600 NE Grand Ave.
Portland, OR 97232-2736

Metro | *Agenda*

2018 REGIONAL TRANSPORTATION PLAN UPDATE

Regional Freight Work Group - Meeting # 3

Date: Sept. 27, 2016
Time: 8 a.m. – 10 a.m.
Place: Metro Regional Center, Council Chambers
600 NE Grand Avenue, Portland, OR 97232

Agenda items

8:00	**Welcome, and introductions**	All
8:10	**Review Regional Priority Freight Needs** *Review existing regional freight needs that will be presented to TPAC.*	Tim Collins
8:25	**Review 2018 RTP Regional Freight Performance Measures and potential measures for project prioritization**	All
9:40	**Update on Draft Key Freight Trends and Logistics Issues Report**	Tim Collins
9:50	**Next steps** *Need to finalize Freight Performance Measures at additional Regional Freight Work Group meeting in early November. Ask about group's availability during first two weeks in November.*	Tim Collins
10:00	**Adjourn**	

Meeting packet:

- Agenda
- 2018 RTP Regional Freight Performance Measures memo
- Draft Performance Measures Scoping Report (April 2016)
- Regional Freight Network Map (available at meeting)
- List of priority freight needs by mode (available at meeting)

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Metro | *Memo*

Date: September 16, 2016

To: 2018 RTP Regional Freight Work Group

From: Tim Collins, Freight Project Manager, Metro

Subject: 2018 RTP Regional Freight Performance Measures

Introduction

This memo outlines the proposed 2018 Regional Transportation Plan (RTP) freight performance measures developed by Metro staff for review with the Regional Freight Work Group.

Current Freight RTP System Evaluation Measures:

- Total truck delay and cost of truck delay on the regional freight network during the 1-hour mid-day and 2-hour PM peak.
- Congestion – Location and number of miles of throughways, arterials, and regional freight network facilities that exceed RTP motor vehicle-based level of service thresholds during the 1-hour mid-day and the 2-hour PM peak.
- Hours of truck delay per truck trip (region-wide) during the 1-hour mid-day and 2-hour PM peak.

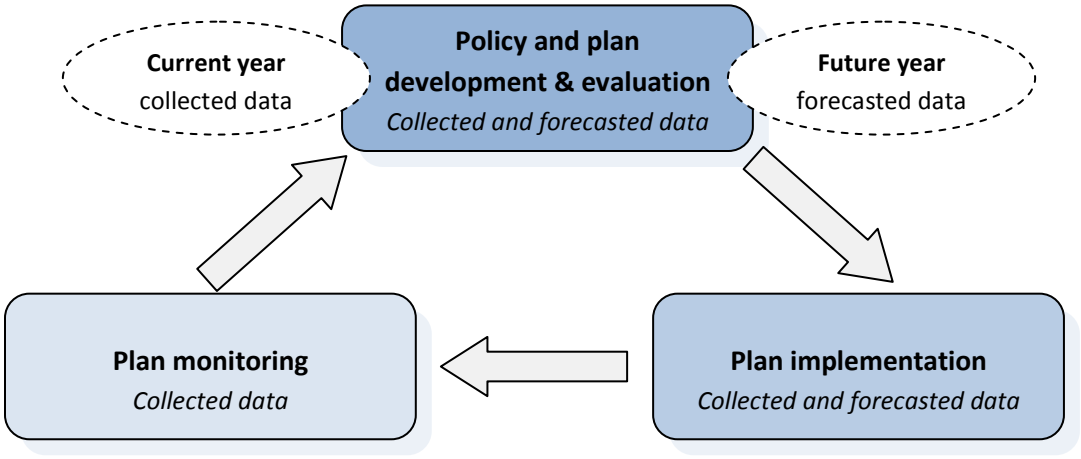
Background: Policy Framework for setting performance measures

Performance measures are indicators that enable decision-makers and other stakeholders to monitor changes in system condition and performance against established visions, goals, objectives and policies. The policy framework guiding the update of regional freight performance measures is captured in Metro's 2014 RTP (Chapter 2) as the foundation for the Regional Freight Network Vision. The five freight policies are:

1. Use a system approach to plan for and manage the freight network
2. Reduce delay and increase reliability
3. Protect industrial lands and freight transportation investments
4. Look beyond the roadway network to address critical marine and rail needs
5. Pursue clean, green and smart technologies and practices

Performance measures serve as the dynamic link between RTP goals and plan implementation by formalizing the process of target-setting, evaluation and monitoring to ensure the RTP advances toward achievement of the region's transportation, land use, economic, and environmental goals. The RTP refers to the process of plan development, evaluation and monitoring over time as the performance measurement system, as shown in Figure 1.

Figure 1. RTP Performance Measurement System



Metro's *Performance Measures Scoping Report* (April 2016) provides the background and context for reviewing and refining adopted regional transportation performance measures and targets for the 2018 RTP.[1] Performance discussions in 2016 are focused on refining the RTP system evaluation measures. Discussions in 2017 will cover performance target setting as well as developing an action plan for system monitoring and Congestion Management Process (CMP) reporting, including an approach to data collection and methods development. The freight performance measures currently do not include monitoring measures.

Table 1 shows the RTP Performance Target, RTP System Evaluation Measures, and proposed RTP Monitoring Measures for regional freight, and distinguishes between current 2014 RTP freight measures and proposed 2018 RTP freight measures.

[1] See the 2018 RTP Performance Measures page: http://www.oregonmetro.gov/public-projects/2018-regional-transportation-plan/performance

Table 1. RTP Freight Performance Measures

Type of RTP Measure	2014 RTP Freight Measures (Current Measure)	Proposed 2018 RTP Freight Measures
RTP Performance Targets set time bound, quantifiable goals for achieving the region's desired policy outcomes for investment in the region's transportation system. These measures use a combination of modeled and observed data.	*"By 2040, reduce vehicle hours of delay per truck trip by 10 percent compared to 2010."*	
RTP System Evaluation Measures compare the base year conditions with alternative investment packages (projects) to document how well each package of transportation investments performs on an array of measures that are linked to RTP goals, and in most cases, overlap with the RTP performance targets.	• Total truck delay and cost of delay on the regional freight network during the 1-hour mid-day and 2-hour PM peak. • Congestion – Location and number of miles of throughways, arterials, and regional freight network facilities that exceed RTP motor vehicle-based level of service thresholds during the 1-hour mid-day and the 2-hour PM peak. • Hours of truck delay per truck trip (region-wide) during the 1-hour mid-day and 2-hour PM peak.	• Total truck delay on the regional freight network from 10 AM to 4:00 PM (replaces 1-hour mid-day) • Accessibility - Number and cost of freight projects on the regional freight network (including railroad lines) that improve accessibility to Port terminals, Marine facilities, Rail yards and other major intermodal freight facilities. • Reliability – Calculate a Buffer Index and a modified Planning Time Index during the AM peak, mid-day and PM peak (1-hour each) for all Main Roadway Routes on the regional freight network.*
RTP Monitoring Measures support the region's federally-required Congestion Management Process reporting between RTP update cycles.	Currently there are no monitoring measures for freight.	• The number and percentage increase in natural gas powered and electric vehicles (EV) from private delivery companies. • The number and percentage increase of conversions from old diesel truck engines to new, cleaner diesel truck engines with DEQ incentives.

* This reliability measure may need to be moved under the RTP Monitoring Measures which will be developed in 2017.

Potential 2018 RTP System Evaluation Measures for Freight

RTP System Evaluation Measures compare the base year conditions of the transportation system with alternative investment packages of projects and programs to document how well each package of transportation investments performs on an array of measures that are linked to RTP Goals.

Table 2, to be developed in coordination with the Regional Freight Work Group and the Performance Measures Work Group; describes the freight measures that could be applied in prioritizing regional freight projects, as well as proposed 2018 RTP freight measures. **Table 2** relates these proposed 2018 RTP Freight System Evaluation Measures and Monitoring Measures back to the freight policies in chapter 2 of the RTP that Metro staff could develop performance measures for.

Table 2. Potential Freight System Evaluation Measures

Policies that serve Regional Freight Network Vision	Descriptions for Proposed 2018 RTP Freight System Evaluation Measures or Monitoring Measures
Reduce delay and increase reliability	- Total truck delay on the regional freight network from 10 AM to 4:00 PM (replaces 1-hour mid-day). Current measure for cost of truck delay on the regional freight network during the 1-hour mid-day and 2-hour PM peak would be retained. - Reliability – Calculate a Buffer Index and a modified Planning Time Index during the AM peak, mid-day and PM peak (1-hour each) for all Main Roadway Routes on the regional freight network. The modified Planning Time Index would provide a ratio of how much more travel time is needed to arrive on time 19 out of 20 times (95th percentile) and excludes mostly the worst weather related or collision incidents from the travel times; and average travel time (50th percentile).**
Look beyond roadway network to address critical marine and rail needs	- Accessibility - Number and cost of freight projects on the regional freight network (including railroad lines) that improve accessibility to Port terminals, Marine facilities, Rail yards and other major intermodal freight facilities. This measure would need to define improved accessibility and could include rail grade separations and rail capacity projects (double tracking) on the regional freight rail network.
Pursue clean, green and smart technologies	- The number and percentage increase in natural gas powered and electric vehicles (EV) from private delivery companies. - The number and percentage increase of conversions from old diesel truck engines to new, cleaner diesel truck engines with DEQ incentives.

**A Reliability measures memo will be developed that will provide a more detailed description of the Buffer Index and the modified Planning Index that will be used; and that will describe the data sources and methodology being used.

Getting there with a connected region

2018 REGIONAL TRANSPORTATION UPDATE

DRAFT Performance Measures

Scoping Report

April 2016

Metro
Making a great place

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Metro is the federally mandated metropolitan planning organization designated by the governor to develop an overall transportation plan and to allocate federal funds for the region.

The Joint Policy Advisory Committee on Transportation (JPACT) is a 17-member committee that provides a forum for elected officials and representatives of agencies involved in transportation to evaluate transportation needs in the region and to make recommendations to the Metro Council.

The established decision-making process assures a well-balanced regional transportation system and involves local elected officials directly in decisions that help the Metro Council develop regional transportation policies, including allocating transportation funds.

Project website: www.oregonmetro.gov/rtp

The preparation of this report was financed in part by the U.S. Department of Transportation, Federal Highway Administration and Federal Transit Administration. The opinions, findings and conclusions expressed in this report are not necessarily those of the U.S. Department of Transportation, Federal Highway Administration and Federal Transit Administration.

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INTRODUCTION

Cities and regions around the country are facing important choices about how and where they want to grow and invest in their communities. Faced with limited funding and significant infrastructure needs, the desire for getting the most out of our transportation investments has increased. Performance-based planning has emerged over the past decade as an effective way to understand the consequences and benefits of the choices facing regions. Performance measurement is a way to build accountability and transparency into the transportation planning process.

When used effectively, performance measures can enable more comprehensive evaluation across multiple issue areas and help communicate tradeoffs and funding decisions to stakeholders. It allows stakeholders and decision-makers to understand whether the region's investment priorities are helping create a great place to live, work and play in an efficient, fiscally-responsible and equitable manner. Applied effectively, performance management can be a powerful tool for building public confidence that the available funds are well spent.

The purpose of this scoping report is to provide background and context to inform a focused review and refinement of adopted performance measures and targets as part of the 2018 Regional Transportation Plan (RTP) update.

PERFORMANCE-BASED PLANNING AND THE RTP

Background

With its adoption, the 2010 Regional Transportation Plan (RTP) introduced a framework for an outcomes-driven, performance-based planning approach intended to better link investment decisions to desired goals. The goals adopted in the RTP reflect values and priorities identified by the public and other stakeholders during development of the plan.

During the 2010 RTP update, Metro convened a performance measures technical work group and worked with regional partners through an extensive process to develop the RTP performance management system. The RTP's performance management system identifies three layers of measurement to establish an on-going evaluation and monitoring cycle.

The **RTP performance targets**, described in Chapter 2 of the RTP[1] set time-bound, quantifiable goals for achieving the region's desired policy outcomes for investment in the region's

RTP Policy Goals

What We Want to Achieve

1. Vibrant communities
2. Economic competitiveness
3. Transportation choices
4. Efficient management
5. Safety and security
6. Environmental stewardship
7. Human health
8. Leadership on climate change

How We Get There

9. Equity
10. Sustainability
11. Accountability

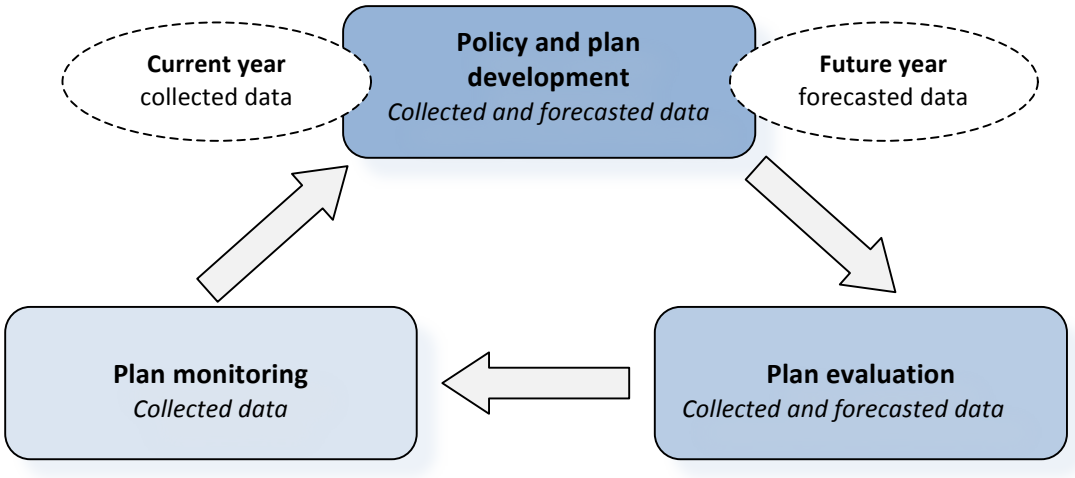
First adopted in 2010 RTP and amended in 2014.

[1] Shown in table 1 on following page & in 2014 Regional Transportation Plan, p. 2-17, available at: http://www.oregonmetro.gov/sites/default/files/RTP-2014-final.PDF

transportation system. The RTP performance evaluation and monitoring framework, described in Chapter 4 of the plan, include the **RTP system evaluation measures** which compare the base year conditions with alternative investment packages (projects) to document how well each package of transportation investments performs on an array of measures that are linked to the RTP goals, and in most cases, overlap with the RTP performance targets[2]. The final measurement layer is the **RTP monitoring measures** that support the region's federally-required Congestion Management Process reporting between the RTP update cycles.[3] Some of these measures also overlap with the performance targets and system evaluation measures, but rely on collected (observed) data rather than forecasted data.

The performance measures will serve as the dynamic link between RTP goals and plan implementation by formalizing the process of target-setting, evaluation and monitoring to ensure the RTP advances toward achievement of the region's transportation, land use, economic, and environmental goals. The RTP refers to the process of plan development, evaluation and monitoring over time as the performance measurement system, as shown in F**igure 1.**

Figure 1. RTP Performance Measurement System



Source: 2014 Regional Transportation Plan

This outcomes-based performance management approach remains in the plan today, with minor updates made to the safety performance target during the 2014 RTP update to reflect recommendations from the 2012 Regional Transportation Safety Plan. Through evaluation and monitoring, the region can better understand the extent to which investments in the transportation system achieve desired outcomes and provide the best return on public investments. Development of a performance measurement system also satisfies benchmarks

[2] See Appendix E for System evaluation measures and linkages to the RTP goals.
[3] See Appendix F for System monitoring measures.

mandated by the Oregon Transportation Planning Rule (TPR) and federal requirements to use performance monitoring as part of the region's Congestion Management Process (CMP).

Table 1 summarizes the current RTP performance targets.

Table 1. 2014 RTP Performance Targets

ECONOMY
Safety –By 2040, reduce the number of fatal and severe injury crashes for pedestrians, bicyclists, and motor vehicle occupants each by 50% compared to 2007 - 2011 average.
Congestion – By 2040, reduce vehicle hours of delay (VHD) per person by 10% compared to 2010.
Freight reliability – By 2040, reduce vehicle hours of delay per truck trip by 10% compared to 2010.
ENVIRONMENT
Climate change – By 2040, reduce transportation-related greenhouse gas emissions per capita below 2010 levels.
Active transportation – By 2040, triple walking, biking and transit mode shares compared to 2010.
Basic infrastructure – By 2040, increase by 50% the miles of sidewalk, bikeways, and trails compared to the regional networks in 2010.
Clean air – By 2040, ensure zero % population exposure to at-risk levels of air pollution.
Travel – By 2040, reduce vehicle miles traveled per person by 10 percent compared to 2010.
EQUITY
Affordability – By 2040, reduce the average household combined cost of housing and transportation by 25 percent compared to 2010.
Access to daily needs – By 2040, increase by 50% the number of essential destinations accessible within 30 minutes by bicycling & public transit for low-income, minority, senior and disabled populations compared to 2010.

2018 Regional Transportation Plan

For the 2018 RTP update, Metro is convening a RTP performance work group to conduct a focused review and refinement of the regional performance management system, specifically the performance targets and the measures recommended for system evaluation and monitoring. The update will respect the significant effort and input that went into developing the 2010 framework by building on that foundation. However, staff will seek opportunities to learn from and build on more recent local, regional, state and national performance-based planning efforts and emerging best practices.

Recent regional efforts

Climate Smart Strategy The RTP performance measures framework guided the evaluation used to inform development of the 2014 Climate Smart Strategy. The adopted strategy[4] included a performance monitoring approach for tracking the region's progress on implementing the strategy. The performance measures identified for monitoring are a combination of existing and new measures, most of which are drawn from the Regional Transportation Plan and the Urban Growth Report, that track existing land use and transportation policies. The measures are summarized in Appendix G.

The Climate Smart Strategy monitoring and reporting system relies on existing performance monitoring requirements per ORS 197.301 and updates to the RTP and Urban Growth Report. The Climate Smart Strategy recommended further review of the measures and performance monitoring targets before being incorporated into the 2018 Regional Transportation Plan. The recommendation recognized the measures and targets may need to be further refined to address new information, such as new MAP-21 performance-based planning provisions and recommendations from Metro's Equity Strategy. The strategy also called for the region to advance the consideration of public health, equity and economic benefits of investment in the region's transportation system as part of the 2018 RTP update.

Metro Equity Strategy Baseline report. This report is the culmination of a year-long process initiated by Metro to better define and evaluate "Equity" in our region – one of the six desired outcomes adopted by Metro Council in 2010 (along with Vibrant Communities, Safe & Reliable Transportation, Economic Prosperity, Clean Air & Water, and Leadership on Climate Change). The research shows that, like most of the nation, the Portland region's communities are becoming more diverse.[5] It is projected that by the year 2045, communities of color will be the majority[6]. The two major transportation equity findings in the report are that:

- Transportation, housing, and other policies that increase car-dependency in our region by not providing adequate transportation alternatives promote cycles of poverty, segregation, and displacement.
- Decision makers should prioritize lowest-cost transportation options such as public transit, walking, and biking that safely and effectively connect people to jobs, housing, places of worship and education, services and social activities.

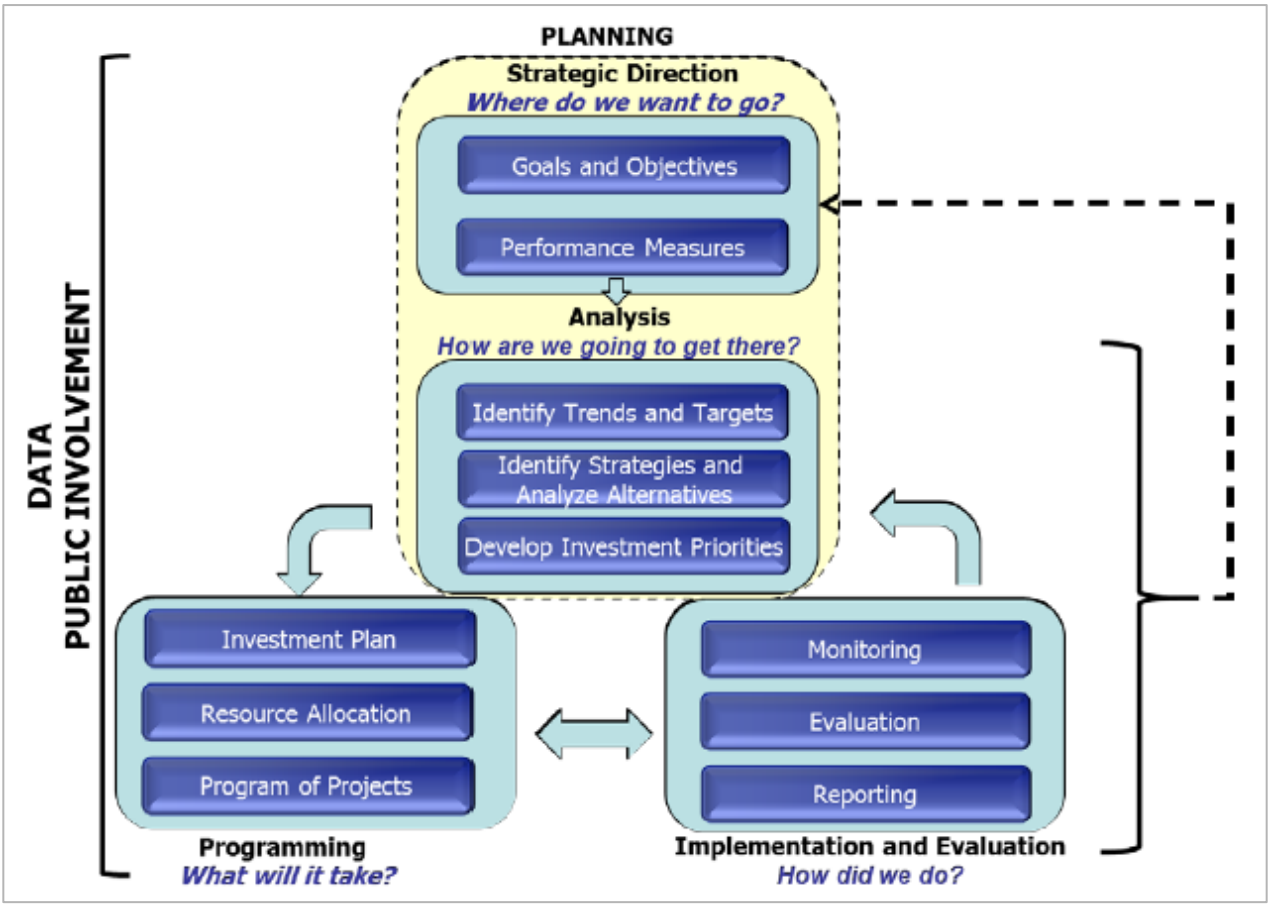
Recent national efforts

Since passage of the Moving Ahead for Progress in the 21st Century (MAP-21) in 2012, the US DOT, Transportation Research Board and others have been conducting research and developing best practices, case studies, guidebooks and other tools to support implementation

[4] The 2014 Climate Smart Strategy is available at: http://www.oregonmetro.gov/climatesmart
[5] U.S Census Bureau, 2010.
[6] Metro Equity Strategy Baseline report, available at http://www.oregonmetro.gov/equity-framework-report

of performance-based planning and programming (PBPP) by MPOs, state DOTs and transit agencies. Links to these efforts are provided in Appendix A. Performance management is credited with improving project delivery, informing investment decision-making, focusing staff on leadership priorities, and providing greater transparency and accountability to the public. Figure 2 demonstrates how PBPP stages fit within a traditional planning and programming process.

Figure 2. Performance-Based Planning Framework



Source: Performance-Based Planning and Programming Guidebook. US Department of Transportation (September 2013)

In Spring 2015, Transportation For America published *Measuring What We Value: Setting priorities and evaluating success in transportation*. This report describes the various ways performance measures can be used in long-range planning, project selection and alternatives analysis - including methods successfully in use across the country. It highlights innovative efforts of DOTs and MPOs and covers a wide array of measures that address the public's interest in the transportation system.

Recent local efforts

In early 2016 Metro hosted a Measuring Success workshop. More than sixty transportation staff, public officials and community advocates from across the Metro region met to share ideas and learn how to best bring performance measures into transportation planning. Guest presenters from Transportation for America, Washington County and the cities of Wilsonville and Portland shared both local and national models for performance-based planning and decision-making. Presentation topics included:

- The Portland TSP update used multi-modal performance measures for evaluating and prioritizing transportation projects and programs
- The Wilsonville Transportation System Performance Report[7]
- Washington County Multimodal Performance measures & standards for different levels of planning: TSP, Corridor / Project Plan, Development Review/Plan Amendments[8]
- Transportation For America's best practices on performance measures & experience from other regions[9]

Takeaways from the workshop include:

- Impressive turnout / interest given the technical topic
- It is helpful to hear how various local jurisdictions are using and applying performance measures. While application approaches and scales varied, all were working towards a common goal.
- It was interesting to hear about investment level measures from the Bay Area MTC.

Moving forward in the 2018 RTP update

Updating the RTP's evaluation framework will include working with partners to advance the region's performance based planning efforts to address requirements and recommendations of MAP-21, the 2014 Climate Smart Strategy for the Portland metropolitan region and the recent Baseline Framework Report for Metro's Equity Strategy.

It is anticipated that this work will further align the region's investment priorities with the plan's goals, performance targets, and expected resources. In addition, this work will help demonstrate how investments in the transportation system will help achieve the six desired regional outcomes and the goals of the RTP. This work will inform recommendations on further development of data, methods and analytic tools needed to improve our ability to measure the impacts of investment options across economic, equity and environmental goals to demonstrate the return on investment across multiple outcomes.

[7] Accessed at http://www.ci.wilsonville.or.us/DocumentCenter/View/9681
[8] Accessed at https://www.oregon.gov/LCD/TGM/TGMProducts/1F-12_1.pdf
[9] Accessed at http://t4america.org/2015/03/03/new-t4a-report-measuring-what-we-value/

The refined RTP evaluation framework and related performance targets will be used for three purposes:

(1) to identify where the region is meeting its transportation goals or falling short;

(2) to identify how the region will assess the benefits and impact of projects and programs that are identified for inclusion and/or prioritization in the plan's shared investment strategy, to be developed in 2017; and

(3) to identify how the region will monitor and track progress in between RTP updates as part of the federally-required Congestion Management Process (CMP) reporting.

One guiding principle will be to simplify and reduce the number of measures, while remaining comprehensive. The current performance-based planning framework is overly cumbersome and complicated to administer and be meaningfully used in the regional decision-making process. Any adjustments to the RTP targets and measures need to be easily understood by the public and elected officials and reflect the topic areas that they value most in order to be useful for decision-making.

Another guiding principle will be to balance monitoring of previously-defined measures with the development of new measures over time. Monitoring the same measures cyclically over time is a fundamental requirement of a measurement program so that the region can track its progress. However, the current RTP identifies certain measures that are essentially "to be determined," and the current national discussion surrounding federal performance measure rule-making has highlighted the desire and need for meaningful and comprehensive accessibility and reliability measures, two areas that are not adequately addressed in the current RTP. The RTP update provides an opportunity to advance development of accessibility and reliability measures.

FEDERAL REQUIREMENTS

MAP-21

Signed into law in 2012, the Moving Ahead for Progress in the 21st Century (MAP-21) created the most significant federal transportation policy shift since the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA). A fundamental element of the legislation was its focus on performance-based planning and programming.

For the first time, MAP-21 established a performance management framework intended to improve transparency and hold state transportation departments, transit agencies and metropolitan planning organizations (MPOs) accountable for the effectiveness of their transportation planning and investment choices. The objective of the new framework was to ensure States and MPOs invest federal resources in projects that collectively will make progress toward the achievement of the national goals identified in MAP-21.

The legislation established seven national performance goals for the federal-aid highway program and directed the USDOT to develop performance measures for each goal area:

- **Safety** – *to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.*
- **Infrastructure condition** – *To maintain the highway infrastructure asset system in a state of good repair.*
- **Congestion reduction** – *To achieve a significant reduction in congestion on the National Highway System.*
- **System reliability** – *To improve the efficiency of the surface transportation system.*
- **Freight movement and economic vitality** – *To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.*
- **Environmental sustainability** – *To enhance the performance of the transportation system while protecting and enhancing the natural environment.*
- **Reduce project delivery delays** – *To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agency work practices.*

In addition, MAP-21 directed state transportation departments, transit agencies, and metropolitan planning organizations (MPOs) to incorporate a performance-based approach in their planning, including measures and targets, that are to be used in transportation decision-making. States and MPOs must set targets for measures specified by USDOT and track and report progress toward meeting these targets.

FAST Act

Fixing America's Surface Transportation (FAST ACT) passed Congress in December 2015, replacing MAP-21. The FAST ACT did not make any major changes to the Performance Requirements of MAP-21 and did not add any new performance measures.

Status of Federal MAP-21 Rulemaking

USDOT has released and received comment on the first two sets of performance measures required by MAP-21 for safety and condition for highways and bridges. The agency is expected to release the last set of measure required by Map-21, which will cover "System Performance" in the coming months. These will cover system reliability, interstate freight reliability, traffic congestion and mobile source emissions.

The most recent schedule for federal rulemaking is summarized in **Table 2**.

Table 2. MAP-21 Rule-making status

Performance Areas	Notice of Proposed Rulemaking	Comments Due	Anticipated Final Rule
Safety Performance Measures	March 2014	Closed June 2014	Published
Highway Safety Improvement Program	March 2014	Closed June 2014	March 2016 Published
Statewide and Metro Planning; Non-Metro Planning	June 2014	Closed Sept 2014	July 2016
Pavement and Bridge Performance Measures	January 2015	Closed May 2015	September 2016
Highway Asset Management Plan	February 2015	Closed May 2015	August 2016
System Performance Measures	April 2016 (projected)	120 days	Unknown

Source: Accessed on April 7, 2016 at: www.fhwa.dot.gov/tpm/about/schedule.pdf

To date, 12 performance measures have been identified through MAP-21 and subsequent USDOT rulemaking. Table 3 summarizes the performance measures identified for each national goal area.

Table 3. MAP-21 National Goal Areas, Federal Performance Measures, and Existing RTP measure

National Goal Area	Federal Performance Measure(s)	2014 RTP Target / Measure
Safety	Fatalities (number[10] and rate per 100 million vehicle miles traveled) Serious injuries (number[11] and rate per 100 million vehicle miles traveled)	By 2040, reduce the number of fatal and severe injury crashes for pedestrians, bicyclists, and motor vehicle occupants each by 50% compared to 2007 - 2011 average.
Infrastructure condition	Condition of pavements on the Interstate System Condition of pavements on the National Highway System (excluding the Interstate System) Condition of bridges on the National Highway System (including the Interstate System)	None
Congestion reduction*	Traffic congestion	By 2040, reduce vehicle hours of delay (VHD) per person by 10% compared to 2010.
System reliability*	Performance of the Interstate System Performance of the non-Interstate NHS	None – though reliability is called out as recommended as a system monitoring measure. Also, there's a target labeled "freight reliability" but it measures congestion, not reliability.
Freight movement and economic vitality*	Freight movement on the Interstate	By 2040, reduce vehicle hours of delay per truck trip by 10% compared to 2010.
Environmental sustainability*	On-road mobile source emissions	By 2040, ensure zero % population exposure to at-risk levels of air pollution.
Reduce project delivery delays*	None	None - likely to be addressed within MTIP document, not RTP.

** Note: Draft performance measures for these goal areas have not been released by USDOT. The measures shown reflect the performance areas identified in MAP-21. The system performance measures are projected to be released in April 2016 for a 120-day comment period.*

Clean Air Act

Due to the region's past history of exceeding the National Ambient Air Quality Standards (NAAQS) for the certain regulated air pollutants, the region has been required to demonstrate the transportation investments in the region will not have detrimental impacts to air quality. As

[10] Number of motorized and non-motorized fatalities.
[11] Number of motorized and non-motorized serious injury crashes.

part of the region's demonstration, it has committed to conducting assessment, monitoring, and mitigation activities. These include:

1. Conducting transportation conformity assessments for a 20-year time frame;
2. Implementing transportation control measures (TCMs)[12]; and
3. Monitoring certain air pollutants and transportation activities and if triggered, implementing any antibacksliding air quality measures.

The region will continue to ensure it is meeting any performance standards required for federal air quality compliance purposes.

Implications for 2018 Regional Transportation Plan update

Performance measures and targets in the adopted 2014 Regional Transportation Plan cover all federal performance goal areas to some extent, except for infrastructure condition, reliability and project delivery delays. As noted previously, the USDOT has not yet completed rulemaking that would establish more specific measures within the national goal areas related to system performance.

Once final rulemaking for each performance area is complete, State DOTs and MPOs will be required to set performance targets and measures consistent with the USDOT goal areas and final measures. States will have one year following the effective date of the final rules to set statewide targets and MPOs will have 180 days following the State DOT deadline. Metro will coordinate with ODOT, TriMet and SMART to ensure consistency between performance measures. This coordination will occur as part of the 2018 RTP update and through other means.

Metro has been working on performance measurement within several past RTP updates. Now that there is a federal framework & requirements around this topic, Metro plans to reorganize its approach to be consistent with MAP-21 and build around it. Metro anticipates moving toward a simplified Goals-Targets-Measures structure as shown below.

Additionally, since the region's designation from non-attainment to attainment status of the National Ambient Air Quality Standards (NAAQS), the region has demonstrated with each RTP

[12] The Second Portland Area CO Maintenance Plan, approved by the Oregon Environmental Quality Commission and US EPA, includes three TCMs: 1) Transit Service Increase - Regional transit service revenue hours (weighted by capacity) shall be increased 1.0% per year; 2) Bicycle Paths - Jurisdictions and government agencies shall program a minimum total of 28 miles of bikeways or trails within the Portland metropolitan area… A cumulative average of 5 miles of bikeways or trails per biennium must be funded from all sources in each Metropolitan Transportation Improvement Program (MTIP); and 3) Pedestrian Paths - Jurisdictions and government agencies shall program at least nine miles of pedestrian paths in mixed use centers… including the funding of a cumulative average of 1½ miles in each biennium from all sources in each MTIP.

and MTIP that future transportation investments will not cause air pollution levels to exceed the NAAQS and transportation control measures are being implemented in a timely manner. As the region approaches the 20-year anniversary of reaching the attainment status, the region will no longer need to perform the assessment of future investments as of October 2017. Nonetheless, the region will continue to implement the identified transportation control measures and work with partners to monitor air pollution levels. These transportation control measures may get incorporated "as-is" as part of the RTP performance monitoring and/or serve as a monitoring tool or help shape potential modification to existing RTP performance targets.

Sample of Refined RTP Performance Measures Framework

RTP Goal	RTP Performance Target	RTP Performance Measure

STATE REQUIREMENTS

Oregon Transportation Planning Rule

The Oregon Transportation Planning Rule requires the RTP to include performance measures that ensure the transportation system is adequate to serve planned land uses and demonstrate progress toward increasing transportation choices, reducing reliance on the automobile and increasing biking, walking, sharing rides and use of transit. Specifically, TPR Section 660-012-0035(5) states:

"(5) MPO areas shall adopt standards to demonstrate progress towards increasing transportation choices and reducing automobile reliance as provided for in this rule:

(a) The commission shall approve standards by order upon demonstration by the metropolitan area that:

(A) Achieving the standard will result in a reduction in reliance on automobiles;

(B) Achieving the standard will accomplish a significant increase in the availability or convenience of alternative modes of transportation;

(C) Achieving the standard is likely to result in a significant increase in the share of trips made by alternative modes, including walking, bicycling, ridesharing and transit;

(D) VMT per capita is unlikely to increase by more than five percent; and

(E) The standard is measurable and reasonably related to achieving the goal of increasing transportation choices and reducing reliance on the automobile as described in OAR 660-012-0000."

The RTP performance targets (shown in Table 1), the regional modal targets (described below and shown in Appendix C), the interim regional mobility policy (described below and shown in Appendix D), and the system evaluation measures (found in Appendix E) have served as the basis for meeting Section 660-012-0035(5) and determining whether the proposed transportation system adequately addresses the RTP goals[13] and planned land uses during the plan period.

2040 Regional Modal Targets

The RTP non-drive alone modal targets (shown in Appendix C) reflect the region's current approach for complying with Oregon Transportation Planning Rule's requirement to reduce reliance on single-occupancy vehicles and vehicle miles traveled by 10 percent per capita. The targets are goals for cities and counties to work toward as they implement the regional land use vision, the 2040 Growth Concept, at the local level. The most urbanized areas of the region, such as regional centers, town centers and main streets, have higher non-drive alone modal shares (for travel to and within them) than less developed areas closer to the urban growth boundary. Progress toward the modal targets are reported as part of updates to the RTP.

Implications for 2018 Regional Transportation Plan update
Given the overlap with the RTP performance target for a tripling of walking, biking and transit mode share region-wide and an expectation that the region will continue to experience reductions in vehicle miles traveled per capita, the 2018 RTP update presents an opportunity to consider consolidating the two Non-SOV modal targets to aid in simplifying the RTP performance-based planning approach.

Oregon Highway Plan

The Oregon Highway Plan (OHP) Highway Mobility Policy (Policy 1F) sets targets for identifying state highway mobility performance expectations for regional and local planning and plan implementation purposes. Table 7 of the OHP defines acceptable Volume to Capacity Ratio targets within the Portland Metro region. Table 7 reflects a level of performance in the region that the Oregon Transportation Commission (OTC) deemed tolerable at the time of its adoption. At the same time the Metro and the OTC also recognized the policy as an incremental step toward a more comprehensive set of measures that consider congestion, safety and other aspects of system performance, as well as financial, environmental and community impacts. It was intended for interim use only, with the expectation that Metro would work with ODOT and stakeholders to explore a variety of measures to assess mobility and to develop alternative targets that best reflect the multiple transportation, land use, and economic objectives of the region.

[13] Shown within Appendix E of this report and in 2014 Regional Transportation Plan, p. 2-12, available at: http://www.oregonmetro.gov/sites/default/files/RTP-2014-final.PDF

Interim Regional Mobility Policy

Table 7 of the OHP is incorporated into the RTP as the interim regional mobility policy[14], shown in Appendix D. The interim regional mobility policy shows the minimum performance level desired for major roadways within the region. It describes operational conditions that are used to evaluate the quality of service of the road network, using the ratio of traffic volume to planned capacity (referred to as the volume/capacity ratio) of a given roadway. The measures are used to diagnose the extent of roadway congestion during different times of the day in order to identify deficiencies, i.e. roadway facilities and services in the plan that do not meet the mobility target.

The OTC adopted amendments to the OHP in December 2011. Action 1F3 recognizes that where it is infeasible or impractical to meet the mobility targets in Table 7, ODOT, regional and local jurisdictions may explore different target levels, methodologies and measures for assessing mobility, while balancing mobility with other policy objectives.

ODOT Region 1's "*Portland Metro Area Highway Performance Project*" aims to make recommendations for:

- A small set of performance measures for mobility and safety for application in the Portland metropolitan area.
- A decision-making framework that shows where, under what circumstances, and how certain performance measures could apply in long-range planning and development review.

Implications for the 2018 Regional Transportation Plan update

No changes are recommended to the interim regional mobility targets, however this section will be expanded to provide guidance in the RTP and in Section 3.08.230 of the RTFP on how the mobility policy applies to planning decisions, and how it relates to and complements other regional targets and policies. The mobility policy is principally an issue for the freeways and statewide highways on the region's principal arterial system. Findings and recommendations from ODOT's Portland Area Highway Performance Project are anticipated in late Spring 2016. ODOT region 1 staff will engage stakeholders in this work. ODOT's staff representative on Metro's performance measures work group will help ensure that the state and regional efforts stay coordinated.

Metropolitan Greenhouse Gas Reduction Targets Rule

Metro is required to show ongoing progress in the RTP toward meeting the State goal to reduce greenhouse gas emissions by at least 75 percent below 1990 levels by 2050 (HB 3543). In 2011,

[14] Described as "interim" since the State and region have recognized this policy is not a comprehensive way to measure performance of the road system. The OTC has indicated a desire to advance beyond the traditional mobility performance measure used to guide investment decisions. See description of the "Portland Metro Area Highway Performance Project" on following page.

the Land Conservation and Development Commission (LCDC) adopted rules (OAR 660-044) setting targets to guide long range-planning by Oregon's largest urban areas to reduce greenhouse gas emissions from light-duty vehicle travel. The rules call for each MPO to explore ways to reduce greenhouse gas emissions from auto and light truck travel by 17 to 21 percent per person by the year 2035 (in addition to reductions anticipated to come from advancements in technology and state and federal actions). The Portland region target is to achieve a 20 percent per capita reduction by 2035, in addition to what was anticipated to be achieved through changes to vehicle fleet and technology.

On May 21, 2015, the LCDC reviewed and approved the Portland metropolitan area's Climate Smart Strategy for achieving the required reductions in greenhouse gas emissions. The strategy is expected to reduce greenhouse gas emissions from cars and and light trucks by 29 percent by 2035. At that same time, LCDC agreed the state rules[15] should be updated to set greenhouse gas emissions reduction targets for the year 2040 to be available for future RTP updates. To do this, the Department of Land Conservation and Development (DLCD) will convene an advisory committee and will work with metropolitan areas, ODOT and other stakeholders to evaluate how these modeling and planning efforts can be integrated into other metropolitan area work on transportation and land use plans, such as the RTP.[16]

Implications for 2018 Regional Transportation Plan update
The RTP performance work group will assess how to update the existing greenhouse gas reduction target included in Chapter 2 of the RTP to be consistent with State rules and the 2014 Climate Smart Strategy. Metro staff will serve on the DLCD advisory committee and will coordinate with Metro staff leading the RTP performance measures work. Additionally, Metro and ODOT staff are working together to support the region's transition to using the EPA-approved MOVES model for reporting this measure.

CHALLENGES AND ISSUES TO BE ADDRESSED

The use of performance measures is an evolving practice and MPOs across the nation have faced significant challenges integrating them into the planning process. Reports for the USDOT and the Transportation Research Board found the following typical challenges:[17] [18]

- **Right-sizing measures to balance relevance, simplicity and coverage.** Selecting the right number and mix of performance measures can be a challenge and is an evolving process. Some types of performance are easier to measure than others.

[15] OAR 660-044. Accessed on 3/17/16 at:
arcweb.sos.state.or.us/pages/rules/oars_600/oar_660/660_044.html
[16] Information on this effort can be found at:
www.oregon.gov/LCD/CLIMATECHANGE/pages/metropolitan_greenhouse_gas_reduction_targets.aspx
[17] USDOT, Incorporating Performance Measures into Regional Transportation Planning, Accessed 12/30/15 at https://planning.dot.gov/Peer/WashingtonDC/dc_2010.asp.
[18] Transportation Research Board, Performance Management in Practice.
Accessed 12/31/15 at http://onlinepubs.trb.org/onlinepubs/trnews/trnews293.pdf

- **Getting the right data and getting the data right.** Agencies must be creative in dedicating adequate resources to develop and implement an effective performance measurement strategy. Performance measures are only useful if based on credible, consistent, and timely data—and acquiring good data is costly. An agency must manage expectations when embarking on performance based planning given the difficulty in setting up a data collection system.
- **Getting to data-driven decisions.** Developing an effective performance measurement approach takes time and capacity building. Defining how performance data will be used to prioritize resources is critical in implementing an effective performance management program. These decisions cannot be based solely on performance data, however, because many non-quantifiable factors are at play, and practicalities such as equity must be considered and may not always be quantifiable with data.
- **Making it relevant and communicating effectively.** Many agencies struggle with transforming data into information and presenting the result in a manner that enables meaningful conclusions and helps tell a story that the public and elected officials care about and understand. Data presentation must help to tell not only how the system is performing but why. The information must also be easily understood by the public and elected officials in order to be useful for decision-making.

The Portland metropolitan region has found all of these issues to be present in past discussions and use of performance measurement. Regarding the second challenge listed above, collecting and managing data has indeed proven to be expensive and difficult. Thankfully, with advancements in intelligent transportation systems in the region, more and better data is available today and will continue to grow with the implementation of data collection projects identified in the 2010 Regional Transportation System Management and Operations (TSMO) Plan.[19]

Since 2008, the region has provided ongoing funding for implementation, including an annual Regional Flexible Fund Allocation to fund PORTAL[20], the regional transportation data archive, housed and maintained by Portland State University (PSU) in partnership with ODOT, TriMet, Metro and other agencies. PORTAL provides data aggregation, maintenance and reporting on the region's roadways and transit systems. Metro will continue to work with ODOT and other regional partners to expand existing data collection and performance monitoring and reporting capabilities, in order to better track system performance for all modes of travel and implement MAP-21 performance-based planning requirements and the region's congestion management process.

[19] http://www.oregonmetro.gov/sites/default/files/062010_regional_transportation_system_management_operations_plan_executive_summary.pdf

[20] http://portal.its.pdx.edu/

ASSESSMENT OF CURRENT RTP PERFORMANCE TARGETS, SYSTEM EVALUATION MEASURES AND SYSTEM MONITORING MEASURES

In order to help focus the efforts of the RTP performance work group, Metro staff has prepared an assessment of the existing RTP targets and measures, summarized in Table 4.

Table 4. Assessment of existing RTP Performance Targets and Measures

RTP Measure	Assessment
2014 RTP Performance Targets ***Establish quantifiable goals for what we are trying to achieve with our investments***	
Safety –By 2040, reduce the number of fatal and severe injury crashes for pedestrians, bicyclists, and motor vehicle occupants each by 50% compared to 2007 - 2011 average.	The region does not currently forecast this measure, though this could be explored. Discuss the possibility of establishing a more ambitious, "Vision Zero" target (eliminating all fatalities) with RTP safety work group. The draft state Transportation Safety Action Plan has included a vision zero statement. The city of Portland has adopted a Vision Zero Target. MAP-21 rulemaking also identified additional measures related to the rate of fatalities and serious injury crashes. These measures will need to be included in the 2018 RTP for consistency. The RTP Performance work group will develop a recommendation on this target in coordination with the safety work group.
Congestion – By 2040, reduce vehicle hours of delay * (VHD) per person by 10 percent compared to 2010. **Delay is defined in RTP as time accrued in congested conditions (V/C 0.9)*	This measure can be forecasted. Delay (time spent in traffic) is understandable to public but has an unintended bias that free-flow conditions are the desired performance target and does not account for the travelers who are less exposed to congestion, such as transit riders and people biking and walking. As a result, this measure needs to be placed in context and should not be as a "standalone" measure. The current method of calculating on a per capita basis helps factor in travelers who are less exposed to congestion. MAP-21 rulemaking is anticipated to identify a

RTP Measure	Assessment
	delay-based measure for MPOs and DOTs. The RTP performance work group should review how this measure is calculated (e.g., maximum throughput speed versus free-flow speed, v/c 0.9 or versus v/c 1.0). The State of California has shifted away from LOS/delay to VMT per capita and per employee to measure project level and development impacts. The RTP performance work group will develop a recommendation on this target.
Freight reliability – By 2040, reduce vehicle hours of delay per truck trip by 10 percent compared to 2010.	This is not a true reliability measure. Reliability is a measure of the variability in travel time, not simply the delay in travel time. SHRP2 and other research have devised feasible, data-driven methods to measure roadway reliability. Staff recommends discussing how the region could support and apply such techniques to freight corridors. The RTP performance work group will develop a recommendation on this target in coordination with the RTP freight work group.
Climate change – By 2040, reduce transportation-related greenhouse gas emissions per capita below 2010 levels.	This should be updated through the 2018 RTP update to be consistent with Oregon's more aggressive target for greenhouse gas emissions reduction and the region's reduction target for light-duty vehicles. Metro and ODOT staff are working together to support the region's transition to using the EPA-approved MOVES model for reporting this measure and will make recommendations to the RTP performance work group.
Active transportation – By 2040, triple walking, biking and transit mode shares compared to 2010.	Mode share works well and is a direct outcome of transportation and land use policies and investments. This data is tracked by U.S. Census Bureau and through regional household travel activity surveys and can be forecasted using the regional travel model. Metro's Equity Baseline Framework Report

RTP Measure	Assessment
	emphasizes the need to prioritize investments in the lowest cost options: walking, biking, & transit. The RTP performance work group will develop a recommendation on tripling the share of trips made by biking, walking and using transit.
Basic infrastructure – By 2040, increase by 50% the miles of sidewalk, bikeways, and trails compared to the regional networks in 2010.	This measure is a good way to track progress in implementing regional vision for completion the region's walking and biking systems. Lack of sidewalk GIS data for all RTP projects prevents estimating whether or not the region is meeting the sidewalk completion target. Lack of regularly updated regional sidewalk data layer also hinders the region's ability to track progress. From an equity perspective, the RTP update should consider a sub-target that addresses the basic infrastructure needs in underserved / low-income communities to advance consideration of equity in investment decisions. The RTP performance work group will develop a recommendation on this target in coordination with the RTP transportation equity work group.
Clean air – By 2040, ensure zero percent population exposure to at-risk levels of air pollution.	This measure has mainly been addressed through air quality conformity analysis, but some additional refinements are needed. Currently, the region is focused on federally-regulated mobile source emissions (e.g., ozone, CO and PM 2.5). More discussion is recommended on whether to include non-regulated pollutants such as air toxics as recommended by the Portland Air Toxics Solutions study completed in the DEQ.[21] This measure may also be addressed through a voluntary memorandum of understanding developed by Metro and DEQ once the region's transportation conformity obligations expire in October 2017.

[21] http://www.deq.state.or.us/aq/toxics/pats.htm

RTP Measure	Assessment
	The RTP performance work group will develop a recommendation on this target in coordination with the equity work group, specifically whether non-regulated pollutants such as air toxics should be included.
Travel – By 2040, reduce vehicle miles traveled per person by 10 percent compared to 2010.	VMT works well as a target and has emerged as a best practice nationally. This measure captures the full extent of vehicle travel, tracks changes in driving in the region and helps track the potential for increased fatalities. Research has document a strong correlation between fatality rates and annual per capita vehicle miles traveled (VMT), or total miles driven. The TPR seeks to ensure VMT per capita does not increase by more than 5% per year. The Climate Smart Strategy is expected to result in a 6% reduction in VMT per capita by 2035 (from 2010 levels). This measure is useful to use alongside additional measures such as mode share that capture the generally intended goal implied by lower VMT: more travel with other modes like transit, biking, and walking. This measure and the region's travel model do not account for how increasing market penetrations of transport-as-service (e.g. Uber) and automated vehicles may affect achievement of our VMT target. Growth in VMT can be an indicator of economic growth. VMT *per employee* may better factor in fluctuation in VMT due to economic swings. The region also monitors annually for increases in VMT as part of a memorandum of understanding with DEQ and as part of our on-going monitoring to ensure the region is not "backsliding" on its attainment status for ozone pollution. The monitoring of VMT must remain in place unless the region undertakes revision to the State Implementation Plan with DEQ.

RTP Measure	Assessment
	The RTP performance work group will develop a recommendation on this target, considering whether 10% reduction is the appropriate target.
Affordability – By 2040, reduce the average household combined cost of housing and transportation by 25 percent compared to 2010.	While observed data is available, this measure is not easily calculated through the regional travel demand model. In addition, the RTP has limited ability to reduce housing costs. The RTP update should consider refining in several ways, e.g. setting a more realistic target given rising housing costs, focusing on renters, and/or considering affordability by different income groups. The RTP performance work group will develop a recommendation on this target in coordination with the transportation equity work group.
Access to daily needs – By 2040, increase by 50% the number of essential destinations accessible within 30 minutes by bicycling & public transit for low-income, minority, senior and disabled populations compared to 2010.	This target needs to be revisited and refined through the RTP update to create a meaningful, measurable and comprehensive accessibility measure. Data and methods necessary to measure this are limited. Metro has previously considered travel-shed accessibility measures (number of jobs within a 30-min commute shed) with limited success. National research has created accessibility measurement methods that show some promise. Metro could test potential methods as part of this RTP update. The RTP performance work group will develop a recommendation on this target in coordination with the transportation equity and transit work groups.
Interim Regional Mobility Policy[22]	While the policy is intended to be used as a diagnostic tool to identify the location and extent of congestion on the roadway network, the policy does not adequately account for safety and availability of other travel options during peak

[22] See table in Appendix D.

RTP Measure	Assessment
	periods. In addition, the policy has caused challenges for local governments considering plan amendments proposals for compact development in centers because it is also being used as a plan amendment review standard. No change is recommended to the mobility targets as part of the 2018 RTP update; however this section will be expanded to provide guidance in the RTP and in Section 3.08.230 of the RTFP on how the mobility policy applies to planning decisions, and how it relates to and complements other regional targets and policies. Additionally, the performance work group may identify recommendations for future work, post-RTP adoption, pending recommendations from ODOT Region 1's Portland Metro Area Highway Performance Project.
Regional 2040 Modal Targets[23]	This measure overlaps with the target to triple walking, biking and transit mode share regionwide. However, the geographic element of this target is helpful for monitoring impacts of investment alternatives on reducing drive alone travel in mixed-use areas. The current target groups all *Non-SOV* modes together (walk, bike, transit, shared ride). It may be helpful to have a *non-driving* target mode share (walking, biking, transit) for different geographies – e.g. regional centers, town centers, etc. Portland Central city performance measure work could help inform this. The RTP performance work group will develop a recommendation on whether to retain or refine this target.

[23] See table in Appendix C

RTP Measure	Assessment
RTP System Evaluation Measures ***Tell us whether the RTP system of investments helps us make progress toward our targets***	
Vehicle and bicycle miles traveled (total and per capita)	VMT is useful as described previously. Bicycle miles traveled (BMT) is a notable new measure as it's an output of the regional bicycle model. *See previous discussion on vehicle miles traveled per person.*
Total delay and cost of delay on the regional freight network in mid-day and PM peak	*See previous discussion on vehicle hours of delay per person.*
Motor vehicle and transit travel time between key origin-destinations for mid-day and 2-HR PM peak	This measure is currently reported over 12 pages. It needs a simpler presentation format. Metro could pilot-test a measure of potential total travel time savings in key travel corridors.
Congestion - Location of throughways, arterials, and regional freight network facilities that exceed RTP motor vehicle-based level of service thresholds in mid-day and 2-HR PM peak	*See previous discussion on vehicle hours of delay per person and interim regional mobility policy.*
Mode share and non-drive alone trips system-wide, by mobility corridor and for central city and individual regional centers (*Number of daily walking, bicycling, shared ride and transit trips and % by mode)*	*See previous discussion on mode share performance target and regional modal targets.*
Transit productivity *(transit boarding rides per revenue hour)* for High Capacity Transit (HCT) and bus	Consider refining measure to specifically frequent bus service and HCT. The RTP transit work group in coordination with the performance work group will make a recommendation on this measure.
Number and percent of households within ½-mile of regional trail system	This measure helps demonstrate whether access to the regional trail system is increasing over time. *See also previous discussion on access to daily needs.*
Environmental justice measure (under development)	The RTP transportation equity work group will make recommendations on this measure(s) in coordination with the performance work group.

RTP Measure	Assessment
Tons of transportation-related air pollutants (e.g. CO, ozone, and PM-10)	*See previous discussion on air quality related performance target.*
Tons of transportation-related greenhouse gas emissions (e.g. CO_2)	*See previous discussion on greenhouse gas emissions performance target.*
Number and percent of projects that intersect high value habitat	This measure is mapped and used to identify projects in the RTP that may impact high value habitat areas identified in the Regional Conservation Strategy and may require additional environmental analysis as part of future planning and project development activities.
RTP System Monitoring Measures Tell us how the system performs over time to identify whether course adjustments are needed	
Vehicle and bicycle miles traveled (total and per capita)	*Metro has had limited resources and capacity to track these measures every two years as intended, and instead relied on updates to the RTP. Metro will be moving toward a new online tool for system monitoring. The measures most valuable to be tracked online will be discussed with the RTP Performance work group in 2017. The work group will also develop recommendations and an action plan for system monitoring and Congestion Management Process (CMP) reporting, including an approach to data collection and methods development.*
Average trip length by mobility corridor	
Motor vehicle and transit travel time between key origin-destinations for mid-day and PM peak	
Congestion - Location of throughways, arterials, and regional freight network facilities that exceed RTP motor vehicle-based level of service thresholds in mid-day and PM peak	
Travel time reliability on throughways	
Average incident duration on throughway system	
Number and share of average daily shared ride, walking, bicycling and transit trips region wide, by mobility corridor and for the Portland central city and individual regional centers	
Transit productivity (transit boarding rides per revenue hour) for High Capacity Transit and bus	
Percent of regional pedestrian system completed region-wide and by 2040 centers and RTP transit-mixed-use corridor	

RTP Measure	Assessment
Percent of regional bicycle system completed region-wide and by mobility corridor	
Number and percent of households and jobs within 30 minutes of central city, regional centers, and key employment/industrial areas for mid-day and PM peak	
Number of fatalities, serious injuries and crashes per vehicle miles traveled for all modes of travel regionwide	
Average household combined cost of housing and transportation	
Tons of transportation-related air pollutants (e.g. CO, ozone, and PM-10)	

BEST PRACTICES FROM OTHER REGIONS[24]

Over the course of 2015 and early 2016, Transportation for America worked with Metro and four other MPOs to explore ways to integrate health and equity into their performance measure frameworks. One product of that work is a report prepared by Calthorpe Analytics. The report outlines the utility and trade-offs of various specific performance measures and their application to consider health and equity impacts of transportation investments. Links to national resources for performance-based planning can be found in Appendix A. Additionally, Metro staff has compiled a few best practices from other MPOs as a way to help inform the discussions of the 2018 RTP Performance work group on how to update Metro performance based planning techniques.

Who: Sacramento Area Council of Governments (SACOG)
What: Congested Vehicle Miles Traveled (VMT) per capita
Why: Evaluating different scenarios in its Regional Transportation Plan

SACOG, the MPO in the Sacramento, CA area, uses Congested VMT per capita to focus on the biggest bottlenecks that affect the most people for the largest amount of time, rather than viewing all delay as equally problematic. Congestion is defined as a demand to capacity ratio of more than 1. Because the measure is per capita, it gives the region credit for the people that

[24] Transportation For America. Measuring What we value, http://t4america.org/maps-tools/performance-measures-report/, accessed 12/30/15, and phone conversations with MPO staff.

are not in that traffic, due to using other forms of travel and land use planning creating trips closer to home. Additionally, compared with typical congestion measures, e.g. total delay in a region, this congested VMT per capita is something that an individual can relate to on a more personal basis– "How many miles per day does an average person spend in the worst congestion". SACOG compares this measure regionally with different levels of investment of funding and project types.

Who: The Metropolitan Transportation Commission (MTC)
What: Project screening
Why: Deciding what projects to include in Regional Transportation Plan

MTC, the MPO in the San Francisco, CA area, conducts a project level assessment for all potentially eligible projects to its regional transportation plan. Low-cost projects are screened qualitatively based on how well they achieve regional goals. High-cost projects undergo a quantitative benefit-cost analysis.

Who: The Metropolitan Transportation Commission (MTC)
What: "Vital Signs" website - Monitoring transportation related outcomes
Why: Communicating how they're doing to the public

The MTC has established a monitoring initiative to track trends related to transportation, land and people, the economy and the environment. Measurements in these areas help the region understand where it's succeeding and where it falls short. A user friendly website (http://www.vitalsigns.mtc.ca.gov/) compiles indicators, each presented with interactive visualizations that allow an exploration of historical trends, differences between cities and counties, and comparisons with other peer metropolitan areas.

Who: Virginia Department of Transportation (VDOT)
What: Project Selection Process
Why: Direct funding to the most cost-effective projects

The State Legislature recently passed two laws that significantly change how transportation projects are funded in Virginia. These laws are expected to bring transparency and objectivity, replacing a process that was considered confusing, opaque and overly political. House Bill 2, adopted in 2014, creates a process where projects will be screened and ranked based on five priority outcomes: economic development, safety, accessibility, congestion mitigation and environmental quality. House Bill 1887, adopted in 2015, reforms the state's funding formulas, directing more funds for maintenance and repair. It splits the remaining funds between priority state projects (using the new HB2 ranking process) and local projects selected through regional competitions. More information can be found at: http://www.virginiahb2.org/default.asp and http://t4america.org/maps-tools/state-transportation-funding/capital-ideas-2/virginia/

2018 RTP SCOPE AND TIMELINE FOR PERFORMANCE RELATED WORK

In order to help focus the efforts of the RTP Performance work group, Metro staff has summarized key topics that are included in the scope of the performance measures-related work to be conducted in the 2018 RTP update, as shown in Table 5.

Table 5. 2018 RTP Performance Measures related work – What's in / What's out?

What's in	What's out	To be Determined
Updating RTP existing conditions (Chapter 1)	Developing measures and methods specifically targeted at development review and/ or local plan amendments subject to the TPR -0060 (measures that trigger "significant impact" and measures for evaluating proposed mitigation.) However, measures included in the RTP may also be useful for this purpose.	A performance-based RTP project solicitation process, e.g. project screening criteria that are based on RTP performance targets to better link RTP investment priorities to RTP goals and performance targets.
Updating RTP policy level performance targets (Chapter 2)	2019-21 Regional Flexible Funding project evaluation criteria	
Updating RTP System Evaluation Measures (Chapter 4) to be more streamlined	Establishing alternative mobility policy targets, as allowed under Oregon Highway Plan policy 1F.3[25]	Recommendations for future alternative mobility policy targets work to be conducted post-RTP adoption
Updating definitions and terms related to performance measurement to be more clear		
2022-24 Regional Flexible Funding project evaluation criteria		
Action plan for system monitoring and Congestion Management Process (CMP) reporting, including approach to data collection and methods development		
Consistency with MAP-21 requirements		
Expanded guidance on how the mobility policy applies to planning decisions, and how it relates to and complements other regional targets and policies		

[25] ODOT is leading the Portland Metro Area Highway Performance project which is aimed at providing guidance and flexibility in Region 1.

2018 RTP Timeline for Performance Measures related work

Phase 1: Getting started – Fall 2015

Scope and document challenges to updating RTP performance framework, considering best practices from other regions as well as federal and state requirements.

Phase 2: Framing trends and challenges – January to April 2016

Convene a technical work group to review existing performance measures framework and performance of existing RTP projects relative to adopted performance targets.

Phase 3: Looking forward – May 2016 to February 2017

Convene a technical work group to update RTP performance targets, considering input from regional leadership forums, community members and other RTP technical work groups addressing safety, transportation equity, freight and transit.

Phase 4: Building a shared strategy – March to December 2017

Convene the technical work group to inform RTP project solicitation process, review system evaluation results using updated performance targets, and discuss how to monitor progress in between RTP updates.

2018 RTP| PERFORMANCE MEASURES WORK PLAN

Getting there by tracking our progress

May to Dec. 2015	Jan. to April 2016	May 2016 to Feb. 2017	March to Dec. 2017	2018
Define work plan	Host workshop on approaches to performance measurement	Review existing RTP performance targets and input from regional forums and community members, on values and priority outcomes for investments in the transportation system	Inform project solicitation process of the 2018 RTP	Adopt as part of the RTP
Identify work group	Assess 2014 RTP and Climate Smart Strategy system performance with updated land use assumptions	Coordinate with equity, safety, transit and freight work groups regarding updated equity, safety, transit and freight related performance measures	Review 2018 RTP systems analysis and identify potential refinements to performance measures	
Research best practices from other MPOs and challenges to be addressed	Prepare Performance Measures Scoping Report of MAP-21 mandates, best practices, and challenges to address	Review updated draft RTP performance targets, measures and evaluation methods	Coordinate evaluation with equity, safety, transit and freight work groups regarding system evaluation with updated equity, safety and freight performance measures	
Document MAP-21 national goal areas and performance-based planning and target setting mandates and gaps in existing RTP performance framework	Document existing conditions and current plan performance	Coordinate with ODOT, TriMet, SMART and C-Tran on MAP-21 performance measures	Identify data gaps and updates for RTP monitoring and Mobility Corridors Atlas	
Document performance measure related challenges and issues to be addressed	Coordinate with ODOT, TriMet, SMART and C-Tran on current conditions and MAP-21 performance measures		Review Climate Smart Strategy recommendations for performance monitoring	
Document challenges with Mobility Corridors Atlas				

DELIVERABLES

Work plan	**Workshop on performance measurement approaches** **Performance Measures Scoping Report** **Existing Conditions & Current Plan Performance Report**	**Draft updated RTP performance targets and measures** **Draft evaluation methods**	**Final draft RTP performance targets and measures** **Recommendations for performance monitoring, including online Mobility Corridor Atlas** **Draft Mobility Corridors Atlas (V 3.0)**	**Updated 2018 RTP** including adopted performance targets, measures and action plan for monitoring

March 2016

APPENDIX

Appendix A. Resources for Performance-Based Planning:

Transportation Research Board. (2000). *NCHRP Report 446 - A Guidebook for Performance-Based Transportation Planning.* Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_446.pdf

Transportation Research Board. (2010). *NCHRP Report 660 - Transportation Performance Management: Insight from Practitioners*. Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_660.pdf

Transportation Research Board. (2010). *NCHRP Report 666 - Target-Setting Methods and Data Management to Support Performance-Based Resource Allocation by Transportation Agencies*. Retrieved from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_666.pdf

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The focus of this guidebook is to provide "how to" information for agencies interested in implementing or improving the application of transportation performance management. The guidebook is tailored to transportation agencies including state DOTs, MPOs, and transit agencies.

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Appendix B. Glossary of Common Terms relating to Performance Measurement:

- A **goal** is a statement of purpose that describes *long-term desired outcomes* for the region's transportation system to support and implement the Region 2040 vision.

- An **objective** is similar to a goal as it also represents a desired outcome. However, an objective is an *intermediate, shorter-term result* that must be realized during the plan period to reach the longer-term goals of the RTP. An objective is measurable.

- An **indicator** is a *categorical term* for a particular feature of the transportation system that is tracked over time. Indicators are *conceptual and qualitative and are tied to the policy framework's goals and objectives.* Examples of indicators include access to jobs/access to market areas, reliability, mobility, travel options, equity, clean air and environmental stewardship. No single indicator provides a comprehensive evaluation of the transportation system. Instead, each indicator contributes a piece of information that, when considered with all other indicators, provides a complete picture of the transportation system's effectiveness, documenting how well the system of investments meet the RTP policy framework's goals for the regional transportation system. The indicators need to be translated into specific measures to be meaningful in the planning and decision-making process.

- A **performance measure** is a *quantitative method of analysis* used to evaluate the condition or status of an indicator to determine the degree of success a project or program has had in achieving its stated goals and objectives. Some measures can be used to predict the future as part of an evaluation process using forecasted data, while other measures can be used to monitor changes based on actual empirical or observed data. In both cases, they can be applied at a system level, corridor level and project level, and provide the planning process with a basis for evaluating alternatives, making decisions on future transportation investments and monitoring progress over time. Quantified results from performance measures can be compared to baseline data over time to track progress and to compare between different levels of transportation investments. Tracking progress against the goal or objective allows an assessment of the effectiveness of actions. This is very important for measuring improvement or maintenance of existing conditions. They can also be used to monitor performance of the plan in between updates to determine whether refinements to the policy framework, investment priorities or other plan elements are needed.

- A **target** (also known as Benchmark) is the ***expressed goal of the indicator***, assigning a value to what the RTP is trying to achieve by certain timeframe. They are expressed in quantitative terms and provide an important measure of progress toward achieving different goals within a timeframe specified for it to be achieved. Currently, the RTP performance targets are not mandatory thresholds; instead they are set for planning

purposes as aspirational thresholds.

- A **standard** is criteria set for a certain task. It differs from a recommendation or a guideline in that it carries great incentive for universal compliance. It differs from a regulation in that compliance is not necessarily required for legal operation. It usually is legitimized or validated based on scientific data, or when this evidence is lacking, it represents the widely agreed upon, state-of-the-art, high quality level of practice.

- A **policy** is a clear, simple statement of how an organization intends to conducts its services, actions or business. They provide a set of guiding principles to help with decision making.

Appendix C. 2040 Regional Modal Targets

For the purpose of complying with the Oregon Transportation Planning Rule, the Regional Transportation Plan (RTP) includes 2040 modal targets as the primary "alternative" standard for evaluating the region's progress in reducing reliance on the automobile. First adopted in the RTP in 2000, the table below summarizes the modal targets and represents an aggressive long-term goal for the Portland metropolitan region to reduce non-single occupancy vehicle (non-SOV) travel in the region. Alternative mode share targets are intended to be goals for cities and counties to work toward as they implement the 2040 Growth Concept at the local level. The targets apply to the share of all trips made by biking, walking, use of transit and shared rides.

2040 Design Type	2040 Non-drive alone modal target
Portland central city	60-70%
Regional centers Town centers Main streets Station communities Corridors Passenger intermodal facilities	45-55%
Industrial areas Freight intermodal facilities Employment areas Neighborhoods	40-45%

Note: *The targets apply to trips to and within each 2040 design type. The targets reflect conditions needed in the year 2040 to comply with Oregon Transportation Planning Rule objectives to reduce reliance on single-occupancy vehicles.*

Development of the targets was informed by the alternatives evaluation conducted during development of the 2000 RTP and observed travel behavior collected as part of Metro's 1994-1995 survey of more than 7,500 households in the Portland metropolitan region. The travel survey found areas with good transit service and a good mix of land uses showed the highest percentage of biking, walking, and use of transit. Conversely, areas of the region that lacked these land use and transportation elements showed the highest percentage of auto use. This indicates that individuals are likely to use the automobile when no other choices exist, but may choose other alternatives when they are available.

The results of this study held true in the region's most recent 2012 travel behavior survey, and continue to support this region's effort to link land use and transportation planning as a means to provide a balanced, multi-modal transportation system to manage congestion and address other goals. Progress toward the non-SOV modal targets is an output of the regional travel demand model, but cannot be generated by local jurisdictions. As a result, progress is evaluated as part of RTP updates.

Appendix D. RTP Interim Regional Mobility Policy

Deficiency Thresholds and Operating Standards

Location	Standard	Standard	
	Mid-Day One-Hour Peak [A]	PM 2-Hour Peak [A]	
		1st Hour	2nd Hour
Central City Regional Centers Town Centers Main Streets Station Communities	.99	1.1	.99
Corridors Industrial Areas Intermodal Facilities Employment Areas Neighborhoods	.90	.99	.99
I-84 *(from I-5 to I-205)*	.99	1.1	.99
I-5 North *(from Marquam Bridge to Interstate Bridge)*	.99	1.1	.99
OR 99E *(from Lincoln Street to OR 224 interchange)*	.99	1.1	.99
US 26 *(from I-405 to Sylvan interchange)*	.99	1.1	.99
I-405 [B] *(I-5 South to I-5 North)*	.99	1.1	.99
Other Principal Arterial Routes I-205 [B] I-84 (east of I-205) I-5 (Marquam Bridge to Wilsonville) [B] OR 217 US 26 (west of Sylvan) US 30 OR 8 (Murray Boulevard to Brookwood Avenue) [B] OR 212 OR 224 OR 47 OR 213	.90	.99	.99

A. The demand-to-capacity ratios in the table are for the highest two consecutive hours of weekday traffic volumes. The mid-day peak hour is the highest 60-minute period between the hours of 9 a.m. and 3 p.m. The 2nd hour is defined as the single 60-minute period, either before or after the peak 60-minute period, whichever is highest.

B. A corridor refinement plan is required in Chapter 5 of the RTP, and will include a recommended mobility policy for each corridor.

Appendix E. RTP System Evaluation Measures

The table below lists the RTP performance measures used for plan evaluation, linking them to the RTP goals they support. Performance is evaluated at the system-wide level. The performance measures rely on data generated by the regional travel demand forecast model and Metroscope, the regional land use model, to generate current and future year findings.

System Evaluation Measures		RTP Goals									
		Foster Vibrant Communities and Compact Urban Form	Sustain Economic Competitiveness and Prosperity	Expand Transportation Choices	Effective and Efficient Management of Transportation System	Enhance Safety and Security	Promote Environmental Stewardship	Enhance Human Health	Ensure Equity	Ensure Fiscal Stewardship	Deliver Accountability
1.	Vehicle and bicycle miles traveled (total and per capita)	●		●		*Unable to predict/forecast system safety. To be addressed in plan monitoring.*	●	●			*Unable to predict/forecast accountability. To be addressed in plan monitoring.*
2.	Total delay and cost of delay on the regional freight network in mid-day and PM peak		●		●						
3.	Motor vehicle and transit travel time between key origin-destinations for mid-day and 2-HR PM peak	●	●	●	●						
4.	Congestion - Location of throughways, arterials, and regional freight network facilities that exceed RTP motor vehicle-based level of service thresholds in mid-day and 2-HR PM peak		●		●						
5.	Mode share and non-drive alone trips system-wide, by mobility corridor and for central city and individual regional centers (*Number of daily walking, bicycling, shared ride and transit trips and % by mode)*	●		●	●		●	●			
6.	Transit productivity *(transit boarding rides per revenue hour)* for High Capacity Transit (HCT) and bus	●		●						●	
7.	Number and percent of households within ½-mile of regional trail system			●			●	●	●		
8.	Environmental justice measure (under development)			●					●		
9.	Tons of transportation-related air pollutants (e.g. CO, ozone, and PM-10)			●			●	●			
10.	Tons of transportation-related greenhouse gas emissions (e.g. CO_2)			●			●				
11.	Percent of projects that intersect high value habitat areas	●					●				

Appendix F. RTP Monitoring Measures

Between plan updates, a system monitoring program periodically assesses how well the region's transportation system is functioning for each of the 24regional mobility corridors – using observed data as much as possible. Recommended monitoring measures include the following (Note – not all of these are actually included in the Regional Mobility Corridor Atlas):

1.	Vehicle and bicycle miles traveled (total and per capita)
2.	Average trip length by mobility corridor
3.	Motor vehicle and transit travel time between key origin-destinations for mid-day and PM peak
4.	Congestion - Location of throughways, arterials, and regional freight network facilities that exceed RTP motor vehicle-based level of service thresholds in mid-day and PM peak
5.	Travel time reliability on throughways
6.	Average incident duration on throughway system
7.	Number and share of average daily shared ride, walking, bicycling and transit trips region wide, by mobility corridor and for the Portland central city and individual regional centers
8.	Transit productivity (transit boarding rides per revenue hour) for High Capacity Transit and bus
9.	Percent of regional pedestrian system completed region-wide and by 2040 centers and RTP transit-mixed-use corridor
10.	Percent of regional bicycle system completed region-wide and by mobility corridor
11.	Number and percent of households and jobs within 30 minutes of central city, regional centers, and key employment/industrial areas for mid-day and PM peak
12.	Number of fatalities, serious injuries and crashes per vehicle miles traveled for all modes of travel region-wide
13.	Average household combined cost of housing and transportation
14.	Tons of transportation-related air pollutants (e.g. CO, ozone, and PM-10)

PERFORMANCE MONITORING APPROACH

The last component of the Climate Smart Strategy is a set of performance measures and performance monitoring targets for tracking progress. The purpose of performance measures and targets is to monitor and assess whether key elements or actions that make up the strategy are being implemented, and whether the strategy is achieving expected outcomes.

About the performance measures

The performance measures identified for monitoring are a combination of existing and new measures, most of which are drawn from the Regional Transportation Plan and the Urban Growth Report, that track existing land use and transportation policies.

About the performance monitoring targets

The performance monitoring targets are not policy targets, but instead reflect a combination of the planning assumptions used to evaluate the Climate Smart Strategy and outputs from the evaluation. The measures and performance monitoring targets will be reviewed before being incorporated into the Regional Transportation Plan as part of the next scheduled update. They may be further refined at that time to address new information, such as MAP-21 performance-based planning provisions and recommendations from Metro's Equity Strategy.

About the process for performance monitoring

To monitor and assess implementation of the strategy, Metro will use observed data sources and existing regional performance monitoring and reporting processes to the extent possible. These processes include regularly scheduled updates to the Regional Transportation Plan and Urban Growth Report and reporting in response to Oregon Revised Statutes ORS 197.301 and ORS 197.296. When observed data is not available, data from regional models may be reported.

If the assessment finds the region is deviating significantly from the Climate Smart Strategy performance monitoring target, then Metro will work with local, regional and state partners to consider the revision or replacement of policies and actions to ensure the region remains on track with meeting adopted targets for reducing greenhouse gas emissions.

HOW WILL PROGRESS BE MONITORED?

POLICY AREA	MEASURE	BASELINE 2010 unless otherwise noted	2035 PERFORMANCE MONITORING TARGET
1. Implement the 2040 Growth Concept and local adopted land use and transportation plans	Share of households living in walkable, mixed-use areas[1] (new)	26%	37% A methodology for tracking progress will be developed in 2018 RTP update.
	New residential units built through infill and redevelopment in the urban growth boundary (UGB)[2] (existing)	58% *(average for 2007-12)*	65%
	New residential units built on vacant land in the UGB[3] (existing)	42% *(average for 2007-12)*	35%
	Acres of urban reserves added to the UGB[4] (existing)	0	12,000
	Daily vehicle miles traveled per capita[5] (existing)	19	17
2. Make transit convenient, frequent, accessible and affordable	Daily transit service revenue hours (new)	4,900	9,400
	Share of households within ¼-mile all day frequent transit (new)	30%	37%
	Share of low-income households within ¼-mile of all day frequent transit (new)	39%	49%
	Share of employment within ¼-mile of all day frequent transit (new)	41%	52%
	Transit fares (new)	A baseline for tracking transit affordability relative to inflation and other transportation costs will be developed in the 2018 RTP update.	A baseline for tracking transit affordability relative to inflation and other transportation costs will be developed in the 2018 RTP update.

HOW WILL PROGRESS BE MONITORED?

POLICY AREA	MEASURE	BASELINE 2010 unless otherwise noted	2035 PERFORMANCE MONITORING TARGET
3. Make biking and walking safe and convenient	Daily trips made by biking and walking[6] (existing)	179,000 bike trips 505,000 walk trips	280,000 bike trips 768,000 walk trips
	Per capita miles of bike and pedestrian travel per week[7] (new)	2.1 miles biked 1.3 miles walked	3.4 miles biked 1.8 miles walked
	Bike and pedestrian fatal and severe injury crashes[8] (existing)	35 bike crashes 63 pedestrian crashes	17 bike crashes 32 pedestrian crashes
	New miles of bikeways, sidewalks and trails in UGB[9] (existing)	Bikeways (on-street) = 623 miles Sidewalks (on at least one side of the street) = 5,072 miles Trails = 229 miles	663 new miles Bikeways (on-street) = 1,044 miles Sidewalks (data not available but will be developed in the 2018 RTP update. Trails = 369 miles
4. Make streets and highways safe, reliable and connected	Motor vehicle, bike and pedestrian fatal and severe injury crashes[10] (existing)	398 motor vehicle crashes 35 bike crashes 63 pedestrian crashes	199 motor vehicle crashes 17 bike crashes 32 pedestrian crashes
	Change in travel time and reliability in regional mobility corridors (existing)	A baseline for this measure will be developed in the 2018 RTP update.	A performance monitoring target and methodology for tracking progress will be developed in the 2018 RTP update.
	Share of freeway lane blocking crashes cleared within 90 minutes (new)	Data under development with ODOT staff. A baseline for this measure will be developed in the 2018 RTP update.	100%[11]
5. Use technology to actively manage the transportation system	Share of arterial and freeway delay reduced by traffic management strategies (new)	10%	35% A methodology for tracking progress will be developed in 2018 RTP update.
	Share of regional transportation system covered with transportation system management and operations (TSMO) strategies (new)	A baseline for tracking progress will be developed in 2018 RTP update.	A performance monitoring target and methodology for tracking progress will be developed in 2018 RTP update.

HOW WILL PROGRESS BE MONITORED?

POLICY AREA	MEASURE	BASELINE 2010 unless otherwise noted	2035 PERFORMANCE MONITORING TARGET
6. Provide information and incentives to expand the use of travel options	Share of households participating in individualized marketing programs (existing) Share of the workforce participating in commuter programs (existing)	9% 20%	45% 30%
7. Manage parking to make efficient use of vehicle parking and land dedicated to parking	Share of work trips occurring to areas with actively managed parking[12] (new)	13%	30% A methodology for tracking progress will be developed in 2018 RTP update.
	Share of non-work trips occurring to areas with actively managed parking[12] (new)	8%	30% A methodology for tracking progress will be developed in 2018 RTP update.
8. Support Oregon's transition to cleaner, low carbon fuels, more fuel-efficient vehicles and pay-as-you-drive private vehicle insurance	Share of registered light duty vehicles in Oregon that are electric vehicles (EV) or plug-in hybrid electric vehicles (PHEV)[13] (new) Share of households using pay-as-you-drive private vehicle insurance[14] (new)	1% auto 1% light truck >1%	8% auto 2% light truck 40%
9. Secure adequate funding for transportation investments	Address local, regional and state transportation funding gap (new)	A baseline and methodology for tracking progress will be developed in 2018 RTP update.	
10. Demonstrate leadership on reducing greenhouse gas emissions	Region-wide per capita roadway greenhouse gas emissions from light vehicles (new)	4.05 $MTCO_2e$[15]	1.2 $MTCO_2e$[16]

PERFORMANCE MONITORING TABLE NOTES

[1] Data is an estimate from the metropolitan GreenSTEP model based on the land use assumptions described below in Table Notes 2–4.

[2] Data is compiled and reported by Metro every two years in response to Oregon Revised Statutes ORS 197.301 and ORS 197.296. The Climate Smart Strategy assumed the regionally-coordinated 2035 Growth Distribution adopted by the Metro Council on Nov. 29, 2012 as the basis for the population, housing, and employment growth assumptions used in the analysis. The adopted 2035 growth distribution was developed using MetroScope and reflects locally adopted comprehensive plans and zoning as of 2010. The performance monitoring target reflects the adopted growth distribution assumption that 65% of new residential units would be built through infill and redevelopment by 2035.

[3] See Table Note 2. The performance monitoring target reflects the adopted growth distribution assumption that 35% of new residential units would be built on vacant land inside the urban growth boundary by 2035.

[4] See Table Note 2. The performance monitoring target reflects the adopted growth distribution assumption that 12,000 acres of urban reserves would be added to the urban growth boundary by 2035.

[5] Data is from the ODOT Oregon Highway Performance Monitoring System (HPMS) and was the official state submittal to the Federal Highway Administration for tracking nationally. The 2014 Regional Transportation Plan (RTP) target calls for reducing daily vehicle miles traveled per person by 10 percent compared to 2010.

[6] Data is an estimate from the regional travel demand model and does not include walk trips to transit. The 2014 Regional Transportation Plan calls for tripling the share of daily trips made by biking and walking compared to 2010.

[7] Data from Oregon Health Authority Climate Smart Strategy Health Impact Assessment.

[8] Data is for the period 2007-2011 and comes from the ODOT Oregon Highway Performance Monitoring System (HPMS). The data was reported in the 2014 RTP adopted by the Metro Council on July 17, 2014. The 2014 RTP target calls for reducing fatal and severe injury crashes for all modes by 50 percent compared to the 2007-2011 period.

[9] The 2014 RTP financially constrained system includes completing 663 miles of bikeways, sidewalks and trails; progress toward completion of the system of investments will be tracked.

[10] See note 8.

[11] The measure and target reflect an ODOT performance goal.

[12] The measure and performance monitoring target reflect a planning assumption from in 2014 Regional Transportation Plan that was used in the Climate Smart Strategy analysis.

[13] The Oregon Department of Motor Vehicles will track this data through vehicle registration records.

[14] The performance monitoring target is less aggressive than the Statewide Transportation Strategy, which assumed nearly all Oregon households would have pay-as-you-drive insurance by 2035.

[15] Data is a model estimate for the year 2005, using the Metropolitan GreenSTEP model.

[16] The performance monitoring target reflects the state mandated 20 percent reduction per person in roadway greenhouse gas emissions, after accounting for state assumptions for anticipated advancements in cleaner, low carbon fuels and more fuel-efficient vehicles. A transition to the Motor Vehicle Emission Simulator (MOVES) model for tracking progress will be made as part of the 2018 Regional Transportation Plan update. The MOVES model is the federally-sanctioned model for demonstrating compliance with federal and state air quality requirements.

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and sustainable transportation and living choices for people and businesses in the region. Voters have asked Metro to help with the challenges and opportunities that affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to providing services, operating venues and making decisions about how the region grows. Metro works with communities to support a resilient economy, keep nature close by and respond to a changing climate. Together we're making a great place, now and for generations to come.

Metro | *Making a great place*

Metro Regional Center
600 NE Grand Ave.
Portland, OR 97232-2736
www.oregonmetro.gov

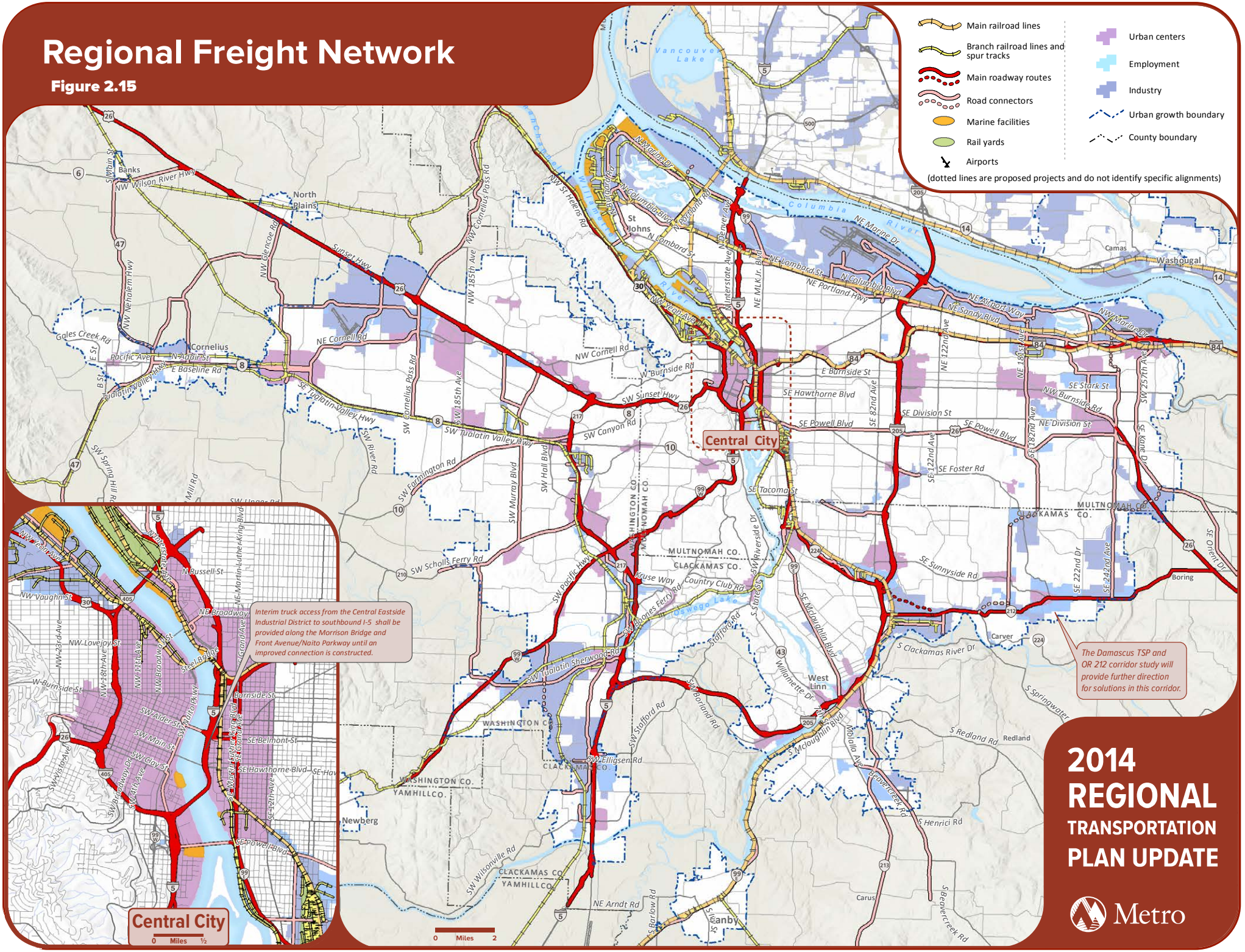
2018 Regional Transportation Plan

www.oregonmetro.gov/rtp

April 15, 2016

Regional Freight Network

Figure 2.15



2014 REGIONAL TRANSPORTATION PLAN UPDATE

Metro

Memo

Metro
600 NE Grand Ave.
Portland, OR 97232-2736

Date: Monday, September 26, 2016
To: Transportation Policy Advisory Committee (TPAC)
From: Tim Collins, Senior Transportation Planner
Subject: Priority Freight Needs by Mode

The Regional Freight work group is one of eight technical work groups identified to provide input and technical expertise to support the 2018 Regional Transportation Plan (RTP) update. The regional freight work group has 25 members and consists of experts in industries involved in moving freight, Portland Freight Committee members, TPAC and MTAC members or their designees, and staff from the City of Portland, larger cities in the region, Clackamas County, Multnomah County, Washington County, Port of Portland, Port of Vancouver, Regional Transportation Council (RTC), Federal Highway Administration (FHWA), and Oregon Department of Transportation (ODOT). Briefings on the progress of the technical work groups are made to the Transportation Policy Alternatives Committee (TPAC) and the Metro Technical Advisory Committee (MTAC) as needed.

The Regional Freight Work Group met on January 20th and May 23rd of this year, and at both meetings the group discussed what they saw as the priority freight needs for the region. The group discussed the needs for freight movement by the different freight modes consisting of trucks, rail lines, air freight and marine/river modes. The following provides a list of priority freight needs and current constraints to freight movement that were identified by the Regional Freight Work Group:

Roadways and Highways (for trucking)

- Mobility needs with increased congestion and congestion spreading over more hours per day on I-5 north of the Freemont Bridge (I-405).
- There is a need to address intra-county freight movements; such as commodities from Washington County that need to get to major distribution centers and the air freight facility near PDX in Multnomah County.
- All of our freeway systems are experiencing more trucks.
- Bottlenecks on roadway connections to I-5 (sometimes on intermodal connectors) cause delays.
- Capacity constraint exists at the Columbia River Bridge on I-5 and needs to be addressed.
- I-5 at the Rose Quarter has been identified as a major traffic bottleneck.
- Peak period delays and overall congestion on I-5 (south of I-205) and on I-205 from I-5 to the Portland Airport are causing some freight deliveries that would use trucking from locations in and south of Wilsonville to the air freight facility on Air Trans Way, to use a more expensive air freight flight option to the air freight facility on Air Trans Way.

Rail Lines

- Rail speed is slow, with some industrial trains that are a mile long (100+ cars), and railroad crossings cause major traffic impacts on the roadway system.

- There is a need for grade separated rail crossings at some locations. An example that was mentioned is the need for grade separation of the Union Pacific line as it crosses SE 8th Ave., SE Milwaukie Ave., and SE 12th Ave. (south of SE Division St.). The current at-grade crossings cause major delays to cars and trucks on the street network around these crossings in an active industrial area. This delay is amplified when freight trains and scheduled Light Rail Transit occur within a short time of one another.
- Freight rail demand on shared rail tracks at North Portland and Peninsula Junction is causing long delays to other freight trains and passenger trains (Amtrak). This year the Oregon Transportation Commission approved an $8.2 million Connect Oregon VI project for rail improvements at North Portland Junction. However, improvements at Peninsula Junction are not included in this project and will need to be completed later.
- There has been increased rail traffic in the region.
- The Union Pacific Kenton Line that runs adjacent to Sandy Boulevard needs some double-tracking. A suggestion has been made to double-track the Kenton Line between North Portland Junction and Troutdale over the long term.
- There is a need for the Kenton Rail Line Study.
- Short term need for speed improvements to the Union Pacific Railroad line just north of the Steel Bridge river crossing. The current train speeds are 6 mph in the curves and would require a realignment of the tracks to improve speed.

Air freight

- We need access to the Portland Airport (PDX) and consolidation facilities. Air freight demand will grow as the area's population grows.
- US Post Office has moved onto Air Trans Way near PDX. This will increase truck demand and increase overall traffic in the airport area.
- There is a need for Port of Portland to study Hillsboro Airport needs and the possibility for an air freight facility (Port will conduct the study).
- Westside Logistics Study showed computer and electronics shipments need to get to the air fright facility on Air Trans Way, but congestion and reliability issues on US 26 (Sunset Highway) are causing delays and other freight routing to get to east Portland. Many of the transfers at the facility are to other modes (primarily trucks) than to flights out of Portland.

Marine/River (for ships and barges)

- There is a need for more marine terminal space.
- There is a need to restore full container service at Terminal 6.
- The barges on the Columbia River cause the lift span on the I-5 Bridge to open when the river rises over six feet. There have been some years with nine months of high water.
- The location of the narrow opening of the railroad bridge (adjacent to the I-5 Bridge) makes for a difficult s-curve maneuver of barge traffic on the Columbia River that comes under these two bridges without lifting the I-5 Bridge. Barge traffic must avoid causing I-5 bridge lifts during peak traffic periods, which causes delays for barge traffic. During high water bridge lifts on I-5 cause major traffic delays even during off-peak hours.

This list of priority freight needs and constraints by mode was reviewed and updated by the Regional Freight Work Group on Tuesday, September 27, 2016.

Definition of the Buffer Index and Modified Planning Time Index

A new 2018 RTP regional freight performance measure has been developed for determining how reliable the Main Roadway Routes on the regional freight network are. This new freight performance measure is related to the concept of a buffer index (BI). A "buffer index is a measure of trip reliability that expresses the amount of extra 'buffer' time needed to be on time for 95 percent of trips (e.g., the time you would need to add to the average travel time so that you are only late for 1 out of 20 trips)".[1] The BI is expressed as a percentage. For example, if a trip usually takes 30 minutes, but to arrive on time 95 percent of the time you need to allow 45 minutes, then the additional time added to the trip is 15 minutes and the buffer index would be 50 percent (15 minutes = 50 percent more time that the usual 30 minutes).

A 'planning time index" (PTI) provides a ratio that compares the travel time needed to be on time for 95 percent of the trips compared to the travel time during free-flow conditions. The new performance measure for freight reliability on all Main Roadway Routes on the regional freight network[2] would be a modification of the planning time index. Instead of a ratio that compares the travel time needed to be on time for 95 percent of the trips to the travel time during free-flow conditions; this new index would compare it to the travel time needed to be on time 50 percent of the time. Therefore, if the travel time on US 26 from I-405 to Highway 217 is 20 minutes to be on time 95 percent of the time and the travel time is 10 minutes to be on time 50 percent of the time; then the modified PTI ratio would be 2.0 (20 minutes divided by 10 minutes). The equation for calculating the new reliability index (modified PTI) that is being suggested is as follows:

$$\text{New Reliability Index} = \frac{95^{th} \text{ Percentile Travel Time (in minutes)}}{50^{th} \text{ Percentile Travel Time (in minutes)}}$$

This new reliability index is the same one being used in ODOT's Freight Highway Bottlenecks List Project to measure freight reliability on the Oregon State Highway System. Using this measure for the 2018 RTP to determine freight reliability will be consistent with the current measure being used statewide in Oregon.

[1] TTI's 2011 Congested Corridors Report powered by INRIX traffic data

[2] See the handout for the Regional Freight Network