Rogue Valley Metropolitan Planning Organization
Regional Transportation Plan
Performance Measure Development

Year-End Report
2005-2006 Unified Planning Work Program
Task 3.3

Monday, June 26, 2006

RTP Performance Measures

Introduction

The Rogue Valley Regional Transportation Plan (RTP) was approved by the Policy Committee of the Rogue Valley Metropolitan Organization (RVMPO) on May 5, 2005. Development and maintenance of this Plan is a responsibility given to the RVMPO under Federal and State rules. One of the maintenance responsibilities is to monitor the implementation of the RTP and evaluate the degree to which the goals and policies in the Plan are guiding transportation initiatives in the region:

> "Regional and local TSPs shall include interim benchmarks to assure satisfactory progress towards meeting the requirements of this section at five year intervals over the planning period. MPOs and local governments shall evaluate progress in meeting interim benchmarks at five year intervals from adoption of the regional and local TSPs."
>
> OAR 660-012-035(7)

The performance evaluation called for by the Transportation Planning Rule (TPR) is distinct from project evaluation requirements for the RTP project list or for Transportation Improvement Program (TIP) updates. RTP performance must be evaluated at a region-wide scale, and look at entire transportation subsystems as they relate to the Plan's goals and policies.

Regional transportation goals and policies were adopted as part of the RTP, and acknowledged by the MPO member agencies. These goals did not include the State-defined standard for a 5% per capita reduction in Vehicle Miles Traveled (VMT). Rather, a system of alternative measures was adopted and approved by the State Land Conservation and Development Commission (LCDC). The RTP also included a system of measures and benchmarks for evaluating these alternative measures, and a baseline evaluation was conducted. *However, performance measures were not developed for the goals and policies that make up the "Guiding Principles" of the Plan.* Development of an evaluation system was left for future work programs.

The existence of adopted goals and policies does not mean that development of performance measures and standards is merely a technical matter. A separate consensus among RVMPO member agencies must be reached for measurement methodologies, because the choice of method is suffused with value judgments and, therefore, implications for the results. In other words, a variety of performance indicators can be technically correct, but can emphasize different aspects of policy.

Selection of performance measures is the initial step in designing and implementing a system for monitoring and upgrading the policies set forth in the RTP. After measure selection, the MPO must set periodic benchmarks (e.g. at 5-year intervals) for each set of indicators. The measures must actually be evaluated, and the results must be weighed against the benchmarks. Finally, if the regional transportation system is not achieving its goals, as expressed by the benchmarks, the RTP must be revised to include more effective policies.

RTP MONITORING PROGRAM

	Program Steps
1	Measure Selection (matching indicator sets to Plan goals)
2	Baseline evaluation (calculate current values for indicators)
3	Setting Benchmarks
4	Indicator evaluation (data collection, technical analysis, computation)
5	Performance evaluation (weighing measures against benchmarks)
6	Policy analysis, RTP revision

The quantitative indicators selected in this project fall into one or more of several categories:

- Can be evaluated by RVMPO staff;
- Can be evaluated by ODOT's Transportation Planning Analysis Unit (TPAU) using the "new" model;
- Can only be evaluated after a major data development effort.

The distinction between the old and new transportation models is important because the new model will not be functional until the 2006-2007 fiscal year. Since there is an immediate need for some analysis of the transportation network (specifically highways), the performance measures project will be split across two years. The objectives of this year's project were:

- Measure selection;
- Data collection;
- Evaluation of those indicators that can be calculated using MPO resources;
- Selection of highway performance indicators

TPAU also used the "old" regional transportation model to evaluate the selected highway measures, and a preliminary analysis of those results is included in this report.

The new model will be capable of new types of measurement, as well as greater accuracy for many of the same measures that are produced by the old model. Thus, benchmark-setting will await baseline evaluations using the new model that will be comparable across model runs in future years.

Performance measures for the Rogue Valley RTP were developed with input from ODOT, TPAU, and the MPO members. This report will form the basis for Task 3.3 of the MPO's 2006-2007 UPWP, which is intended to complete the baseline performance evaluation, set interim benchmarks for the RTP, and make policy recommendations.

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Project Objectives

- To build consensus on a set of quantitative performance indicators that meet rigorous technical standards and accurately reflect the values inherent in the adopted goals and policies of the RTP.
- Begin baseline and first-increment evaluations of the region's transportation system by determining values for those performance indicators that can be evaluated in-house by MPO staff. The year 2000 will be the baseline year, and 2005 will serve as the first increment. This will make possible an initial 5-year trend analysis.
- An analysis of the performance of the region's highways, including an examination of the way existing and potential new policies could impact the highway network.
- Prepare a report for publication. Report will describe the way performance of the regional transportation system will be evaluated over the time horizon of the RTP. It will identify strengths and weaknesses in the region's highway system, and make policy recommendations.

Performance Measure Selection

Agency Input

ODOT –

ODOT officials expressed great interest in assessment of the prospects for the regional highway system. The principal concern was to predict the impact of regional population and economic growth on the effectiveness or efficiency of the region's highways, both Interstate and State-designated. ODOT officials wanted to know whether/when planning for increased capacity and/or demand management should commence. They also wanted to know which portions of the network to prioritize for such planning.

The RTP expresses the intent of MPO members that the region's transportation system conform to state transportation goals. These goals are expressed in a variety of documents, including the TPR, STIP, Oregon Transportation Plan (OTP), and the Oregon Highway Plan (OHP). Figure 1 shows how RTP goals correspond to OTP goals. The OHP comprises a more focused set of transportation goals relevant to the region. Most pertinent to the purposes of this project are the OHP's Mobility Standards.

TAC –

The MPO's Technical Advisory Committee looked at a first draft of proposed performance measures. The TAC asked that final indicator selection await preliminary quantitative evaluations. This changed the project strategy somewhat, since some evaluations could not be done until FY 06-07. TAC members (RVTD in particular) made a number of specific suggestions for indicators of compact urban form, transit-friendly development (beyond those included in the RTP's Alternative Measures), multi-modal sensitivity, and the environmental impacts of transportation.

Literature Review

A tremendous amount of research continues to be generated on the subject of measuring transportation system performance. An excellent overview from the perspective of the Oregon planning system was published in October of 2005 by researchers from TPAU and from the Lane Council of Governments (LCOG). This technical report reviews measures currently used in Oregon, identifies some weaknesses, and makes some excellent recommendations for indicators that could meaningfully illuminate the strengths and weaknesses of regional transportation systems. All of the indicators recommended in the report can be evaluated using the new transportation model for the Rogue Valley, and some can be evaluated using the old model. RVMPO staff worked with one of the authors of this report – Brian Gregor, of TPAU – to pick out some of the recommended indicators that would be meaningful in the context of transportation in the Rogue Valley.

Measures for MPO Evaluation

For the purposes of this report, the word "measure" will refer to an evaluation concept or strategy, and the work "indicator" will refer to the specific quantitative methodology used to effect a measure. Figure 2 is a matrix depicting the transportation system performance measures selected for preliminary evaluation by the MPO. Some of these measures can be produced by the MPO, with data from member jurisdictions. Others are products of the regional transportation computer model maintained by TPAU. It is unlikely that all of these measures will be adopted into the RTP, but a preliminary evaluation will help the TAC recommend those measures that are most meaningful for the region. The matrix shows roughly the way each measure relates to the goals of the RTP. Although each measure has a check mark in only one column, most of the measures relate to multiple goals. For instance, in Figure 2, Measures 36 through 39 show how well the region is making use of emerging technology, but 37 through 39 are also have some bearing on how well the region is providing incentives for alternative travel modes. When a measure is of primary importance to more than one goal (such as transit mode share), it is repeated and grouped with other measures for the same goal.

Measure Rationales

Brief rationales are presented here to show why the measures in Figures 2 & 3 were chosen for preliminary evaluation. These rationales are organized by the RTP goals that the measures are intended to evaluate. In several cases, measures are identified as "system output" performance measures or as "system management" performance measures. Output measures evaluate the function of a system, while management measures evaluate policy implementation. As an example, an output measure for modal balance might evaluate the percentage of trips made by walking. A management measure for the same goal might evaluate the implementation of policies that encourage walking, such as increasing the percentage of streets with sidewalks.

Goal 1 – "Plan for, Develop, and Maintain a Balanced Multi-Modal Transportation System that Will Address Existing and Future Needs for Transportation of People and Goods in the Region"

The Goal 1 measures are divided into two categories:

1. evidence of modal balance, and
2. evidence of system network balance.

Modal balance measures look at:

a. the degree to which travelers favor certain modes over others (output performance), and

b. the degree to which the transportation system provides for various modes (management performance).

Network balance measures look at the degree to which routes are utilized. The network is unbalanced when some routes are over-utilized while others are under-utilized.

Measures selected for preliminary evaluation of modal balance are:

	MODAL BALANCE Measure	**RATIONALE**
1	Per-capita VMT	This is the principal performance measure in the TPR, because it is strongly influenced by the proportionate use of single-occupancy vehicles (SOV). As pointed out in the TPAU/LCOG technical report, however, VMT is not a particularly direct measure of modal balance.
2	Person Trips/ Auto Trip	Much more direct measure of SOV use, though the result is based on certain inferences within the regional computer model.
3	Transit mode share	Output measure of the principal alternative mode for which a reasonably accurate measurement methodology is available. Very little data exists for evaluation of traffic volumes for modes such as walking and biking.
	Transit funding per capita	Management measure for regional commitment to transit.
4	% of major streets with sidewalks	While "system output" performance is difficult to measure for alternative modes, "system management" performance can be much more directly measured.
5	Miles of bike lanes	See above.
6	% of Travel Market Basket accessible by non-SOV modes	This is a new indicator recommended in the TPAU/LCOG technical report, and is a very direct measure of modal balance.
7	% of freight shipped by rail	Freight is an important component of traffic in the transportation network, and this is a direct measure of the principal alternative mode.

Measures selected for preliminary evaluation of network balance are:

	NETWORK BALANCE Measure	**RATIONALE**
8	Road Network Concentration Index	This is a direct measure of the balance of the network as a whole.
9	Intersection density	This is actually a measure of "connectivity," and is used here as a "system management" measure, since increasing connectivity is a policy used to improve network balance.
10	Cul de sac and dead end density	This is the inverse of intersection density, in that it measures the amount of development with low-connectivity design characteristics.

Goal 2 – "Optimize Safety and Security on the Transportation System"

Measures selected for preliminary evaluation of the safety and security of the transportation network are:

	NETWORK SAFETY Measure	**RATIONALE**
11	Accident rates – highways	A direct output measure. Highway data contains different attributes than local police data.
12	Accident rates – local	A direct output measure. Highway data contains different attributes than local police data.
13	% of seismically safe bridges	A security management measure (natural hazards).
14	# of at-grade rail crossings	A safety management measure.

Goal 3 – "Use Transportation Investments to Foster Compact, Livable Communities. Develop a Plan That Builds on the Character of the Community, is Sensitive to the Environment, and Enhances Quality of Life."

This Quality of Life (QOL) goal is measurable to the extent that it specifies compact communities and environmental sensitivity. If the region had adopted QOL measures, these could have been incorporated. Although this goal includes environmental sensitivity, environmental measures discussed under Goal 8, below. Most of the RTP's "Alternative Measures" reflect an emphasis on compact urban development. Additional such measures are included in this group.

Measures selected for preliminary evaluation of the ways in which quality of life and transportation inter-relate are:

	QOL Measure	**RATIONALE**
15	Average trip length	While this can be a measure of "smallness," it is mainly a measure of compactness, which is characteristic of communities that do not have wide separations between homes and destinations for jobs, goods, and services.
16	Population density	Direct measure of compactness.
17	Jobs within ¼ mile of transit Households within ¼ mile of transit	Together, these measure the way urban form in the region supports mode choice.
18	Transit stops in TOD's and along transit corridors with special land-use overlays.	This is an indirect measure of the region's commitment to TOD – a type of compact transportation-efficient urban design – since new transit service is generally not provided until demand achieves a certain threshold.
19	Transit stops with pull-outs.	An easily quantifiable measure of the region's commitment to transit-friendly site design.

Goal 4 – "Develop a Plan that Can Be Funded and that Reflects Responsible Stewardship of Public Funds."

Measures sought to reflect this goal were intended to evaluate the effectiveness of the region's transportation investments without attempting a detailed cost-benefit analysis of the entire transportation network.

Measures selected for preliminary evaluation of responsible stewardship of regional transportation investment are:

	FISCAL RESPONSIBILITY Measure	**RATIONALE**
20	% of good roadway	This is derived from data generated by annual reporting requirements of local governments by the state. It reflects the degree to which past road investments are protected through good initial design and ongoing maintenance.
21	TDM funding	Demand management is seen as a reliably cost-effective alternative to capacity development.

Goal 5 – "Maximize the Efficient Utilization of Existing and Future Transportation Infrastructure to Facilitate Smooth Movement of People and Motorized and Non-motorized Vehicles."

This goal was seen as seeking a balance between "system efficiency" and what is referred to by transportation modelers as "perceived cost," i.e. measures that reflect the experience of individual travelers. System efficiency is generally not maximized when perceived cost is minimized. Efficiency implies full utilization, while perceived cost is lowest with minimal utilization.

Measures selected for preliminary evaluation of the utility of the network to its users are:

	PERCEIVED COST Measure	**RATIONALE**
22	Annual congestion delay per capita Annual total delay per capita Travel Time Index	These are travel delay indicators. Since they are per capita measures, (rather than per network mile), they relate to the life experience of the region's residents, or perceived costs of using the transportation system.
23	Intersections with LOS < "D"	This is a measure of travel delay that pertains to the street networks in local jurisdictions.
24	OHP Urban Mobility standard	These standards relate volume-to-capacity (V/C) ratios to highway performance. Most of the standards are set at V/C's of 0.85 or slightly less, above which perceived cost and system efficiency both diminish.

Goal 6 – "Through the Use of Incentives, Encourage Regional Multi-Occupant and Non-Motorized Vehicle Facilities and Services, so That these are the Choice for an Increased Percentage of Regional Trips."

The wording of this goal asks for both system management measures – incentives – and system output measures – increased mode-share – for multi-occupant and non-motorized vehicles. The goal is also divided into four sections (A, B, C and D) emphasizing TDM, parking management, bicycle/pedestrian, and transit strategies, respectively.

Measures selected for preliminary evaluation of Goal 6 are:

	ALTERNATIVE MODES Measure	**RATIONALE**
25	# of employees participating in TMA or other incentive programs	These are some of the most important transit-oriented TDM strategies.
26	# of park-and-ride spaces	Another important transit-oriented TDM strategy.
27	Transit Mode Share	An output measure, also used to measure modal balance.
28	Commercial parking acreage per capita	Ample parking is an incentive for automobile use, so the size of the parking supply is a measure of auto-dependence. However, parking in non-commercial areas is not clearly identifiable, so commercial parking is used as a proxy.
29	Parking vacancy rates	A measure of parking demand.
30	Number of market-rate parking spaces	A system-management measure of an important market-based TDM strategy.
31	Number of jurisdictions with commercial parking maximums	Ditto.
32	Miles of bike lanes	An output measure, also used to measure modal balance.
33	Miles of sidewalks	An output measure, also used to measure modal balance.

Goal 7 – "Provide an Open, Balanced, and Credible Process for Planning and Developing a Transportation System that Complies With State and Federal Regulations."

This goal does not lend itself to quantitative evaluation.

Goal 8 – "Provide Environmentally Sensitive and Healthy Transportation Options."

Some of these measures were included in the

Measures selected for preliminary evaluation of Goal 7 are:

	ENVIRONMENTAL Measure	**RATIONALE**
34	Air quality impacts of the transportation system, as modeled by TPAU using the MOBILE 6 emissions model. MOBILE6 estimates hydrocarbon (HC), carbon monoxide (CO), oxides of nitrogen (NOx), exhaust particulate matter, tire wear particulate matter, brake wear particulate matter, sulfur dioxide (SO2),	These are output performance measures. Only two of these contaminants are enforcement issues in the Rogue Valley, but all of them represent aspects of the transportation system's environmental impact.

	ENVIRONMENTAL Measure	RATIONALE
	ammonia (NH3), six hazardous air pollutant (HAP), and carbon dioxide (CO2) emission factors for gasoline-fueled and diesel highway motor vehicles, and for certain specialized vehicles such as natural-gas-fueled or electric vehicles that may replace them.	
35	Level of alternative fuel use.	At least for biofuels.

Goal 9 – "Encourage Use of Cost-Effective Emerging Technologies Where Appropriate to Achieve Regional Transportation Goals and Policies."

	TECHNOLOGY Measure	RATIONALE
36	Number of ITS systems	A direct output measure.
37	Demand-management ITS systems	TDM is generally considered to be more cost-effective than increasing capacity, so this measure would directly address the goal.
38	Pedestrian-priority ITS systems	A direct output measure.
39	Transit-priority ITS systems	Transit use is generally considered to be more cost-effective than automobile use, and transit-oriented ITS systems would multiply existing efficienies.

Goal 10 – "Use Transportation Investments to Foster Economic Opportunities."

	ECONOMIC IMPACT Measure	RATIONALE
40	Travel Cost Index	A computer model product that can be used with other economic data to measure the transportation component of transaction costs.
41	Travel Market Basket accessible by transit	Also used to measure modal balance. Transit is increasingly seen by the business community as a way of decreasing the opportunity costs embodied in automobile-dedicated infrastructure.
42	Payroll in mixed-use districts	This is a more direct measure of the economic impact of the type of development encouraged as RTP policy.

Methodologies for MPO-Evaluated Measures

Precise methodologies have been recorded for each measure that the MPO has evaluated so far. These include sources, descriptions, and locations of the actual data used in each evaluation. Methodologies also document the software and processes used to analyze the data and generate indicator values. See Figure 3 – a summary table of the measures evaluated so far by MPO staff – for brief descriptions of the data and processes used. In many cases, methods involved spatial

analysis, so the summaries describe GIS data, spatial selection, and spatial arithmetic. Methodologies used for TPAU-generated measures are available from TPAU.

Evaluation Results

MPO Evaluation Results

This section discusses the performance measures that the MPO was able to evaluate during the 2006-2007 fiscal year.

Goal 1 Measures

#	Measure	Value	GOAL	Geography
9	Intersection Density	4.34 per mile of road	Balance	TAZ
10	Dead-end Density	1.38 per mile of road	Balance	TAZ

Discussion – Goal 1 Measures Results

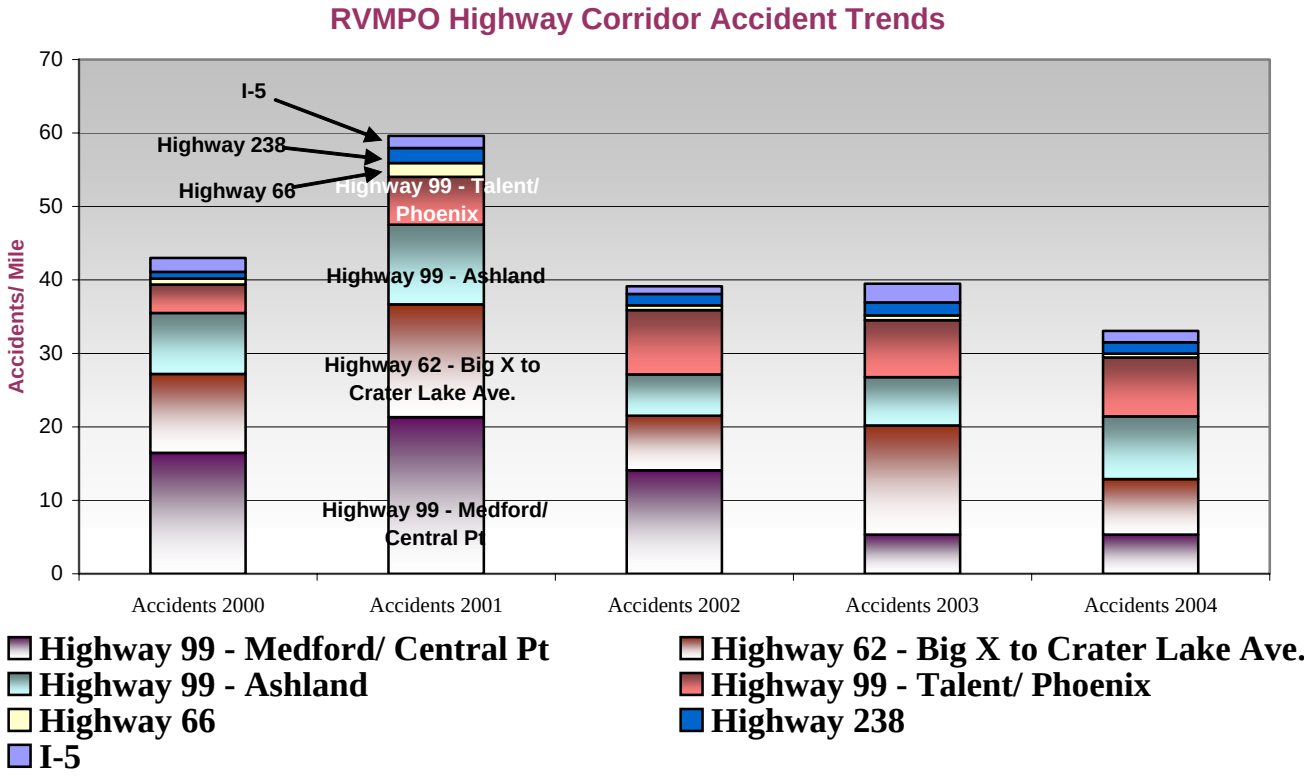
These measures emphasize the connectivity of the local street network. As the results of TPAU's Road Network Concentration Index (RNCI, discussed below) show, local streets vary tremendously in traffic loads. The importance of these density measures is predicated on the idea that a better connected local street network will carry more of the peak hour traffic that would otherwise add to the loading on higher order streets. See the attached Intersection Density map and Cul de Sacs and Dead-ends Density map to understand how these measures vary across the region.

Policy questions to which these results point include:

- How important is connectivity to network balance? This question may be answerable using the new regional transportation model.
- How best to target connectivity efforts to benefit those higher order streets most likely to experience congestion?

Goal 2 Measures

#	Measure	Value	GOAL	Geography
9	Accident Rates - highway	4.12 accidents/mile/year	Safety	TAZ



Source: ODOT GIS

Discussion – Goal 2 Measures Results

From 2000 through 2004, highway safety performance improved dramatically on the stretch of Highway 99 that passes through Medford and Central Point. Accident rates along highway 62 have varied considerably, and can be expected to continue to be variable because of major road construction projects as well as continued commercial development. Accident rates along Highway 99 through Ashland have been fairly steady, but the stretch of 99 that passes through Phoenix and Talent has seen a doubling of the accident rate over this five-year period.

Identifying causal relationships between road or traffic conditions and accident rates is difficult from this analysis. The overall highway accident rate for the entire MPO may be more meaningful from a policy perspective, since conditions on individual roads are subject to a tremendous range of variables.

Goal 3 Measures

	Measure	Value	GOAL	Geography
15	Average trip length	5.22 miles	Compact, livable communities	Network link
16	MPO Population density	0.93 persons/ acre	Compact, livable communities	MPO Boundary
17	Jobs within ¼ mile of transit Households within ¼ mile of transit	55,978 – 74% of total 79,546 – 51% of total	Compact, livable communities	MPO Boundary
18	Transit stops in TOD's and along transit corridors with special land-use overlays.	69 stops	Compact, livable communities	MPO Boundary
19	Transit stops with pull-outs.	1 stop – 1.4% of total	Compact, livable communities	MPO Boundary

Discussion – Goal 3 Measures Results

Along with the baseline inventories for the RTP Alternative Measures, these measures help define the baseline status for the relationship between land use and transportation. An increase in trip length at the next 5-year benchmark evaluation could be an indicator of sprawl, worsening jobs/housing balance, or increasing economic segregation. Population density is one of the oldest measures of urban form, and still one of the most meaningful, as it relates to the nature of trip generation, transit efficiency, the viability of non-automobile transportation modes, and many other transportation issues. Job and housing counts along transit routes are currently quite high. Maintaining these percentages as the region grows will be an indication of a regional commitment to increasing transit ridership.

Goal 6 Measures

#	Measure	Value	GOAL	Geography
28	Commercial off-street parking per capita	356 sq ft/ capita	Incentives for non-automobile mode choices	MPO Boundary

Discussion – Goal 6 Measures Results

This is only one of nine proposed measures for this goal. These measures require extensive data collection, a task that is scheduled for FY 2006-2007. Commercial off-street parking was estimated using Assessor taxlot data and the county orthophoto. The estimate methodology was designed to be conservative, as most lots without clear-cut parking areas were eliminated entirely

from the count. See Figure 3 for more detailed information about the method used to evaluate this measure.

Other Measures

In addition to the measures discussed above for Goal 1, an indicator for one additional Goal 1 measure was evaluated by TPAU. Indicators for an important Goal 5 measure – Travel Delay – were also evaluated by TPAU. These results are discussed below.

A number of measures are listed in the summary table in Figure 2, but are not discussed above. Data for these measures will be collected and evaluations conducted during FY 2006-2007. Many of these measures are closely related to the Alternative Measures delineated in Appendix C of the RTP, so it was deemed efficient to combine evaluation of the remaining RTP measures into next year's Alternative Measures evaluation project.

Conclusions from MPO Evaluations

The performance measures evaluated this year by the MPO reveal both good news and bad news about the region's transportation infrastructure. Despite the region's low overall population density, economic activity and residential development is thickly clustered around the eight transit routes. In areas expected to develop as TOD's, there are already 69 transit stops. So, whatever the actual transit mode share, the region has great potential for high levels of transit use.

Regarding automobile mobility, safety is improving, but lack of connectivity among local streets may be seriously unbalancing the road network. Results from TPAU for congestion measures and network balance support this conclusion.

TPAU Evaluation Results

TPAU obtained the results described here using the old regional model, which includes Medford, Phoenix, and Central Point. This was a limited evaluation intended to be useful for understanding the performance of the region's highways. Therefore, TPAU's modeling efforts were mainly restricted to state and federal highways, and the principal streets that affect them. This included all streets not classified in the model street network as "local." See the nine Highway Measures and Highway Projections maps (at the end of this document).

Regional model results are in no way intended for use in local project review. Facility adequacy and transportation impact analysis require higher resolution data and locally specified methodologies. These results allow a general comparison of different aspects of and locations in the road network. The model produced values for the year 2005 based on current conditions, and for the year 2030. The forecast is based on anticipated regional growth, planned and funded capacity improvement projects, and many other factors.

TPAU Measures for Goal 1

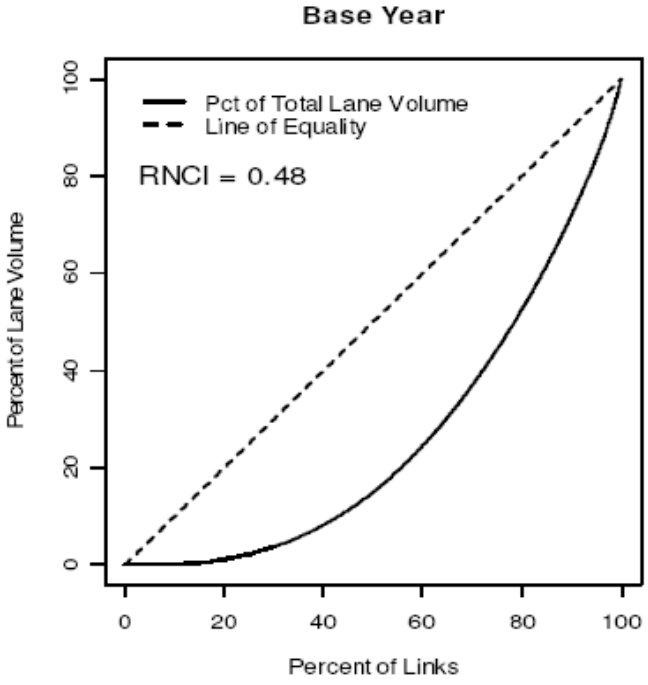
#	Measure	Value	GOAL	Geography
8	Road Network Concentration Index **(RNCI)**	See table below	Balance	Network Link

RNCI	2005	2030
Freeway	**0.13**	**0.12**
Major Arterial	**0.26**	**0.22**
Minor Arterial	**0.29**	**0.29**
Collector	**0.49**	**0.50**
Local	**0.72**	**0.70**
Freeway Ramp	**0.40**	**0.39**
Weighted Arterial/Collector	**0.48**	**0.47**

Discussion

RNCI compares how heavily used are different segments in the network. Most of the results listed above compare segments with the same functional class, i.e. freeway segment to freeway segment, local to local, etc. This is to ensure that comparisons are for roads with similar capacities. When arterials and collectors were considered in the same comparison, they were weighted for capacity. The closer the value of the index is to zero, the more evenly used are the different segments. Not surprisingly, the index is inversely proportional to functional class (the more substantial the road, the lower the index). This is because local variations in connectivity and trip density are averaged in larger traffic sheds. To gauge the meaning of the index values, the example of the arterial/collector index is illustrative: 20% of these roads together carry an insignificant amount of the total traffic for this class, and 60% of these roads together carry less than 20% of the total load.

Weighted RNCI for Arterials and Collectors



Policy questions to which these results point include:

- What index values reflect a healthy network?
- What actions are implied? E.g. would improvements in local connectivity result in a better balanced arterial network?

TPAU Measures for Goal 5

#	Measure	Value	GOAL	Geography
22	**Travel Delay**: Annual Peak-hour Congestion Delay per capita Annual Total Delay per capita Peak Hour Travel Time Index	See tables below	Balance	MPO

Annual Peak-hour Congestion Delay (between 5 & 6 PM) per Capita (hours)

Comparison	Functional Class	2005	2030
Compared with free-flow conditions	All Links	15.66	53.98
	Arterials	9.02	36.62
Compared with LOS D/E	All Links	1.41	26.1
	Arterials	0.81	20.74

Annual Total Delay per Capita (hours)

Comparison	Functional Class	2005	2030
Compared with free-flow conditions	All Links	37.82	147.94
	Arterials	23.87	111.48
Compared with LOS D/E	All Links	3.2	77.11
	Arterials	1.96	65.86

Travel Time Index(between 5 & 6 PM)

Comparison	Functional Class	2005	2030
Compared with free-flow conditions	All Links	1.27	2.06
	Arterials	1.35	2.69
	Non-arterials	1.17	1.42
Compared with LOS D/E	All Links	1.15	1.68
	Arterials	1.2	2.11
	Non-arterials	1.09	1.23

Discussion

TPAU modeled travel delay for both the base year and the year of the RTP planning horizon. Each of the travel delay indicators was based on two comparisons: delay compared to free traffic

flow (speed limit), and delay compared to a V/C ratio of 0.87, which is at the high end of LOS D. Road utilization is at its highest efficiency (most vehicles per hour) at those traffic volumes, though travelers will not be experiencing free-flow traffic conditions. These two comparisons form the basis of a standard by which policy-makers can determine a balance between system efficiency and perceived cost.

Currently, there is an annual total of 16 hours per capita of some level of peak-hour delay, though only about 1.4 hours per year per capita is congested enough to actually diminish roadway capacity. Rush hour currently increases travel times by between 17% and 35% over free-flow conditions. None of which is particularly bad compared to other regions. However, the model projects that by the end of the planning period, rush-hour trips will take more than twice as long as trips made during free-flow conditions – nearly three times as long on arterials (freeways, highways, major streets). The model assumes that all Tier 1 projects will have been completed by 2030, including the South Medford Interchange.

Other TPAU modeling results

TPAU calculated values for a number of other indicators. Some of these were intermediate to the indicators discussed above, such as peak hour V/C ratios for every network link in the analysis (all roads except local streets). TPAU also provided link-by-link calculations for Average Daily Trips (ADT), ADT/Capacity ratios, and Daily Congestion Delay. Finally, TPAU performed some average trip length calculations for selected links along I-5 and Highway 62. Unfortunately, this work was conveyed to the MPO only recently, and MPO staff has not had sufficient time to analyze all these results. At the end of this report are attached a series of maps depicting link values for peak hour V/C, ADT, ADT as percent of total network trips, and the locations of the Select Link Analysis. Daily Congestion Delay has not yet been mapped. MPO staff also mapped V/C as a function of the OHP Mobility Standards.

Figure 2 shows quite a few performance measures intended for evaluation by TPAU. Most of those measures are not

Conclusions from TPAU modeling

While TPAU does not expect network balance (RNCI) to change much over the RTP planning horizon, low balance levels will have an increasingly negative effect on the performance of the Rogue Valley's transportation network. Comparison of the 2005 V/C and Mobility Standards maps with the 2030 forecasts shows that the network will experience increasing levels of stress, with most of the I-5 and Highway 62 corridors falling below OHP Mobility Standards by 2030.

Several possible inferences can be drawn. Examples are:

- The current RTP project list is not sufficient to maintain the long-term functionality of the network.
- Anticipated land development patterns do not sufficiently support the functional sustainability of the road network over the long term.
- The transportation model undervalues policy and behavior responses to congestion and other perceived costs of SOV use (such as increased transit use).

These conclusions are not mutually exclusive. It will be instructive to see if results from next year's modeling work support any or all of these conclusions.

Caveat

It is important to understand the limitations of the modeling work that was done for this project. TPAU's old model does not include the current extent of the MPO planning boundary. At this point, it is not possible to know whether the expanded boundary (including the new member jurisdictions) would improve the performance outlook or not. Besides an expanded planning area, the new model is far more complex, and is expected to more realistically reflect the way travel behavior impacts network performance.

Next Steps

Data Collection

Data collection is necessary for evaluation of the remaining MPO-generated measures. Data inputs for TPAU's new model have already been finalized, and the model-generated measures can be calculated as soon as TPAU's schedule permits. For the MPO-generated measures, a region-wide inventory effort employing GPS data collection and SOU geography students is planned as part of the effort to collect data relating to urban form. This is necessary for a complete assessment of the Alternative Measures and for the Goal 6 measures. Data collection will be focused on identifying mixed-use districts, streetscape characteristics (primarily sidewalks and bike lanes), and parking inventories. These inventory efforts are beyond the staffing capacities of MPO member jurisdictions.

Evaluation of Remaining Measures

Evaluations will be conducted when sufficient data has been collected. This year's results will be combined with those from FY 2006-2007 and presented to the TAC as a comprehensive portrait of the region's current transportation functionality. Results for the Alternative Measures (RTP Appendix C) will also be presented to DLCD.

What If? Scenarios

With input from the TAC, alternate land use and transportation improvement scenarios will be proposed for evaluation by TPAU, as well as any additional performance measures recommended by TAC members. Scenarios will be designed to show the relative effectiveness of various individual transportation-related policies. Hopefully, the results will be useful for setting regional performance benchmarks.

Benchmark Setting

Scenario results and performance benchmark recommendations will be presented to the TAC. TAC will recommend adoption into the RTP of a set of performance measures and benchmarks.

Policy Recommendations

Staff may propose amendments to the RTP that respond to any policy weaknesses revealed by this initial round of performance measurement.