Agenda

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

Meeting: Transportation Policy Alternatives Committee (TPAC) Workshop
Date: Wednesday, March 9, 2022
Time: 9:30 a.m. to 12:00 p.m.
Place: Virtual meeting held via Zoom
Connect with Zoom
Passcode: 515676
Phone: 888-475-4499 (Toll Free)

9:30 a.m.	**Call meeting to order and Introductions** • Committee input on creating a Safe Space at TPAC	Chair Kloster
9:37 a.m.	**Public communications on agenda items**	
9:39 a.m.	**Consideration of TPAC workshop summary, January 12, 2022** • Edits/corrections sent to Marie Miller	Chair Kloster
9:40 a.m.	**Draft 2022-2023 Unified Planning Work Program (UPWP) Review And Discussion** Purpose: Discuss Draft 2022-23 UPWP and its adoptions schedule.	John Mermin, Metro
10:00 a.m.	**Regional Mobility Policy Update Case Study Findings and Policy Options** Purpose: Continue discussion of the case study findings and seek TPAC input on potential options for the updated policy.	Kim Ellis, Metro Susie Wright, Kittelson & Associates Glen Bolen ODOT Lidwien Rahman, ODOT
10:55 a.m.	**Safe and Healthy Urban Arterials - 2023 Regional Transportation Plan (RTP) policy brief** Purpose: Discuss arterials policy brief and get TPAC input on recommended actions for regional partners.	John Mermin, Metro Lake McTighe, Metro
11:55 a.m.	**Committee comments on creating a safe space at TPAC**	Chair Kloster
12:00 p.m.	**Adjournment**	Chair Kloster

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សេចក្តីជូនដំណឹងអំពីការមិនរើសអើងរបស់ Metro

ការគោរពសិទ្ធិពលរដ្ឋរបស់ ។ សំរាប់ព័ត៌មានអំពីកម្មវិធីសិទ្ធិពលរដ្ឋរបស់ Metro ឬដើម្បីទទួលពាក្យបណ្តឹងរើសអើងសូមចូលទស្សនាគេហទំព័រ www.oregonmetro.gov/civilrights។
បើលោកអ្នកត្រូវការអ្នកបកប្រែភាសានៅពេលអង្គប្រជុំសាធារណៈ សូមទូរស័ព្ទមកលេខ 503-797-1700 (ម៉ោង 8 ព្រឹកដល់ម៉ោង 5 ល្ងាច ថ្ងៃធ្វើការ) ប្រាំពីរថ្ងៃថ្ងៃធ្វើការ មុនថ្ងៃប្រជុំដើម្បីអាចឲ្យគេសម្រួលតាមសំណើរបស់លោកអ្នក ។

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2022 TPAC Work Program

As of 3/4/2022

NOTE: *Items in* ***italics*** *are tentative;* ***bold*** *denotes required items*

March 4, 2022 **9:00 a.m. – 12:00 p.m.**	**March 9, 2022 – TPAC Workshop**
Comments from the Chair: • New Zoom online meeting format with panelists/attendees discussion & consideration of 9:30 am start to TPAC workshop meetings (Chair Kloster) • Creating Safe Space at TPAC (Chair Kloster) • Committee member updates around the Region (Chair Kloster & all) • Monthly MTIP Amendments Update (Ken Lobeck) • Fatal crashes update (Lake McTighe) • RFFA update, timeline, next steps (Dan Kaempff) • DLCD Climate Friendly Equitable Communities (CFEC) Rules – Update (Kim Ellis) **Agenda Items:** • **MTIP Formal Amendment 22-5251** Recommendation to JPACT (Lobeck, 10 min) • **2018 RTP Amendment 21-1467 I-205 Toll Project** Recommendation to JPACT (Kim Ellis, Metro/ Mandy Putney & Garet Prior, ODOT, 60 min) • **MTIP Formal Amendment 21-5234** Recommendation to JPACT (Lobeck, 10 min) I-205 Toll Project • 2023 RTP Draft Values and Outcomes, Work Plan and Engagement Plan Review and Discussion (Kim Ellis & Molly Cooney-Mesker, Metro, 35 min) • Draft 2022-23 UPWP Review & Discussion (John Mermin, 20 min) • Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)	**9:30 am – noon** **Agenda Items:** • Draft 2022-23 UPWP Review & Discussion (John Mermin, 20 min) • Regional Mobility Policy Update Case Study Findings and Policy Options (Kim Ellis, Metro/ Susie Wright, Kittelson & Associates/ Glen Bolen & Lidwien Rahman, ODOT, 55 min) • Safe and Healthy Urban Arterials - 2023 RTP policy brief (John Mermin/Lake McTighe, 60 min)

<u>April 1, 2022</u> 9:00 am – noon

Comments from the Chair:

- Creating Safe Space at TPAC (Chair Kloster)
- Committee member updates around the Region (Chair Kloster & all)
- Monthly MTIP Amendments Update (Lobeck)
- Fatal crashes update (Lake McTighe)

Agenda Items:

- **MTIP Formal Amendment 21-******
  <u>Recommendation to JPACT</u> (Lobeck, 10 min)
- **2022-23 UPWP Resolution 22-5244**
  <u>Recommendation to JPACT</u> (Mermin, 20 min)
- **2023 Regional Transportation Plan Update Work Plan and Engagement Plan –**
  <u>Recommendation to JPACT</u> (Kim Ellis/ Molly Cooney-Mesker, 30 min.)
- 82nd Avenue Project update (Elizabeth Mros-O'Hara, Metro/ City of Portland TBD; 30 min)
- *RFFA additional fund allocations from IIJA, discussion (Ted Leybold & Margi Bradway, 20 min)*
- Updated 2024-27 MTIP revenue forecast (Grace Cho/Ted Leybold, Metro; 20 min)
- 2024-27 ODOT Administered Fund Program Allocations/ Scoping updates (Chris Ford 10 min)
- Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)

<u>April 20, 2022 – MTAC/TPAC Workshop</u>
10 am – noon

Agenda Items:

- 2019-2021 Regional Flexible Fund – Local Agency Project Fund Exchanges Update (Grace Cho, 15 min)
- Regional Mobility Policy Update: Shaping the Recommended Policy and Action Plan - (Kim Ellis, Metro/ Lidwien Rahman, ODOT, 60 min)
- 2023 RTP policy brief - Congestion Pricing Policy Development (Alex Oreschak / Kim Ellis, 60 minutes)

<u>May 6, 2022</u> 9:00 am – noon

Comments from the Chair:

- Creating Safe Space at TPAC (Chair Kloster)
- Committee member updates around the Region (Chair Kloster & all)
- Monthly MTIP Amendments Update (Lobeck)
- Fatal crashes update (Lake McTighe)

Agenda Items:

- **MTIP Formal Amendment 21-******
  <u>Recommendation to JPACT</u> (Lobeck, 15 min)
- *Interstate Bridge Replacement (IBR) draft modified LPA discussion (Elizabeth Mros-O'Hara & TBD, 45 min)*
- Transportation Equity Analysis for the 2023 RTP (Eliot Rose, Metro, 30 min)
- Transport Work Program update (Caleb Winter, Metro/ Kate Freitag, ODOT, 30 min)
- Enhanced Transit Concepts / Better Bus update (Malu Wilkinson & Alex Oreschak, 30 min)
- Transit Agencies Budget and Programming of Projects Update (Nancy Young-Oliver, TriMet/ Kelsey Lewis, SMART, 30 min)
- 2024-27 ODOT Administered Funding-OTC Program Allocations among Fix-It & Enhance Highway Programs(Chris Ford; 20 min)
- Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)

<u>May 11, 2022 – TPAC Workshop</u>
10 am – noon

Agenda Items:

- Regional Freight Delay and Commodities Movement Study (Tim Collins, Chris Johnson, Kyle Hauger, Metro; 60 min)
- Regional Flexible Funds Allocation (RFFA) Outcomes Evaluation and Risk Assessment review (Dan Kaempff, 30 min)
- 2024-2027 MTIP Performance Evaluation – Approach & Methods (Grace Cho, 30 min)
- Transit-Oriented Development (TOD) Program Strategic and Work Plan update (Andrea Pastor, Metro, 30 min)
- TriMet Forward Together Service Alternatives Planning Project (Grant O'Connell and Tara O'Brien, TriMet, 45 min.)

<u>June 3, 2022</u> 9:00 am – 11:30 a.m.
Comments from the Chair:

- Creating Safe Space at TPAC (Chair Kloster)
- Committee member updates around the Region (Chair Kloster & all)
- Monthly MTIP Amendments Update (Ken Lobeck)
- Fatal crashes update (Lake McTighe)

Agenda Items:

- **MTIP Formal Amendment 21-******
  <u>Recommendation to JPACT</u> (Lobeck, 15 min)
- Regional Mobility Policy Update: Recommended Policy and Action Plan - Discussion (Kim Ellis, Metro/ Lidwien Rahman, ODOT, 60 min)
- Emerging Transportation Trends Study Recommendations (Eliot Rose, Metro, 30 min)
- Regional Flexible Funds Allocation (RFFA) initial input on developing staff proposals (Dan Kaempff, Metro; 30 min)
- 2023 RTP policy brief - Congestion Pricing Policy Development (Alex Oreschak / Kim Ellis, 60 minutes)
- Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)

<u>June 15, 2022 – MTAC/TPAC Workshop</u>
10 am – noon

Agenda Items:

- RTP - Equitable Finance 2023 RTP (Lake McTighe, Metro) 45 min
- DLCD Climate Friendly & Equitable Communities Rulemaking item (Kim Ellis, Metro; 60 min)
- Urban Growth Management Functional Plan Amendments – discussion (Ted Reid & Tim O'Brien, Metro; 60 min)

<u>July 8, 2022</u> 9:00 am – 11:30 a.m.
Comments from the Chair:

- Creating Safe Space at TPAC (Chair Kloster)
- Committee member updates around the Region (Chair Kloster & all)
- Monthly MTIP Amendments Update (Ken Lobeck)
- Fatal crashes update (Lake McTighe)

Agenda Items:

- **MTIP Formal Amendment 21-******
  <u>Recommendation to JPACT</u> (Lobeck, 15 min)
- High Capacity Transit Strategy Update for 2023 RTP (Ally Holmqvist, Metro, 30 min)
- Transportation Needs and Disparities Analysis for 2023 RTP (Eliot Rose, Metro, 30 min)
- Regional Flexible Funds Allocation (RFFA) public comment report, initial draft staff recommendations (Dan Kaempff, Metro, 45 min)
- Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)

<u>July 13, 2022 – TPAC Workshop</u>
10 am – noon

Agenda Items:

- Regional Flexible Funds Allocation (RFFA) refining staff recommendations (Dan Kaempff, Metro, 90 min)

<u>August 5, 2022</u> 9:00 am – 11:30 a.m. Comments from the Chair: • Creating Safe Space at TPAC (Chair Kloster) • Committee member updates around the Region (Chair Kloster & all) • Monthly MTIP Amendments Update (Ken Lobeck) • Fatal crashes update (Lake McTighe) **Agenda Items:** • **MTIP Formal Amendment 21-****** <u>Recommendation to JPACT</u> (Lobeck, 15 min) • **Regional Mobility Policy Update: Recommended Policy and Action Plan** <u>Recommendation to JPACT</u> (Kim Ellis, Metro/ Glen Bolen & Lidwien Rahman, ODOT; 30 min) • Regional Flexible Funds Allocation (RFFA) refined draft staff recommendations, with CCC priorities (Dan Kaempff, Metro, 45 min) • Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)	**<u>August 17, 2022 – MTAC/TPAC Workshop</u>** **10 am – noon** **Agenda Items:**
<u>September 2, 2022</u> 9:00 am – 11:30 a.m. Comments from the Chair: • Creating Safe Space at TPAC (Chair Kloster) • Committee member updates around the Region (Chair Kloster & all) • Monthly MTIP Amendments Update (Ken Lobeck) • Fatal crashes update (Lake McTighe) **Agenda Items:** • **MTIP Formal Amendment 21-****** <u>Recommendation to JPACT</u> (Lobeck, 15 min) • **Regional Flexible Funds Allocation (RFFA) Final Project Selection** <u>Recommendation to JPACT</u> (Dan Kaempff, Metro; 45 min) • RTP needs assessment and performance measures (Eliot Rose, Metro, 30 min) • Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)	**<u>September 14, 2022 – TPAC Workshop</u>** **10 am – noon** **Agenda Items:**

<u>October 7, 2022</u> 9:00 am – 11:30 a.m. Comments from the Chair: • Creating Safe Space at TPAC (Chair Kloster) • Committee member updates around the Region (Chair Kloster & all) • Monthly MTIP Amendments Update (Ken Lobeck) • Fatal crashes update (Lake McTighe) **Agenda Items:** • **MTIP Formal Amendment 21-****** <u>Recommendation to JPACT</u> (Lobeck, 15 min) • Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)	**<u>October 19, 2022 – MTAC/TPAC Workshop</u>** **10 am – noon** **Agenda Items:**
<u>November 4, 2022</u> 9:00 am – 11:30 a.m. Comments from the Chair: • Creating Safe Space at TPAC (Chair Kloster) • Committee member updates around the Region (Chair Kloster & all) • Monthly MTIP Amendments Update (Ken Lobeck) • Fatal crashes update (Lake McTighe) **Agenda Items:** • **MTIP Formal Amendment 21-****** <u>Recommendation to JPACT</u> (Lobeck, 15 min) • High Capacity Transit Strategy Update for 2023 RTP (Ally Holmqvist, Metro, 30 min) • Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)	**<u>November 9, 2022 – TPAC Workshop</u>** **10 am – noon** **Agenda Items:**
<u>December 2, 2022</u> 9:00 am – 11:30 a.m. Comments from the Chair: • Creating Safe Space at TPAC (Chair Kloster) • Committee member updates around the Region (Chair Kloster & all) • Monthly MTIP Amendments Update (Ken Lobeck) • Fatal crashes update (Lake McTighe) **Agenda Items:** • **MTIP Formal Amendment 21-****** <u>Recommendation to JPACT</u> (Lobeck, 15 min) • Committee Wufoo reports on Creating a Safe Space at TPAC (Chair Kloster; 5 min)	**<u>December 21, 2022 – MTAC/TPAC Workshop</u>** **10 am – noon** **Agenda Items:** • *2024 Growth Management Decision Work Program (Ted Reid, 60 min)*

Parking Lot: Future Topics/Periodic Updates

- RTP – Goals, Objectives and Targets for the 2023 RTP (Kim Ellis & Eliot Rose)
- RTP – Safe and Healthy Urban Arterials Policy Development for 2023 RTP (John Mermin & Lake McTighe)
- RTP – Climate Smart Strategy Update and Climate Analysis for 2023 RTP (Kim Ellis)
- RTP – Transportation Equity Analysis for the 2023 RTP (Eliot Rose)
- RTP – Transportation Needs and Disparities Analysis for 2023 RTP (Eliot Rose)
- RTP – Revenue Forecast for 2023 RTP (Ted Leybold)
- RTP Needs Analysis and Performance Measures for Evaluating 2023 RTP Priorities (Eliot Rose)
- RTP – Call for Projects for 2023 RTP (Kim Ellis)
- RTP – Update on Call for Projects for 2023 RTP (Kim Ellis)
- Ride Connection Program Report (Julie Wilcke)
- Get There Oregon Program Update (Marne Duke)
- RTO Updates (Dan Kaempff)
- Update on SW Corridor Transit
- Burnside Bridge Earthquake Ready Project Update (Megan Neill, Multnomah Co)
- Columbia Connects Project
- Best Practices and Data to Support Natural Resources Protection
- Better Bus Program (Matt Bihn)
- Regional Emergency Transportation Routes Update Phase 2 (John Mermin, Metro & Laura Hanson, RDPO)

Agenda and schedule information E-mail: marie.miller@oregonmetro.gov or call 503-797-1766.
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Meeting minutes

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

Meeting: **Transportation Policy Alternatives Committee (TPAC) Workshop**

Date/time: Wednesday January 12, 2022 | 10:00 a.m. to 11:30 a.m.

Place: Virtual online meeting via Web/Conference call (Zoom)

Members Attending	**Affiliate**
Tom Kloster, Chair	Metro
Karen Buehrig	Clackamas County
Allison Boyd	Multnomah County
Chris Deffebach	Washington County
Lynda David	SW Washington Regional Transportation Council
Dayna Webb	City of Oregon City and Cities of Clackamas County
Jay Higgins	City of Gresham and Cities of Multnomah County
Don Odermott	City of Hillsboro and Cities of Washington County
Chris Ford	Oregon Department of Transportation
Idris Ibrahim	Community Representative

Alternates Attending	**Affiliate**
Jaimie Lorenzini	City of Happy Valley and Cities of Clackamas County
Julia Hajduk	City of Sherwood and Cities of Washington County
Glen Bolen	Oregon Department of Transportation

Members Excused	**Affiliate**
Eric Hesse	City of Portland
Karen Williams	Oregon Department of Environmental Quality
Laurie Lebowsky	Washington State Department of Transportation
Lewis Lem	Port of Portland
Jessica Stetson	Community Representative
Wilson Munoz	Community Representative
Yousif Ibrahim	Community Representative
Donovan Smith	Community Representative
Rachael Tupica	Federal Highway Administration
Katherine Kelly	City of Vancouver, WA
Rob Klug	Clark County
Shawn M. Donaghy	C-Tran System
Jeremy Borrego	Federal Transit Administration
Rich Doenges	Washington Department of Ecology

Guests Attending	**Affiliate**
Mike McCarthy	City of Tualatin
Steve Kelly	Washington County
Chris Lamm	Cambridge Systematics
Adriana Antelo	

Michael Weston	City of King City
Steve Koper	City of Tualatin
Sorin Garber	
Alice Biber	Oregon Department of Transportation

Metro Staff Attending

Dan Kaempff, Principal Transportation Planner	Ted Leybold, Resource & Dev. Manager
Lake McTighe, Senior Transportation Planner	Grace Cho, Senior Transportation Planner
Tim Collins, Senior Transportation Planner	John Mermin, Senior Transportation Planner
Eliot Rose, Tech Strategic Planner	Ken Lobeck, Senior Transportation Planner
Joe Gordon, Senior GIS Specialist	Kyle Hauger, Sr. Researcher & Modeler
Grace Stainback, Associate Trans. Planner	Clint Chiavarini, Senior GIS Specialist
Al Mowbray, Senior GIS Specialist	Thaya Patton, Sr. Researcher & Modeler
Summer Blackhorse, Program Assistant	Marie Miller, TPAC Recorder

Call to Order and Introductions

Chair Kloster called the meeting to order at 10:00 a.m. Introductions were made. Reminders where Zoom features were found online was reviewed. The link for providing 'safe space' at the meeting was shared in the chat area.

Public Communications on Agenda Items - none

Consideration of TPAC workshop summary, November 10, 2021 (Chair Kloster) No edits or corrections from the committee were received.

Regional Freight Delay & Commodities Movement Study Policy Framework (Tim Collins, Metro/ Chris Lamm, Cambridge Systematics) Tim Collins began the presentation with an overview of the study objectives:

- Identify which mobility corridors are carrying the highest volumes and highest values of commodities
- Explore how increases in e-commerce are impacting the transportation system and regional economy
- Examine how congestion and unreliability on the regional transportation system impacts commodity movement
- Make recommendations for future regional policy and planning efforts to improve commodity movement; while addressing equity, safety and climate when applicable

Project Management Team members (PMT) and Stakeholder Advisory Committee Members (SAC) were noted. With regional freight policy framework and questions being developed in task 3, the study will move to the big picture with next tasks outlined.

- Task 4 Regional Freight Modeling Work and Measures
- Task 5 Growth Trends in E-commerce and Delivery Services (includes logistics solutions and Covid-19 impacts on ecommerce and delivery services)
- Task 6 Policy Findings and Recommendations
- Task 7 Final Report and Presentations

Regional Freight priorities and RTP policy strategies were noted. The Regional Freight Strategy has a regional freight action plan. Each of the freight action items are associated with one of the seven regional freight policies. Some of the action items speak directly to the objectives and work tasks in the Regional Freight Delay and Commodities Movement Study.

Comments from the committee:

- Don Odermott noted that historically freight was measured by roadway counts and weight, not tracked by value. Where did the basis of this data come from? Mr. Collins noted several freight inputs; how freight movement goes around the county, input and exports in the country, no longer simply origin to destination for routes, and survey inputs on truck routes and time needed to reach destinations. More information on the financial values, and comparisons with truck sizes will be developed and discussed with Task 4.

  Chris Lamm added information about the survey with census bureau data, value of goods movement and freight tonnage estimated. Mr. Odermott added that in the last RTP the freight element was not recognizing congestion links that failed in the system. It was hoped the new Freight model would provide better calculation on this.

- Karen Buehrig asked what type of information is expected from the model for policy decisions. Mr. Collins noted several elements are expected; truck volumes on different mobility corridors, truck speeds, times of travel, and value with tonnage and specific areas identified from 10 different commodity groups. Asked when feedback on this is expected in the study will be completed, the PMT and Stakeholders Advisory Committee meetings should have this information in April, along with GPS data.
- Chris Deffebach was excited to see improvements with the data from the study. It was noted that ODOT did a transit corridor statewide network study, but regional focus on a freight corridor with the I-5 was needed. Standards with time mobility is now obsolete with congestion on the system 12 hours a day. It was noted the importance of this study being folded into other freight plans with implications on the whole corridor systems. Mr. Collins noted the timing with the study regarding both I-5 and I-84 freight movement. It was agreed RTP strategies, mobility policy updates and freight studies would be coordinated together.

Mr. Collins reviewed Freight Policy Framework development:
• Importance of developing a freight policy framework
1. Needs to be consistent with other regional policies
2. Address economic benefits and impacts of commodity movement
3. Address the growth impacts of goods delivery and e-commerce.
• Knowing the existing regional freight and transportation policies; what should be in our freight policy framework?
• Public sector considerations related to the growth impacts of goods delivery and e-commerce.

Policy questions for the study will address what emerging trends in the freight sector that have certain types of impacts on the transportation system, when and how should the public sector play a role in addressing the growth impacts that e-commerce and goods delivery is having, are there new ways to address goods movement performance and what is relevant to know about freight and goods movement, and what are ways in which the freight sector can reduce greenhouse gas emissions.

It was noted higher demand in ecommerce deliveries with more delivery vehicles and trips, and more fulfillment center development gave importance to curb management, congestion, emissions, safety, land use and development, workforce and access to work, and effects on local and regional economy. Public sector agencies have noted these changes and are addressing them.

Comments from the committee:

- Karen Buehrig asked how this affects the relationships with other modes of freight delivery such as ports and airlines. Mr. Collins noted we can utilize the Port's data on commodities and value of dollar. Beyond rail and marine ports commodities data are known but not always tonnage and value. Asked about distribution sites outside the Metro area, it was noted the study is looking at trips coming from outside our region, notably intermodal facilities in the valley that could affect delivery changes. The study is looking at several elements that might not necessarily be included in the model.
- Glen Bolen noted that with daily ecommerce deliveries, were public coordination available. Mr. Lamm noted some outside the US have urban consolidation centers for delivery carriers but there were challenges. One being ceding control of the last mile between companies, and consumer demands for same day delivery that is popular now. Asked what affects rising shipping costs of deliveries were sustainable, factors being studied include supply/demand, challenges in our public policy environment, and opportunities on orders with demand changes.
- Mike McCarthy asked about diversion affects with trucks taking routes away from major roads to avoid congestion and making longer routes to get to destinations. It was noted that quantified numbers on diversion with where, amount of times, and the safety impacts from this would be useful. Noted also was the effect of companies relocating or declining to locate in the region because of the rising congestion for deliveries. Mr. Collins noted the model did not specifically target diversion but other studies on freight delays were included in the study. Mr. Lamm added other data was available at the corridor level with the study.
- Don Odermott concurred with the congestion comments by Mr. McCarthy. Truck routes taken externally to the travel model are missing, as well as the reliability data in the study.
- Allison Boyd asked if a question in the study more directed on environmental justice could be added regarding impact on freight corridors. Mr. Collins requested specific language for this question be sent to him for enclosure.

The presentation was concluded with data on employment trends, national retail ecommerce trends, near term and long term freight and delivery affects, and further key data points to investigate with the study. The presentations were added to the packet following the meeting, with the committee invited to contact Mr. Collins and Mr. Lamm on further questions.

FFY 2021 Obligation Target Performance and Annual Obligation Report (Ted Leybold & Ken Lobeck, Metro) Mr. Leybold presented an overview of the obligation target performance, including definition by the Federal Highway Administration and process. The process involves agreement between ODOT and Oregon's large MPOs (Portland, Salem, Eugene), provides MPOs with flexibility in year-to-year spending of funds, provides ODOT with more certainty in spending levels of MPOs, and helps Oregon qualify for supplemental federal transportation funds each year.

Reward and penalty based incentives are implemented annually following 2021-2023 performance cycle. Only Regional Flexible Funds are subject to meeting targets. Obligation performance are measured on a three-year rolling average. Metro implementation includes draft programming of funds at beginning of federal fiscal year, adjust programming in consultation with ODOT local area liaisons and agency staff to "lock in" obligation target by December, and measure and report obligation performance at end of federal fiscal year.

In 2021, Metro met 102.8% of a $30,451,550 obligation target. Obligation target for 2022 is $40,266,561. Three-year obligation total for 2021 – 2023 time period must be 80% or greater of funds programmed to obligate in those years. ”Older Funds” (pre-2021) must be obligated by 2023 or will be lost. Lead agency responsibilities were outlined with consequences to lead agency(s) responsible if region misses obligation target and funding penalty is imposed. Mr. Lobeck noted the memo in the packet that provided more details on projects.

Comments from the committee:

- Jay Higgins asked if these were already discussed with the local agencies for monitoring. Mr. Leybold noted several presentations at Metro, and Mr. Lobeck serving on the monthly meeting with ODOT and local agency liaisons that review projects to monitor these funding budgets and implementations.
- Chris Deffebach asked if risk assessments would be a consideration with next round of RFFA grants. Mr. Leybold noted that if applying for a second round on the same project they would identify the delay and how to get the project back on track. Noting the ‘readiness to go’ on projects, it was agreed that a well scoped project was encouraged, with more questions asked about projects on applications.

Asked by Chair Kloster if quarterly project reports were planned, Mr. Leybold and Mr. Lobeck agreed to provide which would report on project status and any programming issues.

Committee comments on creating a safe space at TPAC – no comments received.

Adjournment
There being no further business, workshop meeting was adjourned by Chair Kloster at 11:32 a.m.
Respectfully submitted,
Marie Miller, TPAC Recorder

Attachments to the Public Record, TPAC workshop meeting, January 12, 2022

Item	Document Type	Document Date	Document Description	Document No.
1	Agenda	1/12/2022	1/12/2022 TPAC Workshop Agenda	011222T-01
2	TPAC Work Program	1/5/2022	TPAC Work Program as of 1/5/2022	011222T-02
3	Minutes	11/10/2021	Minutes for TPAC workshop, 11/10/2021	011122T-03
4	Report	1/12/2022	Draft Timeline for Tasks in the Statement of Work for the Regional Freight Delay and Commodities Movement Study	011222T-04
5	Memo	1/5/2022	TO: TPAC and interested parties From: Ken Lobeck, Funding Programs Lead RE: Metro Annual Obligation Target Overview	011222T-05
6	Presentation	1/12/2022	Regional Freight Delay and Commodities Movement Study Project overview and Freight Policy Framework	011222T-06
7	Presentation	1/12/2022	Regional Freight Delay and Commodities Movement Study Developing the Study's Freight Policy Framework	011222T-07
8	Presentation	1/12/2022	Regional Freight Delay and Commodities Movement Study Subtask 3.2 COVID-19 E-Commerce Research Overview	011222T-08
9	Presentation	1/12/2022	Transportation Funding Obligation Targets	011222T-09

Memo

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

Date: February 25, 2022
To: Transportation Policy Alternatives Committee (TPAC) and interested parties
From: John Mermin, Senior Transportation Planner
Subject: 2022-23 Draft Unified Planning Work Program (UPWP)

Background

What the UPWP Is

The Unified Planning Work Program (UPWP) is developed annually by Metro as the Metropolitan Planning Organization (MPO) for the Portland Metropolitan Area. It is a federally-required document that serves as a guide for transportation planning activities to be conducted over the course of each fiscal year, beginning on July 1st. Included in the UPWP are descriptions of the transportation planning activities, the relationships between them, and budget summaries displaying the amount and source of state and federal funds to be used for planning activities. The UPWP is developed by Metro with input from local governments, TriMet, the Oregon Department of Transportation (ODOT), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). It helps ensure efficient use of federal planning funds. The UPWP may be amended periodically as projects change or new projects emerge.

What the UPWP Is not

The UPWP is not a regional policy making document and does not make any funding allocations. Instead, the UPWP reflects decisions already made by JPACT, the Metro Council and/or the state legislature on funding and policy. The UPWP does not include construction, design or preliminary engineering projects. It only includes regionally significant planning projects (primarily those that will be receiving federal funds) for the upcoming fiscal year.

UPWP Adoption process

A link to download the Draft UPWP was sent out to Federal and State reviewers (and TPAC members) on February 3. The required Federal and State consultation will be held (via Zoom) on March 7. All are welcome to attend. At the April 1 TPAC meeting, Metro staff will provide a revised (tracked-changes) UPWP document and will request a recommendation to JPACT. Staff will provide informational briefings to the Metro Council and JPACT in April and then will ask for adoption at the May 19 JPACT and Council meetings. Staff will transmit the adopted UPWP to Federal & State partners by May 20. This allows time for the IGA to be signed by Metro's COO prior to June 30, allowing for federal funding to continue flowing into the region without delay.

Please contact john.mermin@oregonmetro.gov, for inquiries about the UPWP.

Oregon Department of Transportation

March 2, 2022

To: TPAC
From: Vanessa Vissar, Oregon Department of Transportation
Re: Draft FY 2022-2023 Unified Planning Work Program: I-5 Boone Bridge and Seismic Improvement Project

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The I-5 Boone Bridge and Seismic Improvement Project was included in the Draft FY 2022-2023 Unified Planning Work Program (UPWP) sent to TPAC members in February. ODOT staff are requesting a slight language modification be made to the I-5 Boone Bridge and Seismic Improvement Project description in the final FY 2022-2023 UPWP that TPAC will consider taking action on at the April 1 meeting. In the attached narrative, the description has been updated to more accurately reflect ODOT's project Planning Phase activities and feedback provided by Metro Council and staff. ODOT staff will continue to consult with Metro staff throughout the Planning Phase.

I-5 Boone Bridge and Seismic Improvement Project

Staff Contact: Vanessa Vissar, Vanessa.vissar@odot.oregon.gov

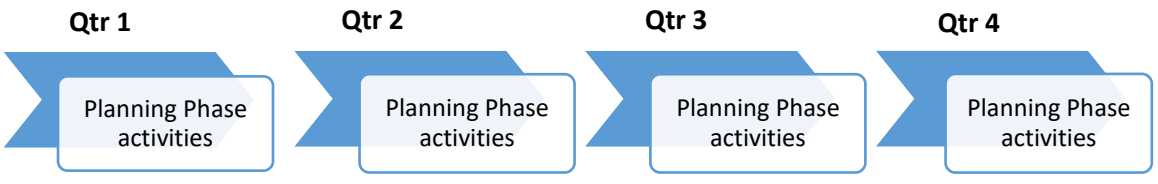
Description

In 2017-2018, ODOT and the City of Wilsonville partnered on a Southbound I-5 Boone Bridge Congestion Study. The study led to the adoption of the I-5 Wilsonville Facility Plan, which documented a southbound auxiliary lane concept consistent with implementation recommendations for this corridor (see Project 11990 and 11304 on the 2018 RTP Financially Constrained List).

As directed by the 2019 Legislature, ODOT evaluated the I-5 Boone Bridge widening and interchange improvements between Wilsonville Road and the Canby-Hubbard Highway. The I-5 Boone Bridge and Seismic Improvement Project Technical Report was completed and submitted to the Oregon Legislature in January 2021. Along with the engineering analysis of the bridge, ODOT worked with Metro to analyze the effects of bridge widening on travel patterns, demand, and land use impacts in the region.

In March 2021, the Oregon Transportation Commission allocated $3.7M for the Planning Phase. While much of this funding allocation will be dedicated to bridge engineering, a portion of the funding is available for the planning work needed to ensure that the impacts of this project on land use and transportation are understood, noting that full NEPA analysis would occur in the Preliminary Engineering phase. ODOT will consider recommendations from the I-5 Boone Bridge and Seismic Improvement Project Technical Report and analysis of the effects of bridge widening on travel patterns to complete the Planning Phase. ODOT will further refine a cost estimate range, update the prior ~~traffic~~ analysis (i.e., travel patterns, demand, and land use impacts) with tolling assumptions and the current project scope that reflects current auxiliary lane proposals, advance ~~seismic~~ project design, determine bicycle, ~~and~~ pedestrian ~~access~~, and public transportation access, conduct stakeholder engagement, develop and integrate an equity framework, evaluate land use impacts, ~~conduct environmental analysis,~~ and complete other pre-NEPA activities. ODOT staff will consult with regional partners throughout the Scoping and Planning Phase on travel demand and land use. The Planning Phase was initiated in an amendment to the FY 2021-2022 UPWP ($200,000), will continue through FY 2022-2023 ($2.5 million), and is estimated to be completed in 2023 (with remaining work and associated costs to be outlined in the FY 2023-2024 UPWP) .

Key Project Deliverables / Milestones



FY 2022-23 Cost and Funding Sources

Requirements:		**Resources:**	
Personal Services	**$** 500,000	Federal grant	**$** 2,000,000
Materials & Services	**$** 2,000,000	Local Match	**$** 50,000
TOTAL	**$ 2,500,000**	**TOTAL**	**$ 2,500,000**

oregonmetro.gov/mobility

Memo

Date: February 9, 2022

To: Metro Technical Advisory Committee (MTAC), Transportation Policy Alternatives Committee (TPAC) and interested parties

From: Kim Ellis, Metro Project Manager
Lidwien Rahman, ODOT Project Manager

Subject: Case Study Analysis Findings and Discussion Draft Regional Mobility Policy Report

PURPOSE

The purpose of this memo is to introduce and seek feedback on:

- Case study findings (See Attachment 1)
- Recommended measures and potential measurement options described (See Attachment 2)

DISCUSSION QUESTIONS

- Questions on the case study findings?
- Questions or feedback on the recommended measures?
- Questions or feedback on the mobility policy measurement options?

BACKGROUND

Metro and the Oregon Department of Transportation (ODOT) are working together to update the policy on how we define and measure mobility in the Portland region.

The current 20-year old mobility policy is contained in both the 2018 Regional Transportation Plan (RTP) and Policy 1F (Highway Mobility Policy) of the Oregon Highway Plan (OHP). The policy relies on a vehicle-based measure of mobility (and thresholds) to evaluate current and future performance of the motor vehicle network during peak travel periods. The measure, also known as the v/c ratio, is the ratio of motor vehicle volume to motor vehicle capacity of a given roadway. [1]

What is the Regional Mobility Policy?

State, regional and local transportation plans have many policies; the mobility policy is just one of them.

Last updated in 2000, the region's mobility policy relies on a vehicle-based measure of mobility and thresholds adopted in the Regional Transportation Plan (RTP) and Policy 1F of Oregon Highway Plan (OHP). The measure is referred to as the volume-to-capacity ratio (v/c ratio).

In the past, people often thought of mobility as our system of roads and how we use them—the way traffic flows throughout the day. And, historically, planners and engineers have evaluated performance of transportation systems using the v/c measure for these purposes:

- System planning for the future*
- Evaluating transportation impacts of local comprehensive plan amendments*
- Mitigating development impacts
- Managing and designing roads

An improved mobility policy should consider and balance mobility for people riding a bus or train, biking, walking or moving goods. It should consider why, where, and when people need to travel, how long it takes to reach a destination, how reliable the trip is and if the system is safe for all users.

* The focus of this update.

[1] For example, when the v/c ratio of a roadway equals 0.90, 90 percent of the roadway's vehicle capacity is being used. At 1.0, the vehicle capacity of the roadway is fully used.

The 2018 RTP failed to meet state requirements for demonstrating consistency with the OHP Highway Mobility Policy (Policy 1F) under the current mobility targets for state-owned facilities in the region. As a result, ODOT agreed to work with Metro to update the mobility policy for the Portland area in both the 2018 RTP and OHP Policy 1F.

Figure 1. 2018 RTP Plan Priorities

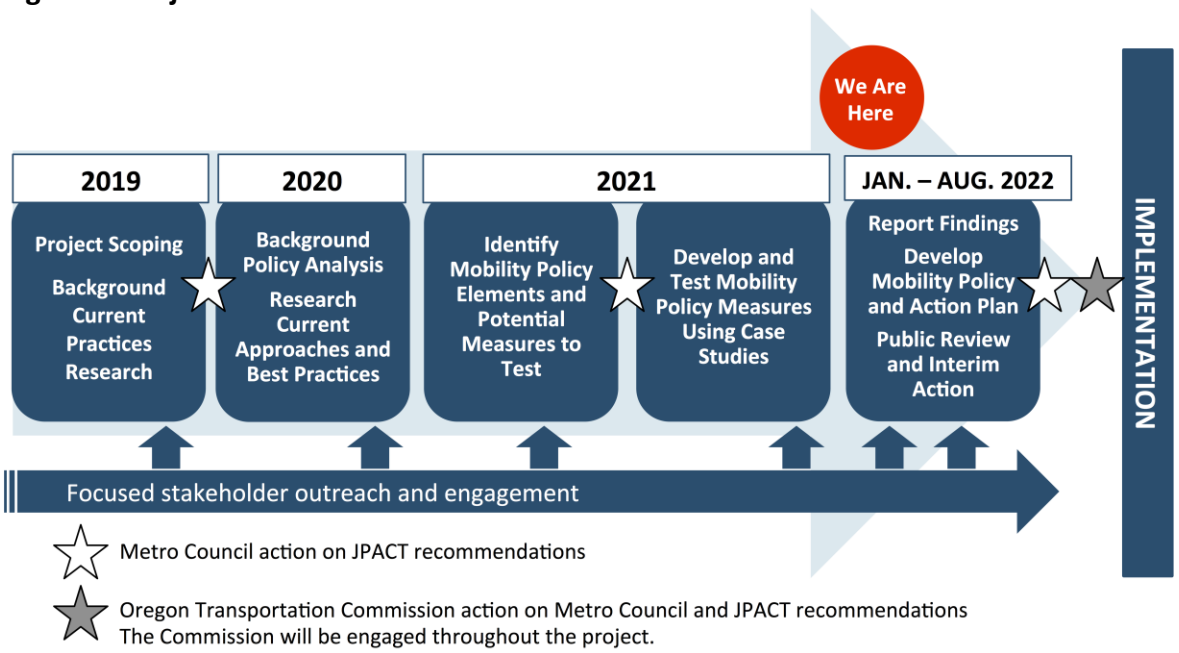
The 2018 RTP is built around four key priorities of advancing equity, mitigating climate change, improving safety and managing congestion – shown in **Figure 1**. The mobility policy update was defined and adopted unanimously in Chapter 8 of the 2018 RTP. At that time, JPACT and the Metro Council recognized this work was important to better align how we measure mobility and adequacy of the transportation system for people and goods with the RTP policy goals for addressing equity, climate, safety, and congestion.

JPACT and the Metro Council also recognized the updated policy must support other state, regional and local policy objectives, including implementation of the 2040 Growth Concept and the region's Climate Smart Strategy. This comprehensive set of shared regional values, goals and related desired outcomes identified in the RTP and 2040 Growth Concept, as well as local and state goals continue to guide the policy update.

Project timeline

Shown in **Figure 2**, the Regional Mobility Policy update began in 2019 and will be completed in Fall 2022 for use in the 2023 Regional Transportation Plan update.

Figure 2. Project Timeline



Overview of How We Got Here

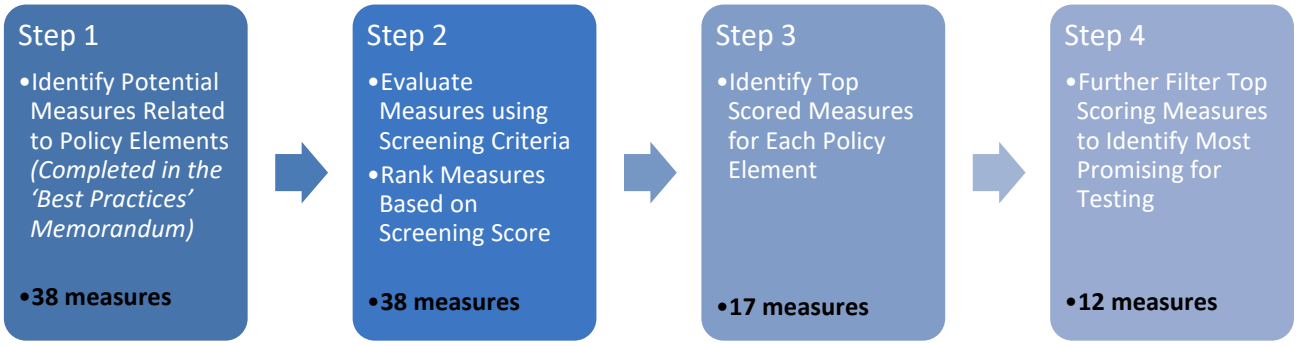
An overview of the process used to identify the mobility policy elements and measures to be evaluated follows.

From Fall 2019 to June 2020, the Transportation Research and Education Center (TREC)/Portland State University documented current mobility-related performance measures and methods being used in the Portland region, statewide and nationally. The Portland State University's Synthesis Research on Current Measures and Tools reviews the existing mobility policy and summarizes current practices in measuring multimodal mobility.

In 2020, the project team reviewed previous input from historically marginalized and underserved communities and other stakeholders from the 2018 Regional Transportation Plan update, development of the Get Moving 2020 investment package and the Scoping Engagement Process for this effort. Based on this review and additional feedback received through two workshops with the TPAC and MTAC in fall 2020, six key transportation outcomes were identified as integral to how we view mobility in the Portland region.

In Fall 2020, TPAC and MTAC also provided feedback on criteria to be used to screen and select potential mobility performance measures for testing that address one or more mobility policy elements. In Winter 2021, the Consultant team applied the screening criteria through a four-step process (shown in **Figure 2**) to narrow a list of 38 potential mobility measures to 12 potential mobility measures that appear most promising for testing and further evaluation through case studies this summer. A technical memo and supporting documents describing the screening process is available on the project website.

Figure 2: Screening Process to Inform Selection of Mobility Measures for Testing



In spring 2021, the project team engaged policymakers, practitioners, community leaders and other stakeholders to review and provide feedback on the draft mobility policy elements and potential measures to include in the updated policy. Throughout May and June 2021, the project team engaged stakeholders through online forums, briefings and committee meetings. The four online forums included two forums for planning, modeling and engineering practitioners, a forum for goods and freight professionals, and a forum for community leaders. A total of about 130 people participated in the forums. Project staff also presented and received feedback at County Coordinating Committees (staff and policy), MTAC, TPAC, the Metro Policy Advisory Committee (MPAC), JPACT and the Metro Council – representing more than 350 individual points of input.

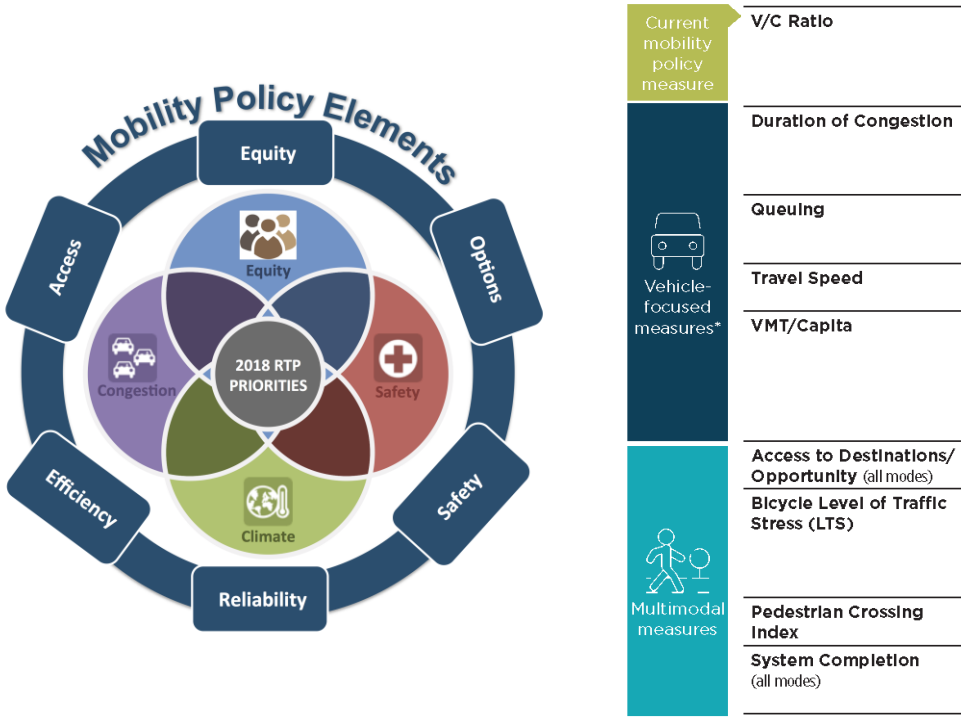
Key themes from Spring 2021 stakeholder input included:

- **Equity and climate should be explicit** in the updated mobility policy
- **Many aspects of access** are important to mobility:
  - Access to places
  - Access to travel options
  - Affordability is key to access
- **Efficient use of the transportation system** is important to mobility
- **Quality, seamless connections between travel options** are important to mobility
- **Ensure that all elements are reflected** across the measures
- **Ensure measures are focused on people and places**, many seem vehicle-focused
- **Avoid redundancy in the measures**
- **Ensure flexibility to allow for different measures in different contexts** (land use and transportation functions), **without being overly complex**

A Stakeholder Engagement Report documenting the engagement process and input received is included in the meeting packet for reference. The Report and supporting Appendices are also available on the project website: www.oregonmetro.gov/mobility.

In June 2021, JPACT and Metro Council recommended the mobility policy elements and measures in **Figure 3** be further evaluated and tested. The recommendation was informed by past research and input, the technical screening process and subsequent stakeholder input.

Figure 3: Regional Mobility Policy Elements and Measures Evaluated



The case studies research focused on learning more about each of the potential new mobility measures and potential ways in which the measures could be applied across different land use/transportation contexts and planning applications – focusing on system planning and plan amendments.

The case study findings **(attachment 1)** and preliminary mobility policy recommendations **(attachment 2)** from this research and subsequent stakeholder input and direction from JPACT and the Metro Council will be used by the project team to develop a recommended mobility policy for the 2023 RTP and proposed amendments to Policy 1F of the OHP, including measures, targets/standards and methodologies.

NEXT STEPS

A schedule of engagement activities is under development. A summary of the remaining steps in the process (and anticipated schedule) follows.

Report Case Study Findings **February to May**

Staff will report research findings from the case studies and potential measurement options to inform developing a recommended mobility policy for the RTP and proposed amendments to Policy 1F of the OHP. Staff will continue to engage TPAC and MTAC. The project team also recommends convening a policymakers forum with expert panel for MPAC, JPACT and the Metro Council later this spring. The purpose of this forum is to share this work and help inform how the region moves forward.

Draft Updated Mobility Policy and Action Plan to Implement Policy **May to July**

Staff will continue to engage TPAC and MTAC in developing an updated regional mobility policy and implementation plan for public review and discussion by JPACT, MPAC, and the Metro Council. This work will include drafting policy language for the 2023 RTP and guidance related to use and applicability of the recommended performance measures, targets/standard, data, methodologies and processes.

In addition, the project team will develop guidance to jurisdictions on how to balance multiple policy objectives and document adequacy, i.e. consistency with the RTP and OHP, in both transportation system plans (TSPs) and plan amendments, when there are multiple measures and targets in place. Finally, the project team will recommend considerations for future local, regional and state actions outside the scope of this project to implement the new policy and to reconcile differences between the new TSP and plan amendment measures and targets and those used in development review and project design processes.

Conduct "Tentative" Approval Process **August 2022**

During this time, a 45-day public comment period and hearings are anticipated. Additional refinements will be recommended to address feedback received during the public comment period for consideration by MPAC, PACT and the Metro Council during the "tentative" approval process.

Pending "tentative" approval and direction by the JPACT, the Metro Council and expressed support from the OTC, the updated policy will be applied in development of the 2023 RTP. In addition, the recommended policy will be forwarded to the OTC for consideration as an amendment to the OHP 1F (Table 7 and related policies for the state-owned facilities in the Portland region). Pending adoption of the 2023 RTP by JPACT and the Metro Council and amendment of the OHP by the OTC, the updated policy will guide development of regional and local transportation plans and studies, and the evaluation of potential impacts of plan amendments and zoning changes subject to the Transportation Planning Rule.

/Attachments

Attachment 1. System Planning and Plan Amendment Case Study Analysis

Attachment 2. Discussion Draft Regional Mobility Policy Report

System Planning and Plan Amendment Case Study Analysis

February 2022

Introduction

Metro and the Oregon Department of Transportation (ODOT) are working together to update the regional mobility policy and related mobility measures for the Portland metropolitan area. The goal of this update is to better align the policy and measures with the comprehensive set of shared regional values, goals, and desired outcomes identified in Metro's Regional Transportation Plan (RTP) and 2040 Growth Concept, as well as with local and state goals.

The policy also needs to be updated to better define expectations about mobility for different travel modes based on land use context and state and regional functional road classifications in the Oregon Highway Plan and RTP. The updated policy will describe the region's desired mobility outcomes and more thoroughly and explicitly define mobility for people and goods traveling through the transportation system in the Portland area.

The project team followed a four-step process to narrow a list of 38 mobility performance measures identified through a review of best practices to the 12 most promising. Based on further evaluation, eight of the 12 measures were advanced for testing through case study applications. Table 1 on the following page shows the eight measures tested through the case studies. These measures are further explored through case study applications included in this memorandum.

What we want to learn from the case studies:

1. How well does the measure help compare outcomes in Equity Focus Areas (EFAs) to other areas?
2. How sensitive is the measure to changes in land use?
3. How could measures that are not sensitive to land use changes be applied in plan amendments?
4. Does Metro's Dynamic Traffic Assignment (DTA) model identify different needs than the travel demand model at the system level? Does it offer significantly different post-processed intersection volumes?

Table 1. Mobility Measures Evaluated and Tested

Current mobility policy measure	**V/C Ratio**	The ratio of traffic volume to the capacity of a roadway link or intersection during a specified analysis period.
 Vehicle-focused measures*	**Duration of Congestion**	Hours of congestion (HOC) is the number of hours within a time period, most often within a weekday, where a facility's congestion target (such as v/c ratio or acceptable speed) is exceeded or not met.
	Queuing	The extent of vehicles queued on intersection approach lanes, including on and off ramps, during a specified analysis period (typically a peak hour).
	Travel Speed	Average or a percentile speed between origin-destination pairs, during a specific time period.
	VMT/Capita	Compares the number of miles traveled by motorists within a specified time period and study area to the number residents or employees in the area. VMT/capita can indicate how much people who live and work in a study area must drive to meet their obligations and daily needs.
 Multimodal measures	**Access to Destinations/ Opportunity** (all modes)	The number of essential destinations within a certain travel time or distance, by different modes.
	Bicycle Level of Traffic Stress (LTS)	Level of traffic stress (LTS) classifies points and segments on routes into different categories of stress ranging from 1 (low stress) to 4 (high stress) based on factors that correlate to the comfort and safety of the bicyclist or pedestrian using that facility.
	Pedestrian Crossing Index	The percent of a corridor or roadway segment meeting the pedestrian crossing target spacing.
	System Completion (all modes)	The percent of planned facilities that are built within a specified network or on a specified corridor/roadway segment.

*These measures impact travel by bus transit and may be able to evaluated for transit trips specifically, such as travel time and speed.

Question 1:
How well does the measure help compare outcomes in Equity Focus Areas (EFAs) to other areas?

Answer:

Each of the measures allows equity focus areas to be compared with non-equity focus areas or to the area as a whole. The measures that are best for identifying disparities and prioritizing projects that address them are **access to destinations** and **system completeness**.

Question 2:
How sensitive is the measure to changes in land use?

Answer:

The current measure (**V/C ratio**) and each of the vehicle-focused measures are sensitive to land use changes. When measured with the regional travel demand model, neither V/C ratio nor travel speed is very sensitive to small changes in land use; however, when the model volumes are post processed and applied at the intersection level, V/C ratio is very sensitive to small land use changes, especially in congested conditions. **Travel speed** can only be applied at the link level, so is slightly less sensitive to land use changes.

Access to destinations is sensitive to land use changes, but assessing whether a comprehensive plan amendment or zone change translates into increased access to destinations is difficult. The measure can tell you if an area has high access to destinations. In these areas, adding more people would increase the number of people with access. It can also tell you where residential areas are lacking in access because of a lack of transportation options, or if land use changes (such as adding more non-residential uses) would help increase access to destinations.

VMT/capita is sensitive to land use changes at the system level and is good for comparing different subareas. Small land use changes would not be reflected at the regional or even sub area level and could give misleading results if looked at for a single Transportation Analysis Zone (TAZ).

The multimodal measures including **bicycle level of transportation stress (BLTS)**, **pedestrian crossing index**, and **system completion** are not impacted by changes in land use although major changes in land use could change the desired roadway cross-sectional elements. Roadway volumes are used to determine BLTS for mixed traffic roadways only, and therefore is sensitive to land use changes in specific conditions.

Question 3:
How could measures that are not sensitive to land use changes be applied in plan amendments?

Answer:

For a measure such as **system completion** that is not sensitive to land use changes, it could be applied to plan amendments as follows:

- Identify system gaps and deficiencies (all modes) impacted by the plan amendment.
- Determine whether the planned system is adequate considering bicycle and pedestrian access needs and desired crossing spacing and consider whether the proposed land use change is likely to increase access to destinations or reduce the area's VMT/capita.

Question 4:
Does Metro's Dynamic Traffic Assignment (DTA) model identify different needs than the travel demand model at the system level? Does it offer significantly different post-processed intersection volumes?

The DTA model is currently calibrated on a project-by-project basis. Calibration is important because the DTA model is capacity-constrained and assigns trips to network links based on congestion and volumes. When a link is reaching or at capacity, the model will no longer assign trips to that link and will instead assign trips along alternative routes or to the next analysis hour.

The regional travel demand model (RTDM), on the other hand, is not capacity-constrained. A link volume can exceed the link capacity. This can result in unrealistic forecast link volumes on major roadways during peak periods, when in reality many drivers will reroute their trip to avoid delays.

The DTA model is a more rigorous tool than the RTDM. It is currently most often used for corridor and subarea level analysis. The DTA model is currently set up for the AM and PM peak periods of the day only.

Based on a review of travel speed output within Oregon City for the 2015 base year and 2040 constrained networks, the DTA model shows less congested peak hours on major roadways. Comparing post-processed intersection volumes using the two models, volumes and queuing projections are less with the DTA model outputs compared to the RTDM outputs at the major intersections. Therefore, when intersection solutions are developed solely based on future intersection volumes developed from the RDTM, there is potential to overbuild solutions and even induce demand. Instead of focusing on minimizing delay at a specific intersection, potentially shifting a bottleneck downstream, it may be more useful to consider overall progression of a facility.

Fact Sheet

Congestion Measures

Travel speed, **V/C ratio**, and **queuing** are vehicle-focused measures that support reliability and efficiency outcomes. Current uses of the interim regional mobility policy rely heavily on V/C ratio to determine where congestion is unacceptable and to identify needed improvements and mitigations. It may be possible to use travel speed, V/C ratio, and queuing measures in tandem for peak period analysis, depending on the methodologies used and questions that need to be answered by the analysis.

Current mobility policy measure		Evaluating Outcomes for Equity Focus Areas	System Planning: Applying a Target to Identify Needs and Develop Plan	System Planning: Setting Standard based on Plan	Plan Amendments: Large-Scale/ Areawide: Show measurable impact (from added trips, any mode)	Plan Amendments: Large-Scale/ Areawide: Identify mitigations if standard exceeded	Plan Amendments: Small-Scale/Site-Specific: Show measurable impact (from added trips, any mode)	Plan Amendments: Small-Scale/Site-Specific: Identify mitigations if standard exceeded
Vehicles	V/C Ratio	A	▮▮✚	▮▮✚	▮▮✚	▮▮✚	▮▮✚	▮▮✚
Vehicles	Duration of Congestion	A	▮▮✚	▮▮✚	▮▮✚	▮▮✚	▮▮✚[5]	▮▮✚
Vehicles	Queuing		▮▮✚[1]	▮▮✚[1]	▮▮✚[1]	▮▮✚[1]	▮▮✚[1]	▮▮✚[1]
Vehicles	Travel Speed	A	▮▮✚[2]	▮▮✚[2]	▮▮✚	▮▮✚[3]	▮▮[4]✚[4]	▮▮[3]✚[3]

▮▮=Thruway ✚=Arterial/Collector

A. Measure can be evaluated and compared for different geographic areas related to concentrations of disadvantaged populations and can be used to evaluate equity.

1. Off-ramps only.

2. The target travel speed on arterials/collectors should have a maximum consistent with area context and the desired posted speed and a minimum threshold for congestion.

3. Intersection v/c ratio analysis can be used to help identify mitigations to improve travel speed.

4. Travel demand model or microsimulation can support the analysis but the impact may be very minimal.

5. Travel demand model or microsimulation can support the analysis but the impact will be negligible.

Case studies: what did we learn?

The study team applied congestion metrics through several case studies from regionwide reviews to subarea sensitivity testing. Key questions reviewed were whether the DTA model identifies different results, what differences occur when using different congestion measures, and how sensitive the measures are to land use changes.

Useful Findings

V/C ratio and travel speed show very similar locations and levels of congestion depending on the thresholds used. Travel speed is more relatable to the public for policy discussions, is consistent with how systems are managed, and switches to a target that cannot be inappropriately applied at the intersection level. Hours of congestion can be applied effectively with either V/C ratio or travel speed. This measure can be used to look at the severity of congested areas and help prioritize bottleneck improvements. It will need to be part of the policy, but it would only be sensitive to change

at the system planning level or following major changes in roadway pricing or capacity. Lower travel speed targets would be needed for arterials than for throughways as a percentage of posted or free-flow speed given the presence of traffic signals. Signal delay results in average speeds below posted or free-flow speed, even in uncongested time periods.

Based on the case studies, the DTA model shows less congested peak hours on major roadways. Comparing post-processed intersection volumes using the two models, volumes and queuing projections are less with the DTA model outputs compared to the RTDM outputs at the major intersections.

When measured with the regional travel demand model and reported at the link level, neither V/C ratio nor travel speed are very sensitive to small changes in land use; however, when the model volumes are post processed and applied at the intersection level, V/C ratio is very sensitive to small land use changes, especially in congested conditions. Travel speed can only be applied at the link level, so is slightly less sensitive to land use changes.

Considerations for the mobility policy

If travel speed is used in the mobility policy, major considerations include:

What speed variable will be the denominator for determining a travel speed threshold?

Options include posted speed, free-flow speed and base link speed from the travel demand model.

- For this analysis, the base link speed from the 2015 travel demand model was used because it was a readily available output that could be easily incorporated into GIS-based calculations. Base link speed is not a measured or designated speed; it is an input that is part of the travel demand model. It is often close to or equal to the posted speed, but it can vary from the posted speed if needed to yield accurate travel times in calibration.
- Whichever speed variable is used, a dataset where the model output and the speed variable data have the same link segmentation will need to be created to simplify requests to Metro and/or the calculation process. Posted speed was not used for this analysis due to the effort required to match the two datasets for use in the calculations.

Key Takeaways

- Travel speed is relatable and consistent with facility management
- Travel speed reduces overemphasis/over design on long-term intersection operations
- Intersection v/c still has a place in planning and near-term mitigations
- Hours of Congestion will need to be considered in the policy for either congestion metric
- Queuing will need to be considered in the policy for either off-ramps only or for arterial intersections as well

How would thresholds be decided?

- 75 percent is currently used by ODOT for the Portland Region Traffic Performance Report (PRTPR) and Corridor Bottleneck Operations Study (CBOS).
- 75 percent may not make sense on roadways that are controlled (versus uncontrolled roadways such as freeways). Roadways that have more traffic control, such as signals and roundabouts, will experience more delay and slower speeds. Thresholds or targets would need to take that into consideration. Potentially using a threshold based on measured speeds (like average travel speed for the link) would provide a realistic base for developing a threshold.
- 75 percent may not make sense for roadways that have low posted speeds (or base link speeds). Minor variations of travel speed (such as a change in 2 mph) would show large percentage changes.

Guidance would need to be developed related to calibration and validation of Metro models in relation to speed if it is going to be used as a measure with a target.

Currently, most of the speed-related measures are used for relative comparisons between various alternatives, not as a measure against a target.

Metro modeling staff notes that there is some calibration related to travel times, which has a direct relationship to travel speeds. The base year link speeds are generally set to yield accurate travel times in calibration. Horizon year speeds may be adjusted when speed changes are known or expected in future year models.

Should the DTA model be used for congestion-based metrics?

Overall, the DTA model provides volumes that are more spread out on the system and likely more realistic for peak travel periods, decreasing volumes on throughways that are congested and adding volumes to parallel arterial routes. Similar to in-the-field conditions, the DTA theoretically never has a V/C ratio greater than 1.0, which would help with target and threshold setting. The RTDM will assign trips to a link even if it is at or over capacity already, which is not possible on the ground.

Although more realistic, Metro does not have a regional DTA. It would take significant time and resources to develop and calibrate the DTA for each area of the region.

It is unclear if there is any feedback to MetroScope/land use and demographic allocation with the current DTA model. The entire region would need to be covered by a DTA model to get that type of feedback into the regional MetroScope and land use tools.

The region's agencies may have other tools like HERS, Fixit, RITIS, etc. that would be more useful for considering land use changes.

If V/C ratio is used in the mobility policy, major considerations include:

- The comparison of post-processed volumes from the RTDM model and the DTA model confirm that volumes from the RTDM are likely to be overestimated in congested areas and could result in overbuilt solutions that induce demand. Consideration should be given to specifying the use of DTA for intersection analysis for plan amendments where the targets are applied as standards to ODOT facilities. Alternatively, an adjustment could be made to the V/C targets or an adjustment could be made to the forecast traffic volumes when a DTA model is not available.

Questions for Stakeholders

- Which measure should be used for congestion, and should it be applied to arterials in addition to throughways?
- If so, should it be applied to all arterials or just those outside of 2040 centers?
- What thresholds/targets should be applied based on the measure selected?

Fact Sheet

Efficiency Measures

Both **VMT per capita** and **access to destinations/opportunity** reflect how well the land use and transportation systems are coordinated and work together, and both respond to the same types of changes in those systems. Neither of these measures evaluates how well the transportation system itself operates.

		System Planning		Plan Amendments: Large-Scale/ Areawide		Plan Amendments: Small-Scale/Site-Specific	
	Evaluating Outcomes for Equity Focus Areas	Applying a Target to Identify Needs and Develop Plan	Setting Standard based on Plan	Show measurable impact (from added trips, any mode)	Identify mitigations if standard exceeded	Show measurable impact (from added trips, any mode)	Identify mitigations if standard exceeded
VMT/Capita[11]	AB	●	●	●	●[1]	Caution[4]	●[5]
Access to Destinations[11]	AB	●	●	●[2]	●[3]	●[2]	●[3]

● =Area

A. Measure can be evaluated and compared for different geographic areas related to concentrations of disadvantaged populations and can be used to evaluate equity.

B. Measure relates to increased access to non-auto modes which are accessible to people without access to vehicles.

1. Mitigations would need to be changes in land use or significant travel demand management (TDM) measures

2. Land use changes would increase or decrease the number of destinations that are accessible but not how far the area of accessibility is

3. Mitigations would need to be changes in land use or significant changes in the transportation network.

4. When looked at in a localized area, VMT/capita may increase for the localized area while contributing to lower VMT/capita for the jurisdiction. This would occur if the projected VMT/capita for the localized area were projected to be below the jurisdiction's average. It would indicate that increased development in that area is more efficient than other areas.

5. Mitigations would need to be changes in land use or land use intensity which may not be effective based on the land use patterns and surrounding transportation network. If not effective, would need to mitigate with TDM or TSMO.

Case studies: what did we learn?

VMT/capita metrics for land use subareas were compared to regional and citywide averages and to the current Oregon Transportation Planning Rule (TPR), which targets a VMT/capita reduction of 5 percent and requires that new plans increase VMT/capita by no more than 5 percent. Proposed updates to the TPR may require further reductions in VMT/capita.

VMT/Capita

Whether measured using a ratio metric (VMT/capita and VMT/employee) or a rate metric (Home-based VMT/capita and Commute VMT/employee), VMT/capita is projected to decline from 2015 to 2040 in greater Portland and in several plan areas. Where VMT/capita is

VMT/Capita...

- Can be modeled and forecasted, showing if the planned land use and transportation systems are moving in the right direction, more efficient to serve
- Demonstrates if planned land use changes result in less vehicle travel
- Can show incremental improvements

projected to increase, those increases are small (less than 5 percent) and in conformance with TPR guidance that cities should limit VMT/capita growth to 5 percent or less. The variation between VMT/capita results can be attributed to increasing the availability of non-driving travel options and increased density and mixing of land uses.

The sensitivity testing conducted in the Colwood and South Hillsboro plan amendment study areas indicates that VMT/capita metrics are reliably responsive to modeled land use changes. In-depth sensitivity testing to evaluate how different infrastructure packages would affect these metrics has not been completed.

The 2018 RTP evaluated VMT/capita and VMT/employee for multiple scenarios; however, the small differences between the fiscally-constrained and strategic scenarios indicates that either VMT/capita is not particularly sensitive to infrastructure changes alone or that the strategic infrastructure package includes elements that would both reduce and increase VMT/capita.

Access to destinations/opportunity

Access to destinations/opportunity can be estimated with great accuracy and precision for existing conditions and with much less accuracy and precision for future (forecasted) conditions. Metro's travel model includes forecasts for jobs and population growth, but does not forecast changes in the locations of community destinations. Analysts must either make assumptions about the future locations of community destinations or assume they will not change over the next 10-20 years.

Travel times by different modes, which are inputs to the measure, can be estimated with great accuracy for existing conditions but not for forecasted conditions, due to how the model estimates transit travel time and its relatively coarse assessment of traffic congestion. The 2018 RTP found that the travel demand model is limited in its ability to evaluate walking and bicycling modes, due to the model's scale of analysis and assumptions about travel behavior. Therefore, while access to destinations/opportunity can be accurately evaluated for walking and bicycling under existing conditions, it cannot be accurately evaluated under forecasted conditions.

Key Takeaways

Regional Transportation Plan

- All scenarios have decreases in average VMT/capita but none achieve the 10 percent target.
  - » No-Build: -1.2%
  - » Constrained: -4.0%
  - » Strategic: -4.0%

Central City MMA

- Home-based VMT/capita of 4.2 compared to 11.0 in region overall
- Able to double population and jobs with minimal increase in VMT/capita
- Able to reduce VMT/employee by 72 percent

Oregon City MMA

- VMT/employee increases by 1.8 percent for the subarea; Oregon City increases by more than 2 percent (conforming to the TPR requirement that new plans not increase VMT/capita by more than 5 percent)

South Hillsboro Community Plan

- Despite the plan area's pedestrian-oriented design and mixed-use town center land uses, people living in South Hillsboro (10.9) would generate more VMT/capita than all residents of Hillsboro (8.5), at an amount close to the Metro Region average (10.5). This demonstrates that infill is more efficient than urban growth areas. This indicates that infill development can support more efficient vehicle travel than development in urban growth areas.
- People working in South Hillsboro (9.2) would generate VMT/employee close to the Metro Region average (9.5) and lower than the Hillsboro average (10.7). This demonstrates the benefit of adding more housing to support Hillsboro jobs.

Useful Findings

TSPs and comprehensive plans collectively can reduce VMT/capita; however, the contributions of specific projects are challenging to measure when considered individually.

When looked at in a localized area, VMT/capita may increase for the localized area while contributing to lower VMT/capita for the jurisdiction as a whole. This would occur if the projected VMT/capita for the localized area were projected to be below the jurisdiction's average. It would indicate that increased development in that area is more efficient than in other areas.

The case studies indicate VMT/capita can be applied at the system planning level and for larger land use changes. For smaller scales, the measure should be used with caution when an increase results in a potential reduction for the larger area, as described above.

The measure is not sensitive to small transportation changes and can show increased VMT/capita when evaluating individual capacity-increasing projects that may be needed to support efficient development.

Access to destinations can be applied at the regional level, but is challenging to apply at the local jurisdiction or subarea plan levels because it requires staff with specialized skills and access to detailed datasets and spatial analysis tools. The measure can also be challenging when evaluating land use and zoning changes in small areas, since the eventual outcomes of zoning changes can be hard to predict.

Considerations for the mobility policy

Both VMT/capita and access to destinations/opportunity reflect the efficiency of land use and travel, and how well land use and the transportation system are coordinated to reduce reliance on the automobile. Of the two, VMT/capita can be evaluated in congruent ways for both existing and future conditions, and can be evaluated for multiple scales, from plan amendments to regional evaluations.

VMT/capita could be applied through the regional mobility policy using the following approach:

- Apply VMT/capita as a primary system performance measure alongside performance measures that evaluate both system operations and system completeness. VMT/capita can be applied in the following ways:
  - **Identifying system needs and system adequacy during system planning:** For TSPs and large subarea plans, forecasted VMT/capita can be compared to existing conditions to determine if land use changes or improvements to multimodal access are needed or would help to reduce VMT/capita.
  - **Evaluating the transportation/mobility impacts of land use decisions in plan amendments:** For TSPs and large subarea plans, forecasted VMT/capita can be compared to the existing condition to determine if the plan amendment would result in a reduction in VMT/capita or an increase, which could have a negative impact that requires mitigation or changes to the plan.
  - **Evaluating mitigations when a threshold of significance is exceeded:** For system planning and subarea planning, Metro's TDM can be used to evaluate the VMT/capita differences between plan alternatives with different levels of land use density and mix of land uses.

Access to destinations/opportunity could still be used as a planning tool, especially when:

- Planning networks for specific travel modes, to ensure they meet community needs;
- Evaluating alternative land use and transportation scenarios in a comprehensive plan; and
- Measuring overall system usefulness for different populations within greater Portland.

Questions for Stakeholders

- Should VMT/capita be incorporated into the mobility policy to ensure that all plans and plan amendments contribute to reaching the regional target?
- If so, should the thresholds/targets be consistent with the TPR targets for Metro?*

*Note: Proposed updates to the TRP to include Climate-Friendly and Equitable Communities (CFEC) may include VMT/capita reduction targets.

Multimodal Measures

The measures evaluated in the case studies to help assess the multimodal system and its safety and comfort for all users included **system completion**, **bicycle level of traffic stress (BLTS)**, and **pedestrian crossing index**. These measures support equity, access, safety, efficiency and options.

			System Planning		Plan Amendments: Large-Scale/ Areawide		Plan Amendments: Small-Scale/Site-Specific	
		Evaluating Outcomes for Equity Focus Areas	Applying a Target to Identify Needs and Develop Plan	Setting Standard based on Plan	Show measurable impact (from added trips, any mode)	Identify mitigations if standard exceeded	Show measurable impact (from added trips, any mode)	Identify mitigations if standard exceeded
	LTS	AB	✚	✚	✚[1]	✚[1]	NO	NO
	Ped. Crossing Index	AB	✚	✚	✚[2]	✚	✚[2]	✚
	System Completion	AB	▮▮✚	▮▮✚	✚[3]	✚	✚[3]	✚

▮▮=Thruway ✚=Arterial/Collector

A. Measure can be evaluated and compared for different geographic areas related to concentrations of disadvantaged populations and can be used to evaluate equity.

B. Measure relates to increased access to non-auto modes which are accessible to people without access to vehicles.

1. Only sensitive to large changes in volumes or looking at access to LTS routes

2. Can document impact on warrants for a protected crossing

3. Can document impact on signal warrants, and number of trips added to system by mode, and if they are impacting an incomplete mode, but difficult to calculate their impact or proportionate share

Case studies: what did we learn?

LTS

LTS analyses most often use a target of 2, which is the minimum LTS level that will encourage most of the potential bike-riding population to consider riding. A BLTS 2 target can be difficult to meet, especially on high-speed roadways. Most local system planning does not attempt to meet a BLTS 2 on all non-freeway throughways and arterials because it is cost-prohibitive. Often, completing the system is prioritized over creating a fully low-stress system. However, many system plans do identify a portion of their bicycle network that is intended to be low stress.

Pedestrian Crossing Index

Metro does not currently have a full pedestrian crossing dataset, but there is an Open Street Maps (OSM) dataset that can be accessed. The OSM dataset is a useful first step toward creating a full pedestrian crossing dataset for the region. It will take significant effort to update the data to be usable for regionwide and subarea analyses, including determining completeness of the dataset and updating or creating attributes. Attributes that are necessary or desirable include roadway ID for the street that is crossed, milepoint of the crossing, roadway classification that is linked to target setting (i.e., regional design classification), and type of crossing (e.g., marked, signalized, enhanced).

ODOT has a pedestrian crossing inventory for their roadways and has a process and script for calculating the pedestrian crossing index. ODOT's methodology is not easily applied to the OSM data because the script requires an identified set of study roadways. The case studies used a manual process, but if pedestrian crossing index

is moved forward as a measure for the RMP, a script similar to ODOT's could be created to streamline the process. Additional effort will also be needed to update the OSM dataset to include the street crossed and identify the target spacing for each roadway using Metro's *Designing Livable Streets and Trails Guide* and ODOT's *Blueprint for Urban Design.*

System Completion

The system completion measure can be used in system planning in several ways, including:

- **Establishing the planned system:** An outcome of system planning is creating a vision for the future transportation system, most often by mode or service. These planned networks become the base for the system completion calculation. Once there is a planned regional or local network established through system planning, future plan amendments, developments, and projects can determine whether the networks are helping further the completion of the planned system. Targets for completion of the planned system can be set, evaluated and monitored over time.
- **Comparing alternatives:** Once they have envisioned the overall planned system, many agencies find they will be unlikely to be able to acquire the funding to fill all the gaps in the system. Determining the system completion of a fiscally constrained system can show the need for additional funding for completing the multimodal networks.

Useful Findings

Bicycle Level of Traffic Stress

Setting a low-stress target for all roads or certain roadway classifications (arterials, for example) is not practical to achieve. However, BLTS is a tool that should be used to identify a network of low-stress routes (current and future) that connect as many destinations as possible with low-stress routes. The low-stress designation can be part of the system completion assessment for those routes.

Pedestrian Crossing Index

Applying the pedestrian crossing index using spacing targets from the *Livable Streets Guide* and *Blueprint for Urban Design* is useful for identifying areas potentially in need of additional crossings; however, a facility-specific target should be set through local planning. This target could then be used as part of an assessment of system completion.

Key Takeaways

- Complete system definition should be set through system planning and include lanes, turn lane policy, bicycle, pedestrian, transit and TSMO/TDM components
- Setting a low-stress target for all roads or certain roadway classifications (arterials, for example) is not practical to achieve
- Crossing spacing targets and LTS should be used to plan the complete system

System Completeness

System completeness can be used to identify needs, but the term "complete" needs to be defined through system planning. The definition should include level of street connectivity, future number of through travel lanes, policy on turn lanes, type and locations of planned bicycle and pedestrian facilities, target pedestrian crossing spacing, type and location of planned transit facilities and service and TSMO/TDM plan elements.

The definition of "complete" will vary based on modal functional classification and design classification, and can be refined by facility in system plans.

Considerations for the mobility policy

In planning modal networks and identifying transportation projects that enhance the comfort and safety of the multimodal network for all users, the following could be considered:

- Define the complete walking and biking networks that maximize access to destinations with low-stress routes and address disparities in EFAs.
- Identify locations where lack of safe crossings is limiting access to destinations for people walking, biking and riding transit. Set spacing targets for each facility based on the changing land use context.

- Identify high-priority locations for additional or enhanced crossings that connect low-stress walking and biking routes and provide access to transit or that are in high-crash locations.
- For the vehicle network, identify the number of through lanes and turn lanes or merge lanes (if applicable) that will be considered the maximum cross-section within the planning horizon. Identify strategies such as demand management, congestion pricing, complete non-auto modal networks, and land use changes to ensure access and mobility in the area.
- Metro and local agencies will set the planned system by planning modal and service networks. Some or all of the following could be included in the system completeness evaluation:
  - » Pedestrian, which could include planned crossings based on pedestrian crossing index
  - » Bicycle, which could include a low-stress network based on bicycle LTS
  - » Transit
  - » Vehicle, which could build off policies in Chapter 3 of the RTP, such as street connectivity/spacing and maximum number of through lanes
  - » TSMO
  - » TDM

Once a complete system is defined, evaluation of land use plan amendments should focus on whether the amendment changes the definition of the complete system for the facilities in the plan area.

Questions for Stakeholders

- Which measure(s) should be incorporated into the mobility policy?
- If only system completeness is included in the policy, should any guidance be provided about the use of pedestrian crossing index and/or bicycle level of traffic stress?

Attachment A:
Supporting Materials

Memo

Oregon Department of Transportation

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

Date: February 7, 2022

To: Kim Ellis, Metro, and Lidwien Rahman, ODOT

From: Susan Wright, PE and Molly McCormick, Kittelson & Associates, Inc.
Sarah Peters, Fehr & Peers

Project: Regional Mobility Policy Update

Subject: Task 7.1 and 7.2: System Planning and Plan Amendment Case Study Analysis - **DRAFT**

INTRODUCTION

Metro and the Oregon Department of Transportation (ODOT) are working together to update the regional mobility policy and related mobility measures for the Portland metropolitan area. The goal of this update is to better align the policy and measures with the comprehensive set of shared regional values, goals, and desired outcomes identified in Metro's Regional Transportation Plan (RTP) and 2040 Growth Concept, as well as with local and state goals.

There is also a need to update the mobility policy to better define expectations about mobility for different travel modes based on land use context and state and regional functional classification(s) of roads in the Oregon Highway Plan and RTP. The updated policy will describe the region's desired mobility outcomes and more robustly and explicitly define mobility for people and goods using the transportation system in the Portland area.

The project team followed a four-step process to narrow a list of 38 mobility performance measures identified through a review of best practices to the 12 most promising. Based on further evaluation, 8 of the measures were advanced for testing through case study applications. Table 1 shows the 8 measures tested through the case studies.

Table 1. Mobility Measures Being Evaluated and Tested

Current Mobility Policy Measure	V/C Ratio	The ratio of traffic volume to the capacity of a roadway link or intersection during a specified analysis period.
Vehicle Focused Measures	Duration of Congestion	Hours of congestion (HOC) is the number of hours within a time period, most often within a weekday, where a facility's congestion target (such as v/c ratio or acceptable speed) is exceeded or not met.
	Queuing	The extent of vehicles queued on intersection approach lanes, including on and off ramps, during a specified analysis period (typically a peak hour).

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	Travel Speed	Average or a percentile speed for a network segment or between key origin-destination pairs, during a specific time period.
	VMT/Capita	Compares the number of vehicle miles traveled by motorists within a specified period and study area to the number of residents or employees in the area. VMT/capita can indicate how much people drive to meet their obligations and daily needs, and can be evaluated for specific types of travel, such as home-to-work commutes.
Multi-modal Measures	Access to Destinations/Opportunities	The number of essential destinations (such as jobs, schools, services, etc.) within a certain travel time or distance, by different travel modes.
	Level of Traffic Stress (LTS)	Level of traffic stress (LTS) classifies points and segments on routes into different categories of stress ranging from 1 (low stress) to 4 (high stress) based on factors that correlate to the comfort and safety of the bicyclist or pedestrian using that facility.
	Pedestrian Crossing Index	The percent of a corridor or roadway segment meeting the pedestrian crossing target spacing.
	System Completion	The percent of planned facilities that are built within a specified network or on a specified corridor/roadway segment.

The measures outlined above are further explored through case study applications included in this memorandum. What we want to learn from the case studies includes:

- How well does the measure help compare outcomes in Equity Focus Areas (EFAs) to other areas?
- How sensitive is the measure to changes in land use?
- How could measures that are not sensitive to land use changes be applied in plan amendments?
- Does Metro's Dynamic Traffic Assignment (DTA) model identify different needs than the travel demand model at the system level?
- Does the DTA model result in significantly different post-processed intersection volumes for use at the intersection level?

Travel Speed, V/C Ratio, and Queuing

Travel speed is the average or a percentile speed for a network segment or between key origin-destination pairs, during a specific time period.

Volume to capacity ratio (v/c) is the ratio of traffic volume to the capacity of a roadway link or intersection during a specified analysis period.

Queuing is the extent of vehicles queued on intersection approach lanes, including on and off ramps, during a specified analysis period (typically a peak hour).

Travel speed, v/c ratio, and queuing measures are vehicle-focused measures that support reliability and efficiency outcomes. Current uses of the interim regional mobility policy relies heavily on v/c ratio to determine where congestion is unacceptable and to identify improvements and mitigations. Travel speed, v/c ratio, and queuing measures may be able to be used in tandem for peak period analysis depending on the methodologies used and questions that need to be answered by the analysis. The project team explored the following questions for these measures, as summarized in the following sections:

- For travel speed thresholds, does the DTA model identify different needs than the travel demand model at the system level?
- Does the DTA model result in significantly different post-processed intersection volumes for use at the intersection level?
- Do different definitions of "congestion" identify different needs at the system level?
- How sensitive are the model outputs to changes in land use?

Does the DTA model identify different needs than the travel demand model at the system level?

One question that the project team explored was whether investing the time and effort to calibrate a region-wide Dynamic Traffic Assignment (DTA) model would be beneficial to identifying regional needs and developing the RTP. The DTA model is currently calibrated based on a project-by-project basis. For example, the Oregon City subarea was calibrated as part of another project in the region, which is why this section focuses on that subarea. Calibration is important because the DTA model is a capacity-constrained model that assigns trips to network links based on congestion and volumes. When a link is reaching or is at capacity, the model will no longer assign trips to that link and will instead assign trips along alternative routes or to the next analysis hour. The link volumes should never exceed the link capacity. The regional travel demand model (RTDM), on the other hand, is not capacity constrained. A link volume can exceed the link capacity. This can result in unrealistic forecast link volumes on major roadways during peak periods when in reality many drivers will reroute their trip to avoid delays.

As noted by Metro modeling staff, the DTA model is a more rigorous tool than the RTDM and currently most often used for corridor and subarea level analysis. In addition, the DTA model is currently set up for the AM and PM peak periods of the day only. Although the trip assignments are more realistic in the DTA model than the RTDM for the peak periods, link volumes are fairly similar between the two models during non-congested time periods.

With pros and cons to both models, the project team reviewed travel speed output within Oregon City for the 2015 base year and 2040 constrained networks. Figures 1 through 4 compare the DTA and RTDM output by showing if each link is congested for one or two hours within the AM or PM peak period. DTA output is represented by the thicker lines and RTDM by the thinner lines. "Congested" is defined in this exercise as when a link travel speed is less than 75 percent of the base link speed. The base link speed is often, but not always, similar to the posted speed limit .

Figure 1. Congestion (Travel Speed Threshold) Oregon City – 2015 Base Year AM Peak Period

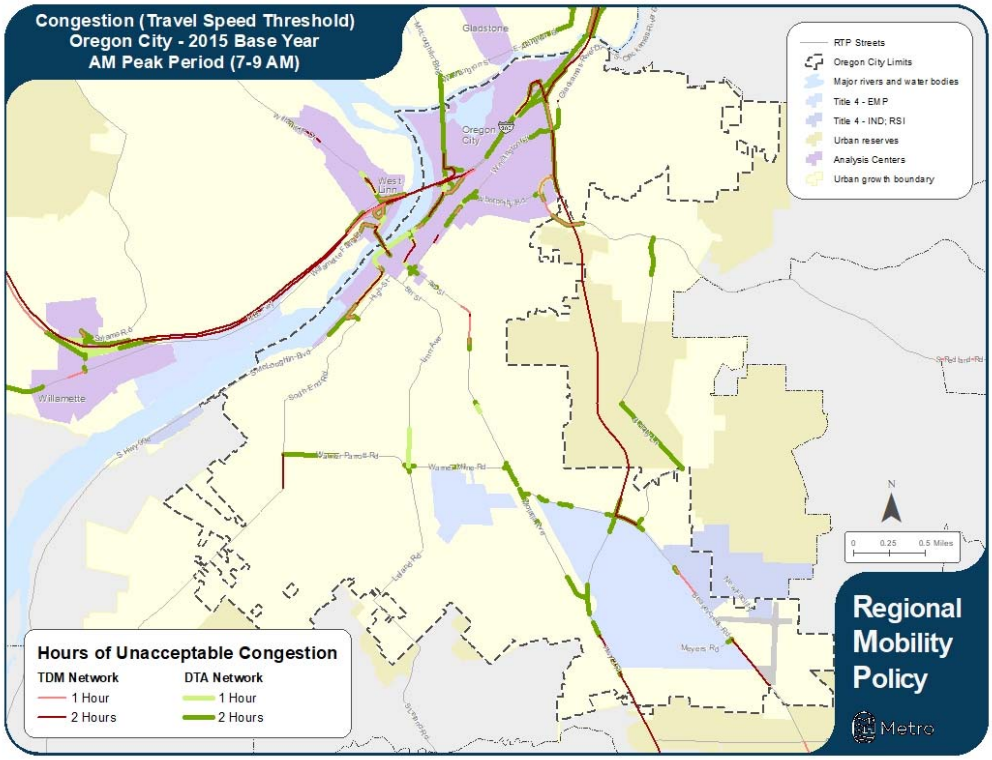


Figure 2. Congestion (Travel Speed Threshold) Oregon City – 2015 Base Year PM Peak Period

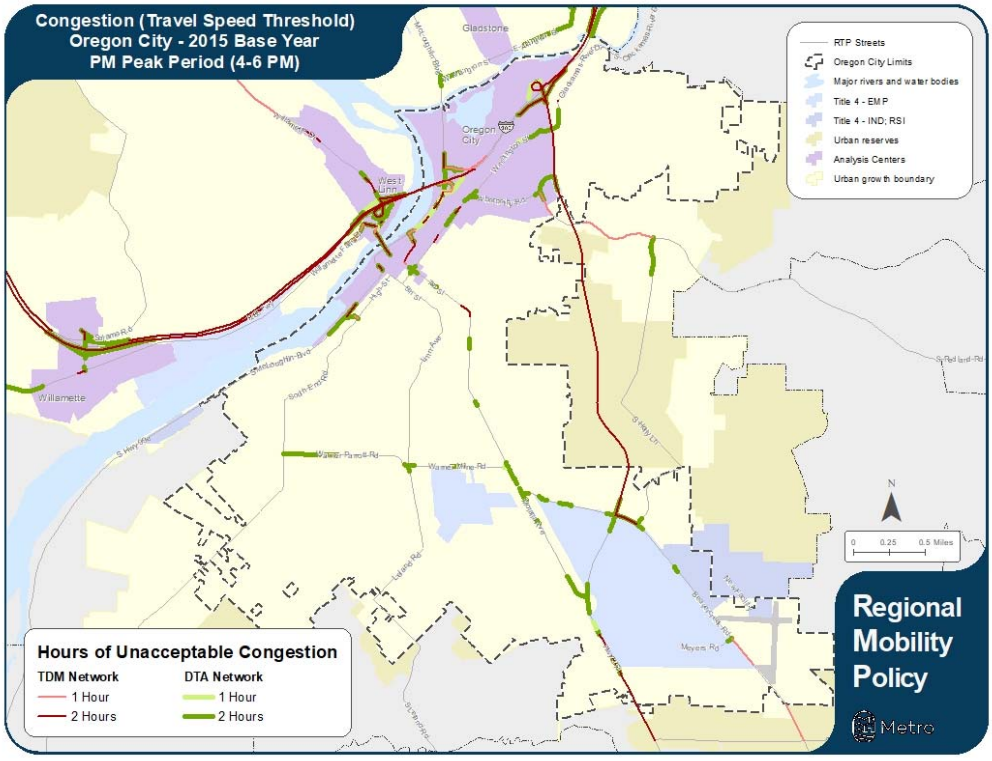


Figure 3. Congestion (Travel Speed Threshold) Oregon City – 2040 Constrained AM Peak Period

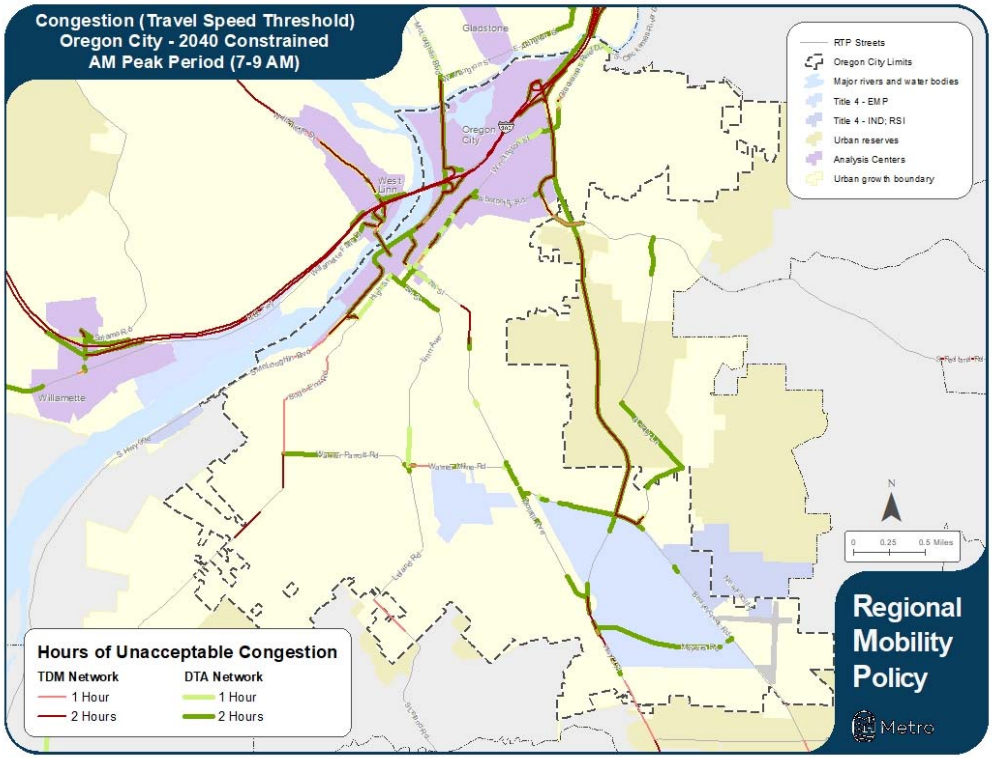
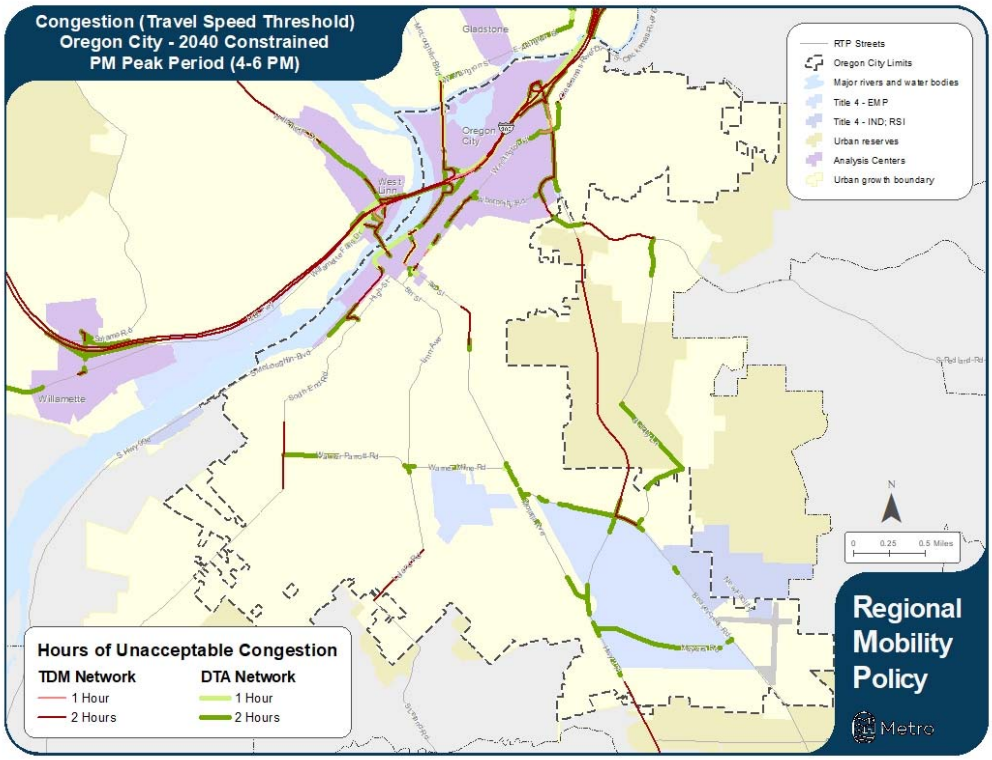


Figure 4. Congestion (Travel Speed Threshold) Oregon City – 2040 Constrained PM Peak Period



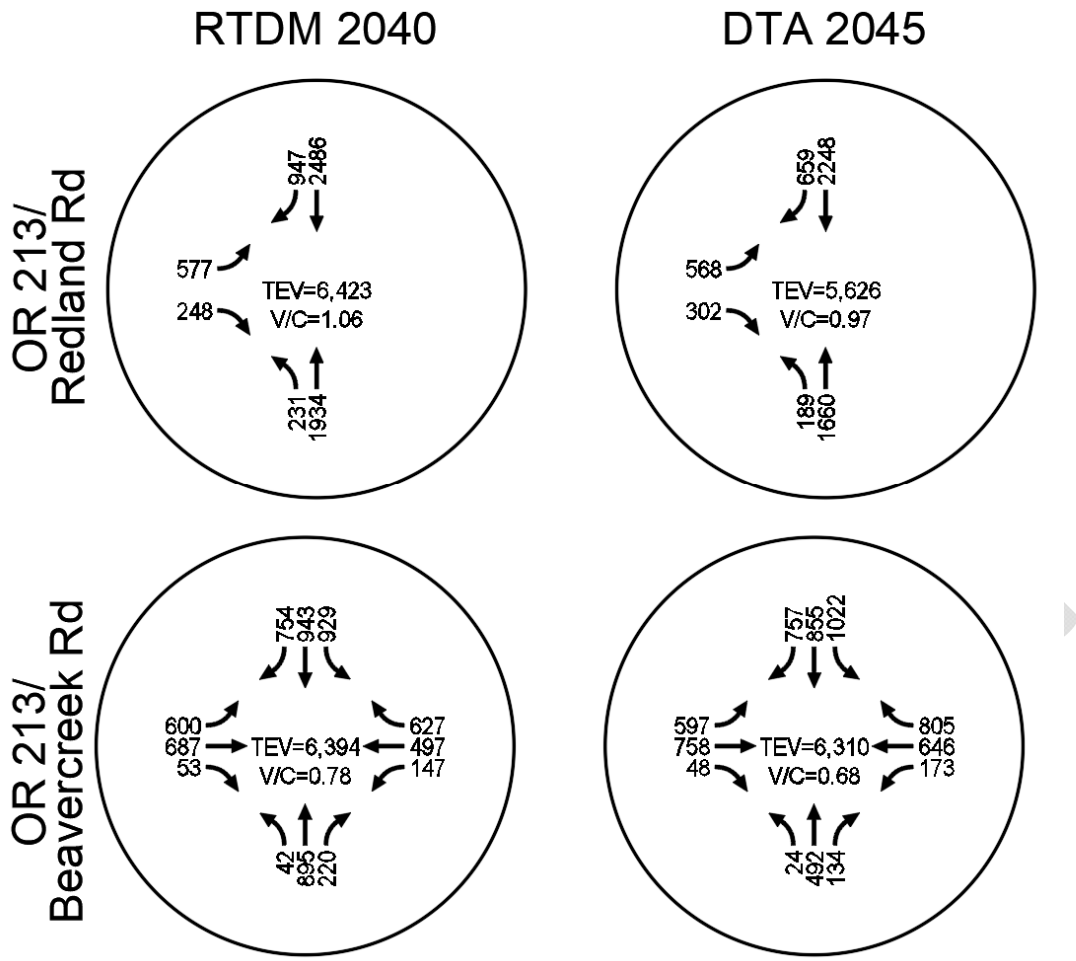
The DTA model shows less congested peak hours on major roadways and more congested hours on parallel routes. For example, the 2040 constrained PM peak period figure shows I-205 as congested for the two analysis hours based on RTDM output, where the DTA output shows segments between the ramps operating at an acceptable travel speed for one or two of the analysis hours. Based on RTDM output, OR 213 is also shown as congested for two hours with adjacent Holly Lane-Maplelane Road operating acceptably. The DTA output suggests that OR 213 operates acceptably and segments of the alternative route are congested for the two analysis hours.

Does the DTA model result in significantly different post-processed intersection volumes for use at the intersection level?

Model link volumes from the RTDM (base 2015 and future 2040) and DTA (base 2015 and future 2045) were used to develop future year turning movement counts at the two study intersections analyzed in the OR 213 Alternative Mobility Target case study: OR 213/Beavercreek Road and OR 213/Redland Road. In addition to link volumes, existing 2017 traffic counts from the case study were also utilized. The forecast traffic volumes were developed by applying the post-processing methodology presented in the National Cooperative Highway Research Program (NCHRP) Report 255 Highway Traffic Data for Urbanized Area Project Planning and Design.

The intersection operations analysis was conducted using Synchro 10, which is a software tool designed to assist with operations analyses in accordance with Highway Capacity Manual 6th Edition (HCM 6) methodologies. Because Synchro 10 does not report overall intersection v/c ratios, the overall intersection v/c ratios were hand-calculated in accordance with the methodologies outlined in ODOT's Analysis Procedures Manual (APM). Exhibit 1 summarizes the results of the intersection operations analysis. Attachment A contains the operations analysis worksheets.

Exhibit 1. Comparison of Regional Travel Demand Model and Dynamic Traffic Assignment Model Post-processed Future Volumes and Intersection V/C Ratios



TEV = Total entering volume

A queuing analysis was also conducted at the signalized study intersections using Synchro 10. Table 2 summarizes the 95th percentile queues during the weekday PM peak hour. Attachment A contains the queuing analysis worksheets.

Table 2. Comparison of Regional Travel Demand Model and Dynamic Traffic Assignment Model Post-processed Future Volumes and 95th Percentile Queues

Intersection	Movement	Volume			Queuing		
		RTDM	DTA	Difference	RTDM	DTA	Difference
OR 213/ Beavercreek Road	EBL	600	597	-3	450	448	-2
	EBT	687	758	71	372	413	41
	EBR	53	48	-5			
	WBL	147	173	26	136	167	31
	WBT	497	646	149	286	380	94
	WBR	627	805	178	488	842	354
	NBL	42	24	-18	92	56	-36

	NBT	895	492	-403	679	296	-383
	NBR	220	134	-86	114	20	-94
	SBL	929	1022	93	639	738	99
	SBT	943	855	-88	445	393	-52
	SBR	754	757	3	426	431	5
OR 213/ Redland Road	EBL	577	568	-9	529	519	-10
	EBR	248	302	54	321	429	108
	NBL	231	189	-42	496	398	-98
	NBT	1934	1660	-274	351	258	-93
	SBT	2486	2248	-238	1421	954	-467
	SBR	947	659	-288	351	150	-201

in Table 2, the largest volume and queuing reductions when using the DTA model instead of the RTDM are seen on OR 213, which is a primary north-south route. This aligns with the DTA methodology that reroutes trips onto alternative routes when users begin to experience delay due to high volumes.

Finding: When intersection solutions are developed solely based on future post-processed volumes, there is potential to overbuild solutions and even induce demand. Instead of focusing on minimizing delay at one spot location, it may be more useful to consider overall progression of a facility. There are locations where a spot treatment only shifts a bottleneck to the next intersection.

Note About Post-Processed Intersection Volumes

It is important to note that this post-processing methodology gives a false level of precision no matter whether the DTA or RTDM are used. Both models utilize the same transportation analysis zone (TAZ)-level inputs to estimate trips generated from a TAZ and assign them to the network. The model does not know where specific land uses are located within the TAZ or where all the driveway accesses are located. For example, trips generated by a grocery store with a driveway access to a facility on the east side of a TAZ may be assigned to enter the model network on a link south of the TAZ. Because of this, the link volume outputs immediately adjacent to the TAZ may not be realistic even though their assigned route based on origin and destination will overall be appropriate.

In addition, and because the model networks are not as detailed as the on-the-ground transportation system, the model may not have a specific local street link within the network. Similar to the driveway location example, the assigned trips make not load onto the network at the exact appropriate origin or destination, but the overall route will be intentional. Although it is the methodology currently used to determine turning movement volumes, the process utilizes link volumes that are better suited for a macro-level analysis instead of an intersection-level analysis.

Do different definitions of "congestion" identify different needs at the system level?

The project team explored two measures that could be used to determine locations of "congestion": v/c ratio and travel speed. Both measures can be provided as or calculated from link-level output from the regional models. The project team reviewed region-wide v/c ratio and travel speed output for the 2015 base year and 2040 constrained networks. For v/c, the current interim regional mobility policy thresholds were used to define "congested" links, which vary by roadway facility. Targets for the midday peak hour are either 0.99 or 0.90, first hour PM peak period targets are either 1.1 or 0.99, and second hour PM peak period targets are 0.99. For travel speed, "congested" was defined as when a link travel speed is less than 75 percent of the base link speed. The base link speed is often similar to the posted speed limit but is not exactly equal to it for all model links.

Figures 5 through 8 compare v/c and travel speed output by showing if each link is congested based on the above thresholds for one or two hours within the midday or PM peak period. V/C-based congestion output is represented by the thicker lines and travel speed-based by the thinner lines.

Figure 5. Congestion Measure Comparison Region-wide – 2015 Base Year Midday Peak Period

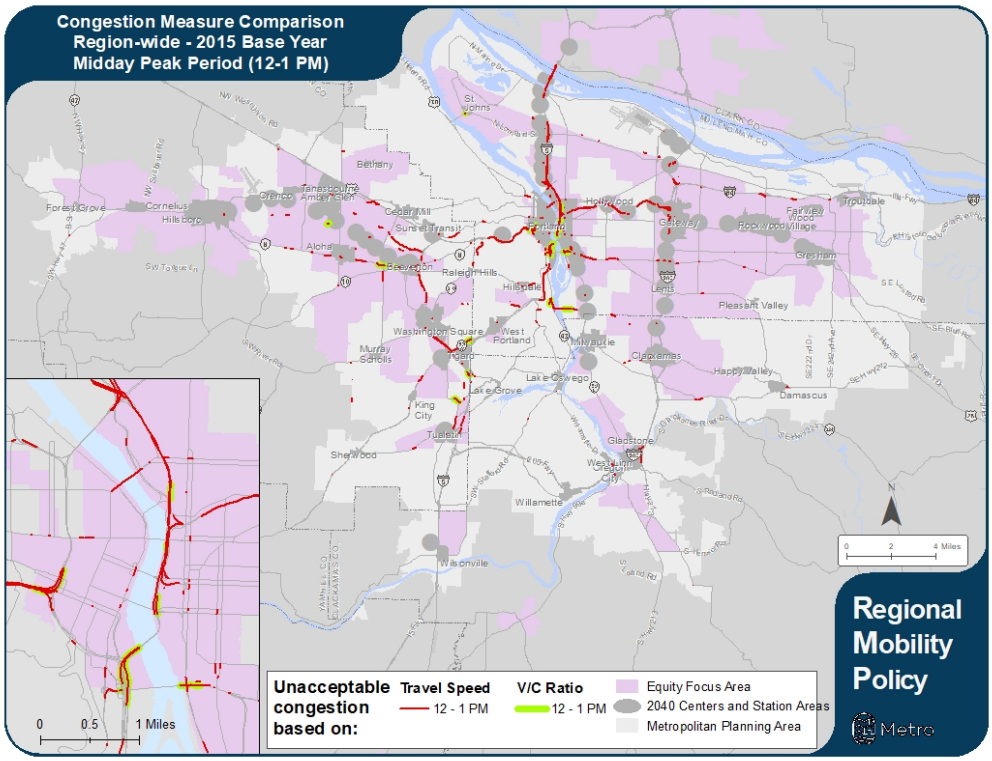


Figure 6. Congestion Measure Comparison Region-wide – 2015 Base Year PM Peak Period

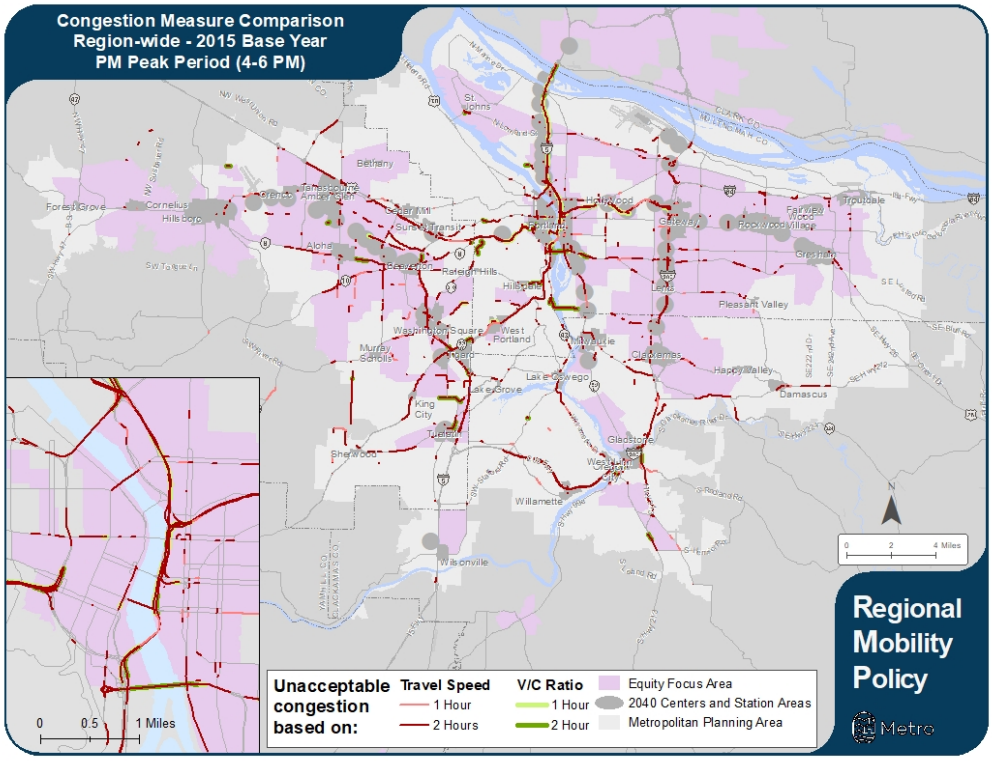


Figure 7. Congestion Measure Comparison Region-wide – 2040 Constrained Midday Peak Period

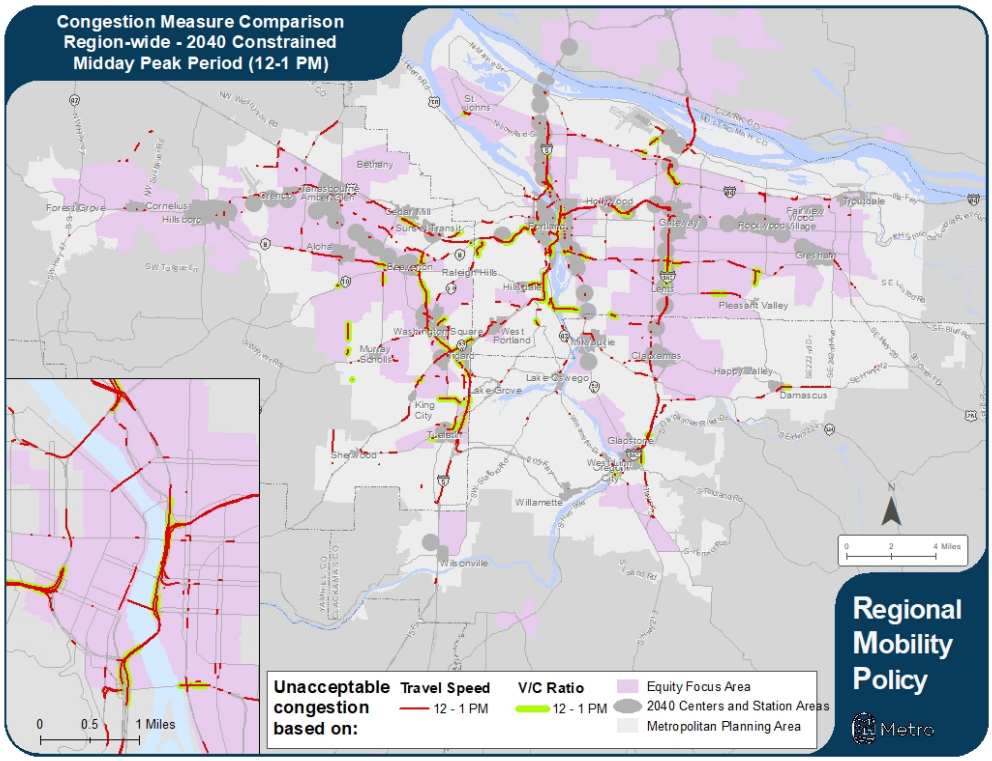
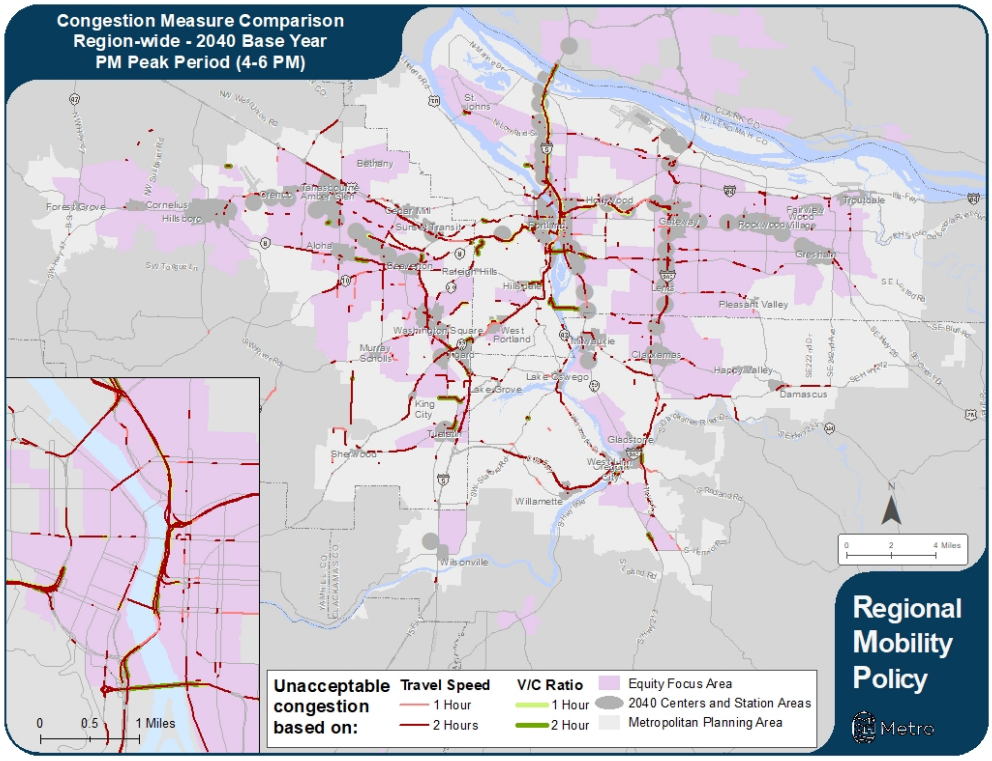


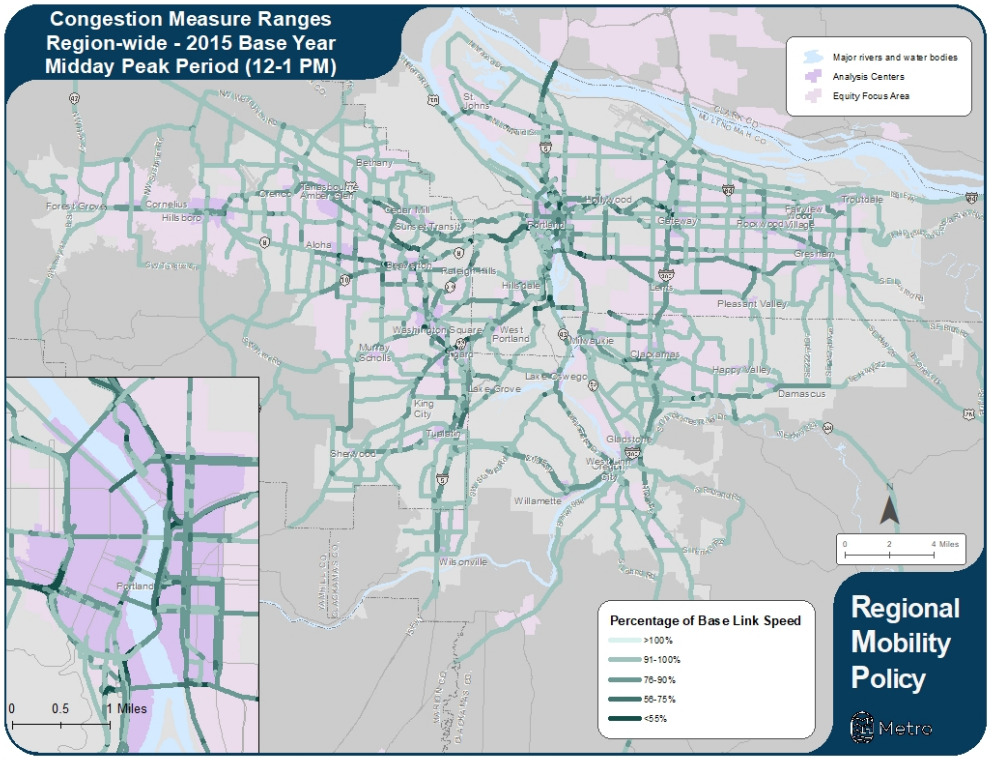
Figure 8. Congestion Measure Comparison Region-wide – 2040 Constrained PM Peak Period



With the thresholds used, v/c-based "congested" links were also "congested" based on the 75 percent travel speed threshold. Travel speed-based congestion was highlighted on more of the network and for more of the analysis period. For example in the 2040 constrained PM peak figure, there are several sections of OR 8 shown as congested based on v/c thresholds between SW 185th Avenue and SW Murray Boulevard. Those same segments are shown as congested based on travel speed and additional segments between SW 170th Avenue and SW Murray Boulevard are highlighted as well..

Findings: Travel speed is an interesting measure because it can use the same percentage-based threshold for all the roadway facilities, instead of determining different v/c ratio thresholds based on the facility type. Base link speeds, which could use posted speed limits, are set on a facility-by-facility basis. In addition to the facility type, the local context and safety considerations of the roadway are used by agencies to set posted speed limits. Posted speed limits can vary along a corridor based on these additional factors and help represent the intended use of the facility. In addition, travel speed is a direct output of the regional models, simplifying the process for calculating the measures. Measured data is also more easily captured through probe data. It is also a measure easily understood by the traveling public, as direction and map-based apps are more common. The biggest challenge to utilizing travel speed as the primary link-level congestion metric is the lack of historic use in the region for the non-highway network and a need to better understand the implications of determining certain thresholds. Figures 9 through 12 show the travel speed and v/c ratio ranges for the region, instead of showing just locations where a threshold is passed. If link travel speed and/or v/c ratio are part of the mobility policy, region-wide data will need to be further reviewed to recommend targets and thresholds.

Figure 9a and b. Congestion Measure Ranges Comparison Region-wide – 2015 Base Year Midday Peak Period



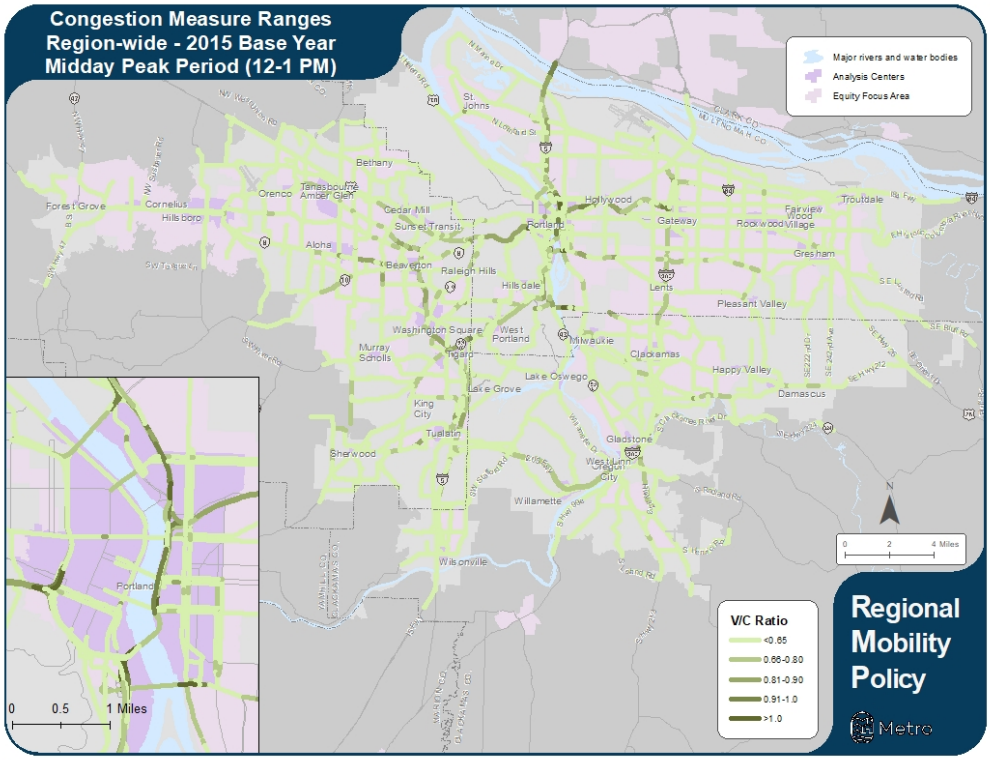
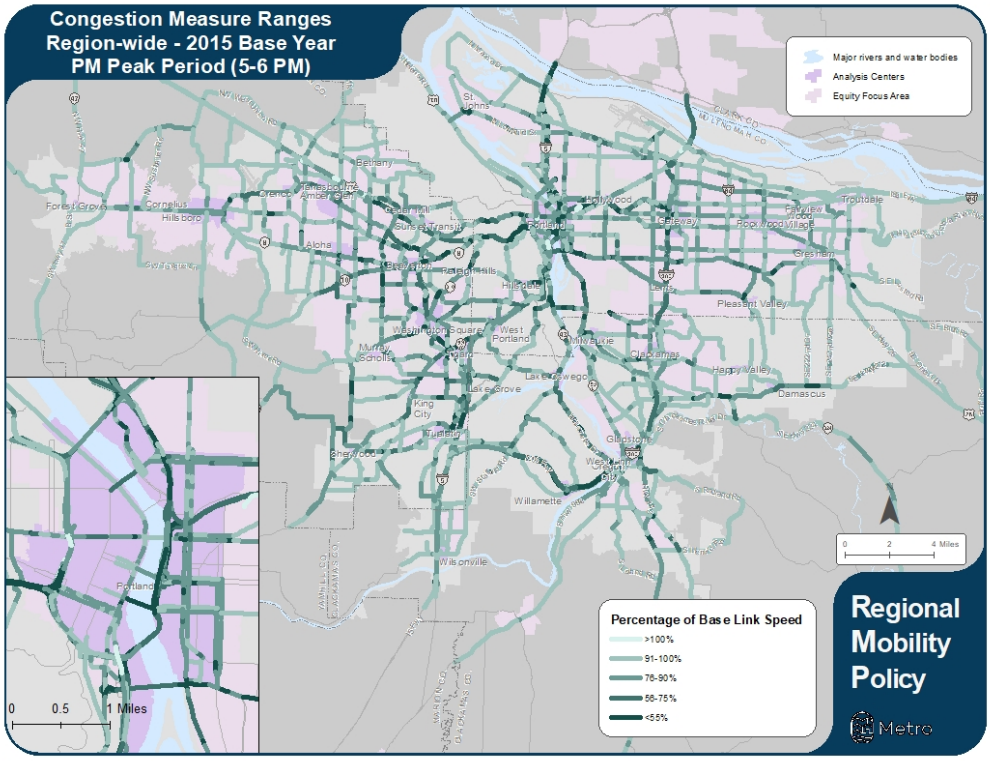


Figure 10a and b. Congestion Measure Ranges Comparison Region-wide – 2015 Base Year PM Peak Period



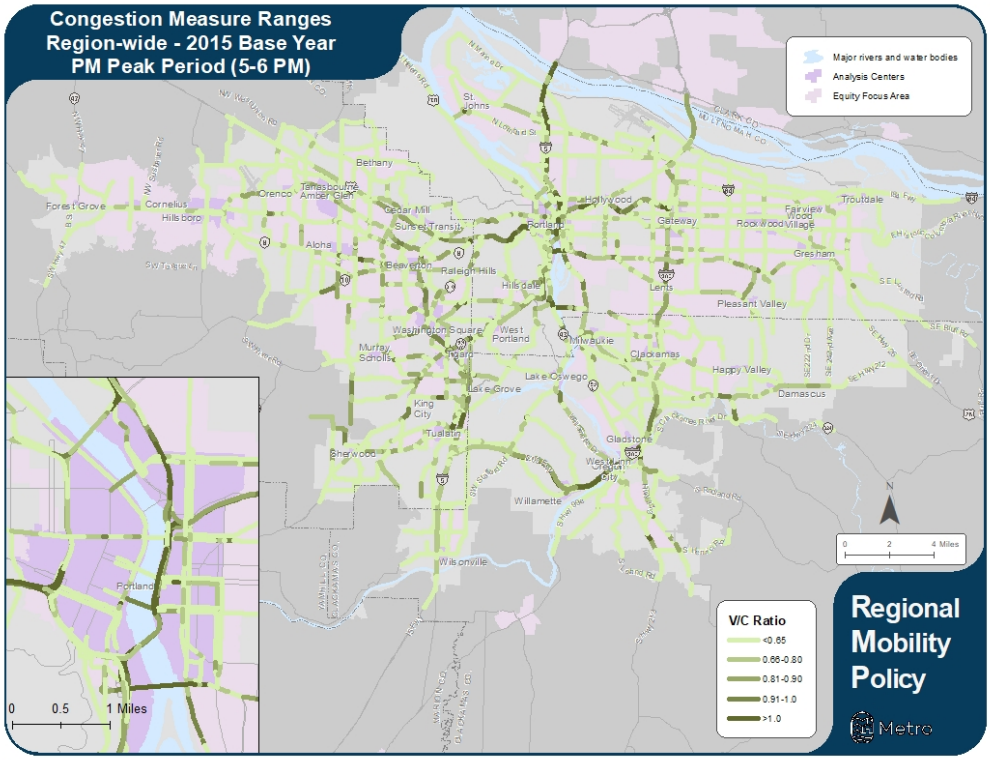
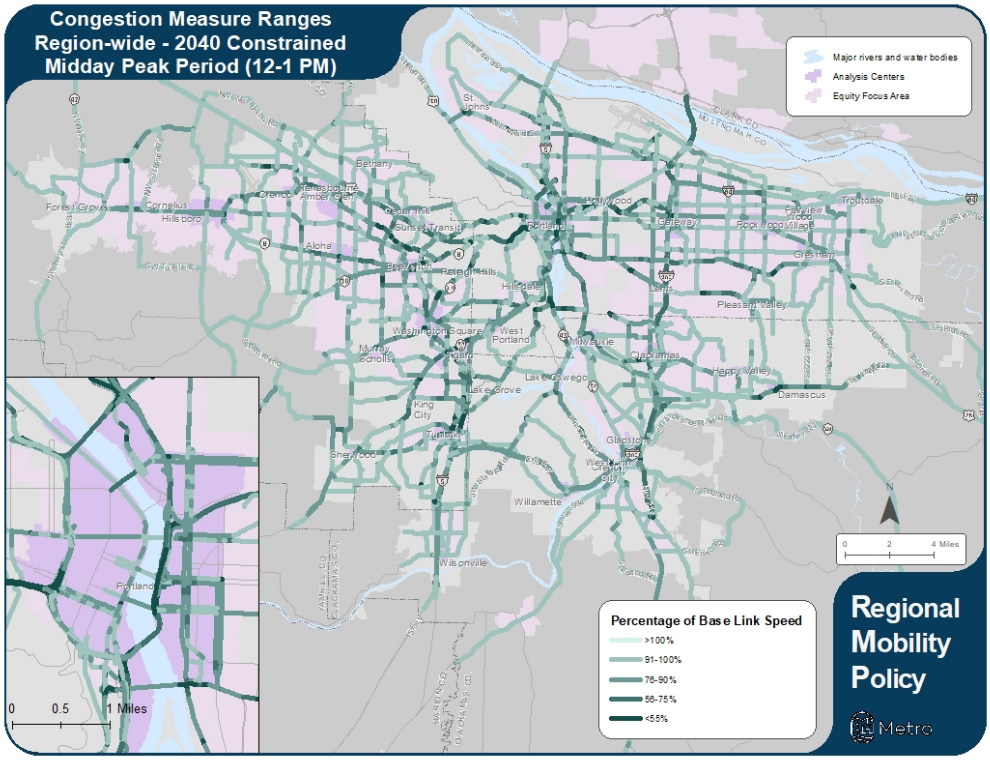


Figure 11a and b. Congestion Measure Ranges Comparison Region-wide – 2040 Constrained Midday Peak Period



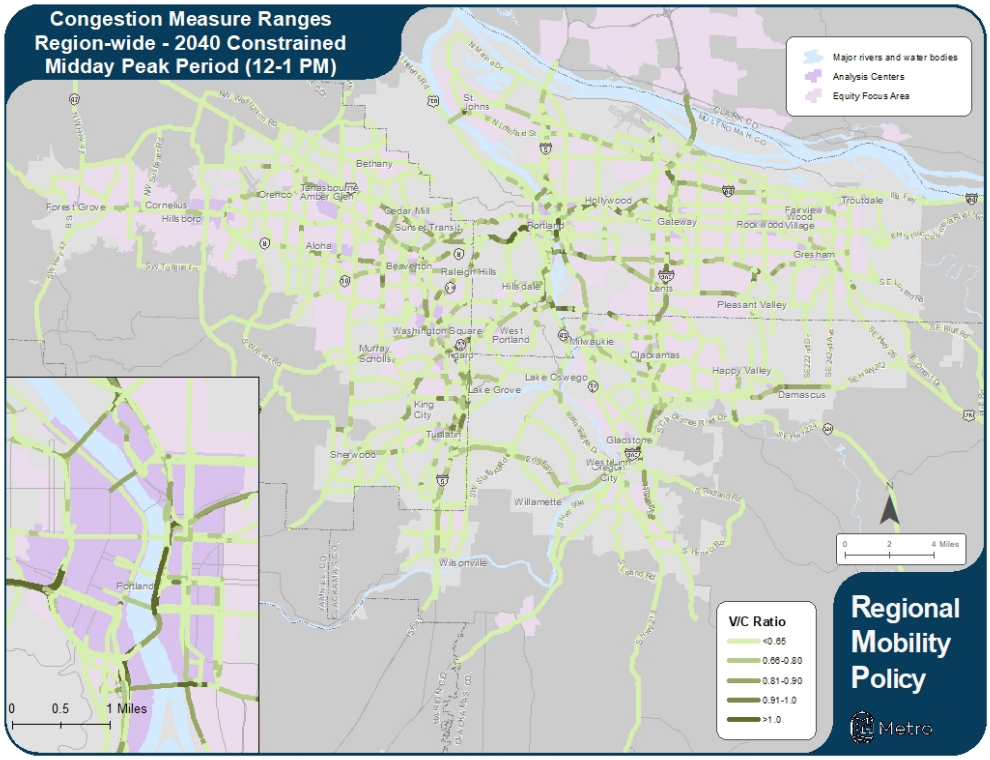
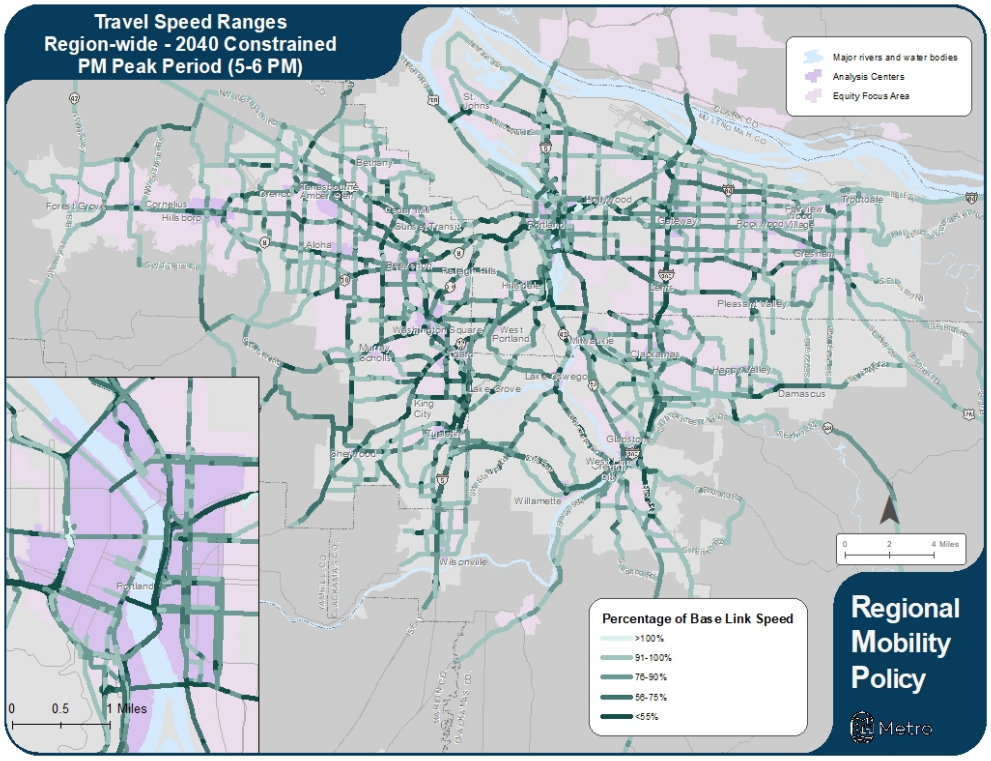
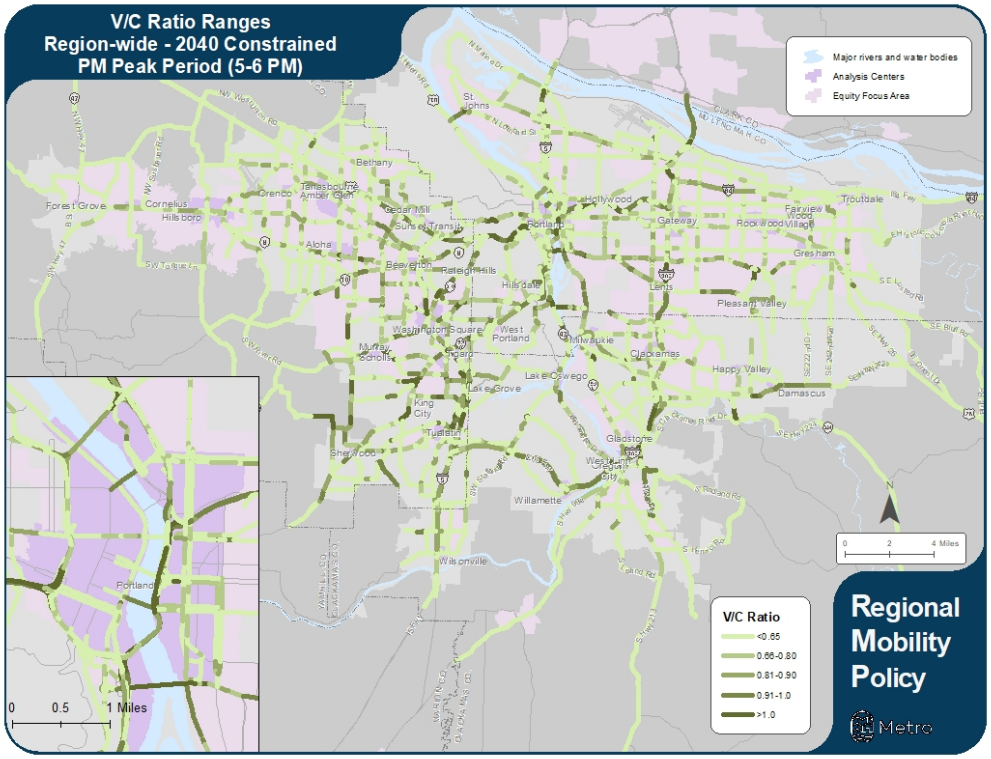


Figure 12a and b. Congestion Measure Ranges Comparison Region-wide – 2040 Constrained PM Peak Period





How sensitive are the model outputs to changes in land use?

Focused sensitivity testing on the congestion-based metrics was conducted for the TV Highway study area. The sensitivity testing scenarios used the 2040 model network as a base, with updated population and employment levels from 2015 and 2027 scenarios depending on the scenario. **Error! Reference source not found.** describes how model year variables were assigned to the sensitivity testing scenarios reviewed for congestion-based metrics.

Table 3: Congestion-based Sensitivity Testing Scenario Definitions

Scenario	Variables from model year			Impacted TAZs
	Households	Employment	Model Network	
Scenario 3 – South Hillsboro No growth	2015	2015	2040FC	1341, 1352, 1353, 1363, 1366, 1367
Scenario 4 – South Hillsboro Minimal growth	2027	2027	2040FC	1341, 1352, 1353, 1363, 1366, 1367
Scenario 5 – South Hillsboro Household-only growth	2040	2015	2040FC	1341, 1352, 1353, 1363, 1366, 1367
Scenario 6 – TV Highway Aloha growth	Increased by 50%	Increased by 50% (TAZ 1137 only)	2040FC	1336, 1337, 1338

Source: Metro Travel Demand Modeling staff, 2021.

Figures 13 through 16 compare the sensitivity testing scenario model travel speed output with the 2040 Constrained output. Based on this comparison, travel speed is not very sensitive to land use changes.

For Scenarios 3 through 5, which focus on land use adjustments within the large South Hillsboro development area, the travel speed changes were mostly seen on arterials instead of throughways. Arterials often have lower posted speeds (or base link speeds which were used for the sensitivity testing calculations) and will therefore see more of a percentage impact for a minor travel speed change like from 24 to 22 MPH. The travel speed changes are almost all in direct correlation to the land use change. In Scenario 3 for example, the scenario removed the household and employee growth that was added to the 2040 Constrained model, reducing trips to and from the South Hillsboro area. As expected, the travel speeds increase between the 2040 Constrained model output and the Scenario 3 output in places where changes occur. For Scenario 6, no significant travel speed changes occurred, suggesting that travel speed is not sensitive to smaller scale plan amendments. The adjusted TAZs are also located along TV Highway, where higher posted speeds (or base link speeds) do not show small changes in travel speed as a significant percentage change.

Figure 13. Sensitivity Testing Scenario 3 (Travel Speed Ranges) TV Highway – 2040 PM Peak

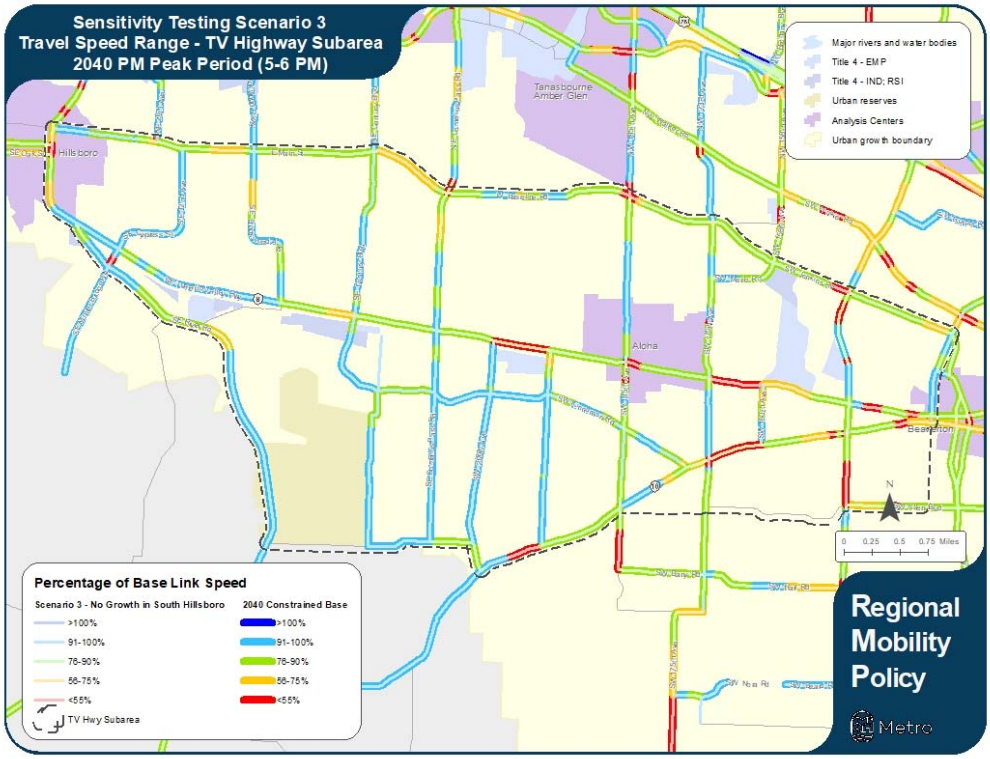


Figure 14. Sensitivity Testing Scenario 4 (Travel Speed Ranges) TV Highway – 2040 PM Peak

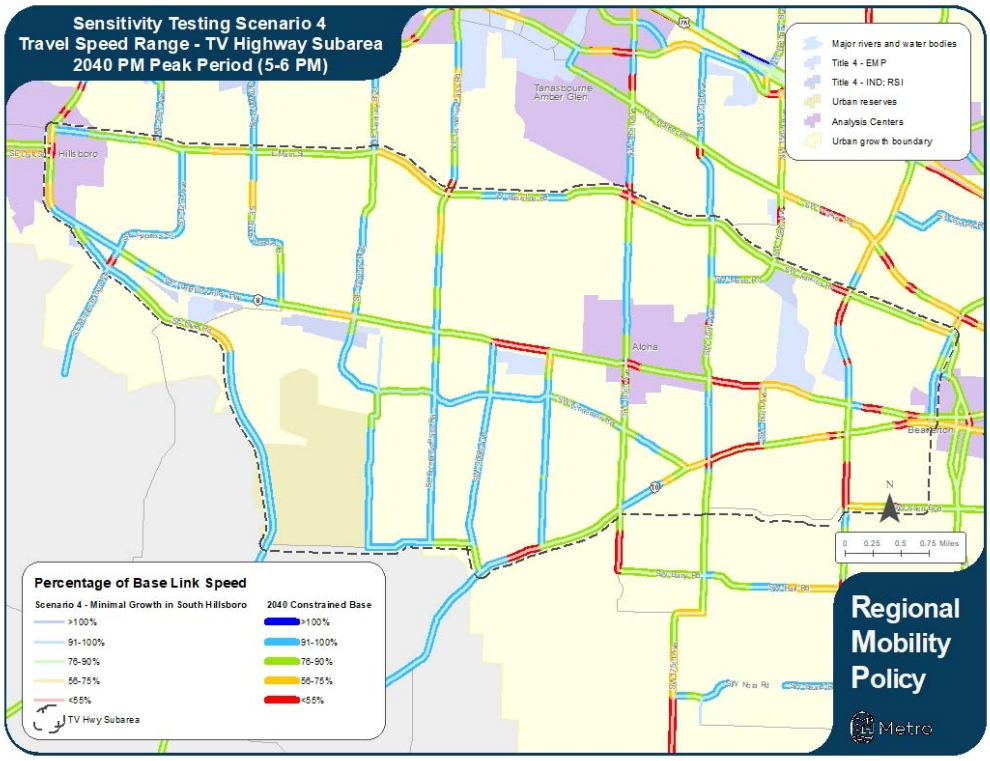


Figure 15. Sensitivity Testing Scenario 5 (Travel Speed Ranges) TV Highway – 2040 PM Peak

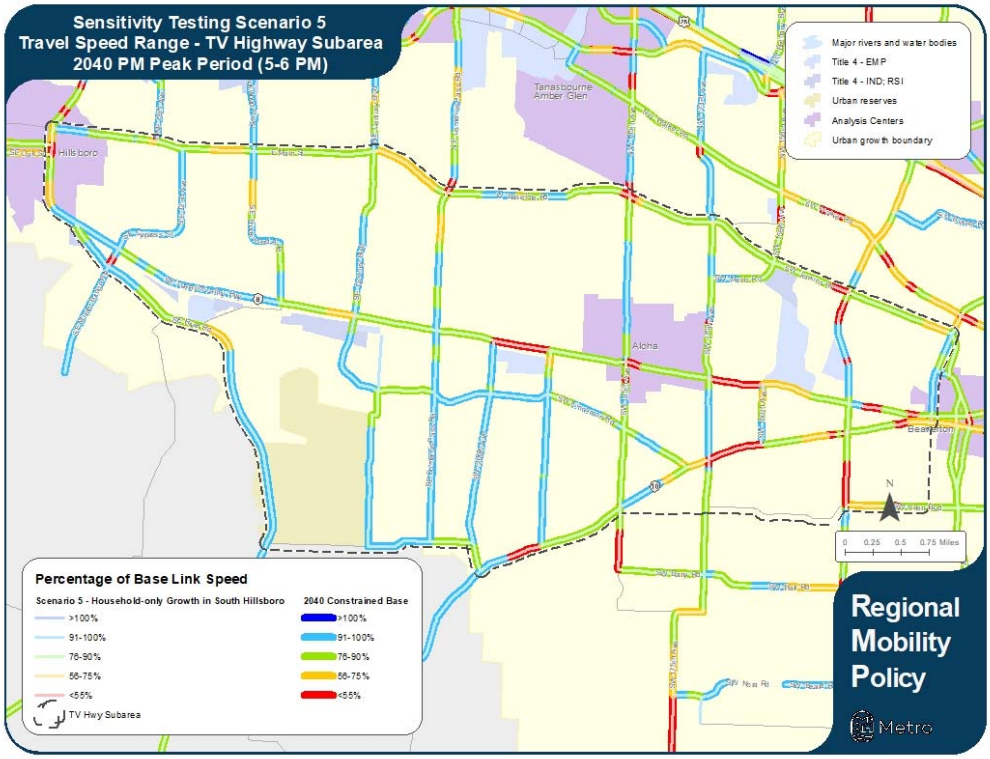
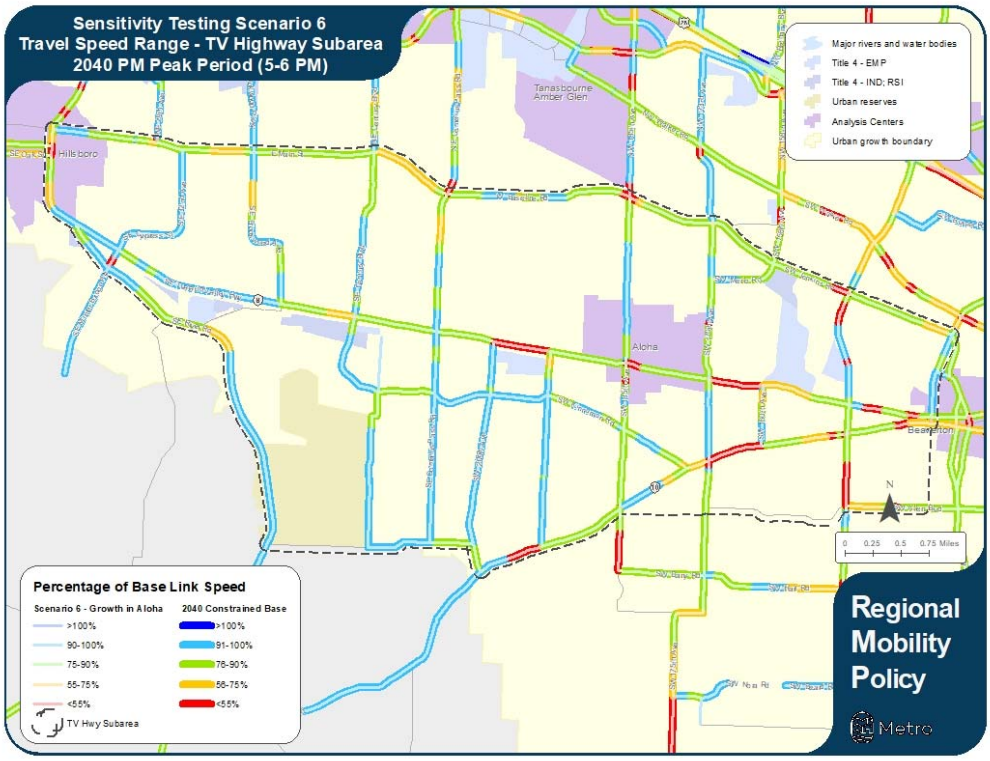


Figure 16. Sensitivity Testing Scenario 6 (Travel Speed Ranges) TV Highway – 2040 PM Peak



Policy Considerations

If travel speed is utilized in the mobility policy, major considerations include:

- What speed variable will be the denominator for determining a travel speed threshold? Options include posted speed, free flow speed, and the base link speed from the travel demand model.
    - For this analysis, the base link speed from the 2015 travel demand model was used because it was a readily available output that could be easily incorporated into GIS-based calculations. Base link speed is not a measured or designated speed; it is an input that is part of the travel demand model. It is often close to or equal to the posted speed, but it can vary from the posted speed if needed to yield accurate travel times in calibration.
    - Whichever speed variable is used, it is recommended to create a dataset where the model output and the speed variable data have the same link segmentation. This will simplify requests to Metro and/or the calculation process. Posted speed was not used for this analysis due to the effort requires to match the two datasets for use in the calculations.
- How would thresholds be decided?
    - 75% is currently used by ODOT for the Portland Region Traffic Performance Report (PRTPR) and Corridor Bottleneck Operations Study (CBOS)
    - 75% may not make sense on roadways that are controlled (versus uncontrolled roadways such as freeways). Roadways that have more traffic control, such as signals and roundabouts, will experience more delay and slower speeds. Thresholds or targets would need to take that into consideration. Potentially using a threshold based on measured speeds (like average travel speed for the link) would provide a realistic base for developing a threshold.
    - 75% may not make sense for roadways that have low posted speeds (or base link speeds). Minor variations of travel speed (such as a change in 2 MPH) would show large percentage changes.
- Guidance would need to be developed related to calibration and validation of Metro models in relation to speed if it is going to be used as a measure with a target. Currently, most of the speed related measures are used for relative comparisons between various alternatives, not as a measure against a target.
    - Metro modeling staff notes that there is some calibration related to travel times, which has a direct relationship to travel speeds. The base year link speeds are generally set to yield accurate travel times in calibration. Horizon year speeds may be adjusted when speed changes are known or expected in future year models.

Should the DTA model be used for congestion-based metrics?

- Overall, the DTA model provides volumes that are more spread out on the system and likely more realistic for peak travel periods, decreasing volumes on throughways that are congested and adding volumes to parallel arterial routes. Similar to in-the-field conditions, the DTA theoretically never has a v/c ratio greater than 1.0, which would help with target

and threshold setting. The RTDM will assign trips to a link even if it is well over capacity already, which is not possible on the ground.

- Although more realistic, Metro does not have a regional DTA. It would take a lot of time to actually develop and calibrate the DTA for each area.
- It is unclear if there is any feedback to Metroscope/land use and demographic allocation with the current DTA model. The entire region would need to be covered by a DTA model to get that type of feedback into the regional Metroscope and land use tools.
    - The region's agencies may have other tools like HERS, Fixit, RITIS, etc. that would be more useful for considering land use changes.

If v/c ratio is utilized in the mobility policy, major considerations include:

- The comparison of post-processed volumes from the RTDM model and the DTA model confirm that volumes from the RTDM are likely to be overestimates in congested areas and could result in overbuilt solutions that induce demand. Consideration should be given to specifying the use of DTA for intersection analysis for plan amendments where the targets are applied as standards to ODOT facilities. Alternatively, an adjustment could be made to the v/c targets or an adjustment could be made to the forecast traffic volumes when a DTA model is not available.

Are the measures useful and practical for system planning?:

Throughways: Travel speed and v/c ratio are both useful for planning on throughways. The two measures trend very similarly when looking at congestion but travel speed has some advantages over v/c ratio. Travel speed is already used by ODOT for reporting on the highway network and is more relatable to the public, allowing them to understand and more meaningfully weigh in on targets.

Queuing at ramp terminals continues to be a good planning measure for safety as well as mobility.

Arterials: Although v/c has been used traditionally, travel speed has some benefits over v/c including that it provides a holistic view of travel progression through a corridor. Posted speed limits can vary along a corridor based on the land use context and intended us of the facility so the target can reflect if it's operating as intended. .

Are the measures sensitive enough to use for plan amendments?

Travel speed is not very sensitive to land use changes and will not be useful for small scale plan amendments. Travel speed has similar disadvantages to v/c ratio when applying the target as a standard to plan amendments in that if the facility is already complete with regard to number of travel lanes, the standard may not be able to be met. The policy should consider not applying a congestion target when the facility is considered complete with regard to travel lanes.

Duration of Congestion (Hours)

Hours of congestion (HOC) is the number of hours within a time period, most often within a weekday, where a facility's congestion target (such as v/c ratio or acceptable speed) is exceeded or not met. HOC is a measure of recurring congestion versus travel time reliability measures which evaluate both recurring and non-recurring congestion.

HOC is a vehicle-focused measure that supports reliability and efficiency outcomes. Current uses of the interim regional mobility policy heavily relies on v/c ratio to determine where congestion is unacceptable, but as explored above, travel speed is another option that could be used and that is easily available from the regional models. The project team wanted to explore the following questions for these measures, as summarized in the following sections:

- Do different definitions of "congestion" identify different needs at the system level?
- How sensitive are the model outputs to changes in land use?

Do different definitions of "congestion" identify different needs at the system level?

There are several potential measures that could be used to determine "congested" hours for HOC. The project team explored two that are already being considered as part of the regional mobility policy update and that can be provided as or calculated from link-level output from the regional models: v/c ratio and travel speed.

Similar to the comparison in the previous section, the project team reviewed region-wide v/c ratio and travel speed output for the 2015 base year and 2040 constrained networks to determine HOC based on each measure. For v/c, the current interim regional mobility policy midday peak hour threshold was used to define "congested" links, which vary by roadway facility. Targets for the midday peak hour are either 0.99 or 0.90, varying by roadway facility. For travel speed, "congested" was defined as when a link travel speed is less than 75 percent of the base link speed. The base link speed is often similar to the posted speed limit but is not exactly equal to it for all model links. These v/c and travel speed thresholds were applied to each link for each hour of the day to determine the number of hours each link was "congested". It is worth noting that the analysis hours are all based on clock hours. So if a link is "congested" from 7:30-9:30AM, it will be reported as only being congested for one hour (8:00-9:00AM).

Figures 17 and 18 compare v/c-based and travel speed-based HOC by model link. v/c-based HOC output is represented by the thicker lines and travel speed-based by the thinner lines.

Figure 17. Hours of Congestion Measure Comparison Region-wide – 2015 Base Year

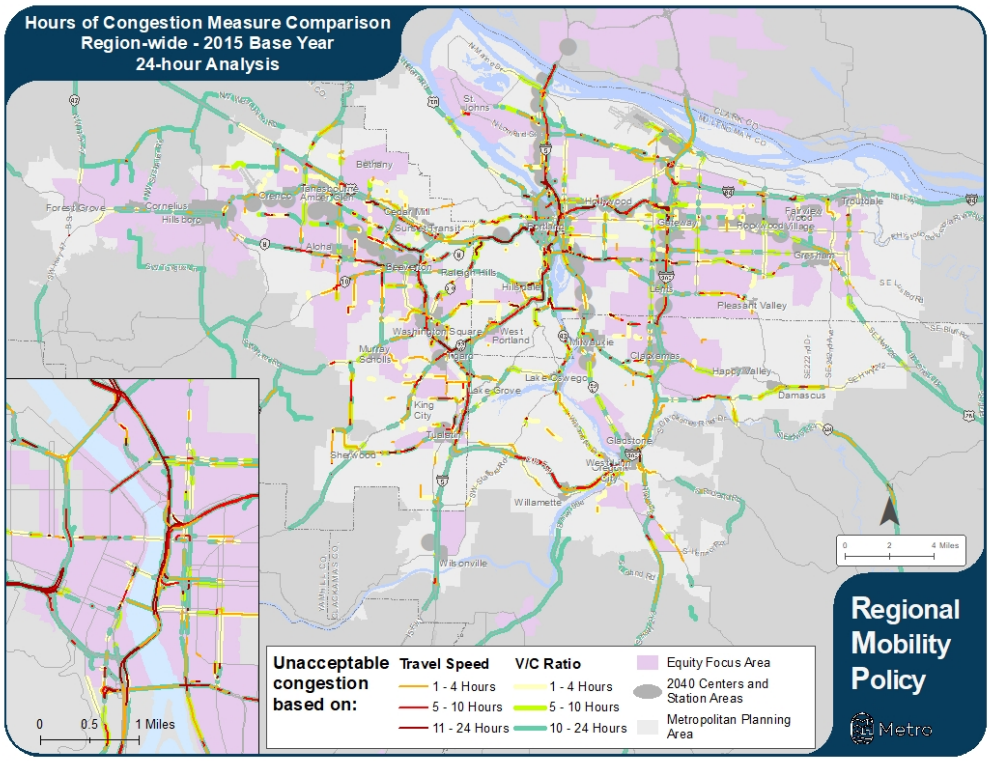
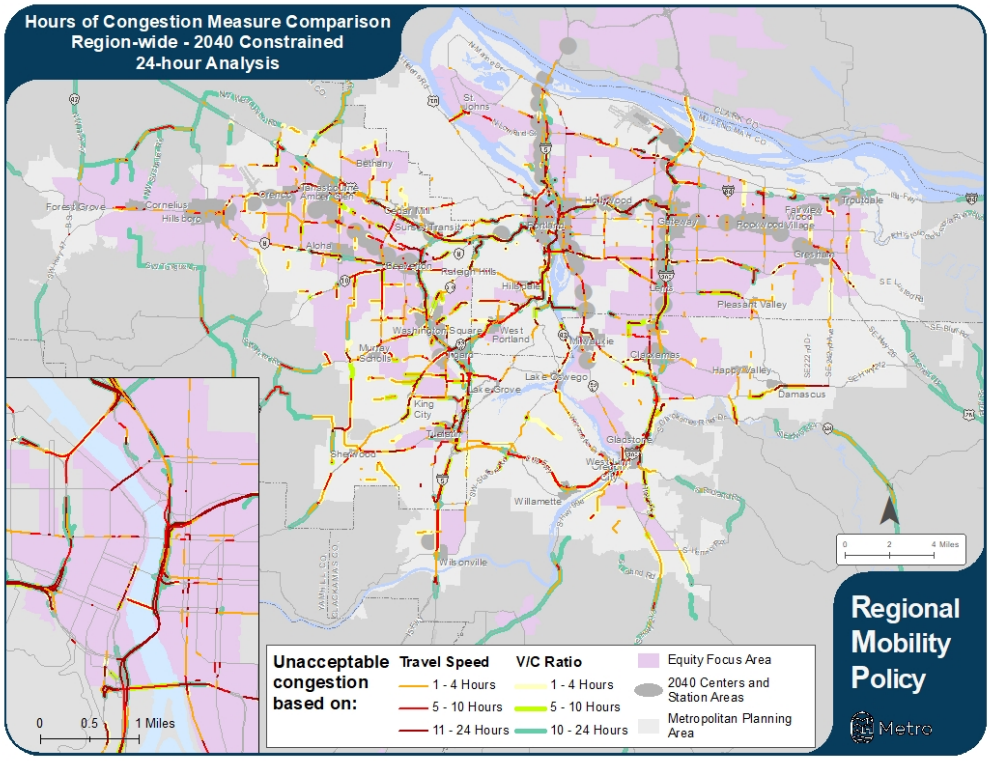


Figure 18. Hours of Congestion Measure Comparison Region-wide – 2040 Constrained



As shown in the figures, most links that have at least one hour of daily congestion based on either metric also experience congestion based on the other metric. In addition, the majority of the links that experience the highest HOCs are modeled to have sustained hours of congestion whether based on v/c or travel speed. The difference between number of hours of congestion reported between v/c and travel speed-based thresholds is not consistent throughout the region. In some areas, v/c-based HOC is higher, and the opposite is true for other areas.

When comparing the figures with the 2018 RTP, all roadways segments that are congested for the two analysis hours in the PM peak period are forecast with HOCs of 3 or more, no matter whether v/c- or travel speed-based. The HOC measure highlights more links that experience congestion, which tells a more holistic story of daily congestion impacts for the region and for throughways in particular.

How sensitive are the model outputs to changes in land use?

Focused sensitivity testing on the congestion-based metrics was conducted for the TV Highway study area. The sensitivity testing scenarios used the 2040 model network as a base, with updated population and employment levels from 2015 and 2027 scenarios depending on the scenario. Table 4 describes how model year variables were assigned to the sensitivity testing scenarios reviewed for congestion-based metrics.

Table 4: Congestion-based Sensitivity Testing Scenario Definitions

Scenario	Variables from model year			Impacted TAZs
	Households	Employment	Model Network	
Scenario 3 – South Hillsboro No growth	2015	2015	2040FC	1341, 1352, 1353, 1363, 1366, 1367
Scenario 4 – South Hillsboro Minimal growth	2027	2027	2040FC	1341, 1352, 1353, 1363, 1366, 1367
Scenario 5 – South Hillsboro Household-only growth	2040	2015	2040FC	1341, 1352, 1353, 1363, 1366, 1367
Scenario 6 – TV Highway Aloha growth	Increased by 50%	Increased by 50% (TAZ 1137 only)	2040FC	1336, 1337, 1338

Source: Metro Travel Demand Modeling staff, 2021.

Figures 19 through 26 compare the sensitivity testing scenario model HOC output with the 2040 Constrained output. Figures 19 through 22 show HOC based on travel speed, where "congested" was defined as when a link travel speed is less than 75 percent of the base link speed. Figures 23 through 26 show HOC based on v/c ratio. For v/c, the current interim regional mobility policy midday peak hour threshold was used to define "congested" links, which vary by roadway facility. Targets for the midday peak hour are either 0.99 or 0.90, varying by roadway facility.

HOC – Travel Speed Threshold

For Scenarios 3 through 5, which focus on land use adjustments within the large South Hillsboro development area, HOC changes were mostly seen on arterials instead of throughways. The HOC changes are all in correlation to the land use change. In Scenario 3 for example, the scenario removed the household and employee growth that was added to the 2040 Constrained model, reducing trips to and from the South Hillsboro area. As expected, the HOC decreases between the 2040 Constrained model output and the Scenario 3 output in places where changes occur. For Scenario 6, no significant HOC changes occurred, suggesting that using a travel speed threshold is not sensitive to smaller scale plan amendments.

HOC – V/C Ratio Threshold

For Scenarios 3 through 5, HOC changes were mostly seen on arterials instead of throughways, especially on TV Highway (major arterial per Metro classifications). The HOC changes are all in correlation to the land use change. In Scenario 3 for example, the scenario removed the household and employee growth that was added to the 2040 Constrained model, reducing trips to and from the South Hillsboro area. As expected, the HOC decreases between the 2040 Constrained model output and the Scenario 3 output in places where changes occur. For Scenario 6, no significant HOC changes occurred, suggesting that using a v/c ratio threshold is not sensitive to smaller scale plan amendments.

Figure 19. HOC Sensitivity Testing Scenario 3 (Travel Speed) TV Highway – 2040 PM Peak

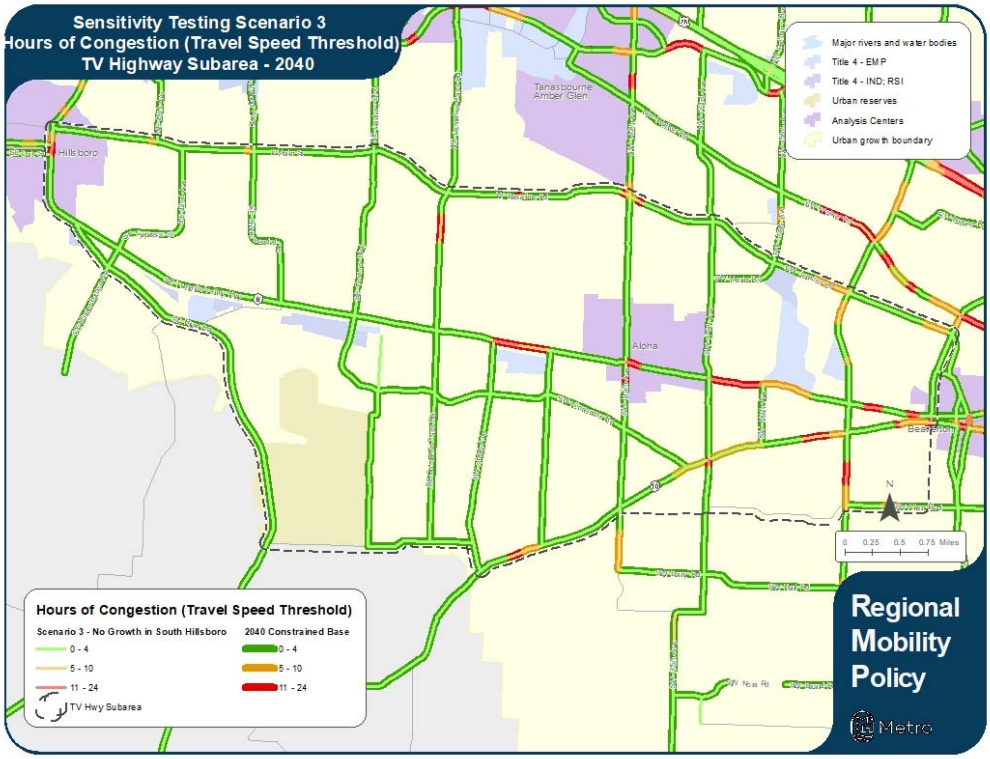


Figure 20. HOC Sensitivity Testing Scenario 4 (Travel Speed) TV Highway – 2040 PM Peak

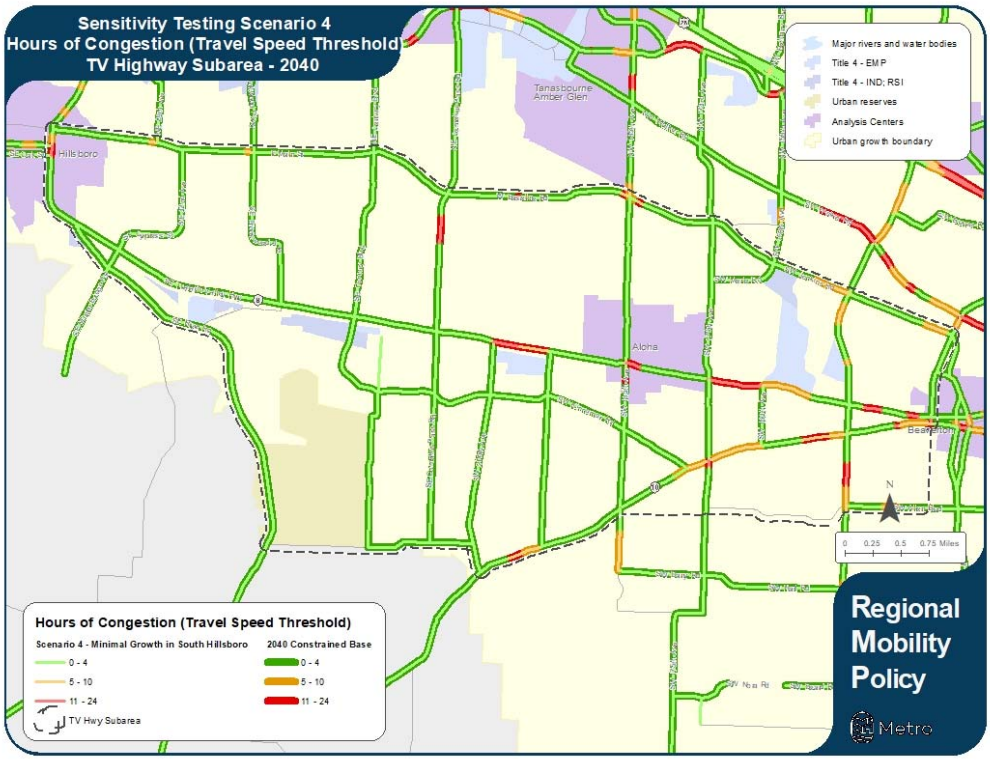


Figure 21. HOC Sensitivity Testing Scenario 5 (Travel Speed) TV Highway – 2040 PM Peak

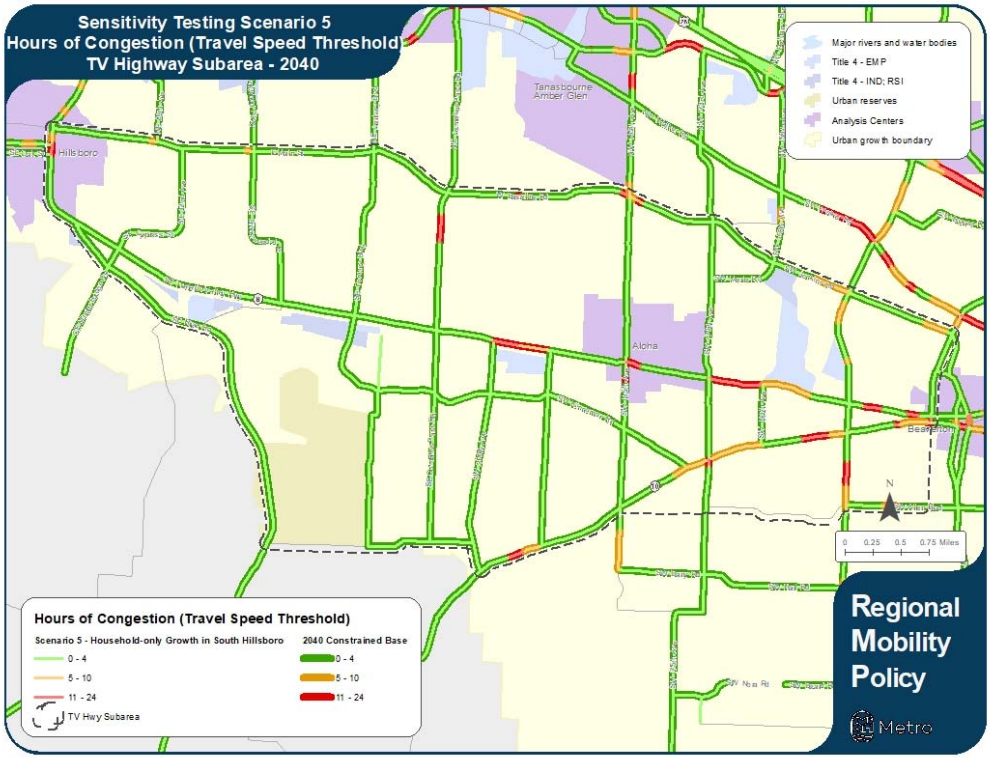


Figure 22. HOC Sensitivity Testing Scenario 6 (Travel Speed) TV Highway – 2040 PM Peak

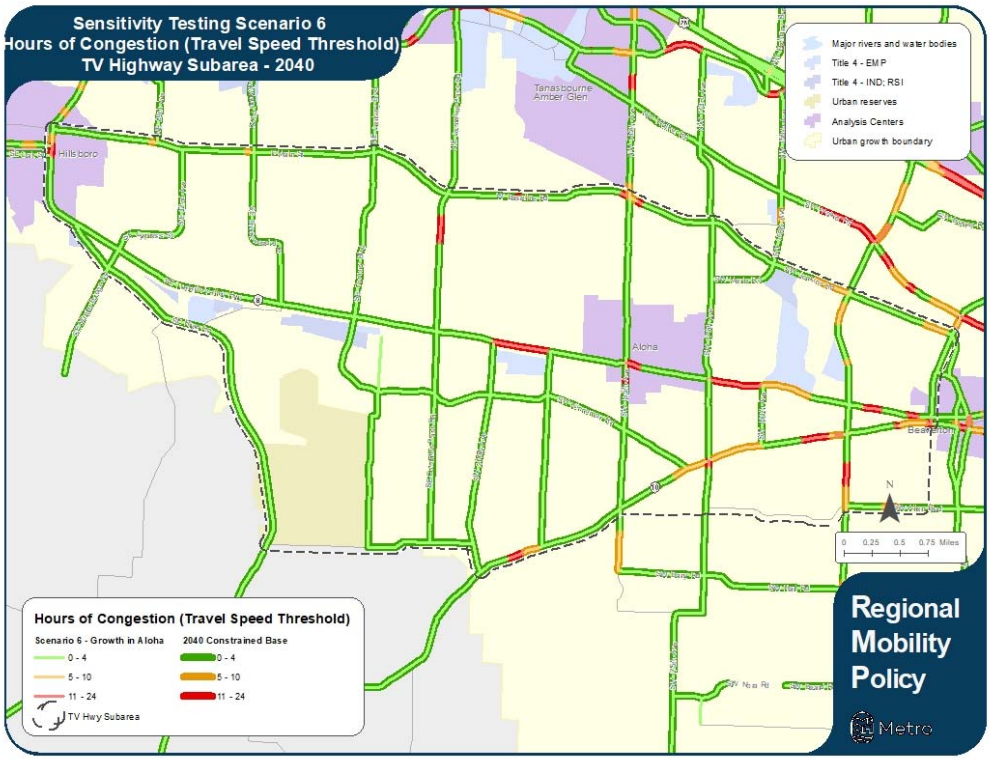


Figure 23. HOC Sensitivity Testing Scenario 3 (V/C Ratio) TV Highway – 2040 PM Peak

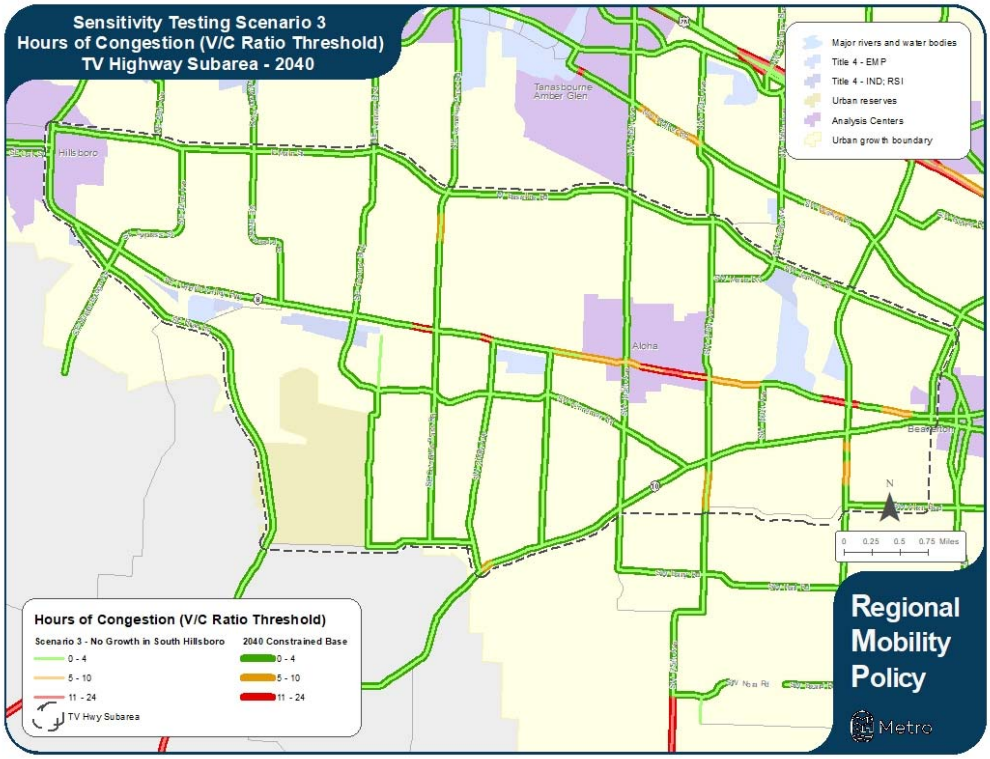


Figure 24. HOC Sensitivity Testing Scenario 4 (V/C Ratio) TV Highway – 2040 PM Peak

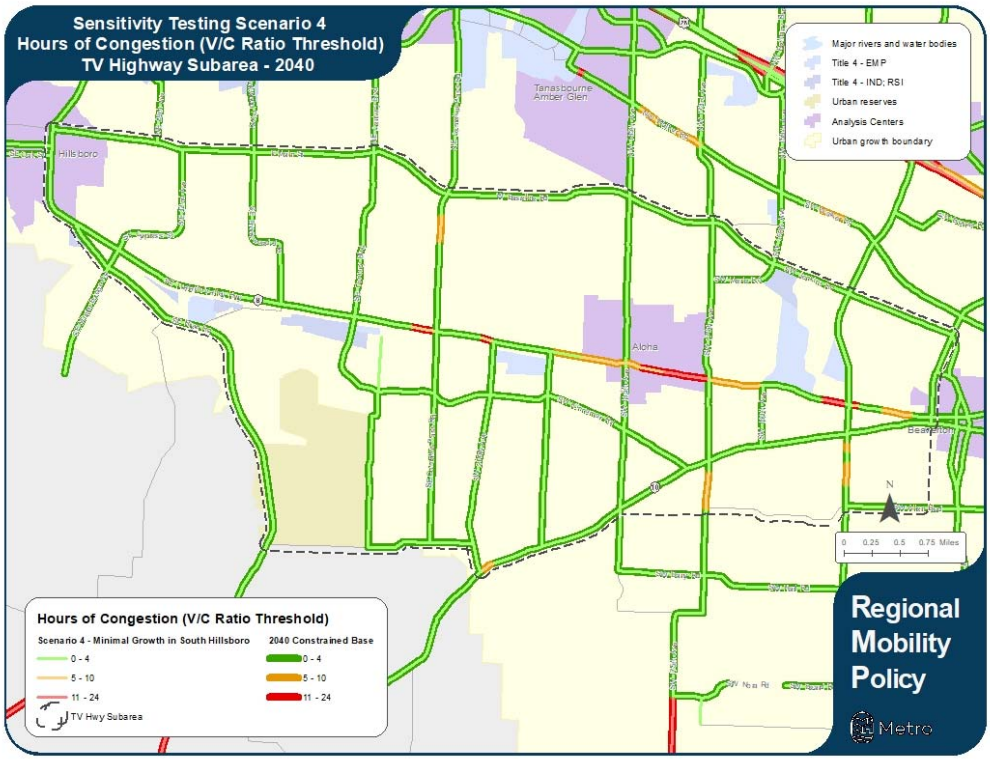


Figure 25. HOC Sensitivity Testing Scenario 5 (V/C Ratio) TV Highway – 2040 PM Peak

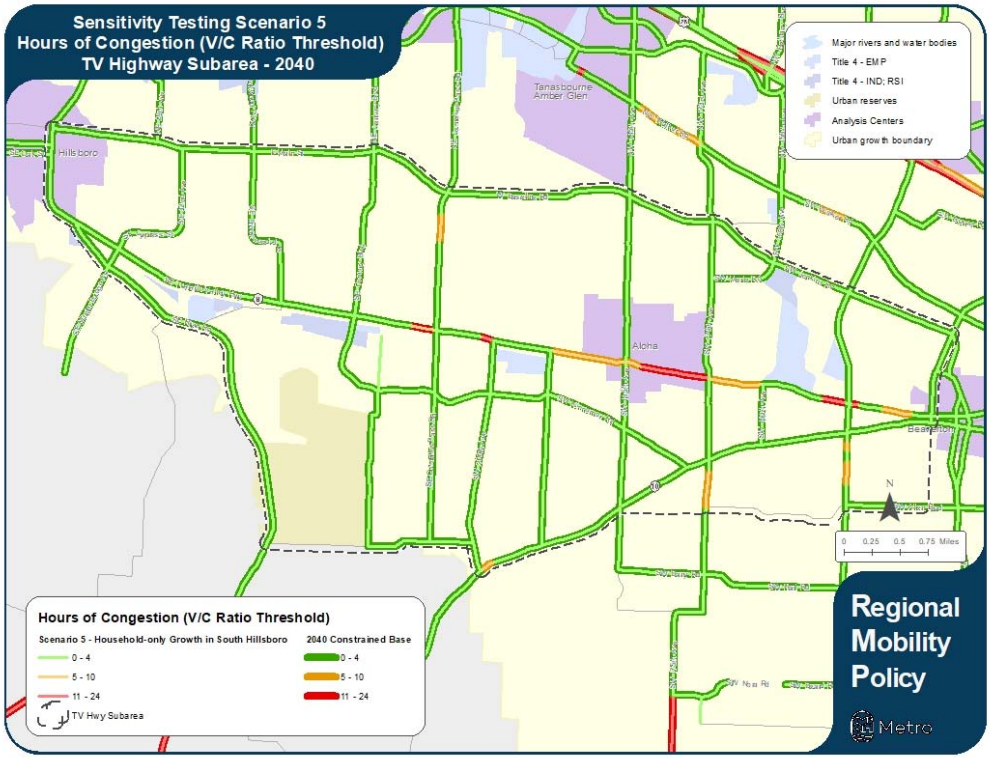
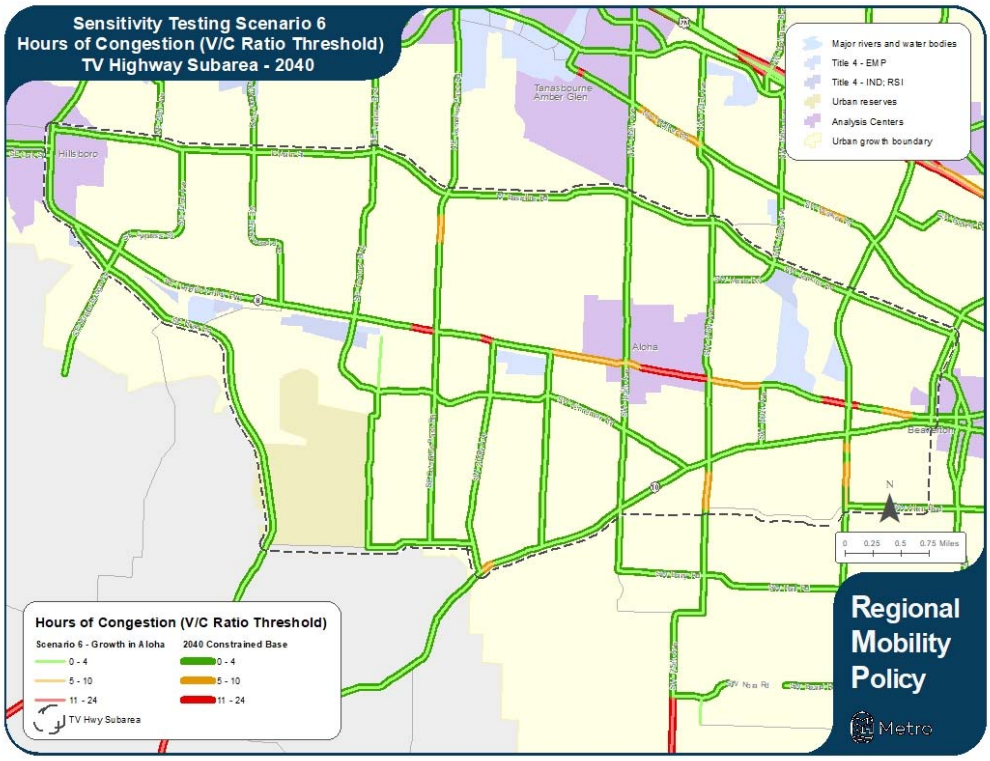


Figure 26. HOC Sensitivity Testing Scenario 6 (V/C Ratio) TV Highway – 2040 PM Peak



Policy Considerations

Considerations:

- The same v/c ratio and travel speed threshold determination questions apply for HOC because the definition of "congested" is required for all three metrics.

Are the measures useful and practical in planning?

Throughways: As a high-level 24-hour view, HOC is a useful measure on throughways to highlight current congestion and forecast locations in the future. HOC based on travel speed is already used by ODOT for reporting on the highway network in the PRTPR. There may be other simulation tools available to support future forecasting that more closely aligns with field operations.

Arterials: As a high-level 24-hour view, HOC is a useful measure on arterials to highlight current congestion and forecast locations in the future. Establishing thresholds for "congested" links on controlled roadways is a primary issue for replicable calculations.

Are the measures sensitive enough to use for plan amendments?

HOC, whether with a travel speed threshold or v/c ratio threshold, is not very sensitive to land use changes.

VMT/Capita and Access to Destinations/Opportunities

Vehicle miles traveled (VMT) is the number of vehicle miles traveled by motorists within a specified time period and study area. . Currently, most vehicles are powered by internal combustion engines; therefore, greenhouse gas emissions tend to rise and fall with VMT, although emissions/VMT tend to be lower in smooth-flowing traffic and higher in slow moving or stop-and-go traffic. The relationship between VMT and greenhouse gas emissions will weaken as electric vehicles become more common. **VMT/capita** compares this number to a specific population, such as total number of residents or employees within a defined area, to measure how much people drive to meet their obligations and daily needs.

Access to destinations/opportunity measures how many essential destinations (such as jobs, community services, and educational institutions) can be reached within a certain travel time or distance using different travel modes. This measure is typically evaluated for a specific site or study area but can also be calculated regionally. As defined in Metro's 2018 RTP, areas with high accessibility enable people "to reach desired goods, services, activities and destinations with relative ease, within a reasonable time, at a reasonable cost and with reasonable choices." Increased used of e-commerce, delivery services, and telecommuting over the past decade (and particularly since 2020) has enabled many people to meet their needs and to access opportunities without leaving home. Geographic measures of access, therefore, do not fully portray the resources available to residents.

What they measure

Both VMT/capita and Access to destinations/opportunity reflect how well the land use and transportation systems work together, and both respond to the same types of changes in those systems. Places with a mix of residential and commercial development and a transportation network

that serves people walking, biking, and taking transit as well as driving tend to have low VMT/capita and high access to destinations/opportunity by multiple travel modes. Conversely, places where housing is far from jobs and services and where people must drive to meet their daily needs tend to have high VMT/capita and low Access to destinations/opportunity, especially for people using transit.

Although they reflect similar transportation and land use characteristics, the two measures focus on different aspects of mobility. VMT/capita indicates how *efficiently* people within a combined transportation and land use system can meet their needs, while Access to destinations/opportunity measures how *useful* that combined transportation and land use system is for specific types of trips and specific travel modes.

What they do not measure

Neither VMT/capita nor Access to destinations/opportunity evaluate how well the transportation system itself operates. They can inform long-range planning, but do not provide useful information for improving the operations of existing transportation systems.. These measures should be supplemented with metrics that indicate network performance (such as travel speed, V/C ratio, queuing, and duration of congestion) and/or with metrics that evaluate network completeness (such as LTS, pedestrian crossing index, and system completion).

Neither VMT/capita nor Access to destinations/opportunity perfectly measures the efficiency and usefulness of a combined land use and transportation system. Key deficiencies include:

- VMT/capita is affected by a range of demographic and economic factors beyond land use and transportation conditions. In general, VMT/capita is higher than average for large households and households with high incomes; it also tends to rise when gas prices fall.
- While VMT currently generates greenhouse gas emissions, this relationship will weaken as electric vehicles become more common, and relationship is also affected by the traffic conditions under which VMT occurs.
- Access to destinations/opportunity does not perfectly reflect the opportunities and resources available to residents, since it does not account for telecommuting, delivery services, and home entertainment that can be ordered online.

How they are measured

Access to destinations/opportunity

Access to destinations/opportunity is often used to compare how well the transportation system serves people using different modes (e.g., transit users vs. auto users) and people living in different locations (e.g., comparing what can be accessed from the center of a Census tract in an Equity Focus Area vs. what can be accessed from the center of a Census tract in a higher-income neighborhood). Defining key destinations and opportunities is essential to evaluating access meaningfully. Access to jobs is one component of access to opportunity, which can also include access to destinations that provide education and training. Community destinations are typically understood as places where people can access key services and meet their daily needs.

To provide consistent results for existing and forecasted conditions, Metro spatial analysts recommend combining spatial data on destinations with travel times calculated using Metro's travel model. At the regional level, this approach was used in Metro's 2018 RTP to evaluate access to low and middle-wage jobs (jobs with annual wages of $65,000 or less) using different travel modes under both existing and forecasted conditions.

Metro's travel model includes forecasts for jobs and population growth averaged at the Transportation Analysis Zone (TAZ) level, roughly equivalent in size to a Census Tract. Plan amendments typically evaluate changes within an area equivalent to a few TAZs; therefore, the model is less useful at evaluating access for plan amendments and other sub-regional geographies. Access to destinations/opportunity for existing conditions can be evaluated with greater precision by combining GIS data on destinations with travel times calculated using transit performance and vehicle speed data to reflect the effects of traffic congestion. Metro's travel model does not provide forecasted destination, transit performance, or vehicle speed data at comparable levels of precision, making Access evaluations under forecasted conditions less precise and difficult to compare to existing conditions.

VMT/capita

Measures of VMT/capita start with measures of VMT. Both current and future VMT are evaluated using Metro's regional travel model, which models and forecasts travel within the four-county Portland metropolitan area. The model is validated against observed travel, employment, and population for a 2015 base year; travel in future years (2027 and 2040) is forecasted using regional assumptions about jobs and population growth, along with planned changes in transportation infrastructure, services, and policy. The model differentiates between passenger and freight travel and generates trips based on household size and the number and type of jobs within the metropolitan area.

VMT metrics evaluated include:

- All (passenger) VMT: All vehicle travel by passenger and commercial vehicles, assigned to the network within a specific geographic boundary. Vehicle volume on each network link is multiplied by link distance.
- Home-Based VMT: All passenger vehicle travel that begins or ends at the traveler's home; includes trips to and from work, shopping, school, recreation, etc.; does not include vehicle travel associated with deliveries or in-home services.
- Commute VMT: All passenger vehicle travel between the traveler's home and work; does not include trips that stop at an intermediate location between home and work (e.g., trips to work that include a school drop off).

VMT/capita is a measure of VMT divided by a defined population, such as the number of households, residents, or employees within the study area. VMT/capita metrics fall under two broad categories:

- *Ratio metrics*, such as VMT/capita as developed for the 2018 RTP Update, in which all passenger VMT is divided by the total population of residents or employees in the area under study, and
- *Rate metrics*, such as commute VMT/employee or home-based VMT/capita, in which passenger VMT generated by specific types of trips to or from an area is divided by the population residents and employees who generate it.

Metro currently evaluates two VMT ratio metrics in its Regional Transportation Plan:

- VMT/capita (all passenger VMT divided by all residents), and

- VMT/employee (all passenger VMT divided by all employees).

These metrics capture non-commute and non-home-based passenger travel, such as trips between workplaces and shopping or recreation destinations.

While VMT rate metrics capture a wide spectrum of passenger vehicle travel, they do not closely tie VMT to the land uses that generate it. To assess how smaller-scale land use and transportation decisions affect VMT, these case studies evaluate VMT ratio metrics, including:

- Home-based VMT/capita, which divides VMT generated by trips that start or end at home by the number of people living in the study area;
- All VMT/capita, which divides VMT generated by passenger trips that start in a study area by the number of people living in that study area;
- Commute VMT/employee, which divides VMT generated by trips between home and work by the number of jobs in the study area; and
- All VMT/employee, which divides VMT generated by passenger trips that end in a study area by the number of jobs in that study area.

Reflecting the assumptions built into the Metro regional travel model, these case studies assume that Metro's 2018 Regional Transportation Plan will be implemented with projected revenue sources (the 2040 fiscally constrained scenario).

Ease of application

The two performance measures are substantially different in how easy they are to apply. VMT/capita is evaluated and forecasted using Metro's regional travel demand model alone.

Questions addressed

The project team explored the following questions for these measures, as summarized in the following sections:

- Can Access to destinations/opportunity be confidently evaluated for existing and future conditions?
- Which VMT/capita metrics are most useful for different land use contexts?
- How sensitive are model calculations of VMT/capita to changes in land use?

Can Access to destinations/opportunity be confidently evaluated for existing and future conditions?

Access to destinations/opportunity can be estimated with great accuracy and precision for existing conditions and with much less accuracy and precision for future (forecasted) conditions. To provide consistent results for existing and forecasted conditions, Metro spatial analysts recommend combining spatial data on destinations with travel times calculated using Metro's travel model.

Consultants reviewed the 2018 RTP's technical appendixes and spoke with Metro modelers to better understand their experience of evaluating Access to destinations/opportunity for the RTP using the

Metro travel demand model. This review identified the following challenges with evaluating Access to destinations/opportunity under both existing and future conditions:

- Spatial data on destinations of all types is available for existing conditions but not for forecasted conditions. Metro's travel model includes forecasts for jobs and population growth but does not forecast changes in the locations of community destinations. Analysts must either make assumptions about the future locations of community destinations or assume that they will not change over the next 10-20 years.
- Spatial data is available at greater levels of resolution for existing conditions than for forecasted definitions. Under existing conditions, the street addresses of jobs and community destinations can be used to evaluate access. Under future (forecasted) conditions, jobs and populations are averaged at the Transportation Analysis Zone (TAZ) level. Plan amendments frequently evaluate land use and transportation changes within just a few TAZs; as a result, forecasted measures of access are less meaningful at the plan amendment scale.
- Travel times by different modes can be estimated with great accuracy for existing conditions but not for forecasted conditions, due to how the model estimates transit travel time and its relatively coarse assessment of traffic congestion.
- The 2018 RTP found that the travel demand model was not a robust tool to evaluating walking and bicycling modes, due to the model's scale of analysis and assumptions about travel behavior. Therefore, while Access to destinations/opportunity can be accurately evaluated for walking and bicycling under existing conditions, it cannot be accurately evaluated under forecasted conditions.

What VMT/Capita output is most useful for different land use contexts?

The following case studies evaluate VMT/capita metrics applied to the Metro Regional Transportation Plan, the Colwood Industrial District, downtown areas in Portland and Oregon City, and the development of the South Hillsboro neighborhood. VMT/capita metrics for land use sub-areas are compared to regional and citywide averages as well as to the Oregon Transportation Planning Rule requirement that new plans do not increase VMT/capita by more than 5% and target of reducing VMT/capita by 5% or more.

Metro 2018 Regional Transportation Plan Update

The 2018 Regional Transportation Plan Update (2018 RTP) is the Metro region's 25-year plan to accommodate population and jobs growth by investing in transportation infrastructure and programming. The 2018 RTP envisions the future of transportation in the Metro region as an integrated, multi-modal system where people are increasingly able to meet their needs by using transit, carpooling, bicycling, and walking. To that end, the 2018 RTP sets a target that VMT/capita will be 10% lower in 2040 than in 2015.

The 2018 RTP evaluated VMT/capita (all passenger VMT divided by all residents) and VMT/employee (all passenger VMT divided by all employees) at the regional scale for three scenarios:

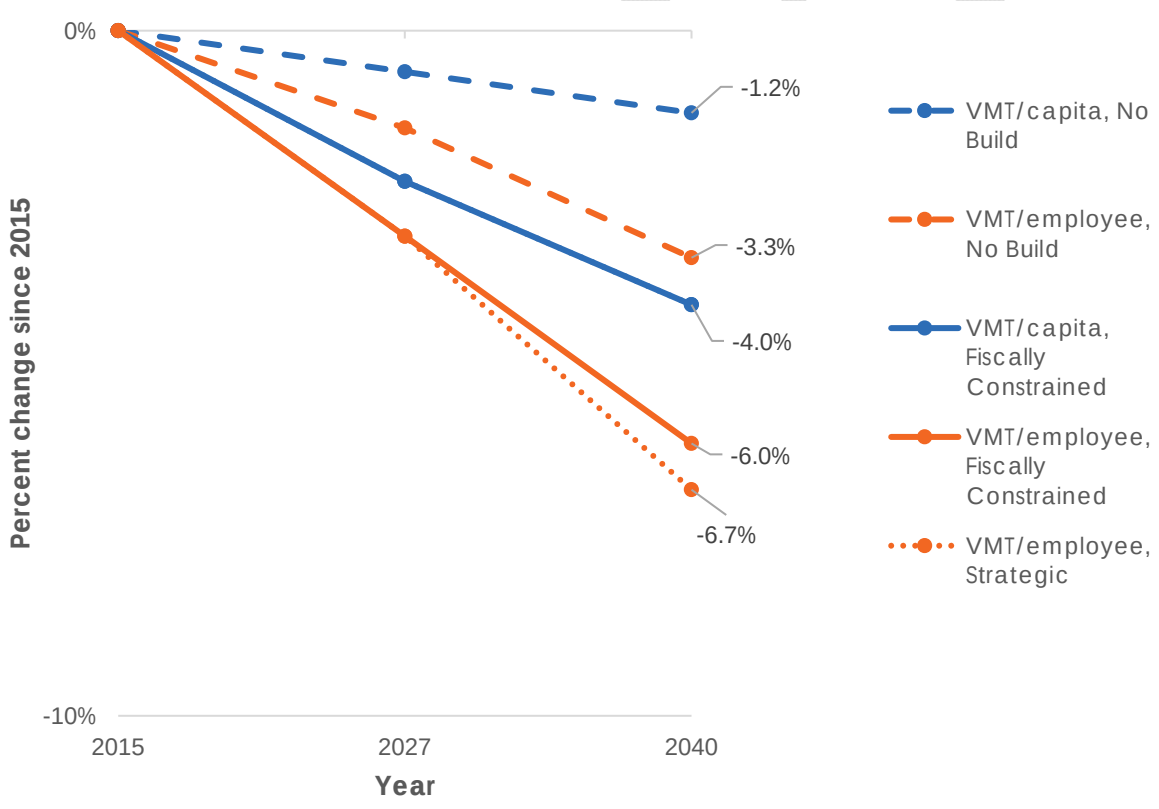
- No Build, which assumes that only projects with fully committed funding as of 2018 would be constructed;

- Fiscally Constrained, which assumes that transportation funding will continue according to current projections; and
- Strategic, which assumes that additional transportation funding will become available, allowing greater investment in infrastructure and programming.

The 2018 RTP estimates that, from 2015 to 2040, the region's population will grow by about 1/3 (36%) and employment will grow slightly more (39%). As a result, total VMT will grow even though average VMT per person will decline. As shown in Exhibit 2, all scenarios would see decreases in average VMT/capita and average VMT/employee, although the investments made under the Fiscally Constrained scenario would reduce these substantially more compared to the No Build scenario. The Strategic scenario would reduce VMT/employee slightly more than the Fiscally Constrained scenario (6.7% vs. 6.0%); it would not provide a substantial reduction in VMT/capita compared to the Fiscally Constrained scenario (4.0% vs. 4.0%). None of the scenarios, including the Strategic scenario, would achieve the 10% VMT/capita reduction target identified in the 2018 RTP.

(Note that Exhibit 2 shows VMT/capita ratio metrics, not the rate metrics that will be evaluated throughout the rest of this memorandum.)

Exhibit 2. Change in average passenger VMT within Metro Planning Area, 2015-2040*



* Note: Exhibit 2 shows VMT ratio metrics as calculated for the 2018 RTP's performance targets.

Change from 2015 to 2040 was also evaluated for the VMT rate metrics (home-based VMT/capita and commute VMT/employees). Exhibit 3 shows how the 2018 RTP performs when VMT rate metrics are applied under the Fiscally Constrained scenario. Home-based VMT/capita declines about the same amount as the VMT/capita metric shown in Exhibit 2 (4.2% vs. 4.0%); Commute VMT/employee declines about 1/3 more (8.1% vs. 6.0%). This reflects that many of the long-term investments

identified under the Fiscally Constrained scenario would expand transit capacity to centers and along corridors that are projected to have substantial jobs and housing growth, improving how well the region's transit system serves commute trips.

For Metro's Equity Focus Areas (EFAs), which have higher than average concentrations of people of color, people with low incomes, and/or people with limited English proficiency, results are similar. As shown in Exhibit 4, the EFAs show a somewhat smaller reduction in Commute VMT/employee than the region overall, but a somewhat larger reduction in Home-based VMT/capita. When measured using Home-based VMT/capita, neither the Equity Focus Areas nor the region as a whole achieve the 10% VMT/capita reduction target.

Exhibit 3. Metro Region Change in VMT/capita, 2015-2040

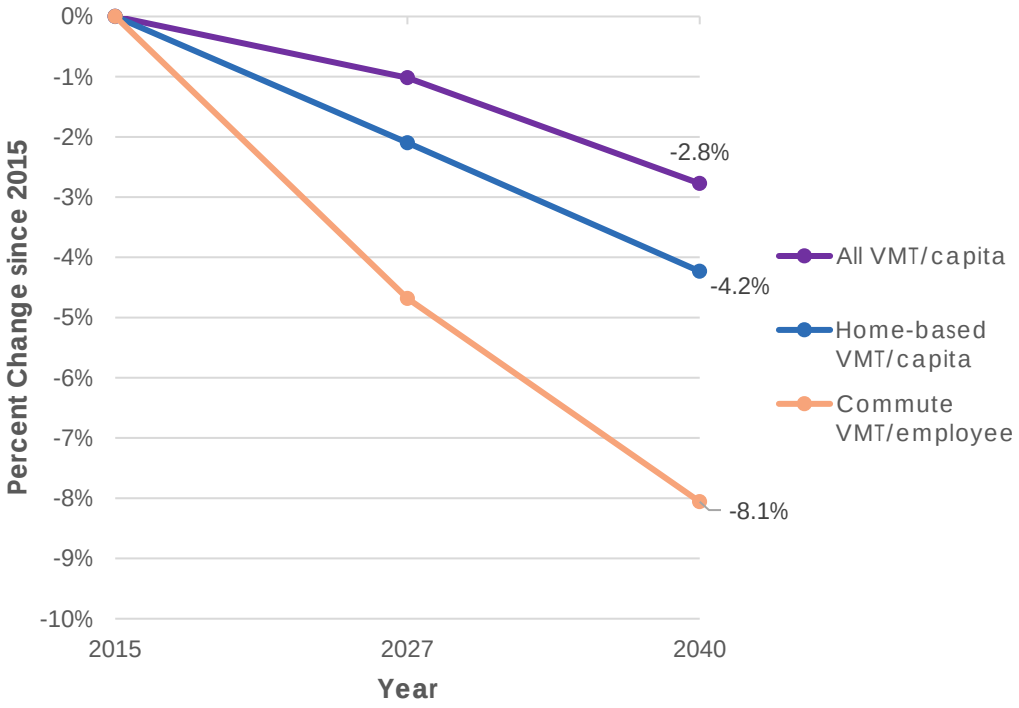
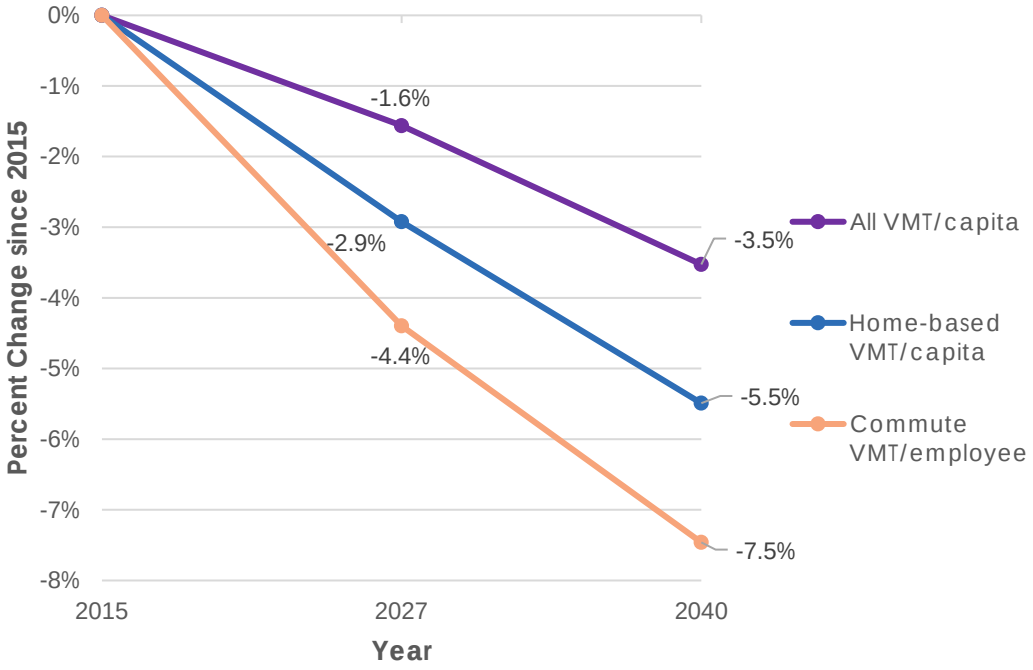


Exhibit 4. Metro Region Change in VMT/capita, 2015-2040 - Equity Focus Areas



Colwood Plan Amendment

The Colwood Plan Amendment (Portland, OR) was adopted in 2013 as a legislative amendment to Portland's Comprehensive Plan, enabling the redevelopment of the Colwood Golf Course as industrial land. The industrial use would add approximately 1,100 jobs to the area, just over 50% more than already existed at the time of the amendment. A Transportation Impact Analysis study for the plan amendment identified auto capacity expansion projects at three nearby intersections to mitigate traffic congestion and comply with Oregon's Transportation Planning Rule.

Industrial jobs are generally located far from housing, other commercial land uses, and transit, and industrial workers may need to travel outside of peak commute hours, when transit is infrequent or not provided at all. As a result, industrial areas typically generate more Commute VMT/employee than the average employment center. As shown in Table 5, jobs in Colwood would generate more commute VMT/employee in 2040 than the average in the Metro region. However, Colwood would see a slight reduction in VMT/employee from 2015 to 2040 (1.2% vs. 8.1% for the region as a whole), while seeing a greater proportional growth in jobs (53% vs. 43% for the region as a whole). Colwood therefore would conform to the Oregon Transportation Planning Rule requirement that that new plans not increase VMT/capita by more than 5%.

Table 5. Colwood Commute VMT/employee

Area	Commute VMT/ Employee, 2040 Fiscally Constrained Scenario	Change in Commute VMT/Employee, 2015-2040	Jobs Growth, 2015-2040
Colwood	12.0	-1.2%	53%
Metro Region	9.5	-8.1%	43%

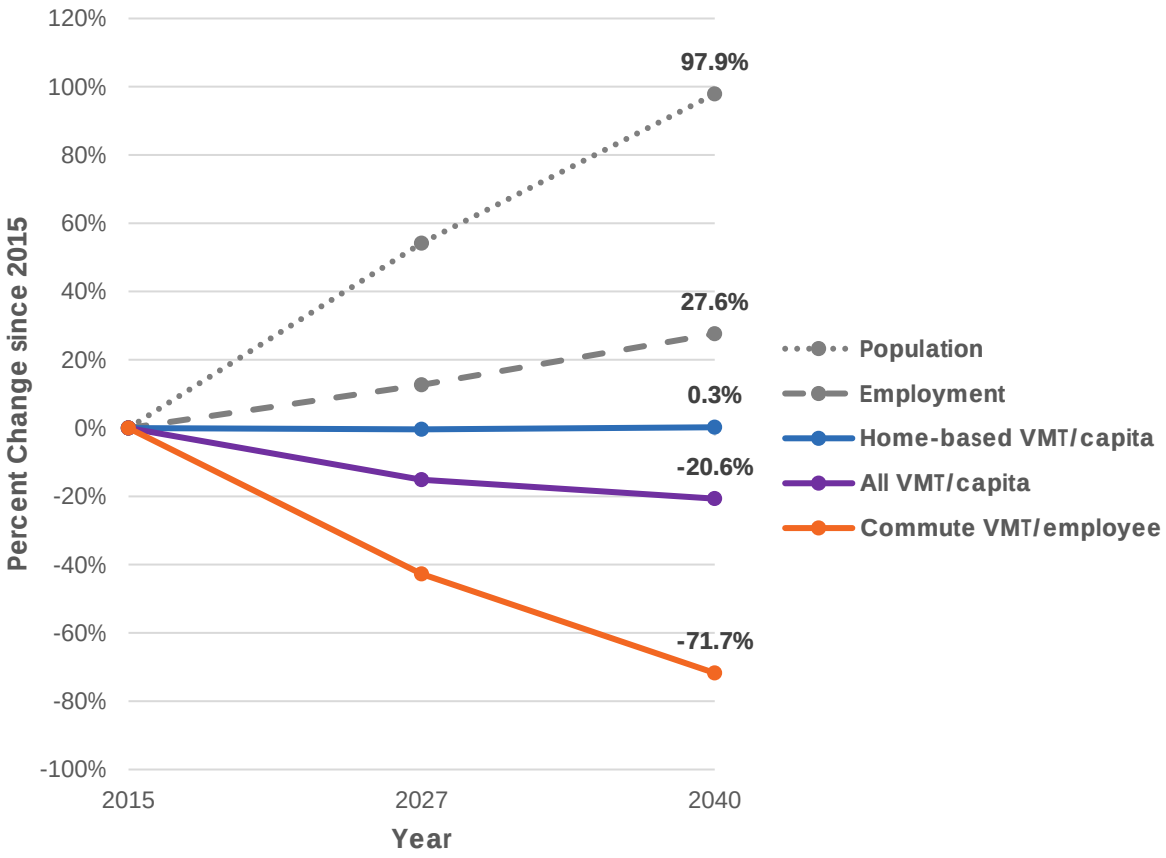
Home-based VMT/capita was not evaluated for Colwood due to the small number of households in the area (fewer than 100 from 2015 to 2040).

Central City Multimodal Mixed-Use Area

The Central City Multimodal Mixed-Use Area (MMA) was established in Portland, OR to permit the continued growth of Portland's city core while complying with Oregon's Transportation Planning Rule. The MMA designation exempts dense neighborhoods that feature well-connected streets, transit service, and a mix of multifamily housing, office, and retail land uses from TPR performance standards related to vehicle congestion. The City of Portland secured grant funding from the state and conducted a feasibility study to demonstrate that the Portland Central City qualified as an MMA.

As shown in Exhibit 5**,** the Central City MMA would see its population double and its jobs grow by about ¼ between 2015 and 2040. Home-based VMT/capita would rise only slightly (less than 1%) in an area where residents already generate less VMT than the average Metro region resident (4.2 Home-based VMT/capita in the MMA vs. 11.0 in the region overall, as of 2015). Over the same period, Commute VMT/employee would drop by over 70 percent, reflecting planned investments in transit access to central Portland from throughout the Metro region.

Exhibit 5. Change in VMT/capita, Portland Central City MMA, 2015-2040

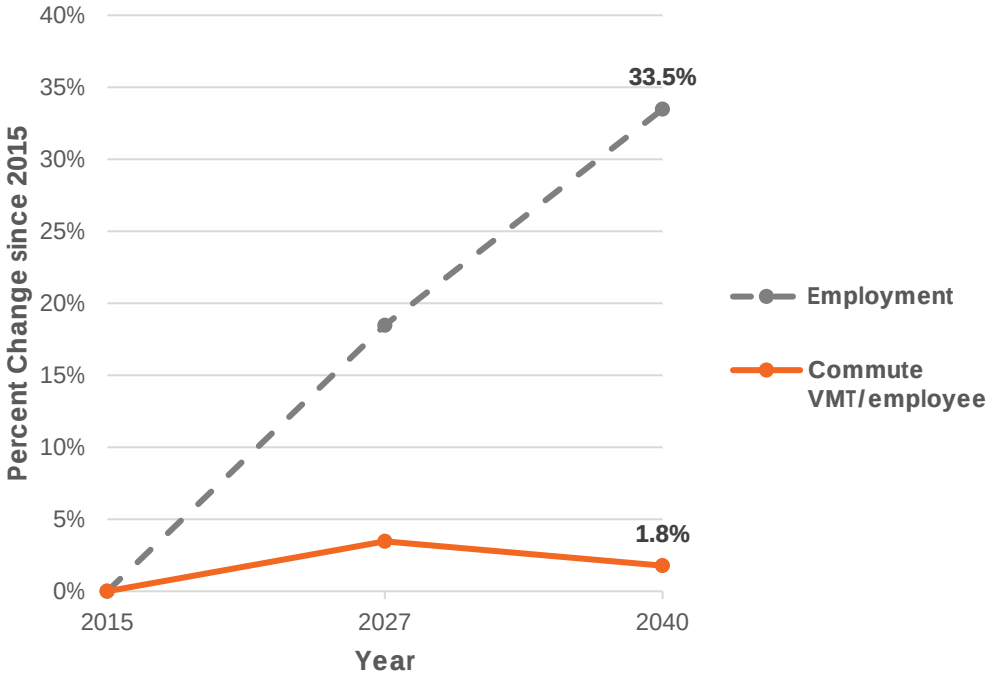


Oregon City Mixed-Use Multimodal Area

In 2014, Oregon City secured an MMA designation to allow for future growth in its downtown area. Downtown Oregon City is bordered by the Willamette River, a decommissioned paper mill on the site of the Willamette Falls, and a high bluff that separates downtown from much of the City's residential neighborhoods. This geography and otherwise limited access by transit and road creates auto congestion that exceeds current OHP and RMP standards.

As shown in Exhibit 6**,** growth in downtown Oregon City and the redevelopment of the paper mill site are projected to increase employment by 1/3 from 2015 to 2040 while increasing Commute VMT/employee by no more than 2%. Commute VMT/employee is projected to increase by more than 2% in Oregon City overall during the same time period; the relatively low increase in the Oregon City MMA may reflect its walkable, well-connected street grid and mix of office, retail, and services. The increase to Commute VMT/employee conforms to the Oregon Transportation Planning Rule requirement that new plans not increase VMT/capita by more than 5%.

Exhibit 6. Employment vs. Commute VMT/employee growth, Oregon City MMA



South Hillsboro Community Plan

The South Hillsboro Community Plan (Hillsboro, OR) was adopted as a legislative plan amendment that enabled the development of Reed's Crossing, a master-planned, 463-acre neighborhood in South Hillsboro. The new neighborhood would add as many as 4,000 housing units along with several hundred thousand square feet of retail and commercial space, along with supportive schools, parks, and community spaces, constructed in four phases between 2017 and 2031. Between 2015 and 2040, Metro estimates that the area would add 22,300 residents, or about 90 times the 2015 population, and nearly 1,300 jobs, or about 11 times the jobs present in 2015.

While most of the land area would be dedicated to detached single-family housing, the neighborhood would feature pedestrian-oriented design and a mixed-use town center, two features that tend to encourage walking and bicycling and to enable transit use. Developing a mix of uses in an area with low-density agricultural and industrial jobs could also enable people who work in the area to live near their jobs. These elements would tend to result in lower VMT per capita for people living and working in the neighborhood even as overall VMT in the area would rise with the addition of jobs and residents.

Despite these design elements, single-family residential neighborhoods tend to generate more VMT/capita than denser mixed use neighborhoods, especially those served by transit. As shown in Exhibit 7, people living in South Hillsboro would generate more VMT, on average, than residents of the City of Hillsboro and the overall Metro Region. This likely reflects South Hillsboro's limited transit access and predominantly residential character. However, people *working* in South Hillsboro would generate less VMT, on average, than their peers in Hillsboro and the region. As shown in Exhibit 8, commute VMT/employee in South Hillsboro would decline substantially even as all commute VMT and all VMT generated by travel to the area increases.

Exhibit 7. South Hillsboro home-based VMT/capita and commute VMT/employee (vs. City of Hillsboro and Metro Region), 2040 Fiscally Constrained Forecast

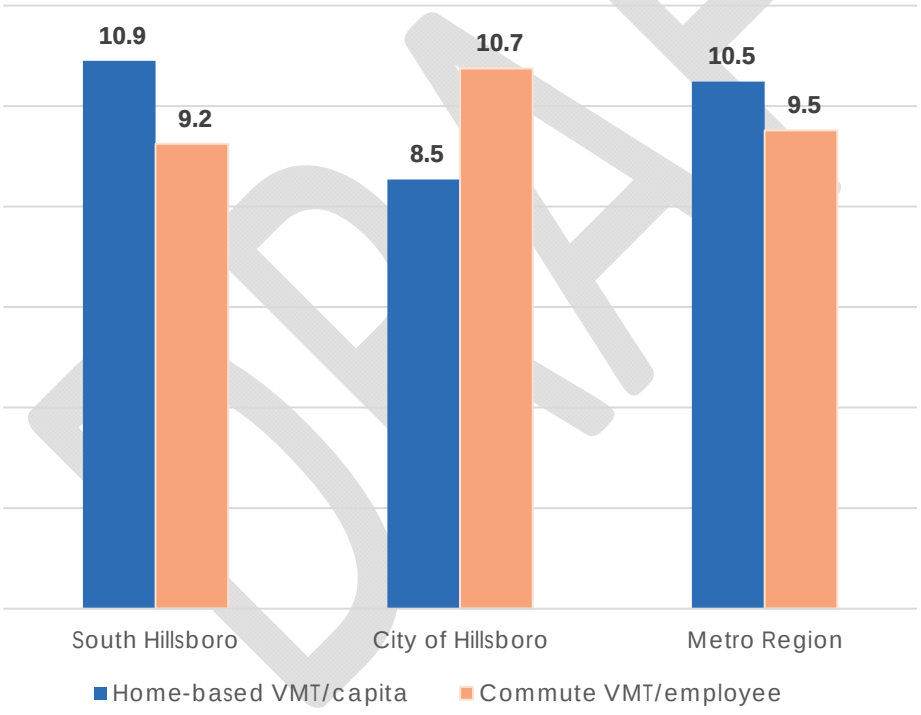
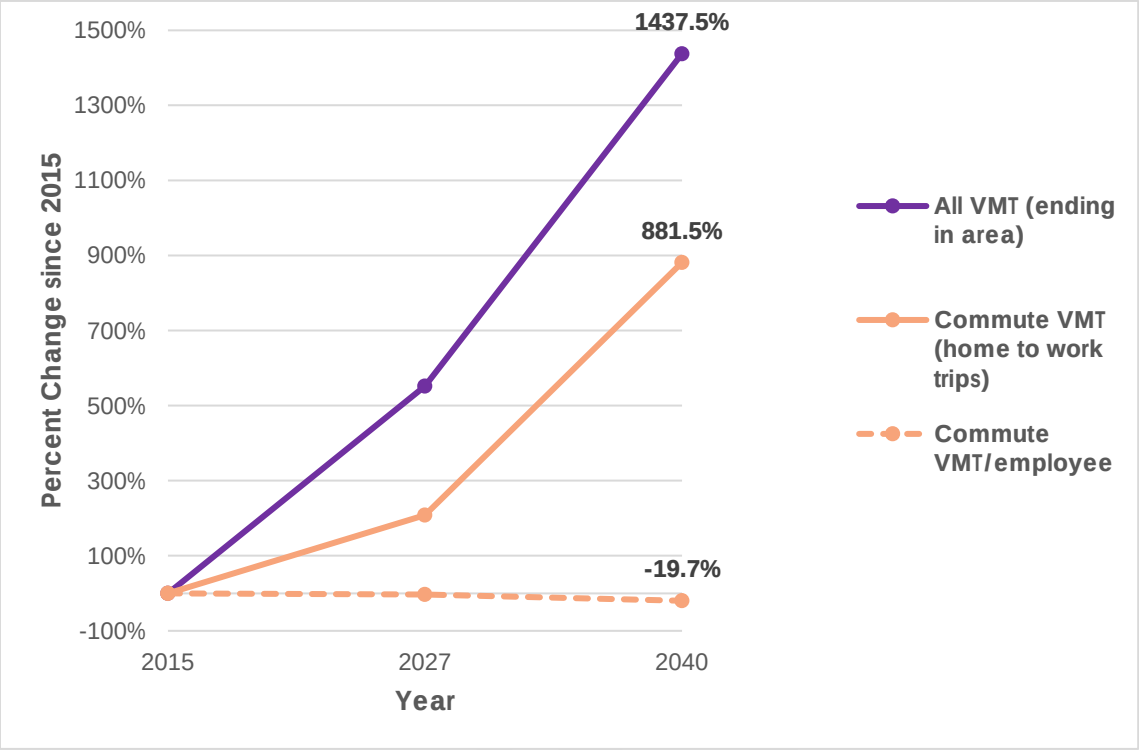


Exhibit 8. South Hillsboro, Change in Commute VMT/employee, 2015-2040



How sensitive are the model outputs to changes in land use?

Focused sensitivity testing on the home-based VMT/capita and commute VMT/employee metrics was conducted for the Colwood and South Hillsboro study areas. To ensure that the transportation investments and policy changes modeled in the 2040 Fiscally Constrained scenario would reliably reduce VMT/capita under different growth scenarios, study areas in the 2040 model network were updated with population and employment levels from 2015 and 2027 scenarios. Table 6 describes how model year variables were assigned to the sensitivity testing scenarios discussed below.

Table 6: Sensitivity Testing Scenario Definitions

Scenario	Variables from model year		
	Population	Employment	Model Network
2015	2015	2015	2015
No growth	2015	2015	2040
2027 FC	2027	2027	2027
Minimal growth	2027	2027	2040
2040 FC	2040	2040	2040
Household-only growth	2040	2015	2040

Source: Metro Travel Demand Modeling staff, 2021.

These scenarios were evaluated for Commute VMT/employee and for Home-based VMT/resident. The assessment found that while the model produces reliable and meaningful VMT/capita results at the

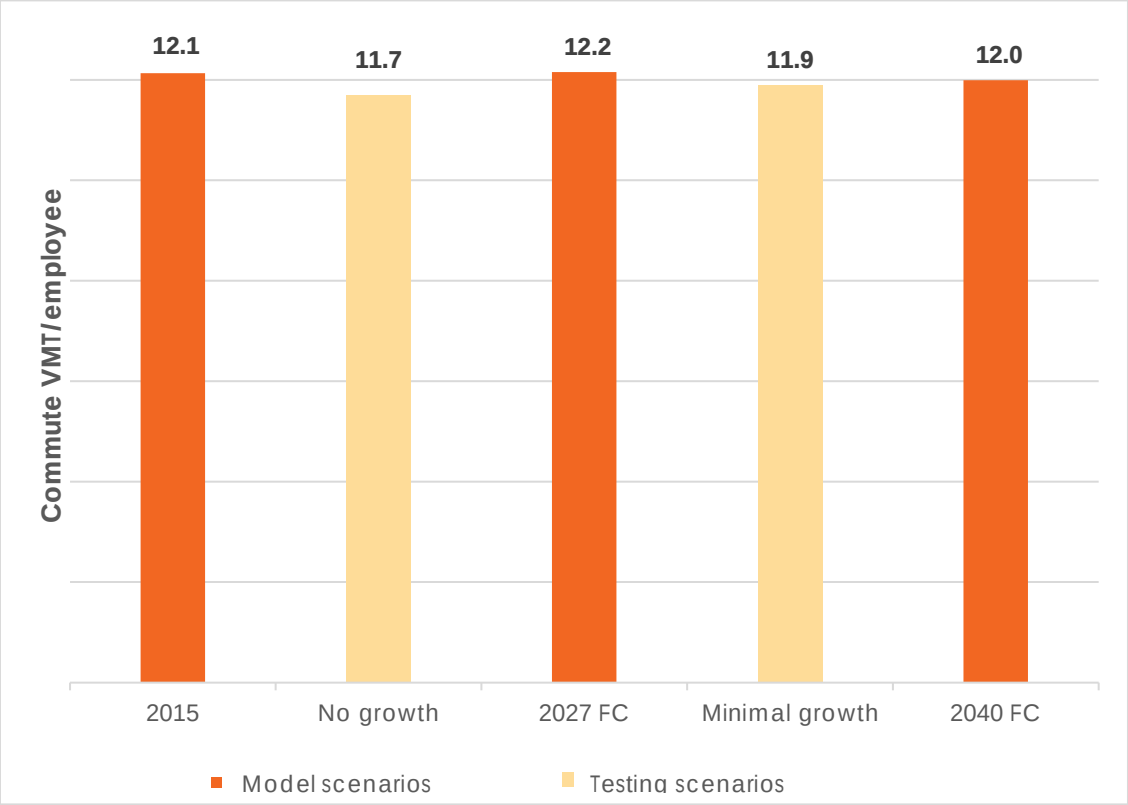
neighborhood level, it cannot reliably produce VMT/capita metrics for very small populations of residents or employees.

Strength: Predictable results for neighborhood-level analysis

Evaluating Commute VMT/capita under the sensitivity testing scenarios and the model scenarios demonstrates that the transportation improvements and policy changes assumed under the 2040 Fiscally Constrained (2040 FC) scenario would reduce the need to drive even at lower levels of employment.

Within the Colwood study area, the scenarios evaluated using the 2040 FC model network (No growth, Minimal growth, and 2040 FC) showed slightly lower Commute VMT/employee than the scenarios evaluated using the 2015 and 2027 FC networks. As shown in Exhibit 9, Commute VMT/capita is lowest in the No growth scenario, in which 2015 levels of employment in the study area are applied within the 2040 FC model network. Adding employment to the study area (under the Minimal growth and 2040 FC scenarios) results in a slight increase in VMT/capita, possibly due to the model assumptions that increased employment would draw workers from more distant neighborhoods. Overall, however, the transportation investments and related policy changes under the 2040 FC scenario would have only a small effect on Commute VMT/employee within the plan amendment study area.

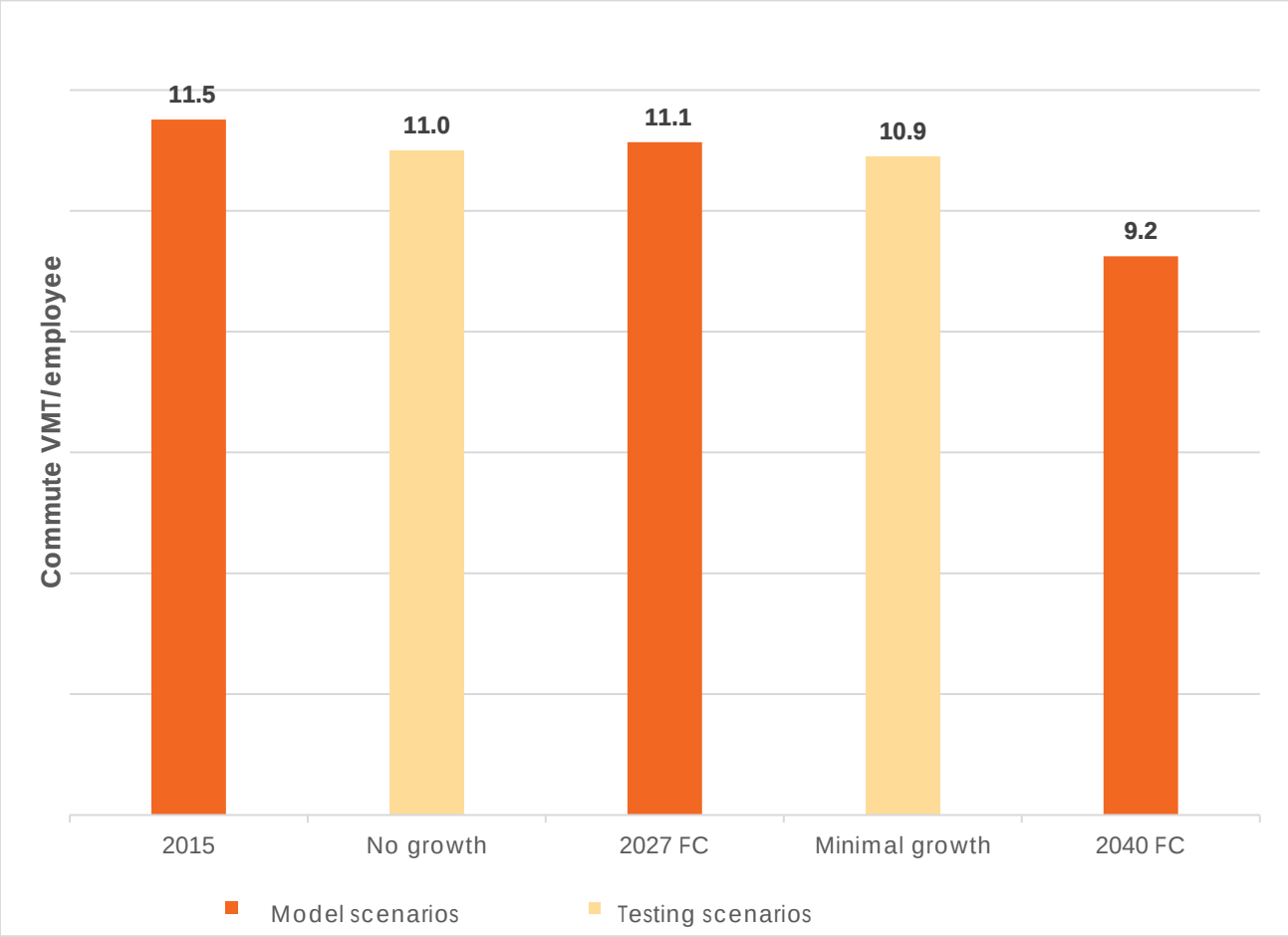
Exhibit 9. Colwood, Commute VMT/employee under multiple scenarios



Evaluating the same scenarios in the South Hillsboro study area shows a greater reduction in VMT/capita, possibly due to land use changes within the study area. As shown in Exhibit 10, Commute VMT/employee is consistently lower under the scenarios evaluated using the 2040 FC model network (No growth, Minimal growth, and 2040 FC) than under the scenarios evaluated using the 2015 and

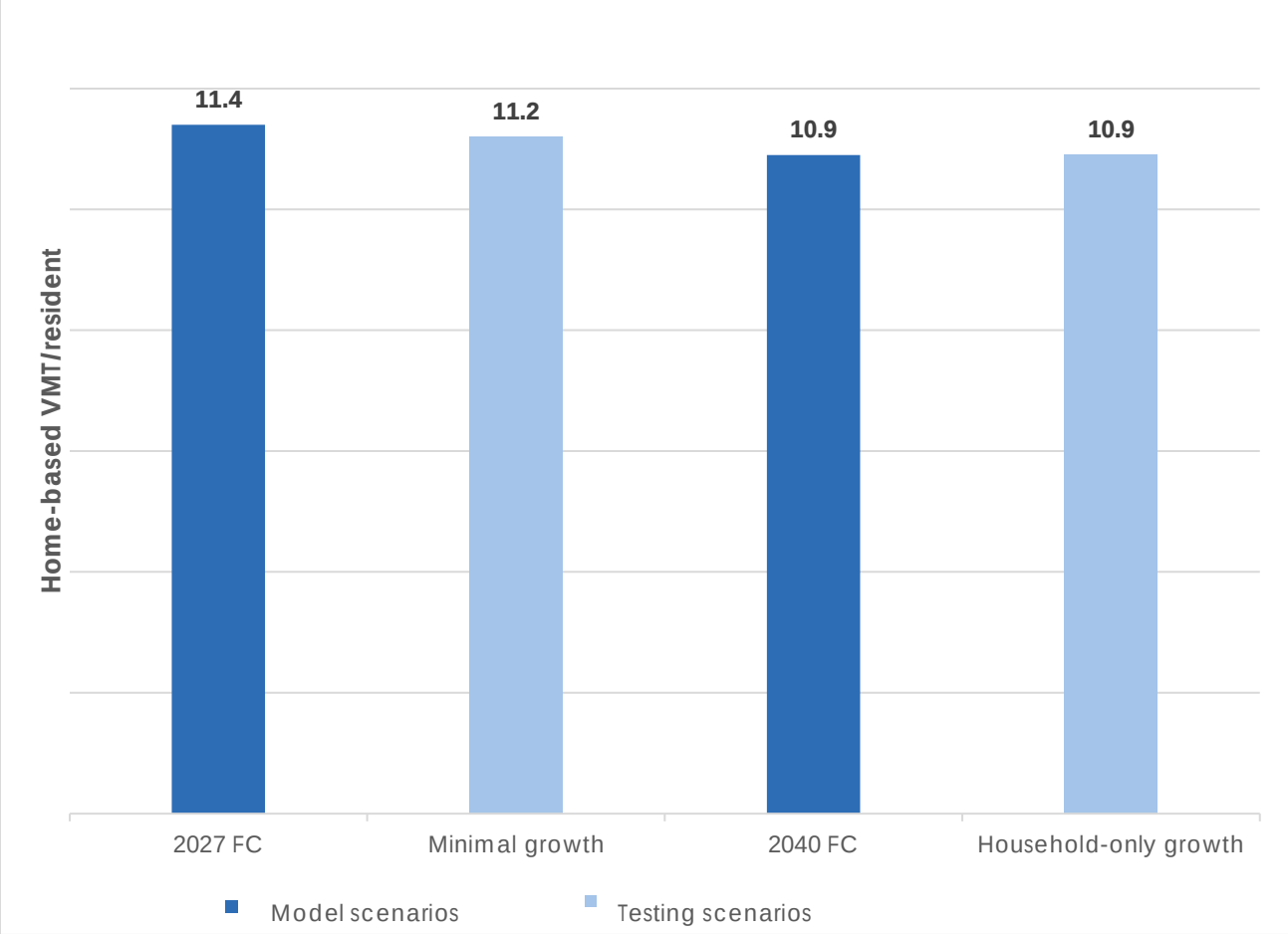
2027 FC networks. Commute VMT/employee is 15% lower (1.7 VMT/employee) under the 2040 FC scenario than under the Minimal growth scenario. This difference could result from model assumptions that the addition of residents within the study area would allow more workers to live close to their jobs, thereby reducing the distances they must drive when commuting.

Exhibit 10. South Hillsboro, Commute VMT/employee under multiple scenarios



A second analysis was conducted for South Hillsboro to assess how Home-based VMT/capita responds to growth in housing without corresponding growth in employment. Exhibit 11 shows Home-based VMT/capita under the 2027 FC, Minimal growth, 2040 FC, and Household-only growth scenarios. (Since there are very few households in the 2015 model, the 2015 and No-growth scenarios could not be reliably evaluated.) Consistent with results from the Commute VMT/employee analysis, Home-based VMT/resident is consistently lower under the scenarios evaluated using the 2040 FC model network (Minimal growth, 2040 FC, and Household-only growth) than under the scenarios evaluated using 2027 FC network. Removing 2015-2040 FC employment growth (under the Household-only growth scenario) has no effect on Home-based VMT/resident. Under the 2040 FC scenario, population in the study area would grow by about 22,000 residents and about 1,200 employees; under the Household-only growth scenario, the same number of residents, but no employees, would be added to the study area. Comparing the results in Exhibit 10 to the results in Exhibit 11, it appears that Commute VMT is more sensitive to changes in local jobs/housing balance than Home-based VMT.

Exhibit 11. South Hillsboro, Home-based VMT/capita under multiple scenarios



Limitation: Evaluating isolated and/or new land uses

The Colwood and South Hillsboro case studies indicates that the Metro regional travel model has a limited ability to evaluate conditions for isolated and new land uses.

In South Hillsboro, an entirely new neighborhood located in an area that was previously undeveloped, the regional travel model was not able to evaluate how home-based VMT/capita changed from 2015 to 2040 simply because the area had fewer than 100 households in 2015, and therefore home-based VMT/capita could not be estimated with confidence. (Comparing home-based VMT/capita in 2040 in South Hillsboro, the City of Hillsboro, and the Metro Region, however, suggests that the model does reflect how density, neighborhood design, and transit access affect the measure.) A VMT/capita policy should provide guidance for evaluating new growth that would substantially change the intensity and nature of existing land uses.

In Colwood, a primarily industrial area, the model could evaluate employee commute VMT/capita with confidence. However, the low number of households in the area (fewer than 100 between 2015 and 2040) meant that the model was not able to confidently evaluate home-based VMT/capita. This does not necessarily mean that results are inaccurate, since home-based VMT would make up only a small share of the total VMT generated in the area. However, it shows that a VMT/capita policy must be written to ensure that analysis is relevant to the area in question and reflects the capacities of the regional travel model.

Limitation: VMT varies in response to variables that the model does not control for

[insert discussion of demographics/residential selection effect issues and job types issues raised in Brian Dunn's comments*; also note increase in VMT with increase in income*

What did we learn?

Whether measured using a ratio metric (VMT/capita and VMT/employee) or a rate metric (Home-based VMT/capita and Commute VMT/employee), VMT/capita is projected to decline from 2015 to 2040 in the Metro region and in several plan areas. Where VMT/capita is projected to increase, those increases are small (less than 5%) and in conformance with TPR guidance that cities should limit VMT/capita growth to 5% or less. The variation between VMT/capita results can be attributed to both transportation investments and increased mixing of land uses.

The sensitivity testing conducted in the Colwood and South Hillsboro plan amendment study areas indicate that VMT/capita metrics are reliably responsive to modeled land use changes.. In-depth sensitivity testing to evaluate how different infrastructure packages would affect these metrics has not been completed. The 2018 RTP evaluated VMT/capita and VMT/employee for multiple scenarios; however, the small differences between the Fiscally Constrained and Strategic scenarios indicates that VMT/capita is either not particularly sensitive to infrastructure changes alone or that the Strategic infrastructure package includes elements that would both reduce and increase VMT/capita.

Policy Considerations

Both VMT/capita and Access to destinations/opportunity reflect the efficiency and usefulness of the combined transportation and land use system,. Of the two, VMT/capita can be evaluated in congruent ways for both existing and future conditions, and can be evaluated for multiple scales, from plan amendments to regional evaluations. Therefore, we recommend the following approach:

- **Apply VMT/capita as a primary system performance measure**, alongside performance measures that evaluate both system operations and system completeness. VMT/capita can be applied in the following ways:
    - *Identifying system needs and system adequacy in system planning:* For TSPs and large sub-area plans, forecasted VMT/capita can be compared to the existing condition to determine if land use changes or improvements to multimodal access are needed or would help to reduce VMT/capita.
    - Evaluating the transportation/mobility impacts of land use decisions in plan amendments: For TSPs and large sub-area plans, forecasted VMT/capita can be compared to the existing condition to determine if the plan amendment would result in a reduction in VMT/capita or an increase, which could be a negative impact that requires mitigation or changes to the plan.
    - Evaluating mitigations when a threshold of significance is exceeded: For system planning and sub-area planning, Metro's travel demand model can be used to evaluate the VMT/capita differences between plan alternatives with different levels of land use density and diversity. However, the model
- **Support the use of Access to destinations/opportunity as a planning tool,** especially when:
    - Planning networks for specific travel modes to ensure that they meet community needs;

- Evaluating alternative land use and transportation scenarios in a comprehensive plan; and
- Measuring overall system usefulness for different populations within the Metro region.

LTS and Pedestrian Crossing Index

Level of traffic stress (LTS) classifies points and segments on routes into different categories of stress ranging from 1 (low stress) to 4 (high stress) based on factors that correlate to the comfort and safety of the bicyclist or pedestrian using that facility.

Pedestrian crossing index is the percent of a corridor or roadway segment meeting the pedestrian crossing target spacing.

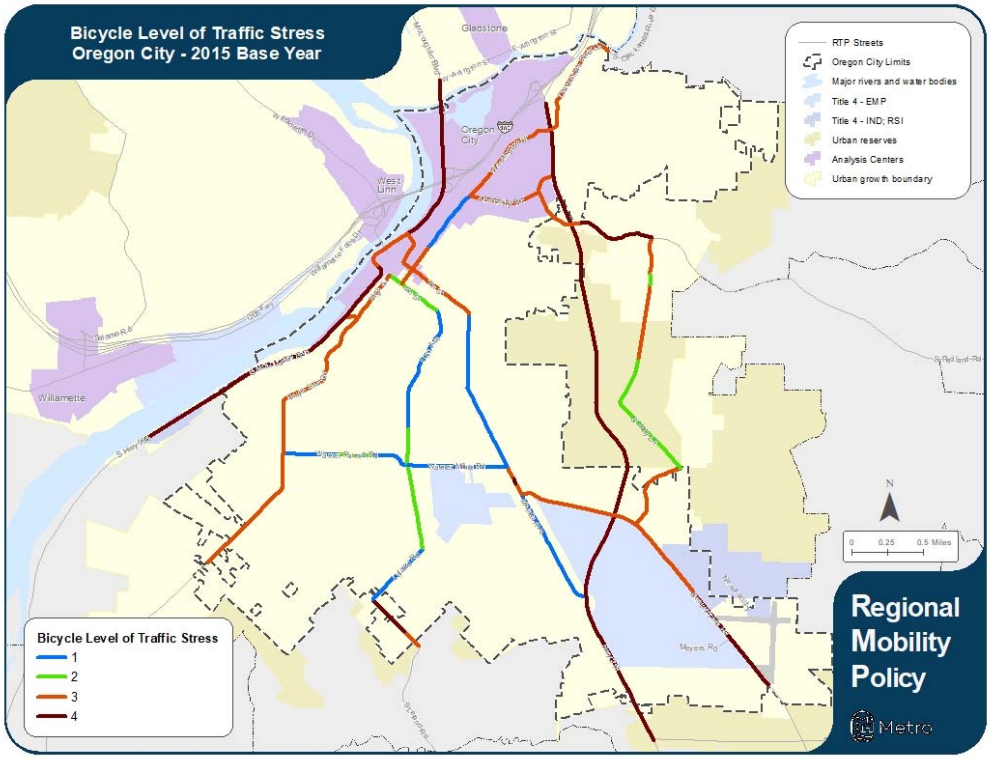
LTS and pedestrian crossing index are multimodal measures that supports equity, access, safety, and options outcomes. Pedestrian crossing index also supports efficiency outcomes. The project team wanted to explore the following questions for these measures, as summarized in the following sections:

- Would a different system have been planned if LTS was the target?
- How useful is the current pedestrian crossing dataset?
- Can the same process used by ODOT be used at a regional/local level?

Would a different system have been planned if LTS was the target?

LTS analyses most often use a target of 2, which will encourage most of the potential bike-riding population to consider riding. A BLTS 2 target can be difficult to meet, especially on high-speed roadways. Most local system planning does not attempt to meet a BLTS 2 on all non-freeway throughways and arterials because it is cost-prohibitive, often looking to complete the system instead of creating a fully low-stress system. For example, the Oregon City TSP does not include a project for the section of OR 213 from Meyers Road to the southern city limits because it already has bike lanes. But this segment, as shown in Figure 27, does not have a BLTS 2 rating due to the number of lanes and high speed. In fact, there is no BLTS 2 rating achievable for a speed equal to or greater than 40 mph when there is no adjacent parking. If a BLTS target of 2 was used, the Oregon City TSP would have included a much different system (reducing travel lanes or requiring right-of-way for parallel off-street facilities) or have not met the target at many locations with restrictions such as travel speed or available roadway width to include buffers. In addition, many cities prioritize filling gaps in their system over updating existing facilities that may not meet the ideal conditions.

Figure 27. Bicycle Level of Traffic Street Oregon City – 2015 Base Year



How useful is the current pedestrian crossing dataset?

ODOT currently has a good dataset that will be used to calculate the percent of state priority corridors meeting target crossing spacing for the annual Key Performance Measures report. Although the dataset is usable, additional updates are recommended, including the street that is crossed for each location. Metro does not currently have a full pedestrian crossing dataset, but there is an Open Street Maps (OSM) dataset that can be accessed. Metro GIS staff completed an initial review of this open-source dataset for relative accuracy and consistency across the region. It was a quick evaluation of a random sample of 400 points. Metro shared the following insights based on this review:

- Of the 400 points evaluated, 92% were in the right location, however only 24% had an attribute for the 'type' of crossing. Only 2.2% of the points were mid-block (not located at an intersection).
- The locations of mid-block crossings for trails were accurately identified when part of the dataset.
- While the 'type' was not consistent, the locations were accurate. There's a limit to the analysis completed without the "type" of crossing so there would certainly be a significant effort requires to augment the dataset with that attribute.
- There has not been an evaluation of the completeness of the layer. Does it capture all of the crossings for the entire region, or are there are areas that are missing? This would need to be reviewed and addressed before the dataset is used in any analysis.

- Adding crossing data into RLIS is a project that needs to be added to Metro's work program, scoped, and prioritized. The level of effort is difficult to determine without the determination of completeness..

Based on input from Metro staff, the OSM dataset is a useful first step toward creating a full pedestrian crossing dataset for the region. But it will take significant effort to update the data to be usable for regionwide and subarea analyses, including determining completeness of the dataset and updating or creating attributes. Attributes that are necessary or desirable include:

- Roadway ID for the street that is crossed
- Milepoint of the crossing on the roadway that is crossed, ideally based on Metro's linear referencing method (LRM) system
    - If the dataset is already being updated, adding this level of information will simply automation of the measure calculation and remove assumptions that would be included if the location is based on a different referencing system.
- Roadway classification that is linked to target setting (i.e. if the Metro regional design classification is used for setting crossing spacing targets, then it should be included in the dataset to support measure calculation)
    - If roadway ID is included in the dataset, an automated calculation tool may be able to reference a different dataset for roadway classification instead of including it in the crossing dataset itself. Metro GIS staff to support decisions on measure automation and potential use of several datasets.
- Type of crossing (marked, signalized, enhanced)
    - This is not strictly necessary for calculating the measure but would be helpful for other planning uses or to calculate spacing between different types of crossings (i.e. what is the crossing spacing for enhanced crossings?). It is worth including if an effort is moved forward to update and add to the crossing dataset..

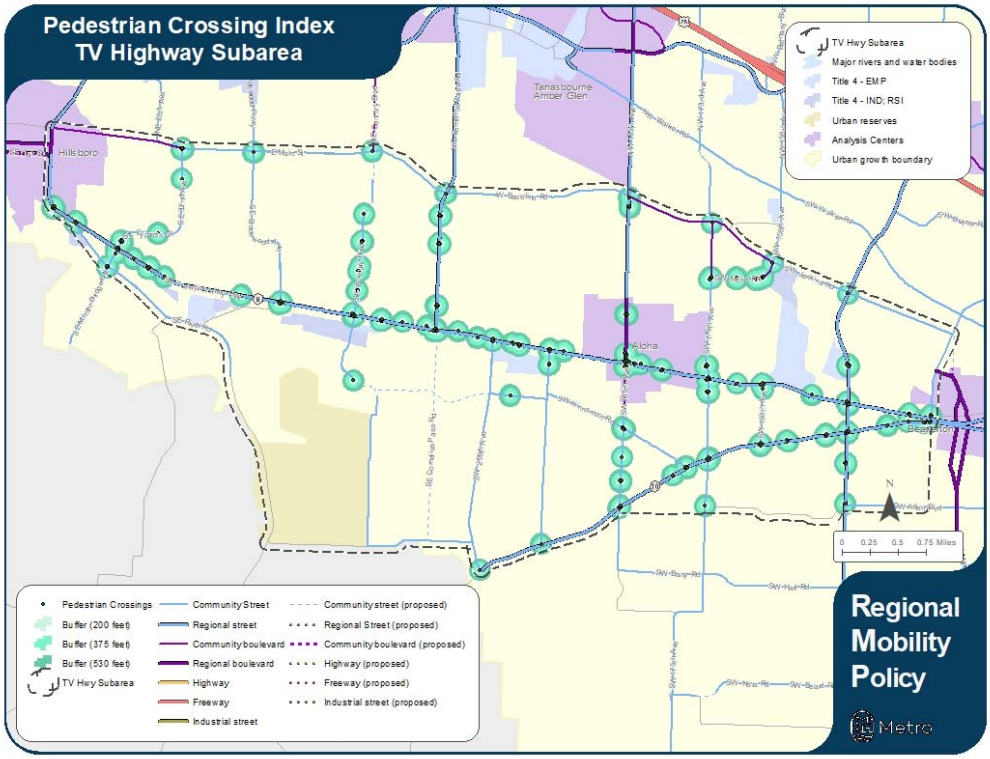
Can the same process used by ODOT be used at a regional/local level?

The project team attempted the process that ODOT recently adopted to calculate pedestrian crossing index for their facilities statewide. Because the ODOT scripts are set for a system that has identified its study corridors, a more manual calculation was completed. If pedestrian crossing index is moved forward, a script similar to ODOT's could be created to streamline the process. Without the pedestrian crossing dataset establishing the street being crossed, all reported crossings were included in the buffer area, which will overestimate the available crossings. If pedestrian crossing index is moved forward, additional effort will be needed to update the OSM dataset to include the street crossed.

Even with the more manual procedure, the overall process can be used on any roadway segment that has a pedestrian crossing dataset. The other important data needed is the target spacing. For this case study test, Metro's Designing Livable Streets and Trails Guide was referenced to establish a spacing target. Within the TV Highway subarea, there are regional and community boulevards and regional and community streets. For these design street classifications, crossings are recommended every 200 to 530 feet. As shown in Figure 28, there are many segments of TV Highway within the case study sub area that do not meet the preferred pedestrian spacing. Between SE 10th Avenue and SW Cedar Hills Boulevard, approximately 3.9 miles of TV Highway does not have pedestrian crossings, based on the available dataset and an average target spacing of 375 feet. That segment of the corridor is

approximately 8.2 miles long and therefore has a pedestrian crossing index of 52% (4.3 miles with pedestrian crossing meeting a target spacing of 375 feet).

Figure 28. Pedestrian Crossing Index – TV Highway Subarea



Policy Considerations

Achieving an LTS 2 on all arterials is too cost-prohibitive to be set as a standard. Some locations will not meet an LTS 2 unless speed limits or land use context change. Some locations already have facilities that would need to be reconstructed to meet an LTS 2 standard. For many cities in the region, the focus is first on creating a complete system, and LTS would create a very high standard that would not be feasible on many facilities. Standard bike lanes on a typical arterial achieves an LTS 3 which is not attractive to the "interested but concerned" potential bicyclists that applying LTS is intended to achieve.

A city is more likely to be able to create a low-stress network for a select few arterials and collectors in coordination with the local streets that help connect key destinations. This more focused approach would create options for active modes while considering the financial impacts of the planned system.

If pedestrian crossing index will be moved forward, Metro will need to put the crossing dataset in the RLIS work program.

In planning modal networks and identifying transportation projects that enhance the comfort and safety of the multi-modal network for all users, the following could be considered:

- Define the complete walking and biking networks that maximize access to destinations with low-stress routes and address disparities in EFAs.

- Identify locations where lack of safe crossings is limiting access to destinations for people walking, biking and riding transit. Set spacing targets for each facility based on the changing land use context.
- Identify high priority locations for additional or enhanced crossings that connect low-stress walking and biking routes and provide access to transit or that are in high-crash locations.

System Completion

System completion is the percent of planned facilities that are built within a specified network or on a specified corridor/roadway segment.

System completion is a multimodal measure that supports equity, access, efficiency, safety, and options outcomes. The project team wanted to explore the following questions for this measure, as summarized in the following sections:

- How can system completion be applied to system planning?
- How can system completion be applied to plan amendments for developed and undeveloped areas?

How can system completion be applied to system planning?

For system planning, system completion may be incorporated in two ways.

- **Establishing the planned system:** An outcome of system planning is creating a vision for the transportation system, most often split by mode or service. These planned networks become the base for the system completion calculation. Once there is a planned regional or local network established through system planning, future plan amendments, developments, and projects can determine whether they are helping further the completion of the planned system.
- **Comparing alternatives:** Once the overall planned system is envisioned, many agencies find that it is unlikely to acquire the funding to fill all the gaps in the system. Determining the system completion of a fiscally constrained system can show the need for additional funding for completing the multi-modal networks.

Regional System Planning

There are many examples of system completion being established or used in Metro region-wide planning projects. The 2010 Metro TSMO Strategic Plan is an example for establishing a planned system. Exhibit 12 shows the existing and planned fiber optic network for transportation data communications. Another TSMO example is shown in Exhibit 13, which highlights planned and built TSMO corridor strategies.

When the plan is established, the denominator for a system completion analysis is set. The target is then to increase the system completion for the relevant systems. TSMO infrastructure/services may not be a relevant system for every RTP throughway and arterial, similar to how constructing sidewalks may not be relevant on the freeway system.

Exhibit 12. Existing and Planned Regional Fiber Communication Infrastructure

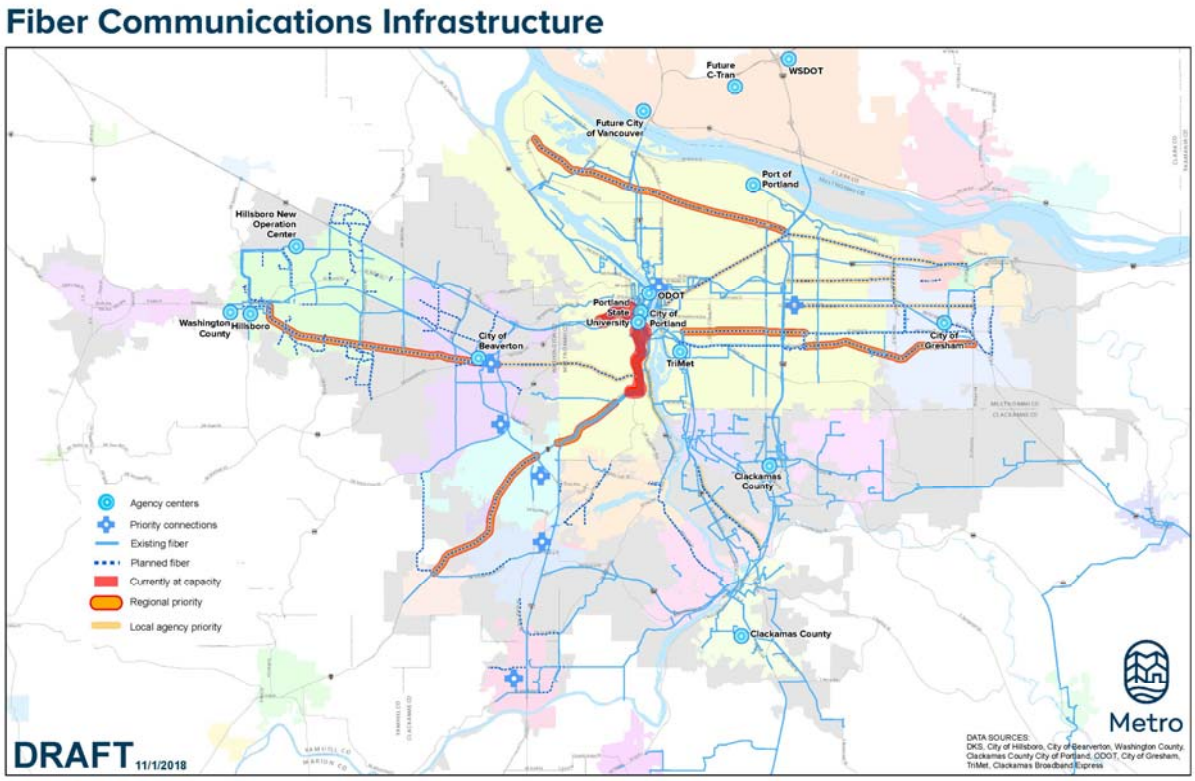
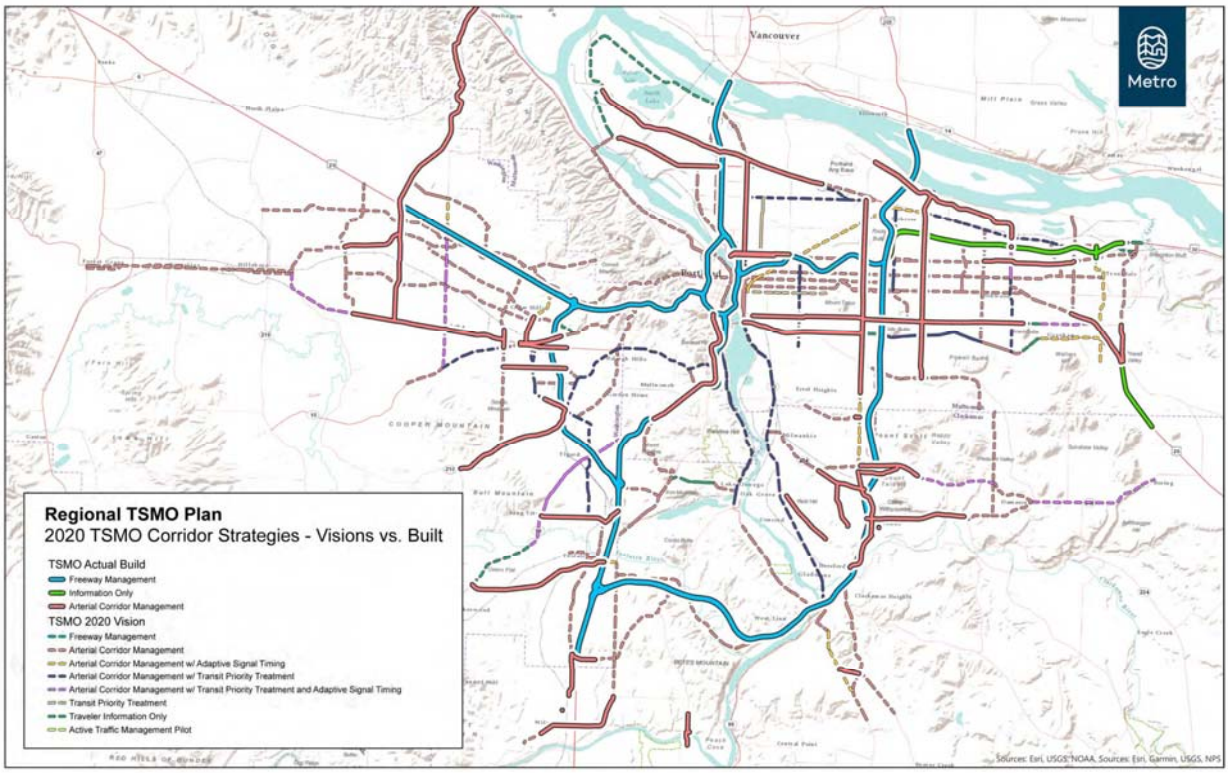


Exhibit 13. Existing and Planned Regional Fiber Communication Infrastructure



Metro's 2018 RTP is also a good example of system completion when conducting regional system planning. For the transit network, the 2018 RTP used a geospatial analysis to determine how much of the planned regional pedestrian, bike, and trail networks are completed within a walking distance to transit. Walking distance to transit was defined as:

- Within ½-mile from light rail stops
- Within 1/3-mile from streetcar stops, and
- Within ¼-mile from bus stops for existing and planned stops.

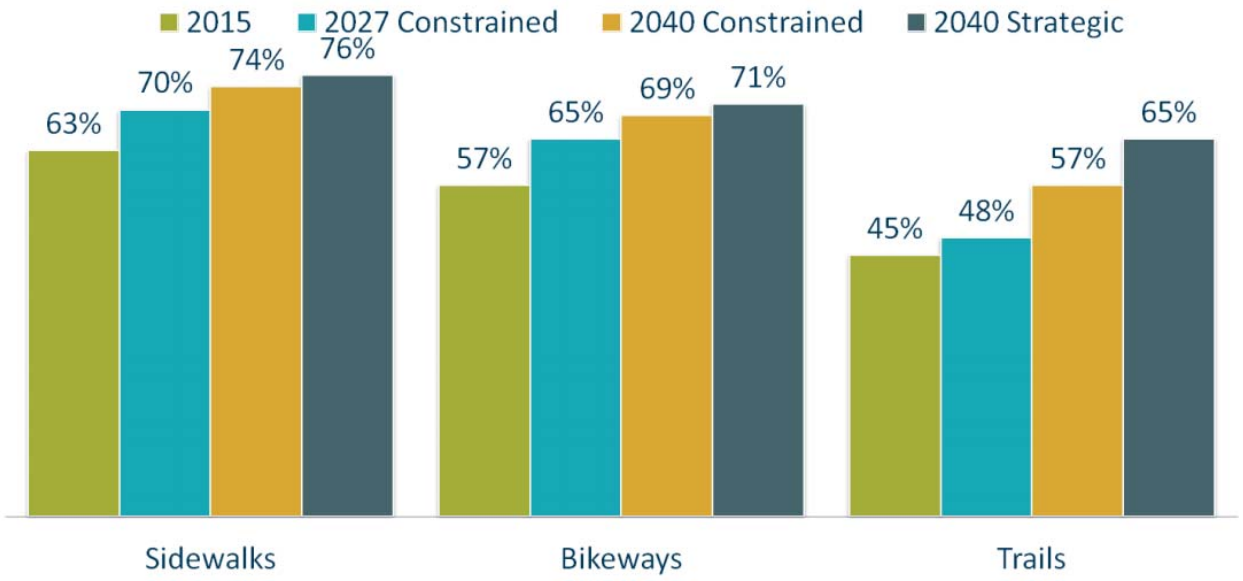
System completeness is a system evaluation measure in Chapter 7 of the 2018 RTP and was used to compare several system alternatives, including two 2040 systems with different funding assumptions. A target was set of one hundred percent completion of the Regional Pedestrian and Bicycle Networks, including within walking distance to transit, by 2040. As shown in Exhibit 14, the 2040 constrained scenario does not reach this target, although greater progress is made to compete the networks near transit compared to region-wide completion. As shown in Table 7, system completeness can very easily look at EFAs because it is a geospatial analysis. For all completeness values except trail completeness in the 2018 RTP, equity focus areas are forecast to see a larger percent completeness compared to the overall network.

Table 7. Sidewalk, Bikeway, and Trail Completeness Near Transit, Region-wide and within Equity Focus Areas

Completeness Measures	2015 Base	2040 No Build	2040 Constrained
Percent of sidewalks completed near transit	63%	63%	74%
Percent of sidewalks completed near transit within equity focus areas	73%	73%	83%
Percent of bikeways completed near transit	57%	57%	69%
Percent of bikeways completed near transit within equity focus areas	59%	59%	72%
Percent trails completed near transit	45%	45%	57%
Percent trails completed near transit within equity focus areas	44%	44%	56%

Source: Data extracted from 2018 RTP Table 7.16

Exhibit 14. Sidewalk, Bikeway, and Trail Completeness Near Transit



Source: 2018 RTP Figure 7.11

Local System Planning

Similar to regional system planning, local system plans (such as TSPs) can establish the planned system to then be used as part of analyzing system completion of future plan amendments or projects. When the plan is established, the denominator for a system completion analysis is set. The target is then to increase the system completion for the relevant systems. Every street should be planned for all modes, with some exceptions based on context and classifications. As an example, Exhibits 15 and 16 show the existing and planned pedestrian system for the Oregon City TSP. In addition to setting the planned pedestrian system for the future, these figures can be used to determine system completion and planned system completion of the RTP pedestrian system. For example, South End Road is an RTP regional pedestrian corridor but the segment from S 2nd Street to Barker Avenue does not have sidewalks and is not planned for a pedestrian project in the Oregon City TSP. This segment is very narrow with steep grade on either sides of the roadway, which is likely part of the reasoning that pedestrian facilities were not included in the TSP.

Exhibit 15. Oregon City TSP – Existing Pedestrian Facilities

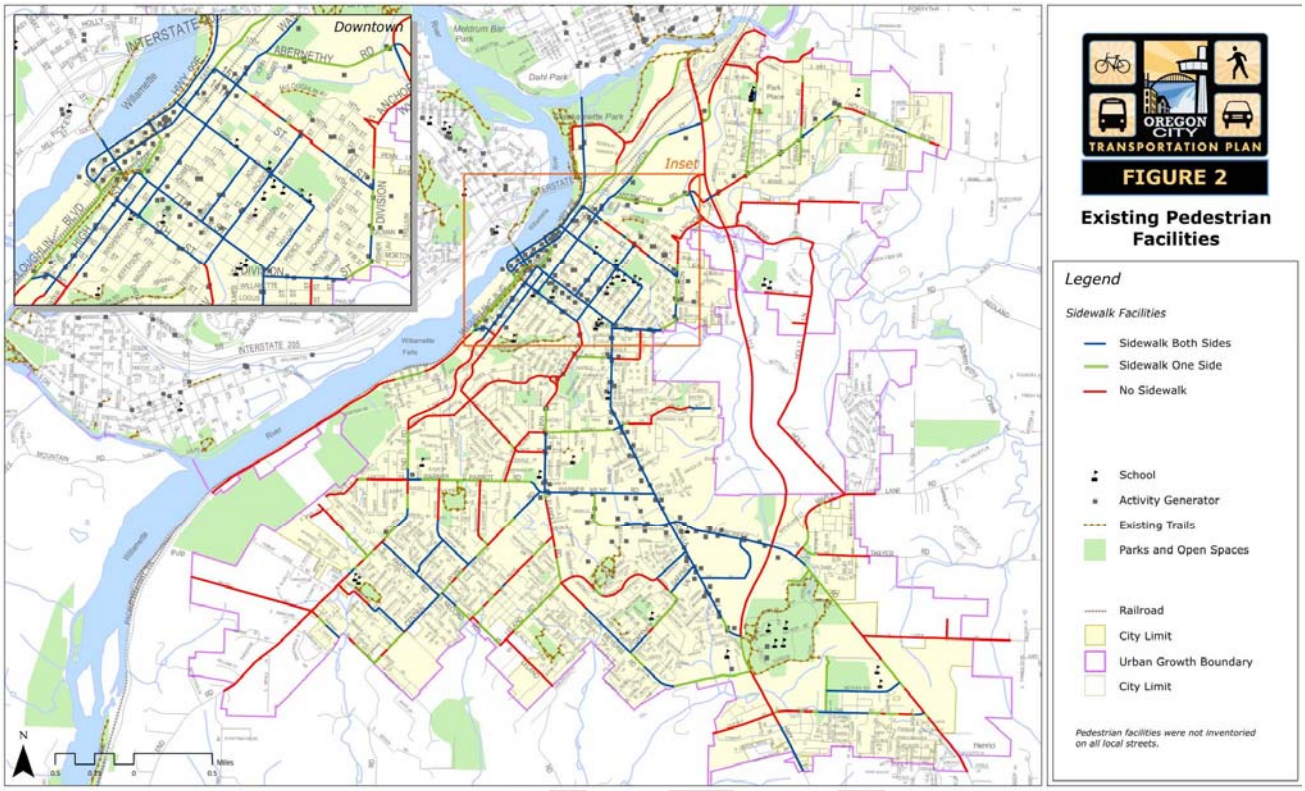
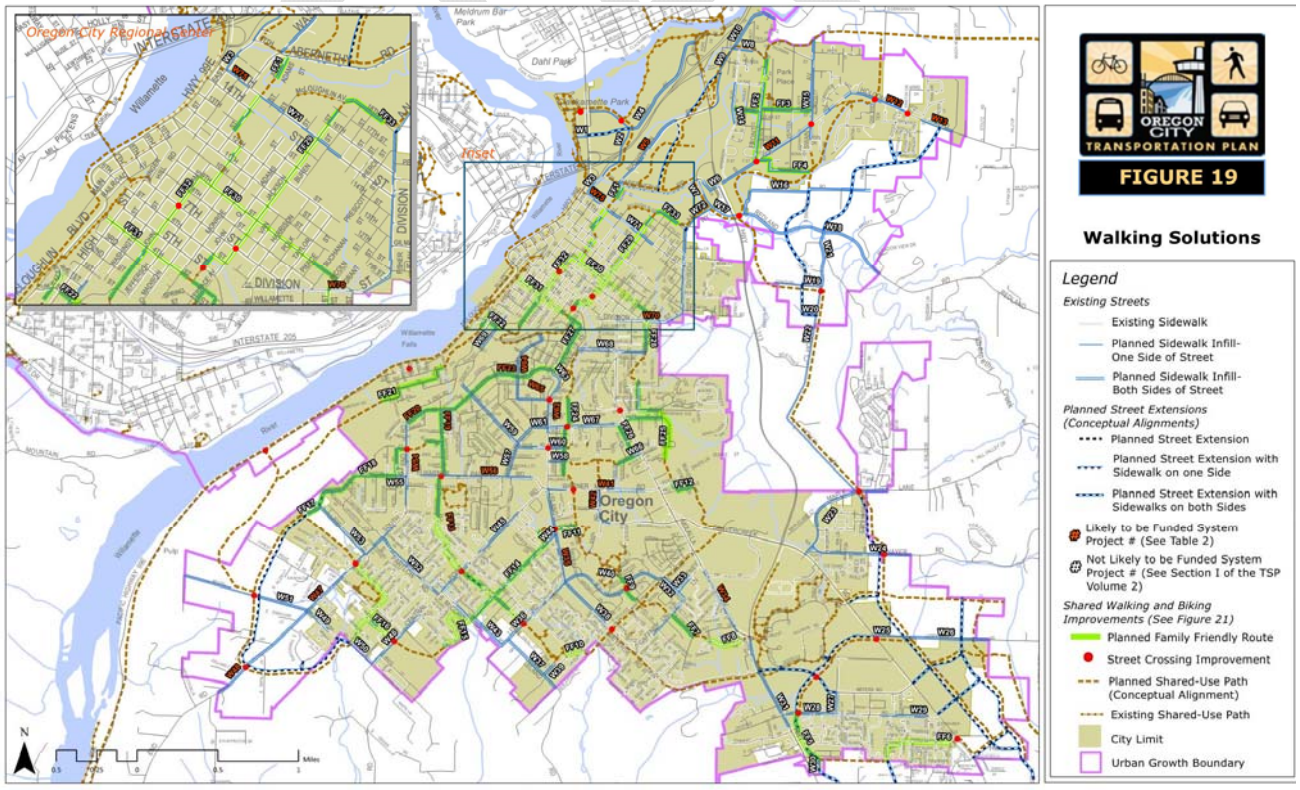


Exhibit 16. Oregon City TSP – Walking Solutions



How can system completion be applied to plan amendments for developed and undeveloped areas?

The definition of complete will vary based on the modal functional classification and design classification and can be refined by facility in system plans. Identify the desired network and projects that will result in better access to more destinations via each mode. The planned networks should ensure that each mode is an accessible option throughout the plan area.

- Where congestion measure targets cannot be met due to financial or right-of-way constraints or land use or multi-modal context (would increase VMT/capita), identify the number of through lanes and turn lanes or merge lanes (if applicable) that will be considered the maximum cross-section within the planning horizon and identify strategies such as demand management, congestion pricing, complete non-auto modal networks, and land use strategies to ensure access and mobility in the area.
- Where land use changes will increase the VMT/capita, the assessment should focus on whether the amendment changes what the definition of the complete system in the area should include. The localized impacts of increased VMT to the study area should largely be addressed during the development review process and applying the local jurisdictions development standards rather than during the plan amendment.

Once a planned system is set, a plan amendment can either show progress in system completion for relevant facility types or establish a change in the planned system due to new roadways or facilities. For those plan amendments that are building new facilities, modifications for the planned system will be established to allow for future monitoring.

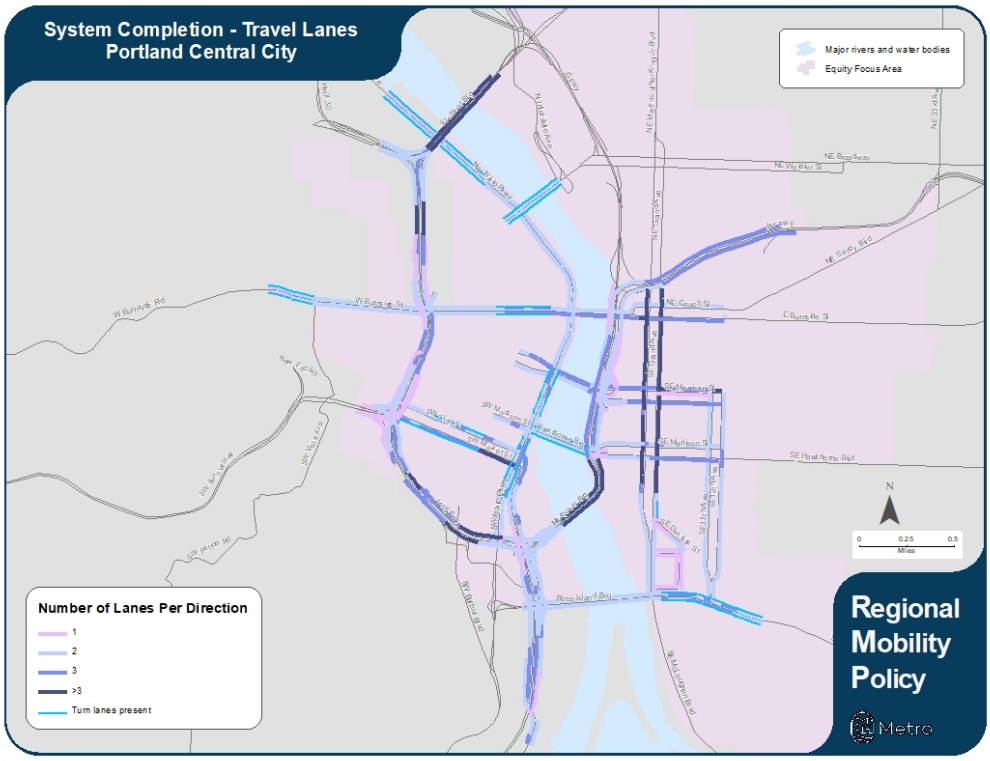
Developed Areas

The Portland Central City MMA is an example of a developed area within the Metro region. In this area, a complete system for walking, biking and accessing transit shall be prioritized over meeting congestion targets (such as in the central city, regional centers, station communities, corridors, town centers, and main streets) if the number of through lanes meet or exceed those in the regional design policy. For the Portland Central City, the following regional design classifications (and the related through lane range) are present:

- Freeways and highways – six lanes plus auxiliary lanes in some places
- Regional and community boulevards – two to four lanes with turn lanes for minor arterials and up to four lanes with turn lanes for major arterials
- Regional and community streets – two to four lanes with turn lanes for minor arterials and up to four lanes with turn lanes for major arterials

As shown in Figure 29, the majority of the roadways in this subarea are already built out based on these definitions. For example, Burnside Street is a regional boulevard and major arterial. With these designations, Burnside Street is planned for and already built with up to four lanes with turn lanes. With this in mind, a plan amendment that incorporates this segment of Burnside Street would need to explore other system completion options (like transit, bike, or pedestrian networks) to maintain mobility.

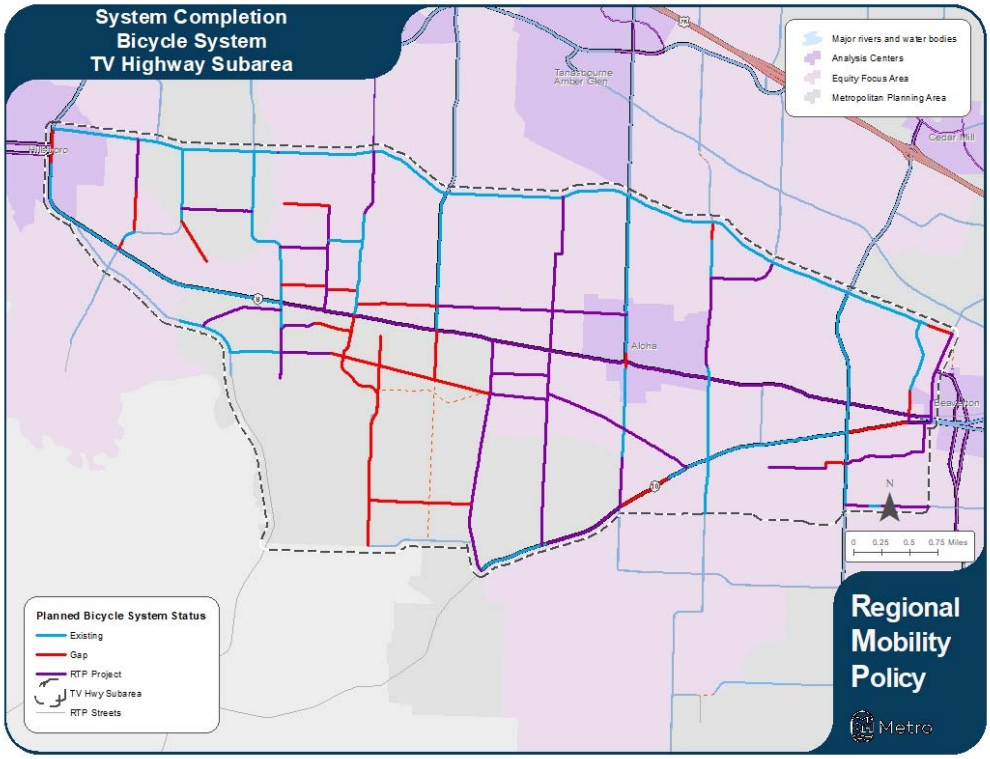
Figure 29. System Completion Portland Central City – Travel Lanes



Undeveloped Areas

South Hillsboro is an example subarea that was planned in an undeveloped location. For plan amendments in these types of locations, the amendment should consider if it changes what the definition of the complete system in the area should include. As shown in Figure 30, two new major connections are planned through the South Hillsboro plan amendment, connecting SE Davis Road and SW Rosedale Road and connecting SW River Road and SW 229th Avenue. Prior to this plan amendment, a bicycle system completion of 83% was planned for this subarea through existing infrastructure and RTP projects ((141,168 feet of existing infrastructure + 150,949 feet of planned RTP projects) / 352,289 total feet of roadway in the subarea). If the new roadway segments (13,268 feet) are included as gaps in the planned system, the new planned system completion is 80%. If the new roadway segments are included as planned projects, the new planned system completion is 84%.

Figure 30. System Completion TV Highway Subarea – Bicycle System



Policy Considerations

Considerations:

- Developed areas within the Metro area have established roadway patterns and meeting motor vehicle connectivity objectives will largely be achieved through concept planning and implementation for urbanizing areas. In contrast, gaps in pedestrian and bicycle systems are prevalent around the region. In many areas, the absence of bikeways and pedestrian facilities is a vestige of past planning and funding that prioritized vehicular mobility, as well as a lack of recognition regarding the need and desire for ways other than the auto to reach key destinations. Land uses have also changed as the region has grown, with established centers accommodating a greater intensity of uses and absorbing the new residents and jobs coming to this area. Opportunities for completing systems, and the pedestrian and bicycle networks in particular, not only improve the conditions for travelers, but also provide ways to support changing land use and travel preferences. Walking and biking become more attractive as the distance between home and destinations shorten; transit can be more cost-effective and frequent the more potential riders (residents and employees) there are in the vicinity of a transit stop.
- System completion is a measure that is used differently for different applications (i.e. system planning versus plan amendments). These differences are discussed above, and it will be important to emphasize the need for system planning to establish the planned system to set the denominator for system completion analysis.

    - Will the RTP become the planned system for throughways and arterials within the Metro region or will the local agency TSPs be the planned system used for completeness analysis?
- Metro and local agencies will set the planned system through planning modal and service networks. There are many networks that can be established and will need to be specifically called out in the mobility policy if system completion is included. Some or all of the following could be included:
    - Pedestrian, which could include planned crossings based on pedestrian crossing index
    - Bicycle, which could include a low-stress network based on bicycle LTS
    - Transit
    - Vehicle, which could build off of RTP policies in chapter 3 such as street connectivity/spacing and maximum number of through lanes
    - TSMO
    - TDM
- The planned TSMO system will likely be established through Metro's ongoing TSMO Strategy project. For example, there is a proposed performance measure for percent of signals on identified routes that have communications.
- The policy language should be very clear about which measures and associated targets apply to throughways (regardless of land use context) versus arterials (based on land use context).
- Every RTP street should be planned for all modes, with some exceptions based on context and classifications. The TSP process would determine what complete looks like for each street. For example, there will be locations where meeting a congestion target should not be done at expense of walking and biking facilities in any area or vice versa.

Are the measures useful and practical in planning?

System completion can be applied to any roadway (throughways and arterials) or transportation facilities or services. When the plan is established, the denominator for a system completion analysis is set. The target is then to increase the system completion for the relevant systems. The vital aspect during the planning process is determining which networks (pedestrian, bicycle, TSMO, etc.) are relevant to each facility or subarea.

Are the measures sensitive enough to use for plan amendments?

System completion is useful for transportation system plan amendments as long as there is a planned system already in place. Once a planned system is set, a plan amendment can either show progress in system completion for relevant facility types or establish a change in the planned system due to new roadways or facilities. For those plan amendments that are building new facilities, modifications for the planned system will be established to allow for future monitoring. Comprehensive plan amendments do not inherently impact system completeness but could be assessed to see if the financially constrained system is adequate to accommodate the change.

Memo

Oregon Department of Transportation

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

Date: January 20, 2022

To: Kim Ellis, Metro, and Lidwien Rahman, ODOT

From: Susan Wright, PE, Kittelson & Associates, Inc.
Darci Rudzinski, Angelo Planning Group

Project: Regional Mobility Policy Update

Subject: Task 8.1: "Discussion Draft" Mobility Policy Report

Introduction

Metro and the Oregon Department of Transportation (ODOT) are working together to update the regional mobility policy and related mobility measures for the Portland metropolitan area. The mobility policy guides the development of regional and local transportation plans and studies, and the evaluation of potential impacts of plan amendments and zoning changes on the transportation system. The goal of this update is to better align the policy and measures with shared regional values, goals, and desired outcomes identified in Metro's Regional Transportation Plan (RTP) and 2040 Growth Concept as well as with local and state goals, and define expectations about mobility by travel mode, land use context, and roadway functional classification. The updated policy will describe the region's desired mobility outcomes and more robustly and explicitly define mobility for transportation system users in the Portland area.

This document builds upon the draft mobility definition and foundational elements integral to achieving the region's desired mobility outcomes, and presents a "Discussion Draft" mobility policy with options and recommendations for policymakers and stakeholders related to how the performance measure case study findings should influence the policy. The performance measure case studies are documented in Case Study Analysis Memorandum and summarized in the attached document which should be referenced when considering the policy options.

Goal

The following draft policies are intended to help achieve a vision of mobility where *people and businesses can safely, affordably, and efficiently reach the goods, services, places, and opportunities they need to thrive by a variety of seamless and well-connected travel options and services that are welcoming, convenient, comfortable, and reliable.*

Desired Outcomes

The following mobility outcomes were identified by stakeholders as critical to how we plan for, manage, and operate our transportation system. They were crafted to achieve the above mobility goal in alignment with ODOT and Metro strategic goals and priorities.

- **Equity** – Black, Indigenous and people of color (BIPOC) community members and people with low incomes, youth, older adults, people living with disabilities and other historically marginalized and underserved communities experience equitable mobility.
- **Access** – People and businesses can conveniently and affordably reach the goods, services, places, and opportunities they need to thrive.

KITTELSON & ASSOCIATES APG

- **Efficiency** – Land use and transportation decisions and investments contribute to more efficient use of the transportation system meaning that trips are shorter and can be completed by more travel modes, reducing space and resources dedicated to transportation.
- **Reliability** – People and businesses can count on the transportation system to travel where they need to go reliably and in a reasonable amount of time.
- **Safety** – People are able to travel safely and comfortably, and feel welcome.
- **Options** – People and businesses can choose from a variety of seamless and well-connected travel modes and services that easily get them where they need to go.

Discussion Draft Regional Mobility Policy

The following includes the proposed policies along with options and recommendations for how they could be implemented. The basis for these recommendations is included in the Case Study Analysis Memorandum.

Policy 1 Ensure that the public's investment in the transportation system enhances efficiency in how people and goods travel to where they need to go.

Recommended Measure:

-VMT/Capita

Efficiency in this context means that transportation requires less space and resources. Efficiency can be improved by shortening travel distances between destinations. Shorter travel distances to destinations enhances the viability of using other and more efficient modes of transportation than the automobile and preserves roadway capacity for transit, freight and goods movement by truck and longer trips. Efficiently using land, and planning for key destinations in proximity to the end users, contributes to shorter trip lengths.

As demonstrated in the case studies, the transportation efficiency of existing and proposed land use patterns and transportation systems can be measured by looking at "vehicle miles traveled (VMT) per capita" of an area.

The following describes how these could be implemented in the policy. The options could be considered individually or in combination.

Measurement Options

- **Option A1**: Incorporate vmt/capita reduction targets into the policy to ensure that land use decisions and transportation system plans[1] support efficient transportation systems and reduced travel demand.
    - A1.1: Apply to comprehensive plans and TSPs at the regional and local jurisdiction level. (Feasible per case studies)
    - A1.2: Apply to sub-area plans (larger-scale comprehensive plan amendments). (Feasible per case studies)

[1] TSPs and comprehensive plans collectively can achieve reduced vmt/capita; however, the contributions of individual projects are challenging to measure and when considered individually or in a localized area may increase vmt/capita.

- A1.3: Apply to all plan amendments (including smaller-scale or individual property amendments) (Case studies indicate the need to use this measure with caution at smaller scales as the proposed land use change could result in higher vmt/capita for the parcel while still contributing lower vmt/capita for the jurisdiction if it's below the jurisdiction's average indicating it would provide for increased development in an area that is more efficient than other areas. In addition, the measure is not sensitive to small transportation changes and will show increased vmt/capita if trying to isolate individual capacity increasing projects that may be needed to support efficient development.)

Policy 2 Provide people and businesses a variety of seamless and well-connected travel modes and services that increase connectivity, increase choices and access to low carbon transportation options so that people and businesses can conveniently and affordably reach the goods, services, places and opportunities they need to thrive.

Viability of trips made by modes other than automobile can be increased by investing in a connected, multimodal transportation system. Multimodal systems serve all people, not just those that have access to vehicles or the ability to drive them, and provide more route choices, increase safety and efficiency, and reduce congestion.

Potential Measures:

-Access to Destinations

-System Completeness *(recommended)*

Closing gaps in networks, particularly pedestrian and bicycle networks, can change land use and travel preferences, reducing vmt/capita. Progress towards well connected, multimodal networks can be measured by mode with the "system completeness" or "access to destinations" measures.

"Access to destinations" is useful for identifying areas where there are disparities in access to destinations between different modes due to gaps and deficiencies in the transportation network as well as where increases in different types of land uses would increase people's access to destinations. It can also be compared for Equity Focus Areas and non-Equity Focus Areas.

The following describes how these measures could be implemented in the policy. The options could be considered individually or in combination.

Measurement Options

- **Option 2A:** Incorporate "system completeness" targets into the policy to identify needs and ensure that the planned transportation system is increasing in connectivity and safety of the multimodal network. The definition of complete will vary based on the modal functional classification and design classification and can be refined by facility in system plans. (Case studies support system completeness for all levels of planning)

- **Option 2B**: Incorporate "access to destinations" metrics into the policy to identify disparities in access to destinations across modes and identify transportation and land use strategies to increase access to destinations. (Case studies indicate this is challenging other than at the system planning level)

  - 2B. 1: Apply at the regional level. (Feasible per case studies)

- 2B.2: Apply to local jurisdiction and sub-area plans (TSPs and larger-scale comprehensive plan amendments). (Challenging per case studies based on available tools and level of staff time required)
- 2B.3: Apply to small plan amendments (individual property amendments) (Challenging to apply to a small zone change as it's dependent upon the specific land use which can be uncertain during the zone change)

Policy 3 Create a reliable transportation system, one that people and businesses can count on to reach destinations in a predictable and reasonable amount of time.

In a reliable transportation system, all users, including people in automobiles and using transit, can reasonably predict travel time to their destinations. Reliability is impacted by travel conditions, safety, street connectivity, congestion and availability of travel options. Investments in safety, street connectivity, transit, operations management, and demand management could yield the greatest benefits reducing congestion and increasing reliability for vehicle modes.

Potential Measures:

-V/C Ratio

-Travel Speed *(recommended)*

-Off-Ramp Queues *(recommended)*

-Hours of Congestion *(potential component)*

For Throughways, the essential function is throughput and mobility for motor vehicle travel. Throughways serve interregional and interstate trips and travel times are an important factor in people and businesses being able to make long-distance trips to and through the region and access destinations of statewide significance in a reasonable and reliable amount of time.

For most Arterials, depending upon the design classification and freight network classification, the essential function is transit, bicycle and pedestrian travel and access or permeability while balancing motor-vehicle travel and the many other functions of intensely developed areas. On Arterials, reducing congestion through additional roadway capacity should not come at the expense of non-motorized modes and achieving system completeness consistent with modal or design classification or achieving the VMT/capita target for the jurisdiction.

Congestion can be measured in many ways. The measures evaluation process resulted in the case studies focusing on "v/c ratio" and "travel speed" to measure congestion and also looked at "hours of congestion" as a potential metric.

The following describes how these measures could be implemented in the policy. The options could be considered individually or in combination.

Measurement options

- **Option 3A:** Incorporate congestion targets into the mobility policy for throughways. Note all options for throughways would include a target for off-ramp queues to minimize queue spillback into through lanes.
  - 3A.1: Base the congestion targets on link v/c ratio (current metric)
  - 3A.2: Base the congestion targets on travel speed (supported by the case studies) (Shows very similar locations and levels of congestion depending on the threshold compared to v/c, but is more relatable to the public for policy discussions, is

consistent with how systems are managed, and switches to a target that cannot be inappropriately applied at the intersection level.)

  - 3A.3: Base the congestion targets on hours of congestion (needs to be based on either v/c ratio or travel speed) (case studies indicate HOC can be applied effectively with either v/c or travel speed and can be used to look at the severity of congested areas and help prioritize bottleneck improvements and could be part of the target but it would only be sensitive to change at the system planning level or major changes in roadway pricing or capacity)

- **Option 3B:** Include link level congestion targets in the mobility policy for all arterials to identify mobility needs and inform decisions on the number of lanes that will be considered complete for the vehicle mode. Targets would vary based on modal classifications and land use context.
  - 3B.1: Base the congestion targets on link v/c ratio (supported by the case studies)
  - 3B.2: Base the congestion targets on travel speed (supported by the case studies) (Note arterials need lower targets than throughways as a percentage of posted or free flow speed given the presence of traffic signals and signal delay even in uncongested time periods results in average speeds below posted or free flow speed))
  - 3B.3: Base the congestion targets on hours of congestion (needs to be based on either v/c ratio or travel speed) (See 3a.3 case study findings)
- **Option 3C:** Include link level congestion targets in the mobility policy for arterials outside of 2040 centers, station communities and main streets to identify mobility needs and inform decisions on the number of lanes that will be considered complete for the vehicle mode. Targets would vary based on modal classifications and land use context.
  - 3C.1: Base the congestion targets on link v/c ratio (supported by the case studies)
  - 3C.2: Base the congestion targets on travel speed (supported by the case studies)
  - 3C.3: Base the congestion targets on hours of congestion (needs to be based on either v/c ratio or travel speed) (See 3a.3 case study findings)
- **Option 3D:** Do not include congestion targets in the mobility policy for arterials (congestion metrics can be used as diagnostic tools to support system planning). Could make exceptions for enhanced transit or high-capacity transit corridors and regional freight network routes.

Policy 4 **Prioritize the safety and comfort of travelers in all modes when planning and implementing mobility solutions.**

Unsafe travel ways can result in injury and loss of life, and place a strain on emergency responders. Both unsafe conditions and perceived unsafe conditions can impact travel behavior, causing users to choose different routes or modes. Prioritizing investments that reduce the likelihood of future crashes and that improve safety and comfort for all users will increase mode choices and improve reliability. System completeness, queuing, pedestrian crossing index, and bicycle level of traffic stress measures are all metric that are useful in identifying needs and investments that could enhance safety and comfort.

The following describes how these measures could be implemented in the policy. The options could be considered individually or in combination.

Potential Measures:

-System Completeness *(recommended)*

-Queuing *(recommended)*

-Pedestrian Crossing Index

-Bicycle Level of Traffic Stress

Measurement options

- **Option 4A:** Incorporate "system completeness" target into the mobility policy to ensure safety and comfort for all modes. (Metric can be used to identify needs but the definition of "complete" would also be defined through system planning to define the future number of through lanes, policy on turn lanes, type of bicycle facility, target pedestrian crossing spacing, and TSMO/TDM plan elements)
- **Option 4B:** Incorporate "queuing" target into the mobility policy for Throughway ramp terminals to minimize queues spilling onto the Throughway creating safety issues.
- **Option 4C:** Incorporate "pedestrian crossing index" metric into the mobility policy to identify needs and inform facility level planning. (Setting target through the RMP not recommended but recommended that system and facility plans establish targets for each facility based on Livable Streets Guide and adjusting for local context.)
- **Option 4D:** Incorporate "bicycle level of traffic stress" metric into the mobility policy to identify needs and inform facility level planning. (Setting target not recommended but recommended that system plans identify the future low-stress bicycle networks and that be incorporated into the system completeness metric)

Policy 5 **Prioritize investments that ensure that Black, Indigenous and people of color (BIPOC) community members and people with low incomes, youth, older adults, people living with disabilities and other historically marginalized and underserved communities experience equitable mobility.**

BIPOC and other marginalized communities have often experienced disproportionately negative impacts from transportation infrastructure as well as disparities in access to safe multimodal travel options. Addressing these disparities is a priority.

The regional transportation system should support access to opportunities for everyone, not just people in motor vehicles. Equity can be enhanced through providing strong multimodal networks with priority provided to historically marginalized and underserved communities.

The following describes how this could be implemented in the policy.

Measurement options

Potential Measures:

Compare EFA vs. Non-EFA Areas

-Access to Destinations (*recommended if included in the policy)*

-System Completeness *(recommended if included in the policy)*

- **Option 5A**: Include targets for reducing disparities between "Equity Focus Areas" and "Non-Equity Focus Areas". This would result in identification of needed investments to address disparities and prioritization of these investments.

Measurement Options Summary

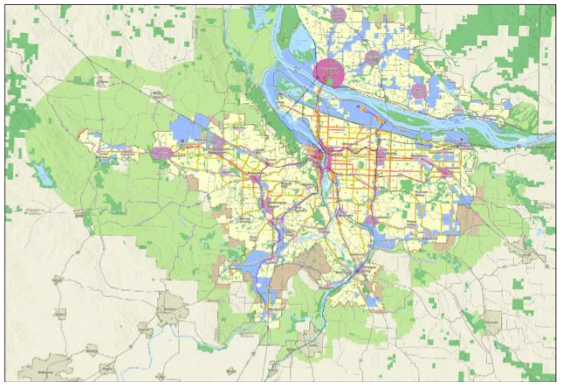
The measurement options included above identify where the performance measures tested through the case studies could be incorporated into the policy and identifies preliminary recommendations for further policymaker and stakeholder discussion. In summary, three measures are recommended to be incorporated into the policy to encompass overall system efficiency, equitable and complete multi-modal networks of safe and comfortable facilities, and reliability as summarized below in Table 1.

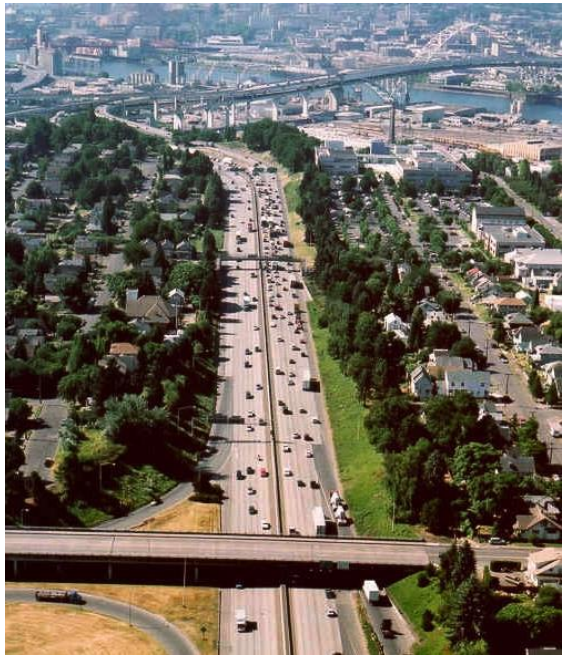
Table 1: Preliminary Mobility Policy Performance Measure Recommendations

Measure	Scale for Application	Purpose
VMT/Capita	Plan Area	Measured for the plan area to ensure that land use and transportation plan changes are working in tandem to achieve VMT/capita reduction targets and resulting in: • reduced need to drive • improved viability of using other and more efficient modes of transportation than the automobile and • preserving roadway capacity for transit, freight and goods movement.
System Completeness	Plan Area and Equity Focus Areas	Used to identify needs. Definition of "complete" would be defined through system planning to define network connectivity, the future number of through lanes, policy on turn lanes, type of bicycle facility, target pedestrian crossing spacing, and TSMO/TDM elements.
Travel Speed	Facility level for throughways and arterials (could exclude 2040 centers or all urban area)	To assess vehicle congestion as one of the major factors impacting travel reliability. On Arterials, reducing motor vehicle congestion through additional roadway capacity should follow the region's congestion management process and OHP Policy 1G on ODOT roadways but should not come at the expense of non-motorized modes and achieving system completeness consistent with regional modal or design classifications or achieving the VMT/capita target for the jurisdiction

Regional mobility policy update

TPAC/MTAC Workshop
February 16, 2022





Metro

Oregon Department of Transportation

Project purpose

- Update the mobility policy and how we define and measure mobility for the Portland area transportation system

- Recommend amendments to the RTP and Oregon Highway Plan Policy 1F for the Portland area

Visit oregonmetro.gov/mobility

Applications of the current mobility policy

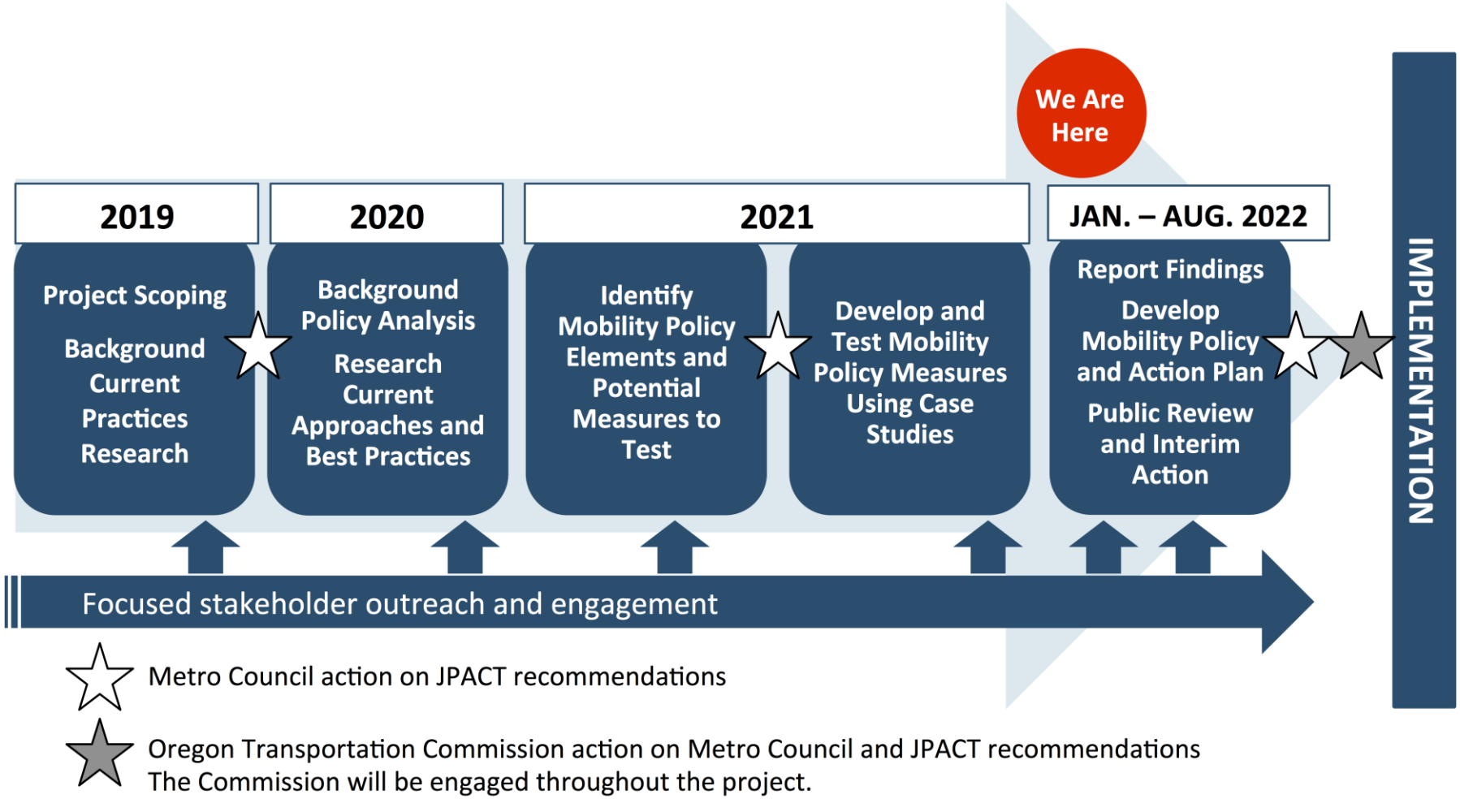
Transportation system plans, corridor and area plans, including concept plans to set performance expectations to identify needs as defined in the RTP and Oregon Highway Plan

Zoning changes and land use plan amendments using transportation thresholds defined in the Oregon Highway Plan for state-owned roads and local codes for city- and county-owned roads

Development approval process to mitigate traffic impacts using thresholds defined in the OHP and local codes

Operational and road project designs as defined in the 2012 Oregon Highway Design Manual and local codes

Timeline


We Are Here
2019
2020
2021
JAN. – AUG. 2022
Project Scoping
Background Current Practices Research
Background Policy Analysis
Research Current Approaches and Best Practices
Identify Mobility Policy Elements and Potential Measures to Test
Develop and Test Mobility Policy Measures Using Case Studies
Report Findings
Develop Mobility Policy and Action Plan
Public Review and Interim Action
IMPLEMENTATION
Focused stakeholder outreach and engagement
Metro Council action on JPACT recommendations
Oregon Transportation Commission action on Metro Council and JPACT recommendations
The Commission will be engaged throughout the project.

2021 Engagement

Metro Council

County coordinating committees

Regional advisory committees

1 community leaders forum

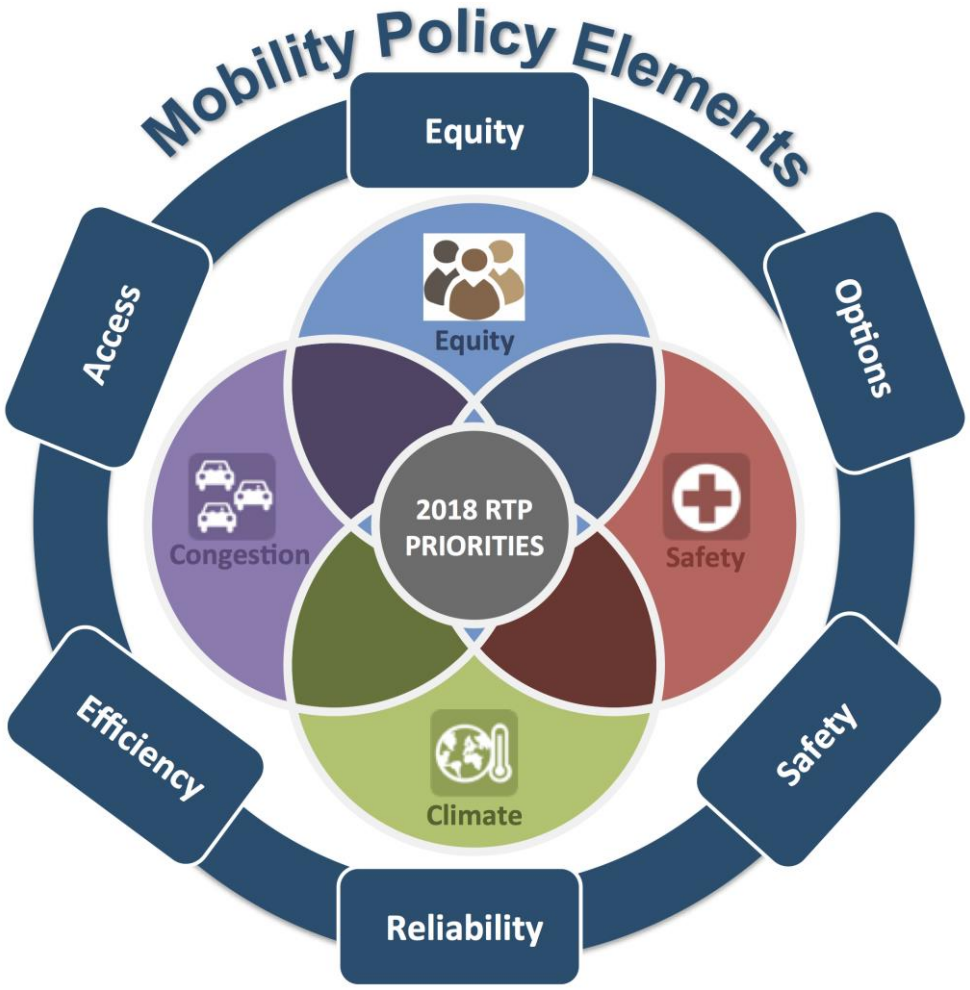
1 freight and goods forum

2 practitioner forums – planners, engineers, modelers

More than 350 participants

zoom

DRAFT Vision for urban mobility for the Portland area: *People and businesses can safely, affordably, and efficiently reach the goods, services, places and opportunities they need to thrive by a variety of seamless and well-connected travel options and services that are welcoming, convenient, comfortable, and reliable.*



Mobility **elements**

Equity
Black, Indigenous and people of color (BIPOC) community members and people with low incomes, youth, older adults, people living with disabilities and other historically marginalized and underserved communities experience equitable mobility.

Access
People and businesses can conveniently and affordably reach the goods, services, places and opportunities they need to thrive.

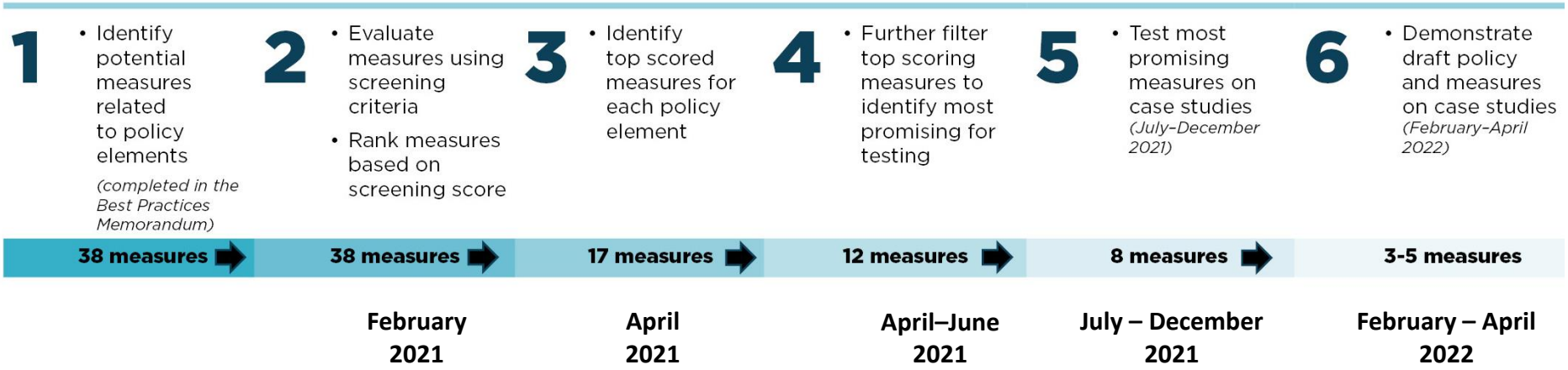
Efficiency
People and businesses efficiently use the public's investment in our transportation system to travel where they need to go.

Reliability
People and businesses can count on the transportation system to travel where they need to go reliably and in a reasonable amount of time.

Safety
People are able to travel safely and comfortably and feel welcome.

Options
People and businesses can choose from a variety of seamless and well-connected travel modes and services that easily get them where they need to go.

Measures Screening Process



Case Study Overview – Further reduced group of measures

Current mobility policy measure	**V/C Ratio**
Vehicle-focused measures*	**Duration of Congestion**
	Queuing
	Travel Speed
	VMT/Capita
Multimodal measures	**Access to Destinations/ Opportunity** (all modes)
	Level of Traffic Stress (LTS) (bike and pedestrian)
	Pedestrian Crossing Index (bike and pedestrian)
	System Completion (all modes)

What we want to learn from the case studies:

1. How well does the measure help compare outcomes in Equity Focus Areas (EFAs) to other areas?
2. How sensitive is the measure to changes in land use?
3. How could measures that are not sensitive to land use changes be applied in plan amendments?
4. Does Metro's Dynamic Traffic Assignment (DTA) model identify different needs than the travel demand model at the system level? Does it offer significantly different post-processed intersection volumes?

Potential application of the measures being tested

System Planning

- Apply as target in planning
- Define the planned complete system
- Set standards based on what the plan achieves

Plan Amendments

- Identify if there is a measurable change in performance
- Compare to standard
- Identify mitigations

Vehicle-focused Measures

Key findings:

- **Travel Speed** is relatable and consistent with facility management
- Using **Travel Speed** reduces overemphasis/over design on long-term intersection operations
- Intersection **v/c ratio** still has a place in planning and near-term mitigations
- **Duration of Congestion** will need to be considered in the policy for either congestion metric
- **Queuing** will need to be considered in the policy for either off-ramps only or for arterial intersections as well

	Current mobility policy measure	Evaluating Outcomes for Equity Focus Areas	System Planning: Applying a Target to Identify Needs and Develop Plan	System Planning: Setting Standard based on Plan	Plan Amendments: Large-Scale/ Areawide: Show measurable impact (from added trips, any mode)	Plan Amendments: Large-Scale/ Areawide: Identify mitigations if standard exceeded	Plan Amendments: Small-Scale/Site-Specific: Show measurable impact (from added trips, any mode)	Plan Amendments: Small-Scale/Site-Specific: Identify mitigations if standard exceeded
	V/C Ratio	A	‖✚	‖✚	‖✚	‖✚	‖✚	‖✚
Vehicles	Duration of Congestion	A	‖✚	‖✚	‖✚	‖✚	‖✚[5]	‖✚
Vehicles	Queuing		‖[1]✚	‖[1]✚	‖[1]✚	‖[1]✚	‖[1]✚	‖[1]✚
Vehicles	Travel Speed	A	‖✚[2]	‖✚[2]	‖✚	‖✚[3]	‖[4]✚[4]	‖[3]✚[3]

‖=Thruway ✚=Arterial/Collector

A. Measure can be evaluated and compared for different geographic areas related to concentrations of disadvantaged populations and can be used to evaluate equity.

1. Off-ramps only.
2. The target travel speed on arterials/collectors should have a maximum consistent with area context and the desired posted speed and a minimum thresholder for congestion.
3. Intersection v/c ratio analysis can be used to help identify mitigations to improve travel speed.
4. Travel demand model or microsimulation can support the analysis but the impact may be very minimal.
5. Travel demand model or microsimulation can support the analysis but the impact will be negligible.

Land Use Efficiency Measures

Key findings:

- **VMT/capita** can be modeled and forecasted, showing if the planned land use and transportation systems are moving in the right direction, more efficient to serve
- **VMT/capita** demonstrates if planned land use changes result in less travel and in less impactful ways
- Can show incremental improvements

		System Planning		Plan Amendments: Large-Scale/ Areawide		Plan Amendments: Small-Scale/Site-Specific	
	Evaluating Outcomes for Equity Focus Areas	Applying a Target to Identify Needs and Develop Plan	Setting Standard based on Plan	Show measurable impact (from added trips, any mode)	Identify mitigations if standard exceeded	Show measurable impact (from added trips, any mode)	Identify mitigations if standard exceeded
VMT/Capita[11]	AB	●	●	●	●[1]	Caution[4]	●[5]
Access to Destinations[11]	AB	●	●	●[2]	●[3]	●[2]	●[3]

● =Area

A. Measure can be evaluated and compared for different geographic areas related to concentrations of disadvantaged populations and can be used to evaluate equity.

B. Measure relates to increased access to non-auto modes which are accessible to people without access to vehicles.

1. Mitigations would need to be changes in land use or significant travel demand management (TDM) measures

2. Land use changes would increase or decrease the number of destinations that are accessible but not how far the area of accessibility is

3. Mitigations would need to be changes in land use or significant changes in the transportation network.

4. When looked at in a localized area, VMT/capita may increase for the localized area while contributing to lower VMT/capita for the jurisdiction. This would occur if the projected VMT/capita for the localized area were projected to be below the jurisdiction's average. It would indicate that increased development in that area is more efficient than other areas.

5. Mitigations would need to be changes in land use or land use intensity which may not be effective based on the land use patterns and surrounding transportation network. If not effective, would need to mitigate with TDM or TSMO.

Land Use Efficiency Measures – VMT/capita

2018 Regional Transportation Plan

- All scenarios have decreases in average VMT/capita but none achieve 10% reduction target

  No build: -1.2% Constrained: -4.0% Strategic: -4.0%

Central City MMA (multimodal mixed use area)

- Home-based VMT/capita of 4.2 compared to 11.0 in region overall
- Able to double population and jobs with minimal increase in VMT/capita
- Able to reduce VMT/employee by 72%

Oregon City MMA (multimodal mixed use area)

- VMT/employee increases by 1.8% for the subarea, Oregon City increases by more than 2% (which meets the current TPR requirement that new plans not increase VMT/capita by more than 5%)

South Hillsboro Community Plan

- Despite pedestrian-oriented design and mixed-use town center land uses, people living in South Hillsboro (10.9) would generate more VMT/capita than residents of the City of Hillsboro (8.5) but roughly equal to the overall Metro Region (10.5) – demonstrates that infill is more efficient than urban growth areas
- People working in South Hillsboro (9.2) would generate less VMT/employee than employees in Hillsboro (10.7) and the overall Metro Region (9.5) – demonstrates benefit of more housing to support Hillsboro jobs

Multimodal Measures

Key findings:

- Complete system definition should be set through system planning and include number of travel lanes, turn lane policy, bicycle, pedestrian, transit and TSMO/TDM components
- Setting a low-stress target for all roads or certain roadway classifications (arterials, for example) is not practical to achieve
- Crossing spacing targets and LTS should be used to plan the complete system

		System Planning		Plan Amendments: Large-Scale/ Areawide		Plan Amendments: Small-Scale/Site-Specific	
	Evaluating Outcomes for Equity Focus Areas	Applying a Target to Identify Needs and Develop Plan	Setting Standard based on Plan	Show measurable impact (from added trips, any mode)	Identify mitigations if standard exceeded	Show measurable impact (from added trips, any mode)	Identify mitigations if standard exceeded
LTS	AB	✚	✚	✚[1]	✚[1]	NO	NO
Ped. Crossing Index	AB	✚	✚	✚[2]	✚	✚[2]	✚
System Completion	AB	‖✚	‖✚	✚[3]	✚	✚[3]	✚

‖=Thruway ✚=Arterial/Collector

A. Measure can be evaluated and compared for different geographic areas related to concentrations of disadvantaged populations and can be used to evaluate equity.

B. Measure relates to increased access to non-auto modes which are accessible to people without access to vehicles.

1. Only sensitive to large changes in volumes or looking at access to LTS routes

2. Can document impact on warrants for a protected crossing

3. Can document impact on signal warrants, and number of trips added to system by mode, and if they are impacting an incomplete mode, but difficult to calculate their impact or proportionate share

Preliminary Recommendations for the Updated Mobility Policy Measures

Measure	Scale for Application	Purpose
System Completeness	Plan Area and Equity Focus Areas	• Used to identify needs. • Definition of "complete" would be defined through system planning to define network connectivity, the future number of through travel lanes, policy on turn lanes, type of bicycle facility, target pedestrian crossing spacing, and TSMO/TDM elements.
Travel Speed (including Duration of Congestion and Queuing)	Facility level for throughways and arterials (could exclude arterials in 2040 centers or all urban area)	• Used to identify needs. • To assess vehicle congestion as one of the major factors impacting travel reliability. • For Throughways and Arterials, reducing motor vehicle congestion through additional roadway capacity should follow the region's congestion management process and OHP Policy 1G on ODOT roadways but should not come at the expense of non-motorized modes and achieving system completeness consistent with regional modal or design classifications or achieving the VMT/capita target
VMT/Capita	Plan Area	Measured for the plan area to ensure that land use and transportation plan changes are working in tandem to achieve VMT/capita reduction targets and resulting in: • reduced need to drive • improved viability of using other and more efficient modes of travel than the automobile and • preserving roadway capacity for transit, freight and goods movement.

Discussion on preliminary recommended measures

Questions or feedback on the recommended measures?

Do you support the recommended primary measures?

Suggestions for how the draft policy and measures should be brought forward to policy committees?

Discussion on potential measurement options

Multi-modal Measures

- Should system completeness be incorporated into the mobility policy?
- If only system completeness is included in the policy, should any guidance be provided about the use of pedestrian crossing index and/or bicycle level of traffic stress?

Vehicle Focused Measures

- Which measure(s) should be used for congestion, and should it be applied to arterials in addition to throughways?
  - If so, should it be applied to all arterials or just those outside of 2040 centers?
- What thresholds/targets should be applied based on the measure selected?

Land Use Efficiency Measures

- Should VMT/capita be incorporated into the mobility policy to ensure that all plans and plan amendments contribute to reaching the regional target?
  - If so, should the thresholds/targets be consistent with the TPR targets for the Portland region?

Next steps

Feb. to Summer 2022	Report findings from case studies
	Seek feedback on policy options Recommend measures and action plan
	Develop and recommend policy for public review and consideration by regional policymakers and OTC (including application, threshold options, and additional case study review)
Summer/Fall 2022	Begin applying interim policy in 2023 RTP update

RTP

Scoping
Oct. 2021 to March 2022

Plan Update
April 2022 to June 2023

Plan Adoption
July to Nov. 2023

Thank you!

Kim Ellis, Metro

kim.ellis@oregonmetro.gov

Lidwien Rahman, ODOT

lidwien.rahman@odot.state.or.us






oregonmetro.gov /mobility

Draft Mobility Policy 1

Recommended Measure:

-VMT/Capita

1: Ensure that the public's investment in the transportation system enhances efficiency in how people and goods travel to where they need to go.

- Option 1A: Incorporate vmt/capita reduction targets into the policy to ensure that land use decisions and transportation system plans support efficient transportation systems and reduced travel demand.

Draft Mobility Policy 2

Potential Measures:

-Access to Destinations

-System Completeness *(recommended)*

2: Provide people and businesses a variety of seamless and well-connected travel modes and services that increase connectivity, increase choices and access to low carbon transportation options so that people and businesses can conveniently and affordably reach the goods, services, places and opportunities they need to thrive.

- Option 2A: Incorporate “system completeness” targets into the policy to identify needs and ensure that the planned transportation system is increasing in connectivity and safety of the multimodal network. The definition of complete will vary based on the modal functional classification and design classification and can be refined by facility in system plans. (Case studies support system completeness for all levels of planning)

- Option 2B: Incorporate “access to destinations” metrics into the policy to identify disparities in access to destinations across modes and identify transportation and land use strategies to increase access to destinations. (Case studies indicate this is challenging other than at the system planning level)

Draft Mobility Policy 3

Potential Measures:

-V/C Ratio

-Travel Speed *(recommended)*

-Off-Ramp Queues *(recommended)*

-Hours of Congestion *(potential component)*

3: Create a reliable transportation system, one that people and businesses can count on to reach destinations in a predictable and reasonable amount of time.

- Option 3A: Incorporate congestion targets into the mobility policy for throughways. Note all options for throughways would include a target for **off-ramp queues** to minimize queue spillback into through lanes. Incorporate **hours of congestion.**

- Option 3B: Include link level congestion targets in the mobility policy for all arterials to identify mobility needs and inform decisions on the number of lanes that will be considered complete for the vehicle mode. Targets would vary based on modal classifications and land use context.

Draft Mobility Policy 3 cont.

3: Create a reliable transportation system, one that people and businesses can count on to reach destinations in a predictable and reasonable amount of time.

- Option 3C: Include link level congestion targets in the mobility policy for arterials outside of 2040 centers, station communities and main streets to identify mobility needs and inform decisions on the number of lanes that will be considered complete for the vehicle mode. Targets would vary based on modal classifications and land use context.

- Option 3D: Do not include congestion targets in the mobility policy for arterials (congestion metrics can be used as diagnostic tools to support system planning). Could make exceptions for enhanced transit or high-capacity transit corridors and regional freight network routes.

Draft Mobility Policy 4

Potential Measures:

-System Completeness *(recommended)*

-Queuing *(recommended)*

-Pedestrian Crossing Index

-Bicycle Level of Traffic Stress

4: Prioritize the safety and comfort of travelers in all modes when planning and implementing mobility solutions.

- Option 4A: Incorporate “system completeness” target into the mobility policy to ensure safety and comfort for all modes. (Metric can be used to identify needs but the definition of “complete” would also be defined through system planning to define the future number of through lanes, policy on turn lanes, type of bicycle facility, target pedestrian crossing spacing, and TSMO/TDM plan elements)

- Option 4B: Incorporate “**queuing**” target into the mobility policy for Throughway ramp terminals to minimize queues spilling onto the Throughway creating safety issues.

Draft Mobility Policy 4 cont.

4: Prioritize the safety and comfort of travelers in all modes when planning and implementing mobility solutions.

- Option 4C: Incorporate “pedestrian crossing index” metric into the mobility policy to identify needs and inform facility level planning. (Setting target through the RMP not recommended but recommended that system and facility plans establish targets for each facility based on Livable Streets Guide and adjusting for local context.)

- Option 4D: Incorporate “bicycle level of traffic stress” metric into the mobility policy to identify needs and inform facility level planning. (Setting target not recommended but recommended that system plans identify the future low-stress bicycle networks and that be incorporated into the system completeness metric)

Draft Mobility Policy 5

Potential Measures:

Compare EFA vs. Non-EFA Areas

-Access to Destinations (*recommended if included in the policy)*

-System Completeness *(recommended if included in the policy)*

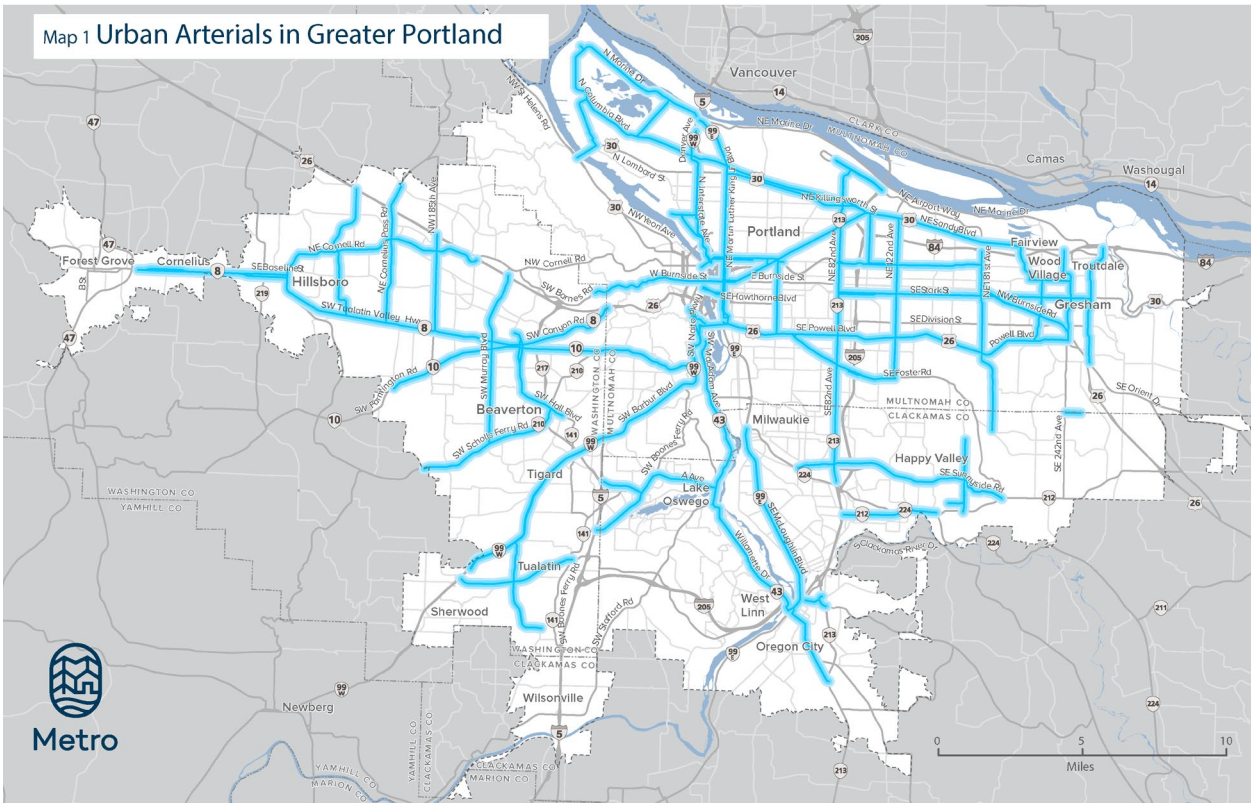
5: Prioritize investments that ensure that Black, Indigenous and people of color (BIPOC) community members and people with low incomes, youth, older adults, people living with disabilities and other historically marginalized and underserved communities experience equitable mobility.

- Option 5A: Include targets for reducing disparities between “Equity Focus Areas" and “Non-Equity Focus Areas”. This would result in identification of needed investments to address disparities and prioritization of these investments.

DRAFT 2023 RTP Policy Brief for Safe and Healthy Urban Arterials

Introduction

The purpose of the policy brief is to frame policy options for consideration by regional leaders. Policy options focus on potential strategies to address identified challenges to developing safe and healthy urban arterial roadways in the region. The brief focuses on the roadways identified as Major Arterials in the 2018 RTP, henceforth referred to as "urban arterials." Map 1 illustrates urban arterials in greater Portland that are the primary focus of the policy brief. Example roadways (see Table 1) in each part of the region are used to illustrate common issues on the urban arterials.



1. Why is a strategy for urban arterials needed?

Urban arterials often serve as multicultural community centers dotted with vibrant businesses, affordable housing, parks and schools. In Metro's 2040 Growth Concept, urban arterials serve as key corridors that connect regional centers. They play a critical role in the transit system and are incredibly complex. They typically have four or more travel lanes carrying tens of thousands of vehicles each day, often with posted travel speeds of 35 miles per hour or higher. Urban arterials are also major freight truck routes.

While these characteristics enable huge numbers of cars, buses and trucks to crisscross the region every day, without safety and health interventions they can be deadly, disproportionately impacting people with lower incomes and Black, Indigenous, and people of color (BIPOC). The majority of urban arterials are designated Regional Emergency Transportation Routes,[1] serving critical life safety function during large scale disasters by helping connect our vulnerable populations with critical infrastructure and

[1] See map at https://rdpo.net/emergency-transportation-routes

essential facilities region-wide.[2] However, despite their critical role in the region's transportation system, decades of underinvestment in urban arterials has led to persistent safety and equity issues, as shown in Map 2. Safety, equity, economic development / land use and transit/mobility represent four important areas of intersection with urban arterials.

Land use / economic development

- **Urban arterials are where people, live, work and play and are critical to implementing regional land use vision**. Many of the urban arterials in the Metro region are also where people access jobs, housing, and other essential services. These corridors play a critical role for communities. All 7 of Metro 2040's Regional centers, 23 out of 32 Town Centers and 54 out of 67 Station Communities have an urban arterial passing through them.

- **Current conditions create barriers to economic development on urban arterials.** Design and safety issues make it difficult for these centers to develop economically and become the thriving communities envisioned in the 2040 growth concept. Without efforts to reduce traffic speeds and volumes, pedestrian improvements alone may not create as many economic benefits as they would compared to lower volume/speed roads. While making pedestrian improvements on higher speed routes has significant benefits for safety and access to transit, the recent Active Transportation Return on Investment study found less economic benefits for businesses than on lower speed/traffic streets within 2040 centers.[3]

Equity

- **Communities of color and with lower income disproportionally live and travel on urban arterials in Portland.** Sixty-seven percent of urban arterial mileage is in areas with higher than average populations of BIPOC, people with lower income and limited English proficiency. People with lower income and people of color, especially Black people, are more likely to be killed in a traffic crash.[4] The five bus routes carrying the most people of color and low-income riders are on urban arterials.

- **Urban arterials contribute to unhealthy air quality in Equity Focus Areas.** Census tracts with the highest estimated prevalence of asthma in the region are more likely to intersect with an urban arterial, especially those within an Equity Focus Area.[5] Many urban arterials lack a robust tree canopy or other green infrastructure, which can help reduce urban heat island effects, air and noise pollution for people traveling, living and working along the roadway.

Mobility (especially for Transit)

- **Urban arterials provide mobility to thousands of people in Portland region on a regular basis**. They only make up about 5 percent of the roadways within the metropolitan area yet they serve as the backbone of the regional roadway network[6], carrying a large share of trips in the region,

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[2] The ETRs were updated in 2020 in a regional effort led by the Regional Disaster Preparedness Organization (RDPO) and Metro. The routes will be prioritized in 2022-23.
[3] Metro Active Transportation Return on Investment Report, February 2022 https://www.oregonmetro.gov/active-transportation-return-investment-study

[4] Regional Transportation Safety Strategy 2-year Progress Report, Metro (June 2021), https://www.oregonmetro.gov/sites/default/files/2021/08/03/RTSS-progress-report-20210603.pdf
[5] Centers for Disease Control (CDC). Places: Local Data for Better Health (accessed 1/14/22). https://experience.arcgis.com/experience/22c7182a162d45788dd52a2362f8ed65
[6] There are approximately 5,894 miles of roadways within the region, 299 of which are classified as Major Arterials; calculation by functional classification, not lane miles.

e.g. TV Highway carries over 40,000 motor vehicle trips per day [7] and 7000 transit trips.[8]

- **Highest bus ridership in the region is on urban arterials.** Seven of the 10 highest-ridership bus routes in the TriMet system are on urban arterials. Collectively these lines carry about 25 percent of TriMet's ridership[9].

- **Nearly all urban arterials are frequent bus routes, but many of these routes need more frequent service and nearly all lack dedicated right of way needed for faster, more efficient service.**

Safety

- **A disproportionate number of serious and fatal crashes occur on urban arterials.** While urban arterials account for 5 percent of roadway miles in the region, 41 percent of traffic fatalities and serious injuries occur on urban arterials. For context, RTP minor arterials make up 7 percent of roadway miles, while 31 percent of fatal and serious crashes occur on them.[10] Urban arterials are more dangerous due to even higher traffic speeds, volumes, and numbers of lanes.

- **A disproportionate number of serious pedestrian and bicycle crashes and fatalities occur on urban arterials.** Fifty percent of fatal bicycle crashes and 49 percent of fatal pedestrian crashes occur on urban arterials. Forty-one percent of serious bike crashes and 53 percent of serious pedestrian crashes occur on urban arterials. Urban arterials can be barriers for people walking, accessing transit, bicycling, or in a mobility device. In 2015, sidewalks were missing on half of all arterial roadway miles, and 44 percent of all arterial roadway miles lacked bikeways.[11] Filling sidewalk and bikeway gaps on urban arterials would considerably increase the number of people with access to essential destinations within walking and bicycling distance.[12] Other safety interventions such as medians, sidewalk buffers, enhanced pedestrian crossings, lighting and signal improvements are also lacking, though more data is needed to better understand needs. Project development for the Get Moving 2020 regional investment measure highlighted the safety and mobility needs of several urban arterials.

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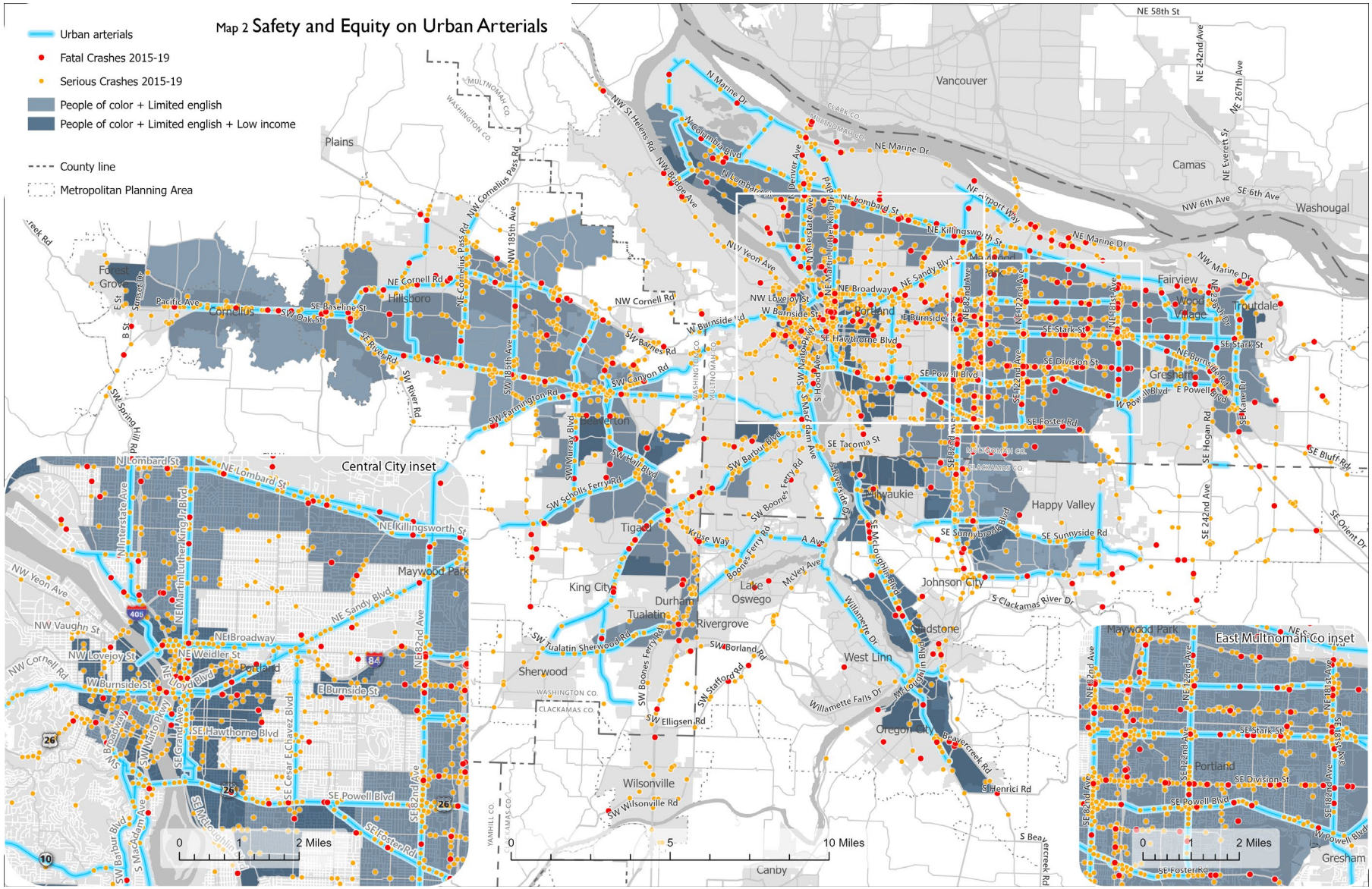
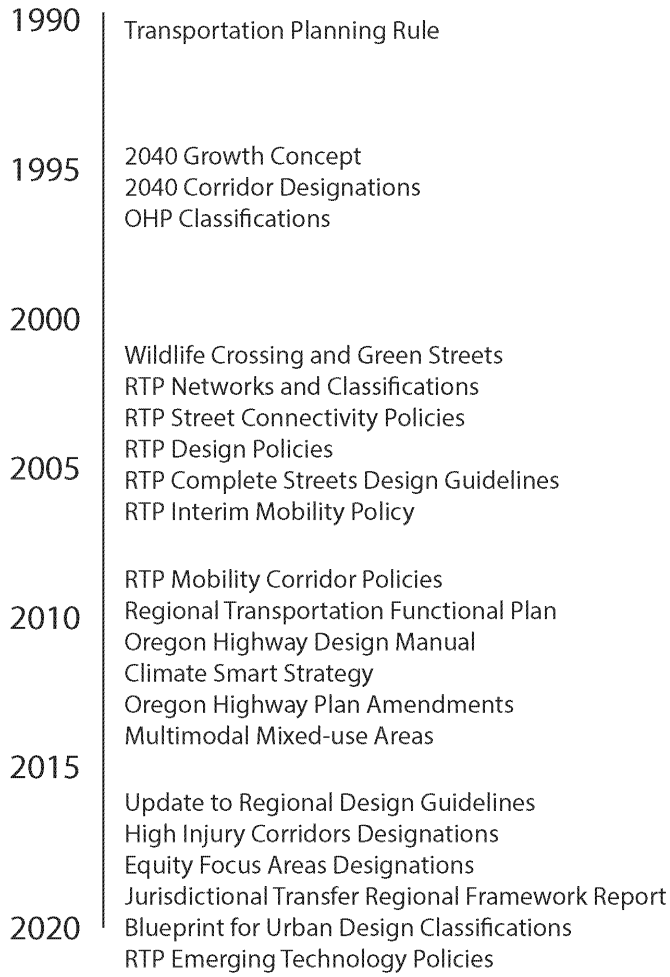
[7] 2019 ODOT, area east of SW 170th Ave. https://www.oregon.gov/odot/Data/Documents/TVT_2019.xlsx
[8] 2019 TriMet data
[9] 2019 TriMet data. Post pandemic (2020), 8 of the top 10 lines are on urban arterials, and these 8 routes made up about 25% of total TriMet ridership.
[10] 2015-2019 ODOT crash data. Out of the 6,793 fatal and serious crashes that occurred, 2,072 occurred on minor arterials. Refer to the crash tables in the Appendix.
[3] 2018 RTP existing conditions analysis for minor and major arterial roadways. Compared to all roadways in the region, arterials have less sidewalks completed. Fifty-five percent of roadway miles in the region have completed sidewalks.
[12] Pedestrian Network Analysis for the Regional Active Transportation Plan, June 2013. https://www.oregonmetro.gov/regional-active-transportation-plan


Map 2 Safety and Equity on Urban Arterials
Urban arterials
Fatal Crashes 2015-19
Serious Crashes 2015-19
People of color + Limited english
People of color + Limited english + Low income
County line
Metropolitan Planning Area
Central City inset
East Multnomah Co inset
Vancouver
Camas
Washougal
Plains
Forest Grove
Cornelius
Hillsboro
Beaverton
Tigard
Tualatin
Sherwood
King City
Durham
Lake Oswego
Rivergrove
West Linn
Oregon City
Gladstone
Johnson City
Milwaukie
Happy Valley
Gresham
Troutdale
Fairview
Wood Village
Portland
Maywood Park
Wilsonville
Canby
0 1 2 Miles
0 5 10 Miles

2. Why now?

As Chart 1 shows, foundational policies beginning in the 1990s with the Transportation Planning Rule and 2040 growth concept lead to thirty years of developing comprehensive connectivity, design and complete street policies. (See the appendix for analysis of the impact of these arterial roadway policies.)

Chart 1 History of Arterial Roadway Policy (1990s to present)



In spite of a comprehensive policy framework supporting the development of healthy and safe roadways, transportation agencies have still not completed a network of healthy urban arterials to equitably serve people's travel needs. Growing numbers of people are dying or getting seriously injured on these roads, with a disproportionate impact to BIPOC. In order to face these safety and equity issues head on, the region needs an agreed upon strategy to fix these roadways, including a coordinated and comprehensive set of projects that help address these issues.

3. What are the challenges to fixing urban arterials?

Understanding the challenges, as well as what has been working, will help us understand what might be done differently and identify potential strategies to achieve safe and healthy urban arterials. Challenges are not mutually exclusive.

Challenges

Funding

Ongoing challenges in bringing funding to urban arterials

1. Needs are greater than available funding. Table 1 below shows five example urban arterials in which the level of need identified in the Regional Investment Measure (RIM) is much greater compared to the level of funded projects identified in the 2018 RTP.

2. Lack of dedicated funding and coordinated investments. Given the current structure of federal, state, local and regional funding, there is no one dedicated funding source to urban arterials. Unlike HCT corridor plans which have a strong vision and dedicated funding sources which enables a full project to be completed at one time, urban arterials typically do not; improvements are made in a piecemeal fashion and it is difficult to piece together enough funding to make substantial improvements.

3. Lack of identified or prioritized projects to address equity, gaps and deficiencies. In the 2018 RTP there are insufficient projects to address all the gaps and deficiencies on urban arterials, including in Equity Focus Areas and communities that have been underserved and underinvested in. Seventeen percent of projects in the 2018 RTP and only 6 percent of revenues are programmed for urban arterials, despite these facilities carrying a large share of regional trips. This is a result of a combination of factors, including inadequate funding, prioritization of other needs, and a lack of data on deficiencies and needs. Very few of the RTP projects programmed for these facilities are prioritized to be built in the first 10 years of the plan, as shown in Table 1.

Policy / Design

Ongoing challenges to achieving multimodal designs

1. Outdated functional purpose of state-owned urban arterials. About 1/3 of urban arterial mileage is owned by the State. Many of these roads no longer serve their original statewide function, and the State has focused its resources on freeways. A handful of these roadways still have a "Statewide" Functional Classification in the Oregon Highway Plan even though they no longer serve a statewide function.[13] Transferring ownership to local agencies has helped, but has not happened yet on many of the state-owned urban arterials. Multiple agencies are typically involved in projects along urban arterials. However, it is not always clear who is leading the way to improve the roadways – local government, ODOT or the transit provider – hence the term 'orphan highways'. This makes it difficult to work through trade-offs in decision making and to address problems in a coordinated manner.

2. Motor-vehicle throughput prioritized over other roadway functions.[14] Urban arterials serve many functions. An outcomes-based design approach seeks to achieve a comprehensive set of shared values, goals and desired outcomes identified in adopted policies. However, the interim regional mobility policy (V/C) has often prioritized wider roads and motor vehicle throughput over other outcomes, such as safety investments for people walking and bicycling. For example, NW/ SW185th Ave has multimodal elements but its design is primarily focused on motor vehicles. As shown in Table 1, very few of the projects planned for these facilities have the primary purpose of reducing fatalities and serious injuries.

3. Planned land use not guiding design. As Table 1 shows, these roadways pass through 2040 centers,

[13] The 2020 Highway Jurisdictional Transfer report, includes Roadway Classification recommendations for portions of TV Highway, Hwy 43, 99W, and 99E Consultant recommendation. See Attachment G at https://www.oregonmetro.gov/jurisdictionaltransfer

[14] Refer to Chapter 43 of the Metro Creating Livable Streets Guide for a discussion of functions.

and are expected to absorb a significant proportion of future residential growth. Despite regional and state design standards requiring transportation design to serve existing and planned land use, many projects do not prioritize designs to support the development of centers, such as pedestrian and transit improvements and reducing speeds.

4. Gaps in data. Lack of data on the needs and deficiencies on urban arterials makes it challenging to plan and identify opportunities. Building on the needs identified in the Regional Investment Measure, an updated network built for analyzing mobility, including locations of driveways, deficient sidewalks, etc. would support developing systematic and coordinated investment plans.

Table 1. Examples of roadblocks to building safe and healthy arterials

	TV Hwy	**82nd Ave**	**SE Mcloughlin Blvd**	**SW/NW 185th Ave**	**SE/NE 122nd Ave**
Needs identified in Regional Investment Measure	$800M	$730M	$330M	$190M	$100M
Project $ on this facility in 2018 RTP	$208M	$65M	$129M	$76M	$23M
Share of RTP projects prioritized for first 10 years of the plan	3 of 16 projects	4 of 6 projects	3 of 10 projects	0 of 3 projects	2 of 2 projects
Share of RTP projects with primary purpose of reducing fatalities/serious injuries	1 of 16 projects	4 of 6 projects	2 of 10 projects	0 of 3 projects	0 of 2 projects
2040 Centers served by road	Forest Grove, Cornelius, Hillsboro, Aloha, Beaverton	82nd Ave Max station area, Clackamas, Lents, Gateway	Milwaukie, Gladstone, Oregon City	Tanasbourne/ Amberglen, Willow Creek/SW 185th station area, Aloha	122nd Ave Max station area, Gateway

Building on what is working

Strategic policy options identified in section 4 build on recent efforts to address challenges on urban arterials.

1. Regional investment measure (RIM). The work was centered on equity, brought multiple stakeholders together, assessed and developed projects with local investment teams that included community members/leaders. RIM included Better Bus projects that would improve transit speeds on urban arterials. Identifying needs along the corridors highlighted the lack of data and planning.

2. Coordinated, systemic investments with investment areas planning. These efforts integrate land use, housing, jobs and transportation corridor planning supporting a systematic and coordinated approach to investments.

3. Metro and ODOT are leading an effort to update the Regional Mobility Policy. Updating how the region defines mobility and measures success will better align the mobility policy with the comprehensive set of shared values, goals and desired outcomes identified in the Regional Transportation Plan, the 2040 Growth Concept, as well as with local and state goals.

4. What's needed to move forward?

The following recommended actions are presented for consideration by regional partners and decision-makers. The actions would be implemented by cities, counties, TriMet, SMART, ODOT, Metro and other entities through the update and implementation of the 2023 Regional Transportation Plan.

Category	Challenge	Recommended Actions for Urban Arterials
Funding	**1. Needs are greater than available funding**	Seek funding for arterials from new Federal grant programs, including RISE, PROTECT program for resiliency to support Emergency Transportation Route (ETR) function of urban arterials; and new funding for wildlife crossings, and green infrastructure Seek new funding source to support maintenance of locally owned roads to free up revenues to be spent on capital projects for urban arterials Create RTP or MTIP funding incentive for developing local revenue sources
	2. Lack of dedicated funding and coordinated investments	Develop a dedicated funding source for urban arterials Develop a pipeline of transit projects for FTA funding urban arterials for corridor-wide improvements Coordinate projects in RTP updates for transformative corridor wide improvements on urban arterials (ensuring comprehensive and coordinated projects)
	3. Lack of identified or prioritized projects to address equity, gaps and deficiencies	Prioritize 2023 RTP revenues for transit (BRT/dedicated ROW), complete streets and safety investments in urban arterials within Equity Focus Areas Add all urban arterial projects from the 2020 Regional Investment Measure (RIM) to the 2023 RTP Require sidewalk, transit and bikeway gaps be filled before other improvements are made Ensure projects to improve safety and transit and fill all gaps on all urban arterials are included in the 2023 RTP Make Equity Focus Areas a criterion of RFFA funding Identify priority ETR, green infrastructure and wildlife crossing projects on urban arterials and add projects to the 2023 RTP

Design / Policy	**1. Outdated functional purpose of state-owned urban arterials.**	Update OHP and RTP roadway classifications to reflect recommendations from consultant in the Highway Jurisdictional Transfer study Identify the next corridor(s) for jurisdictional transfer Form working group, led by Metro and ODOT staff to keep Jurisdictional Transfer discussions alive
	2. Motor-vehicle throughput prioritized over other roadway functions	Update Regional Mobility Policy that reflects comprehensive set of shared values, goals and desired outcomes Establish modal hierarchy in 2023 RTP (implementing motor vehicle policy where biking and walking are prioritized on arterials) Apply outcomes and performance based decision-making process in the planning and design of projects Revise RTP policies to reflect relevant urban arterials work completed since 2018 RTP update (Jurisdictional Transfer study, Livable streets / outcomes based design, safety)
	3. Planned land use not guiding design	Allow local design standards on state owned arterials – reference recent USDOT rulemaking allowing for more flexibility in design.
	4. Gaps in data	Identify resources to update the regional network with missing data, including locations of driveways, deficient sidewalks

Appendix

Impact of urban arterial policies

1. **Oregon Transportation Planning Rule (TPR) (1991)**

This required regional and local system plans. It included a flawed 0060 section. It required balancing land use and transportation, but assumed there's some level of traffic mobility that equals balance. There was a belief that you could build your way out of congestion. This created a choice of creating overbuilt, unsafe streets vs shifting all the development outside the UGB.

2. **2040 Growth Concept (1995) (implemented through Regional Framework Plan and 1996 Urban Growth Management Functional Plan (UGMFP) (UGMFP last updated in 2018)**

This ties land use and transportation together - desired land uses guide transportation investments. It brought multimodal responsibility to the RTP. Previously the only projects in the RTP were either highways or High Capacity Transit. The growth concept established that the region has an interest in mixed use centers being successful. Thus, smaller bike and pedestrian projects within centers (including on arterials) became "regional" / eligible for federal funds. This is a pivotal point on how federal funds are spent.

3. **2040 Corridor designations (1995)**

Corridors were envisioned to play a key role in the success of the 2040 Growth Concept however they have never been clearly defined. Region wide they run through very different land uses, from urban neighborhoods and centers to employment and commercial areas. Due to a lack of a vision for these urban arterials development and redevelopment progress along corridors has been limited with only a few successful examples in the region.

4. **OHP classifications (1999)**

ODOT doesn't have classifications for bike, ped, design, Transportation System Management & Operations (TSMO). This creates confusion. There are conflicting desires from state/region for some arterials and different uses are prioritized. The OHP included Special Transportation Areas, Commercial Centers and Urban Business areas. These are land use areas that could factor into design, to be approved by ODOT. Level of Service (LOS) alone, can't be the deciding factor. A problem is that they had to be approved by ODOT, and solutions were often mobility focused / not place-making focused.

5. **RTP Networks and classifications (e.g., design, motor vehicle, bike, ped, freight and transit, TSMO) (2000), last updated 2018**

This expressed the importance of arterials from modal perspective. RTP classifications link to specific design policies. Inconsistent classifications exist between the state and regional motor vehicle system.

6. **RTP street connectivity policies (2000), continues to be reflected in 2018 RTP**

This established that better local connectivity reduced the need for wider arterials. Retrofitting local street connectivity has been challenging in some areas, e.g. Washington County given the barriers such as railroads, streams and topography.

7. **RTP design policies (2000) continues to be reflected in 2018 RTP**

These specify the desired number of lanes on arterials. The cross sections show a complete streets approach.

8. RTP complete streets design guidelines (2000) Updated with Designing Livable Streets Guide (2020)

These are the design standards for urban arterials to implement the 2040 Growth Concept. They are best practices, but are not requirements. They are not consistently applied in plans and projects. Unclear if the issue is lack of awareness, or that they're viewed as inconsistent with adopted city, county, state design standards. The street design classification should be arbiter of tradeoffs – guidelines provide performance based approach.

9. Wildlife crossing and Green Streets added in to design guidance. (2002)

These are recognized by NOAA fisheries as safe harbor from ESA for salmon and steelhead.

10. RTP interim mobility policy (2000) to be updated in the RTP in 2023.

Achieving this policy is in conflict with 2000 RTP street design policies. We can't afford to build to a congestion-free peak hour. No one wants to pay for it and no one wants the system that would result if you did.

11. RTP mobility corridor policies (2010), continue to be reflected in 2018 RTP

In rapidly filling up travel corridors, there is a need to depend on the nearby local system, likewise the nearby system is affected by the corridors. These policies demonstrate how mobility is supported through multiple facilities and modes within a broader corridor. The policy is implemented through corridor planning. Corridor plans are not all consistent, e.g. EMCP vs. TV Hwy corridor plan. The concept came out of FHWA. Freeways filling up can be relieved by local system, bundle together interrelated facilities, look at the relationship, breakaway from different organizations. They illustrate the land use context. Urban arterials no longer seen as important once a freeway is built in the corridor; lack of thinking about a system. It is challenging to coordinate all the different plans within one travel corridor.

12. Regional Transportation Functional Plan (2012)

The Functional plan expanded to include transportation. Parking provisions were moved into the RTFP (formerly in Urban Growth Management Functional Plan (UGMFP) Title 2. There are minimum and maximum parking ratios for commercial and retail uses along arterials. It guides local implementation of RTP, e.g arterial design concepts and connectivity standards, local pedestrian and bicycle plans including provision for sidewalks and bikeways on all arterials, controlled pedestrian and bicycle crossings of major arterials, local TSMO plans including arterial performance monitoring. It provides hierarchy for what to do first to address mobility, before adding vehicle capacity. Not clear how this is documented and that all steps are taken.

13. Oregon Highway Design Manual (2012)

This uses V/V ratios that are different from RTP and OHP. It creates issues when there are differences between system plan policy targets/standards and project design standards. It is auto-centric.

14. Oregon Highway Plan Amendments (2011)

These created the "Do the Best we can" standard. It was later undone in 2012.

15. TPR – Multimodal Mixed Use Areas (MMAs) (2012)

These established that the power is at local level (in principal) – local cities and counties can adopt these and get a lot more flexibility in design.

16. Climate Smart Strategy (2014)

This links public health outcomes to transportation choices. Transportation System Management & Operations and Transit were found to be the most effective strategies for

reducing GHG emissions, since both have design implications.

17. Emerging Technology in RTP (2018)
This strategy called out need for active curb management for these emerging businesses

18. High injury corridors designations (2018)
A policy map in the RTP that identifies the six percent of roadways in the region where 60 percent of fatal and serious crashes occur (in addition to state and locally identified areas). Nearly all urban arterials are also high injury corridors. High injury corridors are intended to help prioritize investments where they can be most effective.

19. Equity Focus Areas designations (2018)
These are where historically marginalized communities are currently located. Mapping has illustrated the proximity of these communities to urban arterials. Regional policy focuses investments in these areas.

20. Blueprint for Urban Design (BUD) design classifications (2020)
These establishes guidance for urban design on Oregon state highways until such time that all ODOT manuals related to urban design can be updated to include these revised design criteria. The six urban contexts portrayed in the BUD, along with their respective design criteria, will allow project teams to better align ODOTs transportation needs with local community aspirations. The Bud is just beginning to be implemented.

21. Jurisdictional Transfer (JT) regional framework report (2020)
Many (1/3 of mileage) of the RTP Major Arterials are state-owned. The JT report created a prioritization of these roadways as transfer candidates

22. Emergency Transportation Routes Phase 1 (2020)
There is a large overlap in ETRs and arterials. All of the ETRs have been mapped. There is work underway to tier/prioritize these routes and provide operational guidance for their owners in 2022-23.

23. Planning Emphasis Areas (PEAs) (2022)
These are established by Federal Highway Administration and include areas such as Complete Streets and Climate Change. They are expected to be incorporated into regional planning.

RTP Motor Vehicle Functional Classification	Miles (within MPA)	% total
All Roadways	5893.8	100%
Major Arterials	298.7	5.1%
Minor Arterials	395.0	6.7%

Source: Metro RLIS. Calculation is by roadway name, not lane miles.

Crashes on Urban Arterials (Major Arterials)

2007-2019	Urban Arterials	All roadways	
Fatal crashes	343	856	40.1%
Fatalities	354	884	40.0%
Serious crashes	2451	6035	40.6%
Serious injuries	2744	6727	40.8%
F or S crashes	2759	6793	40.6%
ALL crashes	114659	284032	40.4%

2015-2019	Urban Arterials	All roadways	
Fatal crashes	160	404	39.6%
Fatalities	165	415	39.8%
Serious crashes	1032	2469	41.8%
Serious injuries	1129	2686	42.0%
F or S crashes	1173	2834	41.4%
ALL Crashes	45662	115955	39.4%

Source: ODOT

A single crash event can be considered both a fatal crash and a serious crash (they're not exclusive).

2015-2019	Urban Arterials	All roadways in MPA	% on UA
Pedestrian Fatal crashes	83	168	49.4%
Pedestrian fatalities	83	176	47.2%
Pedestrian Serious crashes	168	317	53.0%
Pedestrian Serious Injuries	168	327	51.4%
Bike Fatal crashes	10	20	50.0%
Bike fatalities	10	20	50.0%
Bike Serious crashes	51	126	40.5%
Bike Serious Injuries	51	126	40.5%

ALL Crashes	45662	115955	39.4%

Crashes on Minor Arterials

2007-2019	Minor Arterials	All roadways	
Fatal crashes	213	856	24.9%
Fatalities	218	884	24.7%
Serious crashes	1878	6035	31.1%
Serious injuries	2095	6727	31.1%
F or S crashes	2072	6793	30.5%
ALL crashes	86784	284032	30.6%

2015-2019	Minor Arterials	All roadways	
Fatal crashes	108	404	26.7%
Fatalities	110	415	26.5%
Serious crashes	755	2469	30.6%
Serious injuries	820	2686	30.5%
F or S crashes	857	2834	30.2%
ALL Crashes	34689	115955	29.9%

Urban Arterials in EFAs	Length Miles	% in EFAs
POC+LEP	154.6	51.6%
POC+LEP+LI	200.4	66.9%
Not in EFAs	99.1	33.1%
UAs in EFAs	200.4	66.9%
Total in Dataset	299.5	

Materials following this page were distributed at the meeting.

Memo

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

Date: Wednesday, March 9, 2022
To: Transportation Policy Alternatives Committee and Interested Parties
From: Grace, Senior Transportation Planner
Subject: Status Update on the 2019-21 RFFA Fund Exchange

Purpose: To provide an update on the Metro administered funding projects which resulted from the implementation of the 2019-2021 Regional Flexible Fund Allocation policy direction.

Background:
With the adoption of the 2019-2021 Regional Flexible Fund Allocation program direction, the region agreed to allocate an estimated $130.38 million in regional flexible funds available to support the following policy objectives:

- Increase the region's current high capacity transit bonding commitment to deliver two regional transit projects in development: Southwest Corridor and Division Transit.
- Add a new bonding commitment to advance funding for project development specifically for a selected package of improvements to address regional active transportation needs, and freeway interchanges or arterials that are identified as significant system deficiencies, particularly in the areas of safety and freight delay. This is in response to new or potential funding opportunities at the federal, state, regional and local levels.
- Support project delivery by conducting a funding exchange of federal Regional Flexible Funds with local dollars to assist certain types of projects which struggle with the federal aid process. These Regional Flexible Funds are expected to come from the Step 2 competitive grant process.

In order to achieve the policy objectives, Metro and TriMet executed several different intergovernmental agreements to increase the bonding commitments and also facilitating the fund exchanging of federal dollars for local monies. As a result, Metro and TriMet completed the following:

- Add a new $1.26 million per year bond payment through 2034 to generate $12 million in bond proceeds to be distributed for project development activities for freight, freeway, and interchange bottlenecks ($10 million) and active transportation ($2 million)
- As part of the allocation of Step 2 Regional Flexible Funds, Metro worked directly with TriMet to identify the projects from the Step 2 allocation which would be eligible candidates for fund exchange TriMet general funds to exchange with Regional Flexible Funds.

As a result of implementing this approach, Metro has become the funding administrator for the bond proceeds dedicated for active transportation project development and the projects identified from Step 2 which were funding exchanged. Additionally, since becoming an administrator of fund exchanges, a small number of projects which received Regional Flexible Funds brought forward compelling cases to Metro and coordinated a fund exchange through a willing entity to support the swap of federal to local funds. In agreeing to allow the fund exchange, Metro underwent a handful of MTIP amendments and agreed to become the funding administrator to ensure the project is delivered as proposed in the Regional Flexible Fund application.

Once all the projects were identified for active transportation bond proceeds and the Step 2 fund exchanges, Metro executed intergovernmental agreements with the jurisdictions outlining the project scopes and administration protocols. The first set of projects kicked off in summer 2018.

Status of Metro Administered Projects

As of February 2022, all projects have executed intergovernmental agreements – including those projects which came to Metro with compelling cases and organized their own fund exchanges – and have begun work. In total, Metro is the funding administrator for twenty (20) local transportation projects. (See Attachment 1 for a listing of the projects.) These twenty projects are primarily focused on scoping, designing, and/or constructing active transportation, complete street, or better bus types of capital improvements. Only two projects are primarily focused on signalizations or roadway redesigns for the purposes of industrial area access or goods movement.

Of the eleven active transportation project development projects funded through the 2019-2021 RFFA cycle, a total of seven have been completed as of February 2022. The remaining will be wrapped up by the end of June 2022. Of the eleven projects, two projects have secured additional funding to complete the remaining project development, design, and construction. Both projects received funding through the 2022-2024 Regional Flexible Fund allocation cycle. These include:

- City of Portland – Stark-Washington Corridor Improvements
- City of Gresham – Division Street Complete Street Project

Additionally, five active transportation project development projects have submitted funding application requests in the 2025-2027 Regional Flexible Fund-Metro Trails bond program.

Of the four (4) 2019-2021 Regional Flexible Fund Step 2 projects which were identified for fund exchanges, one project – City of Tigard – Wall Street-Tech Center Drive Extension – has been completed and constructed. The City of Oregon City's Molalla Avenue is close to follow and anticipated completion by the end of June 2022. The two remaining 2019-2021 Regional Flexible Fund Step 2 projects had slower starts and delayed due to staffing and cost impacts pertaining to the COVID-19 pandemic, but anticipate completion in 2024.

Lastly, a surprising outcome to result from the implementation of 2019-2021 RFFA poilcy direction were local jurisdictions approaching Metro to initiate fund exchanges by finding willing entities to accept the federal funding and swap for local funding. These include the following projects:

- City of Tualatin – Herman Road Walking and Bicycling Project
- City of Wilsonville – I-5 Pedestrian and Bicycle Bridge
- City of Tigard – Main Street Phase II
- City of Portland – Central City Transportation Safety Project[1]
- Washington County – Council Creek Trail[2]

Of these five projects, the City of Tualatin – Herman Road Walking and Bicycling project was able to take most advantage of being a locally funded project. The project originally received a 2019-2021 Regional Flexible Fund award for project development and anticipated being able to get to the sixty percent (60%) design phase. As a locally funded project, the City of Tualatin saw the first set of deliverables come in under anticipated budget and amended the intergovernmental agreement

[1] This project was separated into three different Better Bus projects: MLK and Grand rose lanes, Hawthorne bridge rose lanes, and Broadway corridor improvements.

[2] Fund exchange from the 2022-2024 Regional Flexible Fund Allocation – Step 2. This project was selected after Metro staff conducted an internal evaluation process as to which awarded project would be the best candidate to fund exchange with a very constrained amount of local dollars available.

with Metro to deliver the full design of the project with the exchanged funds. Furthermore, the project was able to secure local funding to construct the project. The project is anticipated to be constructed in 2023.

Additionally, another jurisdiction initiated fund exchange which had numerous positive results was The City of Portland's Central City Transportation Safety project. This project was awarded funding in the 2016-2018 Regional Flexible Fund Allocation cycle and had entered the federal aid process to initiate a planning phase to define the different transportation safety projects to be delivered with the awarded funds. That led to the Central City in Motion plan which prioritizes transportation improvements in the Portland downtown core. Eighteen projects were prioritized through Central City in Motion and they include new pedestrian crossings, bus lanes, and bikeways. Following the development of Central City in Motion, City of Portland staff approached Metro and TriMet to facilitate a fund exchange for the remaining Regional Flexible Fund award. The local monies provided greater flexibility and expediency in project delivery than going through the federal aid process. Moreover, the exchanged funds were leveraged with the 2019-2021 Regional Flexible Fund bond proceeds to pilot several enhanced transit concepts. The City of Portland was able to deliver three highly visible Better Bus projects – NE/SE Martin Luther King Boulevard rose lane, NE Grand Avenue rose lane, and SE Hawthorne Boulevard rose lane – to help show a proof of concept of effectiveness as the region's voters contemplated raising revenue for local transportation projects like Better Bus.

Lessons Learned

In the implementation of the 2019-2021 Regional Flexible Fund policy direction, Metro became a funding administrator for the design and delivery of capital transportation projects. This is the first time Metro has taken on this role for Regional Flexible Fund projects. The twenty projects in Metro's funding administration totals roughly around $22 million in Regional Flexible Funds which were localized. In having a limited number of diverse projects – ranging from a feasibility study for a pedestrian and bicycle bridge to the construction of a complete streets project – there were several interesting lessons and themes to emerge. These themes include:

- Early project development is a necessity for success regardless of funding type
    - But there are benefits for locally funded projects as they do not impact the region's federal funding obligation targets
- Early public engagement is necessary to create buy-in and success for the project regardless of funding type
- Local funding allows for creative opportunities in project delivery not always available through the federal aid process
- While local funding in project development provides flexibility and opportunity, continuing to prepare and keep projects eligible for the federal aid process is crucial to incorporate into project development
    - This is especially true for larger scale capital transportation projects

<u>Project Development and Public Involvement as a Necessity</u>

While providing a significant level of flexibility, fund exchanges have not necessarily alleviated the many different challenges or complexities of delivering a capital transportation project. Of the twenty different types of projects Metro oversaw as the funding administer, each ran into different unexpected challenges. Those projects which had done early project development work and/or public involvement prior to the receiving funding through the Regional Flexible Fund, however, were better able to navigate the challenges.

In the case of the eleven projects which received active transportation bond proceed funding, the explicit purpose was for project development of potential active transportation capital projects. While this was the sole intent for these funds, those projects selected to receive bond proceeds which had further project definition tended to utilize the funding more successfully to move into initial design. While those projects to receive bond funds which were still very conceptual were unable to progress towards a design milestone which could have led towards a better position to go after a funding grant. However, even the conceptual projects tended to benefit from initial funding to help further define the scope of the project and develop an initial cost estimate.

For the other projects which included a capital construction phase, in some cases the projects which had not done project development prior to the funding award eventually ran into scope and budget challenges leading to scope reductions from the original application. Additionally, regardless of the flexibility of the local funding, most of the twenty projects ran into project schedule delays, particularly with several taking a significant amount of time to initiate.

Early public involvement also emerged as a theme with the twenty projects being administered by Metro. Whether they were active transportation project development projects or actual capital projects to be constructed, several faced unanticipated local opposition during the grant funded work or needed to conduct further public engagement. Therefore these projects had to find additional funding or consider requesting a reduction in project scope.

Regardless of whether the project is a federal aid project or as a locally funded project, early project development and public involvement is critical to delivering the full scope of a project on schedule and budget.

<u>Creative Opportunities in Local Project Delivery</u>

While many jurisdictional partners stated at the outset a benefit of the fund exchanges would be the creative opportunities and flexibility for project delivery, the region was able to see and experience those benefits with a couple of the projects. In the cases of the City of Oregon City's Molalla Avenue project and the Better Busy NE/SE Martin Luther King and NE Grand Avenue rose lane projects, neither of these projects would have been able to deliver the projects the way in which they did had they been under the federal aid process. Both projects had not necessarily planned their alternative project delivery, but rather the right timing and opportunity happened to emerge.

The City of Oregon City's Molalla Avenue project was able to streamline some construction activity and reduce costs with a sewer project being planned and delivered in the same area. The transportation portion and the sewer projects were able to link up on the timing relatively early during the project design process to seamlessly incorporate the two projects on the corridor. In the end there was only a minor impact on the project schedule.

Additionally, the Better Bus projects – NE/SE Martin Luther King and NE Grand Avenue rose lanes – were able to utilize a maintenance project as a means for delivering the project once the design details were finalized. Leveraging a maintenance project was able to provide cost savings and minimize construction disruptions on the corridor. Had the Better Bus projects gone through the federal aid process, it would not have been possible to identify an existing roadway maintenance project for project delivery.

<u>Local Funding Early, but Federal Funds Likely Needed</u>

While having local funding provided significant flexibility and ability to leverage either other funding opportunities, some projects had an idea at the outset that piecing together different grants to fund the full project would mean needing to look towards federal sources of funding. Recognizing that, several of the projects which received active transportation project development proceeds developed their scopes and incorporated tasks likely needed once the project enters the federal aid process. While the projects were not required or expected to follow the federal aid rules, the projects looked at appropriate elements within the environmental investigation or design several recognized incorporating elements of the federal aid process into the locally funded at this stage would assist with positioning the project in applications for federal grants and ensure the early work would get utilized.

ATTACHMENT 1. List of Active Transportation Project Development or Fund Exchange Projects

Project Name	Jurisdiction	Metro Award Amount	Program	Status
SW Wall Street Extension to SW Tech Center Drive	City of Tigard	$1,730,516	RFFA Fund Exchange (step 2)	Complete
Central Eastside Intersection Improvements	City of Portland	$2,595,879	RFFA Fund Exchange (step 2)	In progress
NE 72nd Avenue: NE Killingsworth – NE Sandy Boulevard	City of Portland	$2,200,000	RFFA Fund Exchange (step 2)	In progress
Molalla Avenue Beavercreek Road – Highway 213	City of Oregon City	$3,800,632	RFFA Fund Exchange (step 2)	In progress
Connected Lents	City of Portland	$150,000	Active Transportation Project Development	Complete
Connected Division Midway	City of Portland	$150,000	Active Transportation Project Development	In progress
Connected Cully Phase 2	City of Portland	$75,000	Active Transportation Project Development	Complete
148th Avenue Safety and Access to Transit	City of Portland	$150,000	Active Transportation Project Development	In progress
Stark/Washington Corridor Improvements	City of Portland	$65,000	Active Transportation Project Development	Complete
I-84 Path Extension	City of Portland	$73,000	Active Transportation Project Development	Complete
Fanno Creek Regional Trail – Bonita Road to Tualatin Bridge	City of Tigard	$161,000	Active Transportation Project Development	In progress
Westside Trail Bridge Design	Tualatin Hills Parks and Recreation District	$400,000	Active Transportation Project Development	Complete
Bike-Pedestrian Access through the Union Pacific Rail Bridge on 223rd Avenue	Multnomah County	$70,000	Active Transportation Project Development	In progress
Division Complete Street	City of Gresham	$100,000	Active Transportation Project Development	Complete

Willamette River Pedestrian-Bike Bridge Feasibility Study	Clackamas County	$306,000	Active Transportation Project Development	Complete
I-5 Bike-Pedestrian Overcrossing: SW Barber-SW Town Center Loop	City of Wilsonville	$1,550,000	Other RFFA Fund Exchange	Complete
Main Street Phase 2: Rail Corridor-Scoffins	City of Tigard	$533,000	Other RFFA Fund Exchange	In progress
Herman Road Walking and Bicycling Improvements	City of Tualatin	$625,000	Other RFFA Fund Exchange	In progress
Better Bus – NE/SE Martin Luther King Boulevard Rose Lane	City of Portland	$4,646,372	Other RFFA Fund Exchange	Complete
Better Bus – NE Grand Avenue Rose Lane	City of Portland		Other RFFA Fund Exchange	Complete
Better Bus – SE Hawthorne Rose Lane	City of Portland		Other RFFA Fund Exchange	Complete
SW/NW Broadway Pedestrian and Bicycle Safety	City of Portland		Other RFFA Fund Exchange	In progress

2022-23 Unified Planning Work Program

TPAC Workshop, March 9, 2022

John Mermin, Senior Transportation Planner

What is the UPWP

- Annual federally-required document that ensures efficient use of federal planning funds
- Describes:
  - Transportation planning tasks
  - Relationship to other planning activities in the region
  - Budget summaries

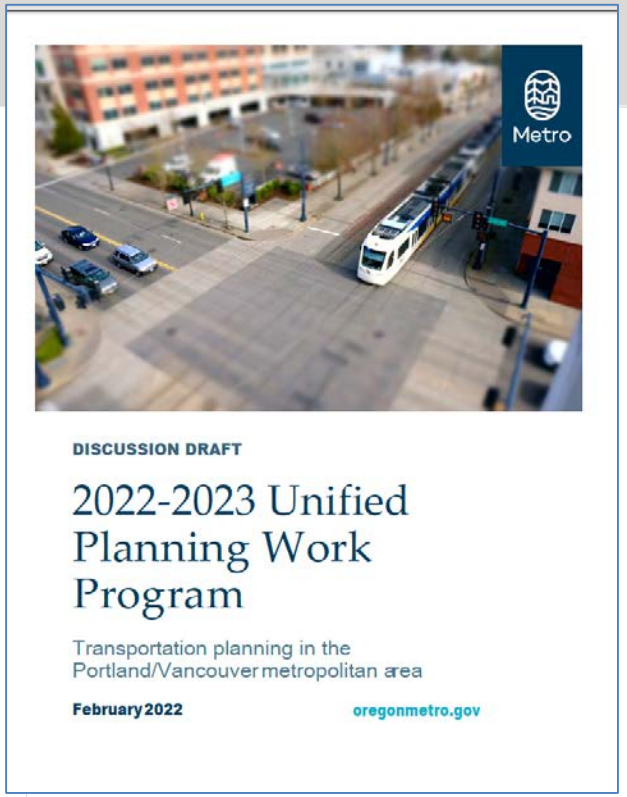
What the UPWP isn't

- Not a regional policy making document
- Not a funding decision document, does not allocate funds
- No construction, design, or preliminary engineering
- Only includes transportation planning projects, federal funds, coming fiscal year

Document Organization

Introduction

1. Regional Planning
2. Corridor / Area planning
3. Administration & Support
4. State Planning of Regional Significance
5. Local Planning of Regional Significance



What are we asking you to do before April 1 action?

- Look for opportunities for projects to be better coordinated
- Look for ways to add clarity to project narratives
- Identify any missing information in the project narratives
- Identify missing project narratives

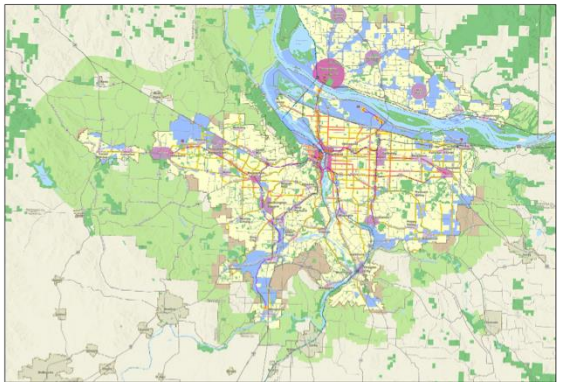
Next Steps

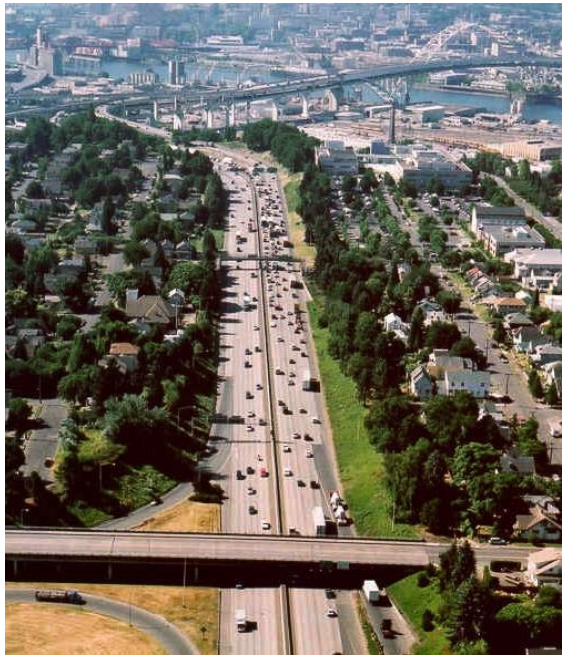
- April 1 TPAC Action
- April 19 Metro Council
- April 21 JPACT
- May 19 JPACT Action
- May 19 Metro Council Action
- May 20 Submit to USDOT & ODOT
- June 30 IGA signed by Metro COO

Questions?

Regional mobility policy update

TPAC Workshop
March 9, 2022





Metro

Oregon Department of Transportation

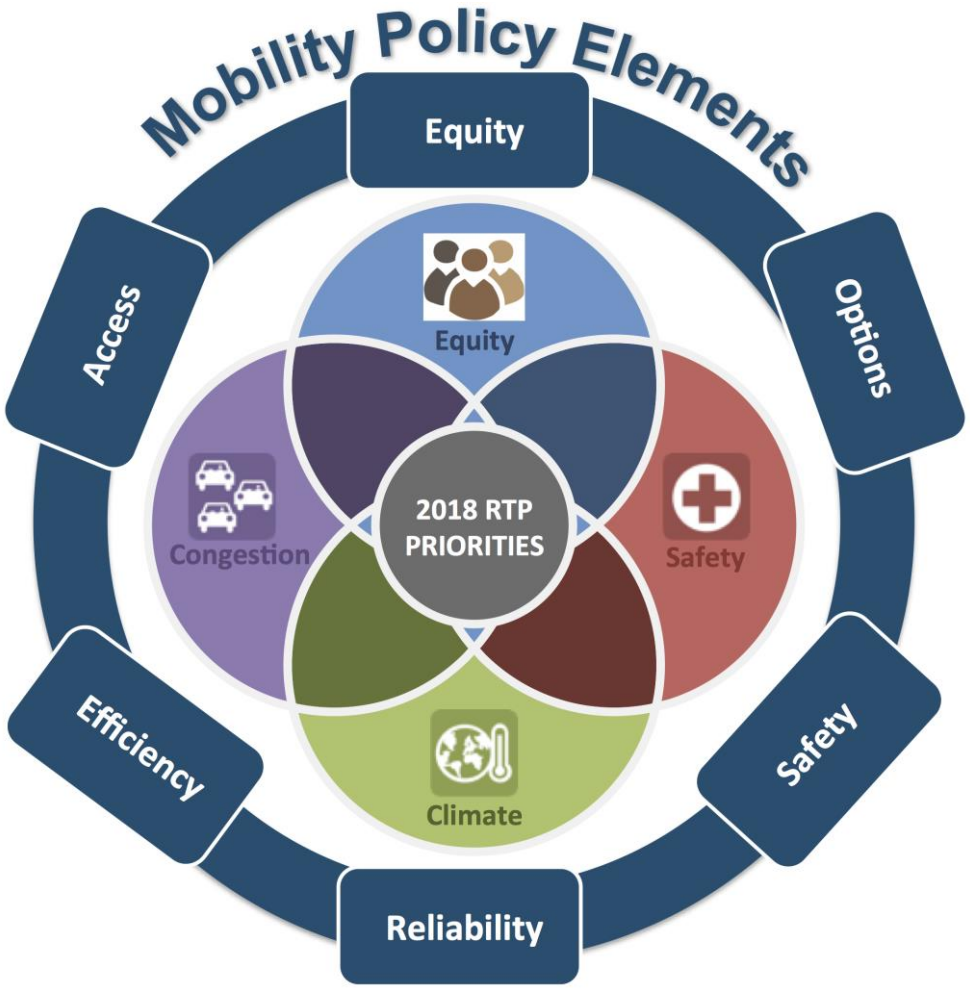
Today's purpose

Brief recap of:

- mobility elements
- draft mobility policies
- draft mobility measures

Continue discussion and feedback on draft mobility measures

DRAFT Vision for urban mobility for the Portland area: *People and businesses can safely, affordably, and efficiently reach the goods, services, places and opportunities they need to thrive by a variety of seamless and well-connected travel options and services that are welcoming, convenient, comfortable, and reliable.*



Mobility **elements**

Equity
Black, Indigenous and people of color (BIPOC) community members and people with low incomes, youth, older adults, people living with disabilities and other historically marginalized and underserved communities experience equitable mobility.

Access
People and businesses can conveniently and affordably reach the goods, services, places and opportunities they need to thrive.

Efficiency
People and businesses efficiently use the public's investment in our transportation system to travel where they need to go.

Reliability
People and businesses can count on the transportation system to travel where they need to go reliably and in a reasonable amount of time.

Safety
People are able to travel safely and comfortably and feel welcome.

Options
People and businesses can choose from a variety of seamless and well-connected travel modes and services that easily get them where they need to go.

Potential application of the measures tested

System Planning

- Apply as target in planning
- Define the planned complete transportation system
- Set standards based on what the plan achieves

Plan Amendments

- Identify if there is a measurable change in performance
- Compare to standard
- Identify mitigations

Draft mobility policies for the Portland region

1. Ensure that the public's investment in the transportation system enhances efficiency in how people and goods travel to where they need to go.
2. Provide people and businesses a variety of seamless and well-connected travel modes and services that increase connectivity, increase choices and access to low carbon transportation options so that people and businesses can conveniently and affordably reach the goods, services, places and opportunities they need to thrive.
3. Create a reliable transportation system, one that people and businesses can count on to reach destinations in a predictable and reasonable amount of time.
4. Prioritize the safety and comfort of travelers in all modes when planning and implementing mobility solutions.
5. Prioritize investments that ensure that Black, Indigenous and people of color (BIPOC) community members and people with low incomes, youth, older adults, people living with disabilities and other historically marginalized and underserved communities experience equitable mobility.

Draft recommended measures for the updated mobility policy

Measure Criteria Summary:

- Cover all aspects of the policy elements and be specific, discrete, not overlapping
- Applicable to multiple applications (e.g., different scales and time periods)
- At least one "on the ground" facility-based measure

Draft Recommended Measures:

- **Multi-modal Measure – System completeness**
  - Supports equity, safety, expanded travel options
- **Congestion Measure – Travel speed**
  - Supports reliability, access by vehicle and for longer distance trips
- **Efficiency Measure – VMT per capita**
  - Supports climate goals, efficient land use patterns, reduced vehicle travel, expanded travel options

Draft Recommended Measures:

- System Completeness (all modes)
- Travel Speed (w/ queuing and hours of congestion)
- VMT/Capita (home-based trips)

Draft recommended measures for the updated mobility policy

Measure	What does it tell us?
System Completeness	• Are there travel options and connectivity allowing people to safely walk, bike, drive and take transit to get where they need to go?
Travel Speed (including duration of congestion and queuing)	• Does the facility function reliably and safely for people, goods and services?
VMT/Capita	• Are we moving towards a land use pattern that is more efficient to serve and supportive of travel options?

System Completeness
(all modes)

Scale for Application	Potential Applications
Plan Area and Equity Focus Areas	• Identify needs • Definition of "complete" would be defined through system planning and could include: -network connectivity -future number of through travel lanes -policy on turn lanes -type of bicycle facility -target pedestrian crossing spacing -TSMO/TDM elements

Travel Speed
(including duration of congestion and queuing)

Scale for Application	Potential Applications

Facility level for throughways
 	
Facility level for arterials (could exclude arterials in 2040 centers or all urban area)
	• Identify needs
	• Determine facility sizing consistent with planned system
	  • addressing motor vehicle congestion through additional roadway capacity should follow the region's congestion management process and OHP Policy 1G on ODOT roadways
	  • addressing congestion should not come at the expense of achieving system completeness for non-motorized modes consistent with regional design classifications

VMT/Capita
(for home-based trips)

Scale for Application	Potential Applications

Plan Area or Jurisdiction Level	• Assess if land use and transportation plan changes are working in tandem to reduce reliance on vehicle travel
	  • reduced need to drive
	  • improved viability of using other and more efficient modes of travel than the automobile
	  • preserving roadway capacity for transit, freight and goods movement
	• Amendments that increase vmt/capita vs decrease vmt/capita could have different analysis and mitigation requirements associated with the other metrics

Key Questions from Feb. 16 TPAC/MTAC workshop

Why travel speed vs travel time?

What people and trips are included and excluded in VMT/capita?

Travel Speed vs. Travel Time

- Travel Speed and Travel Time are related. Travel Time considers the travel distance and the travel speed.
- Travel Speed is calculated at the link level and can be applied at all scales; Travel Time requires specified origin-destination pairs to calculate.
- Travel Speed is recommended as ODOT needs a facility-based metric to assess their facilities. Travel Time between O-D pairs may cover multiple facilities and multiple jurisdictions.
- Travel Time could be used in scenario planning and alternatives analyses.

VMT/Capita

- VMT/Capita for home-based trips
  - Assesses the amount of vehicle travel generated at the household level
  - Can be used to compare how location of growth and land use mixes impact amount of vehicle travel generated at the household level
- Potential use to determine if a plan amendment has “significant impact”, which would depend on the local jurisdiction VMT/capita baseline and the scale and type of amendment
  - Does the amendment reduce household vehicle travel compared to another location?

Discussion on draft recommended multimodal measure

Multimodal Measure

- Do you support system completeness being included as a measure in the mobility policy?
- What elements should be included?
  - network connectivity
  - number of through travel lanes
  - policy on turn lanes
  - type of bicycle facility
  - target pedestrian crossing spacing
  - TSMO/TDM elements
- How would you like to see it informing decision making?

Discussion on draft recommended congestion measure

Congestion Measure

- Do you support vehicle congestion being included as a measure in the mobility policy?
- Do you support travel speed being included as the congestion measure for throughways in the mobility policy?
- Do you support travel speed as the congestion measure for arterials in the mobility policy?
  - Should a travel speed measure apply to arterials outside of 2040 centers only?
- How would you like to see it informing decision making?

Discussion on draft recommended land use and transportation efficiency measure

Land Use and Transportation Efficiency Measure

- Do you support including household based VMT per capita in the mobility policy?
- How would you like to see it informing decision making?

Discussion and feedback on draft recommended mobility measures

Do you support including a multi-modal, congestion, and efficiency measure in the mobility policy?

Do you support using System Completeness, Travel Speed, and VMT/Capita as those measures?

What additional information do you need about these measure?

Next steps on draft mobility policy and measures

April 7	Practitioner Forum (with breakouts) 2-4 PM, planning directors invited
April 20	TPAC/MTAC workshop
May 6	TPAC
May 17	Metro Council
May 18	MTAC
May 19	JPACT
May 25	MPAC
June 6	Region 1 ACT
June/July	Expert panel with policymakers, on-line survey and target setting discussions with regional advisory committees

Learn more at:

oregonmetro.gov/mobility

Metro

Oregon Department of Transportation

oregonmetro.gov /mobility

Draft Mobility Policy 1

Recommended Measure:

-VMT/Capita

1: Ensure that the public's investment in the transportation system enhances efficiency in how people and goods travel to where they need to go.

- Option 1A: Incorporate vmt/capita reduction targets into the policy to ensure that land use decisions and transportation system plans support efficient transportation systems and reduced travel demand.

Draft Mobility Policy 2

Potential Measures:

-Access to Destinations

-System Completeness *(recommended)*

2: Provide people and businesses a variety of seamless and well-connected travel modes and services that increase connectivity, increase choices and access to low carbon transportation options so that people and businesses can conveniently and affordably reach the goods, services, places and opportunities they need to thrive.

- Option 2A: Incorporate “system completeness” targets into the policy to identify needs and ensure that the planned transportation system is increasing in connectivity and safety of the multimodal network. The definition of complete will vary based on the modal functional classification and design classification and can be refined by facility in system plans. (Case studies support system completeness for all levels of planning)

- Option 2B: Incorporate “access to destinations” metrics into the policy to identify disparities in access to destinations across modes and identify transportation and land use strategies to increase access to destinations. (Case studies indicate this is challenging other than at the system planning level)

Draft Mobility Policy 3

Potential Measures:

-V/C Ratio

-Travel Speed *(recommended)*

-Off-Ramp Queues *(recommended)*

-Hours of Congestion *(potential component)*

3: Create a reliable transportation system, one that people and businesses can count on to reach destinations in a predictable and reasonable amount of time.

- Option 3A: Incorporate congestion targets into the mobility policy for throughways. Note all options for throughways would include a target for **off-ramp queues** to minimize queue spillback into through lanes. Incorporate **hours of congestion.**

- Option 3B: Include link level congestion targets in the mobility policy for all arterials to identify mobility needs and inform decisions on the number of lanes that will be considered complete for the vehicle mode. Targets would vary based on modal classifications and land use context.

Draft Mobility Policy 3 cont.

3: Create a reliable transportation system, one that people and businesses can count on to reach destinations in a predictable and reasonable amount of time.

- Option 3C: Include link level congestion targets in the mobility policy for arterials outside of 2040 centers, station communities and main streets to identify mobility needs and inform decisions on the number of lanes that will be considered complete for the vehicle mode. Targets would vary based on modal classifications and land use context.

- Option 3D: Do not include congestion targets in the mobility policy for arterials (congestion metrics can be used as diagnostic tools to support system planning). Could make exceptions for enhanced transit or high-capacity transit corridors and regional freight network routes.

Draft Mobility Policy 4

Potential Measures:

-System Completeness *(recommended)*

-Queuing *(recommended)*

-Pedestrian Crossing Index

-Bicycle Level of Traffic Stress

4: Prioritize the safety and comfort of travelers in all modes when planning and implementing mobility solutions.

- Option 4A: Incorporate “system completeness” target into the mobility policy to ensure safety and comfort for all modes. (Metric can be used to identify needs but the definition of “complete” would also be defined through system planning to define the future number of through lanes, policy on turn lanes, type of bicycle facility, target pedestrian crossing spacing, and TSMO/TDM plan elements)

- Option 4B: Incorporate “**queuing**” target into the mobility policy for Throughway ramp terminals to minimize queues spilling onto the Throughway creating safety issues.

Draft Mobility Policy 4 cont.

4: Prioritize the safety and comfort of travelers in all modes when planning and implementing mobility solutions.

- Option 4C: Incorporate “pedestrian crossing index” metric into the mobility policy to identify needs and inform facility level planning. (Setting target through the RMP not recommended but recommended that system and facility plans establish targets for each facility based on Livable Streets Guide and adjusting for local context.)

- Option 4D: Incorporate “bicycle level of traffic stress” metric into the mobility policy to identify needs and inform facility level planning. (Setting target not recommended but recommended that system plans identify the future low-stress bicycle networks and that be incorporated into the system completeness metric)

Draft Mobility Policy 5

Potential Measures:

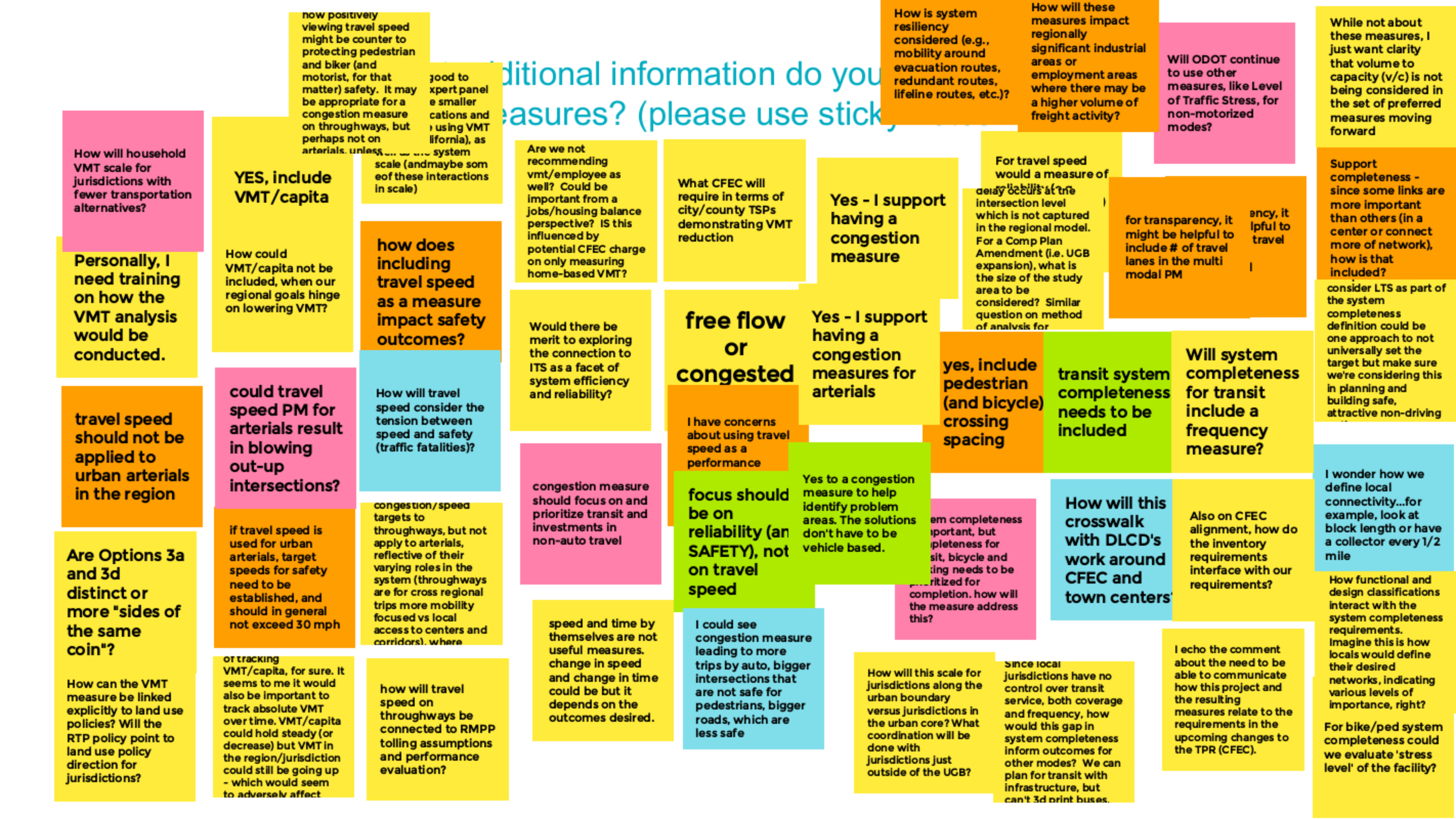
Compare EFA vs. Non-EFA Areas

-Access to Destinations (*recommended if included in the policy)*

-System Completeness *(recommended if included in the policy)*

5: Prioritize investments that ensure that Black, Indigenous and people of color (BIPOC) community members and people with low incomes, youth, older adults, people living with disabilities and other historically marginalized and underserved communities experience equitable mobility.

- Option 5A: Include targets for reducing disparities between “Equity Focus Areas" and “Non-Equity Focus Areas”. This would result in identification of needed investments to address disparities and prioritization of these investments.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YES, include VMT/capita
How could VMT/capita not be included, when our regional goals hinge on lowering VMT?
Personally, I need training on how the VMT analysis would be conducted.
how does including travel speed as a measure impact safety outcomes?
Are we not recommending vmt/employee as well? Could be important from a jobs/housing balance perspective? IS this influenced by potential CFEC charge on only measuring home-based VMT?
What CFEC will require in terms of city/county TSPs demonstrating VMT reduction
Yes - I support having a congestion measure
How is system resiliency considered (e.g., mobility around evacuation routes, redundant routes, lifeline routes, etc.)?
How will these measures impact regionally significant industrial areas or employment areas where there may be a higher volume of freight activity?
Will ODOT continue to use other measures, like Level of Traffic Stress, for non-motorized modes?
While not about these measures, I just want clarity that volume to capacity (v/c) is not being considered in the set of preferred measures moving forward
For travel speed would a measure of
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For a Comp Plan
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travel speed should not be applied to urban arterials in the region
could travel speed PM for arterials result in blowing out-up intersections?
How will travel speed consider the tension between speed and safety (traffic fatalities)?
Would there be merit to exploring the connection to ITS as a facet of system efficiency and reliability?
free flow or congested
I have concerns about using travel speed as a performance
Yes - I support having a congestion measures for arterials
yes, include pedestrian (and bicycle) crossing spacing
transit system completeness needs to be included
Will system completeness for transit include a frequency measure?
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focus should be on reliability (an
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How will this crosswalk with DLCD's work around CFEC and town centers'
Also on CFEC alignment, how do the inventory requirements interface with our requirements?
I wonder how we define local connectivity...for example, look at block length or have a collector every 1/2 mile
How functional and design classifications interact with the system completeness requirements. Imagine this is how locals would define their desired networks, indicating various levels of importance, right?
Are Options 3a and 3d distinct or more "sides of the same coin"?
How can the VMT measure be linked explicitly to land use policies? Will the RTP policy point to land use policy direction for jurisdictions?
if travel speed is used for urban arterials, target speeds for safety need to be established, and should in general not exceed 30 mph
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speed and time by themselves are not useful measures. change in speed and change in time could be but it depends on the outcomes desired.
I could see congestion measure leading to more trips by auto, bigger intersections that are not safe for pedestrians, bigger roads, which are less safe
How will this scale for jurisdictions along the urban boundary versus jurisdictions in the urban core? What coordination will be done with jurisdictions just outside of the UGB?
Since local
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service, both coverage
and frequency, how
would this gap in
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plan for transit with
infrastructure, but
can't 3d print buses.
I echo the comment about the need to be able to communicate how this project and the resulting measures relate to the requirements in the upcoming changes to the TPR (CFEC).
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- which would seem
to adversely affect
how will travel speed on throughways be connected to RMPP tolling assumptions and performance evaluation?
For bike/ped system completeness could we evaluate 'stress level' of the facility?

Land use and transportation (VMT)

1. How will household VMT scale for jurisdictions with fewer transportation alternatives?
2. Personally, I need training on how the VMT analysis would be conducted.
3. travel speed should not be applied to urban arterials in the region
4. Are Options 3a and 3d distinct or more "sides of the same coin"?
5. How can the VMT measure be linked explicitly to land use policies? Will the RTP policy point to land use policy direction for jurisdictions?
6. YES, include VMT/capita'
7. How could VMT/capita not be included, when our regional goals hinge on lowering VMT?
8. could travel speed PM for arterials result in blowing out-up intersections?
9. if travel speed is used for urban arterials, target speeds for safety need to be established, and should in general not exceed 30 mph
10. VMT/capita, for sure. It seems to me it would also be important to track absolute VMT over time.
11. VMT/capita could hold steady (or decrease) but VMT in the region/jurisdiction could still be going up - which would seem to adversely affect mobility (and air quality/public health).
12. From Karen Williams, DEQ: Regarding the congestion measure, particularly travel speed on arterials - one concern I have is how positively viewing travel speed might be counter to protecting pedestrian and biker (and motorist, for that matter) safety. It may be appropriate for a congestion measure on throughways, but perhaps not on arterials, unless conveyed in the context of motor vehicle involved pedestrian/biker serious injury/fatalities.
13. Would be good to have the expert panel address the smaller scale applications and experience using VMT (e.g., in California), as well as the system scale (and maybe som eof these interactions in scale)
14. Are we not recommending vmt/employee as well? Could be important from a jobs/housing balance perspective? IS this influenced by potential CFEC charge on only measuring home-based VMT?
15. What CFEC will require in terms of city/county TSPs demonstrating VMT reduction

Congestion measure/Travel Time

16. how does including travel speed as a measure impact safety outcomes?
17. How will travel speed consider the tension between speed and safety (traffic fatalities)?
18. I would support limiting congestion/speed targets to throughways, but not apply to arterials, reflective of their varying roles in the system (throughways are for cross regional trips more mobility focused vs local access to centers and corridors), where safety and options are more important
19. how will travel speed on throughways be connected to RMPP tolling assumptions and performance evaluation
20. Would there be merit to exploring the connection to ITS as a facet of system efficiency and reliability?
21. congestion measure should focus on and prioritize transit and investments in non-auto travel
22. speed and time by themselves are not useful measures. change in speed and change in time could be but it depends on the outcomes desired.
23. free flow or congested speed?

24. I have concerns about using travel speed as a performance measure on urban arterials.
25. focus should be on reliability (and SAFETY), not on travel speed
26. I could see congestion measure leading to more trips by auto, bigger intersections that are not safe for pedestrians, bigger roads, which are less safe
27. Yes - I support having a congestion measure
28. Yes - I support having a congestion measures for arterials
29. Yes to a congestion measure to help identify problem areas. The solutions don't have to be vehicle based.
30. For travel speed would a measure of reliability (e.g., standard deviation) be more important than absolute speed?
31. How would travel speed and travel time be calculated? Most delay occurs at the intersection level which is not captured in the regional model. For a Comp Plan Amendment (i.e. UGB expansion), what is the size of the study area to be considered? Similar question on method of analysis for VMT/capita. What tool is to be used and over what area?

Multimodal measure

32. yes, include pedestrian (and bicycle) crossing spacing
33. transit system completeness needs to be included
34. system completeness is important, but completeness for transit, bicycle and walking needs to be prioritized for completion. how will the measure address this?
35. How will this scale for jurisdictions along the urban boundary versus jurisdictions in the urban core? What coordination will be done with jurisdictions just outside of the UGB?
36. Since local jurisdictions have no control over transit service, both coverage and frequency, how would this gap in system completeness inform outcomes for other modes? We can plan for transit with infrastructure, but can't 3d print buses.
37. How will this crosswalk with DLCD's work around CFEC and town centers?
38. How will these measures impact regionally significant industrial areas or employment areas where there may be a higher volume of freight activity?
39. How will this crosswalk with DLCD's work around CFEC and town centers?
40. Also on CFEC alignment, how do the inventory requirements interface with our requirements?
41. I echo the comment about the need to be able to communicate how this project and the resulting measures relate to the requirements in the upcoming changes to the TPR (CFEC).
42. Will system completeness for transit include a frequency measure?
43. for transparency, it might be helpful to include # of travel lanes in the multi modal PM
44. for transparency, it might be helpful to include # of travel lanes in the multi-modal measure
45. Support completeness - since some links are more important than others (in a center or connect more of network), how is that included?
46. A requirement to consider LTS as part of the system completeness definition could be one approach to not universally set the target but make sure we're considering this in planning and building safe, attractive non-driving options
47. I wonder how we define local connectivity...for example, look at block length or have a collector every 1/2 mile

48. How functional and design classifications interact with the system completeness requirements. Imagine this is how locals would define their desired networks, indicating various levels of importance, right?
49. For bike/ped system completeness could we evaluate 'stress level' of the facility?

Overall comments

1. How is system resiliency considered (e.g., mobility around evacuation routes, redundant routes, lifeline routes, etc.)?
2. How will these measures impact regionally significant industrial areas or employment areas where there may be a higher volume of freight activity?
3. Will ODOT continue to use other measures, like Level of Traffic Stress, for non-motorized modes?
4. While not about these measures, I just want clarity that volume to capacity (v/c) is not being considered in the set of preferred measures moving forward

Polls from TPAC March 9, 2022 workshop meeting

Polls:

Do you support including a multi-modal congestion and efficiency measure in the regional mobility policy: (16 responses total)

Yes: 56%

No: 6%

Unsure: 38%

Do you support using system completeness, travel speed, and VMT capita as those measures (19 responses total)

Yes: 37%

No: 5%

Unsure: 58%

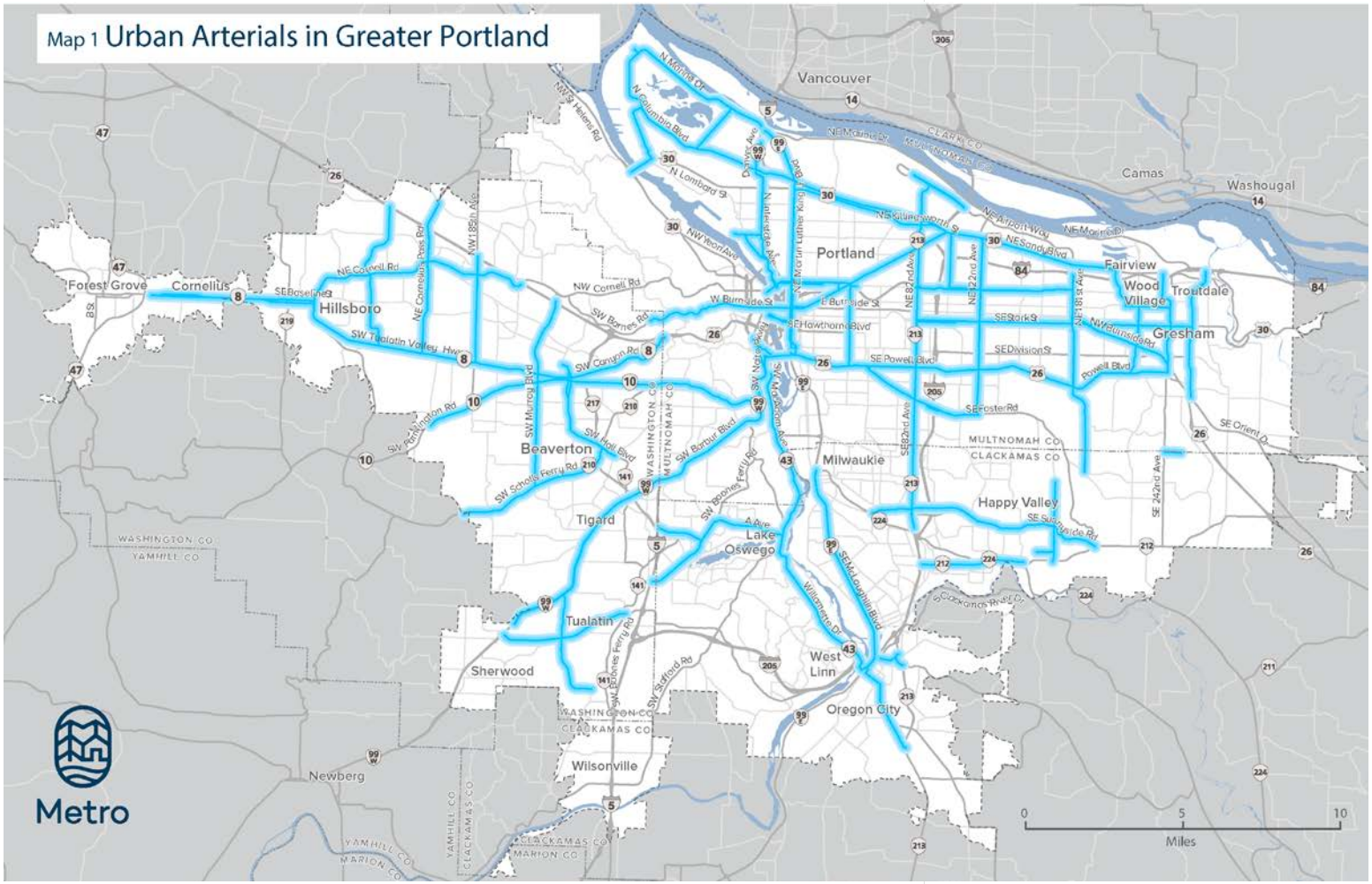
Safe and Healthy Urban Arterials – 2023 RTP Policy Brief

TPAC Workshop, March 9, 2022

John Mermin, Metro

Lake McTighe, Metro

Introduction



Why is a strategy needed?

- Land use / Economic Development
- Equity
- Safety
- Mobility (especially for transit)

SW Barbur Blvd

Photo credit: oregonlive.com

Why is a strategy needed cont'd

Land Use / Economic Development

- People live, work play along them
- Current conditions create barriers to economic development

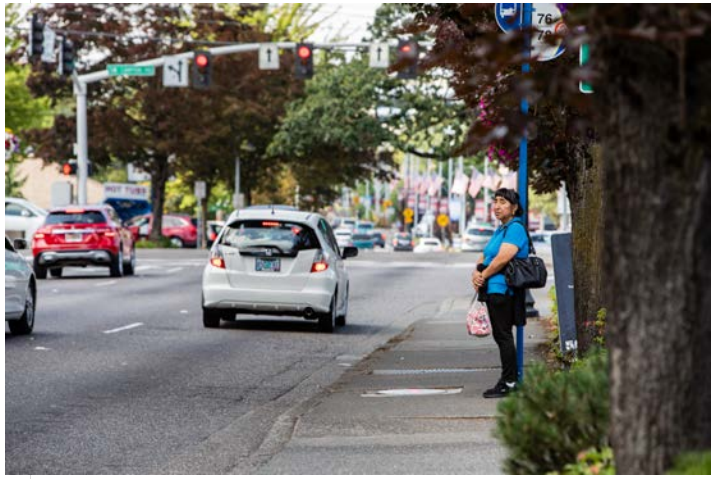
82nd Avenue

Photo credit: City of Portland

Why is a strategy needed? cont'd

Equity

- Communities of Color and low income more likely to live and travel there
- These roads contribute to unhealthy air, heat islands, noise pollution



SW Hall

Photo credit: Metro

Why is a strategy needed? Cont'd

Mobility (especially for transit)

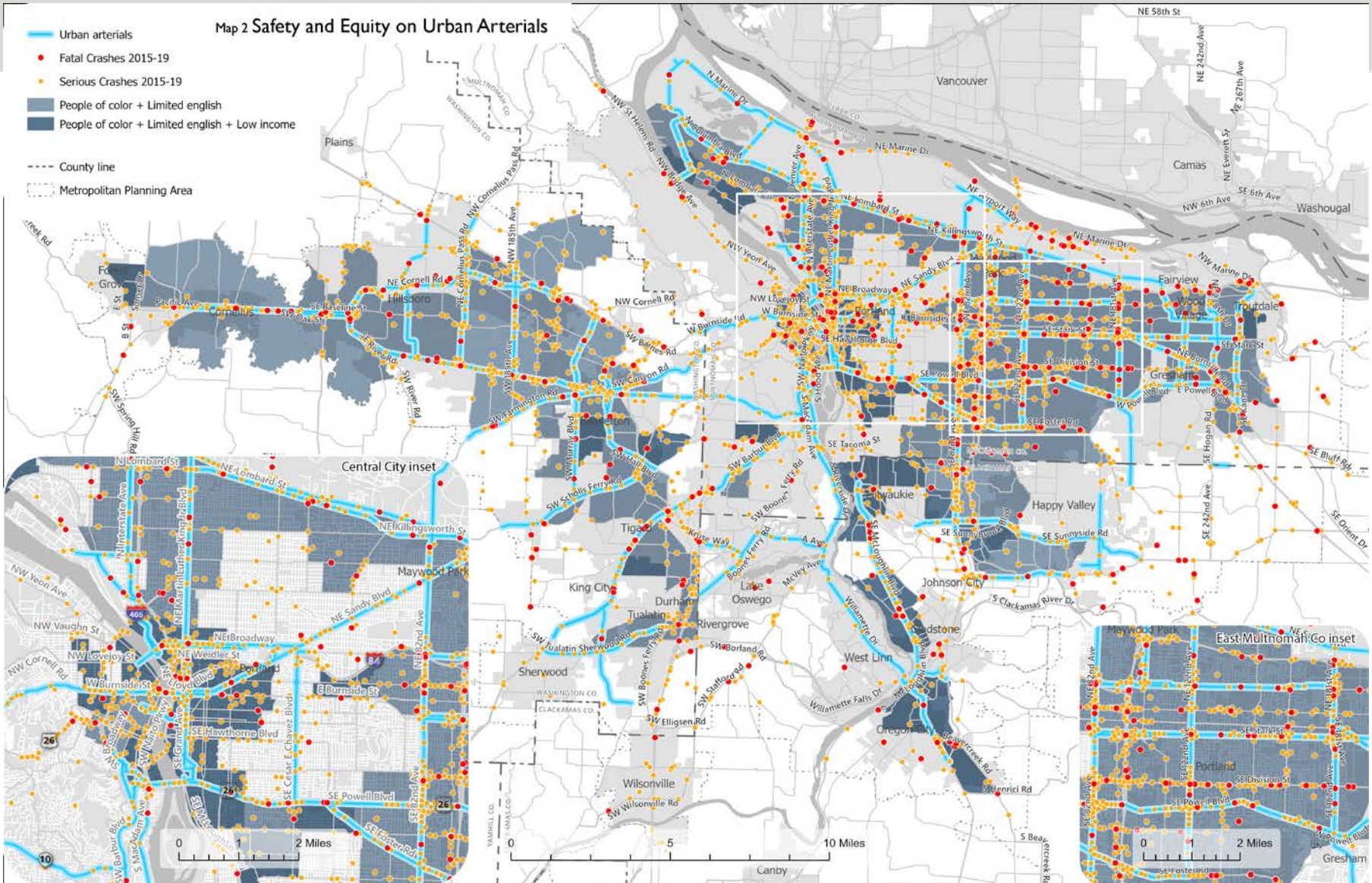
- They provide mobility to thousands of people in Portland region daily
- Highest bus ridership in the region on them
- Nearly all are frequent bus routes, but many lack dedicated right of way for needed for efficient service

Why is a strategy needed? Cont'd

Safety

- Disproportionate number of serious and fatal crashes of all modes, especially walk / bike
  - Urban arterials account for 5 percent of roadway miles in the region, yet 41 percent of traffic fatalities and serious injuries occur on urban arterials
  - 50% of fatal bicycle crashes and 49% of fatal pedestrian crashes occur on urban arterials.

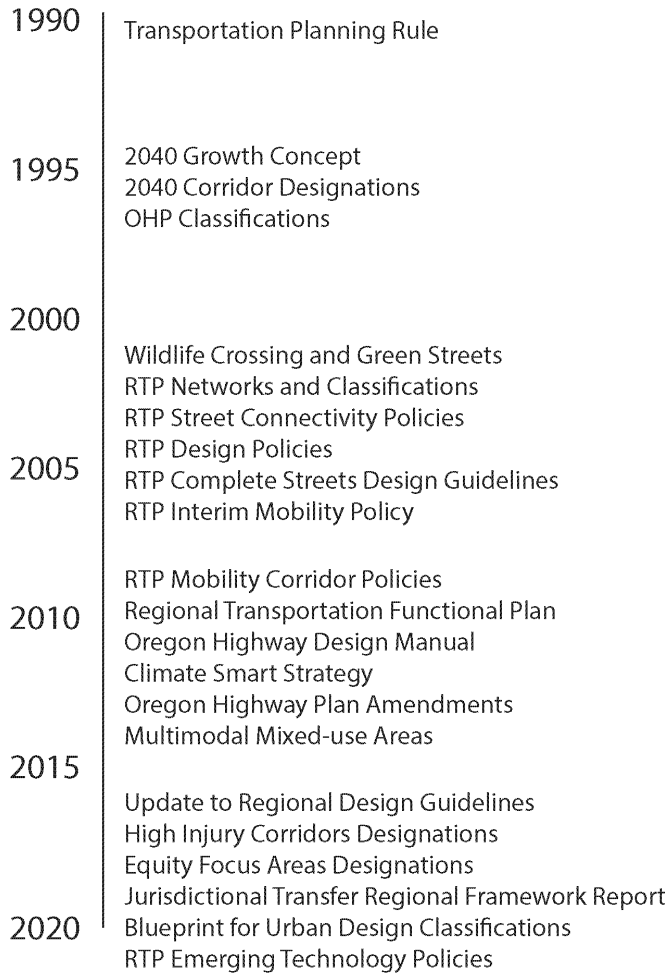
Why is a strategy needed?



Why now?

- Foundational policies over last 30 years for connectivity, design and complete streets.
- In spite of this, we still lack a complete network of safe & healthy urban arterials

Chart 1 History of Arterial Roadway Policy (1990s to present)



Challenges

- Ongoing challenges in bringing **funding** to urban arterials
- Ongoing challenges to achieving multimodal **designs**

NE Hogan Drive

Photo credit: Metro

Challenges cont'd

Funding

1. Needs are greater than available funding
2. Lack of dedicated funding and coordinated investments
3. Lack of identified or prioritized projects to address equity, gaps and deficiencies

TV Highway, Forest Grove

Photo credit: Metro

Challenges cont'd

Policy / Design

1. Outdated functional purpose of state-owned urban arterials
2. Motor vehicle throughput prioritized over other functions
3. Planned land use not guiding design
4. Gaps in data

NE Cornell Road

Photo credit: Metro

What's needed to move forward? (Funding)

Challenge	Recommended Actions for Urban Arterials
1. Needs are greater than available funding	Seek funding for arterials from new Federal grant programs, including RISE, PROTECT program for resiliency to support Emergency Transportation Route (ETR) function of urban arterials; and new funding for wildlife crossings, and green infrastructure Seek new funding source to support maintenance of locally owned roads to free up revenues to be spent on capital projects for urban arterials Create RTP or MTIP funding incentive for developing local revenue sources
2. Lack of dedicated funding and coordinated investments	Develop a dedicated funding source for urban arterials Develop a pipeline of transit projects for FTA funding urban arterials for corridor-wide improvements Coordinate projects in RTP updates for transformative corridor wide improvements on urban arterials (ensuring comprehensive and coordinated projects)

What's needed to move forward? (Funding Cont'd)

Challenge	Recommended Actions for Urban Arterials
3. Lack of identified or prioritized projects to address equity, gaps and deficiencies	Prioritize 2023 RTP revenues for transit (BRT/dedicated ROW), complete streets and safety investments in urban arterials within Equity Focus Areas Add all urban arterial projects from the 2020 Regional Investment Measure (RIM) to the 2023 RTP Require sidewalk, transit and bikeway gaps be filled before other improvements are made Ensure projects to improve safety and transit and fill all gaps on all urban arterials are included in the 2023 RTP Make Equity Focus Areas a criterion of RFFA funding Identify priority ETR, green infrastructure and wildlife crossing projects on urban arterials and add projects to the 2023 RTP

What's needed to move forward? (Policy / Design)

Challenge	Recommended Actions for Urban Arterials
1. Outdated functional purpose of state-owned urban arterials.	Update OHP and RTP roadway classifications to reflect recommendations from consultant in the Highway Jurisdictional Transfer study Identify the next corridor(s) for jurisdictional transfer Form working group, led by Metro and ODOT staff to keep Jurisdictional Transfer discussions alive
2. Motor-vehicle throughput prioritized over other roadway functions	Update Regional Mobility Policy that reflects comprehensive set of shared values, goals and desired outcomes Establish modal hierarchy in 2023 RTP (implementing motor vehicle policy where biking and walking are prioritized on arterials) Apply outcomes and performance based decision-making process in the planning and design of projects Revise RTP policies to reflect relevant urban arterials work completed since 2018 RTP update (Jurisdictional Transfer study, Livable streets / outcomes based design, safety)

What's needed to move forward? (Policy / Design Cont'd)

Challenge	Recommended Actions for Urban Arterials
3. Planned land use not guiding design	Allow local design standards on state owned arterials – reference recent USDOT rulemaking allowing for more flexibility in design.
4. Gaps in data	Identify resources to update the regional network with missing data, including locations of driveways, deficient sidewalks

For Today's discussion

- Do you have general feedback on the Policy Brief?
- Do you have feedback on the recommended actions in section 4 ?

Lombard

Photo credit: Metro