	29%
High Congestion	6%	20%	2%	0%	9%	1%	0%	0%	13%	0%	0%	12%	55%
Total Lane Miles	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

The numbers in the columns in these two tables are the percentages of lane miles on a particular road that are at the volume/capacity ratio ranges indicated in the first column. Congestion is expressed as a ratio of travel demand, or number of vehicle trips to roadway capacity for accommodating vehicles. High congestion indicates too many vehicles attempting to travel on the segment of road, causing delay. The estimates report peak hour travel - travel at certain hours in the day, generally mid-afternoon in the Grants Pass area. (Peak hour varies from region to region, dependent on conditions such as shift changes and school hours.) Congestion on the roads shown on these tables can lead to delays on intersecting roads as well. The model data may be used to identify highly traveled and congested roadways, which can be prioritized for funding through the MRMPO Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP) project selection processes.

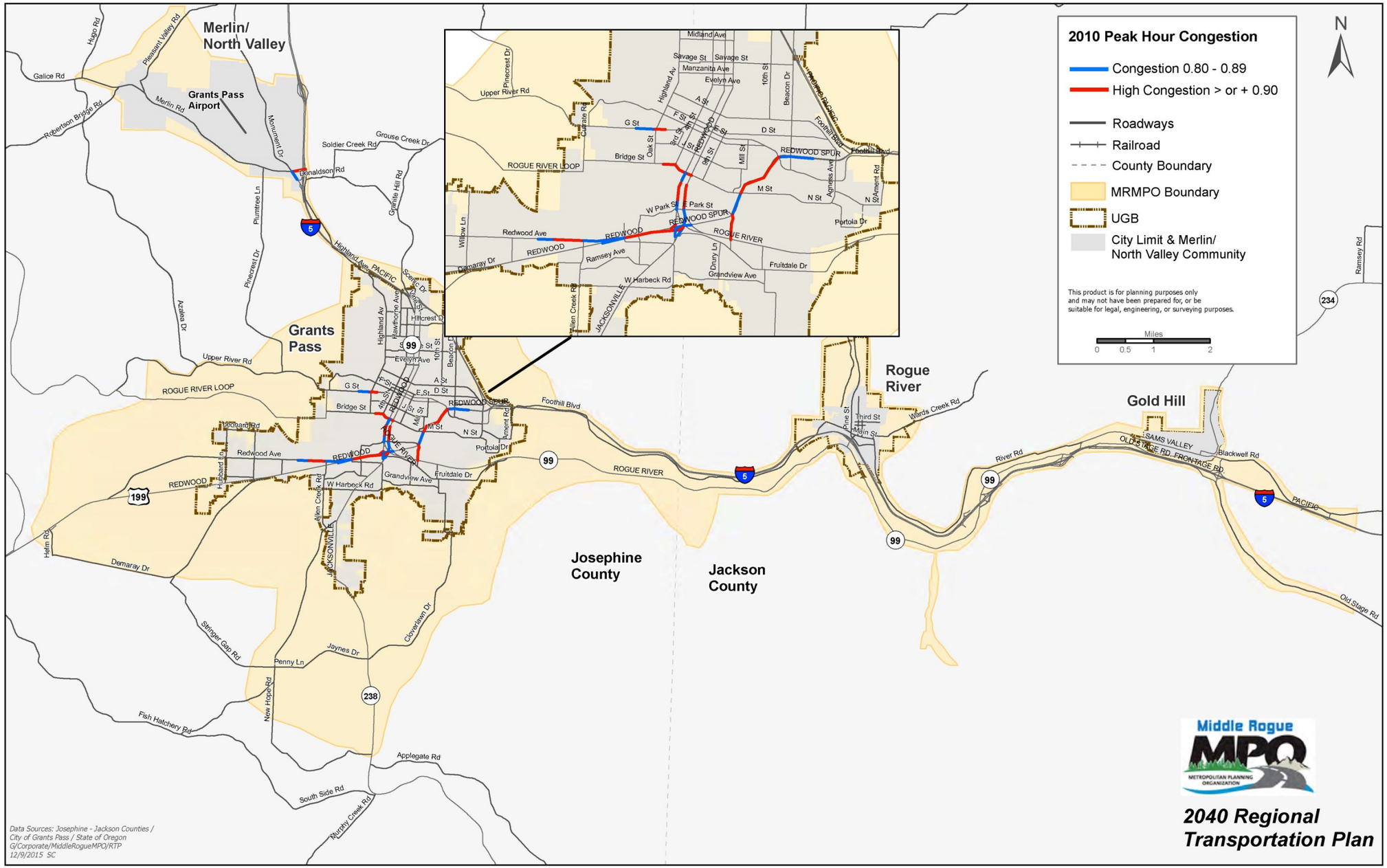
E. Congestions Maps

Maps below indicate locations where the MRMPO travel demand model estimates potential for congestion in future years.

Years shown are 2010 and 2040. By viewing the maps in succession, it's possible to see how, where and when congested conditions are likely to expand.

Rather than showing with absolute certainty future congested conditions, these maps indicate the locations most vulnerable to traffic pressures. The futures shown here are far from certain because MRMPO jurisdictions are in agreement that additional funds will need to be identified for projects not yet in the plan. Beyond that, there are projects being planned, but are not included in this analysis because RTP projects must be financially constrained, as described in Chapter 8 Financial Plan.

Map 11-1 - 2010 Peak Hour Congestion



Map 11-2 - 2040 Peak Hour Congestion