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Metro | *Agenda*

2018 REGIONAL TRANSPORTATION PLAN UPDATE

RTP Performance Work Group - Meeting # 4

Date: September 12, 2016
Time: 2-4p.m.
Place: Metro Regional Center, Room 401
600 NE Grand Avenue, Portland, OR 97232

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Agenda items

2:00	**Welcome & introductions**	Kim Ellis
2:05	**Partner Updates** *Who have you talked to about this work? What have you heard?*	Everyone
2:15	**Review Agenda & Brief update on RTP**	Kim Ellis

2:20	**Continue discussion of potential refinements to measures for 2018 RTP**
	- *Review context for RTP measures*
	  o *Review assessment of measures (understandability, goals addressed, data availability, user experience, usefulness for project prioritization)*
	  o *Review summary of RTP goals addressed through each measure*
	- *Follow up from last month's discussion of measures recommended to be retained and/or refined*
		John Mermin

3:05	**Review recommendations for refinement to Air Quality measure**	Grace Cho
3:20	**Discuss potential refinements recommended by other workgroups** - *Safety* - *Transit (update on preliminary recommendation (time permitting))*	 Lake McTighe Jamie Snook
3:55	**Next steps**	John Mermin
4:00	**Adjourn**	

Meeting Packet	**Next Meeting**

Directions, travel options and parking information
Covered bike racks are located on the north plaza and inside the Irving Street visitor garage. Metro Regional Center is on TriMet bus line 6 and the streetcar, and just a few blocks from the Rose Quarter Transit Center, two MAX stations and several other bus lines. Visit our website for more information: http://www.oregonmetro.gov/metro-regional-center

• Agenda	**Friday, October 14, 2016** RTP Performance Work Group Meeting # 5 10:00 am – noon, Room 401, Metro
• Summary from June 26 meeting	
• Table assessing Metro performance measures	
• Table comparing RTP goals and measures	
• Handout on problems reporting mode share at small geographies	
• Memo on 2018 RTP model network review and validation	
• Memo on Air quality measures	
• Memo on Safety measures	
• Memo on Transit measures	

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Metro | *Meeting Summary*

Performance Work Group Meeting #3
June 27, 2016, 2:00 to 4:00 PM
Metro Regional Center, Room 401

Committee Members Present:

Name	**Affiliation**
Steve Adams	Wilsonville
Jessica Berry	Multnomah County
Tom Bouillion	Port of Portland
Denny Egner	Milwaukie
Christina Fera-Thomas	Hillsboro
Abbot Flatt	Clackamas County
Eric Hesse	TriMet
Bill Holstrom	Oregon Dept. of Land Conservation & Development
Steve Kelley	Washington County
Katherine Kelly	Gresham
Karla Kingsley	Kittleson & Associates Inc.
Lidwien Rahman	Oregon Department of Transportation
Chris Rall	Transportation 4 America
Kelly Rodgers	Confluence Planning

Metro Staff Present
John Mermin
Kim Ellis
Cindy Pederson
Peter Bosa
Lake McTighe
Jamie Snook
Tim Collins
Caleb Winter

Others Present
John Charles, Cascade Policy Institute
Staff person, Oregon League of Conservation Voters

Welcome and introductions
Kim Ellis kicked off the meeting with a quick overview and meeting purpose – to 1) continue the review of 2014 RTP and Climate Smart model results and 2) begin discussion of refinement of measures.

Members of the work group introduced themselves and shared who they have been talking to about the performance work and what have they heard. Chris Rall, from Transportation 4 America, mentioned that *Planning for a Healthier Future* came out last week. Following the meeting, Chris provided a link to share with the work group. (http://t4america.org/2016/06/22/introducing-planning-for-a-healthier-future/)

Review agenda and brief update on the 2018 RTP
Ms. Ellis reviewed the agenda and provided and update on the Regional Leadership Forum #1. Ms. Ellis passed out an overview summary of the forum and mentioned that a more detailed report is online at www.oregonmetro.gov/rtp. The second Leadership Forum is scheduled for September 23 and will focus on the funding and partnerships needed to maintain and improve our transportation system.

Continued review of Climate Smart and 2014 RTP performance
John Mermin mentioned that Cindy Pederson shared measures of VMT per capita and truck delay per truck trip, region-wide mode share for bike, walk and transit at our last meeting. Mr. Mermin then reviewed the handout with ***non-single occupancy vehicle (SOV) mode share*** *table, which included:*

- The table (handout) describes the mode share for five scenarios: 2015 Base year, 2040 No build, 2040 Constrained, 2040 Strategic, and 2040 Climate Smart Strategy.
- The Portland Central City has the highest non-single occupancy vehicle mode share.
- The constrained, strategic and climate smart scenarios all show increases over the no build.
- The results did not show significant differences between constrained, strategic and climate smart scenarios. Possible reasons are that the model needs more drastic differences to show changes in mode share and that many underlying assumptions are the same under each scenario (e.g. land use, parking costs, etc).

Work Group member discussions:

- There was discussion regarding what shared ride includes. It is the carpool element of the non SOV mode share.
- Taking kids to school is included in the carpool, but kids on school bus are not included in the transit mode share. This should be reconciled and clarified about what is included and what is not.
- Pass through trips are not counted in the data reported. Within the table, the "Trips within" column includes trips that occur within those centers and "all trips" includes trips that originate or end within the center.

Mr. Mermin moved on to describe the ***Interim Regional Mobility Policy Maps*** *that are in the packet:*

- The maps in the handout present the model outputs showing levels of congestion for links in the travel model and areas where we don't meet our interim regional mobility policy.
- Since they're based on a regional model, the maps don't show the fine-grained level of exactly how far vehicles back up, but depict areas that should be examined further in local analyses.
- The policy/maps are not intended to dictate solutions such as spot-fixes or widening of roads, but rather point to locations where system-wide fixes are needed – including system & demand mgmt, bike/ped/transit projects, land use strategies, and road capacity etc.
- The No-build shows the most congestion. The constrained shows a reduction. The strategic shows a further reduction. The Climate smart scenario shows a level in between the

constrained and the strategic (its network is composed of the constrained plus extra transit investment.)

Work Group member discussions:

- The maps do not capture how transit investments are providing a benefit; there should be a way to show how we are moving people, particularly under the climate smart scenario versus the constrained scenario.
- Showing transit travel times might be useful in presenting moving people by transit.
- Plots showing where the scenarios differ from each other (difference plots) would be helpful.
- The 2015 base year congestion maps didn't seem to match what might be experienced today. For example, Highway 99W in Tigard and I-205 from Glenn Jackson Bridget to Airport Way. There should be some additional ground truth-ing done prior to publication for the public or electeds. Staff explained the volume to capacity plots show travel demand a two-hour period, which may be different than how people perceive the system they use today. In addition, ODOT and local government staff reviewed the 2015 and No Build networks in Fall of 2015 as part of background work to support the RTP update. Jurisdiction staff are encouraged to follow-up directly with Metro modeling staff on any areas that need further checking to ensure the assumed capacities are correct and that the model is assigning trips to the system properly.

*Mr. Mermin then reviewed the **schedule for measure refinement** for the 2018 RTP:*

- We will be discussing refinements to measures in 2016 (June, September and October)
- In 2017, we will be refining and setting targets for the measures.
- In 2017 and 2018, we will be refining our monitoring approach.
- To accomplish this schedule, we had to add an October meeting.
- Part one of the handout presents the performance measures the work group is discussing without input from another work group, part two are measures being reviewed by other work groups prior to discussion at our work group, and part three includes a MAP-21 infrastructure condition measure not recommended for discussion.
- Part one is further refined into three categories: a) measures Metro staff is initially recommending to be retained as is, b) measures staff recommends keeping with minor refinements, and c) measures that need discussion.

Work Group member discussions:

- There was a question regarding this process and the Regional Flexible Fund Allocation process. This group will not be responsible for the project evaluation for the 2019-2021 RFFA process that is already underway. However, our discussions will influence the next cycle of RFFA project evaluation (in two years).
- Reliability, pedestrians and people-moving measures should be included in our final list.
- Ensure consistency between the federal performance measures and those in the RTP. Staff explained that the federal measures are not yet final and are likely to change from the draft rule under review now.

*Mr. Mermin presented performance measure **recommended to be retained**:*

- There are several measures recommended to be retained, including greenhouse gases per capita, vehicle miles traveled per capita, bicycle miles traveled per capita, motor vehicle travel times between key origins & destinations, and number and percent of households within ½ mile of a regional trail.

Work Group member discussions:

- There was some discussion regarding the definition of a regional trail. There are specific criterions to define regional trails, and those are adopted in the current RTP and the Active Transportation Plan (ATP). The criteria will be provided to the work group.
- The work group would like to see how the performance measures relate back to the goals. While there is a desire to reduce the number of measures, it is important that we are measuring the right things and the evaluation is telling us what we need to know. This will be brought back at the next meeting.
- It's important to measure the connectivity / completeness of the system.
- It's important to measure the programmatic elements in the performance measures, such as the Regional Travel Options, and to identify a return on investment.
- It is important to keep these measures at a high level, each of the modal area plans can dig deeper.

*Mr. Mermin presented performance measure **recommended to be retained with minor adjustments**:*

- There are two measures recommended to be retained with minor adjustments.
- The first is mode share – currently walking, biking and transit are reported at a system-wide level and Non-drive alone is reported for the 2040 design types (e.g. centers, industrial areas, neighborhoods, etc.). The recommended adjustment is report *non-driving* shares instead of *non drive alone* and to report for *mixed use* areas instead of all *2040 design types*.
- The second is the habitat impact – number and % of projects that intersect high value habitat. The proposed adjustment is to report the % of projects that are road widening vs trail projects, since they are different and have different scales of impacts.

Work Group member discussions:

- There was conversation about reporting mode share for the 2040 Corridors. This is a challenge because Corridors are long and narrow and don't work well with the model's transportation analysis zones. Mode share within mobility corridors (which are much broader than 2040 Corridors) could be tracked as a monitoring measure.
- We should continue to report the *system wide* mode share and mixed use area mode shares.
- Another tool we have is the State of Centers which shows how the centers are performing on transit accessibility and completion of the bike and pedestrian system.
- There was a suggestion to continue exploring whether to report industrial areas and employment areas as these may be areas where shared ride becomes important in the future if there are not directly served by transit.
- Ride sharing could be an important measure for health, congestion and first/last mile connections for transit. Ride sharing could open up the conversation regarding travel behavior and the unpredictability about how much that might grow (e.g. Uber, Lyft, etc).
- Members requested reporting of mode shares by mode for each center and industrial area, including shared ride to provide a better sense of differences that may exist before finalizing a recommendation on this measure.
- Currently, projects that intersect habitat are flagged on the RTP project for informational purposes for the public and for the project sponsor. The comment was made that this measure may be more appropriate for informing project development activities rather than system performance.

*Mr. Mermin presented measures recommended **for further discussion and refinement**: congestion and interim regional mobility policy*

- There is a strong desire to shift from measuring V/C and vehicle hours of delay as the primary congestion measures toward measuring reliability and people and goods moving capacity in regardless of mode. Many critiques of congestion as a primary performance measure – it's correlation with strong economies, conflict other goals of region, it ignores biking and walking, often used to justify costly road widening.
- As for the interim regional mobility policy, we are not able to overhaul this (due to the complications of local jurisdictions and ODOT using its thresholds to require developers to help fund local transportation projects – when development is projected to increase congestion) as well as staff capacity limitations. However our work group will spend time in 2017 recommending guidance for how to use it (clarifying what facilities are of primary concern and how the table relates to other targets in the RTP).
- Questions posed to the group to spark discussion
    - What do we really want to achieve, uncongested peak periods vs increased reliability?
    - If we want reliability, what is best way to measure it?
    - How can we measure reliability of all modes, not just driving?
- Desire to move towards reliability measures (the current regional model can't forecast reliability, but it can be monitored with though observed speed data – variations day to day)
- What is the best way to measure congestion in RTP scenarios in the interim?
- Research center staff have begun to explore different measures:
    - Vehicle hours of delay per person (current measure)
    - Congested vehicle miles traveled per person
    - Number of hours each day that the system is full
    - Number of hours of congestion during the shoulder periods (either side of peaks)
- Research center staff have begun exploring different thresholds for "congestion"
    - Adopted interim mobility policy (current policy tailored by location)
    - V/C>.90 (current performance target)
    - MAP-21 draft rule – proposed speeds (35 mph for freeways, 15 mph for non-freeway NHS routes)
    - 70% of posted speed limit (WSDOT system efficiency speed)

Work Group member discussions:

- The measure should relate back to goals/outcomes that we're trying to achieve.
- Travel distance and travel time by mode over time would be interesting to track investments.
- Average speed could measure mobility.
- Reliability and access are important to this measure. Reliability is an important framework for a complete system. This should be used for all modes. A complete system is a reliable system.
- The V/C and LOS are a hindrance and getting in the way of development.
- Desire for more discussion/background of why V/C>1.0 was discarded as a threshold to test during modeling staff analysis. This information will be provided to the work group.
- Break out the freeways from arterials as the USDOT has done for the national performance measures. There could be different measures for freeways than arterials.
- The region is growing quickly again. All around the region people are feeling the pressure from growing congestion; this is a problem in areas not accustomed to urban levels of traffic, e.g. Wilsonville.

- Our current policy acknowledges that we can't build our way out of congestion during the peak periods, but we aspire to protect the off-peak periods for freight to help ensure access to industrial and intermodal facilities.
- Freight trucks try to travel at off-peak periods to avoid congestion. The freight working group is working through the issues of congestion and reliability too. Freight moving from California to Seattle often time route based on Seattle or Bay area traffic not Portland traffic.
- A work group member suggested a memo describing the types and uses for performance measures (e.g. to evaluate packages of projects (as is done in RTP), identify deficiencies in system (as done by ODOT), development review (local jurisdiction and ODOT), etc. The Washington County performance measures work was suggested as a good model for this overview.

Next Steps

John Mermin provided next steps and adjourned the meeting.

- Continue discussing performance measures in September and October.
- Continue to discuss new ways to measure congestion
- Develop system reliability measure(s)
- Other working groups are working through performance measures and will share with this work group at the September and October meetings.
- We will send out to the group today's powerpoint slides and Transportation 4 America's *Planning for a Healthier Future* report will be shared with the work group.

Next Steps for work group:

- Next meeting September 12th at 2pm to continue discussion of measure refinements
- The following meeting will be Friday October 14.

Meeting summary prepared by Jamie Snook.

Meeting materials:

Item	Topic	Document Date	Description
1	Agenda	06/27/16	Meeting Agenda
2	Summary from April 25th meeting	04/25/16	Meeting summary
3	Schedule for RTP measure refinement discussion	06/20/16	timeline
4	Considerations for congestion and reliability memo	06/20/16	Memo to inform refining measures for congestion and reliability
5	Non-drive along mode share in Regional Centers table	06/20/16	Mode share for walking, biking transit and shared ride by centers
6	2018 RTP update hours of congestion	06/23/16	Maps showing hours of congestion
7	Regional Leadership Forum #1 summary	May 2016	Summary

Draft assessment of RTP performance measures *(for RTP Performance Workgroup 9/12/16)*

Existing RTP measures and targets

RTP PM ID	RTP System Evaluation Measure	# of RTP Goals addressed	Understandability	Useful for project prioritization	User experience	Observed data available	Modeled data available
1	Vehicle miles traveled *(total and per capita)*						
2	Bicycle miles traveled *(total and per capita)*						
3	Total delay and cost of delay on the regional freight network in mid-day and PM peak *(auto & truck delay)*						
4	Motor vehicle and transit travel time between key origin-destinations for mid-day and 2-HR PM peak						
5	Congestion - Location and number of miles 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						
6	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)*						
7	Transit productivity *(transit boarding rides per revenue hour)* for High Capacity Transit (HCT) and bus						
8	Number and percent of households within ½-mile of regional trail system						
9	~~Environmental justice measure~~ *(under development see # 19-29 below*	N/A (measure is under development)					
10	Tons of transportation-related air pollutants *(e.g. CO, ozone, and PM-10)*						
11	Tons of transportation-related greenhouse gas emissions *(e.g. CO_2)*						
12	~~Percent of projects that intersect high value habitat areas~~ *(Potential to be updated by #27 below)*	N/A (Not recommended to be used by PM workgroup as a system evaluation measure. Potential to be refined by #27 below)					
13	Hours of vehicle delay per person						
14	Hours of truck delay per truck trip						
15	Fatalities and serious injuries						
16	Miles of Sidewalk, bikeways and trails						
17	~~Avg household combined cost of housing and transportation~~ (See # 19 below)	N/A (measure is under development)					
18	~~Number of essential destinations accessible within 30 min by bicycling & public transit for low-income, minority, senior & disabled populations~~ *(under development see #20-23 below)*	N/A (measure is under development)					

Key to understanding ratings

# of RTP goals addressed
Green = 7-11 goals addressed
Yellow = 4-6 goals addressed
Red = 0-3 goals addressed

Understandability
Green = A measure that can be mostly understood intuitively from the name of the measure.
Yellow = A measure that can be explained in non-technical terms
Red = A measure that is difficult to explain to people not familiar with planning and engineering concepts.

Useful for Project prioritization
Green = Very useful for comparing individual projects
Yellow = Moderately useful for comparing individual projects
Red = Not useful for comparing individual projects

User experience
Green = Directly related to the user of the transportation system during a particular trip
Yellow = Indirectly related to the user experience during a particular trip
Red = Not perceived by the user during a particular trip

Ratings for Understandability, Useful for project prioritization, and User experience are excerpted from the Mutli-Modal Performance Measures & Standards report for Washington County, by Kittleson & Associates, June 2014, available at: https://www.oregon.gov/LCD/TGM/TGMProducts/1F-12_1.pdf.
Ratings for # of RTP Goals addressed, Observed data available and Modeled data available are based on Metro staff assessment.
Additionally, all ratings for measures #2 and #8 are based on a Metro staff assessment (since they were not evaluated in the Kittleson report).

Draft assessment of RTP performance measures *(for RTP Performance Workgroup 9/12/16)*

New or refined measures *(under development by equity, safety, and transit work groups)*	19	Affordability – Combined Housing and Transportation Expenditure						
	20	Accessibility – Proximity of households, low income households and employment within ¼ mile of transit and frequent service transit						
	21	Accessibility – Access to daily needs and jobs in a given travel time						
	22	Accessibility - Improve access to transit – bike and pedestrian improvements						
	23	Accessibility – Intersection of Transportation Investments, Timing and Communities						
	24	Safety – Infrastructure Disparities – Safety Investments on the High Injury Corridor						
	25	Safety – Exposure – Non-Freeway VMT exposure per capita						
	26	Environmental and Health Impacts – Transportation emissions exposure						
	27	Environmental and Health Impacts – Intersection of Transportation Investments, Resource Habitats, and Communities						
	28	Environmental and Health Impacts – Accessing directional change of health outcomes						
	29	Environmental and Health Impacts – Assessing the magnitude of Transportation Impact to public health (burden of disease and premature death) utilizing the Integrated Transportation and Health Impacts Model						
Future Research	30	Person throughput within congested corridors						

RTP System Evaluation Measures and targets vs RTP Goals *(for RTP performance workgroup 9/12/16)*

(Assessment based on RTP performance workgroup recommendations adopted in 2010, except for those underlined which are based on 2016 staff assessment)

		RTP Goals										
	RTP System Evaluation Measures and Performance Targets	Foster Vibrant Communities and Compact Urban Form	Sustain Economic Competitiveness and Prosperity	Expand Transportation Choices	Effective and Efficient Management of System	Enhance Safety and Security	Promote Environmental Stewardship	Enhance Human Health	Demonstrate leadership reducing greenhouse gas emissions	Ensure Equity	Ensure Fiscal Stewardship	Deliver Accountability
Existing RTP measures and targets	**1.** Vehicle miles traveled *(total and per capita)*	●		●			●	●	●			●
	2. Bicycle miles traveled *(total and per capita)*	●		●			●	●	●			●
	3. Total delay and cost of delay on the regional freight network in mid-day and PM peak *(auto & truck delay)*		●		●							●
	4. Motor vehicle and transit travel time between key origin-destinations for mid-day and 2-HR PM peak	●	●	●	●							●
	5. Congestion - Location and number of miles of throughways, arterials, and regional freight network facilities that exceed RTP interim regional mobility policy thresholds in mid-day and 2-HR PM peak		●		●				●			●
	6. 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)*	●		●	●		●	●	●			●
	7. Transit productivity *(transit boarding rides per revenue hour)* for High Capacity Transit (HCT) and bus	●		●					●		●	●
	8. Number and percent of households within ½-mile of regional trail system		●	●			●	●		●		●
	9. ~~Environmental justice measure *(under development)*~~ *(See affordability, accessibility, safety, environmental and health measures 19-29 below)*			●						●		●
	10. Tons of transportation-related air pollutants *(e.g. CO, ozone, and PM-10)*			●			●	●				●
	11. Tons of transportation-related greenhouse gas emissions *(e.g. CO_2)*			●			●	●	●			●
	12. Percent of projects that intersect high value habitat areas (*Potential to be updated by #27 below)*	●					●					●
	13. Vehicle delay per person		●		●							●
	14. Hours of truck delay per truck trip		●		●							●
	15. Miles of Sidewalk, bikeways and trails	●		●		●	●	●	●			●
	16. Fatalities and Serious Injuries					●						●
	17. ~~Average household combined cost of housing and transportation~~ (See affordability measure 19 below)		●							●		●
	18. ~~Number of essential destinations accessible within 30 min by bicycling & public transit for low-income, minority, senior & disabled populations *(data under development)* *(See accessibility measures 20-23 below)~~	●		●			●	●		●		●
New or refined measures (under development by equity, safety, and transit work groups)	**19.** Affordability – Combined Housing and Transportation Expenditure											
	20. Accessibility – Proximity of households, low income households and employment within ¼ mile of transit and frequent service transit											
	21. Accessibility – Access to daily needs and jobs in a given travel time											
	22. Accessibility - Improve access to transit – bike and pedestrian improvements											
	23. Accessibility – Intersection of Transportation Investments, Timing and Communities											
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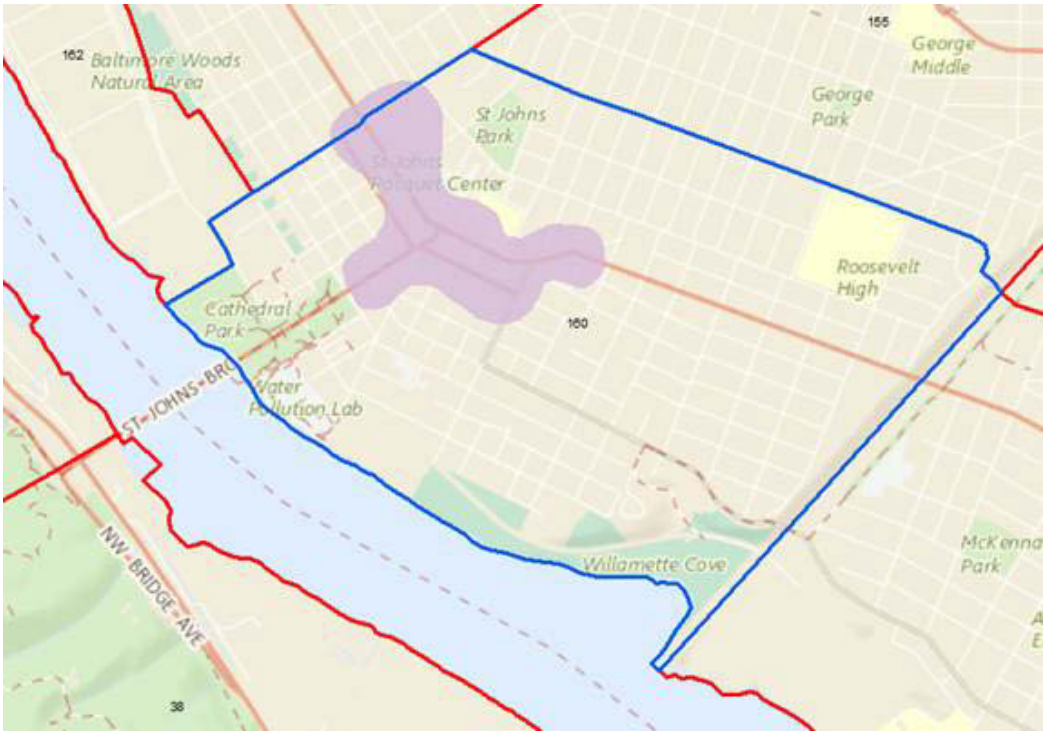
	26. Environmental and Health Impacts – Transportation emissions exposure											
	27. Environmental and Health Impacts – Intersection of Transportation Investments, Resource Habitats, and Communities											
	28. Environmental and Health Impacts – Accessing directional change of health outcomes											
	29. Environmental and Health Impacts – Assessing the magnitude of Transportation Impact to public health (burden of disease and premature death) utilizing the Integrated Transportation and Health Impacts Model											
Future research	**30.** Person throughput within congested corridors											

Review of 2040 design type boundaries and TAZs / why mode share should not be reported at small geographic areas such as Town Centers and Industrial Areas *(for RTP Performance workgroup 9/12/16 meeting)*

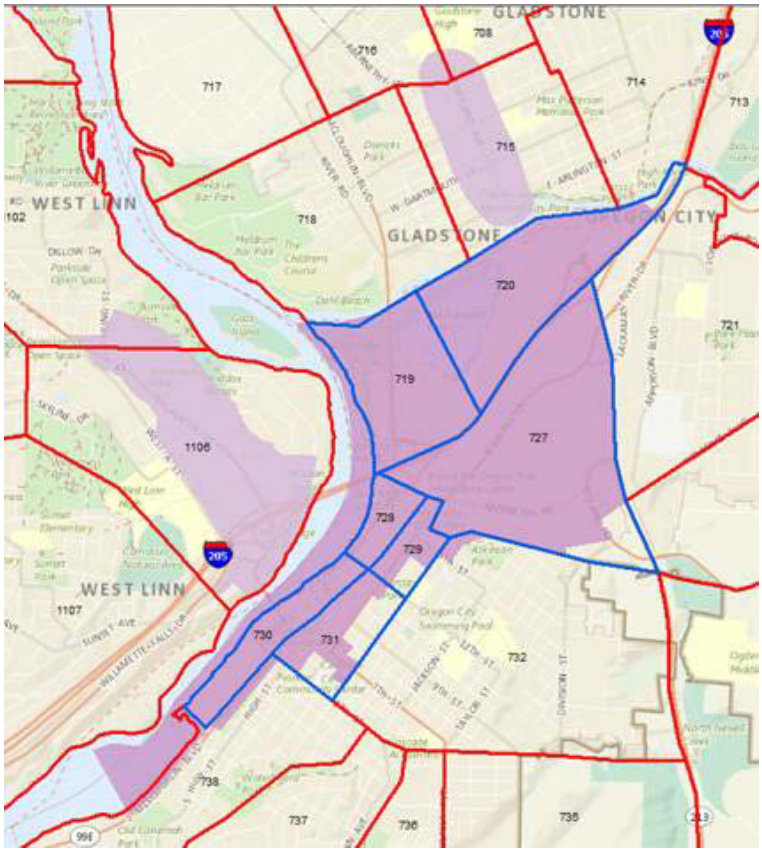
Some Traffic Analysis Zone (TAZ) assumptions that are applied in the travel demand model such as parking and transit pass factors are dependent upon each zone's 2040 designation. A TAZ can be assigned only one 2040 design type to best represent the entire zone. The majority of zones contain multiple classifications, so a script was developed to sort through and assign values based on a mixture of percentages and hierarchies. For larger geographic areas such as the Central City and Regional Centers, this method works well. However, there are locations where the 2040 design types do not match the TAZ geography closely. For example, the portion of the zone below designated as the St John's Town Center (light pink) only comprises 10% of the TAZ.



St John's Town Center - Portland

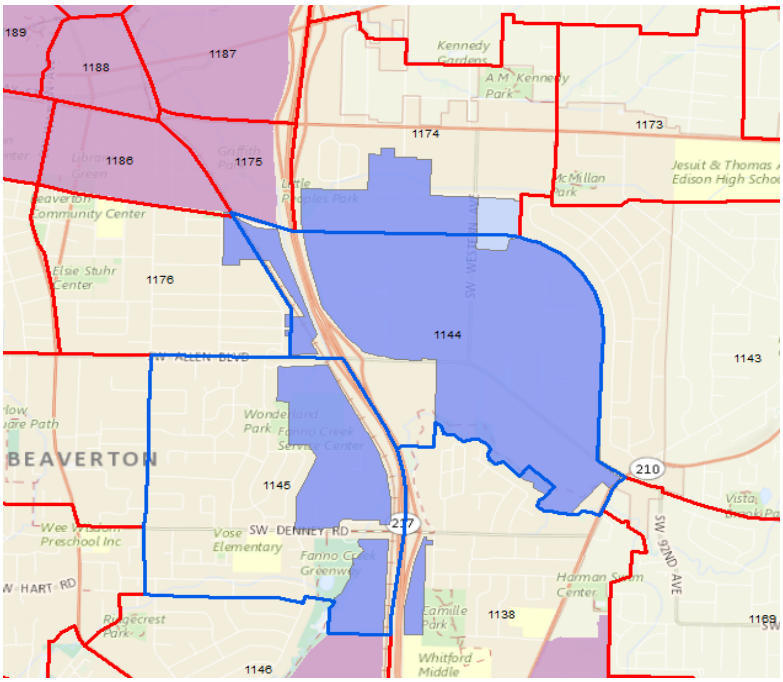
Because the TAZ does not follow the Town Center boundaries well, detailed analysis for the Town Center will not be accurate. In the past the RTP has tracked Non-SOV mode shares for the Central City and Regional Centers. However, it would not be an appropriate use of the model to prepare the data at a smaller level of geography like a Town Center.

The Oregon City Regional Center provides an example of how Regional Center boundaries match up better with TAZs, given their larger size. The blue outlines show the zones with the Regional Center designation, and they mostly cover the Oregon City analysis center in dark pink. Additionally, the lighter pink indicates that the West Linn and Gladstone Town Centers are not represented well by the zonal geography.



Oregon City Regional Center, West Linn Town Center and Gladstone Town Center

Below is an example of an Industrial Area. Again, the blue-shaded portions of the TAZs are not always a good fit with the zonal geography.



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Metro | *Memo*

Date: September 1, 2016
To: Transportation Performance work group and interested parties
From: Peter Bosa, Senior Researcher & Modeler and John Mermin, Regional Planner
Subject: 2018 RTP Model Network development review and validation

Purpose

Provide the RTP Performance work group with response to questions raised about the base year model network during the June 27 work group meeting.

Background

Metro Modeling Services base year transportation networks are validated using industry best practices that meet or exceed Federal guidelines for large, regional transportation models. Prior to any modeling for an RTP update, Metro's partner agencies undertake a jurisdictional review of the base year auto and truck networks and provide Metro staff with any corrections or suggested edits to facility speed, capacity and number of lanes. This review occurred from July to September 2015. Local and regional partners reviewed and provided input to the auto, bicycle and transit networks used to create the 2015 base year and 2040 No-Build networks for use during the 2018 RTP update.

In addition to jurisdictional review of the networks, modeled results on regional networks are compared against observable data to ensure that assigned traffic flows on major facilities and between sub-regions closely match empirical data and that regional mode shares are consistent with regional travel survey sources.

Standard model validation metrics for an RTP level assessment include comparing assigned network volumes across corridor cutlines against collected vehicle counts, model-derived travel times and speeds along major facilities against third-party GPS data sources (e.g., Inrix, HERE, NPMRDS), and modeled regional mode shares against mode shares derived from household activity surveys and U.S. Census (LEHD) data.

The RTP 2015 Base Year network has been compared against all of the above mentioned data sources and has been determined by Metro staff to be reasonably validated for the purposes of regional and corridor-level analyses. As is true with any large regional network, there may be locations on some facilities – particularly those where travel patterns tend to be localized rather than regional – where the regional model does not accurately reflect local traffic characteristics. In these instances, Metro staff encourages the jurisdictions to work with Metro to identify possible solutions to improve the model results in these locations while still maintaining the model's overall regional-level validation.

Please contact Peter Bosa at 503-797-1771 peter.bosa@oregonmetro.gov if you have questions or comments about regional model validation.

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Metro | *Memo*

Date: September 7, 2016
To: Performance Measures Working Group and interested parties
From: Grace Cho, Associate Transportation Planner
Subject: 2018 RTP Performance Measures – Clean Air – Overview and Staff Recommendations

Purpose

Provide the Performance Measures work group an overview of the system evaluation for the existing clean air performance measure and discuss the staff recommended refinements and future work.

Introduction

As part of the 2018 RTP development process, a system evaluation will take place to see how the proposed long-range transportation investment program performs against the RTP goals. The system evaluation takes place as part of the RTP performance management program. Prior to entering the system evaluation, Metro staff is reassessing its performance management program to make any necessary updates or refinements. In reassessing the RTP performance target and system evaluation for clean air, Metro staff worked with DEQ staff to review the existing RTP system evaluation measure. As a result of this review, several refinements are being recommended to the clean air system evaluation for work group discussion.

To help prepare for the discussion of recommended refinements to the clean air performance measure, a brief overview of the existing target, system evaluation method, and pathway to the recommendation is discussed in the following sections.

Clean Air – RTP Performance Target and Approach to System Evaluation

In the 2010 RTP, the performance management program included a clean air performance target and system evaluation measure. The clear air performance target set forth the aspirational goal of:

> "By 2040, ensure zero percent population exposure to at-risk levels of air pollution."

The clean air performance target has been assessed using the EPA-approved emissions model (the current version is called MOVES) to determine the tons of emissions produced for air pollutants:

- Carbon Monoxide (CO)
- Nitrogen Oxides (NO_x)[1]
- Volatile Organic Compounds (VOCs)
- Particulate Matter (PM_{10})

Once the tons of emissions were forecasted for each pollutant, they were reported to show the overall directionality of emissions forecasted based on the future investment scenario and compared to the base year emissions for each pollutant. Table 1 illustrates what has been forecasted for the performance target and system measure in the 2014 RTP.

Table 1. Clean Air – 2014 RTP Performance Target Outputs

[1] Nitrogen Oxide and Volatile Organic Compounds are the pollutant precursors to ozone pollution.

	2010		2040 No Build		2040 Financially Constrained		2040 State	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
Carbon Monoxide	331,177	448,264	172,460	290,047	172,303	289,665	173,330	290,876
Oxides of Nitrogen	96,197	84,786	20,699	17,305	20,605	17,309	20,692	17,400
Volatile Organic Compounds	21,070	20,038	6,144	5,506	6,008	5,413	5,981	5,396
Particulate Matter	2,910	3,304	670	1,141	666	1,137	669	1,141

Furthermore, for the pollutant carbon monoxide the tons of emissions forecasted are then compared to EPA-DEQ approved transportation emissions budgets for the purposes of demonstrating transportation conformity.[2] The approved emissions budget only applies to carbon monoxide because of the region's past history with the pollutant and the federal conformity determination obligations the region must comply with until October 2017.

Clean Air – Assessment of 2014 RTP Performance Measure
To support the refinement efforts of the RTP performance management program, Metro staff reviewed the existing clean air performance target and system evaluation method. The review offered the opportunity to identify refinements needed for the clean air system evaluation as air quality requirements in the region have changed since 2010.

Findings from the review of the RTP clean air performance target include:

1. **The air quality regulatory landscape will be changing for Portland metropolitan region in the very near-term.** More specifically for transportation, as of October 2017, the region will no longer be subject to transportation conformity mandates per the prescribed rules of the U.S. Environmental Protection Agency. Therefore, the traditional mechanism for conducting the system evaluation for the RTP clean air performance target will no longer be a prescribed process for the region. Metro staff sees this change in regulatory landscape as an opportunity to shape the RTP clean air system evaluation measure to better reflect the region's goal of clean air without the narrow prescription from the federal rules.

2. **There is further opportunity to align the system evaluation with the current RTP clean air performance target**. To date, the clean air performance target looks at projected mobile source emissions for three criteria pollutants: carbon monoxide, ozone (through the precursor pollutants volatile organic compounds and nitrogen oxide) and coarse particulate matter. Since 2010, the region has become much more aware of the different air pollutants affecting public health, including air toxics and fine particulates. Additionally, the region is also mandated to look at greenhouse gas emissions through a state law. Because these pollutants are currently not captured as part of the system evaluation for the clear air

[2] An emissions budget is established when a region is designated by the state and federal government to be in violation of national air quality standards. The emission budget is based on a scientific assessment to determine the necessary reduction of emissions to get a region's overall air quality under the federal standards and maintain the standards into the future with projected population growth.

target, they are either not being reported or having to be reported through another program.

3. **The current RTP clean air target, as written, encompasses pollution exposure indiscriminate of source of pollution.** Exposure to at-risk levels of air pollution is cause for significant public health concerns, but as the RTP is the region's strategy for investing in the regional transportation system, the intent of addressing clean air through the RTP is to look at the transportation sector's contribution to air pollution leading to at-risk exposure levels. As written, the target is not specific enough to provide direction and meaningful value towards evaluating whether the RTP investment strategy helps reduce transportation-related air pollution.

4. **The region has a better understanding of air pollutants and their associated public health risk, but the regulatory environment has not caught up**. More research has shown the damaging public health impacts of air toxics exposure, but the regulatory environment pertaining to air toxics emissions is not comprehensive nor uniformly enforced state-by-state. Therefore, air toxics from transportation sources are not formally addressed through the existing target because there are no federal or state required transportation-oriented benchmarks.

Clean Air – Staff Recommendations for the RTP System Evaluation

Based on the review of the clean air performance measure for the 2018 RTP, the following are Metro staff proposed refinements for consideration by the performance measures work group. At this time, the staff recommended refinements are focused towards the system evaluation with specific recommendations to the performance target to be brought forward to the work group in 2017.

1. **Continue to conduct the clean air system evaluation in the same manner as done previously.** The current process of comparing the base-year emissions and projected emissions for a no-build scenario and the horizon-year is a reasonable way of looking at the direction the region's investment strategy is making progress towards reducing transportation's contribution to air pollution.

2. **Continue to use the EPA-approved emissions model (currently the MOVES model) for the RTP clean air system evaluation and remain committed to the updating the model.** Because the region will no longer be mandated through transportation conformity to use the EPA-approved emissions model, the region has options for measuring and modeling projected transportation emissions. However, the EPA-approved model is a reliable and well-researched tool. In addition, the region has familiarity with using the tool and it would be forward-thinking for the region to continue to stay up-to-date with the latest EPA emissions model in case the region becomes subject to transportation conformity again in the future. Lastly, the continued use of the EPA-approved model will support the region's efforts to transition to using MOVES to report on the state mandated reductions in greenhouse gas emissions.

3. **Orient the clean air system evaluation towards specific pollutants.** The clean air system evaluation should be intentional and specific to which air pollutants to track in which the transportation investment program can make an impact. Recommended pollutants the region should continue to measure in the future include:

1) ozone (through the precursors);
2) particulate matter (fine and coarse);
3) transportation generated air toxics; and
4) greenhouse gas emissions.[3]

By placing an emphasis on pollutants for which the region could potentially violate federal air quality standards, state mandates, or address emerging pollutants with high public health risk (e.g. transportation produced air toxics) the assessment of the transportation emissions from the long-range investment strategy would provide more meaningful information to decision-makers.

4. **Reorient the overall clean air performance measure to address transportation emissions rather than pollution concentration levels for at-risk public health conditions**. This would allow for greater focus on the projected transportation emissions from the region's investment strategy and would not link the RTP to air pollution sources beyond the control of the RTP.

Discussion Questions
Based on the assessment of the 2014 RTP clean air performance measure, Metro staff seeks the feedback on the following questions from the performance work group.

1. Are there questions or clarifications regarding the existing 2014 RTP clean air performance target and system evaluation?

2. Are the staff recommendations to the RTP clean air performance measure headed in right direction?

3. What additional information do you need?

Next Steps
In anticipation of future discussions to refine the 2018 RTP performance target and system evaluation for clean air, the following activities and actions are being proposed by Metro staff as next steps to undertake prior to the targets discussion in 2017.

1. Consult with public health partners and continue to hold discussions with DEQ to help identify the appropriate air toxics to include as part of this work.

2. Gather feedback from the performance measures work group on the recommendations to date.

3. Work with travel forecasting staff to determine baseline transportation emissions for the different pollutants of interest.

[3] Carbon monoxide was not identified for future monitoring as part of the performance management program, despite the region's long-term history of having to report on carbon monoxide emissions. This is because EPA and DEQ long-term projections demonstrate carbon monoxide pollution will significantly decline overtime because of the many national level interventions and technology advances has reduced overall carbon monoxide pollution. Additionally, the specific air toxics would be identified with assistance from DEQ and public health partners as there are some air toxics where transportation sources are an insignificant contributor.

4. Continue to consult with DEQ and public health partners to determine potential refinements to the clean air performance target to determine whether an emissions benchmark or per capita level may be a direction to pursue as part of the performance target refinement.

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Metro | *Memo*

Date: September 6, 2016

To: 2018 RTP Performance Measures Work Group

From: Lake McTighe, Transportation Safety Project Manager, Metro

Subject: 2018 RTP Regional Transportation Safety Performance Measures and Targets

Introduction

This memo outlines the proposed 2018 Regional Transportation Plan (RTP) safety performance measures and targets developed by the Regional Transportation Safety Work Group. Metro and the Safety Work Group are seeking input from the Performance Measures Work Group on these measures and targets. Input from the Performance Measures Work Group will be shared with the Safety Work Group at their October 20, 2016 meeting to further refine and finalize the performance measures and targets.

1) **Safety Performance Target for the 2018 RTP**: By 2035 eliminate transportation related fatalities and serious injuries for all users of the region's transportation system, with a 16% reduction by 2020 (as compared to the 2015 five year rolling average), and a 50% reduction by 2025.
2) **Safety System Evaluation Measures for the 2018 RTP:**
    - Percent of safety projects in the RTP investment packages region-wide, and the percent of safety projects in areas with historically underrepresented communities.
    - Exposure to crash risk through the sum of all non-interstate vehicle miles traveled (VMT) in Transportation Area Zones (TAZ) for RTP investment packages region-wide, and in historically underrepresented communities.
3) **Safety Monitoring Measures for the 2018 RTP (including FHWA required safety performance targets):** Annual targets, based on a five year rolling average of the number of people killed and seriously injured in traffic crashes in the region, by mode, per 100 million vehicle miles traveled, and per 100 thousand people.

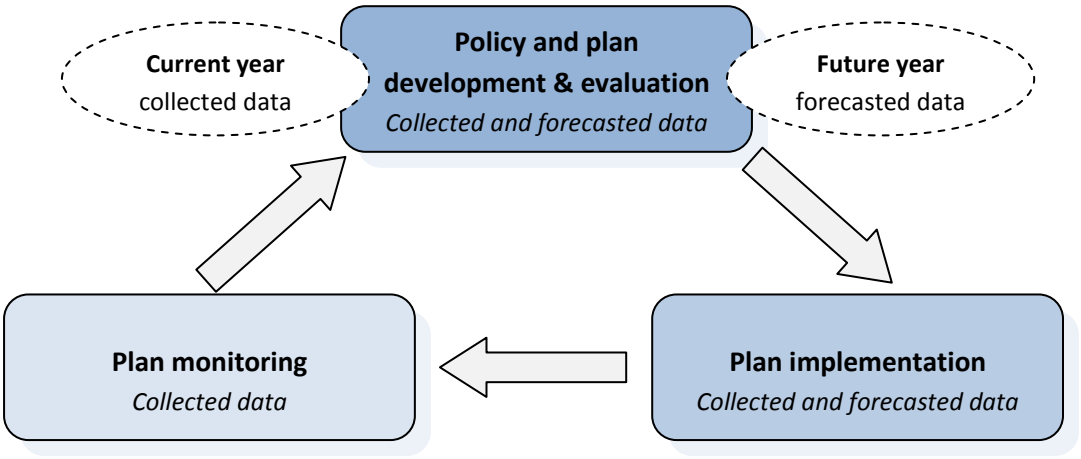
Background: Policy Framework for setting performance measures and targets

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 transportation safety performance measures and targets is captured in Metro's *Regional Transportation Safety Plan Policy Framework Report* (July 2016). It includes an overview of the policies that currently exist at the federal, state and regional level related to transportation safety, highlighting those that have changed since the region's first Regional Transportation Safety Plan was completed in March 2012. In particular, the report highlights policies that reflect:

- Continued emphasis on improving transportation safety
- Growing use of the *Towards Zero Deaths* and *Vision Zero* frameworks and targets
- Use of data, performance measurement, and evaluation
- Recognition of vulnerable users
- Integration of equity and public health perspectives

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] The report describes the three layers of measurement in the 2014 RTP. These are listed in **Table 1** table below with the corresponding 2014 RTP safety measures.

Table 1. RTP Safety Performance Measures

Type of RTP Measure	2014 RTP Safety Measure (Current Measure)	Proposed 2018 RTP Safety Measure
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 the number of fatal and severe injury crashes for pedestrians, bicyclists, and motor vehicle occupants each by 50% compared to 2007 2011 average."*	By 2035 eliminate transportation related fatalities and serious injuries for all users of the region's transportation system, with a 16% reduction by 2020 (as compared to the 2015 five year rolling average), and a 50% reduction by 2025.
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.	The region does not currently forecast the regional safety target, though this is being explored.	1. Percent of safety projects in the RTP investment packages region-wide, and the percent of safety projects in areas with historically underrepresented communities. 2. Exposure to crash risk through the sum of all non-interstate vehicle miles traveled (VMT) in Transportation Area Zones (TAZ) for RTP investment packages region-wide, and in historically underrepresented communities.
RTP Monitoring Measures support the region's federally-required Congestion Management Process reporting between RTP update cycles. State DOTs and MPOs are now required to set performance targets for the Federal safety performance measures identified in MAP-21.	*"Number of fatalities, serious injuries and crashes per vehicle mile traveled for all modes of travel region-wide."*	Annual targets, based on a five year rolling average of the number of people killed and seriously injured in traffic crashes in the region, by mode, per 100 million vehicle miles traveled, and per 100 thousand people.

Proposed 2018 RTP Safety Performance Target

[1] See the 2018 RTP Performance Measures page: http://www.oregonmetro.gov/public-projects/2018-regional-transportation-plan/performance and the meeting packet for April 25, 206

RTP Performance Targets set time bound, quantifiable goals for achieving the region's desired policy outcomes for investment in the region's transportation system.

Metro's *Regional Transportation Safety Plan Policy Framework Report* (July 2016) outlines existing policy direction for the region to develop a target of eliminating transportation related fatalities and serious injuries. Additionally, several current or soon to be adopted plans have "zero deaths" visions and/or targets, including the Oregon Transportation Safety Action Plan, Portland Vision Zero Action Plan, Clackamas County Transportation Safety Action Plan, Washington County Transportation Safety Action Plan, and the Hillsboro Transportation Safety Action Plan.

The Safety Work Group developed a regional transportation safety performance target that included a target date, refers to "all users" of the transportation system, and includes interim targets.

Proposed 2018 RTP Safety Performance Target

"By 2035 eliminate transportation related fatalities and serious injuries for all users of the region's transportation system, with a 16% reduction by 2020 (as compared to the 2015 five year rolling average), and a 50% reduction by 2025."

- This target would replace the current 2014 Safety Performance Target.
- Progress towards meeting the 2035 target (annual and interim targets) would be measured with the targets set in the RTP Monitoring Measures, using an "S-curve" distribution of declining fatal and serious injury deaths.
- The target year of 2035 will not change in subsequent RTP updates.

Potential 2018 RTP System Evaluation Measures for Safety

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, and in most cases, overlap with the RTP Performance Targets.

Metro has not forecasted crashes or crash exposure risk, or measured safety investments in other ways, in past RTPs. The RTP Transportation Equity Work Group recommended the safety system evaluation measures shown in **Table 2**, to be developed in coordination with the Safety Work Group and the Performance Measures Work Group; the measures would be applied in the equity analysis, as well as region-wide.

Table 2. Potential Transportation Safety System Evaluation Measures

Community Priority	System Evaluation Measure Description
Safety – Infrastructure Disparities	Safety Investments on High Injury Corridors: Identified transportation safety investments are mapped to illustrate which overlap with the high injury network and in key community geographies. Assess whether investments are being made evenly in certain communities with evident transportation safety issues (as indicated by the categorization as a high injury facility).
Safety –Exposure	Non-Interstate Vehicles Miles Traveled Exposure: The sum of all non-interstate vehicle miles traveled (VMT) would be totaled for key community geographies and based on the transportation investment program, look at how VMT changes in key community geographies and correlate traffic safety exposure.

- Safety Investments are projects that are constructed on a Regional High-Injury Corridor, and allocate a majority of the project cost to a documented safety countermeasure(s) to address a specific documented risk, [2] and/or improve safety for vulnerable users, including people walking and bicycling, older adults and youth, and/or are Safe Routes to School projects (do not need to be located on a High Injury Corridor).
- Key Communities are historically underrepresented communities and are areas (Census tracts) which are above the regional rate for any of the following: People of Color, Households with Lower Incomes, People with Limited English Proficiency AND census tracts which are above the regional rate for both Older Adults and Young People
- Regional High Injury Corridors (HICs) provide a quantitative assessment of the crash performance of every roadway in the metropolitan region in order to identify the subset of roadways where the highest concentrations of severe crashes involving a motor vehicle occur. Regional HICs were identified to support planning and prioritization of corridor safety efforts, and represent 7% of the region's streets but 60% of its severe crashes. To identify the HICs, 2010-2014 crash data from the Oregon Department of Transportation was analyzed weighting crashes for each mode of travel by severity. Each corridor was divided into segments, which were given an aggregate crash score based on the frequency of severe crashes, normalized by the length of the segment. The corridors identified as HICs are the roadway segments with the highest number of severe crashes per mile in the region. The HICs do not replace state or locally identified high crash corridors.
- Metro staff are exploring possible methodologies for measuring exposure to crash risk using increase in VMT as a correlation for increase exposure to risk. The Safety Work Group was strongly interested in including other factors, such as traffic speed, posted speed, roadway design, land use etc. Including these factors would be useful but will require development of a

[2] Example safety countermeasures include, but are not limited to, FHWA's nine proven safety countermeasures: road diets, medians and pedestrian crossing islands, pedestrian hybrid beacons, roundabouts, access management, retroreflective backplates, safety edge, enhanced curve delineation, and rumble strips.

more extensive safety/crash model. Metro is pursuing this for future RTPs; it is not feasible to construct a model in the planning timeframe.

Proposed RTP Monitoring Measures for Safety

RTP Monitoring Measures support the region's federally-required Congestion Management Process reporting between RTP update cycles. (Metro has had limited resources and capacity to track System Monitoring Measures every two years as intended, and, observed data is not always readily available; crash data for example, is usually at least one year old. To aid better reporting, Metro will be moving toward a new online "Mobility Corridors" tool for monitoring.)

State DOTs and MPOs must now report on the federally required performance measures identified in MAP-21.[3] Metro will report on these measures in each update of the RTP, and in the Metropolitan Service District report of performance measures that Metro is required to submit in accordance with ORS 197.301 to the Department of Land Conservation and Development (DLCD) every two years.

The measures identified in **Table 3**, below, are proposed to replace the 2014 RTP safety monitoring measure: "Number of fatalities, serious injuries and crashes per vehicle mile traveled for all modes of travel region-wide."

The measures in **Table 3** include the five FHWA safety measures that Metro is required to report on, and additional monitoring measures proposed by Metro and the Transportation Safety Work Group, to measure: "The five year rolling average of the number of people killed and seriously injured in traffic crashes in the region, by mode, per 100 million vehicle miles traveled, and per 100 thousand people."

[3] The final safety rule can be accessed at: http://safety.fhwa.dot.gov/hsip/rulemaking/ Significant federal rulemaking activities to implement the performance provisions first included in the Moving Ahead in the 21st Century Act (MAP-21) Act and subsequent provisions contained in the Fixing America's Surface Transportation (FAST) Act have been underway for nearly 4 years by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA).

Table 3. RTP System Monitoring Measures & FHWA Performance Measures

Proposed RTP Monitoring Measures for Safety	Required by FHWA Safety PM Rule
1. Fatalities	
a. Fatalities (Number of People)	**x**
b. Fatalities / 100M Vehicle Miles Traveled (VMT)	**x**
c. Fatalities / 100K Population	
2. Serious Injuries	
a. Serious Injuries (Number of People)	**x**
b. Serious Injuries / 100M VMT	**x**
c. Serious Injuries / 100K Population	
3. Non-motorized Fatalities and Serious Injuries	
a. Non-motorized Fatalities and Serious Injuries (Number of People)	**x**
4. Auto-only Fatalities and Serious Injuries	
a. Auto-only Fatalities (Number of People)	
b. Auto-only Serious Injuries (Number of People)	
c. Auto-only Fatalities / 100M VMT	
d. Auto-only Serious Injuries / 100M VMT	
e. Auto-only / 100K Population	
e. Auto-only Serious Injuries/ 100K Population	
b. Auto-only Fatalities and Serious Injuries / 100M VMT	
5. Pedestrian Fatalities and Serious Injuries	
a. Pedestrian Fatalities (Number of People)	
b. Pedestrian Serious Injuries (Number of People)	
c. Pedestrian Fatalities / 100M VMT	
d. Pedestrian Serious Injuries / 100M VMT	
e. Pedestrian Fatalities / 100K Population	
e. Pedestrian Serious Injuries/ 100K Population	
6. Bicycle Fatalities and Serious Injuries	
a. Bicycle Fatalities (Number of People)	
b. Bicycle Serious Injuries (Number of People)	
c. Bicycle Fatalities / 100M VMT	
d. Bicycle Serious Injuries / 100M VMT	
e. Bicycle Fatalities / 100K Population	
e. Bicycle Serious Injuries/ 100K Population	

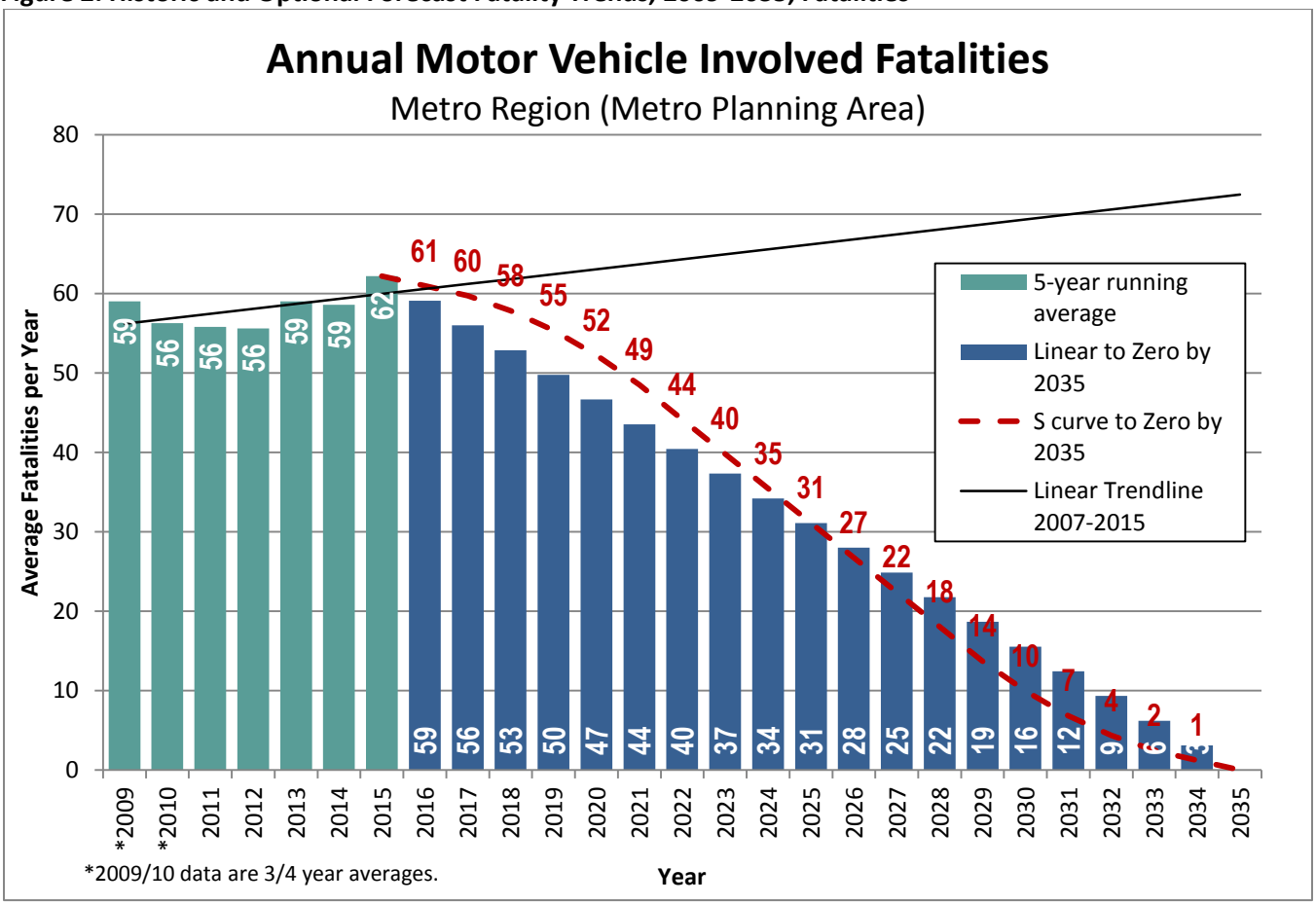
Annual Targets for FHWA Safety Performance Measures

State DOTs and MPOs are required to set annual performance targets for each of the five Federal safety performance measures identified in MAP-21. The targets are based on a five year rolling average and are applicable to all roads. Once established, Metro will be required to report on these measures, and will do so in each RTP update.

Metro will include the Federal safety performance measures and annual targets in the RTP Monitoring Measures; progress on meeting the annual targets will be reported on in each RTP update. ODOT has until April 14, 2017 to set required safety targets. Within six months of ODOT's targets adoption, Metro must also set its first safety targets. ODOT has incorporated the required performance measures and draft targets in the draft Transportation Safety Action Plan (TSAP). ODOT is expected to begin safety target-setting discussions with metropolitan planning organizations (MPOs) and other stakeholders this summer. Metro is proposing (see below under Monitoring Measures) to use the target setting approach recommended by ODOT.

Metro is proposing to use the approach recommended by the Oregon Department of Transportation (ODOT) in the draft 2016 Oregon Transportation Safety Action Plan. The TSAP recommends setting targets based on the the S-curve forecast trend (the dotted lines in the **Figures** below). Metro would set targets for each mode listed in **Table 3**.

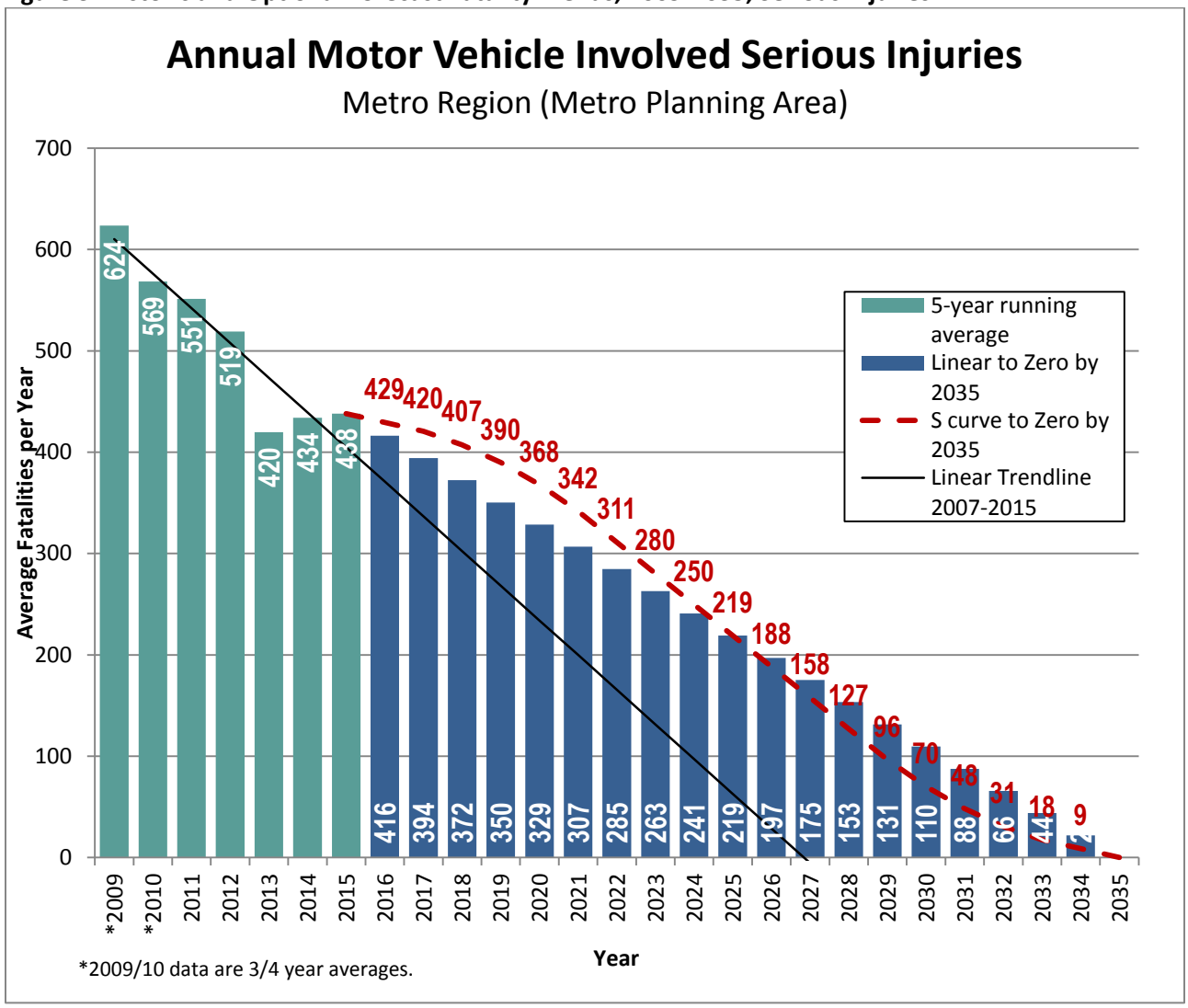
Figure 2. Historic and Optional Forecast Fatality Trends, 2009-2035, Fatalities



The **S-curve forecast method** was developed assuming the five-year average number of crashes may be relatively flat in the near future; start to decline in a few years in recognition of different projects, programs and actions implemented in the region and/or automated vehicles; an flatten out again in the future as it becomes more difficult to address the remaining fatalities.

In the Draft 2016 Oregon Transportation Safety Action Plan, ODOT identified three other trend forecasting options: 1) Straight line to zero by 2035 (shown in Figure 2 above); 2) A 3-percent reduction per year (a conservative approach that would not achieve zero by 2040); 3) Trend-line, based on data 2009-2015 (while the trend-line for the state is trending down, the trend-line for the region is trending up.[4]

Figure 3. Historic and Optional Forecast Fatality Trends, 2009-2035, Serious Injuries



[4] The Draft 2016 Oregon Transportation Safety Action Plan can be accessed on ODOT's website https://www.oregon.gov/ODOT/TD/TP/TSAP/Draft_TSAP.pdf

Figure 4. Historic and Optional Forecast Fatality Trends, 2009-2035, Pedestrian Fatalities & Serious Injuries

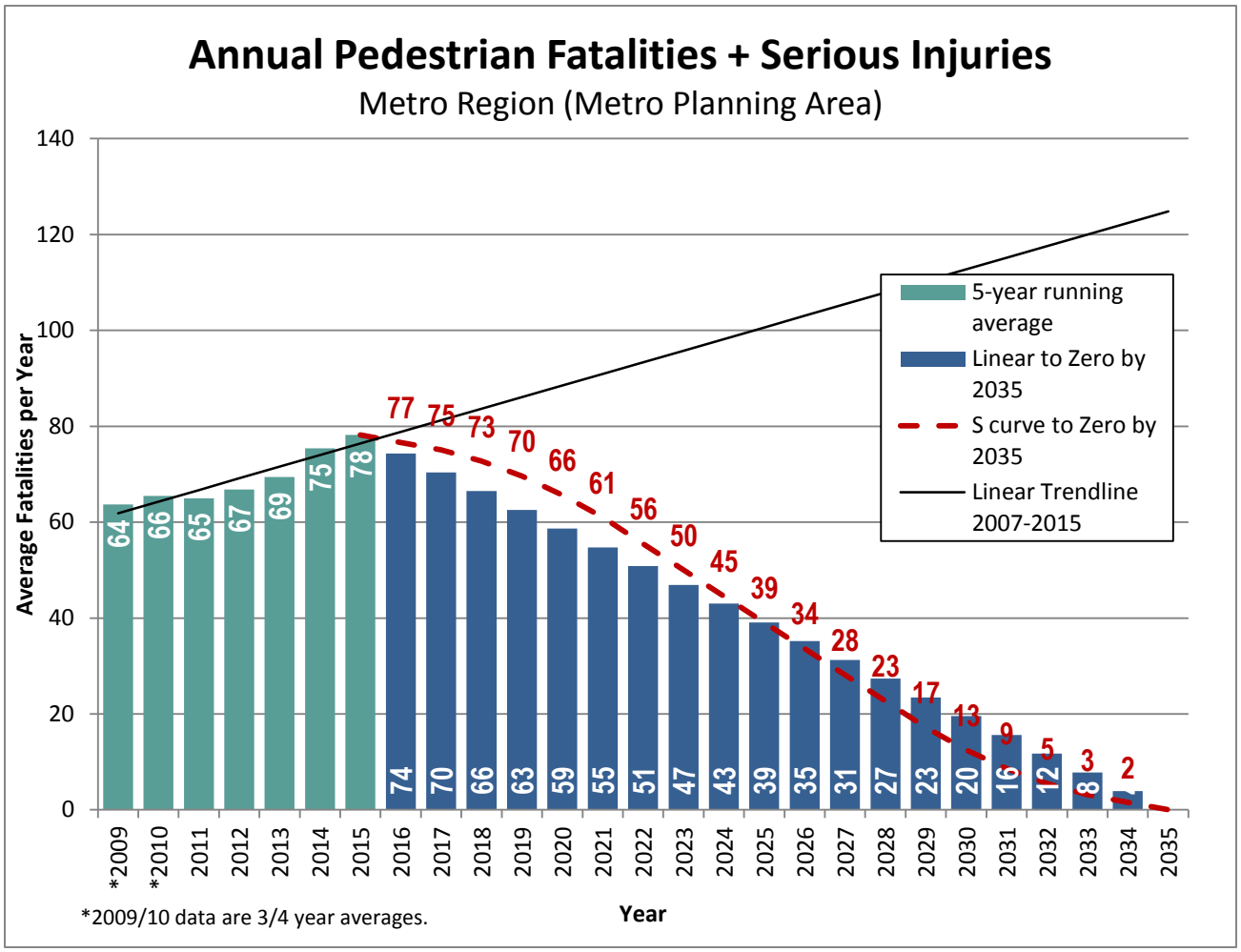


Figure 5. Historic and Optional Forecast Fatality Trends, 2009-2035, Bicycle Fatalities & Serious Injuries

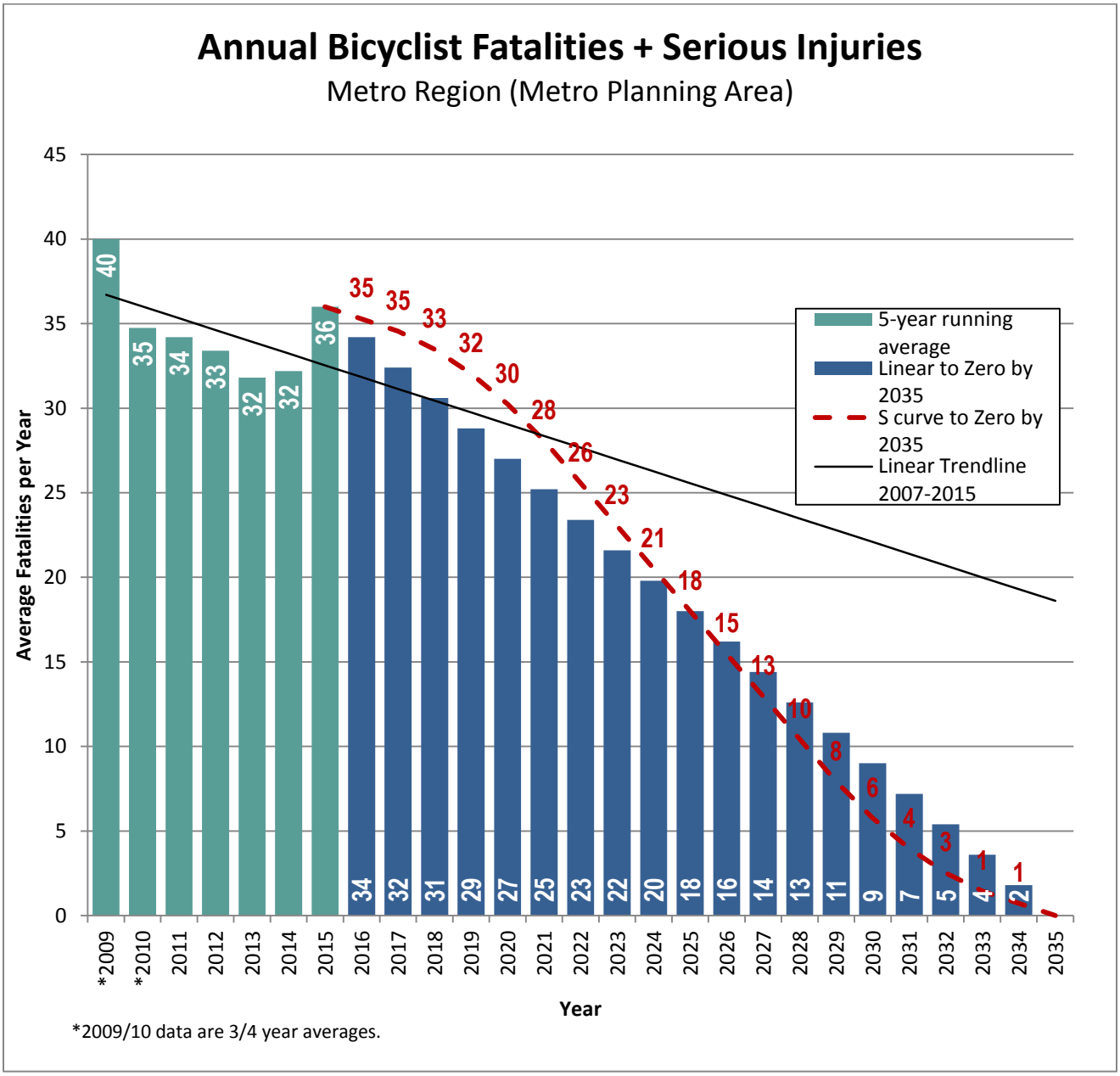


Table 4, below, provides an example of how the annual performance targets would be shown. The **S-Curve** trend line would remain constant throughout the reporting cycles in order to accurately track actual performance in eliminating fatal and serious crashes against the S-Curve.

Table 4: EXAMPLE Annual Safety Targets

	FHWA Performance Measures					Motor Vehicle Only				Pedestrians				Bicyclists			
Reporting Year (based on a 5-year rolling average)	**Fatalities (People)**	**Fatality Rate (People/ 100 MVMT)**	**Serious Injuries (People)**	**Serious Injury Rate (People/ 100 MVMT)**	**Non-Motorized Fatalities and Serious Injuries (People)**	**Fatalities (People)**	**Fatality Rate (People/ 100 MVMT)**	**Serious Injuries (People)**	**Serious Injury Rate (People/ 100 MVMT)**	**Fatalities (People)**	**Fatality Rate (People/ 100 MVMT)**	**Serious Injuries (People)**	**Serious Injury Rate (People/ 100 MVMT)**	**Fatalities (People)**	**Fatality Rate (People/ 100 MVMT)**	**Serious Injuries (People)**	**Serious Injury Rate (People/ 100 MVMT)**
2011 - 2015 (Base)	62	0.86	438	6.0	114	39	0.53	347	4.8	21	0.30	57	0.8	2	0.03	34	0.5
2014 - 2018	58	0.77	407	5.4	106	36	0.48	323	4.3	20	0.27	53	0.7	2	0.02	32	0.4
2015 - 2019	55	0.73	390	5.2	102	35	0.46	309	4.1	19	0.25	51	0.7	2	0.02	30	0.4
2016 - 2020	52	0.68	368	4.8	96	33	0.43	292	3.8	18	0.24	48	0.6	2	0.02	29	0.4
2018 - 2022												44	0.6	2	0.02	27	0.3
2019 - 2023																	
2020 - 2024																	
2021 - 2025																	
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Metro | *Memo*

Date: August 17, 2016
To: Regional Transportation Plan Performance Measure Work Group
From: Jamie Snook, Principal Planner, on behalf of the Regional Transit Work Group
Subject: DRAFT 2018 Regional Transportation Plan (RTP) Performance Measures Preliminary Recommendations

Purpose

The purpose of this memorandum is to summarize the Transit Work Group's preliminary recommendation regarding performance measures to support the 2018 Regional Transportation Plan (RTP). The Transit Work Group is charged with supporting the 2018 Performance Measure Work Group in identifying the appropriate performance measures as it relates to transit.

Background

As part of the 2018 RTP, Metro is working with regional partners to implement the Climate Smart Strategy and develop the Regional Transit Strategy (RTS) to create a single coordinated vision for making transit more frequent, convenient, accessible and affordable. The RTS vision will provide a long-term vision for transit and transit supportive elements for the region.

It is important to note that we are not starting from scratch, a lot work has gone into defining transit performance measures in the past. The most recent past includes the 2014 RTP and the Climate Smart Strategy.

Current RTP performance measures

The RTP establishes an evaluation and system monitoring program for the region's transportation system. The RTP includes the following transit related system evaluation measures in Chapter 4:

- Motor vehicle and transit travel time between key origin-destination for mid-day and 2-hour PM peak.
- Non-Drive alone mode share system-wide and for central city and individual regional centers (% of daily walking, bicycling, shared ride and transit trips).
- Transit productivity (transit boarding rides per revenue hour) for high capacity transit (HCT) and bus.
- By 2040, increase by 50% the number of essential destinations accessible within 30 minutes by bicycle and public transit for low-income, minority, senior and disabled populations compared to 2005 (currently a target and not a measure).

Climate Smart Strategy performance monitoring targets

In addition the RTP, the Climate Smart Strategy recommended the following transit-related performance monitoring targets be considered in the 2018 RTP update:

- Daily transit service revenue hours
- Share of households within ¼ mile all day frequent transit

- Share of low-income households within ¼ mile of all day frequent transit
- Share of employment within ¼ mile of all day frequent service
- Transit fares (measure to be determined with the 2018 RTP update)

In addition to the performance measures for the RTP, the Transit Work Group could develop additional evaluation/performance measures for the regional transit vision. The purpose of this would be to ensure that the proposed improvements in the regional transit vision support the goals and vision for the RTS. These measures could build off of the RTP, Climate Smart Strategy and the previous HCT Plan.

Transit vision statement

Transit is a key component of achieving our region's six desired outcomes and our climate strategy goals. To do this, the region needs to invest to make transit more frequent, convenient, accessible and affordable.

- **Frequent:** Align frequency and type of transit service to meet existing and projected demand and in support of local and regional land use and transportation visions.
- **Convenient:** Make transit more convenient and competitive with driving by improving transit speed, geographic coverage, and reliability through priority treatments (e.g., signal priority, bus lanes, queue jumps, etc.) and other strategies. Improve customer experience by ensuring seamless connections between various transit providers, including transfers, information and payment.
- **Accessible:** Provide safe and direct biking and walking routes and crossings that connect to stops makes transit more accessible. Expand the system to improve access to jobs and essential destinations/daily needs.
- **Affordable:** Ensure transit remains affordable, especially for those dependent upon it.

Planning and implementing transit investments should be done in an equitable way, understanding the range in the types of transit investments as well as the diversity in needs around the region.

Recommended RTP performance measures for transit

The following section describes how the transit related performance measures correspond to the overall transit vision statement. This recommendation combines the performance measures from the 2014 RTP, Climate Smart Strategy performance monitoring targets, input from the Transit Work Group and coordination with the RTP Equity Work Group. Combining measures from multiple sources in this way may requiring some reframing or restructuring to ensure a coherent set of measures. In addition, the Transit Work Group proposes to add two new performance measures:

- System completeness for bike and pedestrian access to transit – in order to help measure the accessibility to transit; and
- Housing + Transportation costs relative to cost burden – in order to measure the affordability of housing and transportation for everyone.

Frequent: Align frequency and type of transit service to meet existing and projected demand and ensure support of local and regional land use and transportation visions.

- Increase daily transit service revenue hours per mode
- Transit productivity (transit boarding rides per revenue hour) for mode or service characteristics

Convenient: Make transit more convenient and competitive with driving by improving transit speed and reliability through priority treatments (e.g., signal priority, bus lanes, queue jumps, etc.) and other strategies. Improve customer experience by ensuring seamless connections between various transit providers, including transfers, information and payment.

- Motor vehicle and transit travel time parity between key origin-destination for mid-day and 2-hour PM peak.
- Non-Drive alone mode share system-wide and for central city and individual regional centers (% of daily walking, bicycling, shared ride and transit trips).

Accessible: Provide safe and direct biking and walking routes and crossings that connect to stops to make transit more accessible. Expand the system to improve access to jobs and essential destinations/daily needs.

Accessibility can be defined in many ways, here there are three definitions used: 1) time based, 2) proximity and 3) infrastructure.

- Destinations accessible within 30 minutes *(travel time to be discussed later)* by public transportation for the region and historically under-represented communities:
    - For daily needs
    - Important services
    - Jobs
- Proximity of households and employment with a ¼ mile of transit and frequent service transit
    - Share of households
    - Share of low-income households (to be coordinated with the Equity Work Group)
    - Share of employment
- Number or percent of bike or pedestrian projects or mileage that improve access to transit or fill in identified gaps in the system to access transit. *(This is a subset of a broader performance measure that looks at closing bike and pedestrian gaps region wide.)*

Affordable: Ensure transit remains affordable, especially for those dependent upon it.

- Housing + Transportation costs relative to cost burdened designation

Additional considerations and next steps

In addition, the Transit Work Group is interested in measuring congested corridors and people throughput as potential monitoring measures, with the understanding that these measures may be

appropriate with broader applications beyond transit activity alone. The Working Group suggests there may be an opportunity to address these interests through updates to the Mobility Corridor Atlas.

The Transit Work Group will continue to coordinate the methodology and analysis of these performance measures with the RTP Equity Work Group and the RTP Performance Measure Work Group. Additionally, there were other transit-related measures identified that may be evaluted through the greater Regional Transit Strategy process. These concepts will be shared and coordinated with the Performance Measures and Equity Working Groups at a later date.

Mode Share for the Central City and Regional Centers

Centers Detailed Mode Share	2015 Base Year	2040 No Build	2040 Constrained	2040 Strategic	2040 Climate Smart Transit
Central City					
Bike	9%	10%	10%	10%	10%
Walk	15%	16%	16%	16%	16%
Transit	14%	14%	20%	22%	22%
Shared Ride	28%	26%	26%	25%	25%
Drive Alone	34%	34%	27%	26%	26%
Amberglen					
Bike	2%	2%	3%	3%	3%
Walk	6%	8%	8%	8%	8%
Transit	2%	2%	4%	5%	5%
Shared Ride	40%	38%	38%	38%	38%
Drive Alone	51%	50%	47%	46%	46%
Beaverton					
Bike	2%	2%	2%	2%	2%
Walk	5%	6%	6%	6%	6%
Transit	5%	5%	7%	9%	9%
Shared Ride	40%	39%	38%	38%	38%
Drive Alone	48%	49%	46%	45%	45%
Clackamas					
Bike	1%	2%	3%	3%	3%
Walk	5%	7%	8%	8%	8%
Transit	5%	5%	7%	8%	8%
Shared Ride	40%	38%	37%	37%	37%
Drive Alone	49%	48%	45%	44%	44%
Gateway					
Bike	3%	3%	3%	3%	3%
Walk	6%	7%	7%	7%	7%
Transit	6%	8%	10%	12%	12%
Shared Ride	38%	36%	35%	35%	35%
Drive Alone	48%	47%	44%	43%	43%
Gresham					
Bike	2%	2%	2%	2%	2%
Walk	7%	7%	8%	8%	8%
Transit	5%	5%	8%	9%	9%
Shared Ride	38%	37%	37%	36%	36%
Drive Alone	48%	48%	45%	45%	45%
Hillsboro					
Bike	2%	2%	2%	2%	2%
Walk	7%	8%	9%	9%	9%
Transit	7%	6%	8%	8%	8%
Shared Ride	36%	35%	35%	34%	34%
Drive Alone	49%	49%	47%	46%	46%
Oregon City					
Bike	1%	1%	1%	1%	1%
Walk	3%	4%	4%	4%	4%
Transit	2%	2%	3%	4%	4%
Shared Ride	43%	41%	41%	41%	40%
Drive Alone	50%	52%	51%	51%	50%
Vancouver CBD					
Bike	2%	3%	3%	3%	3%
Walk	9%	12%	12%	12%	12%
Transit	4%	4%	6%	7%	7%
Shared Ride	37%	34%	34%	34%	34%
Drive Alone	48%	47%	45%	44%	44%
Washington Square					
Bike	1%	2%	2%	2%	2%
Walk	6%	7%	7%	7%	7%
Transit	3%	3%	4%	5%	5%
Shared Ride	40%	38%	38%	38%	38%
Drive Alone	51%	51%	49%	48%	48%

This summary includes all person trips except school bus

Centers Detailed Mode Share	2015 Base Year	2040 No Build	2040 Constrained	2040 Strategic	2040 Climate Smart Transit
Central City					
Bike	85,490	125,490	135,850	133,890	133,840
Walk	151,050	204,080	214,340	212,990	212,690
Transit	139,390	180,530	265,640	282,270	282,270
Shared Ride	274,240	340,240	333,290	331,140	332,040
Drive Alone	341,720	441,760	353,040	344,960	345,930
Amberglen					
Bike	1,090	2,870	3,410	3,430	3,430
Walk	3,580	10,500	10,920	10,880	10,910
Transit	1,600	2,260	5,470	6,060	6,090
Shared Ride	25,460	49,290	49,600	49,480	49,530
Drive Alone	32,600	63,880	61,210	60,400	60,430
Beaverton					
Bike	1,200	1,740	2,130	2,110	2,120
Walk	3,860	5,530	5,850	5,780	5,820
Transit	3,710	4,970	7,100	8,410	8,430
Shared Ride	30,440	37,410	37,380	37,560	37,410
Drive Alone	36,830	47,060	44,650	44,090	43,950
Clackamas					
Bike	2,260	4,310	5,590	5,610	5,550
Walk	8,400	15,570	17,470	17,280	17,320
Transit	7,270	11,280	15,800	17,490	17,510
Shared Ride	62,400	82,140	80,750	80,570	80,490
Drive Alone	76,110	103,580	97,800	96,870	96,810
Gateway					
Bike	3,610	5,290	5,970	5,940	5,930
Walk	8,100	11,790	12,340	12,260	12,260
Transit	9,170	14,070	18,710	20,780	20,720
Shared Ride	53,840	63,800	63,100	62,780	62,820
Drive Alone	68,560	83,470	78,160	76,630	76,740
Gresham					
Bike	1,780	2,650	2,940	2,920	2,910
Walk	6,290	9,140	9,520	9,380	9,430
Transit	4,490	6,580	9,560	10,490	10,430
Shared Ride	33,340	45,150	44,690	44,390	44,420
Drive Alone	41,820	58,680	55,290	54,520	54,600
Hillsboro					
Bike	1,230	2,340	2,640	2,650	2,640
Walk	4,810	9,110	9,660	9,590	9,600
Transit	4,550	7,100	8,700	9,500	9,530
Shared Ride	24,310	39,830	38,810	38,810	38,820
Drive Alone	33,160	55,910	52,550	52,060	52,060
Oregon City					
Bike	240	530	590	580	580
Walk	890	1,620	1,660	1,630	1,650
Transit	610	970	1,350	1,670	1,850
Shared Ride	11,260	18,250	17,920	18,010	17,990
Drive Alone	13,220	23,310	22,510	22,440	22,380
Vancouver CBD					
Bike	2,390	5,520	5,460	5,460	5,450
Walk	10,190	25,830	26,180	26,160	26,170
Transit	5,090	8,860	13,980	14,420	14,420
Shared Ride	42,230	73,990	73,910	73,850	73,830
Drive Alone	55,610	101,120	96,230	95,870	95,860
Washington Square					
Bike	2,440	3,520	4,580	4,680	4,650
Walk	10,070	14,500	15,890	15,720	15,850
Transit	4,480	5,790	8,010	10,520	10,460
Shared Ride	69,190	84,770	84,580	86,670	85,620
Drive Alone	88,450	112,580	107,550	107,680	106,720

This summary includes all person trips except school bus