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Metro | *Agenda*

Meeting: Metro Technical Advisory Committee

Date: Wednesday, April 3, 2013

Time: 10 a.m. – 12 p.m.

Place: Metro Regional Center, Council Chamber

Time	Agenda Item	Action Requested	Presenter(s)	Materials
10 a.m.	**CALL TO ORDER / ANNOUNCEMENTS**	Information	Ray Valone, Chair	In packet
10:10 a.m.	**Climate Smart Communities Scenarios Health Impact Assessment** *Objective: MTAC members understand public health impacts of strategies tested in Phase 1 and how the HIA findings and recommendations shape evaluation of scenarios moving forward*	Information / Discussion	Kim Ellis and Andrea Hamberg, Oregon Health Authority	In packet
10:45 a.m.	**Climate Smart Communities Scenarios Evaluation Update** *Objective: MTAC members provide input on draft scenarios assumptions and evaluation of scenarios* *MTAC will be requested to make a recommendation to MPAC on moving forward with the evaluation at the May 1st committee meeting*	Discussion	Kim Ellis	In packet
11:35 a.m.	**2035 Regional Transportation Amendments** *Objective: Inform MTAC of proposed amendments to the 2035 RTP*	Information	John Mermin	In packet
12:00 p.m.	**ADJOURN**			

MTAC meets on the 1st & 3rd Wednesday of the month. **The next meeting is scheduled for April 17, 2013.**

For agenda and schedule information, contact Alexandra Eldridge: 503-797-1839, Alexandra.Eldridge@oregonmetro.gov.
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2012 Compliance Report

Metro Code Chapter 3.07 Urban Growth Management Functional Plan

and

Metro Code Chapter 3.08 Regional Transportation Functional Plan

March 2013

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

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EXECUTIVE SUMMARY

Metro's Urban Growth Boundary Management Functional Plan provides tools and guidance for local jurisdictions to implement regional policies and achieve the goals set out in the region's 2040 Growth Concept. The 2012 Compliance Report summarizes the status of compliance for each city and county in the region with the Metro Code requirements included in the Urban Growth Management Functional Plan and the Regional Transportation Functional Plan. Every city and county in the region is required, if necessary, to change their comprehensive plans or land use regulations to come into compliance with Metro Code requirements within two years of acknowledgement by the Oregon Land Conservation and Development Commission and to remain in compliance. The information in this report confirms the strong partnerships at work in this region to implement regional and local plans.

In 2012, most local governments that had outstanding compliance issues requested and were granted extensions of their compliance deadlines for Urban Growth Management Functional Plan requirements. Beaverton and Tigard took over West Bull Mountain and River Terrace planning, respectively, from Washington County putting Washington County into compliance and leaving Beaverton and Tigard not in compliance.

Ten jurisdictions originally requested deadlines of December 31, 2012 for meeting the requirements of the Regional Transportation Functional Plan. As described below and in Appendix D, four of these jurisdictions have requested extensions until 2013. Five have requested extensions to 2014. All nine jurisdictions were found to meet one of the two criteria: 1) the city or county is making progress towards compliance; or 2) there is good cause for failure to meet the deadline for compliance. Thus all nine of these extensions were granted by Metro's Chief Operating Officer.

The City of Oregon City is the only jurisdiction with a 2012 deadline that did not request an extension. While technically out of compliance, the City has made significant progress with its Transportation System Plan and is nearing completion.

In 2012, four jurisdictions requested exemption from the Regional Transportation Functional Plan. All four jurisdictions were found to meet the criteria for exemption.

Metro Code Chapter 3.07 Urban Growth Management Functional Plan and Metro Code Chapter 3.08 Regional Transportation Functional Plan – March 2012

Introduction

Metro Code 3.07.870 requires the Chief Operating Officer to submit the status of compliance by cities and counties with the requirements of the Metro Code Chapter 3.07 (Urban Growth Management Functional Plan) annually to the Metro Council. In an effort to better integrate land use and transportation requirements, this compliance report includes information on local government compliance with the Regional Transportation Functional Plan (Metro Code Chapter 3.08) as well as the Urban Growth Management Functional Plan (UGMFP).

On December 16, 2010 the Metro Council adopted Ordinance No. 10-1244B which amended several Urban Growth Management Functional Plan titles. The Land Conservation and Development Commission (LCDC) acknowledged components of the ordinance including changes to the UGMFP in December 2012.

Overview

Per the Metro Code, the Chief Operating Officer (COO) may grant an extension request if a local government meets one of two criteria: 1) the city or county is making progress towards compliance; or 2) there is good cause for failure to meet the deadline for compliance. Currently, a decision by the Land Use Board of Appeals (LUBA) is pending for Spring 2013 regarding Lake Oswego and Title 13.

By statute, cities and counties have two years following the date of acknowledgement of Metro's Regional Transportation Plan (RTP) dated November 24, 2011 to bring their Transportation System Plans (TSPs) into compliance with any new or changed regional requirements. However, Metro exercised its authority under the state's Transportation Planning Rule to extend city and county deadlines beyond the two-year statutory deadline. Metro consulted with each city and county to determine a reasonable timeline for this work and adopted a schedule that is part of the RTP Appendix. The deadlines are phased to take advantage of funding opportunities and the availability of local and Metro staff resources.

Appendix A summarizes the compliance status for all local governments with the requirements of the Urban Growth Management Functional Plan (UGMFP) by the end of 2012.

Appendix B shows the status of Title 11 new urban area planning for areas added to the Urban Growth Boundary (UGB) since 1998.

Appendix C summarizes the compliance dates for each UGMFP title.

Appendix D summarizes the compliance dates for the Regional Transportation Functional Plan (RTFP) in effect as of December 31, 2012.

Appendix E is the Annual Report on Amendments to the Employment and Industrial Areas Map dated January 10, 2013.

Urban Growth Management Functional Plan Compliance Status

Lake Oswego: The City of Lake Oswego's removal of their Resource Conservation overlay protections from certain "isolated tree groves" was in violation of Title 13 protections. Metro filed an appeal with the Land Use Board of Appeals (LUBA) regarding the approval of these comprehensive plan and zoning code changes. The parties to the LUBA appeal have agreed to another 60-day extension of the schedule, which set the date for the city to submit the record to LUBA as February 15, 2013.

The City of Lake Oswego has proposed code changes to bring the city into compliance with Title 4. The first hearing was scheduled for the end of January 2013. Compliance with Title 4 is pending approval of these zoning code amendments.

Sherwood & Tualatin: Order No.74, Relating to the Request by the Cities of Tualatin and Sherwood to Extend the Time for Planning under Title 11 of the Urban Growth Management Functional Plan for the Area Known as Area 6 was issued August 20, 2012.

Tigard: Order No. 75, Relating to the Request by the City of Tigard to Extend the Timeline for Planning under Title 11 of the Urban Growth Management Functional Plan for the West Bull Mountain Concept Plan was issued September 11, 2012.

Regional Transportation Functional Plan Compliance Status

Ten jurisdictions originally requested deadlines of December 31, 2012 for meeting the requirements of the Regional Transportation Functional Plan (RTFP). As described below and in Appendix D, four of these jurisdictions have requested extensions until 2013. Five have requested extensions to 2014. All nine jurisdictions were found to meet one of the two criteria: 1) the city or county is making progress towards compliance; or 2) there is good cause for failure to meet the deadline for compliance. Therefore, all of the extensions requested were approved by the Chief Operating Officer.

Jurisdictions with 2012 deadlines that requested extensions until 2013

Clackamas County

Clackamas County has been in the process of updating its Transportation System Plan (TSP) since early 2011. The county began the process by laying the ground work for the update by developing a Transportation Framework which guided the TSP update project. Working with a 22-member public advisory committee (PAC), the Board of County Commissioners adopted the "Vision, Goals and Objectives" for the transportation system in April of 2012. The consulting team completed the existing conditions and future conditions review of the system in July of 2012. Presently, the county and the consulting team have worked with the PAC and other members of the public to confirm the full list of projects that will be needed over the next 20 years. Parallel to the work of identifying the needed projects, the county has been reviewing all of their transportation policies to ensure they implement the RTP as well as the vision, goals and objectives for Clackamas County's transportation system

Items that remain to be completed as of October 2012 include identification and finalization of a fiscally constrained project list, completion of review of policies, development of implementation language and adoption of comprehensive plan language changes.

It is anticipated that the recommendations from the PAC will be completed by June 2013 and final adoption of comprehensive plan changes will be done by December 2013. Clackamas County requested, and was granted, a revised deadline of December 31, 2013.

Milwaukie

In June 2012, the city contracted with DKS Associates to address many of the technical components of their TSP update project. The DKS scope of work includes revising the existing conditions and future forecasting chapters in the TSP, as well as updating the sections on future conditions and needs and the motor vehicle plan. DKS has delivered turn-movement counts at three key intersections as well as updates of various figures, tables, and text related to existing conditions and future forecasting.

The city is in the process of finalizing the overall scope of the TSP update project. City staff will incorporate the final DKS deliverables into the TSP and will make other updates to ensure that the TSP, zoning code, and comprehensive plan comply with the requirements of the RTFP. The target for adoption of the needed changes by the Milwaukie City Council is early June 2013. However, to allow for any unforeseen delays, the city requested, and was granted, an extension to December 31, 2013.

Tualatin

The City of Tualatin began their TSP update with a public involvement campaign designed by JLA Public Involvement consultants in Summer 2011. Staff and consultants set out to understand the community's concerns and vision for the city's transportation future. Throughout the summer of 2011, staff had a booth at the city's farmers' market and presented materials at several other community events and additionally had an online map on which they collected comments. The city hired a technical consultant, CH2M Hill in Fall 2011 and with the assistance of the consultant team, formed a task force comprised of citizens, city committee representatives, business representatives, elected officials and agency representatives. The task force began meeting in November of 2011. In Spring 2012, the city held an open house to initiate the working group meetings. Working groups were open to the public and focused on specific transportation topics such as Major Corridors and Intersections, Downtown, Transit, Industrial and Freight, Bicycle and Pedestrian, and Neighborhood Livability. The working groups met three to four times to generate ideas, evaluate, and prioritize projects between April and June 2012.

Starting November 2011, the technical team drafted an existing conditions report and plans and policies analysis. In January 2012, they produced a future conditions analysis and in the spring began developing and screening system options. The technical team presented all of their work to the task force for comments and feedback. Additionally, the Planning Commission, Tualatin Parks Advisory Committee and the City Council received updates and briefings.

As of September 2012, the technical team was drafting and refining project recommendations for the TSP. The project recommendations will come from the Task Force, City Council and the community engaging in decisions about the future of transportation in Tualatin. The city requested, and was granted, an extension until June

2013 to allow time for potential additional public meetings and conversations about what projects to include in the TSP.

Wilsonville

In 2010 the City applied for a Transportation Growth Management (TGM) grant to fund a project to update the city's TSP. The city was awarded an $185,000 grant, which the City matched with $50,000 in local funds. The project was delayed due to slow progress by contracting, but the project consultant DKS Associates began work on the project in May 2011.

Significant work has been completed by the project consultants, by city staff and with the community. Of the nine tasks identified in the scope of work, six will be completed by December 2012. Key accomplishments include completion of:

- Existing system inventory
- Needs analysis
- Funding analysis
- Safe Routes to School action plan
- Development and analysis of solutions alternatives
- Two public open houses
- Six technical advisory committee meetings
- Two city council briefings
- Several Planning Commission work sessions
- Draft Planned and Financially Constrained project lists

In 2013 the project team will complete the Planned and Financially Constrained project lists, draft the TSP document and implementing ordinances, and present the package to the Planning Commission and City Council for adoption. The project schedule is to complete these tasks by June 2013. The city requested August 30, 2013 as the revised deadline and was granted an extension until December 31, 2013.

<u>Jurisdictions with 2012 deadlines that requested extensions until 2014</u>

Fairview

The main reason that Fairview could not meet the 2012 deadline was due to budget. In the 2012-2013 fiscal year budget cycle, Fairview went from funding two full-time planning positions to funding one half-time planning position. Without the award of the TGM grant to provide funding for hiring a consultant to assist with the TSP update, Fairview needs additional time to either apply for another TGM grant, or to revise the planning work plan to accommodate the addition of the TSP update work requirement.

In the meantime, The City of Fairview has taken measures towards preparing a TSP Update including the following:

- Attended Metro sponsored workshops regarding elements of the RTFP affecting local TSP updates.
- Reviewed current TSP to identify needed areas of improvements/amendments.
- Applied for a TGM grant to assist with the cost of updating Fairview's TSP.

Unfortunately, Fairview was not awarded the TGM grant, and therefore the city requested, and was granted, an extension to December 31, 2014 in order to allow adequate time to complete the required TSP update.

Happy Valley

The City of Happy Valley has spent approximately $13,000 on consulting work with the Angelo Planning Group (APG) and DKS Associates toward determining the scope of work necessary to create a RTFP-compliant Transportation System Plan (TSP) Update. It is estimated that a RTFP-compliant TSP Update will cost the city between $75,000 and $100,000. This amount far exceeds the budgeted amount the city will be able to dedicate towards the TSP update, which will likely take multiple years to complete. This issue is complicated by the removal of the "Sunrise Project" (also referred to as Phase II or Unit II of the Sunrise) extending from roughly 122nd Avenue to 172nd Avenue from the financially constrained RTP. The removal of this facility from the financially constrained RTP may have serious implications to the city's TSP, including the removal of the project itself, the removal of the Rock Creek Interchange Access Management Plan (IAMP) and the downgrade and potential removal of a portion of a major arterial (Rock Creek Boulevard – west of 162nd Avenue) from the City's TSP. Due to these budgetary and technical constraints, the city requested (and was granted) a revised deadline of December 31, 2014.

Sherwood

The city has their TSP Update listed in the Capital Improvement Project 5-year listing and has budgeted sufficient funding to perform a complete TSP update in Fiscal Years 2012-2013 & 2013-2014.

The city is also in the process of performing a town center planning study. The scheduled completion date of the Town Center Plan is June 2013. Since the TSP update is based on information developed as part of the Town Center Plan, the city is requesting an extension of the TSP compliance deadline by one year to accommodate the development and use of this information in the update of the TSP.

The city also recently received an ODOT TGM Grant for updating the City's TSP. The TSP update effort is expected to take 12 – 14 months, thus the city requested, and was granted, an extension to December 31, 2014.

Washington County

Washington County began its TSP update in late 2011. Significant progress has been made toward compliance with the UGMFP. However, additional time is necessary to complete the two-phase planning effort. The following summary of tasks, activities and deliverables demonstrate the progress made to date as well as the scope of work expected to accomplish the TSP update.

By the end of 2011

- A project team was assembled made up of County staff and a consultant group (DKS Associates and CH2M Hill).

- In December 2011, the Board of County Commissioners appointed two committees: a community advisory committee (CAC) made up of community and stakeholder interests groups, and an interagency coordinating committee (ICC) comprised of cities and agency partners.

By the end of 2012

The County completed phase one of the TSP, including:

- Evaluating existing policies and regulations;
- Refining the travel forecast model;
- Identifying community values; and
- Developing and reviewing with the public, the ICC and CAC, an existing conditions and future needs report.

Phase one involved extensive public outreach and community involvement, including:

- Holding five CAC and two ICC meetings;
- Developing and maintaining a project website – www.tsp2035.com;
- Holding three open houses in three locations throughout the county and a virtual open house hosted on the project's website;
- Attending four farmers markets and several other public events;
- Conducting stakeholder interviews with the following interest groups: business representatives (Nike, Intel, Westside Economic Alliance), manufacturing (Sheldon Manufacturing), nursery and agriculture (Fishback Nursery), transit and demand management (Ride Connection and Westside Transportation Alliance), public health and the environment (Kaiser and 1000 Friends of Oregon);
- Collecting public input by creating an interactive online comment map and attending community and interest group meetings;
- Presenting to community and stakeholder interest groups, including: Committee for Citizen Involvement, community participation organizations, Washington County Farm Bureau, Adelante Mujeres, Washington County Urban Road Maintenance District Advisory Committee, Washington County Rural Road Operations and Maintenance Advisory Committee, Westside Economic Alliance and the Westside Transportation Alliance; and
- Holding a community workshop in December to review and discuss future needs.

By the end of 2013

The project team will work closely with the CAC and ICC and build off phase one public involvement efforts by continuing to engage public and interest stakeholders through a variety of methods. The following outlines phase two tasks necessary to complete an update of the TSP:

- Identify, evaluate and select preferred alternatives/solutions;
- Determine funding options;
- Finalize policies;
- Prepare a draft plan;
- File an ordinance; and
- Adopt a plan.

The county anticipates that the remaining tasks noted above can be completed and an updated TSP can be ready to adopt in 2013. However, to provide flexibility for delays during the ordinance and public hearing process, the county requested (and was granted) a new deadline of December 31, 2014.

West Linn

West Linn's current TSP was adopted in 2008, during the early stages of the update to the RTP. As such, the West Linn TSP contains many of the required elements as outlined in the RTFP. There are however a number of missing components in West Linn's TSP (e.g., 2035 planning horizon; compliance with pedestrian system design and essential community destinations; compliance with Transportation System Management Objectives (TSMO); and performance targets for multiple transportation modes and valuation criteria that will be required to bring the TSP into compliance with the RTFP. In anticipation of the RTFP compliance mandate, West Linn applied for but was denied TGM grant funds in 2011 and in 2012. As part of the TGM grant work, the city completed an evaluation of existing deficiencies in the TSP and prepared a detailed work program to implement an update that complies with the RTFP. The city does not have enough money available to complete this work without an outside source of funding and is planning to apply for a TGM grant in 2013. In the meantime, the city will continue to explore alternative sources of funding to complete this work. For these reasons the city requested, and was granted, an extension until December 31, 2014 to complete its TSP update.

<u>Other jurisdictions with 2012 deadline</u>

Oregon City

The City of Oregon City is the only jurisdiction with a 2012 deadline that did not request an extension. While technically out of compliance, the city has made significant progress with its TSP and is nearing completion. The city began their update to the TSP in June 2011. The city completed an internal draft TSP document in December 2012 and expected to publish it for public review in January 2013. In early 2013 city staff will conduct work sessions with their Planning Commission and City Commissioners to receive feedback before final adoption hearings begin. They expect to have the adoption hearing and complete this TSP update no later than June 30, 2013.

<u>Jurisdictions requesting exemption from RTFP</u>

In 2012, four jurisdictions requested exemption from the RTFP: Durham, Johnson City, King City and Rivergrove. All four jurisdictions were found to meet the criteria:

1. The city or county's transportation system is generally adequate to meet transportation needs;
2. Little population or employment growth is expected over the period of the exemption;
3. The exemption would not make it more difficult to accommodate regional or state transportation needs; and
4. The exemption would not make it more difficult to achieve the performance objectives set forth in section 3.08.010A of the RTFP.

APPENDIX A

Summary of Compliance Status as of December 31, 2012 (UGMFP effect as of 12/15/2010)

Entity	Title 1 Housing Capacity	Title 2 [1] Parking Management	Title 3 Water Quality & Flood Management	Title 4 Industrial and other Employment Land	Title 6 [2] Centers, Corridors, Station Communities & Main Streets	Title 7 Housing Choice	Title 11 Planning for New Urban Areas (see Appendix B for detailed information)	Title 13 Nature in Neighborhoods
Beaverton	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Cooper Mountain Plan not in compliance	In compliance
Cornelius	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance
Damascus	Extended to 12/31/2013	See footnote	Extended to 12/31/2013	Extended to 12/31/2013	See footnote	Extended to 12/31/2013	Extended to 12/31/2013	Extended to 12/31/2013
Durham	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Fairview	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Forest Grove	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance
Gladstone	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Gresham	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance
Happy Valley	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance
Hillsboro	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance
Johnson City	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
King City	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance
Lake Oswego	In compliance	See footnote	In compliance	Pending final city action	See footnote	In compliance	Not applicable	Pending LUBA decision 2/2013
Maywood Park	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Milwaukie	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Oregon City	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Extended to 6/30/2014 for Beavercreek Rd and South End	In compliance
Portland	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance*
Rivergrove	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Sherwood	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance

[1] While Title 2 was removed from the Urban Growth Management Functional Plan through Ordinance 10-1244B, the requirements of Title 2 were added to the Regional Transportation Functional Plan (Metro Code 3.08) in the same ordinance. Compliance with parking requirements should be addressed in each local government's Transportation System Plan.

2 Once acknowledged by LCDC, Title 6 will be an incentive approach and only those local governments wanting a regional investment (currently defined as a new high-capacity transit line) will need to comply.

Entity	Title 1 Housing Capacity	Title 2 [1] Parking Management	Title 3 Water Quality & Flood Management	Title 4 Industrial and other Employment Land	Title 6 [2] Centers, Corridors, Station Communities & Main Streets	Title 7 Housing Choice	Title 11 Planning for New Urban Areas (see Appendix B for detailed information)	Title 13 Nature in Neighborhoods
Tigard	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	River Terrace Plan not in compliance	In compliance
Troutdale	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Tualatin	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Area 61 extended to 12/31/21; Basalt Creek extended to 9/30/2016	In compliance
West Linn	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Wilsonville	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	East Wilsonville Extended to 12/31/2015; Basalt Creek extended to 9/30/2016	In compliance
Wood Village	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Clackamas County	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Not applicable	In compliance
Multnomah County	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	Area 93 extended to 6/2/2021	In compliance
Washington County	In compliance	See footnote	In compliance	In compliance	See footnote	In compliance	In compliance	In compliance

*Letter dated 1/16/13 sent to Portland stating it was in full compliance with Title 13 for 2012.

[1] While Title 2 was removed from the Urban Growth Management Functional Plan through Ordinance 10-1244B, the requirements of Title 2 were added to the Regional Transportation Functional Plan (Metro Code 3.08) in the same ordinance. Compliance with parking requirements should be addressed in each local government's Transportation System Plan.

2 Once acknowledged by LCDC, Title 6 will be an incentive approach and only those local governments wanting a regional investment (currently defined as a new high-capacity transit line) will need to comply.

2012 COMPLIANCE REPORT, APPENDIX B
TITLE 11 NEW AREA PLANNING COMPLIANCE
(As of December 31, 2012)

Project	Lead Government(s)	Compliance	Status
1998 UGB Expansion			
Rock Creek Concept Plan	Happy Valley	yes	Concept plan and implementation measures completed; development on-going.
Pleasant Valley Concept Plan	Gresham and Portland	yes	Concept plan and implementation measures completed; city annexed 524 acres and development to begin in eastern section.
1999 UGB Expansion			
Witch Hazel Community Plan	Hillsboro	yes	Concept plan and implementation measures completed; development on-going.
2000 UGB Expansion			
Villebois Village	Wilsonville	yes	Concept plan and implementation measures completed; development on-going.
2002 UGB Expansion			
Springwater Community Plan	Gresham	yes	Concept plan and implementation measures completed for this mostly industrial area; waiting annexation & development.
Damascus/Boring Concept Plan	Happy Valley	yes	HV portion: Concept plan and implementation measures completed; waiting annexation and development.
	Damascus	DCLD extension to June 2014; FP extension to 12/31/13; Concept Plan extension to 7/31/14	Damascus portion: Comprehensive plan map approved, then overturned by vote; city working on next steps to comply with DLCD deadline of June 2014. NOTE: City has UGMFP extension to 12/31/13 and Concept Plan extension to 7/31/14.
	Gresham	yes	Gresham portion, called Kelley Creek Headwaters Plan, was adopted by city in 2009.
Park Place Master Plan	Oregon City	yes	Concept plan and implementation measures completed; waiting annexation & development
Beavercreek Road	Oregon City	Extension to 6/30/14	Concept plan is completed and accepted by Metro; City has put on hold adoption of the final implementing ordinances pending LUBA appeal and work load.
South End Road	Oregon City	Extension to 6/30/14	Concept plan work underway; expected completion Sept 2013.
East Wilsonville (Frog Pond area)	Wilsonville	Extension to 12/31/15	City initially completed site analysis w/private builders in 2008; currently City is evaluating and budgeting for major sewer upgrade for eastern portion of City which must be completed before planning and development of site.
Coffee Creek 1 (NW Wilsonville)	Wilsonville	yes	Concept plan and implementation measures completed, including master plan for area adopted, for this industrial area; waiting development.
NW Tualatin Concept Plan (Cipole Rd & 99W)	Tualatin	yes	Concept plan and implementation measures completed for this small industrial area.
SW Tualatin Concept Plan	Tualatin	yes	Concept plan and implementation measures completed for this industrial area.
Brookman Concept Plan	Sherwood	yes	Concept Plan and implementation measures completed; waiting development
Project	**Lead**	**Compliance**	**Status**

	Government(s)		
Study Area 59	Sherwood	yes	Concept plan and implementation measures completed; school constructed.
Study Area 61 (Cipole Rd	Tualatin	Extension to 12/31/2021	Extension agreement – planning shall be completed when Urban Reserve 5A is completed, or by 12/31/2021, whichever is sooner.
99W Area (near Tualatin-Sherwood Rd)	Sherwood	yes	Concept plan and implementation measures completed.
King City	King City	yes	Concept plan and implementation measures completed; annexed to city with portion developed as park and rest in floodplain.
West Bull Mountain Concept Plan	Wash County/ Tigard	Extension to 11/30/12	Concept plan adopted by County and City of Tigard; city working to finalize re-named River Terrace Community Plan and code work; expected completion July 2014.
Cooper Mountain area	Beaverton	Extension to 11/30/12	Wash County & Beaverton signed IGA in January 2013 transferring responsibility to City; City to start concept planning in spring 2013, and is in process of applying for an extension.
Study Area 64 (14 acres north of Scholls Ferry Rd)	Beaverton	yes	Concept plan and implementation measures completed; annexed to City.
Study Area 69 & 71	Hillsboro	yes	Areas are included in South Hillsboro Area Plan. City has adopted these areas into its comprehensive plan; upon annexation, they will be zoned to comply with comp plan.
Study Area 77	Cornelius	yes	Concept plan and implementation measures completed; annexed to City.
Forest Grove Swap	Forest Grove	yes	Concept plan and implementation measures completed; annexed to City.
Shute Road Concept Plan	Hillsboro	yes	Concept plan and implementation measures completed; annexed to City and portion developed with Genentech.
North Bethany Subarea Plan	Washington County	yes	Concept plan and implementation measures completed.
Bonny Slope West Concept Plan (Area 93)	Multnomah County	Extension to 6/2/21 or 2 yrs after agreement w/other govt, whichever earlier	Concept plan map developed though not yet adopted by Board of Commissioners; extension order issued by Metro based on difficulty of deciding on service provider(s).
2004/2005 UGB Expansion			
Damascus area	Damascus	See under 2002 above	Included with Damascus comp plan (see above)
Tonquin Employment Area	Sherwood	yes	Concept plan and implementation measures completed.
Basalt Creek/West RR Area Concept Plan	Tualatin and Wilsonville	Extension to 9/30/16	Cities scheduled to begin planning in early 2013.

Project	Lead Government(s)	Compliance	Status
N. Holladay Concept Plan	Cornelius	yes	Concept plan completed; implementation to be finalized after annexation to City.
Evergreen Concept Plan	Hillsboro	yes	Concept plan and implementation measures completed.
Helvetia Concept Plan	Hillsboro	yes	Concept plan and implementation measures completed.
2011 UGB Expansion			
North Hillsboro	Hillsboro	yes	Concept planning completion due January 2014.
South Hillsboro	Hillsboro	yes	Concept planning completion due January 2014.
South Cooper Mountain	Beaverton	yes	Concept planning to begin in spring 2013; expected completion fall 2014
Roy Rogers West	Tigard	yes	Concept planning underway; expected completion July 2014.

APPENDIX C:
COMPLIANCE DATES FOR THE
URBAN GROWTH MANAGEMENT FUNCTIONAL PLAN

Functional Plan Requirement	When Local Decisions Must Comply		
	Plan/Code Amendment 3.07.810(C)[1]	**Land Use Decision** 3.07.810(D)[2]	**Adoption** 3.07.810(B)[3]
Title 1: Adopt minimum dwelling unit density (3.07.120.B)	12/21/2013	12/21/2013	12/21/2014
Title 1: Allow accessory dwelling unit in SFD zones (3.07.120.G) *(provision included in previous version of Metro Code as 3.07.140.C)*	12/8/2000		12/8/2002
Title 3: Adopt model ordinance or equivalent and map or equivalent (3.07.330.A)	12/8/2000		12/8/2002
Title 3: Floodplain management performance standards (3.07.340.A)	12/8/2000	12/8/2001	12/8/2002
Title 3: Water quality performance standards (3.07.340.B)	12/8/2000	12/8/2001	12/8/2002

[1] After one year following acknowledgment of a UGMFP requirement, cities and counties that amend their plans and land use regulations shall make such amendments in compliance with the new functional plan requirement.
[2] A city or county that has not yet amended its plan to comply with a UGMFP requirement must, following one year after acknowledgement of the requirement (the date noted), apply the requirement directly to land use decisions
[3] Cities and counties must amend their plans to comply with a new UGMFP requirement within two years after acknowledgement of the requirement (the date noted)

Functional Plan Requirement	When Local Decisions Must Comply		
	Plan/Code Amendment 3.07.810(C)[1]	**Land Use Decision** 3.07.810(D)[2]	**Adoption** 3.07.810(B)[3]
Title 3: Erosion control performance standards 3.07.340.C)	12/8/2000	12/8/2001	12/8/2002
Title 4: Limit uses in Regionally Significant Industrial Areas (3.07.420)	7/22/2005	7/22/2006	7/22/2007
Title 4: Prohibit schools, places of assembly larger than 20,000 square feet, or parks intended to serve people other than those working or residing in the area in Regional Significant Industrial Areas (3.07.420D)	12/21/2013	12/21/2013	12/21/2014
Title 4: Limit uses in Industrial Areas (3.07.430)	7/22/2005	7/22/2006	7/22/2007
Title 4: Limit uses in Employment Areas (3.07.440)	7/22/2005	7/22/2006	7/22/2007
Title 6: (Title 6 applies only to those local governments seeking a regional investment or seeking eligibility for lower mobility standards and trip generation rates)			
Title 7: Adopt strategies and measures to increase housing opportunities (3.07.730)			6/30/2004
Title 8: Compliance Procedures (45-day notice to Metro for amendments to a comprehensive plan or land use regulation) (3.07.820)	2/14/2003		

Functional Plan Requirement	When Local Decisions Must Comply		
	Plan/Code Amendment 3.07.810(C)[1]	**Land Use Decision** 3.07.810(D)[2]	**Adoption** 3.07.810(B)[3]
Title 11: Develop a concept plan for urban reserve prior to its addition to the UGB (3.07.1110)	N/A	N/A	N/A
Title 11: Prepare a comprehensive plan and zoning provisions for territory added to the UGB (3.07.1120)	12/8/2000	12/8/2001	2 years after the effective date of the ordinance adding land to the UGB unless the ordinance provides a later date
Title 11: Interim protection for areas added to the UGB (3.07.1130) *(provision included in previous version of Metro Code as 3.07.1110)*	12/8/2000	12/8/2001	12/8/2002
Title 12: Provide access to parks by walking, bicycling, and transit (3.07.1240.B)			7/7/2005
Title 13: Adopt local maps of Habitat Conservation Areas consistent with Metro-identified HCAs (3.07.1330.B)	12/28/2005	1/5/2008	1/5/2009
Title 13: Develop a two-step review process (Clear & Objective and Discretionary) for development proposals in protected HCAs (3.07.1330.C & D)	12/28/2005	1/5/2008	1/5/2009
Title 13: Adopt provisions to remove barriers to, and encourage the use of, habitat-friendly development practices (3.07.1330.E)	12/28/2005	1/5/2008	1/5/2009

APPENDIX D

Summary of Compliance Status

(Regional Transportation Functional Plan in effect as of 12/31/12)

	Title 1 Transportation System Design	Title 2 Development and Update of Transportation System Plans	Title 3 Transportation Project Development	Title 4 Regional Parking Management	Title 5 Amendment of Comprehensive Plans
Beaverton	In compliance	In compliance	In compliance	In compliance	In compliance
Cornelius	12/31/16	12/31/16	12/31/16	12/31/16	12/31/16
Damascus	12/31/14	12/31/14	12/31/14	12/31/14	12/31/14
Durham	Exempt	Exempt	Exempt	Exempt	Exempt
Fairview	12/31/14	12/31/14	12/31/14	12/31/14	12/31/14
Forest Grove	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Gladstone	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Gresham	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Happy Valley	12/31/14	12/31/14	12/31/14	12/31/14	12/31/14
Hillsboro	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Johnson City	Exempt	Exempt	Exempt	Exempt	Exempt
King City	Exempt	Exempt	Exempt	Exempt	Exempt
Lake Oswego	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Maywood Park	Recommending exemption	Recommending exemption	Recommending exemption	Recommending exemption	Recommending exemption
Milwaukie	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Oregon City	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance
Portland	12/31/14	12/31/14	12/31/14	12/31/14	12/31/14
Rivergrove	Exempt	Exempt	Exempt	Exempt	Exempt
Sherwood	12/31/14	12/31/14	12/31/14	12/31/14	12/31/14
Tigard	In compliance	In compliance	In compliance	In compliance	In compliance
Troutdale	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Tualatin	6/30/13	6/30/13	6/30/13	6/30/13	6/30/13
West Linn	12/31/14	12/31/14	12/31/14	12/31/14	12/31/14
Wilsonville	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Wood Village	12/31/14	12/31/14	12/31/14	12/31/14	12/31/14
Clackamas County	12/31/13	12/31/13	12/31/13	12/31/13	12/31/13
Multnomah County	12/13/14	12/31/14	12/31/14	12/31/14	12/31/14
Washington County	12/31/14	12/31/14	12/31/14	12/31/14	12/31/14

Date shown in table is the deadline for compliance with the RTFP. Note – a city or county that has not yet amended its plan to comply with the RTFP must, following one year after RTFP acknowledgement, apply the RTFP directly to land use decisions.

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www.oregonmetro.gov

Metro | *Memo*

Date: January 10, 2013
To: Metro Council, MPAC
From: Martha Bennett, Chief Operating Officer
Subject: 2012 annual report on amendments to the Employment and Industrial Areas Map

Background

Title 4 (Industrial and Other Employment Areas) of the Urban Growth Management Functional Plan seeks to improve the region's economy by protecting a supply of sites for employment by limiting the types and scale of non-industrial uses in Regionally Significant Industrial Areas, Industrial Areas, and Employment Areas. Those areas are depicted on the Employment and Industrial Areas Map.

Title 4 sets forth several avenues for amending the map, either through a Metro Council ordinance or through an executive order, depending on the circumstances. Title 4 requires that, by January 31 of each year, Metro's Chief Operating Officer submit a written report to the Council and MPAC on the cumulative effects on employment land in the region of amendments to the Employment and Industrial Areas Map during the preceding year. This memo constitutes the report for 2012.

Summary of Title 4 map amendments in 2012

During 2012, no Title 4 Map amendments were made by executive order. In 2012, there were three separate ordinances approved by the Metro Council that amended the Title 4 Map to reflect existing uses, local plans, or zoning designations[1]. These amendments responded to requests from the cities of Fairview, Forest Grove, Happy Valley, Hillsboro, Portland, Troutdale, Tualatin, and Wood Village and Washington County. The cumulative effect of the three ordinances is summarized in Table 1. The bulk of the changes took place in a map cleanup ordinance adopted in October.

Table 1: summary of Title 4 Map changes adopted in 2012

Adopted change	Gross acres (not all acres are vacant)
Newly added to Title 4 map	132
Change from one Title 4 designation to another	252
Removal of Title 4 designation	1,042

Chief Operating Officer recommendations for 2013

There are currently about 49,000 acres designated on the Title 4 Map, representing about one-fifth of the acres inside the urban growth boundary[2]. Staff does not believe that the Title 4 Map amendments made in 2012 represent a cumulative erosion of the region's employment capacity. Therefore, staff does not, at this time, recommend changes to Title 4 policies.

[1] Ordinance Nos. 12-1284 (various jurisdictions), 12-1288 (Happy Valley), 12-1290 (Troutdale)
[2] These acreage figures are primarily for land, but do include acres of water. They are cited here for general context.

Climate Smart Communities Scenarios Health Impact Assessment Summary

Oregon Health Authority **March 2013**

Health Impact Assessment

Health impact assessment (HIA) provides decision-makers with information about how a proposed policy, program or project may affect the health of people, with a specific focus on equity. HIA differs from traditional public health assessment in one important way - the health impacts of a proposal are assessed before a final decision is made, allowing the results of the HIA to be considered in the decision-making process. HIA provides objective information that can be used to increase the positive health impacts of a project or policy and mitigate negative impacts.

The Climate Smart Communities Scenarios HIA aims to support Metro and its partners in the consideration of public health and health equity in the selection and implementation of transportation and land use decisions related to GHG reduction policy in the Portland metropolitan region. OHA's recommendations apply to the selection of the three Phase Two scenarios to be further tested in 2013, as well as the development and adoption of a preferred scenario in 2014.

Findings

Through modeling and an extensive review of current literature, OHA found:

1. That almost all of the policies under consideration could be positive for health, and that certain policies were more beneficial than others.
2. The majority of the health benefits result from:
    a. increased physical activity,
    b. followed by reductions in road traffic crashes and
    c. lower exposure to particulate air pollution.
3. Strategies that meet GHG reduction goals by decreasing vehicle miles traveled (VMT) will have the most positive impact on human health by
    a. increasing physical activity through active transportation and
    b. reducing injuries and fatalities from collisions.
4. Strategies supporting the highest increases in active transportation may also be the most successful in decreasing air toxics emissions and exposures because of lower VMT.
5. The scenarios found to be the most health-promoting in our quantitative comparison all had similar elements which led to the most positive health outcomes: most ambitious levels of community design policies, intermediate and ambitious levels of pricing and incentives, highest levels of active transportation (including transit), lowest levels of single occupancy vehicle driving, and lowest levels of particulate air pollution.

Oregon Health Authority

CSCS HIA Recommendations

Develop and implement a preferred scenario that meets or surpasses the greenhouse gas emissions reduction target set for the region. Further:

- **Prioritize strategies that lead to decreases in air pollution exposure for all populations in the region;** in particular for low income communities, children, seniors, people with low incomes, and people with chronic health conditions or disabilities. An example strategy may be creating and promoting walking and biking routes adjacent to low-traffic roads specifically to these groups).
- **Follow through with implementation of the recommendations identified in the Portland Air Toxics Solutions Report.** The report identifies a number of recommendations that will reduce air pollution from light vehicles and have also been linked to reducing GHG emissions.

> **From the report**: "*Low-income communities and communities of color are more likely to live in close proximity to high-traffic roads and have higher exposures to harmful air pollution as a result. These groups may also live in lower quality housing with poor indoor air quality. Their cumulative exposure to indoor and outdoor air pollution may be significantly higher than other groups.*"

To maximize public health benefits and meet the state target, emphasize strategies that best increase active transportation and physical activity: community design, pricing and incentives. Further:

- **Implement active transportation strategies with an understanding of existing local health conditions and inequities.** Metro and partners should implement strategies in ways that do not worsen these health conditions and inequities, such as planning for necessary safety infrastructure. Increasing the number of people biking and walking could cause a small increase in injuries and deaths from collisions. Additionally, not all Portland Metro region residents have equal access to active transportation opportunities.
- **Prioritize strategies that lead to increases in active travel for all populations in the region, in particular for children, seniors, people with low incomes, communities of color, and people with chronic health conditions or disabilities.** Example strategies include marketing and incentive programs targeted to these populations, improved active travel infrastructure on routes to schools, and improved public transportation service in areas where these populations live. Engaging the highest per-capita-VMT population with active transportation strategies would have a positive impact on all residents of the region.

> **From the report:** "*People who commute by walking, bicycling or public transit are more likely to meet physical activity recommendations, and they do twice as much total physical activity (transportation and recreation combined) as those who commute by automobiles. Children who walk or bike to school are more likely to meet physical activity recommendations, and to attain healthier body composition and cardiorespiratory fitness.*"

Oregon Health Authority

Include strategies, such as community design, that can lead to decreases in road traffic injuries and fatalities for all populations in the region, in particular for children. Further:

- **Prioritize strategies that lead to decreases in road traffic injuries and fatalities for all populations in the region**; in particular for children and older adults. The community design, pricing and incentives strategies that lead to reductions in VMT may also increase safety in the region.
- **Mitigate potential increases in pedestrian and bicyclist injuries and fatalities through proven design strategies**, such as increasing the visibility of vulnerable road users; separate facilities like sidewalks, bike boulevards or cycle tracks; and traffic calming or speed control measures (133, 135). The feeling of safety given by these mitigations may also expand the percentage of the population willing

From the report: *"Motor vehicle crashes are the leading cause of death for individuals between the ages of 5 and 24."*

Carry out additional quantitative health impact assessment of the three scenarios that are identified for further evaluation in spring 2013 to further inform development and adoption of a final preferred scenario. OHA recommends the use of ITHIM or a similar health impacts model for this future assessment. Further:

- OHA recommends that when the CSCS Project develops the preferred scenario in 2013-14, health stakeholders (in particular local health departments) should be consulted in order to take local health expertise into account and to continue building relationships between public health and planning professionals and policymakers**.**
- OHA recommends that future related HIAs include consideration of land use, housing affordability, location relative to employment, gentrification and displacement, or air pollution other than $PM_{2.5}$.
- This HIA found that the most significant health benefits of the GHG reduction policies under consideration in the CSCS project were from increased physical activity through active transportation. Future assessments should include this health determinant and should attempt to answer additional questions, such as how can policies or programs be implemented to result in increases to active transportation in the Portland Metro region? And, how can Metro and local governments assure equal access across the region to active transportation?

From the report: *"The healthiest scenario could result in hundreds of premature deaths prevented and years living with disability averted in the region. Health should be a key consideration in Metro's scenario planning process."*

For more information

Jae p. Douglas, PhD, MSW, Principle Investigator Climate Smart Communities Scenarios HIA
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jae.p.douglas@state.or.us

Copies of the full report will be available at OHA's website: www.healthoregon.org/hia

Oregon Health Authority

Climate Smart Communities Scenarios Project: Health Impact Assessment

A collaborative approach to building livable, prosperous, equitable and climate smart communities

Scenarios Project Health Impact Assessment

Transportation and health

Transportation produces 25 percent of the Portland metropolitan region's greenhouse gas emissions, contributing to a warming climate that could severely impact our health and quality of life. Policies and investments that reduce greenhouse gas emissions can also limit exposure to air and noise pollution, encourage physical activity, and reduce traffic-related injuries and deaths. By understanding benefits, impacts, and tradeoffs the Scenarios Project will identify how to reduce greenhouse gas emissions and improve the health of everyone in the region.

Assessing health impacts

To ensure that the health impacts of the strategies in the preferred scenario are carefully considered, Metro is partnering with Oregon Health Authority to conduct a health impact assessment (HIA). The CSC HIA will present the health benefits and impacts of different land use and transportation strategies, the building blocks for regional scenarios, to help inform the scenario development and selection process. The HIA will help to ensure that public health and equitable health outcomes are considered and included in transportation and land use decisions for decades to come.

Advisory work group

The Scenarios Project HIA will bring together public health experts, land use, planning and transportation experts, and community health, environmental and community-development advocates. This advisory work group will help OHA determine the scope of the HIA, ensure that health and equity issues are considered, and offer available resources and expertise.

Assessment

In the assessment, OHA will describe the direction and magnitude of health impacts for the Scenarios Project policy strategies that have been prioritized by the advisory work group. We may use the following analytic methods, depending on our scope and resources and what will best answer the research questions: literature review, meta-analysis, stakeholder interviews, risk analysis, and health effects modeling.

Climate Smart Communities Scenarios Project

Metro is leading the Climate Smart Communities Scenarios Project to determine how building healthy, livable, prosperous, and equitable communities supports state and regional goals for the reduction of greenhouse gas emissions from light vehicle travel. Metro is collaborating with local governments and other partners to develop, analyze, and select a preferred land use and transportation scenario that reduces emissions from cars, small trucks and SUVs as directed by the Oregon Legislature in 2009. The Scenarios Project will identify the best land use and transportation policies and investments that will keep communities vibrant and prosperous for everyone and reduce greenhouse gas emissions. The project continues to be about jobs, livable communities and public health as it is about a healthy environment.




Timeline

The Scenarios project is taking place in three phases from 2011 to 2014. The HIA method will be developed during Phase 2. During Phase 1, Metro developed scenarios to identify the mix of strategies that will help the region meet state greenhouse gas reduction goals. In Phase 2, the project team—in collaboration with local governments and other stakeholders—will explore how and where different strategies could be applied in the region. Throughout 2012, Oregon Health Authority (OHA) will engage partners, including decision-makers, to develop the HIA method and apply it to the Phase 1 scenarios. In 2013 and 2014 the project team will apply the HIA method to alternative scenarios and eventually to the preferred regional scenario. OHA and Metro will collaborate with partners to develop relevant communication materials for all decision-making bodies, with an eye to assisting decision-makers in understanding alternatives, tradeoffs and mitigation opportunities when deciding between scenarios.

The region's 6 desired outcomes—endorsed by city and county elected officials and adopted by the Metro Council in December 2010.

Implementation

The preferred scenario will be implemented through policies, investments and actions at the state, regional and local levels, including Metro's Regional Transportation Plan, the region's growth management strategy and local plans. Making this information clear to decision-makers will ensure that the best health-promoting elements are included throughout the scenario development and implementation process.

State-wide impact

The Oregon Sustainable Transportation Initiative (OSTI) is an integrated statewide effort to reduce greenhouse gas (GHG) emissions from transportation while creating healthier, more livable communities and greater economic opportunity. As part of this statewide strategy, ODOT has expressed interest in the Scenarios Project HIA methods and findings, further magnifying the impact of this work. Metro is the first Oregon MPO to address state mandates in partnership with the larger statewide effort. As part of this partnership, Metro is developing tools and methods that other MPOs could use in their own scenario planning efforts.

Building blocks for regional scenarios

- **Community design:** Complete neighborhoods and mixed-use areas, urban growth boundary, transit service, bike travel, parking
- **Pricing:** Pay-as-you-drive insurance, gas tax, road use fee, carbon fee
- **Marketing and incentives:** Eco-driving, individualized marketing programs, employer commute programs, car-sharing
- **Roads:** Freeway and arterial capacity, traffic management
- **Fleet:** Fleet mix and age
- **Technology:** Fuel economy, carbon intensity of fuels, electric and plug-in hybrid electric vehicle market share

The Oregon Public Health Division is the lead state agency for all public health matters including disease prevention, environmental health, maternal and child health, emergency preparedness, and community health systems planning and coordination.

The Office of Environmental Public Health, Research and Education Services section serves as Oregon Public Health Division's technical, scientific and educational public health resource. We identify, assess and report on threats to human health from exposure to environmental and occupational hazards. We advise the people and communities of Oregon to best understand potential risks where they live, work and play in order to remain healthy and safe.

www.healthoregon.org/hia

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

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

www.oregonmetro.gov/climatescenarios.

February | 2012

Climate Smart Communities Scenarios Project: Health Impact Assessment

A collaborative approach to building livable, prosperous, equitable and climate smart communities

Working toward healthier communities

Health impact assessment (HIA) provides decision-makers with information about how any policy, program, or project may affect the health of people. The Scenarios Project HIA (Scenarios HIA) will describe the health impacts of proposed land use and transportation strategies to decision-makers and ensure that the best health-promoting elements are included in the final outcome of this work.

Health Impact Assessment: Working toward healthier projects and policies

The Oregon Public Health Division's Health Impact Assessment initiative focuses on building Oregon's collective capacity to evaluate the health effects of proposed projects and policies and to provide the information to decision-makers and community members.

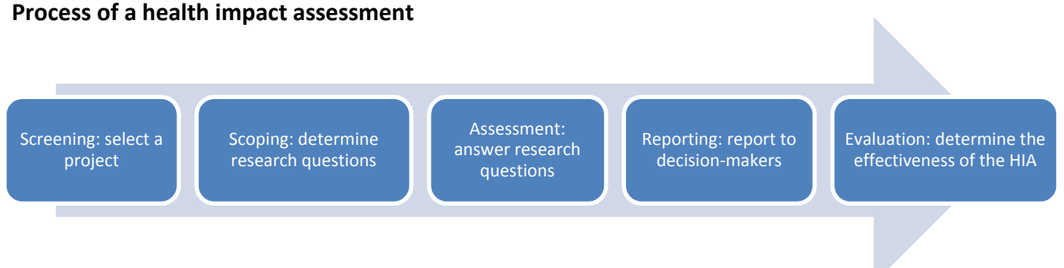
The key element that makes HIA different from traditional public health assessment is that its approach is prospective. Ideally, the health impacts of a proposal are assessed before a final decision is made, allowing the results of the HIA to be considered in the decision-making process. The ultimate goal of HIA is to utilize objective information to minimize negative health impacts and to maximize positive health impacts of a project or policy.

Equity is an integral component of all HIAs. HIA seeks to identify unequal impacts of a policy or project for people of color, people experiencing poverty, people with disabilities or chronic diseases, the young and the elderly.

Once impacts have been reviewed HIA seeks to improve health outcomes for everyone by recommending changes that improve the likelihood of positive impacts and lessen negative impacts.

HIA in Oregon has created new opportunities for collaboration between community members, local government, and the business community, and has been successfully used in Oregon to improve the health impacts of sidewalks and bike paths, parks, roads, zoning and the production of alternative energy.

Process of a health impact assessment



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Metro | *Memo*

DATE: March 15, 2013

TO: TPAC, MTAC and Interested Parties

FROM: Kim Ellis, Principal Transportation Planner

SUBJECT: Climate Smart Communities Scenarios Project – Phase 2 Investment Choices Scenarios Evaluation

****

This memorandum outlines the approach staff will use to evaluate three scenarios for the Climate Smart Communities Scenarios Project during the summer of 2013. Findings from Phase 1, Phase 2 work and technical work group and advisory committee discussions have informed development of this approach.

The Oregon Legislature has required the Portland metropolitan region to reduce per capita greenhouse gas emissions from cars and small trucks by 2035.

The analysis will evaluate the effects of distinct land use and transportation policy and investment choices on the future of the Portland metropolitan region. The investment choices-focused approach is based on the premise that by helping communities implement their local visions and plans for main streets, downtowns and employment areas, citizens and businesses will experience all the benefits of increased transportation and housing choice, jobs, equity, cleaner air and water, and access to nature along with the added benefit of a reduction in greenhouse gas emissions from cars and small trucks.

The results of the analysis will be released in October 2013 - launching the third, and final, phase of the project. Phase 3 will use the analysis results to stimulate a regional discussion aimed at deciding which elements from each of the three scenarios should go forward into a preferred land use and transportation scenario for the Metro Council to adopt in December 2014.

The Metro Council, Metro Policy Advisory Committee (MPAC), Joint Policy Advisory Committee on Transportation (JPACT) will be asked to support moving forward with the evaluation in May 2013.

ACTION REQUESTED

- Provide input on the draft assumptions suggested for each scenario.

Input provided by TPAC at the March 22 meeting will be brought to the technical work group for discussion on April 1. Input provided by MTAC on April 3 will further inform refinements to the draft assumptions.

TPAC will be requested to make a recommendation to JPACT on the scenario assumptions on April 26. MTAC will be requested to make a recommendation to MPAC on the scenario assumptions on May 1.

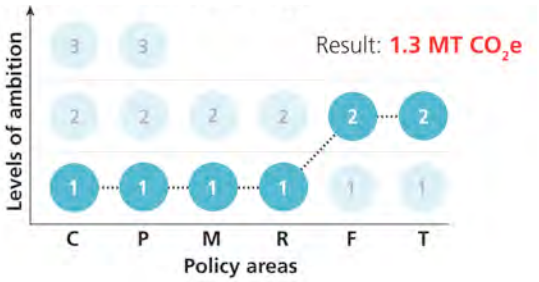
OVERVIEW OF PHASE 1 AND 2 – UNDERSTANDING AND SHAPING LAND USE AND TRANSPORTATION CHOICES

All the work in the Planning and Development Department (e.g., East Metro Connections Plan, Southwest Corridor Plan, Regional Active Transportation Plan, Industrial Lands Readiness effort, TOD program) is focused on implementing the Region 2040 Growth Concept. The Climate Smart Communities Scenarios Project has the same focus: implementation.

Working together with city, county, state, business and community leaders, Metro is researching how land use and transportation policies and investments can be leveraged to help us create great communities, support the region's economy and meet goals for reducing greenhouse gas emissions. The adopted land use plans and zoning of cities and counties across the region are the foundation for the scenarios to be tested, with a goal of creating a diverse yet shared vision of how we can keep this region a great place for years to come – for everyone – and meet state greenhouse gas emissions goals.

PHASE 1: UNDERSTANDING OUR LAND USE AND TRANSPORTATION CHOICES

Phase 1 focused on understanding the region's choices for reducing greenhouse gas emissions from cars and small trucks. Staff tested 144 different combinations of land use and transportation policies (called scenarios) to learn what it might take to meet the region's greenhouse gas emissions reduction target. More than 90 scenarios met or exceeded the target. In addition, staff found that current plans and policies together with advancements in fleet and technology get the region close to the target. [1]



Current plans and policies together with advancements in fleet and technology get the region close to the state target of 1.2 MT CO_2e per capita.

A range of choices exist to meet the region's state greenhouse gas emissions reduction target and most of the strategies under consideration are already being implemented to varying degrees in communities to achieve other important economic, social and environmental goals.

Staff also conducted sensitivity analysis of the Phase 1 scenarios to better understand the GHG emissions reduction potential of individual strategies.[2 and 3] Assuming adopted community plans and national fuel economy standards, the most effective individual strategies for reducing greenhouse gas emissions were found to be:

- **Fleet and technology** advancements
- **Transit** service expansion
- **Pricing of transportation** (e.g., fuel price, pay-as-you-drive insurance, parking fees, mileage-based fee, and carbon fee)

[1] Understanding Our Land Use and Transportation Choices: Phase 1 Findings (January 2012).
[2] Memo to TPAC and interested parties on Climate Smart Communities: Phase 1 Metropolitan GreenSTEP scenarios sensitivity analysis (June 21, 2012).
[3] Memo to TPAC and interested parties on Climate Smart Communities: Updated Draft Scenario Options Framework (June 26, 2012).

The reductions found for each strategy individually do not reflect synergistic benefits that could come from combining various strategies. It is also important to note that while some strategies did not individually achieve significant GHG reductions, such as increasing walking or bicycle mode share or participation in marketing and incentives programs, they remain important elements to complement more effective strategies such as transit service expansion and building walkable downtowns and main streets as called for in community plans.

To date, no evaluation has been conducted on the potential financial, political, social equity, environmental or economic implications of the different strategies; these implications will be considered as part of the summer 2013 evaluation.

PHASE 2: SHAPING OUR LAND USE AND TRANSPORTATION CHOICES

Phase 2 is focused on shaping future choices for the region to advance implementation of community visions and meet the region's greenhouse gas emissions reduction target.

The Climate Smart Communities Scenarios Project made significant progress in 2012 and early 2013:

- **Engaged local governments and other stakeholders to share project information and early findings.** From January to September 2012, Metro councilors and staff shared the Phase 1 findings and other project information through briefings to city councils, county boards, county-level coordinating committees, state commissions, Metro advisory committees, regional and state conferences and other meetings. Staff also regularly convened a local government staff technical working group in 2012. The work group provided technical advice to Metro staff, and assistance with engaging local government officials and senior staff.
- **Convened workshops with community leaders on the public health, equity/environmental justice, and environmental outcomes that are most important to consider in the scenario evaluation process.** Reports documenting the Environmental and Equity/Environmental Justice workshops can be downloaded from the project website – www.oregonmetro.gov/climatescenarios. The public health report will be made available in the next month.
- **Partnered with business associations to host a series of focus groups to understand their challenges, opportunities and priorities.** The first four focus groups have been held in partnership with the Columbia Corridor Association, the East Metro Economic Alliance, the Clackamas County Business Alliance and the Westside Economic Alliance and Wilsonville and Greater Hillsboro Chambers of Commerce. The two remaining focus groups will be held in the next month and include small business owners in partnership with the Portland Business Alliance, and developers. A summary report will be prepared upon completion of the focus groups in April.
- **Developed a community investment choices frame to guide development of three alternative scenarios to be tested in Summer 2013.** The project's technical work group continues to serve an important advisory role to staff and helped develop the framework.
- **Researched eight case studies to spotlight local success stories and the innovative strategies they have implemented to achieve their local visions and that will also help reduce greenhouse gas emissions.** Staff expects to complete the case studies in April in consultation with local planning staff.
- **Convened workshops with local staff to affirm visions for future community development using Envision Tomorrow to make sure the latest information on local land use goals is**

incorporated into the project. Southwest Corridor project staff used Envision Tomorrow to develop the draft land use vision for the corridor last fall. All of these assumptions will be used as land use inputs in the scenarios we test this summer.

Several of these activities have been extended into early 2013 given the time it has taken to effectively engage local communities in work sessions, business leaders in focus groups and complete other activities.

WORK AHEAD IN 2013

To stimulate thinking about our choices for the future and the possibilities they present, three scenarios will be tested in 2013. Findings from Phase 1, Phase 2 work and technical work group and advisory committee discussions have informed development of this approach.

The approach is based on the premise that by helping communities implement their local visions and plans for main streets, downtowns and employment areas, citizens and businesses will experience all the benefits of increased transportation and housing choice, jobs, equity, cleaner air and water, and access to nature along with the added benefit of a reduction in greenhouse gas emissions from cars and small trucks.

Staff will request a recommendation on the assumptions to test and the questions to be addressed in the evaluation in May 2013. With regional support, staff will move forward with the evaluation, using the agreed upon key outcomes to measure – e.g., economic, fiscal, equity, community and environmental outcomes.

OVERVIEW OF INVESTMENT CHOICES TO BE TESTED IN PHASE 2

Background

The three alternative scenarios to be evaluated are conceptual in nature, and are not intended to represent a preferred scenario or future Metro Council, Oregon Transportation Commission (OTC), local government or TriMet policy intentions. The scenarios to be tested will draw from the policies tested in Phase 1 and bear greater resemblance to realistic, yet ambitious policy alternatives than the 144 scenarios tested in Phase 1 of the project. The proposed approach is consistent with OAR 660-044-0040, which requires the region to evaluate at least 3 scenarios – a reference case scenario that reflects implementation of existing adopted comprehensive plans and transportation plans and at least two alternative land use and transportation scenarios for meeting greenhouse gas reduction targets.

The adopted land use visions (as expressed in local plans and zoning codes) of cities and counties across the region are the foundation for the scenarios to be tested. The analysis will consider transportation investments together with different levels of funding, advancements to clean fuels and vehicle technologies and, to the extent possible, updated community visions identified through the Southwest Corridor Plan, East Metro Connections Plan and local planning and periodic review activities currently. The analysis will inform development of a preferred land use and transportation scenario and identification of the policies, tools, investment and actions needed to implement it. It is important to emphasize that the preferred scenario developed in 2014 will likely include elements from all 3 scenarios tested.

Purpose

The purpose of scenario planning is to test a range of potential futures that reflect choices policymakers, businesses and individuals might make. The CSCS investment scenarios analysis is intended to provide policy makers with better information about the implications and tradeoffs of different land use and transportation policy and investment choices, relative to the region's shared equity, economy, environmental and community goals.

Major objectives of the analysis are to:

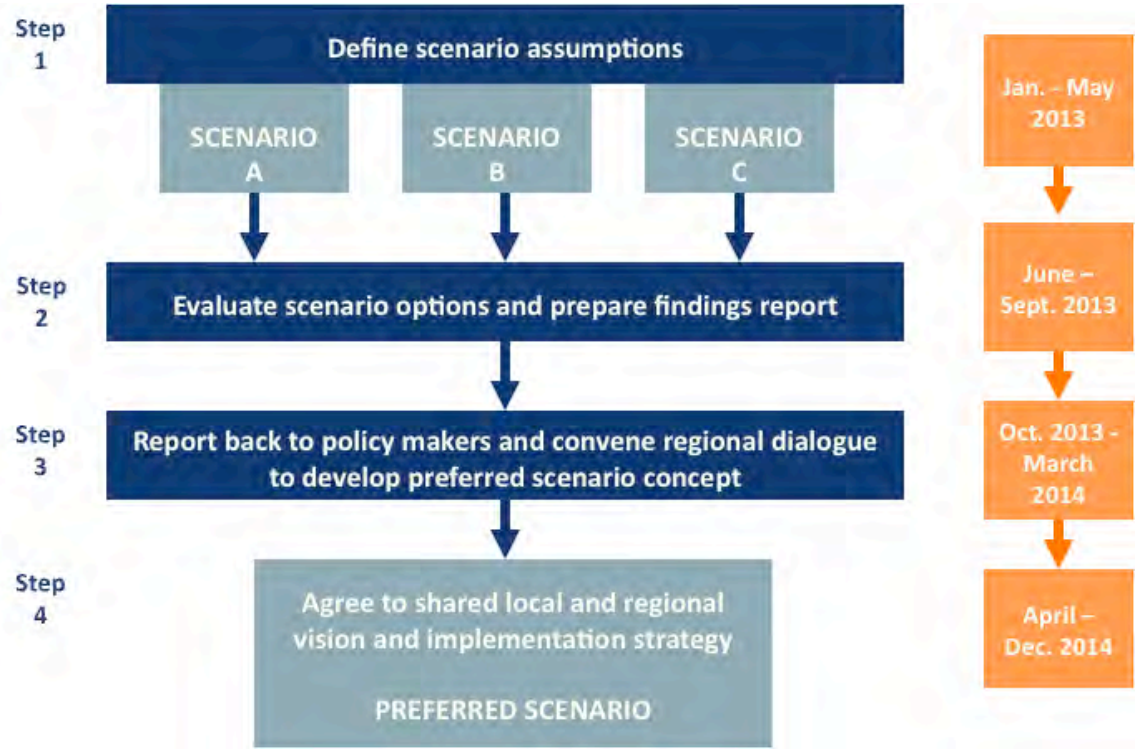
- Test distinct investment policy choices that frame the boundaries of the political landscape and public opinion to better understand the effect of different levels of investment on public health, travel behavior, development patterns, equity, the economy, the environment and greenhouse gas emissions.
- Evaluate the relative effect and cost of different investment choices in order to recommend what combinations of investments, tools and strategies are needed to best achieve community visions and state greenhouse gas emissions reductions.
- Provide recommendations to guide development of a preferred land use and transportation scenario.

General Construct and Scope

This analysis will examine three conceptual futures for their ability to serve forecast 2035 population and employment growth and meet state greenhouse gas emissions reduction targets. Each of the three scenarios is based on a "What if" policy-theme focus, resulting in a distinct mix and level of transit service, bike, pedestrian, road, system and demand management strategies that are linked to pricing strategies (revenues) assumed within in each scenario.

The three scenarios represent what the region could look like in 2035, if various transportation and land use strategies are pursued, and what it could mean for how we live, how we work and how we get around. The adopted land use plans and zoning codes of cities and counties across the region are the foundation for the scenarios to be tested. **Figure 1** shows the general construct and timeline for this analysis.

Figure 1. Climate Smart Communities Investment Scenarios Construct and Timeline



Each scenario is initiated by a "what if" question:

- **Scenario A (Recent Trends)** - What if we implement adopted plans with existing revenues?

  Purpose: This scenario follows the funding trends of the past decade and shows the results of limiting community investments to existing revenues.

  Scenario A represents what the future could look like if recent trends continue and we implement adopted plans with existing revenues (e.g., gas tax, payroll tax and existing local sources like urban renewal district (URD), SDCs, TIFs that have been used to fund transportation investments). Scenario A assumes the region continues to rely on existing revenues, which continue to decline in their purchasing power over time due to rising costs, inflation and improved fuel economy of vehicles. In addition, some URD are set to expire between now and 2035. This future would reflect maintaining existing TriMet service with small increases targeted to address overcrowding, delays due to congestion giving priority to routes serve the region's most vulnerable communities – children, seniors, low-income and people of color. Transit service growth is tied to the forecasted rate of job growth in the region, which reflects that the payroll tax continues to be the primary source of funding for transit service. Other transportation investments would also be limited as an increasing share of the revenues available are spent on maintaining the transportation system in place today. Bicycle and pedestrian investments are focused on improving access to transit, and providing safe routes to schools.

  An implication of limited community investment is that cities and counties are not able to achieve their adopted plans and the region falls short of goals for maintaining an adequate supply of shovel-ready industrial lands that attract new employers. *This scenario is not expected to meet the greenhouse gas emissions target.*

- **Scenario B (Adopted Plans)** - What if we implement adopted plans and raise additional revenues as called for in the adopted Regional Transportation Plan?

  Purpose: This scenario counters recent funding trends and shows the results of investing in a mix of transportation and land use strategies with revenues projected in the adopted RTP.

  Scenario B represents what the future could look like if we counter recent trends and are successful implementing adopted plans with additional revenues assumed in the 2035 Regional Transportation Plan. The scenario would assume the adopted RTP levels of transit, road, operations and bike/pedestrian investment, current adopted local land use plans and planned funding as adopted in the RTP (e.g., 1 cent per year gas tax increase, increases to vehicle registration fees, some increase in the payroll tax for transit). In this scenario, TriMet is able to restore and expand frequent bus service in priority corridors and to serve the region's most vulnerable communities, consistent with Service Enhancement Plans. Scenario B assumes the 2035 RTP Financially Constrained System of projects and programs adopted by JPACT and the Metro Council in June 2010.

  An implication of this scenario is that with significantly more community investment, cities and counties are better able to achieve their adopted plans and attract new employers – as reflected in the regionally-reviewed 2035 growth distribution adopted by the Metro Council in November 2012. The region is better able to maintain its competitive advantage by helping local companies access global markets and grow local jobs. More job opportunities are likely to be available throughout the region in downtowns, existing employment areas and other locations with good transportation access. *This scenario may meet the greenhouse gas emissions target.*[4]

[4] The regionally-reviewed growth distribution will be used in this analysis. A draft growth distribution was used in Phase 1. In addition, the RTP financially constrained system state gas tax increase assumption of 1 cent per year

- **Scenario C (New Plans and Policies)** - What if we more fully achieve adopted and emerging plans, and pursue new policies and revenues to meet greenhouse gas emissions reduction targets and achieve other goals?

  Purpose: This scenario shows the results of more investment aimed at fully achieving adopted and emerging plans and greenhouse gas emissions reduction targets.

  Scenario C represents what the future could look like if we are able to fully implement adopted plans (including the full RTP) and additional transit, bike, pedestrian and road investments needed to support new plans such as the Southwest Corridor Plan, East Metro Connections Plan, the Regional Active Transportation Plan, and updated community plans identified through local planning efforts. In this scenario, TriMet is able to further expand frequent and local bus service to more parts of the region with supporting land use and better serve the region's most vulnerable communities. Transit transfer times are extended and high school and colleges students across the region have a free, year-round transit pass. The State of Oregon implements a comprehensive intercity transit system, which includes the Cascadia high-speed rail and other service that connects the region to Salem and Eugene as well as other major west coast cities, including San Francisco, Seattle and Vancouver, B.C. More services, shopping opportunities and job opportunities are located near transit and where people live and work. Most major employers and commercial destinations in the region in the region have electric vehicle charging stations available for visitors and employees.

  This scenario also reflects a policy area (transportation pricing) that Metro and the region have not examined in great detail and more work is needed to understand the effectiveness and the potential benefits and impacts pricing policies bring, including effects on households of modest means and businesses. This scenario presents an opportunity to test new revenue mechanisms like a bike fee, mileage-based fee or a carbon fee to maintain and operate the transportation system and fund needed investments or market incentives that help reduce GHG emissions. This scenario could also be designed to explore using the mileage-based fee to test the effect of transitioning from the state gas tax to a mileage-based fee.

  An implication of this scenario is that cities and counties are better able to achieve their adopted plans, attract new employers, and expand local companies' access to global markets to further grow local jobs because more sustainable transportation funding mechanisms are developed to fund needed investments. Incentives and market-oriented reform are linked with investments in information and green technology to further expand access to housing, economic and educational opportunities for everyone. *This scenario is expected to meet or exceed the greenhouse gas emissions target.*

The scenarios are cumulative and for research purposes. The scenarios do not represent future Metro Council, Oregon Transportation Commission (OTC), local government or TriMet policy intentions.

Methodology

The Investment Choices Scenarios Analysis is intended to be a starting point for developing a recommended land use and transportation scenario that meets the state greenhouse gas emissions reduction target. The understanding gained through this analysis will guide the design and analysis of a preferred scenario in Phase 3 of the project.

increase was not fully evaluated in Phase 1. The state gas tax was assumed in the Level 2 pricing assumptions as a mileage-based fee. Many of the Phase 1 scenarios with Level 2 pricing met or exceed the state greenhouse gas emissions target.

MPAC, JPACT and the Metro Council will provide direction on the assumptions to be tested in each of the scenarios and the questions to be addressed through the evaluation. The three scenarios will be developed and evaluated in the summer of 2013 using the Metropolitan GreenSTEP model, GIS analysis and workshops aimed at identifying the action needed to implement each scenario.

Evaluation

While the technical evaluation of the investment scenarios will generate an array of data, the analysis will focus on reporting how each scenario responds to shared concerns about growth in the region as expressed in the Outcomes-Based Evaluation Framework endorsed by the MPAC and JPACT in June 2011. Performance of each scenario will be compared using a set of key indicators being developed based on input provided by business and community leaders in 2012 and early 2013, and the public through an Opt-In opinion survey. [5] The evaluation will consider public health, social equity, environmental, economic, financial, and political implications associated with each scenario.

Planning-level cost estimates for each scenario will be developed by Metro, in partnership with ODOT and TriMet. In addition, project staff will convene workshops as part of the evaluation to identify feasibility and actions needed to implement the scenarios being evaluated.

Questions to Answer with the Evaluation

The scenarios will help answer policy questions that forecasted growth and fiscal constraints in the region raise about our ability to protect the region's quality of life and economy for current residents and future generations and meet state targets for reducing greenhouse gas emissions, including:

- What will our choices cost and what can we afford?
- Which strategies are most effective for supporting community visions and reducing greenhouse gas emissions?
- What are the risks, opportunities and tradeoffs of our choices – considering public health, social equity, environmental, economic, financial, and political implications?

OVERVIEW OF PHASE 3 - DEVELOPMENT AND SELECTION OF A PREFERRED LAND USE AND TRANSPORTATION SCENARIO

Phase 3, the final phase of the process, will begin in Fall 2013 with release of the scenarios analysis results. The results of the analysis will be reported using an Outcomes-Based Evaluation Framework being refined by Metro staff based on input provided during a series of workshops and focus groups held with community leaders working to advance public health, equity and environmental justice, protection of the environment and economic prosperity in the region.

Release of the findings will kick-off a broader regional discussion aimed at identifying which policies, investments and actions should be included in a preferred scenario - likely drawing elements from each of the three scenarios tested in Phase 2. Policy recommendations that result from this discussion will provide direction to Metro, ODOT, TriMet and local agency staff on the draft preferred scenario to be analyzed in Spring 2014. A draft preferred scenario concept is anticipated by March 2014 to allow sufficient time to meet state timeline and scenario selection requirements.

A final preferred scenario is required to be selected by the end of 2014 after public review and consultation with local governments and state and regional partners. The preferred scenario will not result in a one-size fits all vision or implementation strategy. It will allow for local flexibility to support the differences among the region's cities and counties and seek to advance achievement of

[5] A series of scorecard workshops and business focus groups and an Opt-In survey will inform refinements.

their of their unique goals and visions. The preferred scenario will also include regional and state implementation actions.

The preferred scenario will initially be implemented through amendments to Metro's Regional Framework Plan and 2040 Growth Concept in December 2014. Implementation through Metro's functional plans, local comprehensive plans, land use regulations and transportation system plans will occur through future actions as defined by Oregon Administrative Rules adopted by the Land Conservation and Development Commission.[6]

TIMELINE

The timeline for the scenarios analysis and final adoption of a preferred scenario meets OAR 660-044-0040:

February - April 2013	Metro Council, MPAC, JPACT review investment choices scenarios construct and outcomes-based evaluation framework.
	Newsfeeds on strategies under consideration are underway, and are available the project web site: www.oregonmetro.gov/climatescenarios.
	Complete business focus groups.
	Conduct Opt In on-line survey in April to gather input on investment priorities and priority outcomes to be evaluated, and build understanding of the project and strategies under consideration
May 2013	Metro Council, MPAC, JPACT confirm scenario assumptions to be tested and questions to be addressed in analysis.
June-August 2013	Project staff and technical work group analyze investment scenarios using Metropolitan GreenSTEP and GIS.
	Convene workshops to identify feasibility and actions likely to be necessary to implement scenarios.
August-September 2013	Project staff and technical work group report analysis results in CSCS Investment Choices Findings Report.
October 2013	Staff release CSCS Investment Choices Findings Report for regional discussion; begin phase 3.
Oct. 2013 – March 2014	Report back to communities, decision-makers and regional partners on the results and decide which elements should be included in a preferred scenario.
March/April 2014	MPAC, JPACT and Metro Council confirm draft preferred scenario concept.
April-July 2014	Consult with local governments, and state and regional partners on draft preferred scenario concept and implementation strategies.
	Analyze draft preferred scenario using the regional travel demand model and Metropolitan GreenSTEP.
Summer 2014	Project staff prepare adoption package for public comment period.

[6] OAR 660-044-0040 and OAR 660-044-0045.

Fall 2014	45-day public comment period on adoption package.
December 2014	MPAC and JPACT recommendation to the Metro Council on the preferred land use and transportation scenario Metro Council takes action on recommended preferred land use and transportation scenario.

CLIMATE SMART COMMUNITIES SCENARIOS PROJECT

Technical Work Group Members

March 6, 2013

	Name	Affiliation	Membership
1.	Tom Armstrong	City of Portland	MTAC alternate
2.	Chris Deffebach	Washington County	TPAC & MTAC member
3.	Chuck Beasley	Multnomah County	MTAC member
4.	Lynda David	Regional Transportation Council	TPAC member
5.	Jennifer Donnelly	DLCD	MTAC member
6.	Denny Egner	City of Lake Oswego	MTAC member
7.	Karen Buehrig	Clackamas County	TPAC member
8.	Steve Butler	City of Milwaukie	Local government staff
9.	Jon Holan	City of Forest Grove	MTAC alternate
10.	Katherine Kelly/ Jonathan Harker	City of Gresham	TPAC member/MTAC member
11.	Nancy Kraushaar	City of Wilsonville	TPAC member
12.	Alan Lehto/ Eric Hesse	TriMet	TPAC/MTAC member TPAC/MTAC alternate
13.	Mary Kyle McCurdy	MTAC citizen/community group	MTAC member
14.	Ben Bryant	City of Tualatin	Local government staff
15.	Barbara Fryer	City of Beaverton	MTAC alternate
16.	Margaret Middleton	City of Beaverton	TPAC member
17.	Lainie Smith	ODOT	TPAC alternate and MTAC member
18.	Dan Rutzick/ Peter Brandom	City of Hillsboro	Local government staff
19.	Mara Gross	Coalition for a Livable Future	Community member

CLIMATE SMART COMMUNITIES SCENARIOS PROJECT

DRAFT

February 26, 2013

Shaping our choices for the future – a starting point for gathering input on what choices to test

A scenario is an example of what the future might look like based on the choices we make today. The three scenarios presented are intended to serve as a starting point for gathering input on what choices should be tested in summer 2013.

An analysis of the scenarios will stimulate a discussion about our choices for the future and the possible impacts they may have on how we live, travel, work and invest in our communities. Working together, cities, counties and regional partners will decide which elements from each of the three scenarios should go forward into one preferred scenario for the region to adopt in December 2014. Considerations for developing a preferred scenario will include: costs and benefits across public health, environmental, economic and social equity outcomes, financial implications, public support and political will.

The Oregon Legislature has required the Portland metropolitan region to reduce per capita greenhouse gas emissions from cars and small trucks by 2035.

NOTE: The scenarios are cumulative and for research purposes. The scenarios do not represent future Metro Council, Oregon Transportation Commission, TriMet or local government policy intentions.

WHAT THE FUTURE MIGHT LOOK LIKE IN 2035

	Scenario A RECENT TRENDS	Scenario B ADOPTED PLANS	Scenario C NEW PLANS AND POLICIES
Purpose	This scenario follows the funding trends of the past decade and shows the results of limiting community investments to existing revenues.	This scenario counters recent funding trends and shows the results of investing in a mix of transportation and land use strategies with revenues projected in the adopted Regional Transportation Plan.	This scenario shows the results of more investment aimed at fully achieving adopted and emerging plans and GHG emissions reduction targets.

LESS INVESTMENT AND POLICIES MORE

FLEET AND TECHNOLOGY ASSUMPTIONS

	Scenario A RECENT TRENDS	Scenario B ADOPTED PLANS	Scenario C NEW PLANS AND POLICIES
Fleet and technology	Target rulemaking assumptions will be used for all three scenarios.		

Vehicle and Fuel Characteristics	Target Rulemaking Assumption
Auto fuel economy (miles per gallon)	68
Light truck fuel economy (miles per gallon)	48
Auto fuel economy—plug-in hybrids in charge sustaining mode (miles per gallon)	81
Light truck fuel economy—plug-in hybrids in charge sustaining mode (miles per gallon)	56
Proportion of autos that are plug-in hybrids or electric vehicles	8%
Proportion of light trucks that are plug-in hybrids or electric vehicles	2%
Plug-in hybrids battery range (miles)	35
Electric vehicles battery range: auto and light truck (miles)	175
% reduction in fuel carbon intensity from current levels	20%
Electric power sources compared to current Renewable Portfolio Standard	Meet
Average vehicle replacement rate (years)	8

LAND USE ASSUMPTIONS

	Scenario A RECENT TRENDS	Scenario B ADOPTED PLANS	Scenario C NEW PLANS AND POLICIES
Land use plans and zoning	Local land use plans and zoning as adopted by cities and counties for downtowns, main streets and employment areas will be the same for all three scenarios.		
Growth captured in UGB	TBD	As reflected in 2035 Regional Growth Distribution adopted by the Metro Council in November 2012.	Southwest Corridor Plan land use vision and other city and county planning efforts underway (if available).
Public/private investment	TBD		TBD

See reverse for more information

NOTE: The scenarios are cumulative and for research purposes. The scenarios do not represent future Metro Council, Oregon Transportation Commission, TriMet or local government policy intentions.

DRAFT

WHAT THE FUTURE MIGHT LOOK LIKE IN 2035

February 26, 2013

	Scenario A RECENT TRENDS	Scenario B ADOPTED PLANS	Scenario C NEW PLANS AND POLICIES
Purpose	This scenario follows the funding trends of the past decade and shows the results of limiting community investments to existing revenues.	This scenario counters recent funding trends and shows the results of investing in a mix of transportation and land use strategies with revenues projected in the adopted Regional Transportation Plan.	This scenario shows the results of more investment aimed at fully achieving adopted and emerging plans and GHG emissions reduction targets.

TRANSPORTATION ASSUMPTIONS

	Scenario A RECENT TRENDS	Scenario B ADOPTED PLANS	Scenario C NEW PLANS AND POLICIES
Transit	**Operations and maintenance** ▪ Maintain existing TriMet service with small increases targeted to address overcrowding and delays due to congestion ▪ Implement SMART and C-TRAN plans **Capital** ▪ Extend MAX to Milwaukie ▪ Powell/Division BRT ▪ Extend MAX to Vancouver, WA ▪ Close Portland streetcar loop	**Operations and maintenance** ▪ Restore and expand frequent bus service in priority corridors, consistent with Service Enhancement Plans **Capital** ▪ Streetcar extension along priority corridors ▪ Additional transit priority and pedestrian/bike access to transit projects	**Operations and maintenance** ▪ Expand frequent bus service coverage to all major arterials with supporting land use connecting regional and town centers, consistent with TriMet Service Enhancement Plans ▪ Expand local bus service coverage and connections to frequent bus service and high capacity transit, consistent with TriMet Service Enhancement Plans **Capital** ▪ Cascadia rail connections to Eugene, Salem and Vancouver B.C. ▪ High capacity transit: Southwest Corridor and AmberGlen ▪ WES service frequency improvements ▪ Bus rapid transit serving I-205 and Tualatin-Valley Highway corridors ▪ Other Portland streetcar extensions ▪ Additional transit priority and pedestrian/bike access to transit projects
Streets and highways	**Operations and maintenance** ▪ Fall behind on fixing potholes and repairs ▪ Implement 50% of regional TSMO strategic plan to achieve 10% delay reduction **Capital** ▪ I-5 Bridge Replacement ▪ 2016-18 STIP and MTIP projects	**Operations and maintenance** ▪ Keep up with fixing potholes and repairs ▪ Implement full regional TSMO strategic plan to achieve 20% delay reduction **Capital** ▪ Adopted RTP including: I-5 Bridge Replacement, Sunrise Project from I-205 to 172nd Avenue, US 26 widened to 6 through lanes to Cornelius Pass Road and interchange improvements at US 26, OR 217, I-205, Troutdale/I-84 and I-84/I-5	**Operations and maintenance** ▪ Keep up with fixing potholes and repairs ▪ Expanded TSMO strategic plan achieves 35% delay reduction **Capital** ▪ I-5/OR 217 interchange (Phase 2) ▪ State RTP project list
Bike and pedestrian	▪ Investments are limited with no dedicated funding; X% of regional system completed ▪ Complete 2016-18 STIP and MTIP projects	▪ Complete adopted RTP bike and pedestrian projects; X% of regional system completed	▪ Complete 100% of regional bike and pedestrian networks, including regional trails, further targeting short trips and access to transit and centers

EDUCATION AND INCENTIVES ASSUMPTIONS

	Scenario A RECENT TRENDS	Scenario B ADOPTED PLANS	Scenario C NEW PLANS AND POLICIES
Education and incentives	▪ 10% of households practice ecodriving and participate in travel options programs ▪ 20% of employees participate in commute programs ▪ 1% of households participate in car-sharing ▪ 10% of vehicle owners use pay-as-you-drive insurance	▪ 20% of households practice ecodriving and participate in travel options programs ▪ 20% of employees participate in commute programs ▪ 2% of households participate in car-sharing ▪ 10% of vehicle owners use pay-as-you-drive insurance	▪ 40% of households practice ecodriving and participate in travel options programs ▪ 40% of employees participate in commute programs ▪ 4% of households participate in car-sharing ▪ 10% of vehicle owners use pay-as-you-drive insurance

PRICING ASSUMPTIONS

	Scenario A RECENT TRENDS	Scenario B ADOPTED PLANS	Scenario C NEW PLANS AND POLICIES
Pricing	**Existing revenues at 2012 levels** **Fuel use and emissions fees** ▪ Federal gas tax = 18 cents/gallon ▪ State gas tax = 30 cents/gallon ▪ Local gas tax = 1-2 cents/gallon Vehicle travel fees ▪ I-5 Bridge toll **Other transportation fees** ▪ Payroll tax and farebox recovery ▪ Parking fees in downtown Portland, OHSU campus and the Lloyd district ▪ Other federal, state and local revenues at existing levels	**Revenues assumed to fund adopted RTP** **Fuel use and emissions fees** ▪ Federal gas tax = 18 cents/gallon ▪ State gas tax = 55 cents/gallon ▪ Local gas tax = 1-2 cents/gallon Vehicle travel fees ▪ I-5 Bridge toll **Other transportation fees** ▪ Payroll tax and farebox recovery ▪ Parking fees in more locations served by high capacity transit ▪ Other federal, state and local revenues at RTP levels	**New and expanded revenues** **Fuel use and emissions fees** ▪ Federal gas tax = 18 cents/gallon ▪ Carbon fee = $20-50/ton ▪ Local gas tax = 1-2 cents/gallon **Vehicle travel fees** ▪ I-5 Bridge toll ▪ VMT fee = $.03-.15/mile **Other transportation fees** ▪ Payroll tax and farebox recovery ▪ Parking fees in new locations served by high capacity transit ▪ Bicycle fee

Metro

Phase 1: 2010 base year and alternative scenario inputs

The input assumptions are for research purposes only and do not necessarily reflect current or future policy decisions of the Metro Council, MPAC or JPACT.

This table summarizes the inputs for the 2010 Base Year and 144 alternative scenarios that reflect different levels of implementation for each category of policies. The inputs were developed by Metro staff in consultation with a technical work group of MTAC and TPAC members. Documentation of the inputs and rationale behind each input can be found in the Phase 1 Metropolitan GreenSTEP Scenarios Technical Documentation report (January 2012). This information is for research purposes only and does not necessarily reflect current or future policy decisions of the Metro Council, MPAC or JPACT.

			Reference case		
		2010	2035		
	Strategy	**Base Year** Reflects existing conditions	**Level 1** Reflects current plans and policies	**Level 2** Reflects more ambitious policy changes	**Level 3** Reflects even more ambitious policy changes
Community design	Households living in mixed-use areas and complete neighborhoods (percent)	GreenSTEP calculates			
	Urban growth boundary expansion (acres)	2010 UGB	7,680 acres	7,680 acres	No expansion
	Bicycle mode share[1] (percent)	2%	2%	12.5%	30%
	Transit service level	2010 service level	2035 RTP service level	2.5 times RTP service level	4 times RTP service level
	Workers/non-work trips paying for parking (percent)	13% / 8%	13% / 8%	30% / 30%	30% / 30%
	Average daily parking fee ($2005)	$5.00	$5.00	$5.00	$7.25
Pricing	Pay-as-you-drive insurance (percent of households participating and cost)	0%	0%	100% at $0.06/mile	No change from Level 2
	Gas tax (cost per gallon $2005)	$0.42	$0.48	$0.18	
	Road use fee (cost per mile $2005)	$0	$0	$0.03	
	Carbon emissions fee (cost per ton)	$0	$0	$0	$50

[1] Percent of all tours less than 6 miles roundtrip.

	Strategy	2010	Reference case 2035		
		Base Year Reflects existing conditions	**Level 1** Reflects current plans and policies	**Level 2** Reflects more ambitious policy changes	**Level 3** Reflects even more ambitious policy changes
Marketing and incentives	Households participating in eco-driving	0%	0%	40%	No Level 3
	Households participating in individualized marketing programs (percent)	9%	9%	65%	
	Workers participating in employer-based commuter programs (percent)	20%	20%	40%	
	Car-sharing in high density areas (target participation rate)	Participation rate of 1 member/100 people	Participation rate of 1 member/100 people	Double participation to 2 members/100 people	
	Car-sharing in medium density areas (target participation rate)	Participation rate of 1 member/200 people	Participation rate of 1 member/200 people	Double participation to 2 members/200 people	
Roads	Freeway and arterial expansion	2010 system	2035 financially constrained system	No expansion	
	Delay reduced by traffic management strategies (percent)	10%	10%	35%	
Fleet	Fleet mix (proportion of autos to light trucks and SUVs)	auto: 57% light truck/SUV: 43%	auto: 56% light truck/SUV: 44%	auto: 71% light truck/SUV: 29%	
	Fleet turnover rate (age)	10 years	10 years	8 years	
Technology	Fuel economy (miles per gallon)	auto: 29.2 mpg light truck/SUV: 20.9 mpg	auto: 59.7 mpg light truck/SUV: 41 mpg	auto: 68.5 mpg light truck/SUV: 47.7 mpg	
	Carbon intensity of fuels	90 g CO_2e/megajoule	81 g CO_2e/megajoule	72 g CO_2e/megajoule	
	Light-duty vehicles that are electric or plug-in electric vehicles (percent)	auto: 0% light truck/SUV: 0%	auto: 4% light truck/SUV: 1%	auto: 8% light truck/SUV: 2%	

COMPARISON OF KEY DIFFERENCES BETWEEN PHASE 1 AND PHASE 2 ASSUMPTIONS

Policy input	Phase 1 Assumptions	Phase 2 Assumptions
Land use	**All scenarios** = Draft Gamma distribution (Oct. 2011)	**Scenario B =** Adopted Gamma distribution (Nov. 2012) **Scenario A and C =** New distribution to be developed to reflect effect of lower/higher levels of investment/policy tools
Transit	**Level 1 =** adopted RTP (financially constrained) **Level 2 =** 2.5 times RTP **Level 3 =** 4 times RTP	**Scenario A =** same as today with small operations enhancements **Scenario B =** adopted RTP (financially constrained) **Scenario C =** adopted RTP (full plan) + Westside enhancements (equivalent of between L1 and L2) and other items in draft assumptions table
Roads	**Level 1 =** adopted RTP (financially constrained) **Level 2 =** no new road projects	**Scenario A =** low build of RTP **Scenario B =** adopted RTP (financially constrained) **Scenario C =** adopted RTP (full plan)
I-5 Bridge toll	*Not considered in Phase 1*	**All scenarios**
State gas tax	**Level 1 =** $.30 gallon (same as today) **Level 2 =** transitioned $.55/gallon to VMT fee equivalent of $.03/mile **Level 3 =** same as level 2	**Scenario A =** $.30 gallon (same as today) **Scenario B =** $.55/gallon per adopted RTP (financially constrained) **Scenario C =** transitioned to VMT fee equivalent of $.03 - .15/mile to close funding gap
Carbon fee	**Level 1=** $0 **Level 2 =** $0 **Level 3 =** $50/ton	**Scenario A =** $0 **Scenario B =** $0 **Scenario C =** $20-50/ton to close funding gap
Pay-as-you drive insurance	**Level 1 =** 0% participation **Level 2 =** 100% participation	**Scenario A =** 10% participation **Scenario B =** 10% participation **Scenario C =** 10% participation
Parking	**Level 1=** same as today **Level 2 =** adopted RTP (financially constrained) **Level 3 =** adopted RTP + increased average cost	**Scenario A =** same as today **Scenario B =** adopted RTP (financially constrained) **Scenario C =** adopted RTP (full plan) + new HCT corridors
Bicycle fee	*Not considered in Phase 1*	*TBD*
Individual marketing	**Level 1 =** 9% participation (same as today) **Level 2 =** 65% participation (linked to transit access)	**Scenario A =** 10% participation **Scenario B =** 20% participation **Scenario C =** 40% participation
Commuter programs	**Level 1 =** 20% participation (same as today) **Level 2 =** 40% participation	**Scenario A =** 20% participation **Scenario B =** 20% participation **Scenario C =** 40% participation
Ecodriving	**Level 1 =** 0% participation **Level 2 =** 40% participation	**Scenario A =** 10% participation **Scenario B =** 20% participation **Scenario C =** 40% participation

About Metro

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

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

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New challenges call for new choices

What choices are you willing to make to respond to these challenges?

Clean fuels and technology
How can the region support state and federal efforts to transition to clean fuels and technology?

Community investment
How do we pay for investments needed to realize our shared vision for walkable communities, job creation, and affordable housing and transportation choices?

Transit
How much frequent transit should the region provide and what areas should be a priority? What other investments are needed to complement this strategy?

optin ONLINE PANEL

Join Metro's online opinion panel today at **www.optinpanel.org** and be entered to win a $100 gift card.

LOOKING AHEAD

Developing a preferred scenario

Working together, cities, counties and regional partners will decide which elements from each of the three scenarios should go forward into one preferred scenario for the region to adopt in December 2014.

Considerations for developing a preferred scenario include:

- costs and benefits across public health, environmental, economic and social equity goals
- financial implications
- public support and political will.

www.oregonmetro.gov/climatescenarios

CLIMATE SMART COMMUNITIES SCENARIOS PROJECT

MAKING A GREAT PLACE

Metro

The Road to 2040

Choices for our future

Nearly two decades ago, the residents of this region set a course for growth with the adoption of the 2040 Growth Concept – a plan for how the region grows over the next 50 years.

The vision for 2040 calls for each community to decide the best way to create vibrant downtowns, provide good jobs, and offer affordable housing and transportation choices for its residents. Together, these community visions encourage growth in downtowns, main streets and employment areas, and preserve farms, forestland and natural areas. They help build a strong regional economy, while celebrating and strengthening individual local character.

Shaping the region with intention

The desired outcome of this shared vision is a region where people live, work and play in healthy communities with easy access to everyday needs. Where safe and reliable transportation choices connect people to jobs and goods to market. Where current and future generations benefit from the region's sustained economic competiveness and resilience. Where everyone enjoys clean air, clean water and a healthy ecosystem. And where the benefits and costs of growth and change are equitably shared among all communities.

The Oregon Legislature has required the Portland metropolitan region to reduce per capita greenhouse gas emissions from cars and small trucks by 2035.

How we get there is up to you.

Shared values for livable communities guide our policy and investment choices to create a unique sense of place and quality of life that attract people and businesses to the region and inspire generations to call this place home.

Leadership on climate change

Because we have focused development where it makes sense – in downtowns, main streets and employment areas – and invested in transportation choices, we drive 20 percent fewer miles every day than other regions of a similar size.

By taking direction from the 2040 plan and working together with local communities as they develop and update community visions, we can grow in a more sustainable manner that reduces greenhouse gas emissions from transportation and improves the environment for healthier, more livable communities.

But there's more to be done.

CLIMATE SMART COMMUNITIES SCENARIOS PROJECT

WE ALL HAVE CHOICES TO MAKE

The choices we make today will determine the future of the Portland metropolitan region. While we have worked together to create strong local communities and a region with an enviable quality of life, today's uncertain economy, limited resources, rising energy costs and a growing and diverse population have brought new challenges.

In collaboration with city, county, state, business and community leaders, Metro is researching how investments and transportation and land use policies can be leveraged to respond to these challenges and meet climate goals.

Scenario planning

To stimulate thinking about our choices for the future and the possible impacts they may have on how we live, travel and work, three scenarios will be tested in 2013 to help answer the questions:

- What will our choices cost and what can we afford?
- Which strategies are most effective for supporting community visions and reducing greenhouse gas emissions?
- What are the risks, opportunities and tradeoffs of our choices?

WHAT THE FUTURE MIGHT LOOK LIKE IN 2035

Scenario A
RECENT TRENDS — $

This scenario follows the funding trends of the past decade and shows the results of limiting community investments to existing revenues.

How we live
Developers provide some new housing choices near transit and downtown areas.

How we get around
Streets in my community need repair. I often drive because transit is not available in my neighborhood. There are limited new pathways for biking and walking to get me to transit.

How we work
I look for ways to lower the fuel operating costs for my business while maintaining my delivery schedule and serving customers.

How we invest
We rely on existing revenues, many of which are declining (e.g., gas tax, payroll tax, federal funds). We spend an increasing share of that revenue on maintaining what we have.

What is a scenario?

A scenario is an example of what the future might look like, based on the choices we make today.

The scenarios presented are intended to serve as a starting point for gathering input on what choices should be tested in 2013.

Scenario B
ADOPTED PLANS — $$

This scenario counters recent funding trends and shows the results of investing in a mix of transportation and land use strategies with revenues projected in the adopted Regional Transportation Plan.

How we live
My community provides more housing choices, jobs and services near transit.

How we get around
Streets, highways and transit systems in my community are in good repair. Targeted investments make it easier to walk, bike or take transit to work and to meet my everyday needs.

How we work
I build on past cost saving measures to invest in new technologies and cleaner fuels to support my delivery and business needs.

How we invest
We partner with nearby city, regional and state leaders to increase existing revenues to properly maintain and expand streets, highways, transit, sidewalks and bike pathways.

Scenario C
NEW PLANS AND POLICIES — $$$

This scenario shows the results of more investment aimed at fully achieving adopted and emerging plans and greenhouse gas emissions reduction targets.

How we live
More young people, seniors and families live close to services and transit because of the convenience this offers. I live close to where I work and can choose to drive or take another way.

How we get around
Streets, highways and transit systems in my community are in good repair. I can easily walk, bike and take transit to work and to meet my everyday needs.

How we work
I reinvest cost savings to create more jobs and further shift operations toward energy efficiency for my business and delivery needs.

How we invest
We work together with business and community leaders to find new ways to fund maintenance and make new investments in streets, highways, transit, sidewalks and bike pathways.

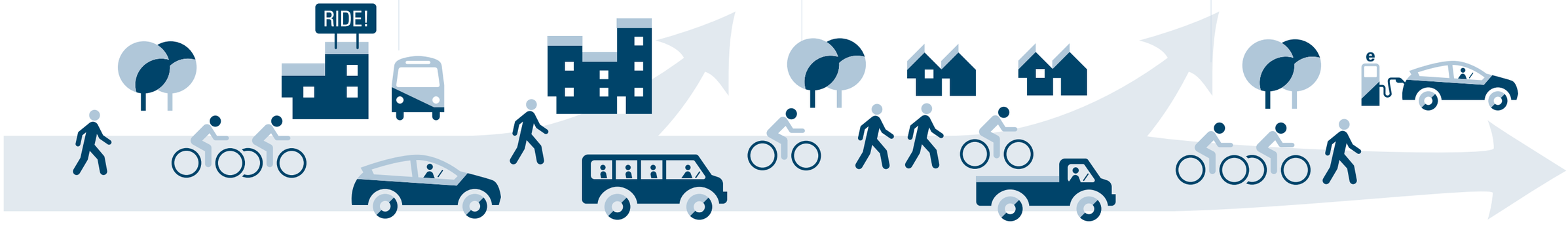
CLIMATE SMART COMMUNITIES SCENARIOS PROJECT TIMELINE

UNDERSTAND CHOICES
2011-12
Research how strategies could impact community outcomes and GHG emissions

SHAPE CHOICES
Jan.-Sept. 2013
Develop and evaluate scenario options to learn how choices today impact our communities tomorrow

SHAPE PREFERRED SCENARIO
Oct. 2013-March 2014
Report back to communities and develop a preferred scenario

SELECT PREFERRED SCENARIO
April-Dec. 2014
Adopt a preferred land use and transportation scenario



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Metro | *Memo*

Date: March 27, 2013

To: JPACT, MPAC, MTAC and TPAC and interested parties

From: Kim Ellis, Principal Transportation Planner
Grace Cho, Assistant Transportation Planner

Re: Climate Smart Communities Scenarios Project: – Phase 2 Evaluation Framework and Evaluation Criteria

Purpose

This memorandum outlines the Phase 2 evaluation framework staff will use to assess three scenarios for the Climate Smart Communities (CSC) Scenarios Project. The framework reflects the Phase 1 evaluation framework endorsed by the Metro Policy Advisory Committee (MPAC) and the Joint Policy Advisory Committee on Transportation (JPACT) in June 2011 and input provided by community leaders and Metro advisory committees in 2012 and 2013. April advisory committee discussions and an Opt In public opinion survey (www.climatesmartsurvey.com) that launched on March 27 are anticipated to inform further refinements to the evaluation measures.

Action Requested

Metro staff requests feedback on the evaluation criteria and questions to be addressed in the evaluation.

Background

The purpose of scenario planning is to test a range of potential futures that reflect choices policymakers, businesses and individuals might make. Phase 1 focused on understanding the region's land use and transportation choices for reducing greenhouse gas (GHG) emissions from cars and small trucks. Staff tested 144 different combinations of land use and transportation policies (i.e. scenarios) to learn what it might take to meet the region's GHG emissions reduction target. Staff also conducted sensitivity analysis of the Phase 1 scenarios to better understand the GHG emissions reduction potential of individual strategies.[1 and 2] The strategies tested included pay-as-you-drive insurance, traffic operations, expanded transit service, pricing, transportation demand management programs, community design and advancements in clean fuels and vehicle technologies.

Given the significant number of scenarios tested, Phase 1 did not include an evaluation of the potential financial, political, social equity, environmental or economic implications of the different scenarios; these implications will be measured as part of the evaluation of three alternative investment scenarios during the summer of 2013.

To inform the Phase 2 evaluation, Metro is creating a "scorecard" to measure how well the three scenarios work to advance the region's desired outcomes. In 2012-13, Metro staff convened a series of "scorecard" workshops and focus groups with public health, environmental, social equity, and business leaders to identify the outcomes that are priorities for the evaluation. [3] In early 2013,

[1] Memo to TPAC and interested parties on Climate Smart Communities: Phase 1 Metropolitan GreenSTEP scenarios sensitivity analysis (June 21, 2012).

[2] Memo to TPAC and interested parties on Climate Smart Communities: Updated Draft Scenario Options Framework (June 26, 2012).

[3] A summary of the environmental and equity/environmental justice workshops can be downloaded from the project website. The public health workshop and business focus groups reports will be available in April.

Metro's advisory committees provided additional feedback on the information needed from the evaluation. Metro advisory committee discussions and feedback from the community leaders informed development of the Phase 2 evaluation framework and preliminary evaluation measures.

The evaluation measures for each outcome should be sees as gauges on a car dashboard, not as grades on a report card. They will provide information about each scenario, but not judge the scenario. Each scenario will have some benefits and drawbacks, and there will be trade-offs to consider. The trade-offs discussion will occur during the Fall of 2013 and in early 2014.

Phase 2 Scenarios Evaluation Framework

Adopted in 2010, the region's six desired outcomes will continue to be used as the framework guiding the evaluation in Phase 2. For the CSC scenarios project, social equity will be addressed as a lens across all desired outcomes. The six regional outcomes are:

- Vibrant Communities
- Economic Prosperity
- Safe and Reliable Transportation
- Leadership on Climate Change
- Clean Air and Water
- Equity

The Phase 2 scenarios evaluation will measure the GHG emissions reduction potential of the three scenarios and provide policy makers with information about the implications, benefits and drawbacks of different land use and transportation policy and investment choices, relative to the region's shared social equity, economic, environmental and community goals.

Major objectives of the analysis are to:

- Test distinct investment policy choices that frame the boundaries of the political landscape and public opinion to better understand the effect of different levels of investment on public health, travel behavior, development patterns, social equity, the economy, the environment and GHG emissions.
- Evaluate the relative effect and cost of different investment choices in order to recommend what combinations of investments, tools and strategies are needed to best achieve community visions and GHG emissions reductions.
- Provide recommendations to guide development and implementation of a preferred and feasible land use and transportation scenario.

Planning-level cost estimates for each scenario will be developed by Metro, in partnership with ODOT and TriMet. In addition, project staff will convene workshops as part of the evaluation to scope feasibility and actions needed to implement the three scenarios. The evaluation will include collaborating with community leaders working to advance social equity in the region. To the extent possible, this collaboration will help identify policy tools to reduce existing community disparities through implementation of the preferred scenario that is selected in 2014. Evaluation activities will also assess implementation feasibility – including political or public acceptability, legal, legislative or regulatory barriers, and institutional capacity – considering social equity, economic, environmental and community implications.

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http://library.oregonmetro.gov/files//equity_and_environmental_justice_scorecard_workshop_report_20121130_v2.pdf
http://library.oregonmetro.gov/files//environmental_scorecard_workshop_report__appendices_20121204_web.pdf

A Phase 2 Findings Report will include the "scorecard" and a narrative describing the methodology, analysis and outcome for each evaluation measure for each scenario and summarize results using info-graphics and other visual tools to convey the expected trade-offs between the scenarios. No weighting of the evaluation measures is proposed. Decision-makers are encouraged to determine the measures that are important to them and to include that in their decision-making.

The findings report will communicate which combination of strategies (e.g., scenarios) will achieve the state GHG targets and how different levels of investment and policy implementation could affect the cost of moving freight, air quality, household and business expenditures, public health, infrastructure costs, travel behavior, and other outcomes. The report will be brought forward for discussion by the region's decision-makers and community and business leaders in Fall 2013. The information is expected to assist in the identification of the preferred scenario by March 2014.

Phase 2 Evaluation Criteria

During the scorecard workshops in 2012-13, the community leaders identified priority outcomes to be considered, and in some cases, potential evaluation measures. Feedback was clear that measurable outcomes are vital to the success of the scenarios evaluation and monitoring future implementation of a preferred scenario. Priority outcomes included transportation system safety and reliability, the cost of motor vehicle and freight delay, neighborhood stability, access to education, resiliency of the natural environment, environmental justice and equity, attracting new businesses to the region and protection of farms, forestlands and natural areas.

Metro staff compared the priority outcomes with the outputs of the two models being used to evaluate the alternative scenarios in Phase 2 – MetroScope and metropolitan GreenSTEP. These tools have a specific set of inputs and outputs that limit the scope of the evaluation. Staff linked the priority outcomes to the outputs available from the analysis tools. As time and resources allow, staff will conduct additional ArcGIS analysis and other "off-model" or qualitative analysis to supplement GreenSTEP or MetroScope analysis.

Attachment 1 lists the proposed GreenSTEP and MetroScope evaluation measures and their connection to the "scorecard" categories that have been identified to date by Metro's advisory committees and community leader workshop discussions. Only a subset of GreenSTEP and MetroScope outputs were selected as they were deemed to best reflect the priorities identified by community leaders and Metro's advisory committees. In addition, Metro is working with the Oregon Health Authority to determine whether they have adequate staff resources to evaluate how the three scenarios will impact priority health outcomes, such as fatalities and chronic illness, as they did for the Phase 1 scenarios.

A limitation of the analysis is that several of the priority outcomes identified to date do not match well with the capabilities of the analysis tools being used in Phase 2. In some cases these may be used in the evaluation of the preferred scenario in 2014, which will use Metro's regional travel demand model. More discussion of the Phase 3 evaluation measures and modeling tools will occur later in 2013.

Next Steps

Metro staff will present the Phase 2 evaluation framework and evaluation criteria for feedback in April 2013. The Metro Council, Metro Policy Advisory Committee (MPAC), Joint Policy Advisory Committee on Transportation (JPACT) will be asked to support moving forward with the evaluation in May 2013.

CLIMATE SMART COMMUNITIES SCENARIOS PROJECT

Phase 2 Evaluation Framework and Criteria

Evaluation criteria	Questions to answer	Evaluation measure	Estimation Method/Tool
 **Jobs and housing**	*How will our choices effect where we work and live?*	Distribution of housing (by type and location)	MetroScope output
		Distribution of jobs (by type and location)	MetroScope output
		Access to destinations (households within .5-mile distance of neighborhood services, parks, etc. by income group, race and ethnicity)	MetroScope output and ArcGIS
 **Economy**	*What will our choices cost and how will they effect public sector and household budgets, and the economic competitiveness of businesses and industry in the region?*	Transportation infrastructure costs (capital and operations)	GreenSTEP output
		Other public/private infrastructure costs	GreenSTEP/MetroScope output
		Social costs per capita and by income group (e.g., combined cost of travel delay, climate change damage and adaptation, energy security, air and noise pollution, crash costs to non-drivers and other environmental impacts)	GreenSTEP output
		Housing costs per household (total and as a percent of income by income group)	MetroScope output
		Out-of-pocket household transportation costs by income group (total and as a percent of income)	GreenSTEP output
		Freight truck travel costs	GreenSTEP output
		Transportation revenues per capita and by income group	GreenSTEP output
 **Travel**	*How will our choices effect how we get around?*	Vehicle miles traveled per capita	GreenSTEP output
		Vehicle delay per capita	GreenSTEP output
		Transit service per capita (revenue miles)	GreenSTEP output
		Access to transit (households within .5-mile distance of high capacity transit and .25-mile distance of frequent transit by income group, race and ethnicity)	MetroScope output and ArcGIS
		Change in metropolitan travel patterns	GreenSTEP/MetroScope output
 **Energy consumption and GHG emissions**	*How will our choices effect climate change and energy security?*	GHG emissions per capita	GreenSTEP output
		Fuel consumption (region-wide)	GreenSTEP output
 **Natural resources**	*How will our choices effect air quality, water supplies and farms, forestland and natural areas?*	Criteria pollutant emissions	GreenSTEP output
		Land consumed for development	MetroScope output
		Residential water consumption	GreenSTEP output
 **Public health**	*How will our choices effect our health?*	Physical activity per capita (walk trips and bike miles)	GreenSTEP output
		Chronic illness (obesity, diabetes, asthma)	Public health model output
		Traffic safety (change in fatalities and injuries)	Public health model output
 **Feasibility**	*What choices can we afford, what choices are feasible and how do we implement our choices in an equitable and cost-effective manner?*	Financial, legal, legislative or regulatory barriers for implementation	Qualitative assessment
		Political or public acceptability	Qualitative assessment
		Institutional capacity for implementation and long-term "ownership"	Qualitative assessment
		Policy tools to reduce existing community disparities during implementation	Qualitative assessment and ArcGIS

Evaluation measures highlighted in yellow can be measured across population groups (e.g., income, age and ethnicity) to identify whether disproportionate impacts may occur to vulnerable populations in the region. Vulnerable populations are defined to include: low-income households, communities of color, older adults, children, households with limited english proficiency and people with disabilities.

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Metro | *Memo*

Date: March 26, 2013

To: MTAC

From: John Mermin, Senior Transportation Planner

Re: 2035 Regional Transportation Plan (RTP) Amendments

Background

In late 2012, Washington County staff inquired about an RTP amendment for a Scholls Ferry Rd project for which they would like to begin construction in Spring 2013. The County's inquiry presented an opportunity for other local jurisdictions to request potential RTP amendments that have been *identified through planning processes* completed since June 2010. RTP amendments typically take several months to complete, given the required air quality analysis, public comment period and approval process through the regional committees. Given the significant amount of staff time and resources both from Metro and affected local jurisdictions, Metro staff recommended that proposed RTP amendments be submitted in a single window for consideration by JPACT and the Metro Council. These requests were instructed to be limited to amendments that are *needed immediately* and cannot wait until the next RTP update is completed in June 2014.

At the November 30 TPAC meeting, Metro staff made a request for potential amendments to the 2035 RTP to be submitted by December 20. A summary of the proposed amendments are listed below. See attached letters for more detail.

- **Attachment 1. Washington County** has requested to add the Scholls Ferry Rd: Roy Rogers Rd to Teal Blvd project to the 2035 RTP Financially Constrained list and remove project # 10547, a proposed 174th/173rd undercrossing of US 26. The Scholls project would add eastbound and westbound through lanes and a continuous center turn lane.

- **Attachment 2. The City of Beaverton** has requested a minor change to the extent of the Crescent St multimodal extension project on the 2035 RTP Financially Constrained list. The terminus will now be Westgate Dr, instead of Cedar Hills Blvd.

- **Attachment 3. The City of Hillsboro** has requested to add six projects to the 2035 RTP financially constrained list, and remove project #10547 a proposed 174th/173rd undercrossing of US 26. The projects to be added include:
    - Gibbs Dr - a new 3-lane street with cycle tracks and sidewalks in AmberGlen Regional Center
    - 253rd – a new 3-lane street with bike lanes and sidewalks near the US 26/Brookwood Pkwy area, recently recommended for funding as part of the Regional Economic Opportunity Fund
    - Road widenings in the US 26/Brookwood Parkway area to support planned Intel expansions:
        - Brookwood Pkwy (7-lanes with bike lanes and sidewalks)
        - Butler Dr (5-lanes with bike lanes and sidewalks)
        - Cornelius Pass Rd (7-lanes with bike lanes and sidewalks)
        - US 26 westbound off-ramp at Cornelius Pas Rd (add second lane on westbound off-ramp and third southbound approach lane on Cornelius Pass Rd).

- **Attachment 4. Metro** (on behalf of the **East Metro Connections Plan (EMCP)** partners) has requested to add the EMCP's top priority project, NE 238th Drive: Halsey Street to Glisan Street Freight and Multimodal Improvements, to the 2035 RTP Financially Constrained list and remove projects #11074 - East Buttes Loop trail and #10409 - Beaver Creek trail. The EMCP has also recommended several changes to RTP policy maps, e.g. modifying the maps that currently designate the 242nd right-of-way as a future part of the regional transportation system (moving that designation to the existing 238th/242nd), designating the existing North/South arterials in the EMCP study area to be of equal significance for motor vehicle and freight movement, and adding a future trail connection between the Sandy River and Springwater trail.

- **Attachment 5. The Oregon Department of Transportation** has requested to add three projects to the 2035 RTP Financially Constrained list:
    - Extending existing auxiliary lane on I-205 Southbound from I-84 Eastbound entrance-ramp to Stark/Washington St
    - Extending existing acceleration-lane on I-205 Northbound from Powell entrance ramp to match with existing auxiliary lane from Division St entrance ramp to Stark/Washington St exit ramp, and provide two lane exit at Stark/Washington.
    - Extending I-5 SB auxiliary lane from Lower Boones Ferry exit-ramp to Lower Boones Ferry entrance-ramp

  Financial Constraint is maintained through a reduction in cost of an existing ODOT project in the RTP.

- **Attachment 6. The City of Portland** has requested to add to the 2035 RTP Financially Constrained list the N. Williams Traffic Safety operations project, (N Winning Way to N Killingsworth St) and to reduce the cost of project #11191 – Citywide bicycle boulevards. The Williams project is composed of pedestrian and bicycle traffic safety and operational improvements, including enhanced crossings, buffered bike lane, traffic calming, a new traffic signal and modifications at existing signals on N. Williams, and neighborhood greenway improvements on a low-traffic parallel street - NE Rodney. Financial Constraint is maintained through a reduction in cost of an existing PBOT project in the RTP.

Time line / Next Steps

Metro has completed modeling demonstrating that if all of the proposed projects were built, the region would still meet federal and state air quality requirements. The public comment period on the amendments and air quality analysis will finish on April 8th. The calendar below shows upcoming meetings that are part of the adoption process. The amendments that come before MPAC, TPAC, JPACT and Metro Council for action will come in the form of five resolutions (one per jurisdiction) and one ordinance. The EMCP amendments will be in ordinance form since they include changes to RTP policy maps which are considered to be land use decisions per state law.

April 4 - JPACT Informational
April 10 - MPAC Informational
April 24 - MPAC Recommendation
April 26 - TPAC Recommendation
May 9 - JPACT Adoption
May 9 - Metro Council First reading
May 16 - Metro Council Adoption

For more information, contact John Mermin at 503-797-1747 or john.mermin@oregonmetro.gov

Attachment 1.

WASHINGTON COUNTY
OREGON

December 19, 2012

John Mermin, Senior Transportation Planner
Metro Planning & Development
600 NE Grand Ave.
Portland, OR 97232-2736

Dear Mr. ~~Mermin~~ John:

Washington County requests an amendment to add the *Scholls Ferry Road: Roy Rogers Road to Teal Boulevard* project to the 2035 RTP Financially Constrained project list. This project will result in a widening of Scholls Ferry Road from Teal Boulevard to Roy Rogers Road as shown on the attached location map. The project will consist of adding eastbound and westbound through-lanes and a continuous center turn lane. The attached cross-section diagram depicts general design features of the project including the following: 11.5-12 foot wide travel lanes, a 13 foot-wide continuous center-turn lane, a four foot-wide planter strip, five foot wide bike lanes and sidewalks and dark sky friendly lighting. The project will be constructed on 98 feet of right-of-way with an arterial road design speed of 45 miles per hour.

To meet our scheduled bid advertizing opening date of April 1, 2013, we request that a decision on our RTP amendment be made prior to this date. Contract awards are scheduled for April or May with construction starting in June 2013. The project is funded for an estimated $12 million through Washington County's MSTIP. To add the Scholls Ferry project to the Financially Constrained list, Washington County is proposing to drop RTP #10547, the proposed 173rd/174th undercrossing of Hwy. 26 from the Financially Constrained list. This project is slotted into the RTP's 2018-2025 time period and has an estimated cost of $58.6 million.

Please don't hesitate to contact me if you have questions or concerns about this request, and thanks for all the help in addressing this issue.

Sincerely,

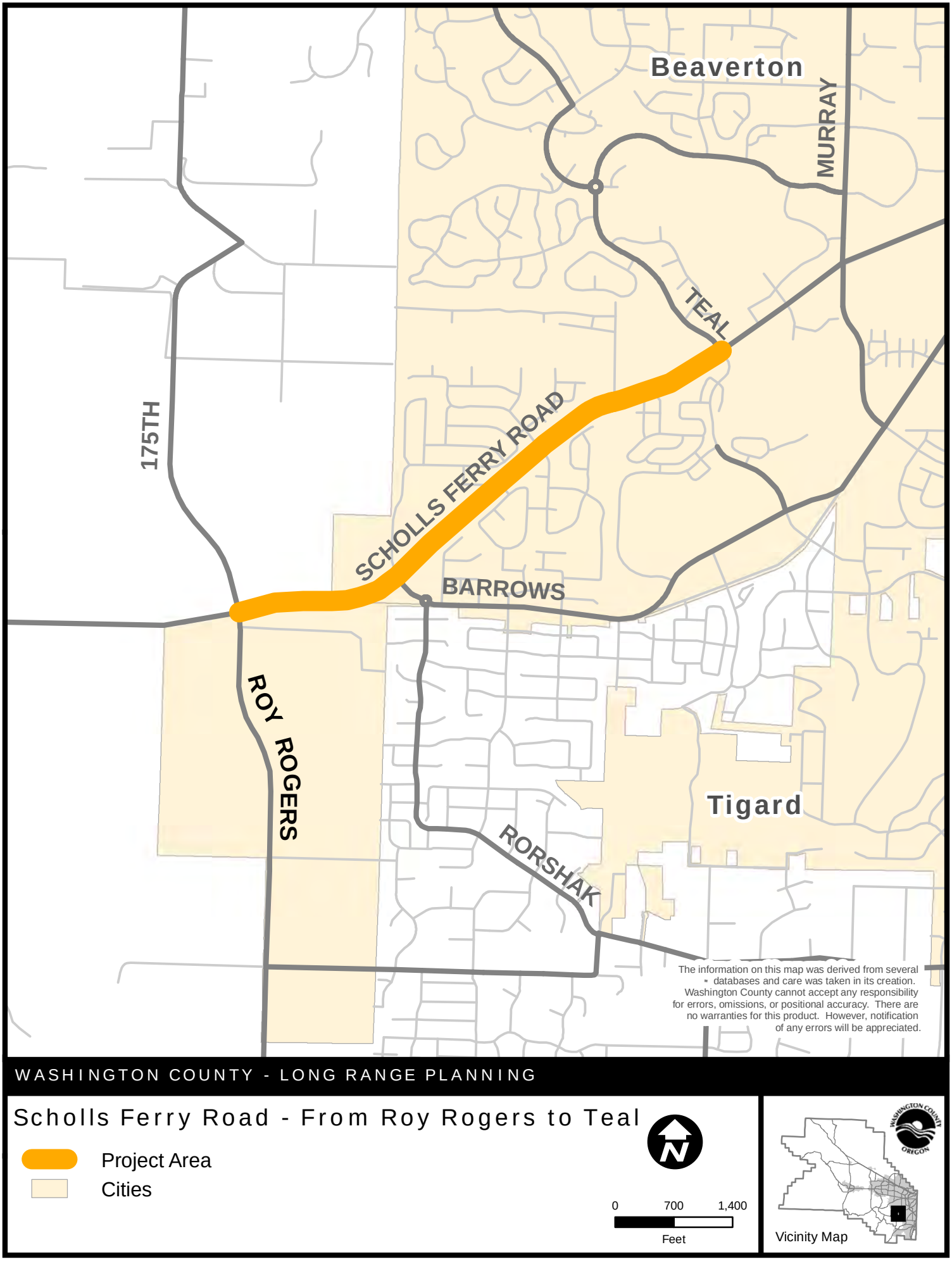
Clark F. Berry, Senior Planner

Attachments

cc: Andrew Singelakis, Director
Andy Back, Manager
Joe Younkins, Principal Engineer
Bill Ihly, Project Manager

Department of Land Use & Transportation • Long Range Planning Division
155 N. First Avenue, Suite 350-14, Hillsboro, OR 97124-3072
phone: (503) 846-3519 • fax: (503) 846-4412

Attachment 1.

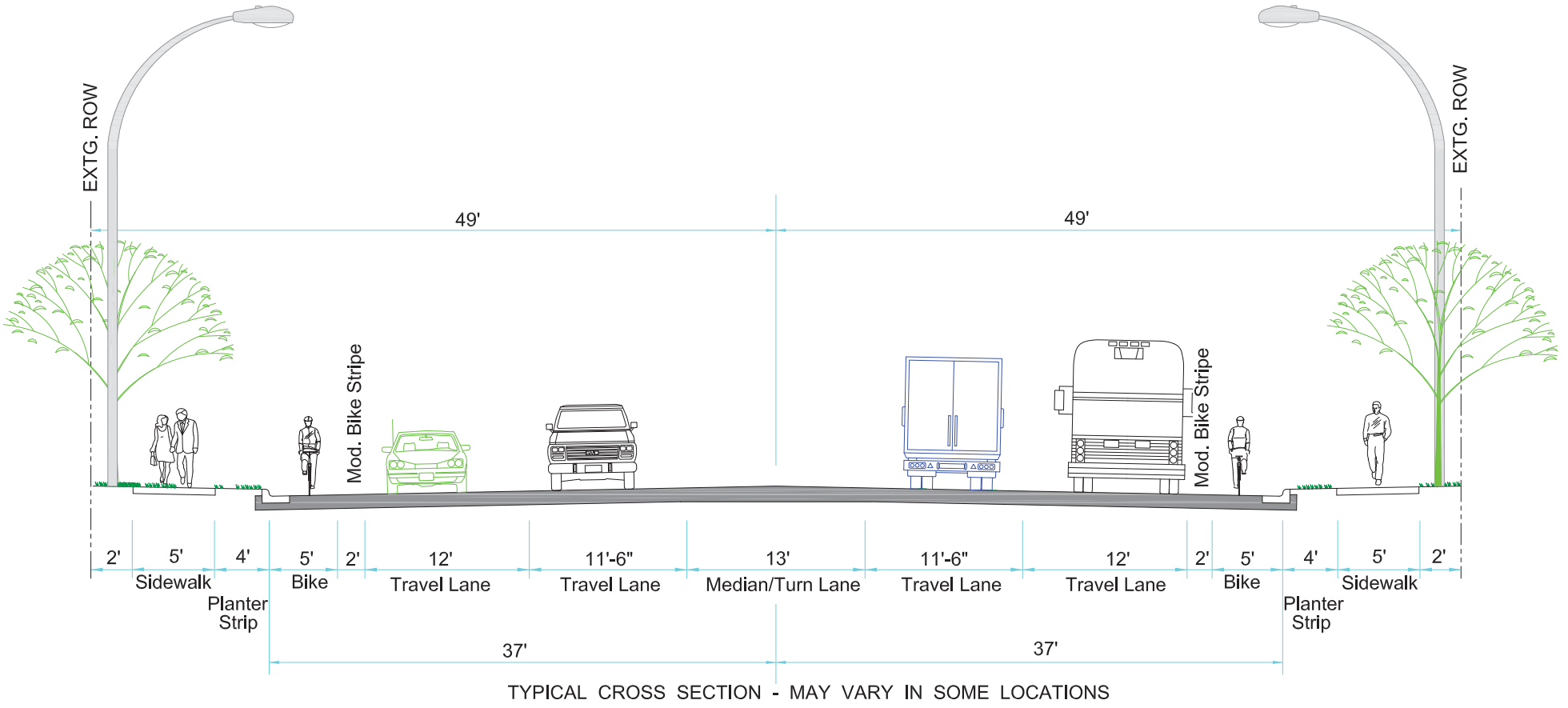


Path: J:\Users\DoriaM\GIS_maps_temp\STAFF\Clark\2012\SchollsFerry_121912.mxd 12/19/2012

Attachment 1.

S.W. SCHOLLS FERRY ROAD - TYPICAL 5 LANE SECTION

S.W. ROY ROGERS ROAD TO S.W. TEAL BLVD.



TYPICAL CROSS SECTION - MAY VARY IN SOME LOCATIONS

MSTIP
MAJOR STREETS TRANSPORTATION IMPROVEMENT PROGRAM

WASHINGTON COUNTY OREGON
DEPARTMENT OF LAND USE & TRANSPORTATION ENGINEERING

Attachment 2.

Beaverton
OREGON

December 17, 2012

Mr. John Mermin
Metro
600 NE Grand Avenue
Portland OR 97232-2736

Dear Mr. Mermin,

The City of Beaverton requests that the 2035 Regional Transportation Plan (RTP) Financially Constrained scenario be amended to acknowledge the adopted refined alignment for the Crescent Street multimodal extension (Rose Biggi Ave. – Westgate Drive [previously Cedar Hills Blvd.]). The project is included in Metro's adopted 2035 Regional Transportation Plan as project 10619. The City's Comprehensive Plan Amendment to revise the alignment is expected to be adopted on January 15, 2013, and will be effective 30 days later. The City applied for STIP "Enhance" funds to design and construct the project, so this opportunity to refine the description is very timely. Waiting until the next full RTP update leaves uncertainty in the interim and is not advisable given the redevelopment potential created by the amended alignment.

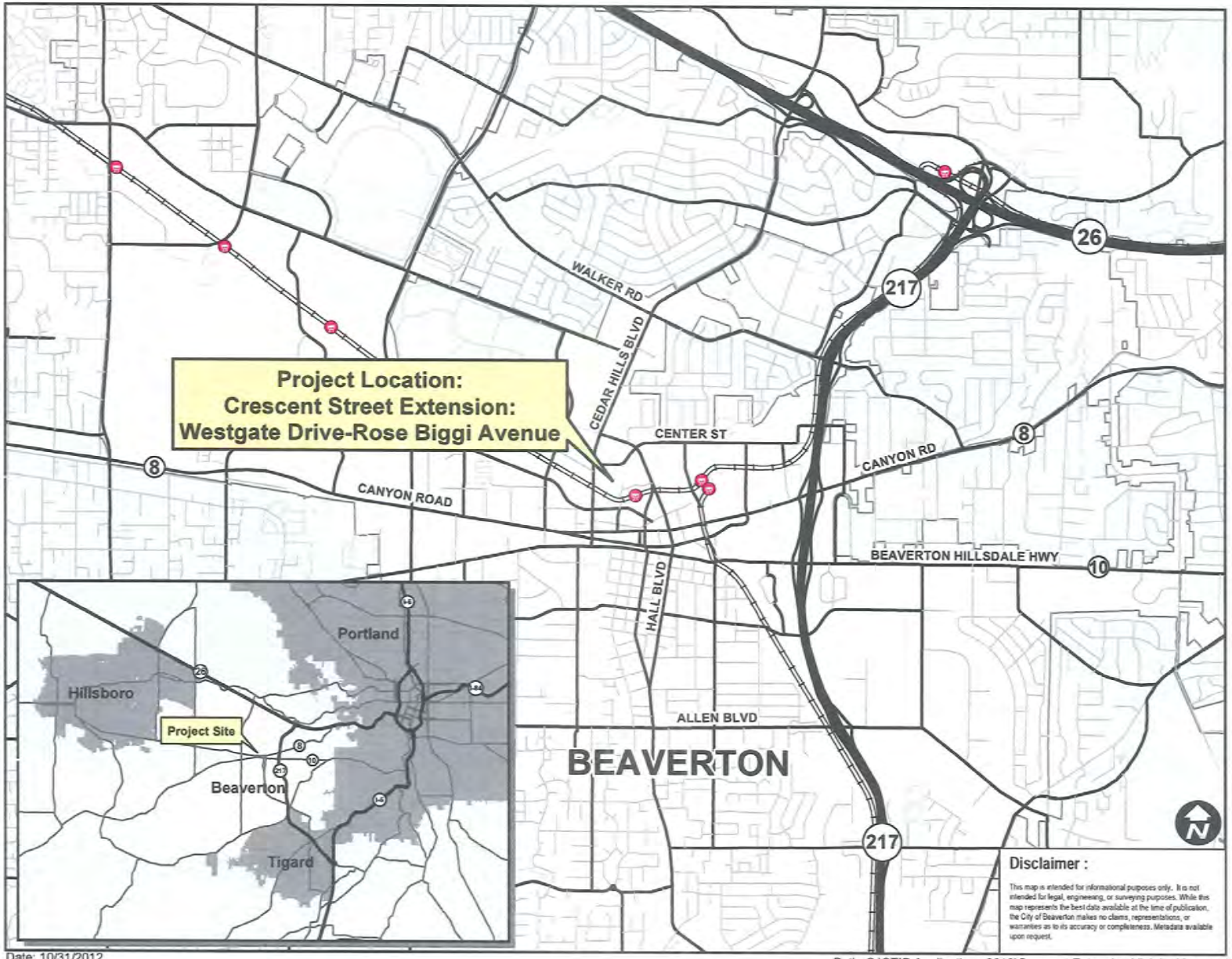
The project was originally identified and listed in the Beaverton Downtown Connectivity Plan and subsequent 2015 and 2020 Transportation System Plans. It is most currently listed as Project #25 in the City's adopted 2035 Transportation System Plan and Comprehensive Plan Transportation Element (page IV-34). It is Project 5080 in the City's adopted Capital Improvements Plan, and is included as a critical multimodal connection in the Beaverton Civic Plan. The cost of the project remains the same.

A map and cross section are attached as requested. Please let me know if you have any questions or concerns.

Sincerely,

Margaret A. Middleton
Principal Transportation Planner

cc: Clark Berry, Washington County DLUT



GEOGRAPHIC INFORMATION SYSTEM

VICINITY MAP

STIP Application:
Crescent Street Extension:
Westgate Drive-Rose Biggi Avenue

- Light Rail Station
- Light Rail
- Freeways
- Arterials
- Minor Streets
- Private Roads
- Beaverton
- Outside City Limits

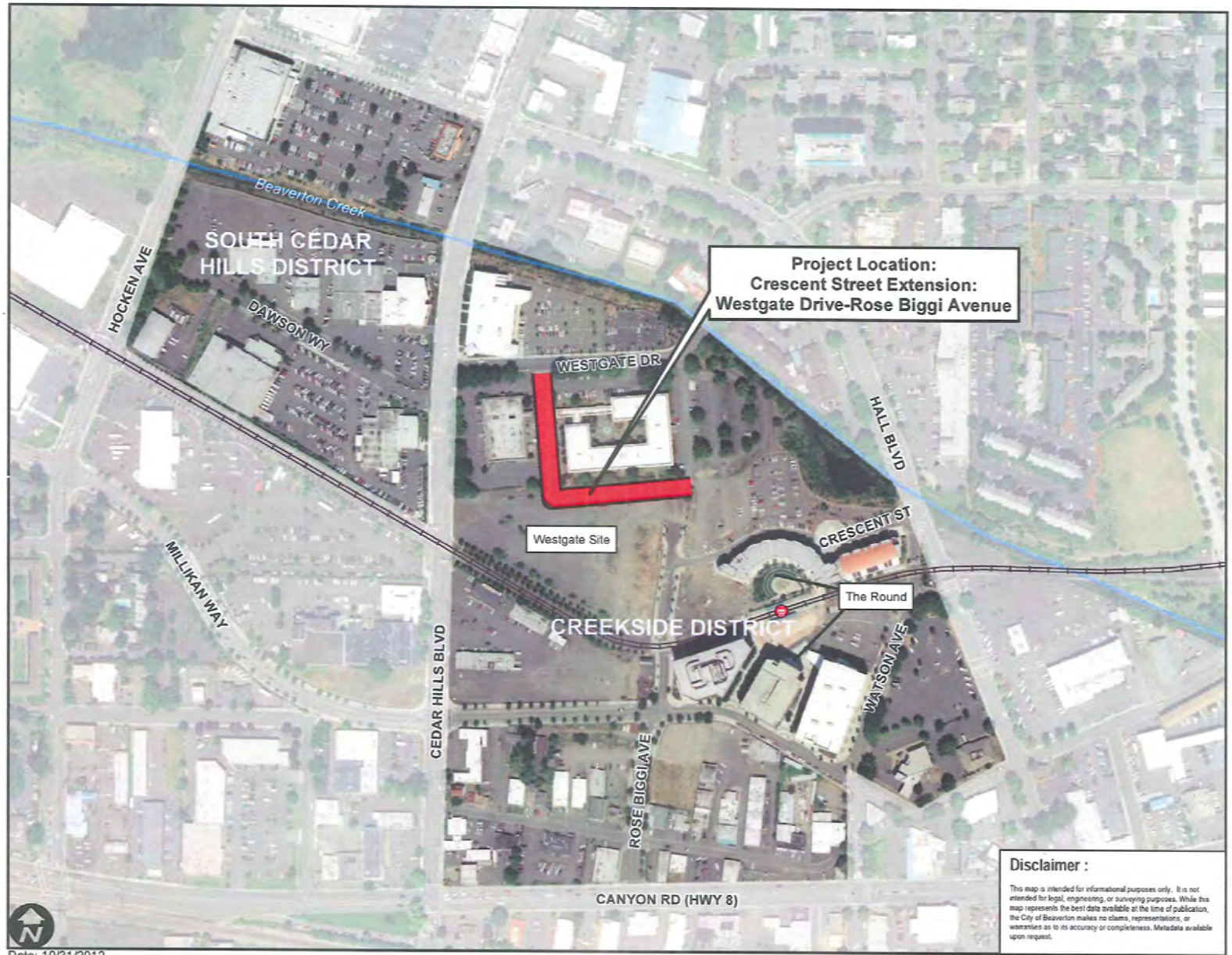
0 0.25 0.5 1
Miles

Beaverton

Date: 10/31/2012

Path: S:\STIP Applications 2012\Crescent Extension Vicinity Map.mxd

Attachment 2.



Date: 10/31/2012

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GEOGRAPHIC INFORMATION SYSTEM

SITE MAP

STIP Application:
Crescent Street Extension:
Westgate Drive-Rose Biggi Avenue

- Crescent Street Extension
- Light Rail Station
- Light Rail

Notes:

1. The aerial photo was taken in 2011.

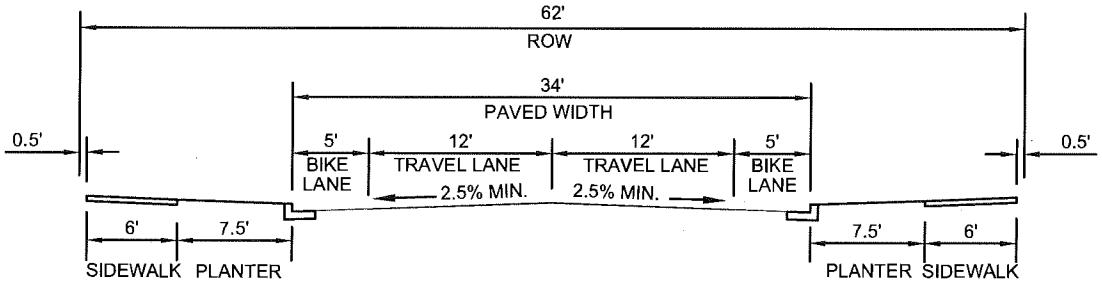
0 125 250 500

Feet

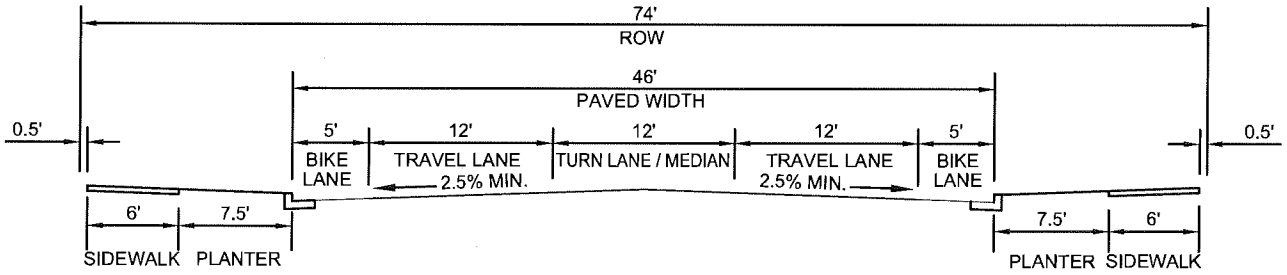
Beaverton OREGON

Attachment 2.

Attachment 2.



2 LANES



3 LANES

NOTES:

1. A planter strip is required on all Collectors.
2. Paved width and planter strip are measured to face of curb.
3. Provide 0.5 feet from right-of-way line to the back of sidewalk for maintenance and survey monument protection.
4. Street trees and street lights are required and shall be located within the planter strip.

City Of Beaverton

PUBLIC WORKS DEPARTMENT		MINIMUM COLLECTOR STREET WIDTHS	
TRAFFIC ENGINEER Randall R. Wooley	DATE 6 - 10 - 04	DRAWN BY JR - CPD	DRAWING NO. 101

Attachment 3.

Hillsboro Planning

January 24, 2013

John Mermin
Metro
600 NE Grand Ave
Portland, OR 97232-2736

Dear Mr. Mermin,

Given the recent opportunity to submit proposed amendments to the Regional Transportation Plan (RTP), the City of Hillsboro would like to request the addition of the following projects to the RTP at a total estimated cost of $30.6 million.

- 253rd Ave (from Huffman extension to Meek Rd): construct new three-lane road with bike lanes and sidewalks (est. $4 million)
- Gibbs Dr (from proposed Stucki Rd extension to Walker Rd): construct new three-lane road with cycle tracks and sidewalks (est. $2 million)
- Brookwood Pkwy (from Evergreen Rd to US 26): widen from five to seven lanes with bike lanes and sidewalks (est. $9 million)
- Butler Dr (from 229th Ave to Cornell Rd): widen from three to five lanes with bike lanes and sidewalks (est. $2 million)
- Cornelius Pass Road (from Cornell Rd to US 26): widen from five to seven lanes with bike lanes and sidewalks (est. $8.6 million)
- US 26 westbound off-ramp at Cornelius Pass Rd: add second lane on westbound loop off-ramp and third southbound approach lane on Cornelius Pass Rd (est. $5 million)

The need for 253rd Ave was identified as part of the US 26/Brookwood Interchange Area Management Plan (IAMP) process. In addition, 253rd Ave was recently recommended for inclusion in the Regional Economic Opportunity Fund (REOF) portion of the Regional Flexible Fund to construct this roadway from Evergreen Rd to Meek Rd (253rd Ave is currently a gravel road extending approximately 2,700 feet north from Evergreen Rd). The construction of 253rd Ave from Evergreen Rd to Huffman extension as a three-lane roadway is already in the RTP as project # 10822. This request is to add the portion from Huffman extension to Meek Rd. Current development opportunities have surfaced which is contingent upon the opening of 253rd Ave by summer 2014.

Gibbs Drive is a planned collector road in the adopted AmberGlen Community Plan. It will provide the needed connectivity in order to support the type of intense, mixed-land use and multi-modal transportation environment envisioned in the AmberGlen Community Plan. Current development interests in the area prompted the urgency to amend this road to the RTP.

Mail 150 E Main Street, 4th Floor, Hillsboro, Oregon 97123 Phone 503.681.6153 Fax 503.681.6245 Web www.hillsboro-oregon.gov

Brookwood Pkwy, Butler Dr, Cornelius Pass Rd, and US 26 westbound off-ramp improvements are all improvements identified as needed, based upon traffic analyses conducted over the past two years, in response to recent and future development expansions on the Intel Ronler Acres campus and on adjacent industrial green field sites. The widening of Brookwood Pkwy was also identified as a needed improvement in the US 26/Brookwood IAMP process. The ongoing expansion of Intel Ronler Acres campus has created the urgency for these improvements in order to provide the needed mobility and safety for the anticipated increase in traffic.

The identified improvements have been amended into the City and County's Transportation System Plans (TSP) in the fall of 2012 (City of Hillsboro Ordinance No. 6031, October 2, 2012, and No. 6032, October 16, 2012, Washington County Ordinance No. 749, September 18, 2012). During the public involvement process of the TSP amendments, these projects received overwhelmingly positive support from the public.

The City, with concurrence from Washington County, proposes to join the County in the removal of RTP project # 10547 - 173rd/174th undercrossing of US 26 at $58.6 million from the RTP financially constrained list to offset the costs of the proposed additions to the RTP. The City had previously proposed to remove RTP Project #10846 – TV Hwy Congestion Relief; but after consulting with Washington County, decided to join the County in its removal of project # 10547 since there is enough value to offset the combination of the City and the County's projects.

Please feel free to contact me if you have any questions or concerns.

Sincerely,

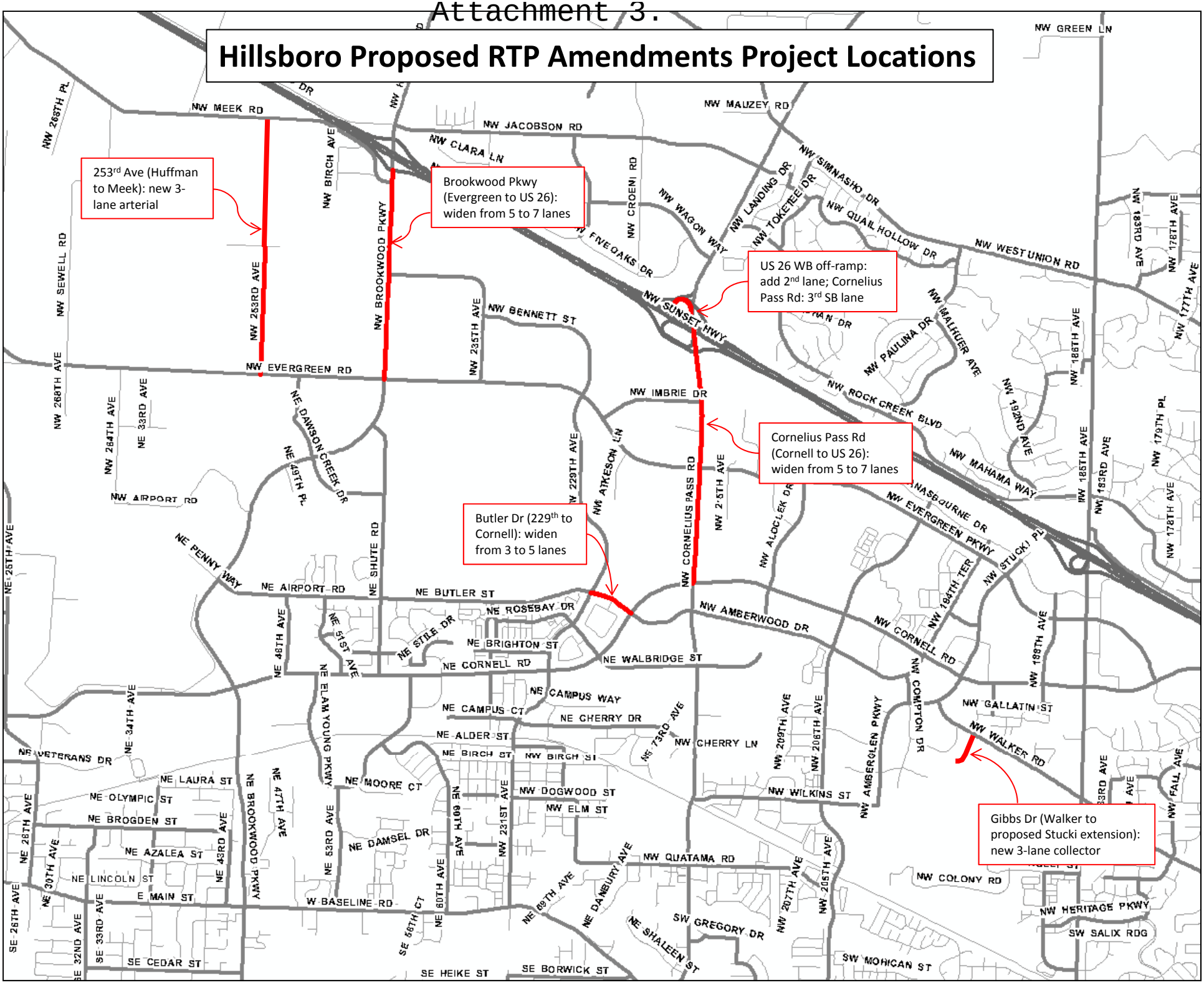
Brad Choi
Transportation Planner

Enclosure

cc: Clark Berry, Washington County

Attachment 3.

Hillsboro Proposed RTP Amendments Project Locations



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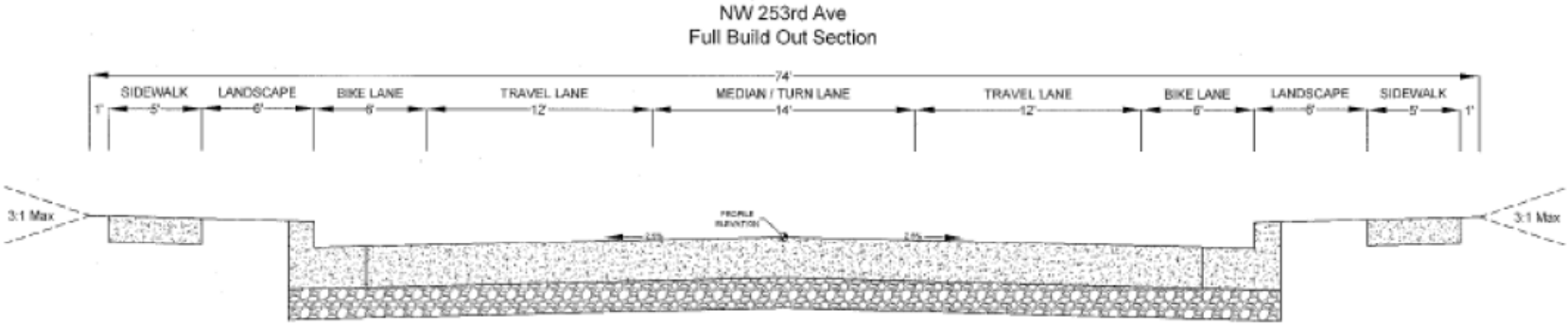
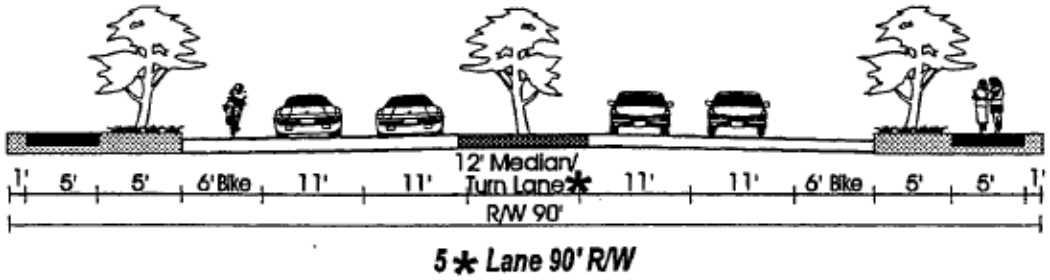
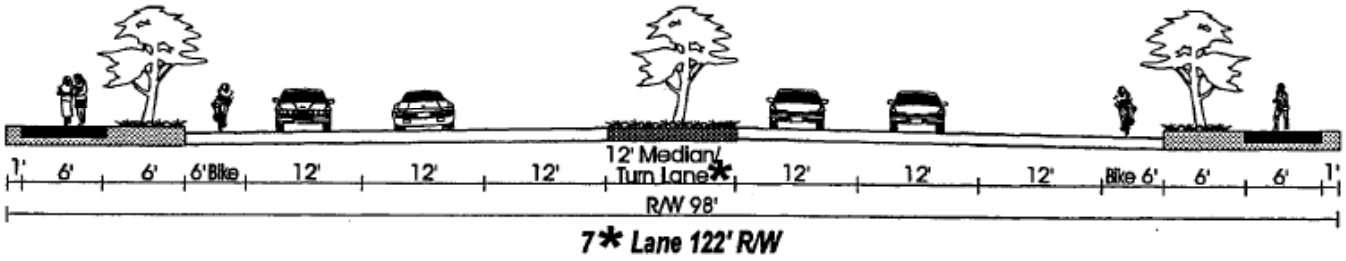


Proposed Cross Section for 253rd Ave

Attachment 3.



Proposed Cross Section for Butler Dr



Proposed Cross Section for Brookwood Pkwy and Cornelius Pass Rd

Attachment 3.

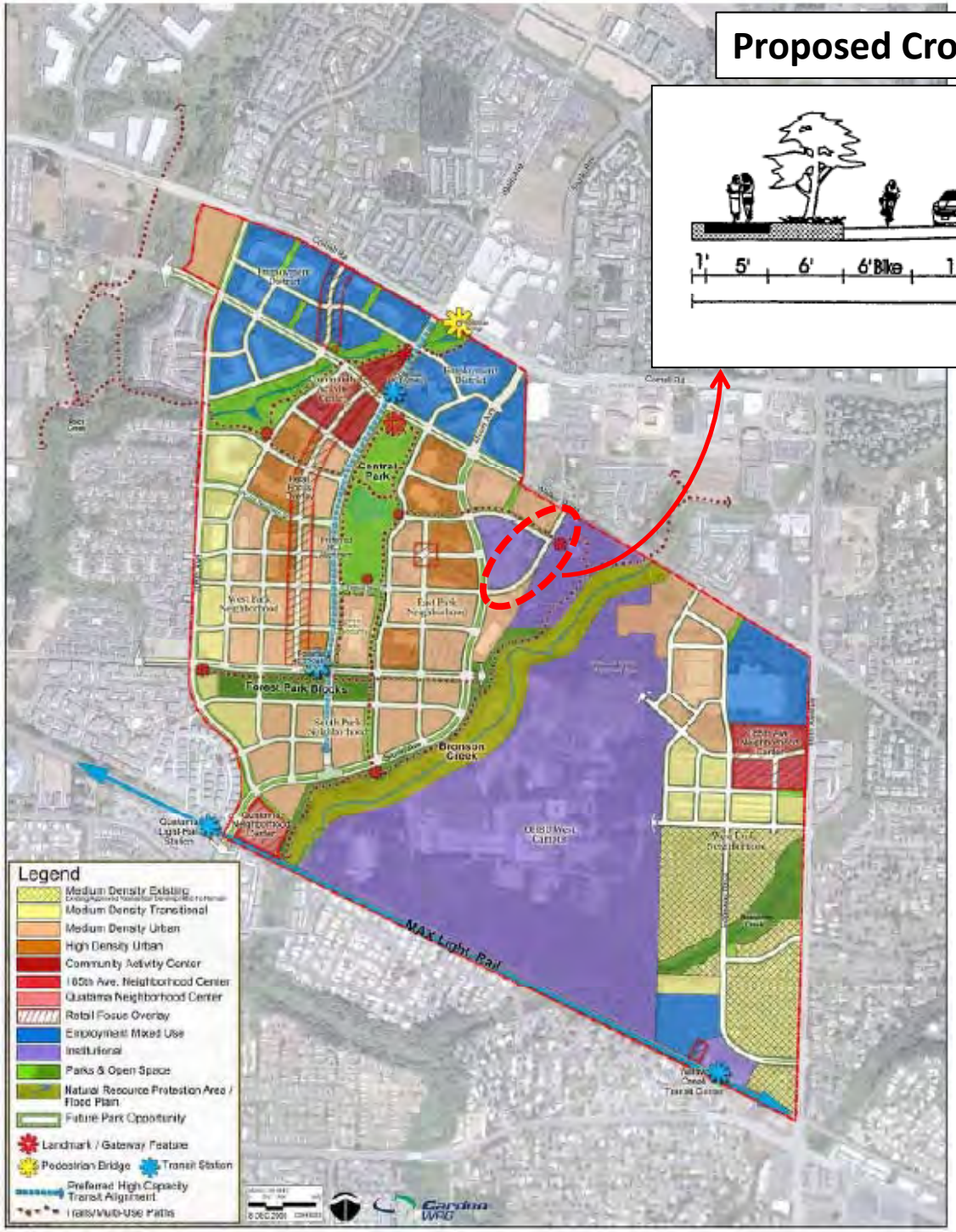
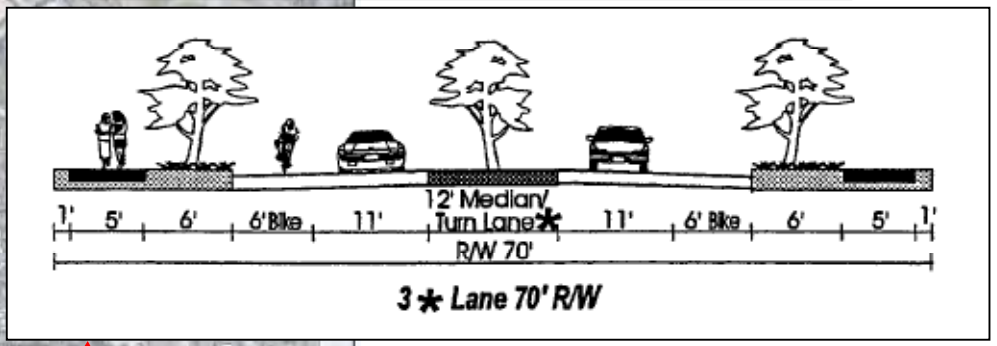


Figure 2-1: AmberGlen Community Plan Land Use Concept Map

Note: This map is presented in the Vision and Concept Plan Section as "Figure B"

Proposed Cross Section for Gibbs Dr



Attachment 4.

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

Metro | *Memo*

Date: Friday, February 8, 2013
To: John Mermin
From: Brian Monberg
Subject: 2035 Regional Transportation Plan Amendments from East Metro Connections Plan

The following is a proposed amendment to incorporate the top priority project identified through the East Metro Connections Plan process into the 2035 RTP Financially Constrained list.

The East Metro Connections Plan (EMCP) is the first "mobility corridor refinement" plan identified in the 2035 Regional Transportation Plan to be implemented in our region. A mobility corridor refinement plan aims to better integrate land use, community and economic development, environmental and transportation goals when identifying projects along major transportation corridors. EMCP project partners include the cities of Fairview, Gresham, Troutdale and Wood Village, Multnomah County, ODOT, and Metro. Additional participating entities include Damascus, Portland, Clackamas County, the Port of Portland and TriMet.

This two year effort analyzed present and future transportation needs and opportunities and prioritized solutions for updates to the Regional Transportation Plan and project implementation.

Project Refinements
Members of the EMCP process propose to include the top priority project, NE 238th Drive: Halsey Street to Glisan Street Freight and Multimodal Improvements, for inclusion in the 2035 Regional Transportation Plan. The project consists of improvements to the curvature of the road and construction of multimodal facilities. Elements include construction of a cross-section that includes a southbound travel lane with a passing lane, and a northbound travel lane, and bike and pedestrian facilities on both the northbound and southbound sides. The purpose for inclusion into the 2035 RTP is to allow this project to be nominated as a top priority project for both the 2016-2018 STIP and MTIP cycles. The estimated cost of this project is $9,000,000. Members of the EMCP process are proposing to drop: 1) RTP #11074, *East Buttes Loop Trail: From Springwater Trail to Rodlun Road*, a City of Gresham project in the amount of $8,300,000, and 2) RTP #10409, *Beaver Creek Trail*, a Multnomah County project in the amount of $1,400,000 from the Financially Constrained list.

Policy Changes
Consistent with the outcomes based planning framework of the Regional Transportation Plan and the mobility corridor strategy, the East Metro Connections Plan will advance updated policy elements to support project development identified in the plan. Policy refinements will include the following:

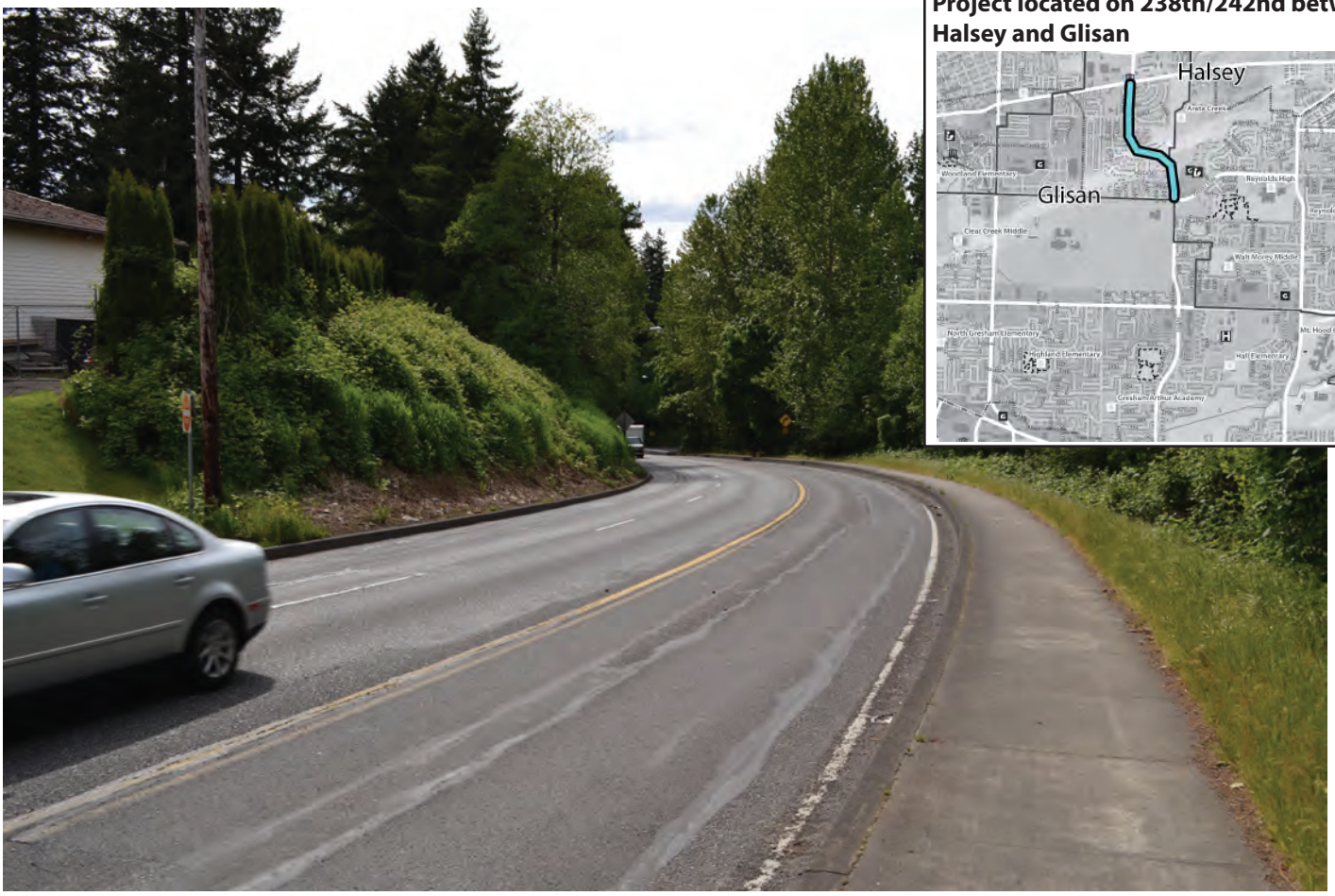
- The RTP freight network map (RTP figure 2.20) will be amended to reflect the proposed East Metro Connections Plan "freight grid", including main roadway routes and road connectors. Projects developed on the "freight grid" will be designed for safe freight movement.
- These changes will include updates to the regional freight network map. Updates to the arterial and through network map and regional design classifications map will be updated for policy consistency with the freight network map.

Attachment 4.

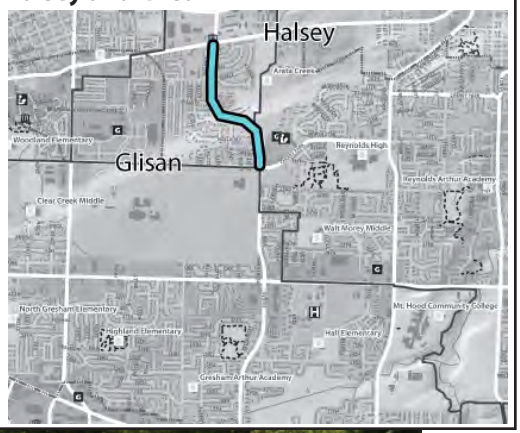
- The East Metro Connections Plan recommends adding a new proposed trail alignment to the regional trail plan. The Sandy River to Springwater Trail would connect the "Sandy River Connections Plan" Trail concept to Mt. Hood Community College, Springwater District, and Springwater Corridor Trail. Future master planning would identify route and design.

Attachment 4.

Existing 238th - looking north

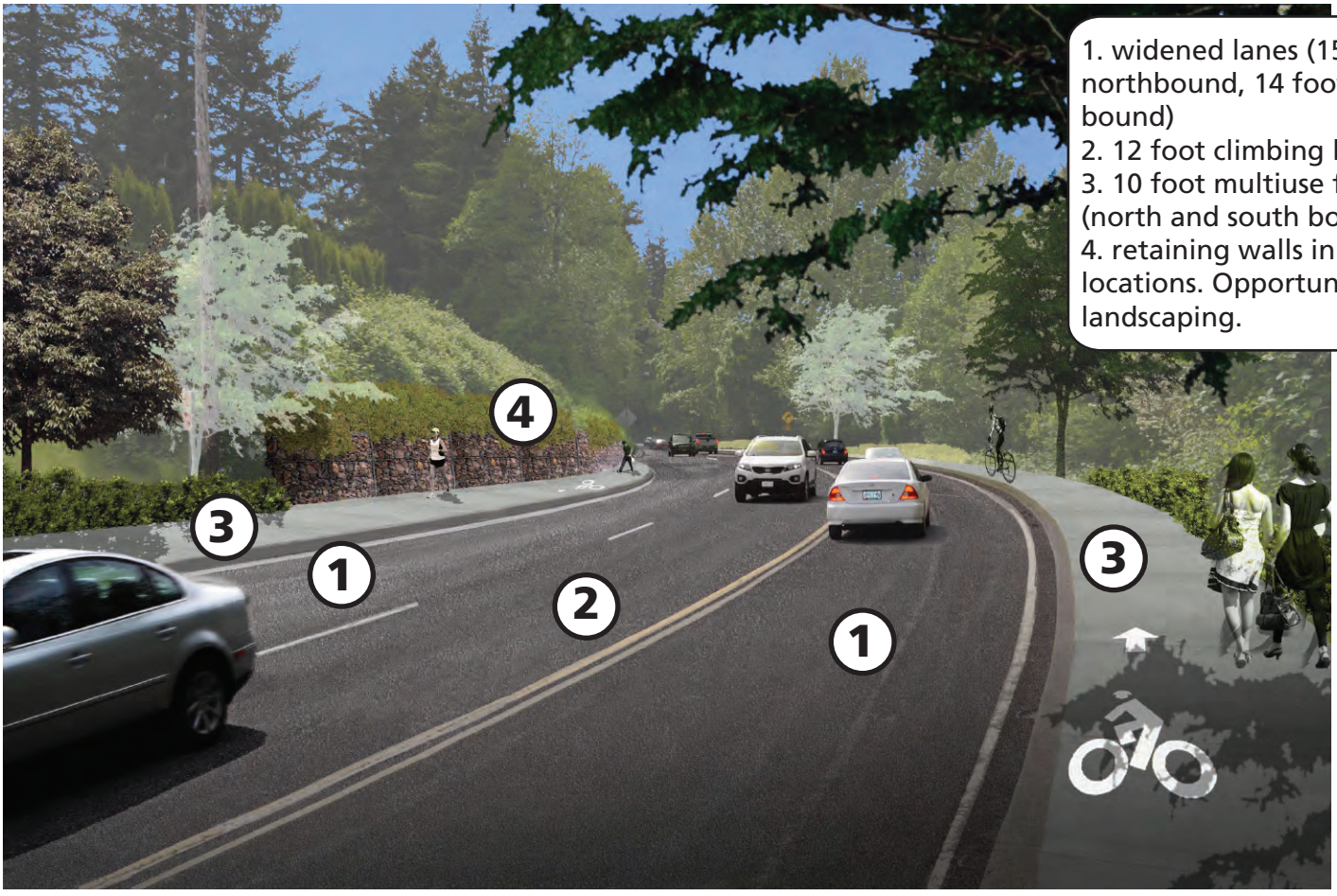


Project located on 238th/242nd between Halsey and Glisan



Refined 238th - looking north

widened travel lanes, widened bicycle and pedestrian facility for safety



1. widened lanes (15 foot northbound, 14 foot south-bound)
2. 12 foot climbing lane
3. 10 foot multiuse facility (north and south bound)
4. retaining walls in two locations. Opportunities for landscaping.

East Metro Policy Updates

What is the regional freight network?

The Regional Transportation Plan (RTP) has two types of freight designations:
- Main roadway routes are the "trunk" of the freight system - higher volume, major connectors with other regions.
- Road connectors have lesser volumes, provide connectivity to industrial/employment land and connect those more significant main roadway routes.

What changes are proposed?

- Remove, from the RTP freight network, Burnside between 181st and 223rd to reflect its actual usage.
- Broaden the RTP freight network to include the following routes as road connectors: 223rd between Glisan and Burnside; 257th/Kane from I-84 to US 26 (Note: projects would not include major improvements that connect Kane to US 26 which might attract more through trips).
- Update the US 26/Hogan connector to be consistent with Springwater Plan.

Why propose changes to the freight network?

Proposed changes to the RTP freight network would bring the use and function of plan area roads more in line and resolve land use conflicts.

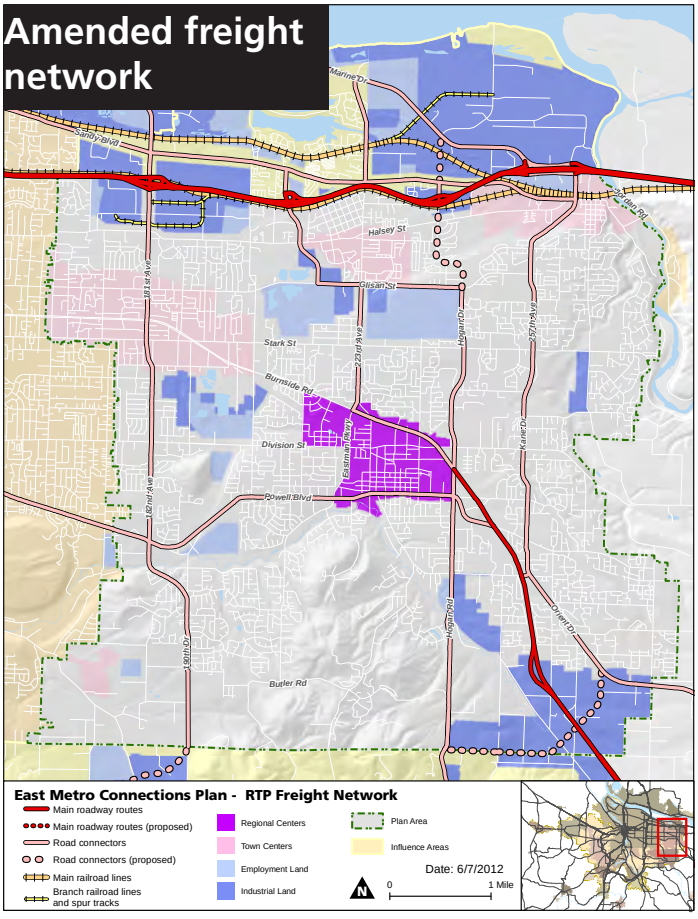
- Proposed freight network roads could see projects that increase their mobility (reducing stops/starts and travel time), that increase safety of other users and projects that accommodate trucks.

- The RTP freight network map (figure 2.20) should be amended to reflect the proposed East Metro Connections Plan "freight grid", including main roadway routes and road connectors. Projects developed on the "freight grid" will be designed for safe freight movement.

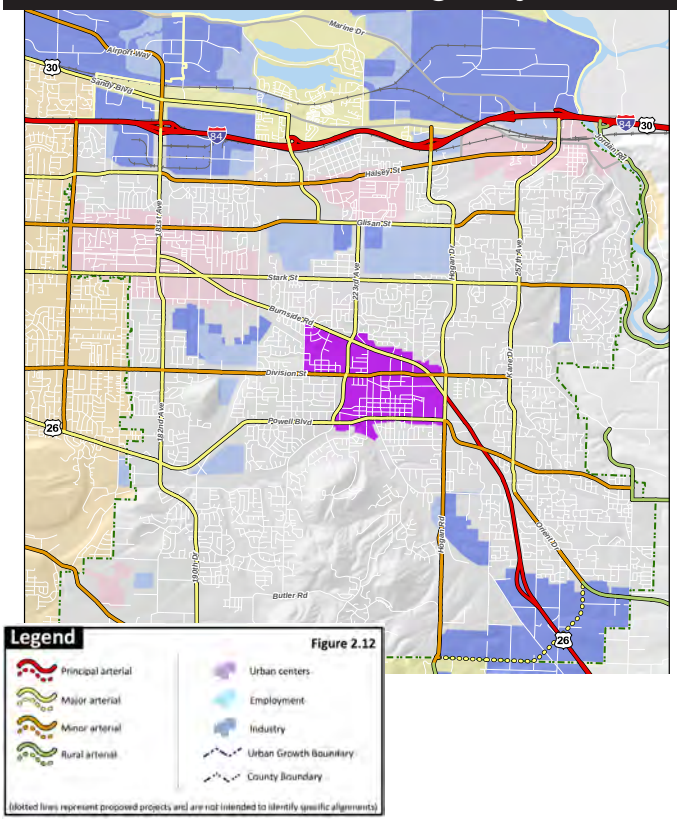
Updates to other RTP road networks

Consistent with the updated Freight Network, updates will also occur to the Arterial and Throughway Network and the System Design Network.
- Update the 238th/242nd link north of Glisan.
- Update the US 26/Hogan connector to be consistent with Springwater Plan (identified as a proposed link on the proposed freight network).

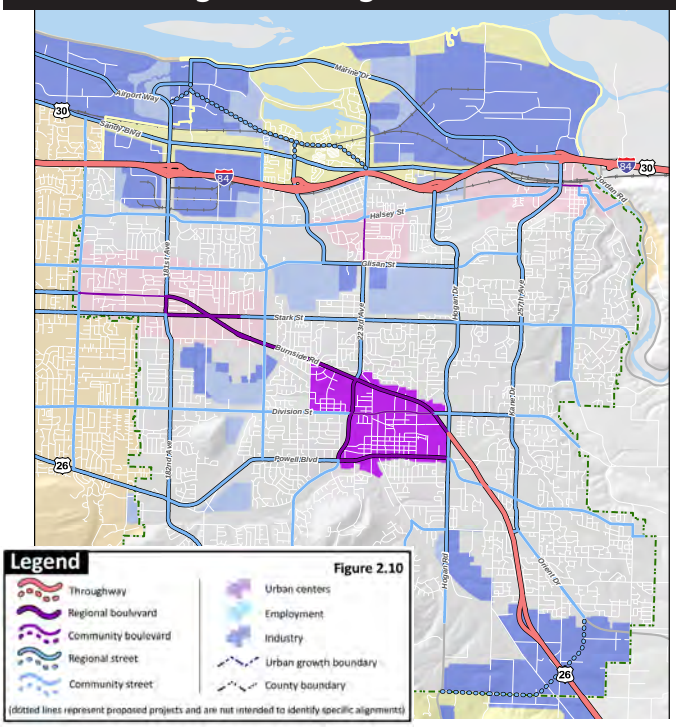
Amended freight network



Amended arterial and throughway network



Amended regional design classifications



Attachment 5.

Oregon
John A. Kitzhaber, MD, Governor

Department of Transportation
Region 1 Headquarters
123 NE Flanders Street
Portland, Oregon 97209
(503) 731.8200
FAX (503) 731.8259

John Mermin, Senior Transportation Planner
Metro Planning & Development
600 NE Grand Ave.
Portland, OR 97232-2736

John
Dear ~~Mr.~~ Mermin:

ODOT requests amending the Regional Transportation Plan (RTP) to incorporate Corridor Bottleneck Operations Study (CBOS) projects to the 2035 RTP Financially Constrained project list. ODOT Region 1 Major Projects started the CBOS in 2009 to identify, rank and provide conceptual solutions for the worst bottlenecks on I-5 south of the Marquam Bridge, I-205, I-84, I-405 and US 26 in the Portland Metro Region. Several projects have been moved into design and construction, and preliminary results are very encouraging.

The CBOS has identified several bottlenecks on the aforementioned corridors based on PORTAL data, ODOT traffic cameras, travel time runs, collision data and field observations. These data helped identify the location of the bottleneck, the duration of the congestion, contributing factors and speeds during bottleneck activation periods. Some bottlenecks locations were eliminated from further investigation because a project has been programmed to address the problem, or a cost-effective improvement was not feasible. The bottlenecks were ranked in terms of delay and cost, and those projects with the highest delay and lowest costs were proposed to move forward.

Four (4) high-priority projects proposed to address bottlenecks on major commute/freight routes in the Portland metro area are described in more detail on the following pages. One of these projects (I-5 NB at Lower Boones Ferry Rd, Figure 1) does not require an RTP amendment, as it only involves restriping.

These projects were selected as providing the best value of benefits and cost. It should be noted, however, that traffic volumes on these highways are very high, particularly during the peak commute hours, and as these operational improvements do *not* add capacity, the benefits achieved will not eliminate congestion, but rather improve the operations and safety of the mainline. Notwithstanding these occurrences, the proposed projects will reduce congestion at identified bottlenecks, particularly on the peak commute shoulders, and enhance safety by improving the weaves and merges that occur at interchanges. Follow-up phases are identified that would provide further benefits, funding permitting.

Briefly, the three high priority projects are summarized as:

I-5 SB: Lower Boones Ferry to Nyberg, Figure 2

- ***Problem:*** The fourth lane from Hwy 217 entrance-ramp drops at Lower Boones Ferry Road exit-ramp, and a high volume weaving movement to Nyberg St. exit-ramp, resulting in poor lane utilization and operational deficiency. Solution: Extend I-5 SB auxiliary lane from Lower Boones Ferry exit-ramp to Lower Boones

Ferry entrance-ramp. Auxiliary lane would provide direct connection from Hwy 217 to Nyberg Street exit-ramp.

- ***Solution:*** Extend I-5 SB auxiliary lane from Lower Boones Ferry exit-ramp to Lower Boones Ferry entrance-ramp. Auxiliary lane would provide a continuous lane from Hwy 217 to Nyberg Street exit-ramp.
- ***Project Benefits:*** Reduce congestion, improve lane balance and travel time reliability, and sustain stable traffic flow. Extension of the auxiliary lane would provide continuous lane from Hwy 217 to Nyberg St. exit. Construction of the auxiliary lane is anticipated to result in a 30% reduction in mainline crashes, based on similar comparative auxiliary lane improvements.
- ***Estimated Cost:*** $7M - $8.5M

I-205 NB: Powell/Division to Stark/Washington, Figure 3

- ***Problem:*** The combined volumes from the two consecutive entrance ramps are high, coupled with the high mainline volumes. Conflicts between entrance-ramps create turbulence at merge points with mainline and difficult weaving movements. Heavy exit demand at Stark/ Washington St. creates unsafe weaves to existing single-in exit ramp.
- ***Solution:*** Extend existing accel-lane from Powell Blvd. entrance-ramp to match with existing auxiliary lane from Division St. entrance-ramp to Stark/Washington St. exit-ramp, and provide two-lane exit at Stark/Washington. Auxiliary lane would provide an extended distance for traffic to merge onto mainline. Two-lane exit at Stark/Washington St. will reduce weaving conflicts in this segment.
- ***Project Benefits:*** Reduce congestion and enhance stable traffic flow. Construction of a 2-lane exit ramp at Stark/Washington will allow motorists additional time/distance to find gaps and safely weave over lanes. Construction of the auxiliary lane is anticipated to result in a 30% reduction in mainline crashes, based on similar comparable auxiliary lane improvements.
- ***Estimated Cost:*** $6.5M to $7.5M

I-205 SB: I-84 EB to Stark/Washington, Figure 4

- ***Problem:*** Division/Powell Blvd. exit-ramp to entrance-ramp from I-84 EB. Congestion/queuing starts from weaving section between Stark/Washington St. entrance-ramp and Hwy 26/Division St./Powell Blvd exit ramp to I-205. Contributing Factors: high volumes from I-84 EB merging with I-205 mainline traffic. Conflicts between entrance-ramps create turbulence at merge points with mainline and difficult weaving movements.
- ***Solution:*** Extend lane from I-84 EB entrance-ramp to Stark/ Washington St., to match existing auxiliary lane from Stark/Washington St. to Division St./Powell Blvd. Approximately 25% of traffic from I-84 EB entrance-ramp is destined for Division/ Powell Blvd. exit. Auxiliary lane would provide direct connection to this exit for almost one out of four vehicles in this segment of I-205.
- ***Project Benefits:*** Reduce congestion, improve lane balance and travel time reliability, and sustain stable traffic flow. Construction of the auxiliary lane would facilitate the I-84 EB to Division/Powell movements. This auxiliary lane is anticipated to result in a 30% reduction in mainline crashes, based on similar comparable auxiliary lane improvements.
- ***Estimated Cost:*** $7.0M - $8.5M

The total estimated costs of these projects are $21.5 - $26.5 million. To add these projects to the Financially Constrained list, ODOT is proposing to reduce $26.5 M from the OR 217: Braid from B-H to Allen (#10875) from the Financially Constrained list.

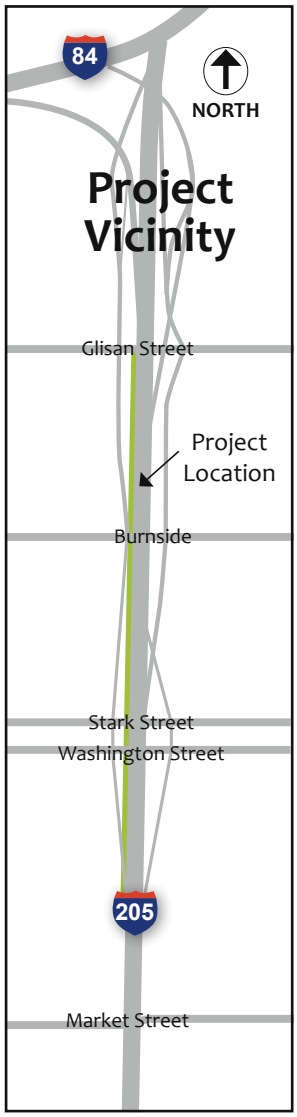
Please don't hesitate to contact me if you have questions or concerns about this request,
Cordially,

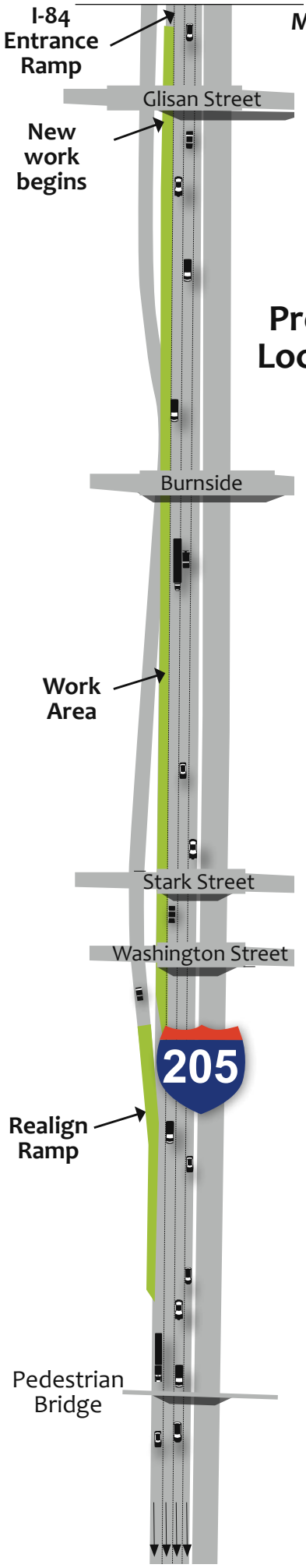
Andrew Johnson
Major Projects Manager
ODOT, Region 1

Attachments

cc: Jason Tell, ODOT Region 1 Manager
Rian Windsheimer, ODOT Planning & Development Manager
Tim Wilson, ODOT Senior Planner

Attachment 5.





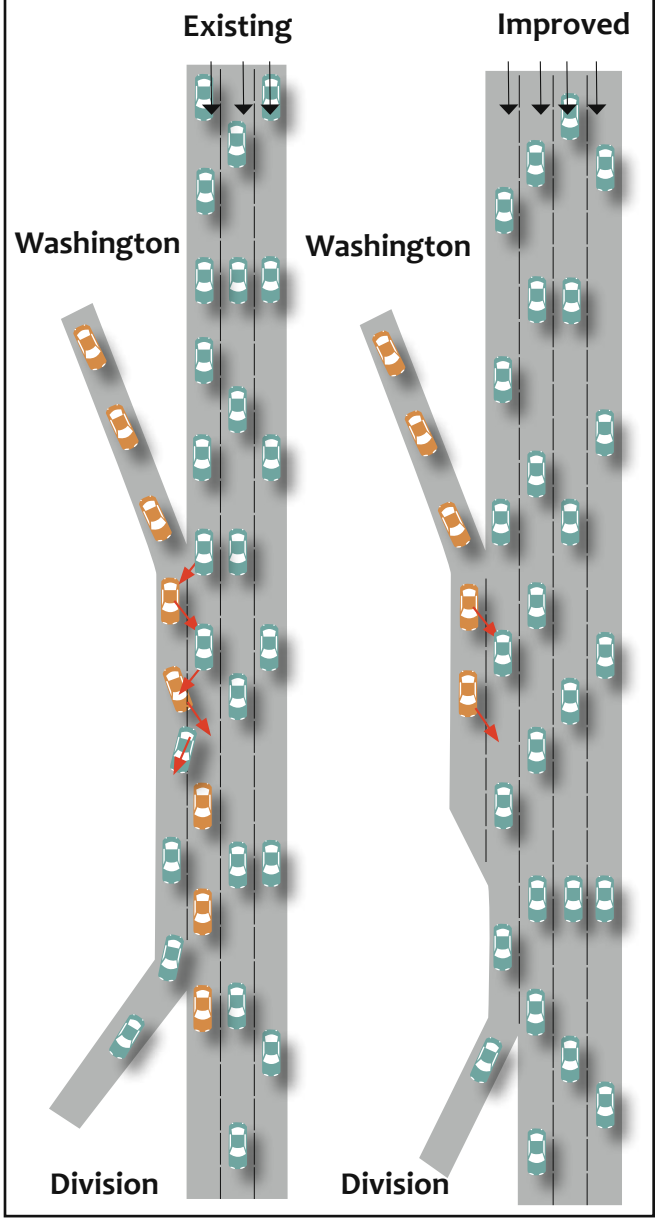
I-205 Southbound

I-84 to Stark/ Division Streets Auxiliary Lane

Oregon Department of Transportation

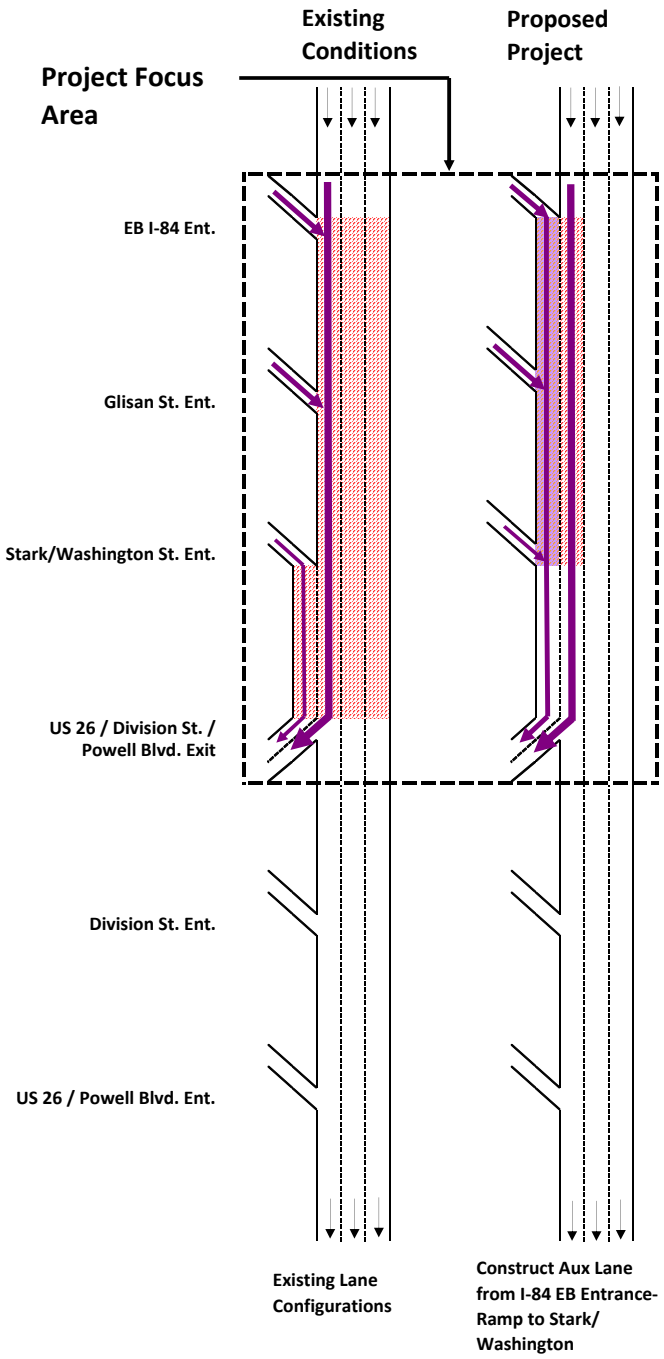
Project Location

Diagram of Improvements



Attachment 5.

I-205 SB: I-84 EB Entrance-ramp to Stark/Washington St. Auxiliary Lane



LEGEND

- Area of Congestion
- I-205 SB Auxiliary Lane
- Critical Movements in Focus Area

Existing Conditions

Queue: Division/Powell Blvd. exit-ramp to entrance-ramp from I-84 EB . Congestion/queuing starts from weaving section between Stark/Washington St. entrance-ramp and US 26/Division St./Powell Blvd exit ramp. Contributing Factors: high volumes from I-84 EB merging with I-205 mainline traffic. Conflicts between entrance-ramps create turbulence at merge points with mainline, and difficult weaving movements.
Duration: Approximately 3 hours daily between 3:00PM to 6:00PM.
Speed: Bottleneck activation speeds drop as low as 20 mph.
Volume (2011ADT): Mainline: 81,760 (8.7% truck); Entrance-Ramp from I-84 EB: 17,390, of which approximately 25% exit to Division/Powell.
Project Focus Area Crashes: Rate: 0.60 per MVMT; Frequency: 112 crashes from 2007 to 2011; No fatal crashes.

Proposed Project

Description: Extend lane from I-84 EB entrance-ramp to Stark/ Washington St., to match existing auxiliary lane from Stark/Washington St. to Division St./Powell Blvd. Approximately 25% of traffic from I-84 EB entrance-ramp is destined for Division/ Powell Blvd. exit

Benefits:

Queue: Congestion/queuing would be reduced in all lanes and completely reduced in the two leftmost lanes.
Duration: It is anticipated that the queue would be reduced to an hour during the peak periods.
Speed: Average speeds within the congested areas are expected to increase to between 40 and 45 mph.

Project Focus Area Benefits Summary:

Reduce congestion, improve lane balance and travel time reliability, and sustain stable traffic flow. Construction of the auxiliary lane would facilitate the I-84 EB to Division/Powell movements. Auxiliary lane would provide direct connection to this exit for almost one out of four vehicles in this segment of I-205. This auxiliary lane is anticipated to result in a 30% reduction in mainline crashes, based on comparable auxiliary lane improvements.

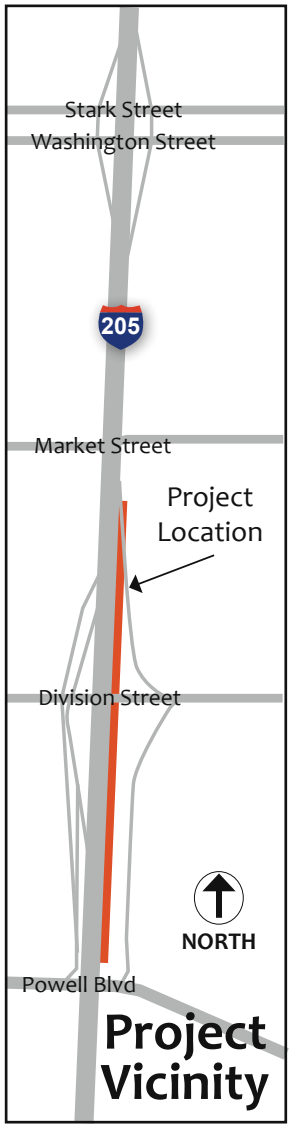
Project Estimated Cost:

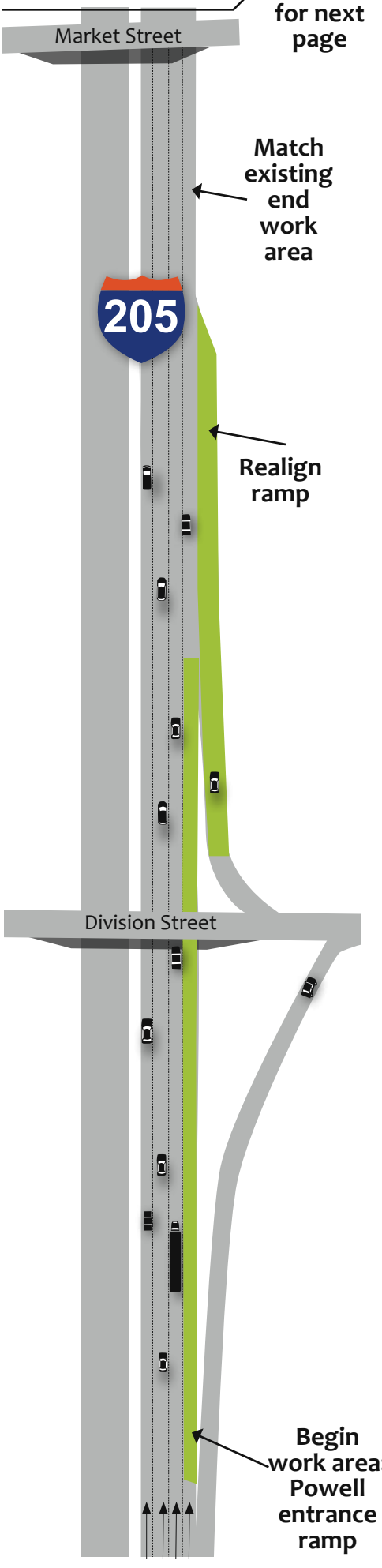
$7.0M - $8.5M

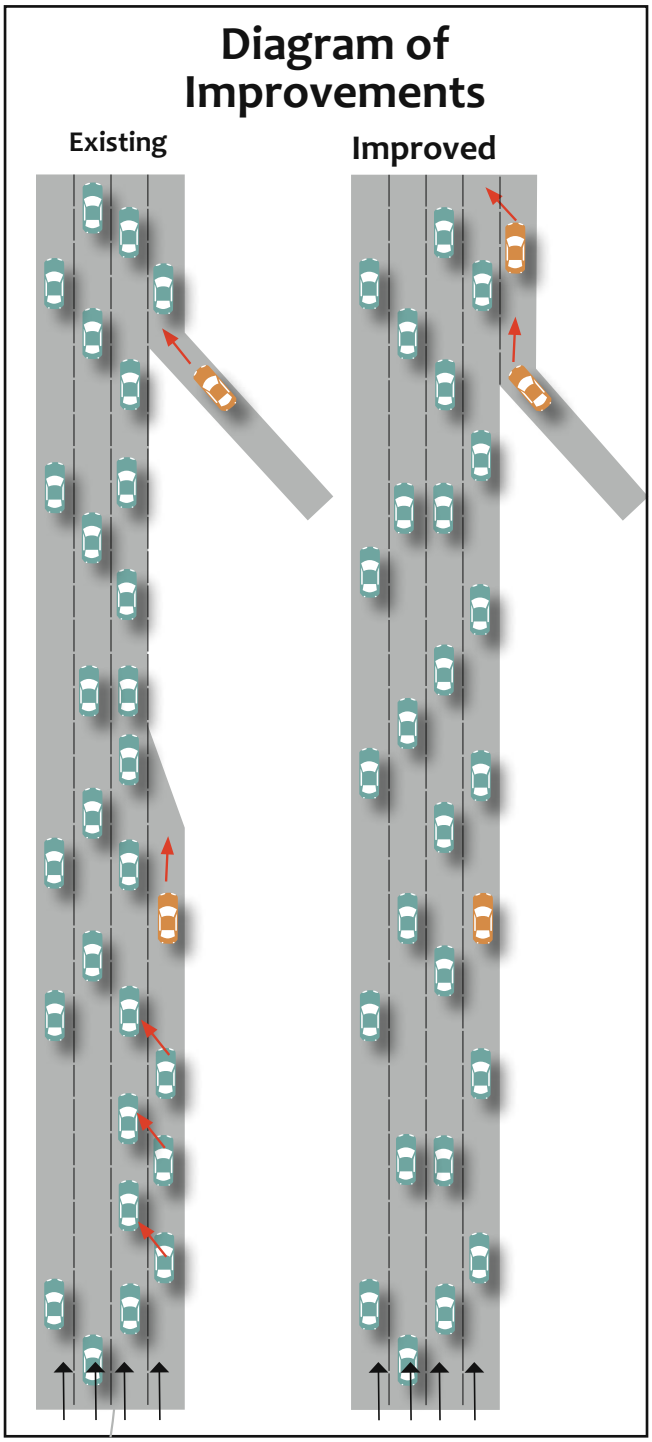
Oregon Department of Transportation

Site Map Diagram
C-BOS: High Priority Projects
I-205 SB: I-84 EB Entrance-ramp to Stark/Washington St.

Attachment 5.





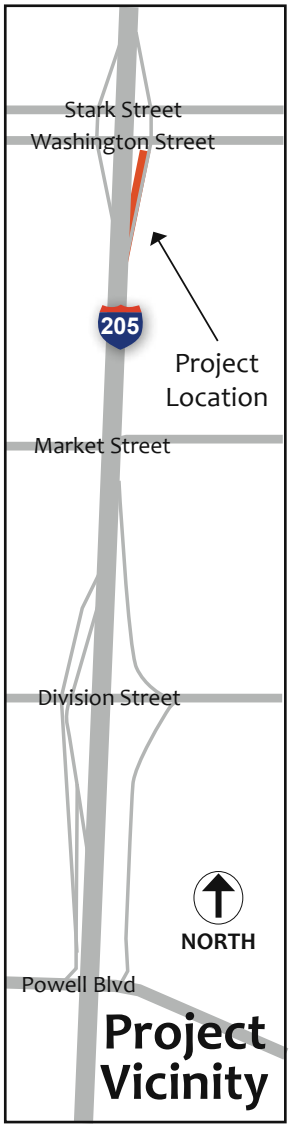


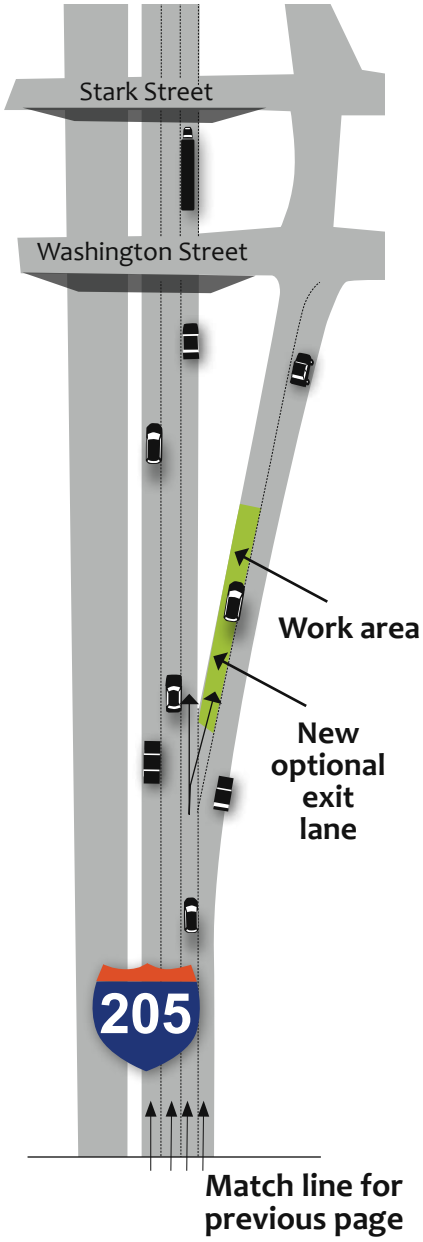
I-205 Northbound

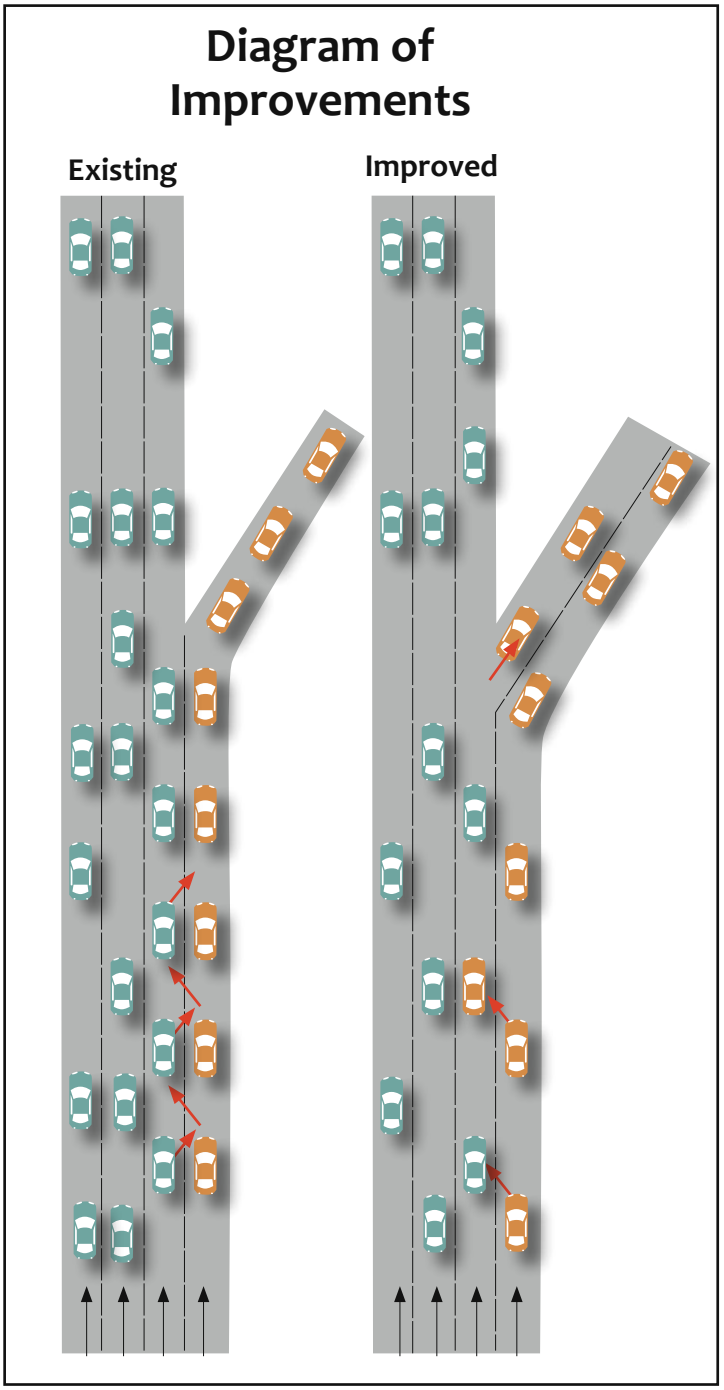
Powell Blvd to Washington St Auxiliary Lane

Oregon Department of Transportation

Attachment 5.







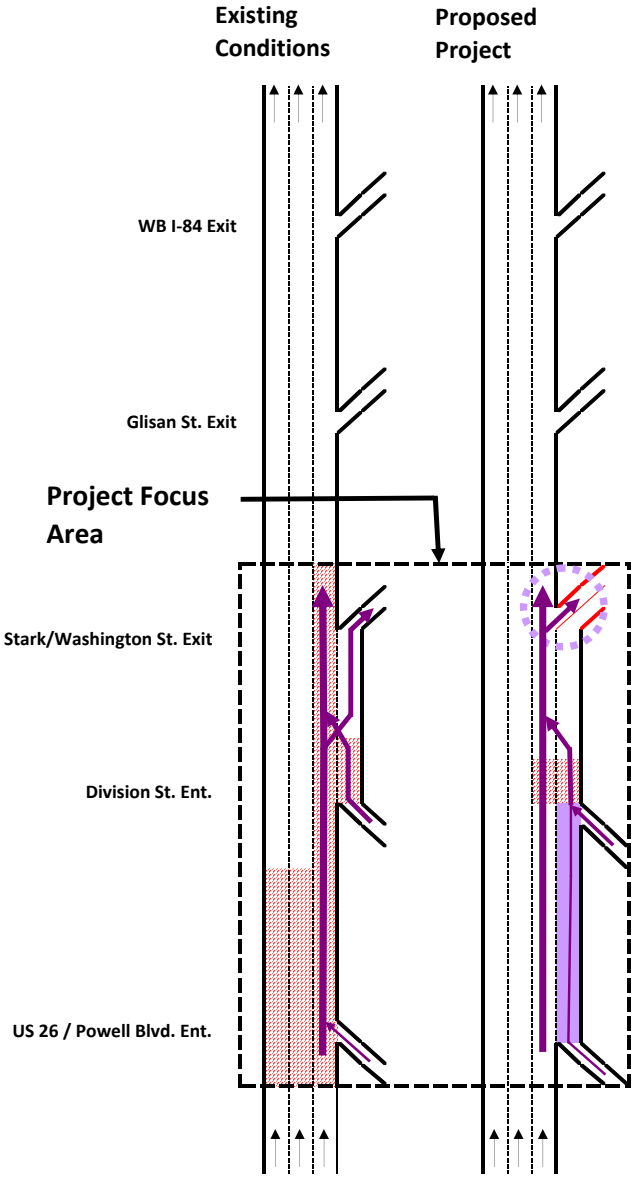
I-205 Northbound

Washington/ Stark Exit Ramp

Oregon Department of Transportation

Attachment 5.

I-205 NB: US 26/Powell Blvd Entrance-ramp to Division Entrance-ramp Auxiliary Lane and Stark/Washington St. Exit-ramp Bottleneck



LEGEND

- Area of Congestion
- I-205 NB Auxiliary Lane
- 2-Lane Exit-Ramp
- Critical Movements in Focus Area

Existing Conditions

Queue: AM queues appear to be caused by turbulence at the Powell Blvd entrance-ramp merge point, and is reflected in queues to Stark/ Washington St. exit. In the PM, queues occur at both entrance-ramps (Division St., Powell Blvd.). Contributing Factors: The combined volumes from the two consecutive entrance ramps is high, coupled with the high mainline volumes. Conflicts between entrance-ramps create turbulence at merge points with mainline, and difficult weaving movements. Heavy exit demand at Stark/ Washington St. creates unsafe weaves to existing single lane exit-ramp.

Duration: Approximately 2 hours daily between 4:00PM to 6:00PM.

Speed: Bottleneck activation speeds drop as low as 20 mph.

Volume (2011 ADT): Mainline: 82,810 (8.7% Truck); Powell entrance-Ramp: 11,300; Division entrance-Ramp: 6,790.

Project Focus Area Crashes: Rate: 0.74 per MVMT; Frequency: 114 crashes from 2007-2011; No Fatal crashes.

Proposed Project

Description: Extend existing accel-lane from Powell Blvd. entrance-ramp to match with existing auxiliary lane from Division St. entrance-ramp to Stark/Washington St. exit-ramp, and provide two lane exit at Stark/Washington. Auxiliary lane would provide an extended distance for traffic to merge onto mainline. Two-lane exit at Stark/Washington St. will reduce weaving conflicts in this segment.

Benefits:

Queue: Congestion/queuing would be reduced in most lanes and completely reduced in the two leftmost lanes.

Duration: It is anticipated that the queue would be reduced to an hour during the peak periods.

Speed: Average speeds within the congested areas are expected to increase to between 40 and 45 mph.

Project Focus Area Benefits Summary:

The construction of extending the auxiliary lane from Powell to Division and a 2-lane exit ramp at Stark/Washington will allow motorists additional time/distance to find gaps and safely weave over lanes. Construction of the auxiliary lane is anticipated to result in a 30% reduction in mainline crashes, based on comparable auxiliary lane improvements. The improvements will reduce congestion and enhance stable traffic flow.

Project Estimated Cost: $6.5M - $7.5M

Follow-up Phases to Further Enhance Operations and Safety in Corridor

I-205 NB Auxiliary Lanes:

Division St. to Stark/Washington St.; Stark/Washington St. to Glisan St.; and

Glisan St. to I-84 WB

Description: Construct second NB auxiliary lane from Division St. entrance-ramp to 2-lane exit at Stark/Washington St. and auxiliary lane to Glisan; add auxiliary lane from Stark/Washington to I-84 WB exit-ramp. Construction of the auxiliary lane would facilitate the Powell and Division movements to I-84 WB. This would improve lane balance and travel speeds, and sustain stable traffic flow and would result in overall safety improvements.

Project Estimated Cost: $5.5M - $6.5M

Oregon Department of Transportation

Site Map Diagram

C-BOS: High Priority Projects

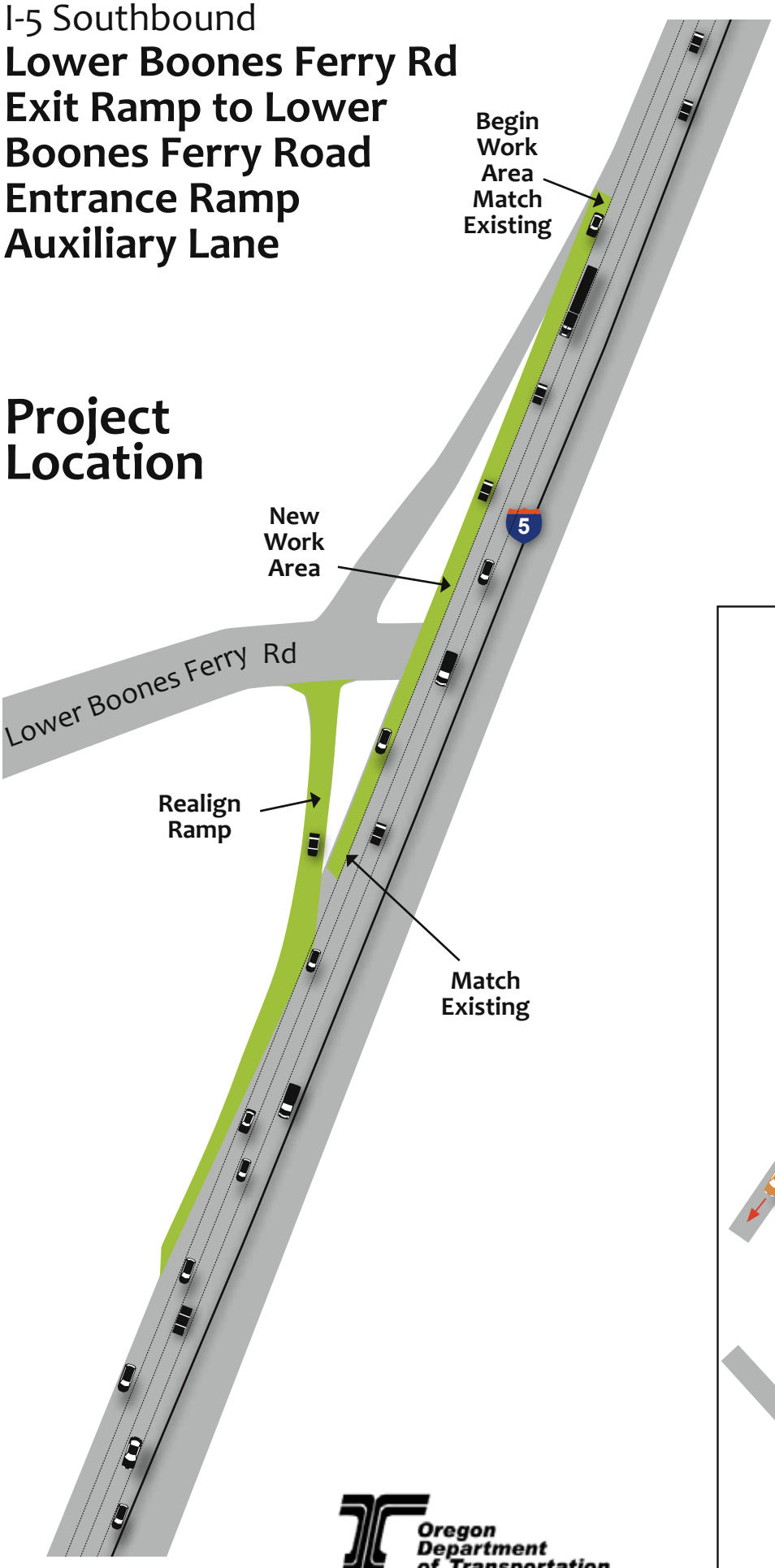
I-205 NB: US 26/Powell Blvd Entrance-ramp to Division Entrance-ramp Auxiliary Lane and Stark/Washington St. Exit-ramp

Attachment 5.

I-5 Southbound

Lower Boones Ferry Rd Exit Ramp to Lower Boones Ferry Road Entrance Ramp Auxiliary Lane

Project Location



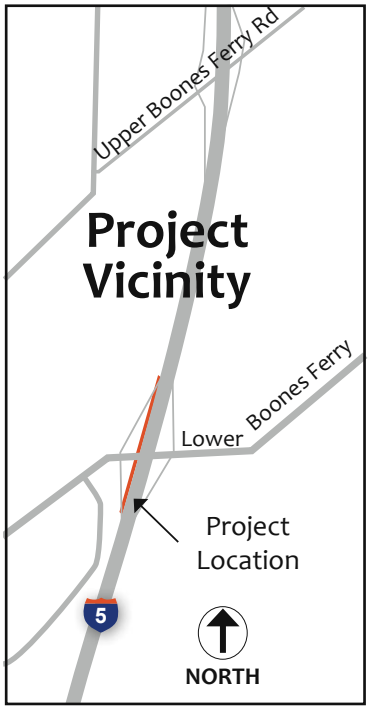
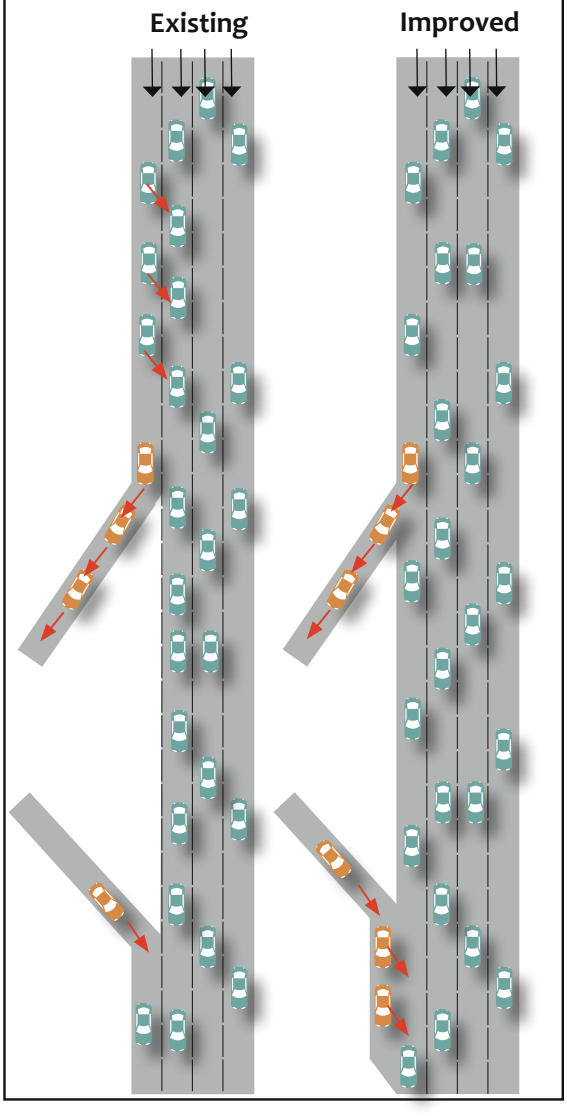


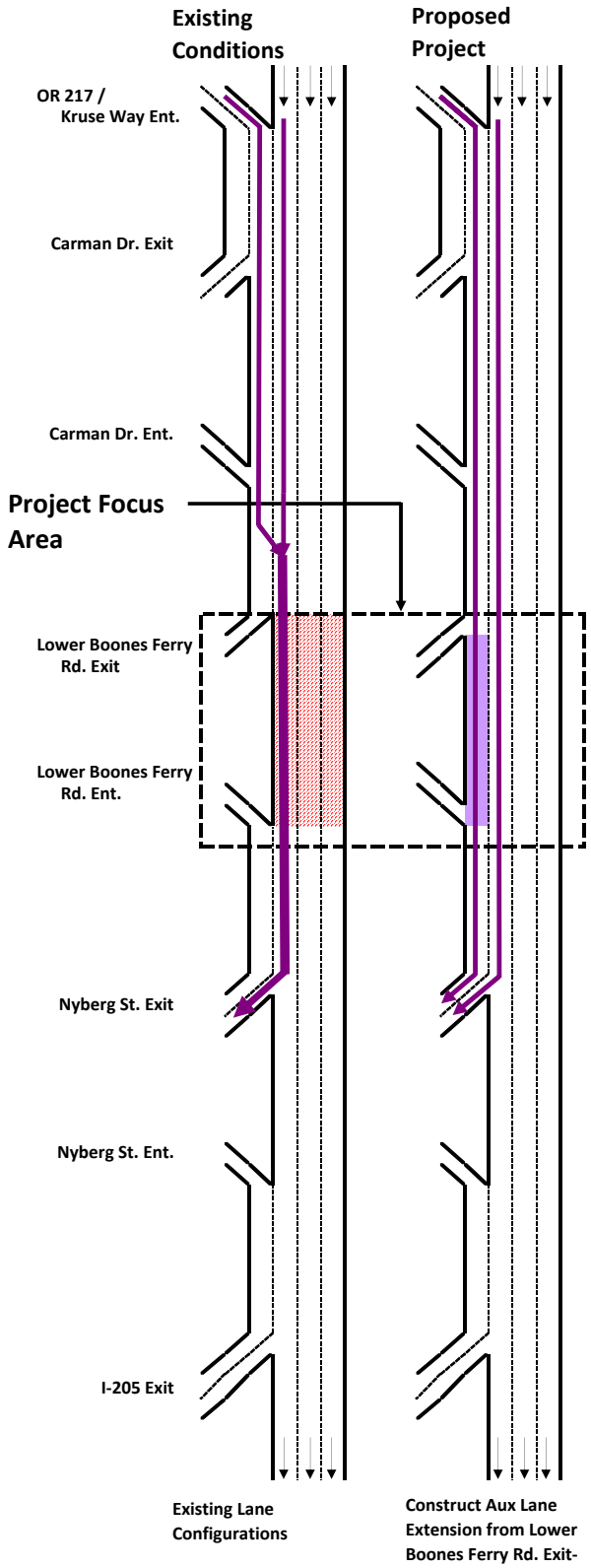
Diagram of Improvements



Oregon Department of Transportation

Attachment 5.

I-5 SB: Lower Boones Ferry Exit-ramp to Lower Boones Ferry Entrance-ramp Auxiliary Lane



Existing Conditions

Queue: Queuing experienced from the Lower Boones Ferry Road exit-ramp to the Lower Boones Ferry Road entrance-ramp. Contributing Factors: The fourth lane from OR 217 entrance-ramp drops at Lower Boones Ferry Road exit-ramp, and a high volume weaving movement to Nyberg St. exit-ramp, resulting in an unbalanced lane utilization and operational deficiency.

Duration: Approximately 2 hours daily between 4:00PM to 6:00PM.

Speed: Bottleneck activation speeds drop as low as 30 mph.

Volume (2011 ADT): Mainline: 77,020 (10% truck); Exit-Ramp to Lower Boones Ferry Road: 13,610; Entrance-Ramp from Lower Boones Ferry Road : 12,870; Exit-ramp to Nyberg St.: 21,190

Focus Area Crashes: Rate: 0.39 per MVMT; Frequency: 27 crashes from 2007-2011; 1 Fatal Crash

Proposed Project

Description: Extend I-5 SB auxiliary lane from Lower Boones Ferry exit-ramp to Lower Boones Ferry entrance-ramp.

Benefits:

Queue: Congestion/queuing would be reduced in all lanes by providing a balanced roadway section.

Duration: It is anticipated that the queue would be reduced to less than an hour during the peak periods.

Speed: Average speeds within the congested areas are expected to increase to between 40 and 50 mph.

Project Benefits Summary:

Reduce congestion, improve lane balance and travel time reliability, and sustain stable traffic flow. Extension of the auxiliary lane would provide continuous lane from OR 217 to Nyberg St. exit. Construction of the auxiliary lane is anticipated to result in a 30% reduction in mainline crashes, based on comparative auxiliary lane improvements.

Project Estimated Cost:

$7M - $8.5M

Follow-up Phases to Further Enhance Operations and Safety in Corridor

I-5 SB Auxiliary Lanes:

An I-5 SB auxiliary lane extension would create a continuous lane connection from OR 217 entrance-ramp to the I-205 exit-ramp.

Description: Extend the SB auxiliary lane from Nyberg St. exit-ramp to the Nyberg St. entrance-ramp. This would connect to the existing auxiliary lane between Nyberg entrance-ramp and I-205 exit-ramp. A new auxiliary lane between Nyberg St. entrance-ramp and I-205 exit-ramp will be required.

Benefits: This would result in improved system to system traffic operations for this section from OR 217 to I-205.

Queue: Congestion/queuing is reduced in all lanes due to improved lane utilization.

Duration: It is anticipated that the queue would be considerably reduced.

Speed: Average speeds within the congested areas are expected to increase to between 40 and 50 mph.

Project Estimated Cost: $19M - $20M

Oregon Department of Transportation

Site Map Diagram

C-BOS: High Priority Projects

I-5 SB - Lower Boones Ferry Exit-ramp to Lower Boones Ferry Entrance-ramp

Attachment 6.

CITY OF PORTLAND BUREAU OF TRANSPORTATION

Charlie Hales
Mayor

Tom Miller
Director

January 23, 2013

John Mermin
Metro
600 NE Grand Ave
Portland, OR 97232-2736

Dear Mr. Mermin,

Given the recent opportunity to submit proposed amendments to the Regional Transportation Plan (RTP), the City of Portland would like to request an amendment to add the following project to the 2035 RTP Financially Constrained Project List:

- **N Williams Traffic Safety and Operations Project** (from N Winning Way to N Killingsworth St): Pedestrian and bicycle traffic safety and operational improvements, including enhanced crossings, buffered bike lane, traffic calming, a new traffic signal and modifications at existing signals on N Williams and neighborhood greenway improvements on NE Rodney (estimated cost: $1,640,000).

There is some urgency to amend the RTP and add this project to the 2035 RTP Financially Constrained Project List, so this opportunity to amend the list is timely. The City of Portland submitted the *N Williams Traffic Safety and Operations Project* for a grant from the State Transportation Enhancement (TE) – OBPAC combined grant program. These grant funds are available as soon as July 2013. If awarded funds, the project will quickly proceed to design and construction, given the advanced work already completed on public outreach, project development and design for this project. Construction is anticipated to begin in Spring 2014. This is prior to the next scheduled RTP Update. In order to not delay this project, it is necessary to amend the RTP and add this project to the 2035 RTP Financially Constrained Project List now.

The *N Williams Traffic Safety and Operations Project* was the outcome of an extensive public outreach process that lasted 16 months and included a 26 member stakeholder advisory committee with a broad, diverse representation of community stakeholders. The process was originally focused on the N Williams bikeway project #8325 in the Bicycle Plan for 2030. During that process, a number of alternative solutions were considered. With assistance from City of Portland traffic engineers and project managers, the stakeholder advisory committee evaluated many different engineering solutions and painstakingly developed the N Williams Traffic Safety and Operations Plan to address both the local community's wishes to shape the corridor's future and the City's need to improve safety and mobility for multiple modes. The outcome of this process led the City to apply for grants to fund the whole project.

The *N Williams Traffic Safety and Operations Project* is supported by the City's transportation policies in several different ways. This project is comprised of two separate projects from the Portland Bicycle Plan for 2030. Project #8325 in the Bicycle Plan for 2030 calls for improvements to North Williams to include a separated in-

roadway bikeway. Project #8227 in the Bicycle Plan for 2030 calls for the development of NE Rodney as a bicycle boulevard (neighborhood greenway). In the current Portland TSP, N Williams is designated a City Bikeway. In the adopted Bicycle Plan for 2030, it is recommended as a Major City Bikeway. These projects and modal designation will be added to the Portland Transportation System Plan during the next scheduled update.

The Portland Bicycle Plan for 2030 was adopted by Portland City Council in March, 2010, following a 2 ½ year planning process. The plan was developed in two phases with public outreach during both. During phase 1, three public open houses were held. During phase 2, six public open houses were held in May 2009. Mailers, flyers and internet invitations were used to reach as many citizens in Portland as possible. Throughout the process, more than 9,700 individuals and lists were e-mailed notices and reminders about the three public meetings. A team of interns distributed more than 600 flyers to bike shops, bars, coffee shops and grocery stores. Flyers were also distributed at events such as the Mt. Tabor race series and Breakfast on the Bridges. 10,000 mailers were sent to SmartTrips participants. 13 print news organizations received a news release.

Additionally, this project supports implementation of Portland Transportation System Plan (TSP) Policy 11.8B, which calls for the city to address "existing deficiencies or hazards by improving pedestrian, bicycle and vehicular safety." The safety deficiencies on N Williams have been well documented through both the process to update the City's bicycle master plan as well as through public outreach that focused on N Williams.

Another local policy supporting the N Williams project is TSP Policy 6.35 (Transportation District Policies for North Transportation District), which calls for the city to develop "additional east-west and north-south bicycle routes to serve commuter and recreational bicyclists and provide connections to Northeast Portland." Part of this new project includes the development of the N Rodney Neighborhood Greenway, which will serve as an additional north-south route serving both commuters and recreational cyclists.

This project supports implementation of regional policy as well. N Williams is designated a 'Regional Bikeway' on the Regional Bicycle Network (north of N Russell).

The City proposes to reduce the project cost dollar amount for RTP project # 11191, *Citywide Bicycle Boulevards*, in the RTP financially constrained list to offset the cost of the proposed addition to the RTP. The estimated cost of RTP project #11191 is $31,250,000 (2007$) and $93,709,479 (YOE$). The City proposed to reduce the estimated cost by $1,640,000.

Please feel free to contact me if you have any questions or concerns.

Sincerely,

Courtney Duke
Senior Transportation Planner

Williams-Rodney Traffic Safety Project

N LOMBARD ST

N Williams existing bicycle boulevard

N ROSA PARKS WAY

I5 FWY

NE Rodney Proposed bicycle boulevard

NE KILLINGSWORTH ST

NE MARTIN LUTHER KING JR BLVD

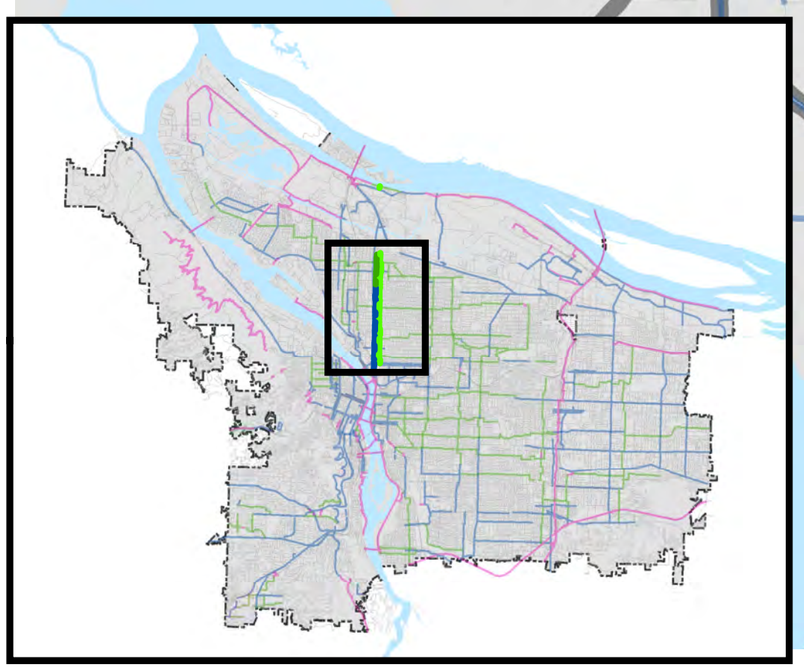
NE PRESCOTT ST

N Williams proposed Safety Improvements

NE FREMONT ST

NE BROADWAY

NE WEIDLER ST



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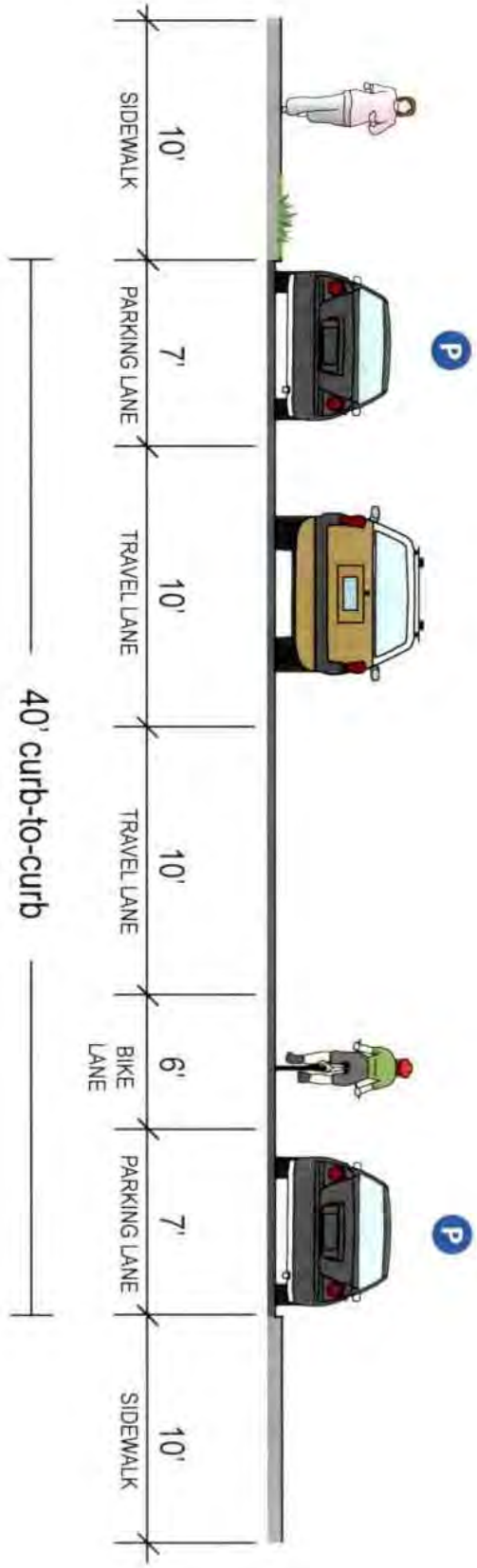
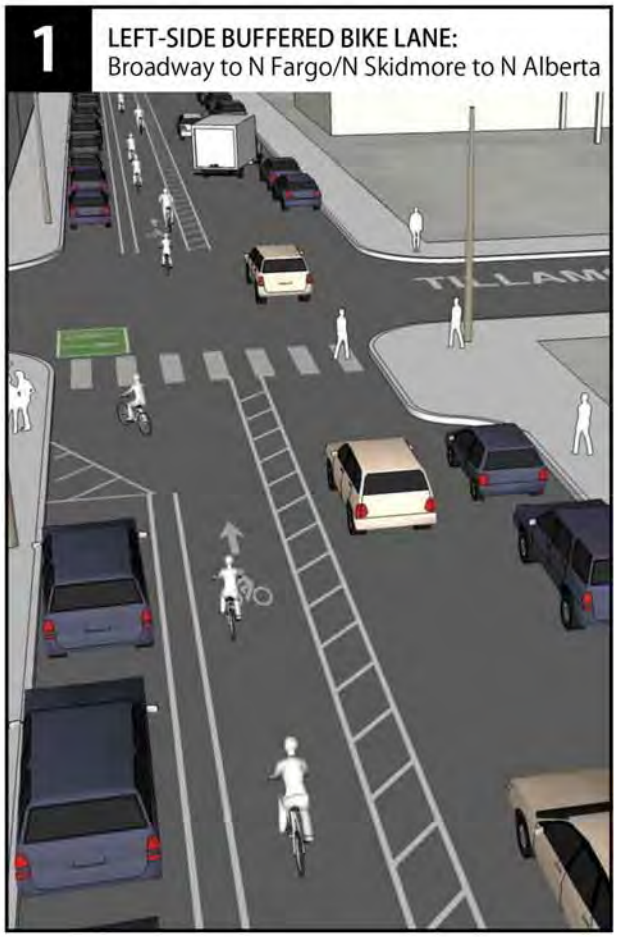
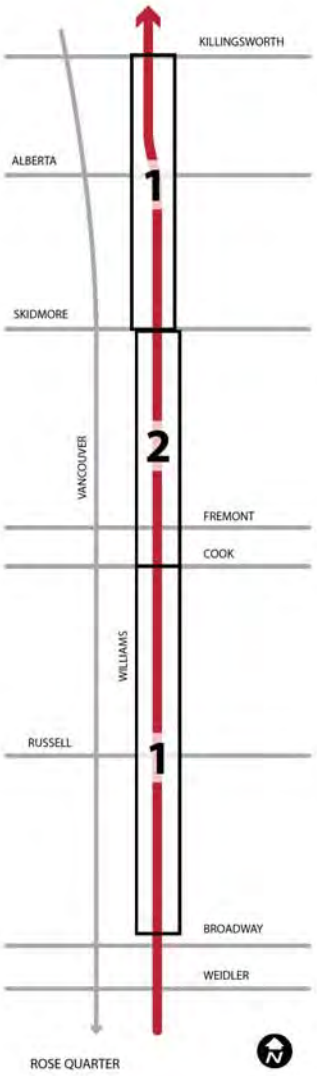
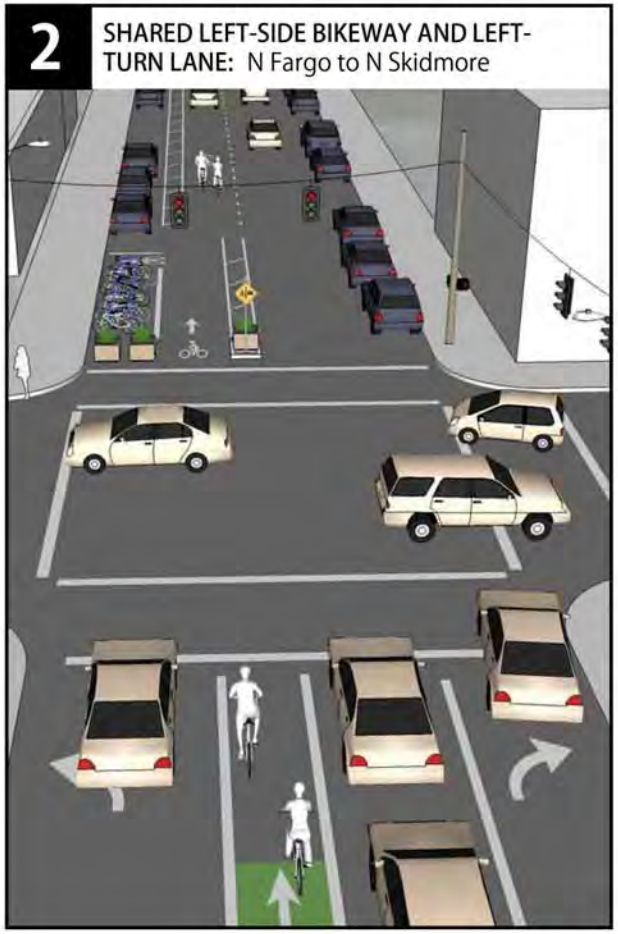


FIGURE 1: Existing street cross section between Hancock Street and Killingsworth Street

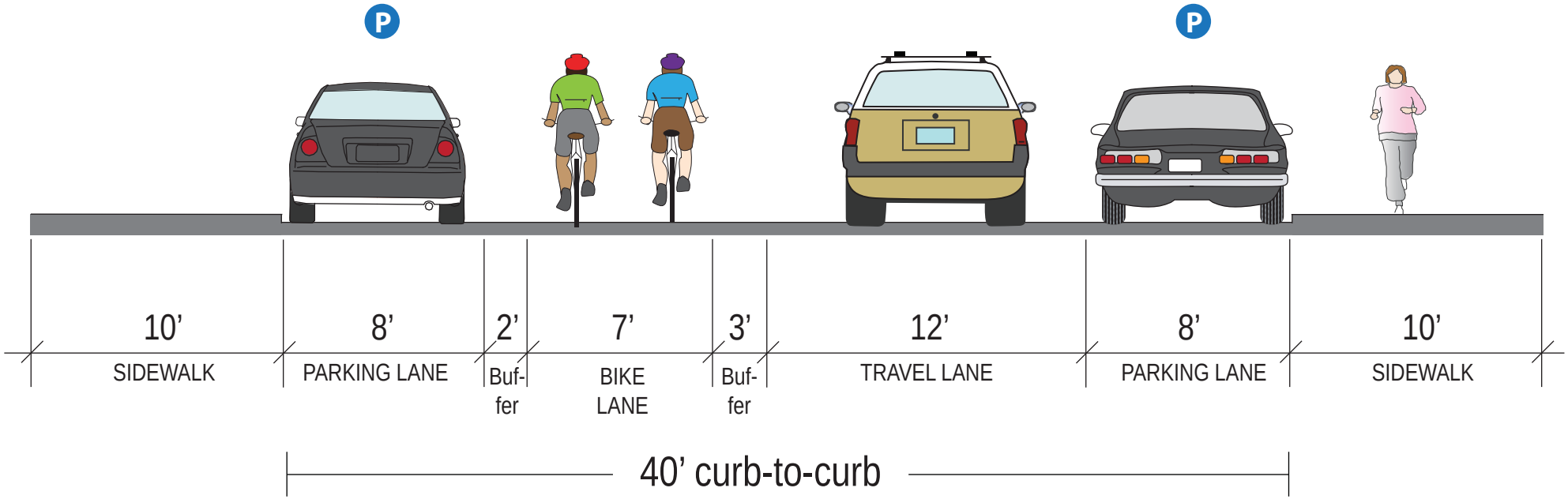
N Williams Traffic Safety and Operations Project
Typical Cross-sections







LEFT-SIDE BUFFERED BIKE LANE CROSS SECTION



Materials following this page were distributed at the meeting.

Presentation to the Metro Technical Advisory Committee

Climate Smart Communities Scenarios HIA

Andrea Hamberg and Eric Main
Oregon Health Authority, Public Health Division
HIA and EPHT Programs
April 3, 2013

What an HIA is…

A structured, but flexible, process that:

- Predicts anticipated health outcomes of a policy decision/project
- Translates that information into recommendations for balanced, well-informed policies
- Helps you weigh trade-offs and understand the direct and indirect health impacts of your work
- HIA's purpose is to improve health, track unintended consequences and mitigate risk

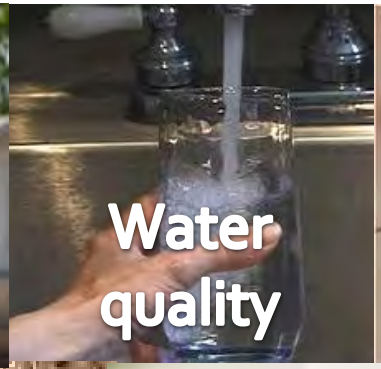
Health determinants

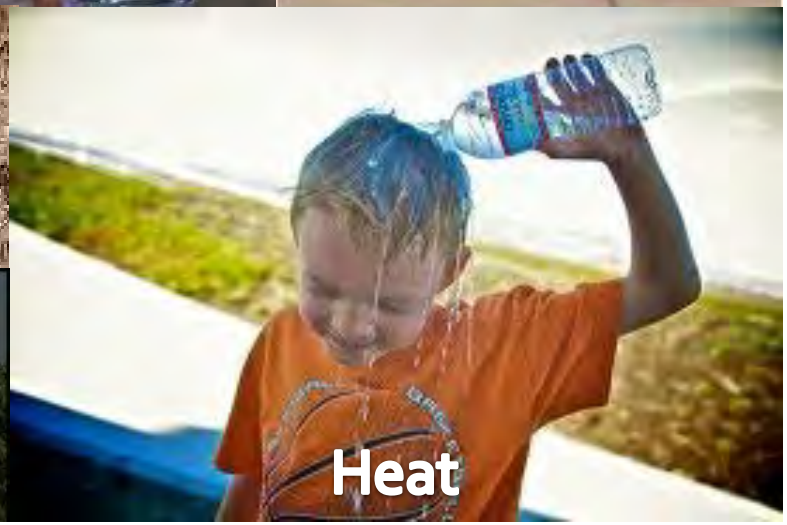
Social and Environmental Determinants of Health

CSCS HIA Advisory Committee

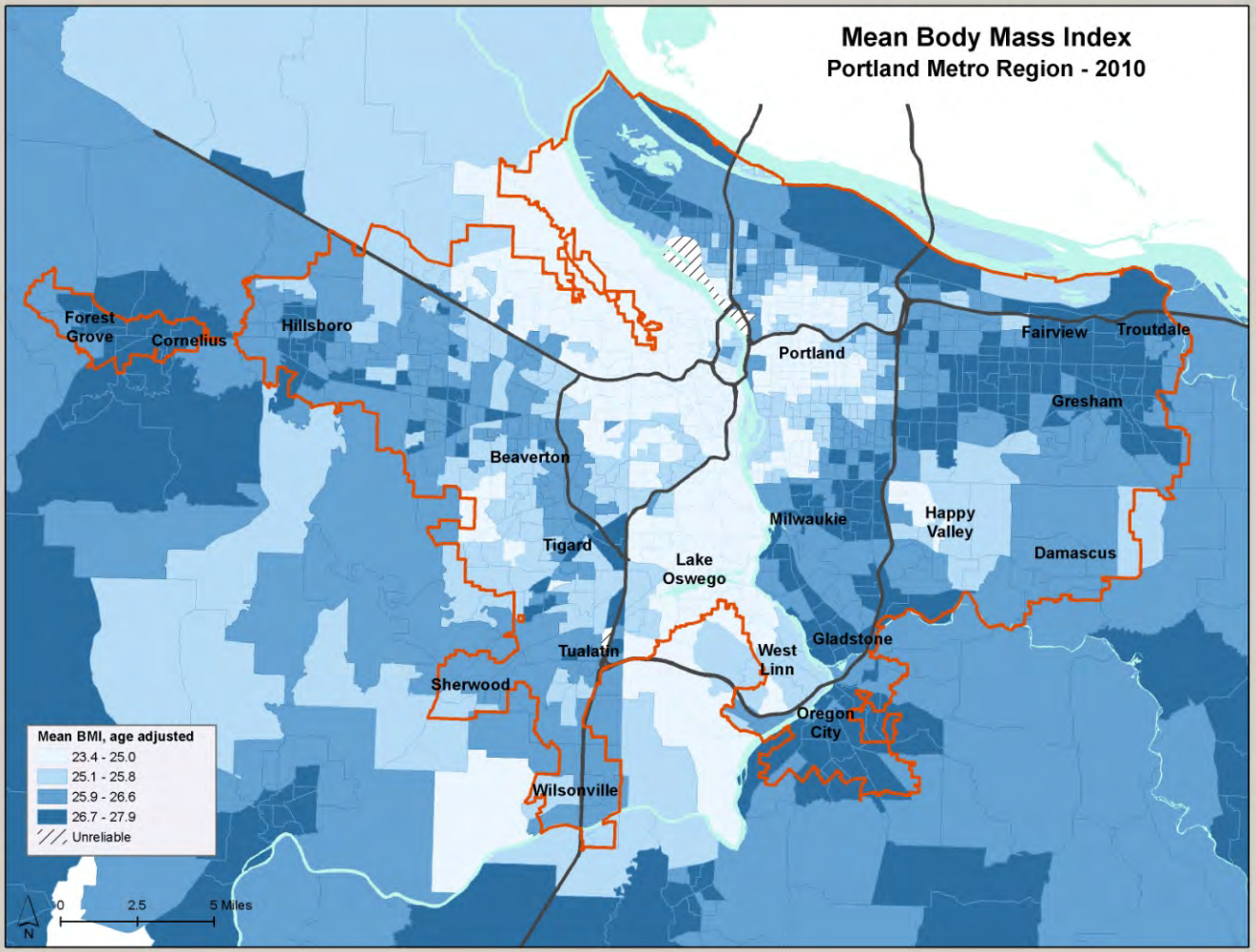
1000 Friends of Oregon
DEQ
DLCD
City of Beaverton
City of Gresham, Urban Design and Planning Department
City of Forest Grove
City of Hillsboro
City of Milwaukee
City of Oregon City
City of Portland
City of Tualatin
Coalition for a Livable Future
Metro
Multnomah County Health Department
Multnomah County Planning
ODOT
OHSU
OPAL
Oregon Environmental Council
Oregon Health Authority
Oregon Public Health Institute
Oregon Transportation Research and Education Consortium
PSU
Regional Transportation Council
The Resource Innovation Group
TriMet
Upstream Public Health
Washington County

Health impacts of climate change





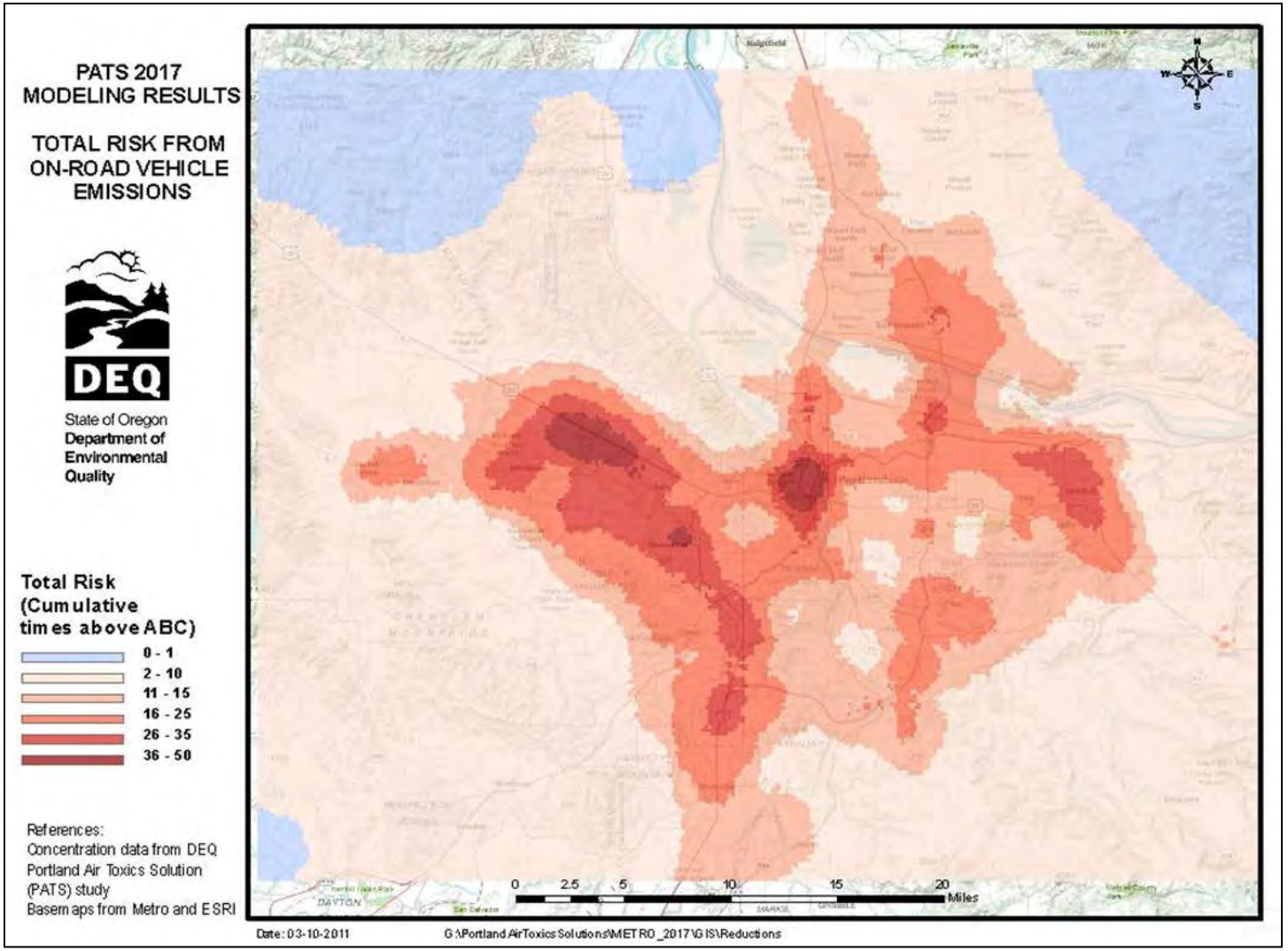
Physical activity



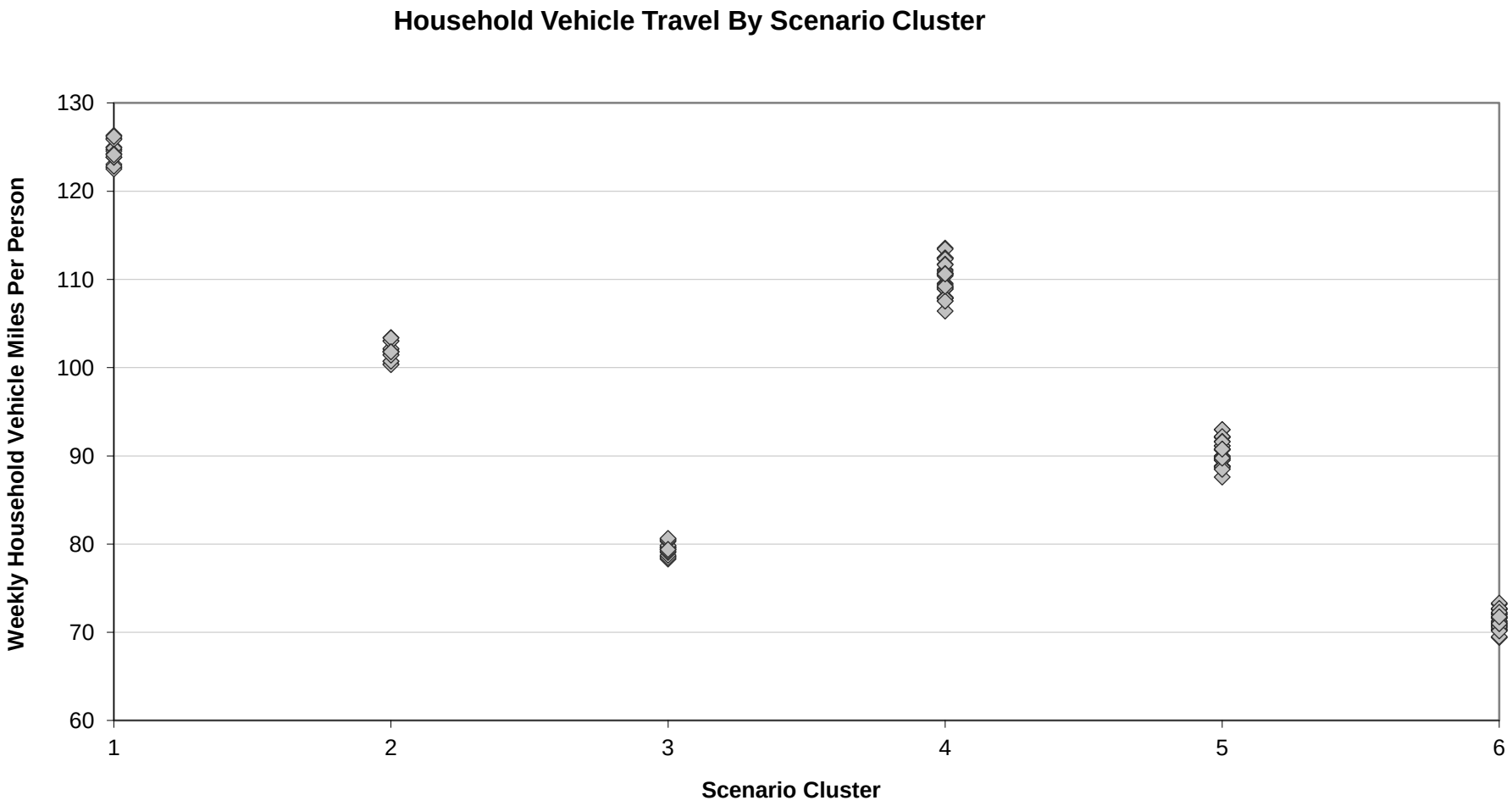
Source: Oregon Health Authority, Environmental Public Health Tracking report: DMV records are valuable for obesity surveillance in Oregon, September 2012

Collisions and fatalities

Air quality


PATS 2017
MODELING RESULTS
TOTAL RISK FROM
ON-ROAD VEHICLE
EMISSIONS
DEQ
State of Oregon
Department of
Environmental
Quality
Total Risk
(Cumulative
times above ABC)
0 - 1
2 - 10
11 - 15
16 - 25
26 - 35
36 - 50
References:
Concentration data from DEQ
Portland Air Toxics Solution
(PATS) study
Basemaps from Metro and ESRI
0 2.5 5 10 15 20
Miles
Date: 03-10-2011
G:\Portland AirToxics Solutions\METRO_2017\GIS\Reductions

Modeling the health outcomes of representative scenarios

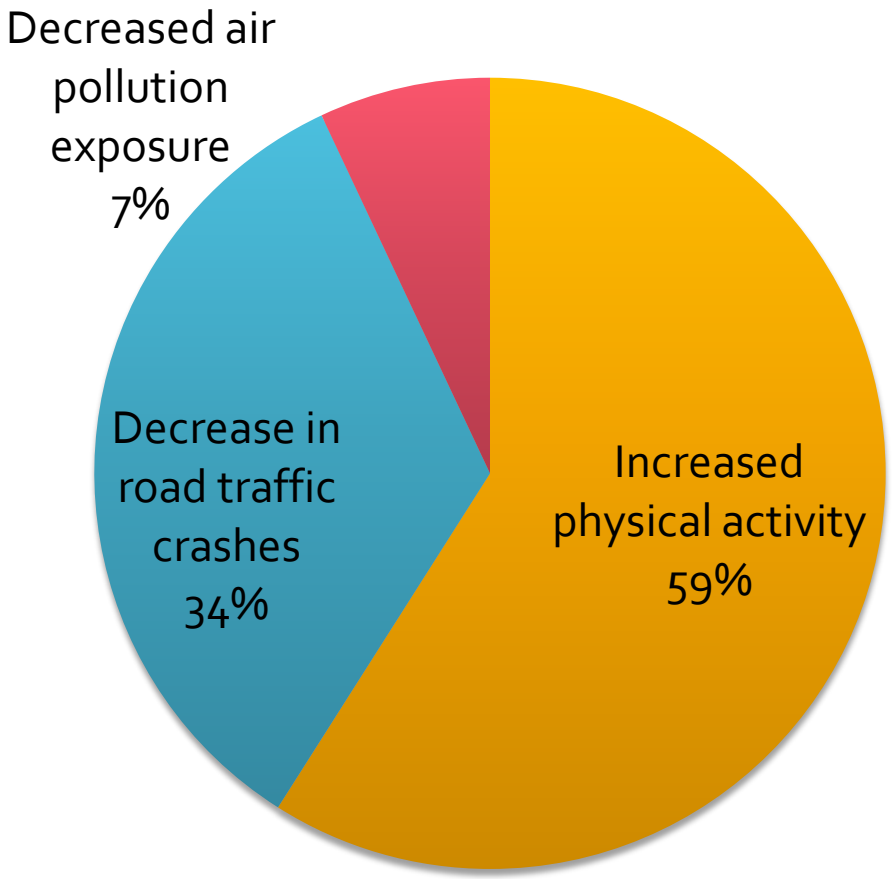


Scenario 6 health impacts by 2035

Overall the region would experience 208 fewer premature deaths and 3,240 years of life gained

- 5% fewer premature deaths
- 6% fewer years of life lost for cardiovascular disease, heart attack and stroke
- 4% reduction in years of life lost for diabetes
- Overall decrease in injuries and fatalities from traffic collisions
- increase injuries/fatalities in bike crashes, from 10 to 12

Health impacts



Key recommendations

- Develop and implement a preferred scenario that meets or surpasses the greenhouse gas emissions reduction target set for the region.
- Emphasize strategies that best increase active transportation and physical activity: community design, pricing and incentives – to maximize public health benefits and meet the state target.
- Include strategies, such as community design, that can lead to decreases in road traffic injuries and fatalities for all populations in the region, in particular for children

Questions?

Climate Smart Communities Scenarios

Health Impact Assessment

Health Impact Assessment Program
Environmental Public Health Tracking Program
Research and Education Services
Center for Health Protection
Public Health Division
Oregon Health Authority

Prepared By:

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Epidemiologist

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Brian Gregor
Oregon Department of Transportation

Acknowledgements:

We would like to thank the members of this project's Advisory Group for their time, expertise, and participation in this HIA. See appendix A for a complete list of the Advisory Group.

We would like to thank Metro, especially Kim Ellis and Nuin-Tara Key for their assistance, and the Oregon Department of Transportation, in particular Brian Gregor, for providing data and support for the assessment. We are grateful to Dr. James Woodcock at the Centre for Diet and Activity Research, Cambridge Institute of Public Health, for allowing us to use ITHIM and for his expert consultation throughout the project, and to Dr. Neil Maizlish at the State of California Department of Public Health for sharing his ITHIM results with us. We would like to acknowledge Daniel Morris, Curtis Cude, Betsy Clapp and Marjorie Bradway for their technical review of this report, and Sandra Healy, Jill Brackenbrough, and Susan Dietz for their assistance throughout this project.

Finally, we thank this project's funders, the Centers for Disease Control and Prevention's Healthy Community Design Initiative, for their continued support to build state and local capacity to conduct Health Impact Assessment in Oregon.

Suggested citation: Green M, Hamberg A, Main E, Early-Alberts J, Dubuisson N, Douglas JP. Climate Smart Communities Scenarios Health Impact Assessment. Oregon Health Authority. April 2013: Portland, OR.

Table of Contents

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List of Figures

Pathway Diagrams

Executive Summary

Health impact assessment (HIA) provides decision-makers with information about how a proposed policy, program or project may affect the health of people, with a specific focus on equity. HIA differs from traditional public health assessment in an important way - the health impacts of a proposal are assessed before a final decision is made, allowing the results of the HIA to be considered in the decision-making process. HIA provides objective information that can be used to increase the positive health impacts of a project or policy and mitigate negative impacts.

The Oregon Health Authority (OHA) conducts HIAs on projects or policies with statewide impact and on local or regional issues when there is sufficient interest from community members or other agencies. OHA supports statewide HIA practice by facilitating the Oregon HIA Network, providing trainings, and awarding mini-grants to local health departments.

The Climate Smart Communities Scenarios (CSCS) project underway in the Portland, Oregon metropolitan (PDX metro) region is the focus of this HIA. The CSCS project is Metro Regional Government's (Metro) response to a legislative requirement to meet Oregon greenhouse gas (GHG) emissions reduction goals for small trucks and cars. While the law was passed in an effort to mitigate climate change and reduce air pollution, Metro is also considering impacts on public health, the economy, the environment and equity as part of the planning effort.

The HIA will help to support Metro in their consideration of public health and health equity in the selection and implementation of transportation and land use decisions related to GHG reduction policy in the Portland metropolitan region. Our recommendations in this report apply to the selection of the three Phase Two GHG-reduction scenarios to be further tested in 2013, as well as the development and adoption of a preferred scenario in 2014.

Changes to our climate have the potential to impact health in many ways [1]. For example, more summer heat waves with higher temperatures or longer durations would increase heat-related illness and death. Increased frequency and severity of winter storms could lead to impacts such as increased respiratory illness from mold exposure, and increased drowning [2, 3]. Plans and policies intended to help communities mitigate or adapt to climate change also have health implications.

Creating walkable and bikeable communities may increase the proportion of Portland metropolitan region residents who meet physical activity benchmarks and reduce the burden of chronic diseases that are associated with inactivity, while reducing vehicle travel and carbon emissions [4, 5]. In addition, advancements in fuel technology and policies related to fleet mix and turnover also may reduce GHG emissions in the region. Reducing greenhouse gas emissions will have inevitable health benefits for Oregonians by slowing down climate change and improving air quality.

Summary of Findings

OHA found that almost all of the policies under consideration could improve health, and that certain policy combinations were more beneficial than others. The majority of the health benefits result from increased physical activity, followed by reductions in road traffic crashes and lower exposure to particulate air pollution. Strategies that meet GHG reduction goals by decreasing vehicle miles traveled (VMT) will have the most positive impact on human health by increasing physical activity through active transportation and reducing injuries and fatalities from collisions.

The most health-promoting scenarios have similar elements: most ambitious levels of community design policies, intermediate and ambitious levels of pricing and incentives, highest levels of active transportation (including transit), lowest levels of single occupancy vehicle driving, and lowest levels of particulate air pollution. The majority of the health benefits come from increases in physical activity, followed by decreases in injuries and fatalities from collisions, and finally from decreased exposure to air pollution.

Some of the policies under consideration, or the way they are implemented, may also negatively affect health. For example, some communities in the Portland metropolitan region have poor access to active transportation infrastructure (sidewalks, bike routes, transit service). If these areas are not prioritized, implementation could worsen existing inequities, leading to increased health disparities for some of the region's residents.

The modeling tool used in this assessment shows positive health impacts due to reductions in motor vehicle crashes, but also revealed potential negative impacts from increased bike injuries. Understanding the range of potential impacts will help policy makers decide which strategies to prioritize and how to implement the strategies to maximize health and reduce health-related costs for local communities.

CSCS HIA Key Recommendations

- Develop and implement a preferred scenario that meets or surpasses the greenhouse gas emissions reduction target set for the region.
- To maximize public health benefits and meet the state target, emphasize strategies that best increase active transportation and physical activity: community design, pricing and incentives.
- Include strategies, such as community design, that can lead to decreases in road traffic injuries and fatalities for all populations in the region, in particular for children.
- Carry out additional quantitative health impact assessment of the three scenarios that are identified for further evaluation in spring 2013 to further inform development and adoption of a final preferred scenario. OHA recommends the use of ITHIM or a similar health impacts model for this future assessment.

Introduction

Health impact assessment (HIA) provides decision-makers with information about how a proposed policy, program or project may affect the health of people. HIA differs from traditional public health assessment in an important way - the health impacts of a proposal are assessed before a final decision is made, allowing the results of the HIA to be considered in the decision-making process. HIA provides objective information that can be used to increase the positive health impacts of a project or policy and mitigate negative impacts.

OHA conducts HIAs on projects or policies with statewide impact and on local or regional issues when there is sufficient interest from community members or other agencies. OHA supports statewide HIA practice by facilitating the Oregon HIA Network and providing trainings, and awarding small grants to local health departments.

Purpose

The Climate Smart Communities Scenarios (CSCS) [6] project underway in the Portland, Oregon metropolitan (PDX metro) region is the focus of this HIA. The CSCS project is a response by Portland metropolitan regional government (Metro) to a legislative requirement to meet Oregon greenhouse gas (GHG) emissions reduction goals for cars and small trucks. While the law was passed in an effort to mitigate climate change and reduce air pollution, Metro is also considering impacts on public health, the economy, the environment and equity as part of the planning effort. All of the findings and recommendations in this report focus on public heath.

The report provides a community profile, including information about current health conditions; results of a literature review on the links between proposed policies and health outcomes; quantitative assessment of land use and transportation policies tested in Phase One of the CSCS project; and recommendations for future work to expand the reach of positive impacts and mitigate negative health impacts.

The HIA will support Metro in their consideration of public health and health equity in the selection and implementation of transportation and land use decisions related to GHG reduction policy in the Portland metropolitan region. Metro's CSCS technical work group, the Metro Council, and other committees and stakeholders will use the report as they develop additional policy options to be tested in 2013, and in the creation of a final scenario to be adopted in 2014.

Climate Policy Background

Oregon passed a bill in 2007 that set goals for reducing GHG emissions in the state. House Bill 3543 states that Oregon will reduce emissions to 10 percent below 1990 levels by 2020, and to

75 percent below 1990 levels by 2050. In 2009, Oregon enacted House Bill 2001, which requires Metro to develop a preferred scenario that accommodates planned population and job growth and reduces GHG emissions from light vehicles. House Bill 2001 was a broad-based transportation bill that focused on sustainable transportation systems and funding, with the goal of ensuring that Oregon begins to address climate change. The law requires Metro to adopt the preferred scenario after public review and consultation with local governments. It also requires that local governments implement the preferred scenario through scheduled updates to transportation and land use plans.

The Oregon Land Conservation and Development Commission (LCDC) subsequently set light duty vehicle GHG emissions reduction targets for each of Oregon's six largest metropolitan areas in June 2011. In November 2012, the LCDC established administrative rules directing Metro to complete the scenario planning and adopt a preferred scenario by December 31, 2014. In the future, Oregon's other metropolitan planning organizations may also conduct similar scenario planning.

Metro's CSCS planning process will adopt a recommended transportation and land use scenario for the Portland metropolitan region that includes policies and strategies for reducing GHG emissions to meet the LCDC target. The adopted scenario will update regional policies and describe a general course of action for achieving the GHG emissions reduction target through policies, investments and actions at the state, regional and local levels.

The Oregon Health Authority (OHA) developed the CSCS HIA to support Metro's consideration of health impacts early in the scenario planning process and in future planning and implementation efforts.

Climate Policy and Health

Changes to our climate have the potential to impact health in many ways [1]. For example, more summer heat waves with higher temperatures or longer durations would increase heat-related illness and death. Increased frequency and severity of winter storms could lead to impacts such as increased respiratory illness from mold exposure, and increased drowning [2, 3]. Plans and policies intended to help communities mitigate or adapt to climate change also have health implications.

Creating walkable and bikeable communities may increase the proportion of Portland metropolitan region residents who meet physical activity benchmarks and reduce the burden of chronic diseases that are associated with inactivity, while reducing vehicle travel and carbon emissions [4, 5]. In addition, advancements in fuel technology and policies related to fleet mix and turnover also may reduce GHG emissions in the region. Reductions in air pollution may have positive impacts on health, including reductions in chronic diseases such as asthma or cancer, and acute conditions such as heart attack or stroke.

However, these policies or the way they are implemented may also negatively affect health. For example, some communities in the Portland metropolitan region have poor access to active transportation infrastructure (sidewalks, bike routes, transit service). If these areas are not prioritized, implementation could worsen existing inequities, leading to negative health effects for some of the region's residents. Understanding the range of potential impacts will help policy makers decide which strategies to prioritize and how to implement the strategies to maximize health and reduce health-related costs for local communities.

Climate Smart Communities Scenarios HIA

The CSCS HIA is intended to inform Phase Two of Metro's CSCS planning effort, which will include the development and evaluation of three alternative scenarios. Although the Phase Two scenario alternatives will draw from the 144 tested in the first phase of the CSCS project, the three scenarios will not necessarily match any of the 144 scenarios tested in Phase One. The three alternatives considered are framed around varying levels of community investment; each is designed to maximize public health, equity, economic, and environmental benefits.

In spring 2013, the Metro Council will direct staff to move forward to test the three alternatives developed in Phase Two, after gathering input from other community and business leaders at a regional summit. These alternatives will be assessed prior to the creation of a final scenario in Phase Three of the CSCS planning process. Results of the Phase Two assessment will be released in fall 2013 for discussion and to gather input to identify which policies, investments and actions should be included in a preferred scenario.

A final preferred scenario will be selected by the end of 2014 and will be implemented through policies, investments and actions at the regional and local levels, including Metro's Regional Transportation Plan and the Portland metropolitan region's growth management strategy and local plans.

The CSCS HIA will help to ensure that public health and health equity are considered in the selection and implementation of transportation and land use options related to GHG reduction policy in the Portland metropolitan region and potentially in Oregon's other metropolitan areas. The goals of the CSCS HIA are:

1. Provide evidence-based recommendations to aid decision-makers in understanding potential health impacts and tradeoffs of the CSCS policy options
2. Build and strengthen relationships between OHA and governing and planning bodies in the Portland metropolitan region
3. Promote consideration of health impacts in transportation planning and climate change mitigation efforts throughout the state
4. Promote HIA practice in Oregon

OHA followed the guidelines recommended in the North American HIA Practice Standards in developing each stage of the HIA. These stages include: screening, scoping, assessment, reporting and evaluation [7].

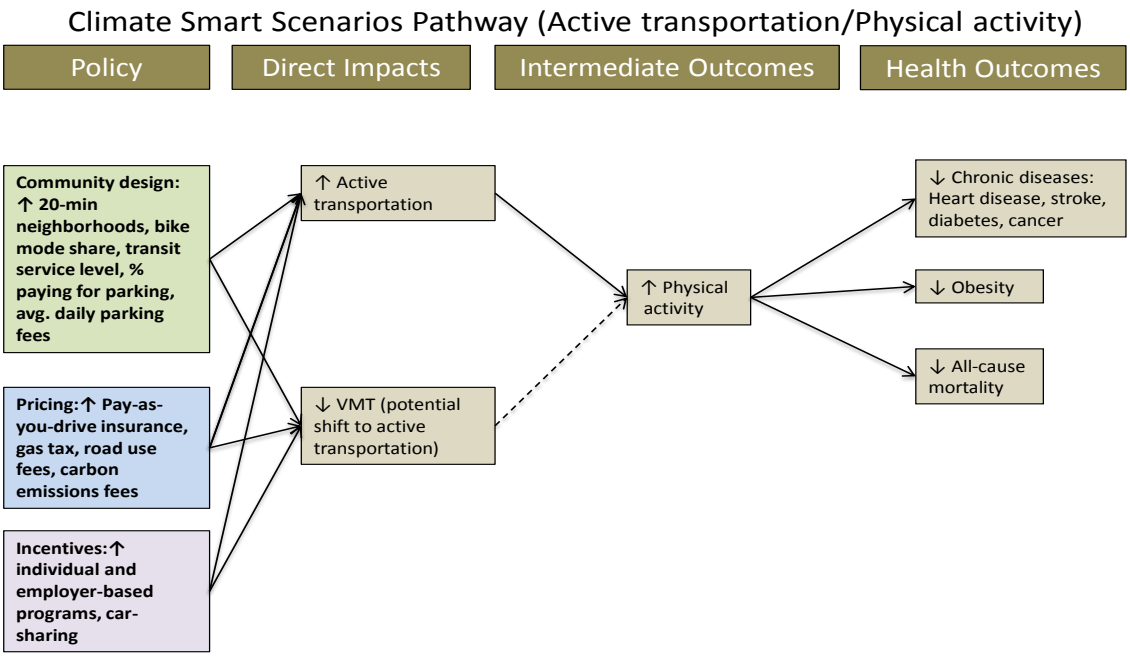
Screening and Scoping

In September 2011, OHA screened the CSCS HIA with partners at Metro and determined that an HIA could bring important health considerations to the CSCS decision-making process. In March 2012, OHA convened a group of 37 stakeholders representing planning, transportation and public health experts from around the Portland metropolitan region for a one-day workshop. Many of these stakeholders also represented local communities and vulnerable populations who will be potentially impacted by Metro's adoption of a preferred scenario. In the meeting, OHA provided an overview of Metro's CSCS planning project, gave an introduction to health impact assessment methodology, and presented the above CSCS HIA goals.

With the input and support of the advisory group, OHA determined priority health impacts, obtained necessary data, and found essential sources for the literature review. A list of advisory group members can be found in Appendix A.

Below is a sample pathway diagram that demonstrates the potential links between GHG reduction policy and program options and health impacts in the Portland metropolitan region. The pathways were drafted by OHA during the scoping phase of the assessment and revised with input from the advisory committee and information learned during the assessment. Additional pathways demonstrating potential links between policies and programs related to particulate air pollution exposure and roadway-related injuries and fatalities and health impacts are in the findings section of the report.

Pathway Diagrams 1 - Active transportation and physical activity



Dotted line indicates weaker evidence base

Assessment Methodology

OHA conducted a literature review about the proposed GHG reduction policies and the priority health determinants or impacts within our scope, which included physical activity, air pollution and road traffic injuries and fatalities. OHA identified the most relevant publications in each category for inclusion in the report's evidence base and rated their quality according to guidelines from the Agency for Healthcare Research and Quality [8]. A summary table is available on page 27.

In addition to the literature review, OHA used the Integrated Transport and Health Impact Modeling (ITHIM) tool in order to quantitatively determine which types of policy combinations had the most positive impact on health [9]. ITHIM is a comparative risk assessment model developed by Dr. James Woodcock at Cambridge University. ITHIM estimates changes to life expectancy and quality of life for scenarios based on known relationships between physical activity and chronic illnesses such as cardiovascular disease and diabetes; serious injuries and fatalities from motor vehicle related crashes; and illness and death from particulate air pollution exposure [9, 10].

Reporting and Evaluation

This report presents information about potential health benefits and impacts of the proposed GHG reduction policies evaluated in Phase One of the CSCS project. It also provides recommendations for expanding the reach of positive impacts and mitigating negative health impacts. Subject matter experts from OHA, the CSCS HIA Advisory Committee and Metro reviewed the report. The report will be disseminated to policymakers and community stakeholders in the Portland metropolitan region and to state and national partners. An evaluation will be completed in the summer of 2013 and will include an evaluation of the CSCS HIA process and its effectiveness in influencing the decision-making process.

Community Profile

The decision-makers and planners at Metro and the region's local governments have done significant work to understand the existing conditions related to health status and local health determinants, as shown in the region's planning documents, travel surveys and reports [11, 12]. The local health context is an essential consideration when choosing policies for inclusion in the 2014 preferred Climate Smart Communities Scenario and when implementing these policies. This existing conditions summary explores population and travel characteristics for the region's counties and presents information about the underlying health status of residents, with a particular focus on vulnerable populations who may experience worse health outcomes. County health measures are compared to the state or to national targets to provide context, as is customary in health assessments. The measures of health status and health determinants for Portland metropolitan region communities presented below relate to the CSCS policies that OHA assessed.

Population and Travel Characteristics/Infrastructure

The Portland metropolitan region has a population of nearly 1.5 million distributed across three counties (Clackamas, Multnomah, and Washington) and 25 cities. It is the most populous region in Oregon and the 24th largest metropolitan area in the country. Portland itself is the sixth largest city on the West Coast. Population in the Portland metropolitan region is forecasted to grow to nearly 2 million by 2035 [13].

Vehicle Miles Traveled

In the Portland metropolitan region in 2010, there were 5,074 vehicle miles traveled (VMT) per capita [14]. This was the lowest level of VMT per capita for the region since 1985 [14]. Nevertheless, due to population growth, average daily VMT has continued to grow steadily. Between 1982 and 2010, average daily VMT for the Portland metropolitan region has risen from 15 million miles to over 26 million miles [14].

In addition to population growth, long commute times and above average dependence upon automobiles for drive-alone commuters have contributed to the increase in VMT in the Portland metropolitan region. The average commute time for every county in the region is above the state average (Appendix B, Table 1). Additionally, Clackamas and Washington counties have higher percentages of single passenger auto commuters. Multnomah County is significantly below the state average of single passenger auto commuters; however, when examined at a smaller scale (Appendix B, Table 2) only the City of Portland is below average while more than one-third of Multnomah County's other cities are above average.

Public Transit Travel

Substantial growth in public transit ridership within the Portland Metro region occurred in the late 1990s. From 1997 to 2007, ridership on bus and rail lines increased 45%, nearly twice the growth rate in population [15]. The rate of ridership slowed to 15% between 2002 and 2012, but it is still well over the 10% population growth rate the region experienced in the same decade [16, 17]. Additionally, with a 52-mile MAX light rail system, 79 bus lines, and a 14.7-mile WES Commuter Rail serving 570 square miles, nearly 90% of the region's residents live within one-half mile of a bus stop or a rail platform [15]. In 2004, transit ridership in the Portland metropolitan region was ranked 7th in the U.S. at 70 passenger trips per capita [18]. Since this time, TriMet, the agency overseeing transit services in the Portland metropolitan region, has expanded its transit network. Consequently, in 2009 transit ridership has increased to 73 passenger trips per capita [19]. TriMet currently operates 225 lift vehicles and provides 958,000 annual rides to seniors and people with disabilities. Weekly ridership on buses and MAX rail lines has increased for all but one year in the past 23 years due to recession-related service cuts [16, 17].

Active Transportation Travel

Significant investments to expand bicycle infrastructure throughout the Portland metropolitan region have also occurred over the past two decades. For example, the City of Portland invested more than $12 million between 1991 and 2004 to develop its regional bicycle network which contains more than 300 bikeway miles [15, 20]. In addition, Metro's Regional Flexible Fund Allocation (RFFA) program provided funding for 46 miles of bicycle boulevards, bike lanes, trails and other bicycle projects between 2006 and 2015 [21]. These investments build on RFFA investments that have been made since 1995. Although bicycle data is limited, regional reports and a recently completed travel behavior survey have documented increased bicycle ridership throughout the region [15].

The regional pedestrian network has not seen the same level of expansion as public transit and bicycle facilities. In addition to locally funded pedestrian projects, Metro's RFFA program provided funding for nearly 9 miles of sidewalks in mixed-use centers throughout the Portland metropolitan region. Although nearly 90% of the region's residents live within one-half mile of a bus stop or a rail platform, only 69% of those stops are accessible by sidewalk [15]. Additionally, it was found that the region has 1,230 miles of potential pedestrian facilities located within transit/mixed use corridors and pedestrian districts [15]. In the regional network of corridors and districts, 19% of all streets have no sidewalks, 19% have sidewalks on at least one side of the street and 62 % of all streets had sidewalks on both sides of the street [15, 22].

One in six trips in the Portland metropolitan region are now made using active travel. Comparison of the 1994 and 2011 Oregon Household Activity Survey shows that between 1994-95 and 2011, all trips made by walking, biking and transit increased by 36% (from 13.1% to

17.8% of all trips) while trips made by auto declined by 5.7%. Walking trips increased by 14%, trips by biking increased over 190%, and trips by transit increased by 50% [23].

Lower income, disabled, and people of color make more of their trips using active travel, especially walking and transit, than higher-income, white and non-disabled persons [24]. People with disabilities particularly rely on access to transit for travel. Nearly 7% of the population reports having a disability that affects their ability to travel. People with disabilities drive and bike less and walk and take transit more often than people that reported having no disability that affects their ability to travel [25].

Safety

Making streets safer for people walking and riding bicycles and reducing bicycle and pedestrian crashes is important to protecting the public's health. Feeling and being safe while walking and bicycling is an important factor in the travel choices people make and therefore is a critical part of a complete transportation system. Transportation safety is also an equity issue. Research and data show that people with low incomes and people of color are more likely to live near wide, high-traffic streets and are thus much more likely to be injured by an automobile [26].

Serious pedestrian and bicycle crashes account for 20% of all serious crashes in the region [27]. Serious crashes are those that result in a fatality or an incapacitating injury. While 3.2% of all trips (not counting trips to access transit) take place by bicycle, 8% of all serious crashes involve bicyclists. Pedestrians make 10% of all trips in the Portland metropolitan region (not including trips to access transit); however 12% of all serious and fatal crashes involve a pedestrian.

There were a total of 1,297 pedestrian crashes resulting in injury in the Portland metropolitan region between 2007 and 2010. Of those crashes, 252 resulted in a death or an incapacitating injury. The majority of pedestrian crashes occur while pedestrians are crossing the roadway, either at an intersection or mid-block. Nearly 80% of all serious and fatal pedestrian crashes occur when people are crossing the roadway.

There were a total of 1,503 bicycle crashes resulting in injury in the Portland metropolitan region between 2007 and 2010. Of those crashes, 140 resulted in a death or an incapacitating injury. Most serious and fatal bicycle crashes (73%) occur at intersections.

Major factors contributing to serious crashes include high-traffic streets, streets with multiple lanes, excessive speed, driver impairment due to alcohol or drugs, lack of adequate street lighting and congestion [27].

Air Quality

Overall, air pollution in the Portland metropolitan region has decreased dramatically over the last 30 years [28]. However, air quality remains an environmental justice and equity issue. The Portland Air Toxics Solutions Committee Report mapped census block groups with minority

populations above 25% overlaid with total times above benchmarks for all pollutants observed in the study, including emissions from cars and trucks [29]. Visual inspection of the overlay suggests that there is an overlap between high minority and high impact areas in some areas of the study boundary, including Forest Grove, Hillsboro, Aloha, Beaverton, North Portland, East Portland and Gresham.

Vulnerable Populations

Transportation is essential to the health of all the region's residents. Transportation connects people to jobs, schools, parks and recreation facilities, shopping, friends, and essential services like health care. Transportation-related air pollution and a lack of access to affordable, high-quality transportation options negatively impacts health. Certain groups within the region are more likely to be affected by air pollution and lack transit access, such as youth, seniors, low-income residents and communities of color [30, 31]. These groups are also at higher risk for health conditions linked to limited transportation options and transportation-related air pollution, such as asthma, heart disease, and obesity [32, 33].

Age

Older adults make up a smaller portion of the Portland metropolitan region's population compared to Oregon as a whole (Table 1). Comparatively, children and teens comprise a greater share of Clackamas and Washington County's population than Oregon as a whole. Multnomah County has a lower percentage of youth than the state.

Table 1. Portland Metropolitan Region Comparison, County and State - Age

Age Category	Clackamas County	Multnomah County	Washington County	State of Oregon
Under 18 Years Old	23.7%	20.5%	25.6%	22.6%
65 Years or Older	13.6%	10.5%	10%	13.9%

Source: Profile of General Population and Housing Characteristics: 2010 prepared by the U.S. Census Bureau, 2011.

Race and Ethnicity

When examining race and ethnicity within the Portland Metro region, Multnomah and Washington County are similar (Table 2). While white residents make up a large share of both counties' population (approximately 81%), Multnomah and Washington still have higher percentages of residents of color (in all race/ethnicity categories) than Oregon as a whole [34]. Washington County in particular has one of the greatest Hispanic/Latino population in the state [34]. In contrast, Clackamas County's population is primarily white and has smaller populations of communities of color (in all race/ethnicity categories) compared to Oregon as a whole [34].

Table 2. Portland Metropolitan Region Comparison, County and State – Race/Ethnicity

Race/Ethnicity	Clackamas County	Multnomah County	Washington County	State of Oregon
White	91.1%	80.5%	80.4%	87.1%
Black or African American	1.4%	7.1%	2.7%	2.6%
American Indian and Alaska Native	1.9%	2.5%	1.7%	2.9%
Asian	4.8%	8.2%	10.6%	4.9%
Native Hawaiian and Other Pacific Islander	0.5%	0.9%	0.9%	0.7%
Some Other Race	3.7%	5.9%	8.4%	6%
Hispanic or Latino	7.7%	10.9%	15.7%	11.7%

Source: **Profile of General Population and Housing Characteristics: 2010 prepared by the U.S. Census Bureau, 2011.**

In the Portland metropolitan region, both white and non-white heads of households make the majority of trips by auto. However, non-white householders make a greater percentage of their trips by walking, bicycling and transit than white householders. Non-white householders make 20.5% of all their trips by walking and bicycling and transit, while white householders make 15% of all their trips by walking and bicycling and transit [12].

Income and Poverty

Within Clackamas and Washington counties, the median household income is approximately $62,000, which is higher than the median Oregon household income ($49,260) [35]. Within both counties, fewer than 10% of people had an income in the past 12 months lower than the poverty rate (Table 3) [35]. This was roughly 5% lower than the state as a whole. In comparison, Multnomah County has a median household income that is similar to the median Oregon household income [35]. Also, 16% of Multnomah County residents had an income in the past 12 months lower than the poverty rate [35], a slightly higher percentage than the state as a whole.

Table 3. Metropolitan Region Comparison, County and State – Other Demographics

Category	Clackamas County	Multnomah County	Washington County	State of Oregon
Median Household Income	$62,007	$49,618	$62,574	$49,260
Income in the past 12 months below the poverty level	9%	16%	9.5%	14%

Source: 2006-2010 American Community Survey [Oregon]prepared by the U.S. Census Bureau, 2011.

Households in the four-county Portland metropolitan region (including Clark County) with lower income levels make more of their trips using active travel modes, especially walking and taking transit. As income rises, more trips are made by auto. For example, for households with income under $15,000, 26% of all trips are made by active modes and 74% of trips are made by auto. This is compared to households with the highest level of income, $150,000 or more, where 11% of trips are made by active modes and 89% of trips are made by auto [12].

For walking trips, 32.8% of all walking trips are made by households with income under $35,000, 32.3% are made by households with income between $35,000 and $75,000, and 35% are made by households with income greater than $75,000. For trips by bicycle, 21.2% of all trips by bicycle are made by households with income under $35,000, 37.1% are made by households with income between $35,000 and $75,000, and 41.8% are made by households with income greater than $75,000 [12].

For transit trips, 44.6% are made by households with income under $35,000, 30% are made by households with income between $35,000 and $75,000 and 24.6% are made by households with income greater than $75,000 [12].

Health Conditions

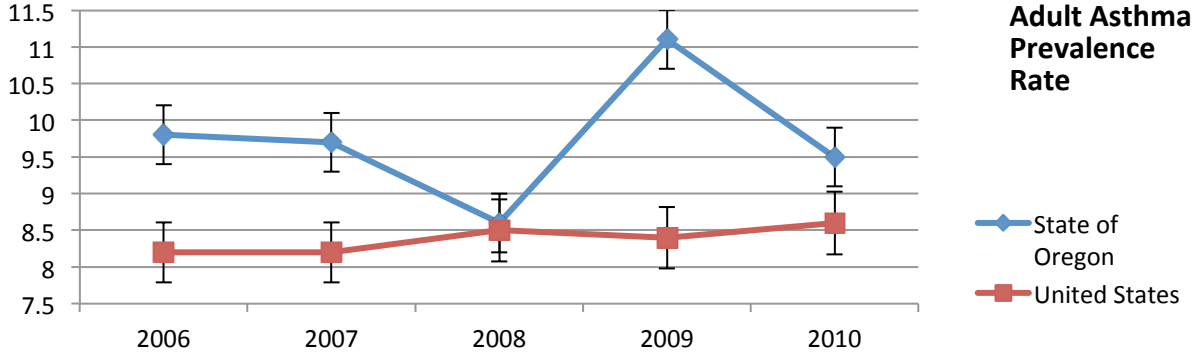
Chronic health diseases such as asthma, diabetes, stroke, heart disease, and cancer, along with factors such as obesity, are significant contributors to illness and death for all Oregon and Portland metropolitan region residents and many of the proposed policies designed to reduce GHG emissions would impact these chronic health conditions. For a tabular comparison of the burden of these illnesses, see Appendix B, Table 3.

Asthma

Asthma is a chronic lung disease that inflames and narrows the airways to cause shortness of breath, coughing, and wheezing [36, 37]. Asthma affects people of all ages, but it is one of the most common long-term chronic diseases of children [38]. Exposure to air pollution increases the risk of developing asthma and can cause those with asthma to experience worsening of symptoms.

In 2009, approximately 10.2 % (≈300,000) of Oregon adults and 9.5% (≈ 83,000) of children had asthma [36] . As a result, Oregon ranked among the top five states in the nation with the highest percent of adults with asthma (Figure 1) [36, 39]. The most current county-level prevalence data (Figure 2) shows that from 2006 – 2009 the counties of Clackamas (9.7%), Multnomah (9.2%), and Washington (9.0%) fared the same or better than the state average prevalence (9.7%) of adult asthma [40].

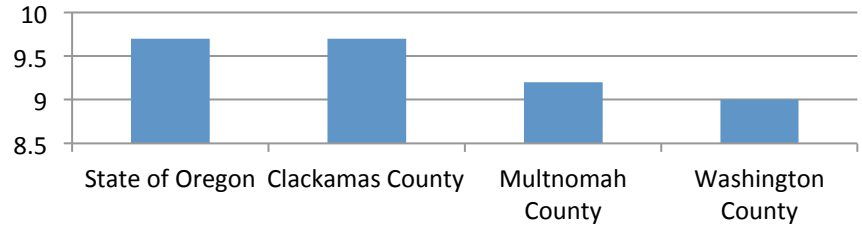
Figure 1. Percent of adult population with asthma, Oregon and U.S.



Source: Behavioral Risk Factors Surveillance System

Source for above image: http://www.cdc.gov/asthma/brfss/default.htm#08

Figure 2. Percent of adults with asthma, Oregon and Portland metropolitan region counties



Age Adjusted Prevalence Rate of Asthma Among Adults: 2006 - 2009

Source: Oregon Behavioral Risk Factors Surveillance System

Source for above image: http://public.health.oregon.gov/DiseasesConditions/ChronicDisease/Documents/TableI.pdf

Studies have shown that asthma is distributed unevenly throughout the population. Non-white children and children living in poverty have a significantly higher risk of asthma than do white children [41]. The local patterns of asthma were highlighted in 2002 by a study which showed lower income, more racially and ethnically diverse areas of inner Northeast Portland had higher rates of asthma than the county average and other higher income, less diverse areas within the region (such as Orenco Station in Hillsboro and inner Southeast neighborhoods in Portland) [42, 43].

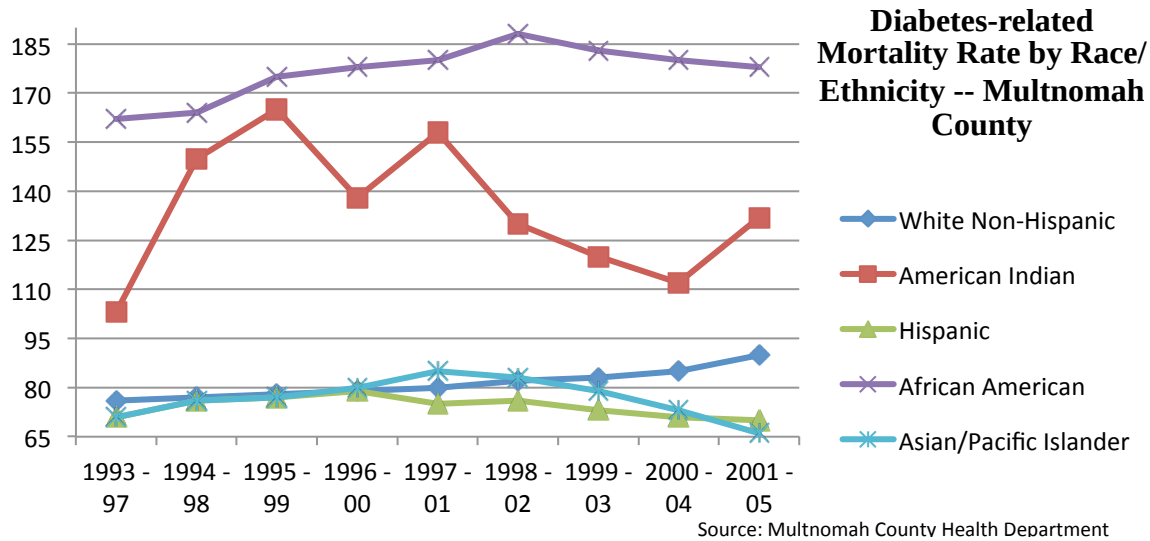
Diabetes

Diabetes is a chronic disease in which blood sugar levels are high and not regulated well, which can lead to serious health complications and premature death [44]. It is the seventh leading cause of death in the United States[45]. Regular physical activity lowers the risk of diabetes.

In 2010, Oregon's diabetes prevalence rate for adults was 7.2%, leading to Oregon's rank among the 10 states with the lowest diabetes rates in the nation [46]. The most current county-level prevalence data shows that from 2006 – 2009 the counties of Clackamas (6.6%), Multnomah (6.2%), and Washington (5.9%) were similar to or slightly better than the state average (6.8%) for adult diabetes [40]. Although the Portland metropolitan region has slightly better diabetes rates than the state average, the rates are still much higher than the 20 per 1,000 population Healthy People 2010 target [47]. Moreover, the most recent data shows that Multnomah County has a higher diabetes mortality rate than the national average [48].

Diabetes predominately affects lower income groups, communities of color, and individuals over the age of 65 [42, 49]. In 2010, diabetes contributed 6.5% of the total deaths for non-white Oregonians, compared to only 3% for white non-Hispanic Oregonians [50]. Figure 3 shows the differences between different races/ethnicities in diabetes-related mortality rates.

Figure 3. Diabetes-related mortality rate, Multnomah County



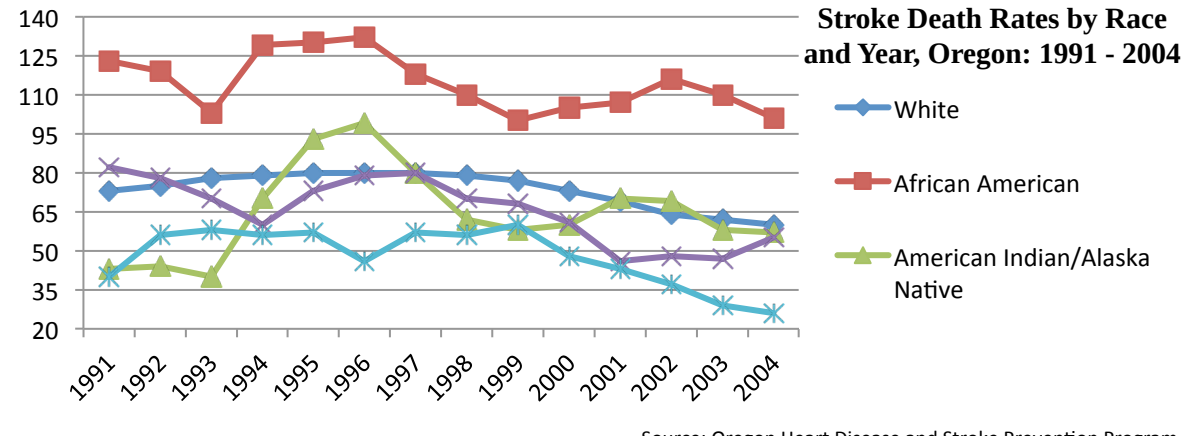
Source for above image: http://web.multco.us/sites/default/files/health/documents/winter2009_diabetes.pdf

Stroke

Stroke is the third leading cause of death in Oregon [51]. In 2010, Oregon's stroke prevalence was 2.2% (1.9 – 2.6) and it ranked among the fifteen states in the nation with the lowest prevalence rate [52]. However, since 1990, Oregon's stroke death rate has been higher than the national average. With a death rate of 49 per 100,000 individuals, Oregon ranks among the top 10 states with the highest stroke death rate in the nation [53, 54]. The most current county-level prevalence data shows that from 2006 – 2009 the counties of Clackamas (2.6%), Multnomah (1.8%), and Washington (1.9%) were similar to the state average (2.3%) of stroke prevalence [53]. Regular physical activity lowers the risk of stroke.

Various studies have shown that in the United States, African-American communities are disproportionately affected by stroke [55]. This disparity also exists in Oregon. Since 1991, the stroke death rates for African Americans living in Oregon have been significantly higher than all other resident races and ethnicities (Figure 4). For example, the African-American death rate from stroke in 2005 was 90.4 per 100,000 [51]. The second closest was the death rate for American Indians/Alaskan Natives which was 69.0 per 100,000 [51]. Figure 4 below shows the differences between different races/ethnicities in stroke-related mortality rates.

Figure 4. Stroke mortality rates by race and year, Oregon



Source for above image:
http://public.health.oregon.gov/DiseasesConditions/ChronicDisease/HeartDiseaseStroke/Documents/2007BurdenReport.pdf

Heart Disease

Heart disease refers to several heart conditions, the most common being coronary artery disease, which results when the flow of blood and oxygen to the heart is restricted or cut off [56]. This disease can cause heart attacks and angina. In 2009, more than 168,000 Oregonians (approximately 5.3%) had heart attack, angina, or coronary artery disease [53]. Approximately, 20% of all deaths in Oregon in 2010 were attributed to heart disease [50]. Nevertheless, the most recent Centers for Disease Control and Prevention data highlights that Oregon ranks among the top five states with the lowest heart disease prevalence in the nation [57]. Regular physical activity lowers the risk of heart disease, while exposure to airborne particulate matter increases the risk. The more a scenario promotes physical activity and decreases air pollution, the greater the expected reduction in this disease.

The most current county-level data shows that from 2006 – 2009 the prevalence of angina or heart attack in Clackamas (4.3%), Multnomah (4.6%), and Washington (4.2%) counties was below the state average (5.0%) [53]. Moreover, similar to the State of Oregon, heart disease mortality rates have dropped within the Portland metropolitan region. Nevertheless, heart disease is the second leading cause of death within Clackamas, Multnomah, and Washington counties [42, 58, 59]. While rates of heart disease mortality have dropped within the Portland metropolitan region, there are still populations that experience higher rates of heart disease. In Multnomah County, for example, the rate of coronary heart disease is higher for African-Americans than for other population groups [42]. Over the past 20 years in Oregon, heart disease mortality rates have been statistically higher in rural areas than in urban areas [53].

Cancer

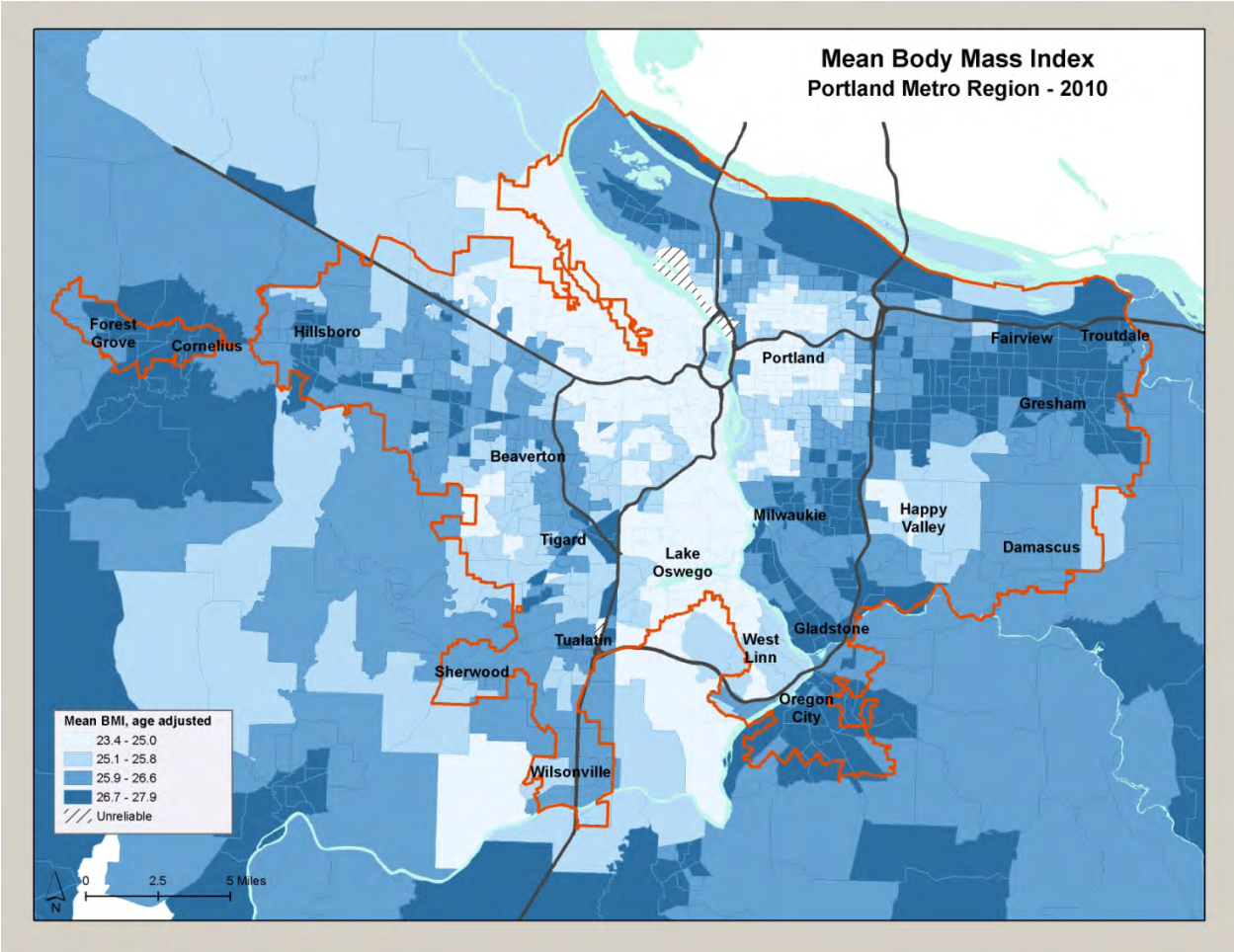
Cancer is the leading cause of death in Oregon and in the Portland metropolitan region [42, 58-60]. With a 2009 death rate of nearly 179 per 100,000 individuals, Oregon ranks in the top quarter of states with the highest cancer death rate in the nation [60, 61]. Additionally, except for lung and colorectal cancer, Oregon has higher incidence rates for all cancer types compared to the national average [62]. Regular physical activity lowers the risk of cancer. Reducing certain transportation-related air pollutants, such as benzene, can also lower cancer risk [29, 63].

Within the Portland metropolitan region, the most current county-level data shows that from 2005 – 2009 the cancer incidence rate for Multnomah County (477 per 100,000) was above the state average (465 per 100,000) while rates in Clackamas (457 per 100,000) and Washington (435) counties were below [64]. Cancer is also the leading cause of years of potential life lost in the region [58].

Obesity

Obesity is increasingly a concern in Oregon and in the Portland metropolitan region [65]. Obesity contributes to the deaths of about 1,400 Oregonians each year, making it second only to tobacco as the state's leading cause of preventable death. More than 60% of Portland metropolitan region residents are overweight or obese, and more than half do not meet physical activity recommendations. Even more worrisome, since those overweight in childhood are more likely to remain so as adults, around one-quarter of Metro region adolescents are overweight or obese. Obesity varies significantly by neighborhood and may be correlated with measures of socio-economic status as well as aspects of the built environment (Figure 5).

Figure 5. Age-adjusted mean Body Mass Index (BMI*) by census block group, Portland metropolitan region, from Department of Motor Vehicles records, 2010



*BMI is expressed in units of kg/m^2, is the standard measure used for population-based obesity surveillance. Higher mean values indicate heavier populations.

Source: Oregon Health Authority, Environmental Public Health Tracking report: DMV records are valuable for obesity surveillance in Oregon, September 2012

Literature review

Methodology

OHA conducted a literature review about the proposed GHG reduction policies and the priority health determinants or impacts within our scope (physical activity, particulate air pollution exposure and road traffic injuries and fatalities).

The CSCS HIA literature review is summarized in Table 4. On the left side there is a list of the policy options that make up the scenarios assessed in Phase One of Metro's scenario planning effort. Metro's scenarios are combinations of the strategies in Table 4 at various levels of proposed change, from a base year representing current conditions (2010) to new policies or more ambitious implementation of current plans (level 3). For example, for the bicycle mode share strategy, the baseline is 10% of the region's single-occupant vehicle tours less than 20 miles round-trip by bike and the most ambitious policy change would increase that to 30%. Detailed descriptions of each strategy and the levels of potential change considered can be found in Metro's Phase One Findings report [66].

To search for available evidence to understand the links between the strategies on the left side and health outcomes on the right (see Table 4), OHA queried multiple online databases using standardized search terms, and included results from PubMed, Google Scholar, Oregon State University library, Human Impact Partners evidence base, and previously published HIAs, in particular the two completed by Upstream Public Health on climate change policy [67, 68]. OHA identified the most relevant publications in each category for inclusion in our evidence base, read and abstracted each article, and rated its quality according to guidelines from the Agency for Healthcare Research and Quality, and summarized the entire evidence base [8] in Table 4 below.

The literature review is represented graphically through pathway diagrams in findings sections of the report below. These diagrams show the connection between the policies and strategies and health outcomes through direct impacts and intermediate outcomes.

Table 4. Climate Smart Communities Scenarios HIA Literature Review - Summary of the Quality of Evidence

Policies (existing conditions - most ambitious scenario)	Physical activity	Air pollution	Crash Injury/ Fatality
Community design			
Mixed use/complete neighborhoods	****	*	**
Bicycle mode share (2% - 30%)	****	**	**
Transit service level (2010 level - 4x RTP level)	***	**	**
Workers/non-work trips pay for parking (13%/8% - 30%/30%)	*	**	*
Average daily parking fee ($5 - $7.25)	*	**	*
Pricing			
Pay as you drive insurance (0% - 100%)	**	**	**
Gas tax ($0.42 - $0.18/cost per gallon^)	**	**	**
Road use fee ($0 - $0.03/cost per mile)	*	*	*
Carbon emissions fee ($0 - $50/cost per ton)	*	**	**
Incentives			
Households participating in eco-driving (0% - 40%)	N	*	*
Households participating in marketing programs (9% - 65%)	*	*	*
Workers in employer-based commuter programs (20% - 40%)	*	*	*
Car-sharing in high density areas (1 - 2 members/100 people)	*	*	*
Car-sharing in medium density areas (1 - 2 members/200 people)	*	*	*
Fleet			
Fleet Mix and turnover rate (light duty vehicles)	N	**	*
Technology			
Fuel economy, Carbon intensity of fuels, electric tech., etc.	N	**	N

^Combined with road use fee - see page 28 of Metro's Phase 1 Findings report for details

Legend

**** 10+ strong studies

*** 5-9 strong studies

** 5 or more studies of weak or moderate quality, or studies have mixed results

* <5 studies and policy-impact link consistent with public health principles

N = No evidence found

For a full explanation of these proposed policies, please see the Metro Climate Smart Communities Phase 1 Findings Report [66].

Integrated Transport and Health Impacts Modeling (ITHIM)

The Integrated Transport and Health Modeling (ITHIM) tool was developed by public health researchers in the UK to assess the potential health impacts of GHG reduction scenarios for London, UK and Delhi, India [9]. The model was later adapted for use in the San Francisco Bay Area and applied to transportation scenarios created to comply with California's GHG reduction goals. OHA further adapted the tool for use in the Portland metropolitan region, including the use of census data for the geography that makes up the Portland metropolitan region governed by Metro.

The purpose of the CSCS Project's Phase One analysis was to understand what level of policies and investments might be needed (beyond current adopted plans and policies) to meet the region's GHG reduction goals. In collaboration with ODOT, Metro staff tested 144 scenarios and found more than 90 scenarios met or exceeded the GHG emissions reduction goals, some by a significant margin. For more detailed information on the CSCS project and methodology please see the CSCS Phase One Report , an essential companion document to this report.

OHA did not assess the health impacts of each of the 144 Phase One scenarios. Instead, OHA used ITHIM to assess 6 sample scenarios in order to provide information about the health impacts of the types of policies and investments decision-makers will consider including as they develop the final three Phase Two scenarios.

Methodology

For the purposes of this HIA, ODOT and Metro staff identified 6 sample scenarios of the 144 scenarios tested in Phase One. OHA also evaluated the current set of policies and investments, named 2010 Base Year, to provide a base year comparison.

The sample scenarios vary primarily with respect to the community design and pricing policy areas tested in Phase One of the CSCS project; differences between each primarily reflect progressively higher levels of transit, bicycle mode share, and pricing strategies as noted by the level 1, level 2 and level 3 labels for each policy area (e.g., community design, pricing).

- Sample scenarios 1 through 3 correspond to community design levels 1 to 3 and pricing level 1.
- Sample 4 through 6 correspond to community design levels 1 through 3 and pricing levels 2 and 3.

More information about the selection of the sample scenarios is available in Appendix D.

The inputs to ITHIM include:

- Information on household vehicle miles traveled (VMT) from the GreenSTEP model [69] developed by the Oregon Department of Transportation (ODOT)
- Monitored particulate matter ($PM_{2.5}$) from DEQ

- 2000 and 2010 census data [13], adjusted for the Portland metropolitan region; household travel data from Metro's Household Activity Survey [70]
- Crash data from ODOT [71]
- Information about the global burden of disease [72]

The outputs to ITHIM include: modeled data on changes in disease, injuries, and deaths. More information about ITHIM is available in Appendix D and in Woodcock et al [73].

Limitations to ITHIM

ITHIM is a unique and reliable tool for modeling and comparing the health impacts of planning scenarios. This is especially true when ITHIM's outputs are considered alongside local health data, such as those described in the existing conditions summary above.

However, ITHIM was developed using global burden of disease data, and OHA did not adapt the tool to use Oregon or Portland metropolitan region health data. Additionally, ITHIM uses particulate air pollution, specifically $PM_{2.5}$, as a proxy for total transportation-related air pollution. Although such assessment is outside of the scope of this HIA, additional analyses on the reduction of toxic air pollutants and ozone precursors from transportation and transportation-specific policies (such as fleet turnover and advances in fuel technology) would likely show additional health benefits [9, 10].

ITHIM detailed results

The CSCS HIA results indicate that all of the GHG reduction scenarios that Metro has evaluated to date could result in net health benefits from increases in active travel and decreases in both air pollution exposure and motor vehicle-related injuries and fatalities (Table 5). There are sample scenarios that are more beneficial to the health of Portland metropolitan region residents than others, and these are discussed in detail below. Additional summary tables are available in appendix C.

A summary of ITHIM's health impact results for sample scenarios 1 through 6 are reported in Table 5, which shows reductions in premature deaths, years of life lost (YLL), years living with disability (YLD), and disability-adjusted life years (DALY) for changes in physical activity, particulate air pollution exposure, and road traffic crashes. DALYs are calculated by adding YLL and YLD across a population. One DALY can be thought of as representing one lost year of healthy life. The sum of DALYs across a population represents the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability [72].

Table 5.ITHIM Results: Annual health co-benefits compared to base year scenario (2010) for sample scenario 1-6 (2035), Portland Metro region

	Counts						Rate per Million Population					
	Sample scenario1	Sample scenario2	Sample scenario3	Sample scenario4	Sample scenario5	Sample scenario6	Sample scenario1	Sample scenario2	Sample scenario3	Sample scenario4	Sample scenario5	Sample scenario6
Physical activity												
Premature deaths	-49	-112	-139	-66	-131	-157	-39	-89	-111	-52	-105	-125
YLL	-492	-1,230	-1,623	-647	-1,403	-1,789	-391	-979	-1,291	-515	-1,116	-1,423
YLD	-201	-528	-710	-216	-526	-703	-160	-420	-565	-172	-419	-560
DALYs	-693	-1,758	-2,333	-863	-1,929	-2,492	-551	-1,398	-1,856	-686	-1,535	-1,983
Particulate air pollution												
Premature deaths	-3	-11	-19	-8	-15	-22	-3	-9	-15	-7	-12	-17
YLL	-42	-140	-236	-105	-189	-271	-34	-111	-188	-83	-151	-215
YLD	0	-1	-1	-1	-1	-1	0	-1	-1	0	-1	-1
DALYs	-42	-141	-237	-105	-190	-272	-34	-112	-189	-84	-151	-216
Road traffic crashes												
Premature deaths	0	-11	-24	-9	-19	-29	0	-7	-16	-6	-13	-20
YLL	-5	-443	-945	-373	-756	-1,181	-3	-299	-637	-252	-510	-796
YLD	-21	-117	-222	-93	-177	-267	-14	-79	-150	-63	-119	-180
DALYs	-25	-560	-1,168	-466	-933	-1,447	-17	-378	-787	-314	-629	-976
Total												
Premature deaths	-53	-134	-182	-83	-165	-208	-42	-106	-142	-65	-129	-162
YLL	-539	-1,813	-2,804	-1,125	-2,348	-3,240	-428	-1,389	-2,116	-850	-1,777	-2,435
YLD	-222	-645	-933	-310	-704	-971	-174	-499	-716	-235	-539	-740
DALYs	-761	-2,458	-3,738	-1,434	-3,052	-4,212	-602	-1,888	-2,832	-1,085	-2,315	-3,175

*YLL, years of life lost; YLD, years living with disability; DALY, disability-adjusted life years (sum of YLL and YLD)

The sample scenarios that represent higher levels of active transportation modes (bicycling, walking and transit), show corresponding reductions in car and light truck travel. The Portland metropolitan area-adapted ITHIM found that with high levels of active transportation compared to the 2010 baseline, as in sample scenarios 3 and 6, the model predicts:

- 5% fewer premature deaths;
- 6% fewer years of life lost for cardiovascular disease, heart attack and stroke; and
- a 4% reduction in diabetes.

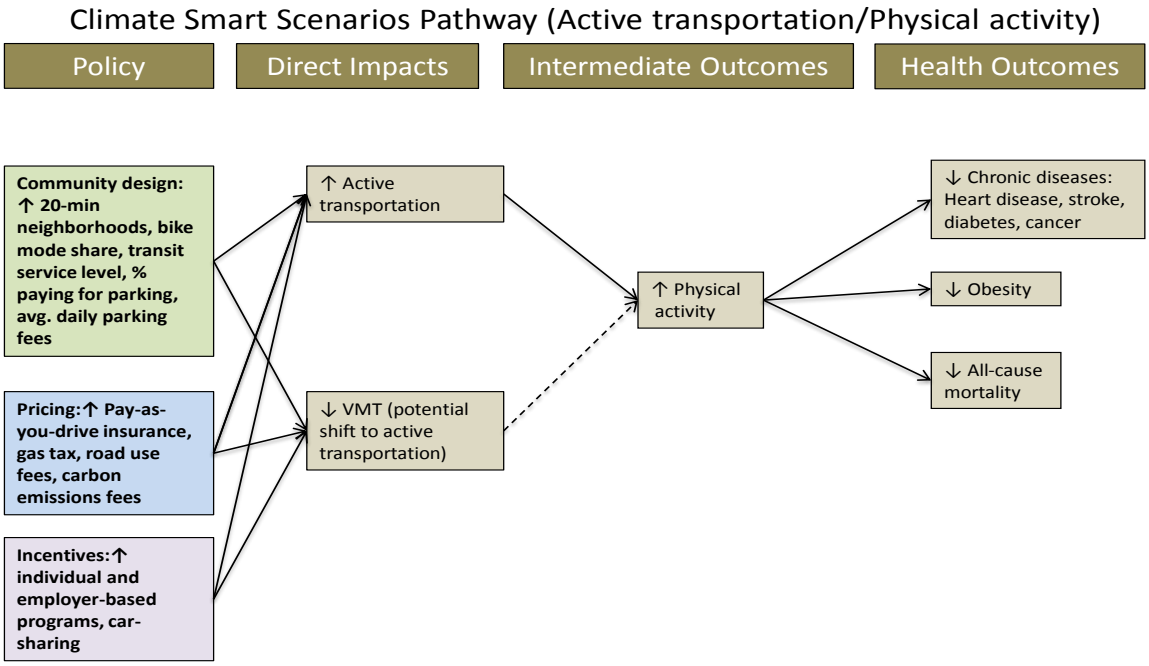
When considering the main health outcome measure (DALYs) between baseline and Scenario 6, the majority (59%) of the health benefit can be accounted for by increased levels of physical activity, followed by decreased road traffic crashes (34%) and decreases in particulate air pollution exposure (7%).

To walk through a specific example from Table 5, under sample scenario 3 the Portland metropolitan region would experience 182 fewer premature deaths in 2035 compared to 2010. In addition 2,804 years of life lost and 933 years living with disability would also be averted. The majority of the health benefits result from increased physical activity, followed by reductions in road traffic crashes and lower exposure to particulate air pollution. Appendix C, Table 2 shows predicted changes in the health of the region's residents due to changes in physical activity under each sample scenario for specific conditions such as heart disease and diabetes.

After accounting for a small increase in the disease burden from fatal and serious traffic injuries to bicyclists (see Appendix C, Table 4), the Portland metropolitan region would still experience 208 fewer premature deaths and 3,240 years of life gained. Strategies for mitigating this increase are discussed in the road traffic injury recommendations below.

Active Transportation and Physical Activity Results

Pathway diagram 1 – Active transportation and physical activity



Pathway 1 was drafted by OHA and refined with information from the advisory committee.

ITHIM findings

Results from the ITHIM model indicate that sample scenarios 3 and 6 have the largest increases in active transportation (Table 5). Averages from these sample scenarios show the largest positive impact on health with reductions of 182-208 premature deaths per year and large reductions in DALYs (scenario 3: 3,738; scenario 6: 4,212). Approximately 60% of the health benefit in these two sample scenarios comes from increased physical activity.

Health equity findings

Decisions about strategies and their implementation can have different impacts on different populations in the Portland metropolitan region. For example, pricing policies that increase costs, including time costs, associated with transportation may disproportionately impact low-income residents. Increased cost burden may lead to increased stress, which negatively affects health [74-76].

Individuals with physical or mental disabilities may experience worse health status than the non-disabled population. In addition they may have more difficulty accessing improvements to active transportation infrastructure or have different needs related to transportation [77-79].

Prioritizing investments and thoughtful implementation of active transportation policies and programs in vulnerable communities could improve inequitable health outcomes for vulnerable populations of the Portland metropolitan region. For example, since African-Americans experience disproportionately higher rates of heart disease, diabetes, and stroke, active transportation investments in predominantly African-American communities may have greater health impacts.

Literature review findings

Policies and investments supporting complete neighborhoods and active modes of travel (walking and biking) best promote physical activity. Public transportation service levels and use also effectively promote physical activity. There is some evidence that pricing policies, such as pay-as-you-drive insurance or a direct tax on gasoline, may reduce VMT and shift trips to active modes of travel. However, these policies may simply reduce the number of driving trips without increasing active transportation, and therefore would not be associated with health benefits associated with physical activity. Policies that lead to reductions in VMT in addition to increases in active transportation will likewise impact the prevalence of chronic disease and mortality.

OHA found the least evidence supporting a positive association between policies in the incentives category and increases in physical activity. There is a need for additional studies about this proposed link. The fleet mix and technology policies as well as the percent of households participating in eco-driving programs are not expected to have an effect on physical activity levels.

It is also worth noting that improvements to active transportation infrastructure may increase leisure time physical activity, along with the accompanying health gains.

Context

When local decision-makers understand the characteristics of their communities that encourage or discourage active transportation, policies and plans can be customized accordingly. For example, a recent HIA in Washington County found a strong preference among residents for bicycle and pedestrian pathways that are separated from traffic, and identified specific barriers to increasing bicycle and pedestrian travel that should be accommodated in local plans and projects [80].

People who commute by walking, bicycling or public transit are more likely to meet physical activity recommendations by engaging in twice as much physical activity (transportation and recreation combined) as those who commute by car [81-88].

Regular, moderate physical activity (at least 30 minutes a day, 5 days a week) provides substantial health benefits, including lower risk of mortality, cardiovascular disease, stroke, cancer, depression, high blood pressure, diabetes, and obesity [89, 90]. Table 6 shows the prevalence of weight-related risk factors and physical activity among adults living in the three counties contributing to the Portland metropolitan region.

Table 6. Age-adjusted prevalence of selected modifiable risk factors among adults by county, 2006-09

Risk factors	Clackamas %	Multnomah %	Washington %	Oregon %
Overweight	35.7	33.8*	36.9	36.1
Obese	23.6	21.8*	23.2	24.5
Met physical activity recommendations	55.6	55.1	53.8	55.8

*Statistically significant difference compared to Oregon

Source: Behavioral Risk Factor Surveillance System, 2006-2009

While obesity is traditionally understood to result from an imbalance between calorie consumption and energy expenditure, it is clear from recent studies that the built environment, transportation infrastructure, access to healthy and nutritious food, and other environmental factors strongly influence physical activity and healthy eating [91-100].

These factors also influence children and adolescents, through commutes to school and other destinations important to youth, like community centers and work locations. Table 7 shows the prevalence of weight-related risk factors and physical activity among 8th and 11th graders living in the three counties contributing to the Portland metropolitan region. Children who walk or bike to school are more likely to meet physical activity recommendations and attain healthier body composition and cardiorespiratory fitness [85, 101-106]. However, just 48% of Oregon children who live within one mile of school walk to school at least 3 days per week, and only 8% bike to school at least 3 days per week.

Table 7. Prevalence of selected modifiable risk factors among 8th and 11th graders by county, 2007-08

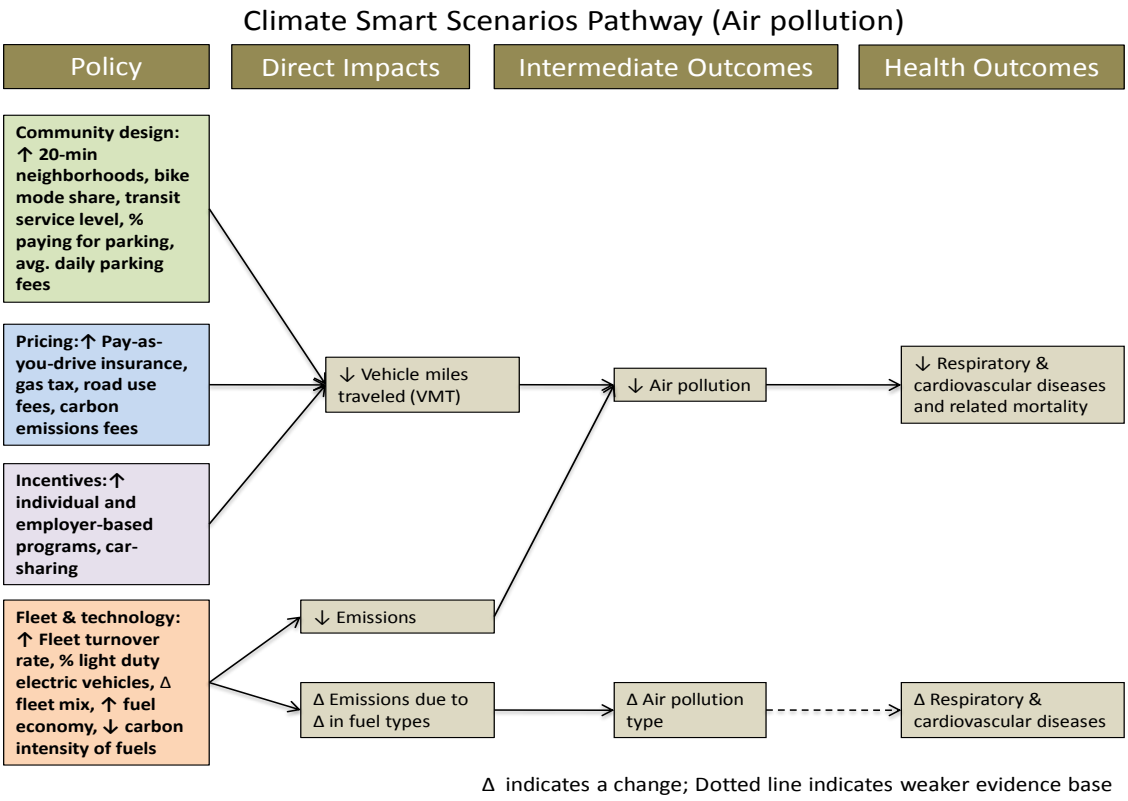
Grade	Risk Factor	Clackamas %	Multnomah %	Washington %	Oregon %
8th	Overweight	14.3	15.4	13.8	15.2
	Obese	9	10.9	10.2	10.7
	Met PA recommendations	53.9*	52.7*	50.8*	57.1
11th	Overweight	13.3	12.8	12.2	14.2
	Obese	9.8	11	10	11.3
	Met PA recommendations	49.8	38.4*	46.2	49.2

*Statistically significant difference compared to Oregon

Source: Oregon Healthy Teens, 2007-2008

Particulate Air Pollution Results

Pathway Diagrams 2 - Particulate air pollution



Pathway 2 was drafted by OHA and refined with information from the advisory committee.

ITHIM findings

Results from the ITHIM model indicate that sample scenarios 3 and 6 have the largest decreases in VMT (Table 5). These scenarios show the largest positive impact on health due to reduced air pollution exposure, with reductions of 19-22 premature deaths per year and reductions in disability adjusted life years (scenario 3: 237; scenario 6: 272). Approximately 6% of the health benefit in these two sample scenarios comes from decreased exposure to $PM_{2.5}$.

Health equity findings

The Oregon Department of Environmental Quality (DEQ) has extensively studied the distribution of air toxics in the Portland metropolitan region. DEQ found that low-income and minority communities are disproportionately impacted by higher concentrations of air toxics compared to mid- to high- income, white communities [29].

Low-income communities and communities of color are more likely to live in close proximity to high-traffic roads, and thus have higher exposures to harmful air pollution. These groups may

also live in lower quality housing with poor indoor air quality. Their cumulative exposure to indoor and outdoor air pollution may be significantly higher than other groups.

There is evidence that children, older adults, people with pre-existing cardiopulmonary diseases and people with low incomes are more susceptible to negative health effects from exposure to $PM_{2.5}$ [107].

Children living next to (within 100 meters of) high-traffic roads (>= 10,000 vehicles per day) have worse lung function measures and more respiratory disease symptoms, asthma hospitalizations and doctor visits than children who live further away from high traffic areas [108-110].

Literature review findings

Policies supporting active modes of travel, including public transportation, would reduce levels of air pollution on and near roadways. There is some evidence that the individuals using active modes could increase their air pollution exposure if they are walking or biking next to busy roads.

There is also some evidence that pricing policies, such as a carbon emissions fee or direct tax on gasoline use, may reduce VMT and related air pollution. OHA found more published evidence linking pricing, fleet and technology policies to air pollution levels than incentive policies.

Shifts to lower carbon-intensity fuels and electric vehicles may change the type of emissions from motor vehicle traffic, and consequently affect changes in health conditions, such as asthma and cancer, that result from exposure. Specifically, nitrogen oxides and aldehydes may increase and benzene and 1,3 butadiene may decrease [111]. However, these changes would require large-scale shifts in the types of fuels and vehicles used in the region. While the link between improved air quality and policies related to fleet turnover and fuel technology has been demonstrated [112-114], the link between different types of emissions and changes in health outcomes has not been adequately described.

The CSCS HIA Advisory Committee asked whether an increase in 20-minute neighborhoods might lead to increased congestion and to increased exposure to air pollutants. OHA did not find any evidence to support this link, and in fact found evidence that 20-minute neighborhoods and similar community design policies decrease congestion and are likely to positively influence health [100, 115-117].

There is evidence that drivers and passengers of cars and buses are exposed to air pollution at levels similar to or exceeding those of pedestrians and cyclists [118-120]. There is also evidence that air pollution exposure is higher for pedestrians and bicyclists along busy roadways than next to roads with less traffic. A study underway in Portland has demonstrated that pedestrian exposure on a high-volume roadway is greater than driving exposure, but less than bus

exposure. Travel along lower-volume roadways significantly reduced pedestrian exposure [121]. In addition, several studies have demonstrated that the health benefits from physical activity outweigh the negative health impacts of air pollution exposures to pedestrians and cyclists [9, 122, 123].

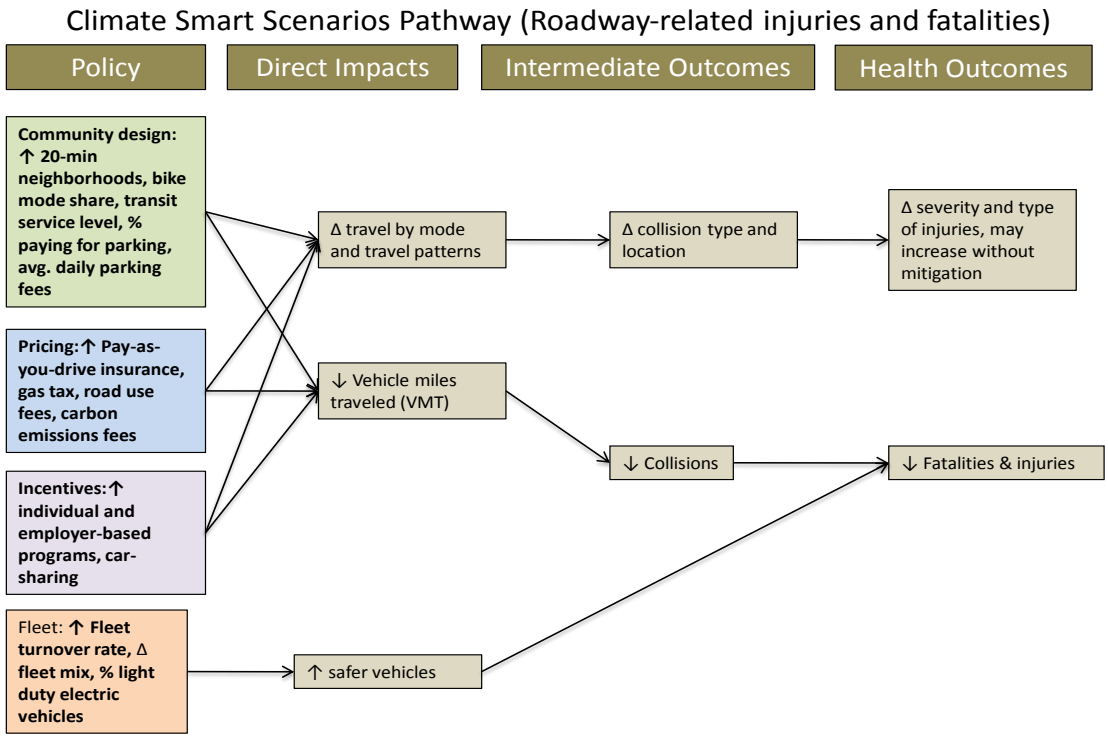
Context

Vehicle emissions contain a mix of particulate matter, nitrogen oxide, diesel exhaust, benzene, and other air toxics. These toxics are harmful to respiratory and cardiovascular health and are associated with increases in mortality and cancer incidence and mortality [32, 124, 125]. There is evidence of a causal relationship between exposure to emissions from motor vehicle traffic and a number of adverse health outcomes, including lung function impairment, asthma incidence, cardiovascular disease, and cardiovascular and overall mortality [125-130]. These adverse health effects may impact drivers and passengers of vehicles, an impact that increases as length of commute time increases. Those outside of cars may also be impacted, including residents of housing less than 300 meters (~1,000 feet) from a major road (more than 10,000 motor vehicles per day), and bicycle and pedestrian commuters along major roads [32, 125, 131].

The literature review and modeling assessment focused on fine particulate matter that is 2.5 micrometers and smaller in diameter ($PM_{2.5}$). The World Health Organization estimates that $PM_{2.5}$ exposure contributes to as many as 800,000 premature deaths each year, making it the 13^{th} leading cause of mortality worldwide [132]. In the U.S., the Environmental Protection Agency estimates that beginning in 2020 approximately 230,000 premature deaths related to $PM_{2.5}$and ozone exposure could be avoided due to implementation of Clean Air Act Amendments [133].

Road Traffic Injuries and Fatalities Results

Pathway Diagrams 3 - Roadway-related injuries and fatalities



Pathway 3 was drafted by OHA and refined with information from the advisory committee.

ITHIM findings

Results from the ITHIM model indicate that sample scenarios 3 and 6 have the largest decreases in VMT (Table 5). These scenarios are associated with the largest positive impact on health due to decreased road traffic crashes, with reductions of 24-29 premature deaths per year and reductions in disability adjusted life years (scenario 3: 1,168; scenario 6: 1,447). Approximately 1/3 of the health benefits from these two sample scenarios come from reductions in motor vehicle crashes. With increased rates of biking, negative health impacts from increased bike injuries and deaths may arise.

Health equity findings

Children between 5 and 9 years have the highest pedestrian-motor vehicle injury rates [134]. Older adult pedestrians are more likely to die as a result of a motor-vehicle pedestrian crash than younger pedestrians [135].

There is a correlation between lower socioeconomic status and the risk of road traffic injury death for child pedestrians [136]. These socioeconomic differences may result from environmental factors or behavioral differences, or a combination of the two.

Literature review findings

Policies and investments supporting complete neighborhoods with safer infrastructure, active modes of travel, including public transportation, as well as pricing policies that reduce VMT would best reduce roadway-related injuries and fatalities. There is the least amount of evidence to support a link between incentives and fleet policies and road-related injuries and fatalities. However, fleet policies could have an impact if fleet turnover increases the number of newer and safer vehicles being driven in the region. Technology policies were not found to have an impact on crash injuries and fatalities. While crash-avoidance technologies such as sensory systems that stop a car before a collision, may reduce crash events, currently this technology is still fairly new and has yet to be directly linked to population-level impacts [112-114, 137, 138].

Risks of traffic injury and death vary by age, with higher injury rates for children and youth and higher fatality rates for older adults. Features of the built environment and transportation infrastructure contribute to the risk of motor vehicle, pedestrian and bicycle crashes. One study found that crosswalk markings without signals or stop signs are associated with increased risk of pedestrian-motor vehicle crashes for older pedestrians [135]. There is evidence of a significant positive relationship between traffic volume and the rate of vehicle collisions involving pedestrians [139-141]. One review and analysis found that the highest risk of severe or fatal crashes occurs in areas with low street network density, and that safety outcomes improve as intersection density increases [140].

One researcher has found that for bike and pedestrian crashes, there is safety in numbers; as the number of bicyclists and pedestrians increases, severe and fatal crashes decrease [142]. However, other studies have shown that higher pedestrian and bike activity does not result in increased safety. These studies suggest that other factors such as vehicle volume, speed, and roadway design are the most important contributors to bicycle and pedestrian motor vehicle crashes [139, 143].

Pedestrian and bicycle injuries are typically underestimated. Non-fatal crashes with motor vehicles and bicycle-only injuries are less likely to result in a police report, and therefore end up in official crash statistics. A Portland study found that 20% of bicycle commuters surveyed had experienced a traumatic event and 5% required medical attention during one year of commuting[144]. A San Francisco study found that over 50% of bicycle injuries treated at one hospital were not associated with a police report [137].

Context

Motor vehicle crashes are the leading cause of injury death in the United States and the second leading cause in Oregon [145, 146]. Motor vehicle crashes are the leading cause of death for individuals between the ages of 5 and 24 [147]. In 2010, the State of Oregon's rate of traffic fatalities per 100 million VMT was .94 [148]. In 2010, the State of Oregon's rate of 1.2 [149]. This was below the national rate of 1.10 and the highest injury rate of 1.2 [148, 149]. Oregon's rate of traffic injuries per 100 million VMT in 2010 was higher than the national MSA average of 8.2 [149, 150].

In 2009, the Portland metropolitan region ranked in the top 15 metropolitan statistical areas (MSA) nationally for lowest annual rate of traffic fatalities per 100,000, with a rate of 6.2 compared to the national MSA average of 8.2 [150]. When injury and fatality data are combined, both Clackamas County (5.2) and Washington County (5.25) had better rates than the statewide (5.51) fatal and injury crash rate per 1,000 [151, 152]. Conversely, Multnomah County was significantly worse (8.03) [153, 154]. Nevertheless, all three counties fared better than the state rate of crash-related deaths for individuals between the ages of 15 and 24 [155]. OHA has set a goal to decrease statewide motor vehicle fatalities by 17% below the 2007 rate of 12.1 per 100,000.

In the Portland metropolitan region, streets with more lanes and higher speeds (arterials such as SE 82nd Ave, SE McLoughlin Boulevard, and SW Beaverton-Hillsdale Highway) have higher serious crash rates, especially for pedestrians. About 40% of all vehicle travel in the Portland metropolitan region between 2007 and 2009 was on arterials. Arterials were the location of 57% of the serious auto crashes, 67% of the serious pedestrian crashes, and 52% of the serious bike crashes [11]. Serious pedestrian and bicycle crashes disproportionately occurred after dark on unlit streets. Travel by transit is relatively safe in the region, with a rate of 0.23 deaths involving a transit vehicle per 100 million transit-passenger-miles, compared to the rate of 0.42 for all traffic [11].

Conclusion and Recommendations

Significant shifts in the climate are already happening and as the climate continues to warm the impacts to public health will become more apparent. We can expect exposure to more frequent heat waves, an increase in asthma, changes in disease patterns and diminishing water quality and quantity. Curbing climate change is a pressing public health issue, and the Public Health Division strongly supports efforts across the state to reduce greenhouse gas emissions. Reducing greenhouse gas emissions will have inevitable health benefits for Oregonians by slowing down climate change and improving air quality.

The changes required to reduce GHG emissions represent a significant investment of resources. To maximize the health benefits of these investments and minimize any potential health risks, OHA makes the following recommendations.

Findings and Recommendations

Air quality

All scenarios that meet GHG reduction goals have potential positive impacts on human health. The most health-promoting scenarios evaluated in this assessment had similar elements:

- The most ambitious levels of community design policies,
- Intermediate and ambitious levels of pricing and incentives,
- Highest levels of active transportation (including transit),
- Lowest levels of single occupancy vehicle driving, and
- Lowest levels of particulate air pollution.

In addition, air pollution has several health equity impacts of concern, such as:

- Children, older adults, people with pre-existing cardiopulmonary diseases and people with low incomes are more susceptible to negative health effects from exposure to $PM_{2.5}$.
- Low-income communities and communities of color are more likely to live in close proximity to high-traffic roads, and thus have higher exposures to harmful air pollution. These groups may also live in lower quality housing with poor indoor air quality. Their cumulative exposure to indoor and outdoor air pollution may be significantly higher than other groups.

Develop and implement a preferred scenario that meets or surpasses the greenhouse gas emissions reduction target set for the region. Further:

- **Prioritize strategies that lead to decreases in air pollution exposure for all populations in the region;** in particular for low income communities, children, seniors, people with low incomes, and people with chronic health conditions or disabilities. An example strategy may

be creating and promoting walking and biking routes adjacent to low-traffic roads specifically in lower income neighborhoods).

- **Follow through with implementation of the recommendations identified in the Portland Air Toxics Solutions Report.** The report identifies a number of recommendations that will reduce air pollution from light vehicles and have also been linked to reducing GHG emissions.

Physical activity

Scenarios that meet GHG reduction goals by decreasing vehicle miles traveled (VMT) will have the most positive impacts on health. In the most health-promoting scenarios assessed, the majority of the health benefits result from increased physical activity (60%), followed by reductions in road traffic crashes (approximately 33%) and lower exposure to particulate matter in the air (6%).

To maximize public health benefits and meet the state target, emphasize the types of strategies that best increase active transportation and physical activity: community design, pricing and incentives. Further:

- **Implement active transportation strategies with an understanding of existing local health conditions and inequities.**
    a. Increasing the number of people biking and walking could cause a small increase in injuries and deaths from collisions. Therefore Metro and partners should implement strategies in ways that do not worsen these health conditions and inequities, such as planning for necessary safety infrastructure.
    b. Portland metropolitan region residents do not all have equal access to active transportation opportunities. An effort should be made to improve access for all communities.
- **Prioritize strategies that lead to increases in active travel for all populations in the region, in particular for children, seniors, people with low incomes, communities of color, and people with chronic health conditions or disabilities.** Example strategies include marketing and incentive programs targeted to these populations, improved active travel infrastructure on routes to schools, and improved public transportation service in areas where these populations live.

Collisions

The modeling tool used in this assessment shows positive health impacts due to reductions in motor vehicle crashes and potential negative impacts from increased bike injuries.

- Children are more likely to experience pedestrian-motor vehicle injuries and older adult pedestrians are more likely to die as a result of motor-vehicle pedestrian crashes.

- Child pedestrians from lower income families are at higher risk of dying from a road traffic injury.

Include strategies, such as community design, that can lead to decreases in road traffic injuries and fatalities for all populations in the region, in particular for children. Further:

- **Prioritize strategies that lead to decreases in road traffic injuries and fatalities for all populations in the region**; in particular for children and older adults. The community design, pricing and incentives strategies that lead to reductions in VMT may also increase safety in the region.
- **Mitigate potential increases in pedestrian and bicyclist injuries and fatalities through proven design strategies**, such as increasing the visibility of vulnerable road users; separate facilities like sidewalks, bike boulevards or cycle tracks; and traffic calming or speed control measures [134, 156]. The feeling of safety given by these mitigations may also expand the percentage of the population willing to bike and walk.

Further assessment

Carry out additional quantitative health impact assessment of the three scenarios that are identified in spring 2013 to further inform development and adoption of a final preferred scenario. OHA recommends the use of ITHIM or a similar health impacts model for this future assessment. Further:

- OHA recommends that when the CSCS Project develops the preferred scenario in 2013-14, health stakeholders (in particular, local health departments) be consulted in order to incorporate local health expertise and to continue building relationships between public health and planning professionals and policymakers**.**
- OHA recommends that future related HIAs include consideration of land use, housing affordability, location relative to employment, gentrification and displacement, or air pollution other than $PM_{2.5}$.

Appendix A. List of Climate Smart Communities Scenarios HIA Advisory Committee members

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Appendix B. Population travel and health characteristics of Portland Metro region

Table 1. Metropolitan Region Travel Characteristics Comparison, County and State

Travel Characteristic	Clackamas County	Multnomah County	Washington County	State of Oregon
Commute to Work – Drove Alone	76%	62.9%	73.9%	72%
Commute to Work – Carpooled	9.6%	9.8%	10.2%	10.8%
Commute to Work – Public Transportation	3.2%	11%	5.7%	4.2%
Commute to Work – Walked	2.4%	4.8%	2.9%	3.9%
Commute to Work – Other Means	1.2%	5.4%	2.1%	3.1%
Average Commute Time (minutes)	26	24.3	24.1	22.1

Source: 2006-2010 American Community Survey - Oregon, U.S. Census Bureau, 2011.

Table 2. Multnomah County Travel Characteristics Comparison, Cities

Travel Characteristic	Fairview	Gresham	Lake Oswego	Maywood	Milwaukie	Portland	Troutdale	Wood Village	State of Oregon
Commute to Work Drove Alone (%)	73	73.5	76.7	79.4	74.8	60.4	76.7	74.7	72
Commute to Work Carpooled (%)	10.3	12.2	6	13.2	8.9	9.4	13.7	6.8	10.8
Commute to Work Public Transport (%)	4.8	7.4	3.8	1.5	8.1	12	3.3	12.2	4.2
Commute to Work Walked (%)	4.5	2.5	1.7	1	2.5	5.4	0.5	2.4	3.9
Commute to Work Other Means (%)	0.6	1.1	1.5	2.2	1.3	6.4	2.1	0.9	3.1
Average Commute Time (minutes)	22.1	26.2	21.5	24.8	24.3	23.9	27.3	26.2	22.1

Yellow = **Positively** different from state average Pink = **Negatively** different from state average

Source: 2006-2010 American Community Survey - Oregon, U.S. Census Bureau, 2011.

Table 3. Portland Metropolitan Region Health Conditions Comparison, 2006 – 2009

Health Condition	Clackamas County	Multnomah County	Washington County	State of Oregon
Asthma Prevalence	9.7%	9.2%	9.0%	9.7%
Diabetes Prevalence	6.6%	6.2%	5.9%	6.8%
Stroke Prevalence	2.6%	1.8%	1.9%	2.3%
Heart Attack Prevalence	2.5%	2.9%	2.5%	3.3%
Obesity Prevalence	23.6%	21.8%	23.2%	24.5%
Meets CDC Physical Activity Recommendation	55.6%	55.1%	53.8%	55.8%
Fatal/Injury Crash Rate (per 1,000 population)	5.2	8.03	5.25	5.51
Source: 2006-2009 BRFSS County Combined Dataset				

Appendix C. Integrated transport and health modeling (ITHIM) results, detailed tables

Table 1. GreenSTEP model inputs for Base Year (2010) and Scenario Clusters 1-6 (2035)

	Walk Trips Per Person Per Week	Bike Miles Per Person Per Week	Household Vehicle Miles Per Person Per Week	Roadway Light Duty Vehicle Miles Per Person Per Week	Bus Revenue Miles Per Person Per Week	Rail Revenue Miles Per Person Per Week
Base Year (2010)	2.81	2.24	129.36	139.03	0.32	0.23
Scenario Cluster 1	3.53	2.16	122.41	131.56	0.44	0.11
Scenario Cluster 2	3.69	3.71	99.00	106.48	0.66	0.66
Scenario Cluster 3	3.90	4.57	76.77	82.61	1.10	1.10
Scenario Cluster 4	3.53	2.16	107.99	116.08	0.44	0.11
Scenario Cluster 5	3.69	3.71	87.49	94.13	0.66	0.66
Scenario Cluster 6	3.90	4.57	68.65	73.90	1.10	1.10

Table 2. Premature deaths, years of life lost, and attributable fractions* due to increased physical activity, Scenario Clusters 1-6, Portland metropolitan region

	Burden of Disease						Attributable Fraction, Percent					
Item by Cause	Scenario Cluster 1	Scenario Cluster 2	Scenario Cluster 3	Scenario Cluster 4	Scenario Cluster 5	Scenario Cluster 6	Scenario Cluster 1	Scenario Cluster 2	Scenario Cluster 3	Scenario Cluster 4	Scenario Cluster 5	Scenario Cluster 6
Premature Deaths												
Ischemic Heart Disease	-25	-58	-73	-34	-69	-82	-1.6%	-3.8%	-4.8%	-2.2%	-4.5%	-5.4%
Hypertensive Heart Disease	-5	-11	-14	-7	-13	-16	-1.7%	-3.8%	-4.8%	-2.3%	-4.5%	-5.5%
Stroke	-12	-27	-33	-16	-31	-37	-1.7%	-3.8%	-4.7%	-2.3%	-4.5%	-5.3%
Diabetes	-3	-8	-9	-4	-9	-11	-1.4%	-3.2%	-3.7%	-1.6%	-3.6%	-4.2%
Dementia	-3	-5	-6	-4	-6	-7	-0.7%	-1.3%	-1.6%	-0.9%	-1.6%	-1.8%
Breast Cancer	0	-1	-2	0	-1	-2	-0.3%	-0.8%	-1.0%	-0.2%	-0.6%	-0.9%
Colon Cancer	-1	-2	-2	-1	-2	-2	-0.4%	-0.9%	-1.1%	-0.5%	-0.9%	-1.1%
Depression	0	0	0	0	0	0	-0.6%	-1.1%	-1.3%	-0.6%	-1.1%	-1.2%
Total	-49	-112	-139	-66	-131	-157	-1.4%	-3.2%	-3.9%	-1.9%	-3.7%	-4.4%
Years Life Lost												
Ischemic Heart Disease	-247	-617	-820	-335	-717	-915	-1.6%	-3.9%	-5.2%	-2.1%	-4.6%	-5.8%
Hypertensive Heart Disease	-53	-134	-187	-73	-156	-208	-1.5%	-3.8%	-5.3%	-2.1%	-4.4%	-5.9%
Stroke	-109	-275	-354	-147	-320	-395	-1.6%	-4.0%	-5.1%	-2.1%	-4.6%	-5.7%
Diabetes	-47	-118	-149	-55	-133	-165	-1.3%	-3.2%	-4.1%	-1.5%	-3.6%	-4.5%
Dementia	-18	-37	-43	-21	-40	-46	-0.7%	-1.4%	-1.7%	-0.8%	-1.5%	-1.8%
Breast Cancer	-10	-28	-43	-8	-20	-37	-0.3%	-0.8%	-1.3%	-0.2%	-0.6%	-1.1%
Colon Cancer	-7	-19	-26	-7	-17	-24	-0.3%	-0.8%	-1.1%	-0.3%	-0.7%	-1.0%
Depression	0	0	0	0	0	0	-0.5%	-1.1%	-1.5%	-0.5%	-1.0%	-1.3%
Total	-492	-1230	-1623	-647	-1403	-1789	-1.3%	-3.2%	-4.3%	-1.7%	-3.7%	-4.7%

Years Living With Disability												
Ischemic Heart Disease	-18	-44	-56	-21	-49	-61	-1.4%	-3.4%	-4.3%	-1.6%	-3.8%	-4.7%
Hypertensive Heart Disease	-7	-15	-17	-9	-17	-19	-1.5%	-2.9%	-3.4%	-1.8%	-3.4%	-3.9%
Stroke	-41	-107	-142	-48	-118	-155	-1.3%	-3.4%	-4.5%	-1.5%	-3.7%	-4.9%
Diabetes	-49	-137	-182	-57	-152	-200	-1.1%	-3.1%	-4.2%	-1.3%	-3.5%	-4.6%
Dementia	-47	-109	-127	-53	-110	-128	-0.6%	-1.5%	-1.7%	-0.7%	-1.5%	-1.7%
Breast Cancer	-3	-7	-11	-2	-5	-10	-0.3%	-0.8%	-1.3%	-0.2%	-0.6%	-1.1%
Colon Cancer	-2	-4	-6	-2	-4	-6	-0.3%	-0.8%	-1.1%	-0.3%	-0.7%	-1.1%
Depression	-33	-104	-168	-24	-70	-124	-0.2%	-0.7%	-1.1%	-0.2%	-0.5%	-0.8%
Total	-201	-528	-710	-216	-526	-703	-0.6%	-1.6%	-2.1%	-0.6%	-1.6%	-2.1%
DALYs												
Ischemic Heart Disease	-265	-661	-876	-356	-766	-976	-1.6%	-3.9%	-5.2%	-2.1%	-4.5%	-5.8%
Hypertensive Heart Disease	-61	-149	-204	-82	-173	-228	-1.5%	-3.7%	-5.1%	-2.0%	-4.3%	-5.6%
Stroke	-150	-382	-496	-195	-438	-550	-1.5%	-3.8%	-4.9%	-1.9%	-4.4%	-5.5%
Diabetes	-96	-255	-332	-112	-285	-365	-1.2%	-3.2%	-4.1%	-1.4%	-3.6%	-4.5%
Dementia	-65	-146	-170	-75	-150	-174	-0.6%	-1.5%	-1.7%	-0.7%	-1.5%	-1.7%
Breast Cancer	-13	-36	-54	-10	-25	-46	-0.3%	-0.8%	-1.3%	-0.2%	-0.6%	-1.1%
Colon Cancer	-9	-24	-32	-9	-21	-29	-0.3%	-0.8%	-1.1%	-0.3%	-0.7%	-1.0%
Depression	-34	-104	-168	-24	-70	-125	-0.2%	-0.7%	-1.1%	-0.2%	-0.5%	-0.8%
Total	-693	-1758	-2333	-863	-1929	-2492	-1.0%	-2.5%	-3.3%	-1.2%	-2.7%	-3.5%

*The attributable fraction (AF) is the proportional reduction in population disease or mortality that would occur if exposure to a risk factor were reduced to an alternative ideal exposure scenario. Many diseases are caused by multiple risk factors, and individual risk factors may interact in their impact on overall risk of disease. As a result, AFs for individual risk factors often overlap and add up to more than 100 percent.

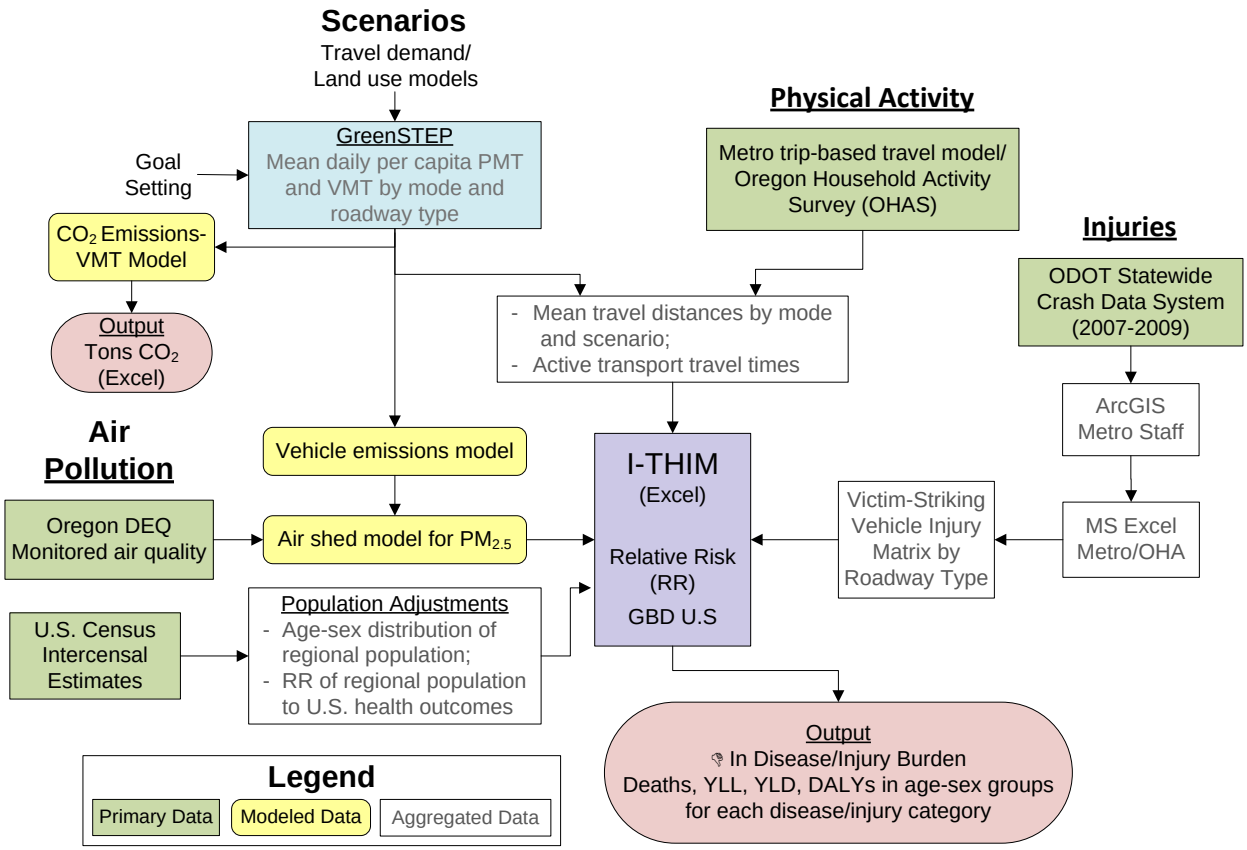
Table 3. Annual mean miles traveled per person by mode and percent mode share for Base Year (2010) and Scenario Clusters 1-6 (2035)

Scenario	Units	Automobile/ Light Truck	Bus	Rail	Bicycle	Walk	Total
Base Year	Miles	6,727	17	12	116	70	6,942
	%	96.9	0.2	0.2	1.7	1.0	100.0
Scenario Cluster 1	Miles	6,365	23	6	112	88	6,594
	%	96.5	0.3	0.1	1.7	1.3	100.0
Scenario Cluster 2	Miles	5,148	34	34	193	92	5,501
	%	93.6	0.6	0.6	3.5	1.7	100.0
Scenario Cluster 3	Miles	3,992	57	57	238	97	4,442
	%	89.9	1.3	1.3	5.4	2.2	100.0
Scenario Cluster 4	Miles	5,616	23	6	112	88	5,844
	%	96.1	0.4	0.1	1.9	1.5	100.0
Scenario Cluster 5	Miles	4,549	34	34	193	92	4,903
	%	92.8	0.7	0.7	3.9	1.9	100.0
Scenario Cluster 6	Miles	3,570	57	57	238	97	4,020
	%	88.8	1.4	1.4	5.9	2.4	100.0

Table 4. Total injuries and fatalities by roadway and mode of travel for Scenario Clusters 1-6, Portland Metropolitan ITHIM model

Roadway/Victim	Baseline	Scenario Cluster 1	Scenario Cluster 2	Scenario Cluster 3	Scenario Cluster 4	Scenario Cluster 5	Scenario Cluster 6
1. Highway							
Walk	0.7	0.7	0.7	0.6	0.7	0.6	0.6
Bicycle	0.3	0.3	0.4	0.4	0.3	0.3	0.3
Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Car	26.3	24.9	20.2	15.8	22.0	17.9	14.1
Truck	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Motorcycle	6.3	6.3	6.2	6.2	6.3	6.2	6.1
2. Arterial							
Walk	39.0	42.8	39.8	36.8	40.3	37.6	35.0
Bicycle	10.3	9.9	12.0	12.1	9.4	11.3	11.6
Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Car	128.0	121.2	98.5	76.7	107.2	87.2	68.7
Truck	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Motorcycle	11.0	10.8	10.2	9.6	10.5	9.9	9.4
3. Local street							
Walk	17.7	19.3	17.8	16.3	18.2	16.8	15.5
Bicycle	18.3	17.5	20.7	20.3	16.5	19.5	19.2
Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Car	61.7	58.4	47.4	36.9	51.6	42.0	33.1
Truck	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Motorcycle	12.0	11.8	11.2	10.5	11.5	10.9	10.3
Total	332.6	325.1	286.2	243.2	295.4	261.4	224.8

Appendix D. ITHIM diagram and data inputs



Data inputs

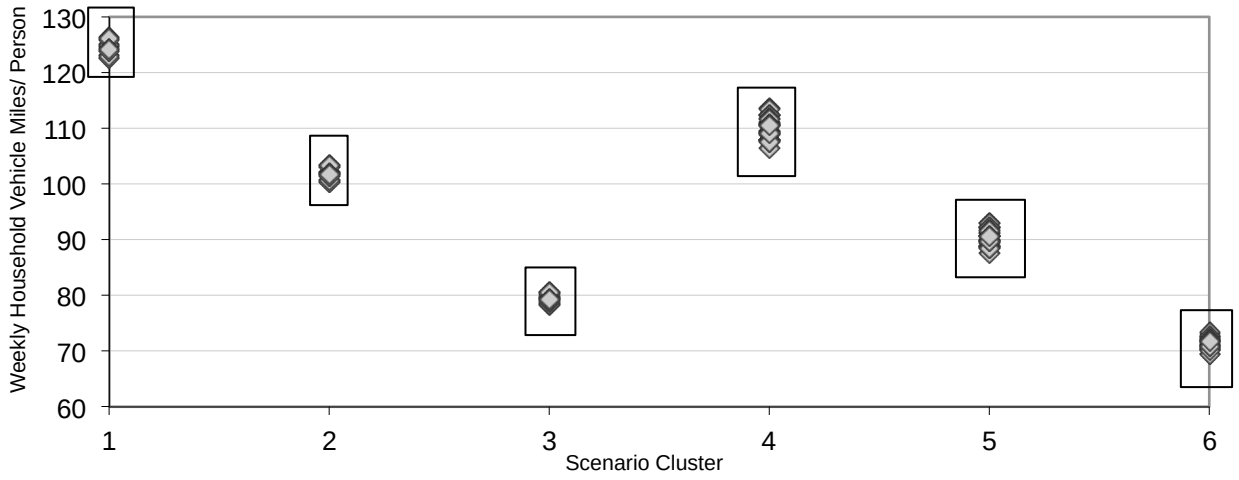
OHA obtained data from various sources for the ITHIM data inputs. These sources and more detailed descriptions of the data follow.

Selection of sample scenarios for assessment in ITHIM

During Phase One of the Climate Smart Communities Scenarios Planning effort, Metro estimated the GHG-reducing properties of 144 specific scenarios. OHA did not assess the health impacts of each of the Phase One scenarios. Instead, 6 sample scenarios were assessed to provide information about the health impacts of the types of policies and investments decision-makers will consider including as they develop the final three Phase Two scenarios.

The sample scenarios are actually averages of 6 clusters of scenarios for the Portland metropolitan region in 2035 and the 2010 base year. The clusters were identified based on similarities in household travel and emissions characteristics as shown in the figure below and in Appendix C, Table 1.

Figure Household Vehicle Travel By Scenario Cluster



The distinguishing features of the sample scenarios are detailed below:

- Scenario Cluster 1 includes all community design level 1 and pricing level 1 scenarios.
- Scenario Cluster 2 includes all community design level 2 and pricing level 1 scenarios.
- Scenario Cluster 3 includes all community design level 3 and pricing level 1 scenarios.
- Scenario Cluster 4 includes all community design level 1 and pricing level 2 and level 3 scenarios.
- Scenario Cluster 5 includes all community design level 2 and pricing level 2 and level 3 scenarios.
- Scenario Cluster 6 includes all community design level 3 and pricing level 2 and level 3 scenarios.

More detailed descriptions of the scenario assumptions for each policy area level can be found in the Phase One Findings Report [66].

Road Traffic Injuries

In 2011, Metro extracted three years of collision data between 2007 and 2009 from Oregon Department of Transportation's (ODOT) statewide crash data system for use in the Metro State of Safety Report. Metro formatted ODOT's crash data to show injury severity by travel mode (motorized vehicles, bicyclists, pedestrians) of injured parties and roadway type where the collision occurred for state of safety report. OHA averaged serious injuries and fatalities for the three years of data used in the report by road type and travel mode of injured parties and applied it in ITHIM's baseline injuries module. Fatal injuries are deaths occurring within 30 days of the collision. Serious injuries are injuries that the victim is not able to walk away from.

Air Pollution

Estimates of average, annual airborne concentration of fine particulate matter (aerodynamic diameter of 2.5 microns, $PM_{2.5}$) were based on two sources. Mobile $PM_{2.5}$ from light duty vehicles was calculated inside ODOT's Greenhouse Gas Statewide Transportation Emissions Planning Model (GreenSTEP) from estimated household vehicle travel, fuel consumption by fuel type and emission rates for each scenario. Fluctuations in emissions from heavy vehicle travel were not included in GreenSTEP scenario outputs.

Annual mean ambient $PM_{2.5}$ concentration was calculated from monitors distributed around the Washington and Multnomah Counties. Most $PM_{2.5}$ monitors measure air quality every sixth day, some every third day and a few measure every day. Monitored $PM_{2.5}$ data was not available for Clackamas County, but it is assumed that air pollution is similar to Multnomah County based on input from DEQ. Mobile emissions calculated for existing conditions in GreenSTEP were treated as a percentage of the total annual mean ambient $PM_{2.5}$ concentration and subtracted from the total to estimate stationary $PM_{2.5}$ for the alternative scenarios. Stationary $PM_{2.5}$ was held constant for the alternative scenarios and only mobile emissions fluctuated.

Census

US Census data were used to create the demographic profile of the three counties in the Metro region. The 2004 population was estimated from the 2000 and 2010 census population growth trend for populations inside Metro's Urban Growth Boundary geography. Relative risk factors were applied in ITHIM to describe risk reduction for several diseases from physical exercise associated with active travel. Age group and sex determine relative risk factors. Population distribution was also used to adjust U.S. health outcomes from the Global Burden of Disease database for the Metro region.

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2035 Regional Transportation Plan (RTP) Amendments

MTAC

April 3, 2013

John Mermin, Metro Senior Transportation Planner

Amending the RTP

- Federal requirements
  - Air quality conformity
  - 30-day public comment period

- State requirements
  - 35-day notice to DLCD
  - 45-day public comment period

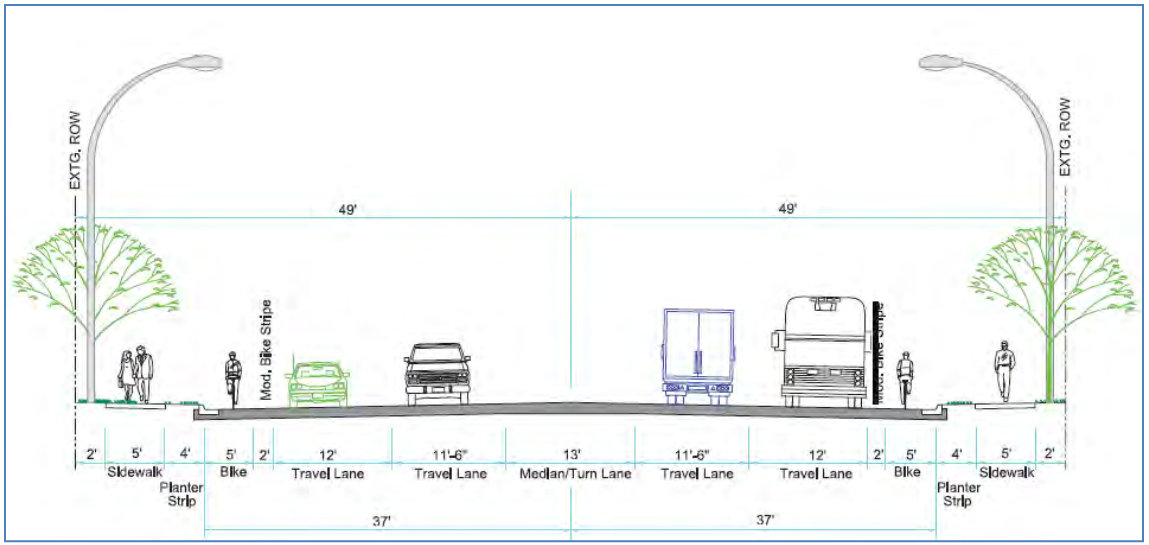
Criteria

- Urgency: expect to advance to design/construction before June 2014

- Comes out of a local process (e.g. TSP, corridor plan) that involves the public

Washington County

- **Scholls Ferry Rd**: Roy Rogers to Teal Blvd
  - Widening from 2 to 5 lanes including buffered bicycle lane and sidewalks



Beaverton

- **Crescent St** multimodal extension project (Rose Biggi to Westgate Dr)

- Minor change to terminus of an existing RTP project (Westgate Dr instead of Cedar Hills Blvd)

Hillsboro

- **Gibbs Dr** – new 3-lane street with cycle tracks and sidewalks in Amberglen RC
- **253rd** – new 3-lane street with bike lanes and sidewalks near US 26/Brookwood Pkwy
- **Butler Dr** – widening from 3 to 5 lanes with bike lanes and sidewalks
- **Brookwood Pkwy** – widening from 4 to 7 lanes with bike lanes and sidewalks
- **Cornelius Pass Rd** – widening from 5 to 7 lanes with bike lanes and sidewalks
- **US 26/Cornelius Pass Rd** – add 2nd lane to westbound off-ramp and third approach lane on Cornelius Pass Rd

East Metro Connections Plan

- Add **top priority project** to RTP
  - **238th Ave** (Halsey to Glisan) freight and multimodal improvements

- RTP **policy maps**
  - Move regional designations from 242nd ROW to existing 238th/242nd
  - Designate N/S arterials to be equally significant for freight & vehicle movement

ODOT

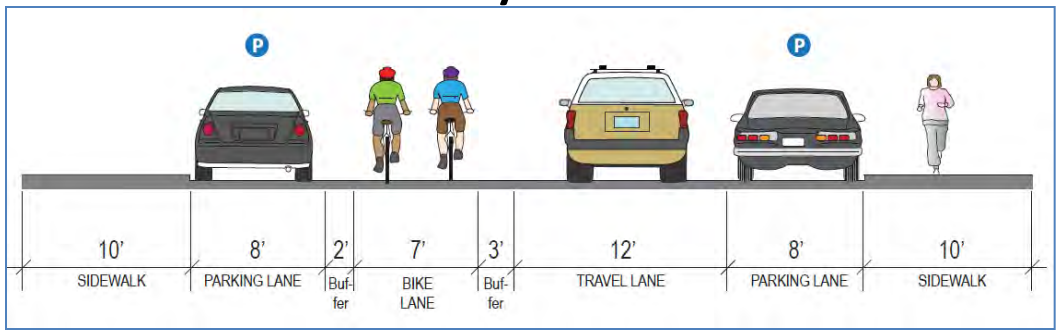
- Extend aux lane on **I-205 SB** from I-84 entrance ramp to Stark/Washington

- Extend accel lane on **I-205 NB** from Powell entrance ramp to match existing aux lane from Division entrance ramp to Stark/Washington exit ramp, and provide two lane exit at Stark/Washington

- Extend **I-5 SB** aux lane from Lower Boones Ferry exit ramp to Lower Boones Ferry entrance ramp

Portland

- **N. Williams Ave** traffic safety operations project (N.Winning Way to N. Killingsworth)
  - Ped & bike safety improvements – enhanced crossings, buffered bike lanes, traffic calming, new signal
  - Neighborhood greenway improvements to NE Rodney



What's coming next?

- Type of proposed actions
  - 5 resolutions
  - 1 ordinance
- Who will be requested to take action
  - JPACT, MPAC, Metro Council

When are actions proposed?

- MPAC – April 24
- JPACT – May 9
- Metro Council – May 16

Questions?

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