600 NE Grand Ave.
Portland, OR 97232-2736

Metro | *Agenda*

Meeting: Joint Policy Advisory Committee on Transportation (JPACT)
Date: Thursday, April 4, 2013
Time: 7:30 to 9 a.m.
Place: Metro Regional Center, Council Chamber

7:30 AM	**1.**		**CALL TO ORDER, DECLARATION OF A QUORUM & INTRODUCTIONS**	**Carlotta Collette, Chair**
7:32 AM	**2.**		**CITIZEN COMMUNICATIONS ON JPACT ITEMS**	**Carlotta Collette, Chair**
7:35 AM	**3.**		**UPDATES FROM THE CHAIR & COMMITTEE MEMBERS**	
		*	• ODOT Transportation Policy Group • OMPOC Update • TIGER V • Legislative Update	
		*	• JPACT Letter to the Oregon Legislature in Support for the Blue Heron Site	
7:40 AM	**4.**	*	**CONSIDERATION OF THE MINUTES FOR MARCH 14, 2013**	
7:45 AM	**5.**	*	2035 Regional Transportation Plan Amendments – INFORMATION *JPACT will be asked to formally adopt the amendments at the May 9 committee meeting*	**John Mermin, Metro**
7:55 AM	**6.**	*	Climate Smart Communities Scenarios Project: Phase 1 Health Impact Assessment (HIA) – INFORMATION	**Andrea Hamberg & Jae Douglas, Oregon Health Authority**
8:20 AM	**7.**	*	Climate Smart Communities Scenarios Project: JPACT Input on Evaluation Criteria – INFORMATION /DISCUSSION • Public health workshop • Environmental workshop • Equity and environmental justice workshop • Business focus groups *JPACT will be asked to make a formal recommendation at the May 9 committee meeting*	**Kim Ellis, Metro**
8:40 AM	**8.**	*	Comments on Congressman Blumenauer's Carbon Tax Legislation – INFORMATION /ACTION REQUESTED	**Andy Cotugno, Metro**

Continued on back…

8:50 AM **9.** * Regional Flexible Fund 150 Percent Project List – INFORMATION **Josh Naramore, Metro**

This item is scheduled for JPACT discussion at the May 9 committee meeting

9 AM **10.** **ADJOURN** **Carlotta Collette, Chair**

Upcoming JPACT meetings:

- May 9, 2013 – regular JPACT meeting
- June 13, 2013 – regular JPACT meeting
- July 11, 2013 – regular JPACT meeting
- August 1, 2013 – regular JPACT meeting (*Note, one week early in observance of Eid al Fitr on August 8*)

* Material available electronically.
** Material will be distributed in advance of the meeting.
# Material will be provided at the meeting.

For agenda and schedule information, call Kelsey Newell at 503-797-1916, e-mail: kelsey.newell@oregonmetro.gov.
To check on closure or cancellations during inclement weather please call 503-797-1700.

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2013 JPACT Work Program
3/22/13

March 14, 2013 • Climate Smart Communities Scenarios project – Discussion on Investment Choices • Governor's 10-year Energy Action Plan – Information **Annual JPACT Washington, DC Trip** March 6-7, 2013	**April 4, 2013** • 2035 RTP Amendments – Information/ Discussion • Climate Smart Communities – Health Impact Assessments – Information • Climate Smart Communities Scenarios project: Evaluation Criteria – Information/discussion • Update on the Regional Flexible Fund project submittals – Information • JPACT letter to the Legislature in support of the Blue Heron site & recent meeting with EPA staff – Information • Comments on Congressman Blumenauer's Carbon Tax Legislation
May 9, 2013 • 2035 RTP Amendments – Action • Report back on the Atlanta Best Practices trip – Information • Climate Smart Communities – Action • Regional Flexible Fund projects – Public Input Process – Information • 2013-15 UPWP and MPO self-certification – Adoption requested	**June 13, 2013** • Regional Active Transportation Plan: Final Plan – Information • 2014 Regional Transportation Plan update – Informational • Transit funding and the MTIP Process – Information • TCM Substitution – Action Requested
July 11, 2013 • RFFA Step 1 Region-wide Programs - Information	**August 1, 2013** • Recommendation to STIP Committee on ODOT Enhance projects – Action
September 12, 2013 • Local Coordinating Committee RFFA Public Hearings Summaries – Information	**October 10, 2013** • RFFA projects – Action • Climate Smart Communities: Phase II findings – Information
November 14, 2013	**December 12, 2013** • Climate Smart Communities: Phase II findings – Discussion

Parking Lot:

- Regional Indicators briefing
- Hole-in-the Air Rulemaking – Review Comment Letter
- RFFA Step 1 Region-wide program briefings

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JOINT POLICY ADVISORY COMMITTEE ON TRANSPORTATION
March 14, 2013
Metro Regional Center, Council Chamber

MEMBERS PRESENT	AFFILIATION
Jack Burkman	City of Vancouver
Carlotta Collette, Chair	Metro Council
Shirley Craddick	Metro Council
Nina DeConcini	Oregon Department of Environmental Quality
Denny Doyle	City of Beaverton, representing Cities of Washington Co.
Charlie Hales	City of Portland
Donna Jordan	City of Lake Oswego, representing Cities of Clackamas Co.
Kathryn Harrington	Metro Council
Neil McFarlane	TriMet
Diane McKeel	Multnomah County
Roy Rogers	Washington County
Paul Savas	Clackamas County
Jason Tell	Oregon Department of Transportation, Region 1
Don Wagner	Washington State Department of Transportation
Bill Wyatt	Port of Portland

MEMBERS EXCUSED	AFFILIATION
Shane Bemis	City of Gresham, representing Cities of Multnomah Co.
Steve Stuart	Clark County

ALTERNATES PRESENT	AFFILIATION

STAFF: Andy Cotugno Kim Ellis, Evan Landman, Ted Leybold, Jonathan Jubera, Ramona Perrault, Robin McArthur

1. CALL TO ORDER, DECLARATION OF A QUORUM & INTRODUCTIONS

Chair Carlotta Collette called the meeting to order at 7:32 a.m. and declared a quorum.

2. CITIZEN COMMUNICATIONS ON JPACT ITEMS

There were none.

3. UPDATES FROM THE CHAIR & COMMITTEE MEMBERS

Mr. Neil McFarlane updated JPACT on the TriMet budget. Mr. McFarlane addressed the management pay raises recently covered by the Oregonian .He noted that after 3 ½ years of pay freezes, the notion of unfreezing was well-vetted by the board and included in contingencies.

Regarding the budget in general, Mr. McFarlane reported that there would be no fare increases or service reductions, and $1.7 million would be available to invest in new services. In addition, a new category of funding under Map-21 will allow for rehabilitation of some parts of the MAX system. The board is scheduled to adopt this budget in late May.

Mr. Jason Tell of ODOT provided an update on the STIP process. The STIP selection committee approved a 150% list at their last meeting. One project not selected for that list was Ride Connection, but the committee elected to send a letter of support and pursue funding for that effort. In the next step, an intensive scoping effort through the summer will inform the narrowing of the 150% list to a 100% list by October 4th, after which the list will go to the OTC for adoption into a draft STIP, after which begins another round of public input.

Members asked about the role of the public in the narrowing of the list from 150% to 100%. Mr. Tell told the group that after the 100% list is submitted to OTC, OTC runs a public input process over a year between submittal and final adoption. During the narrowing, the STIP committee continues to hold meetings open to the public, and jurisdictions continue their outreach efforts.

Chair Collette updated JPACT on several items:

- The Oregon MPO coalition (OMPOC) meets 3-4 times annually. Chair Collette chairs OMPOC, and normally another member from JPACT is on the committee as well. She requested that JPACT members interested in serving on OMPOC contact her.
- In the legislature, HB 2800 committing Oregon to a $450 million funding share for the Columbia River Crossing passed and was signed by the Governor. The bill incorporates a number of triggers, including a funding commitment from Washington, the submission for congressional review of a full faith grant agreement by FTA, and an investment grade analysis approved by the state treasurer. The bill does not have a revenue source, and will draw on funds from ODOT until the 2015 legislative session when proponents will seek new funding sources. Members noted that this is a major milestone, but the work to be ready to push for new revenues in 2015 must begin as soon as this session ends.
- Bills related to ConnectOregon and ConnectOregon PLUS are moving forward; hearings are scheduled for the next week.
- Because of members' availability issues, JPACT will next convene on April 4, rather than April 11 as previously scheduled.
- Chair Collette will be returning to DC later this month to discuss the Blue Heron project in Oregon City with EPA officials. MPAC voted last night to send a letter to the Governor supporting the $5 million allocation in his budget for the project.

MOTION: Mayor Denny Doyle and Councilor Donna Jordan seconded to send a letter on behalf of JPACT supporting the Blue Heron project.

ACTION: With all in favor and 1 abstained (Tell), motion passed.

4. CONSIDERATION OF THE MINUTES FOR FEB. 14, 2013

MOTION: Metro Councilor Kathryn Harrington moved and Metro Councilor Shirley Craddick seconded to adopt the JPACT minutes for February 14, 2013 with no corrections.

ACTION: With all in favor, the motion passed.

5. REPORT BACK ON JPACT WASHINGTON, DC TRIP

Last week, a group of regional leaders traveled to Washington, DC, to meet with Oregon's congressional delegation and DOT staff. Revenues are short and getting shorter, and the challenge is to local governments to figure out how to support the kind of transportation system they want.

In DC, members learned about how projects in the region could be affected by sequestration. Sequestration applies to the general fund, so trust funded projects are protected, though the trust fund itself is backfilled with general fund dollars subject to sequestration. As for projects financed with general fund dollars, FTA has discretion about how to apply cuts. Portland Milwaukie Light Rail is one such project, currently scheduled for $100 million in federal funds this year; the maximum reduction in funding for this project would be 15%, but is more likely to be in the 5% range.

USDOT and JPACT members also discussed performance-based planning processes. USDOT looks to the Portland region as a model for how to address more complicated urban issues in transportation planning, which are already part of this region's RTP and addressed in state.

JPACT member discussion included:

- Members emphasized the increasing importance of local funding for transportation projects, and noted that new funding or reauthorization were not part of the conversation with USDOT.
- Chair Collette noted that there was a sense that the House Transportation and Infrastructure Committee under Rep. Shuster may be more responsive than in the past.

5.1. LETTER OF SUPPORT TO NOMINATE BILL WYATT TO THE NATIONAL FREIGHT ADVISORY COMMITTEE

Ms. Susie Lahsene of the Port of Portland shared information on a letter from Chair Collette on behalf of JPACT to FHWA and USDOT endorsing Bill Wyatt of the Port for the National Freight Advisory Committee.

MOTION: Commissioner Roy Rogers moved and Mr. Jason Tell seconded to endorse Bill Wyatt to serve on the National Freight Advisory Committee.

ACTION: With all in favor, the motion passed.

6. GOVERNOR'S 10-YEAR ENERGY ACTION PLAN

Ms. Margie Hoffman, Governor Kitzhaber's Energy Policy Advisor, presented on the Governor's 10-Year Energy Action Plan. The governor's office convened a task force of community and secotral representatives, who delivered a package of 198 recommendations focusing on energy, transportation, land use and resilience. These recommendations include policies like VMT pricing, the Green Fuels program, transportation system electrification, Intelligent Transportation Systems, and least cost planning. The plan also considers the funding issues faced by all jurisdictions due to the declining power of the gas tax, and proposes a West Coast Infrastructure Exchange modeled on BC Partnerships, the quasi-public corporation in British Columbia credited with funding large projects prior to the 2010 Olympics.

JPACT member comments included:

- Chair Collette noted that BC Partnerships was also a model in the development of the Community Investment Initiative and Regional Infrastructure Enterprise.

7. CLIMATE SMART COMMUNITIES SCENARIOS PROJECT: INVESTMENT CHOICES

Ms. Kim Ellis of Metro presented on the Climate Smart Communities Scenarios Project. CSC is a mandate from the state geared toward reducing emissions from cars and small trucks. The response to this directive has been framed around implementing community plans and visions, like 2040. Phase 1 resulted in the development of 144 combinations of policies; now, in Phase 2, CSC is seeking input to shape the preferred scenario.

The three scenarios being considered are:

- Scenario A: Recent Trends – What if the region implements adopted plans with existing revenues reflecting funding trends of the past decade?
- Scenario B: Adopted Plans – What if the region implements adopted plans and raise new revenues as called for in the RTP?
- Scenario C: New Plans and Policies – What if the region is able to more fully achieve adopted and emerging plans, and pursues new policies and revenues to meet GHG emissions reduction targets and achieve other goals?

These three will be evaluated over the summer and shape the preferred scenario. Ms. Ellis asked JPACT for input on the questions they would like addressed in developing the preferred scenario.

Member discussion included:

- JPACT members emphasized that it is helpful to conceive of these scenarios in terms of choices about the kind of place you want to live in, rather than just GHG reductions. Connecting transit service and economic climate makes this approach real and tangible.
- Members noted that an important question in implementing any of these strategies would be how to become more competitive economically. A related question has to do with how assumptions of economic growth written in to adopted plans are achieved in these scenarios.
- Councilor Donna Jordan commented that one thing happening around the state is balancing priorities, and looking at where money is currently allocated. She warned that jurisdictions need to work to prevent cannibalizing each other's budgets, because all of these different priorities, like parks, jobs, natural areas, etc, contribute to the region's quality of life.
- Commissioner Roy Rogers asked how realistic the automobile fuel economy assumptions included in the draft scenarios are. These numbers were developed by an advisory committee comprised of ODOT, DEQ, and DLCD staff. This assumes awareness of climate change happens quickly, and is followed by a rapid response. Additionally, some have argued that while the mileage numbers are high, the electric vehicle numbers are low, so that it may balance out.
- Members suggested that providing a baseline picture of current conditions as a reference would be useful in sharing this information.
- Members addressed the regional scope of the project. The three counties each have different needs and visions, Chair Collette explained that the project started from a vision to

balance investments in reducing GHG with investments to achieve a better economy, or any of the various goals in existing plans. The idea of this project is not to create a dense urban core all over the region, but to talk about the degree to which everyone's community is doing what it can; each place has very different needs. Commissioner Savas added that this project has a lot of merit as a way of thinking about declining resources and the best way to invest limited funds in a way that will allow the region to remain competitive while fulfilling some of these aspirations.

8. ADJOURN

Chair Collette adjourned at meeting at 9:01 a.m.

Respectfully Submitted,

Evan Landman
Recording Secretary

ITEM	DOCUMENT TYPE	DOC DATE	DOCUMENT DESCRIPTION	DOCUMENT NO.
5.1	Letter	3/14/2013	Letter recommending appointment of Bill Wyatt to National Freight Advisory Committee	031413j-01

March 19, 2013

Transportation Policy Group

Purpose

The Transportation Policy Group serves as a forum for coordination between state and local transportation policymakers and as a place where TPG members can seek input on major transportation policy issues.

Meetings and Agendas

The TPG will meet quarterly, targeting March, June, September, and December. Meetings will be set for the entire year at the beginning of the year.

ODOT will develop each agenda in coordination with TPG members. The agenda for the next meeting will be developed at the end of each meeting based on an annual planning calendar. A month before each meeting, ODOT will advance its proposed topics to TPG members and solicit additional topics for consideration from members. If there are not sufficient items that need to be discussed, meetings may be canceled.

Planning Calendar for 2013

June

- **STIP process:** ODOT will discuss the remaining steps in the process of selecting projects for the 2015-2018 STIP. TPG members will talk to their members who participated in the ACT process and offer a mid-point check-in on the Fix It/Enhance process. ODOT will use this input as it begins development of the 2017-2020 STIP process.
- **Transportation finance and revenue:** Members will discuss revenue and finance in the future both short and long term, including issues of distribution, legislative funding proposals, and alternative revenue mechanisms (mileage based user fees). This will likely be a standing agenda item.
- **Oregon Rail Plan:** ODOT will present on the beginning work on the State Rail Plan and seek input from members.

September

- **STIP process:** TPG members will provide input on Fix It/Enhance process as work on the draft STIP nears completion, and ODOT will share the feedback it has received. ODOT will offer a preview of the timeframe and process for the 2017-2020 STIP.
- **Legislative wrap up:** ODOT will present on any major issues from the 2013 legislative session that affect local governments.
- **Bicycle/pedestrian plan:** ODOT will seek input on the update to the statewide bicycle/pedestrian plan.
- **Federal reauthorization:** Members will discuss a proposal for a joint high-level agenda for reauthorization.

- **Regional collaboration:** Members will discuss the interplay between Regional Solutions and the ACTs, including relationships with MPOs.
- **OTC annual workshop:** ODOT/OTC will offer an agenda preview of the OTC annual workshop in October.

December

- **STIP process:** ODOT will offer further information on the timeframe and process for the 2017-2020 STIP.
- **Legislative preview:** TPG members will discuss any legislative issues they are pursuing in the 2014 legislative session.
- **Federal performance management:** ODOT will lead a discussion on implementation of federal performance measures under MAP-21, including coordination with MPOs.

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JOINT POLICY ADVISORY COMMITTEE ON TRANSPORTATION

March 2013

Sen. Richard Devlin, Co-Chair, Joint Way and Means Committee
Rep. Peter Buckley, Co-Chair, Joint Ways and Means Committee
Sen. Chris Edwards, Co-Chair, Ways and Means Subcommittee on Natural Resources
Rep. Ben Unger, Co-Chair, Ways and Means Subcommittee on Natural Resources

Re: Support for funding Willamette Falls Legacy Project

The Joint Policy Advisory Committee on Transportation enthusiastically supports the proposed $5 million budget allocation in House Bill 5034 for the Willamette Falls Legacy Project. This 23-acre industrial site along the Willamette River in Oregon City provides an opportunity to reconnect Oregonians with the second-largest waterfall in North America, while creating an economic engine, a waterfront destination, a unique habitat and a window into Oregon's past. Willamette Falls has the potential to become one of Oregon's marquee visitor attractions, and a sterling example of economic redevelopment.

Transforming the Willamette Falls site will bolster downtown Oregon City's evolution as a regional center – and bring all the transportation benefits that come along with it. Serving hundreds of thousands of people, regional centers are the focal point of transit and highway investments; they feature high-quality transit service, roads, and pedestrian and cycling facilities. There's no doubt that the Willamette Falls Legacy Project would attract more people to downtown Oregon City. A study estimates that redevelopment would create 560 to 1,110 construction jobs, and 550 to 1,090 office and retail jobs. The project would draw some 660,000 visitors per year, driving demand for an additional 600 local jobs. Redevelopment would also boost property values, both on-site and by generating at least $7.5 million in additional value in the surrounding area.

Thank you for supporting this project with the proposed $5 million investment from the State of Oregon. We look forward to working with partners to ensure that the Willamette Falls Legacy Project is a success for Oregon City, Clackamas County, the greater Portland metropolitan region, the State of Oregon – and all Oregonians. Please feel free to contact me if I can provide more information about how the project supports our region's work to create vibrant places with high-quality transportation choices.

Best regards,

Carlotta Collette

Metro Councilor Carlotta Collette
Chair, Joint Policy Advisory Committee on Transportation

cc: Portland metropolitan area legislators

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Portland, OR 97232-2736
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503-797-1797 fax

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Metro | *Memo*

Date: March 27, 2013

To: JPACT

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 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,

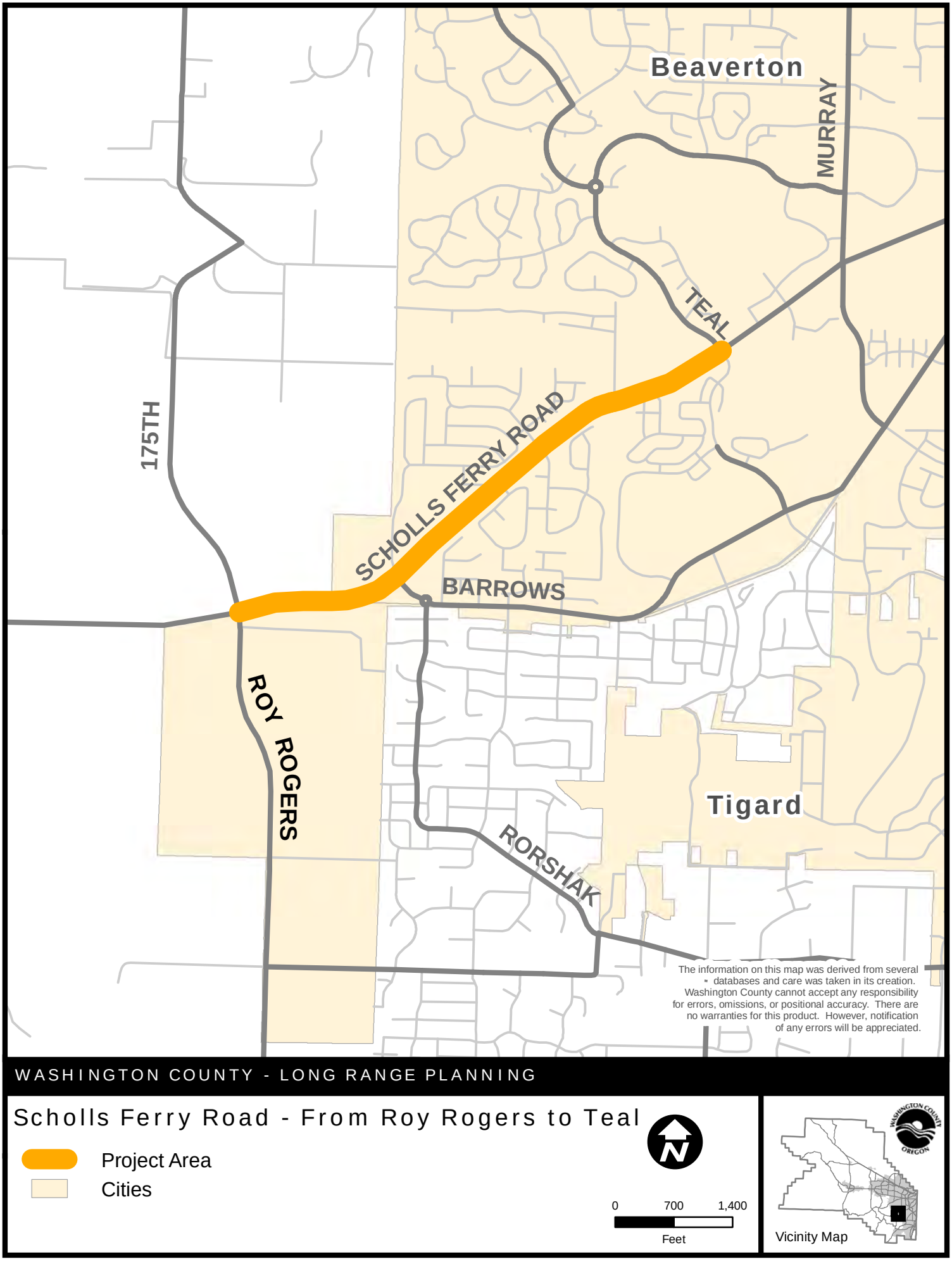
Clark F. Berry, Senior Planner

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.



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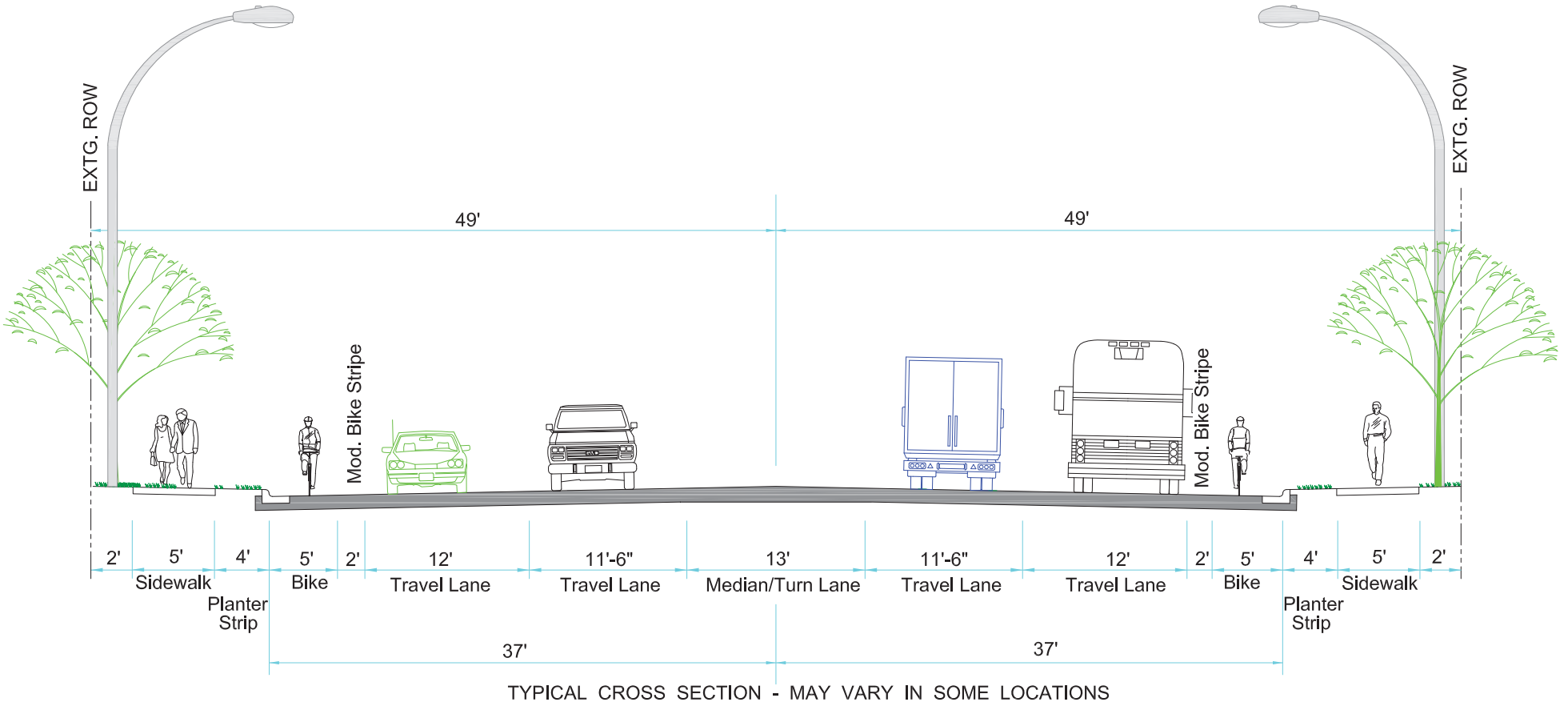
Attachment 1.

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

DEPARTMENT OF LAND USE & TRANSPORTATION ENGINEERING

PLOT STAMP: 10/02/12 9:51A ERIKF
CAD: 100099 SCHOLLS FERRY RD (BARROWS - TEAL).DWG, TAB: PRESEC5
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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.

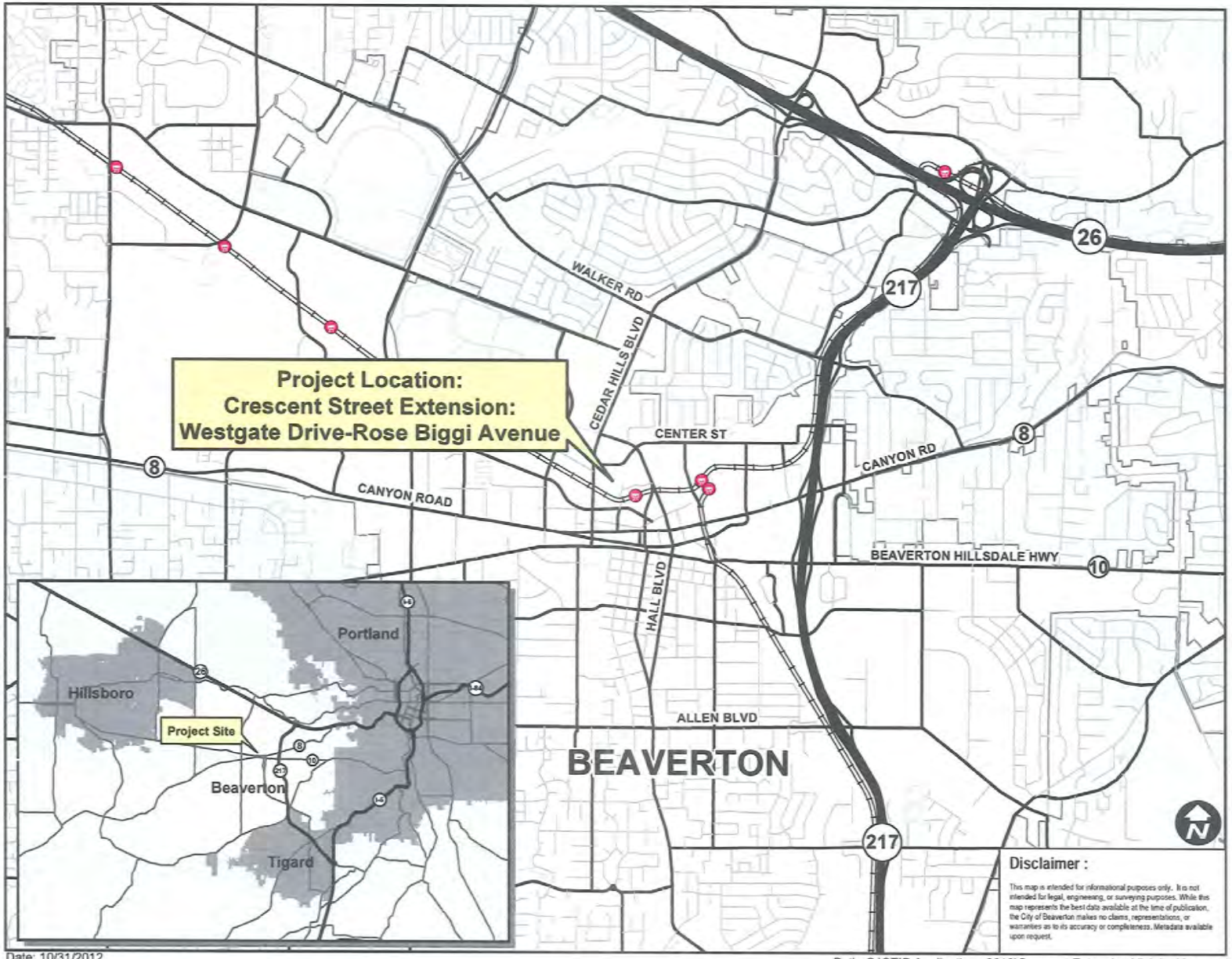
The project was originally identified and listed in the Beaverton Downtown Connectivity Plan and subsequent 2015 and 2020 Transportation System Plans. It is most currently listed as Project #25 in the City's adopted 2035 Transportation System Plan and Comprehensive Plan Transportation Element (page IV-34). 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

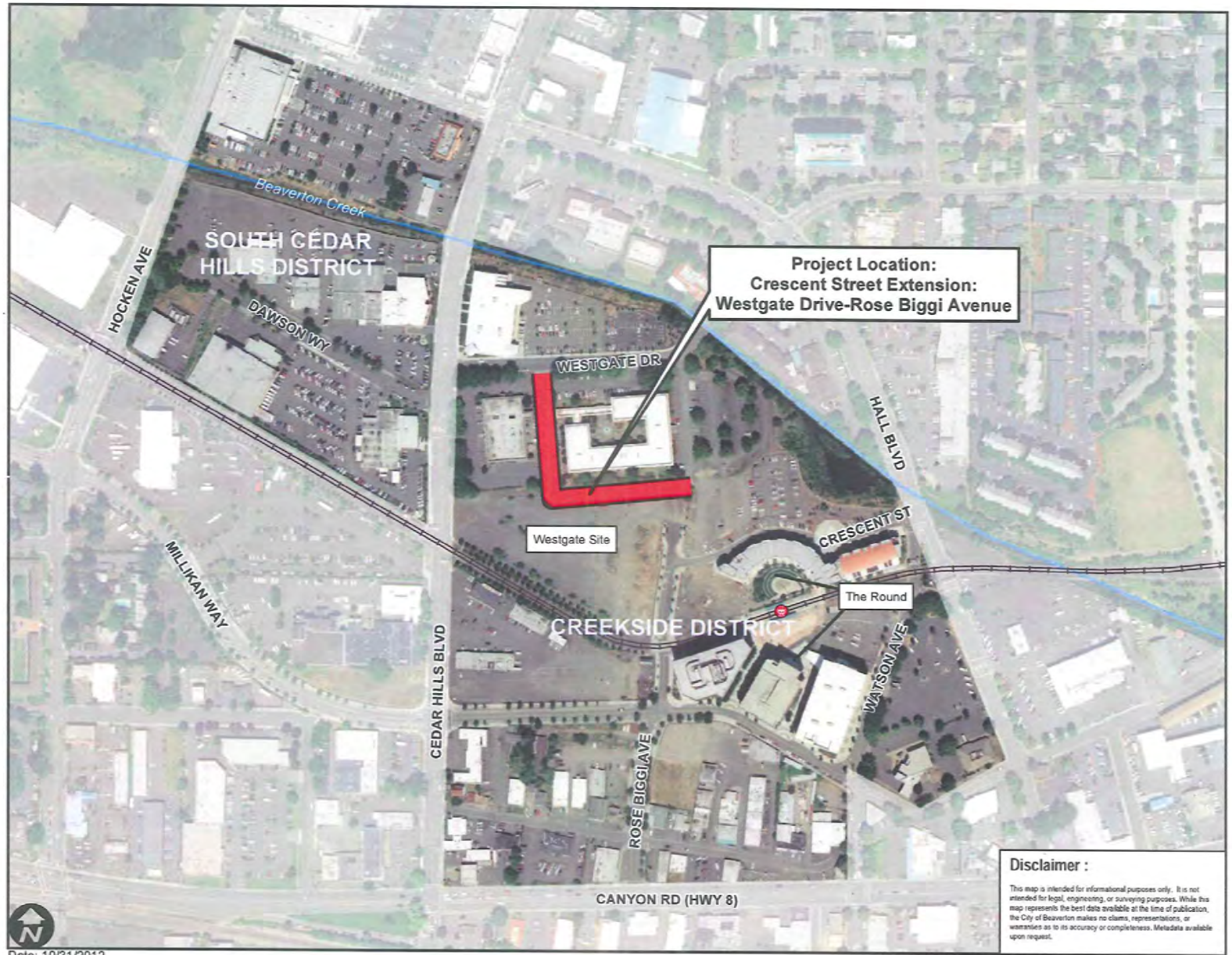
0 0.25 0.5 1
Miles

Beaverton

Date: 10/31/2012

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

Attachment 2.



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

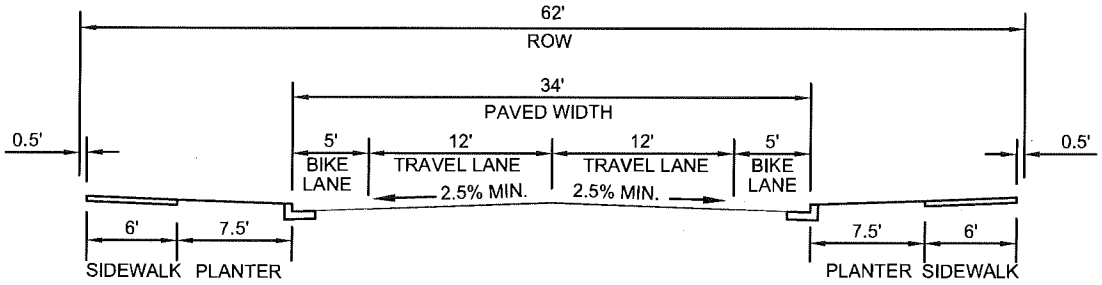
Beaverton

Date: 10/31/2012

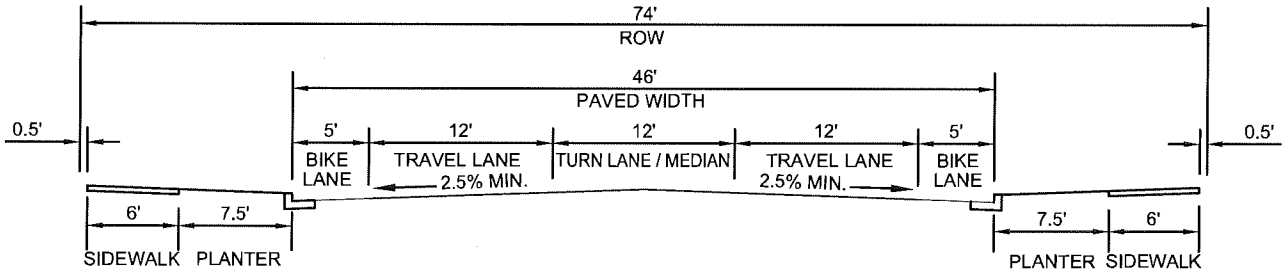
Path: S:\STIP Applications 2012\Crescent Extension Base Map.mxd

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,

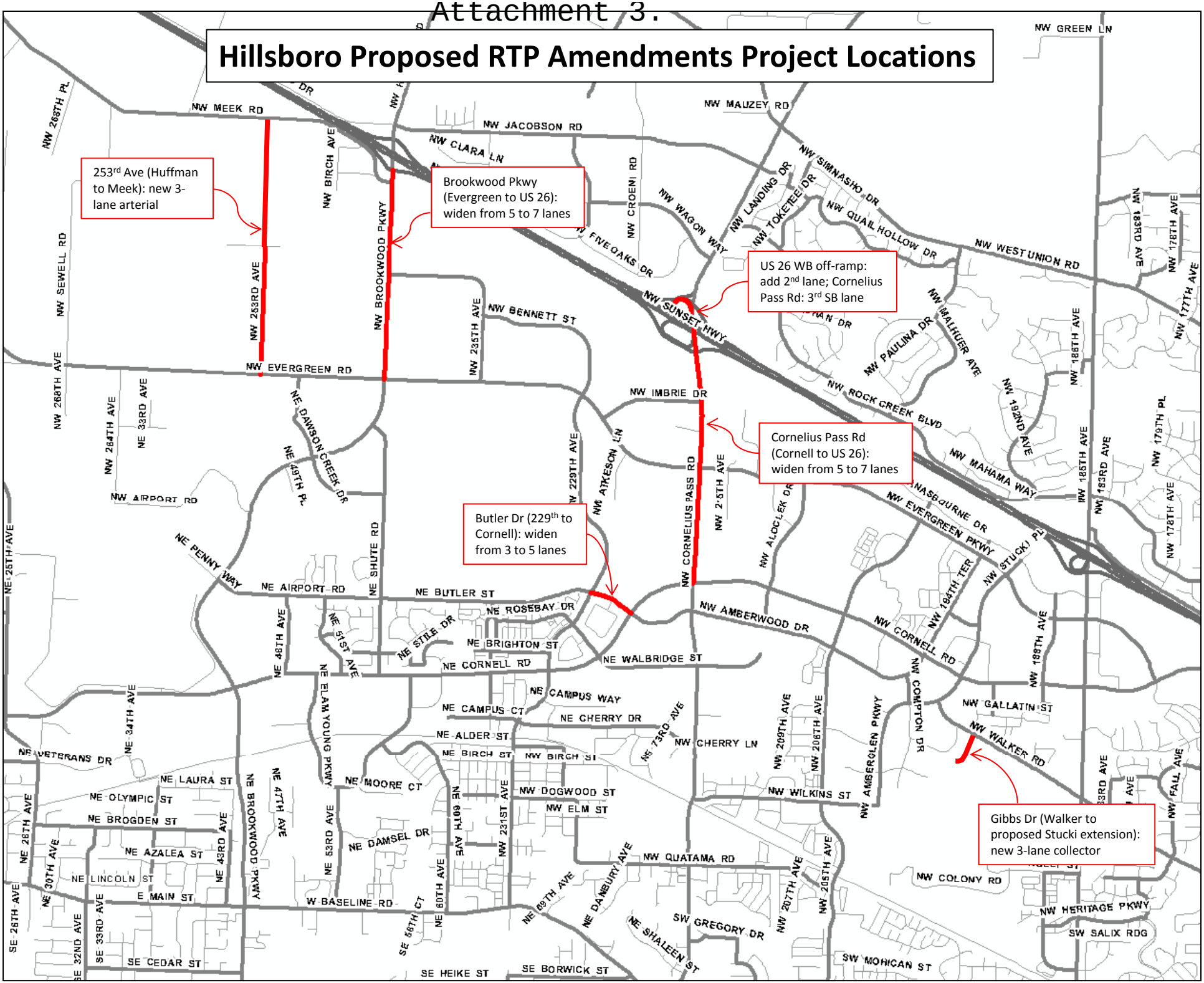
Brad Choi
Transportation Planner

Enclosure

cc: Clark Berry, Washington County

Attachment 3.

Hillsboro Proposed RTP Amendments Project Locations



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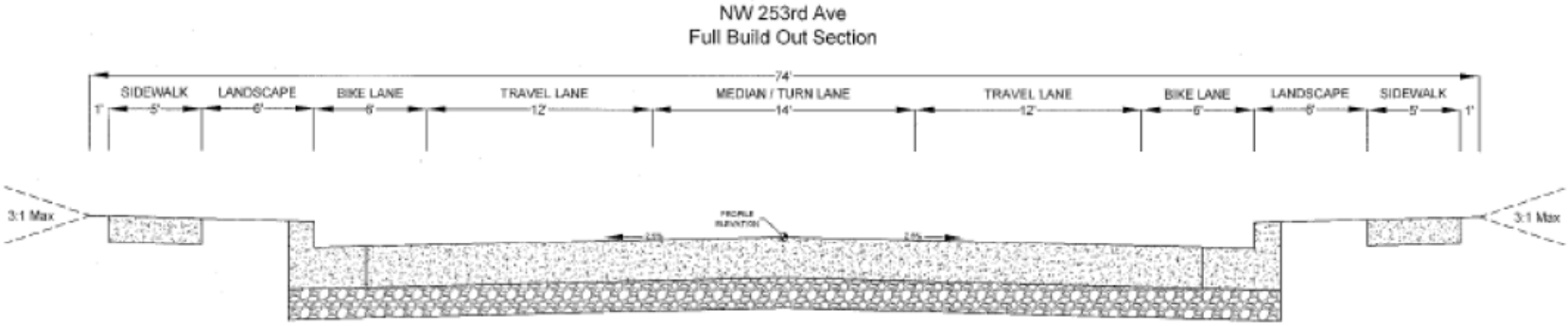
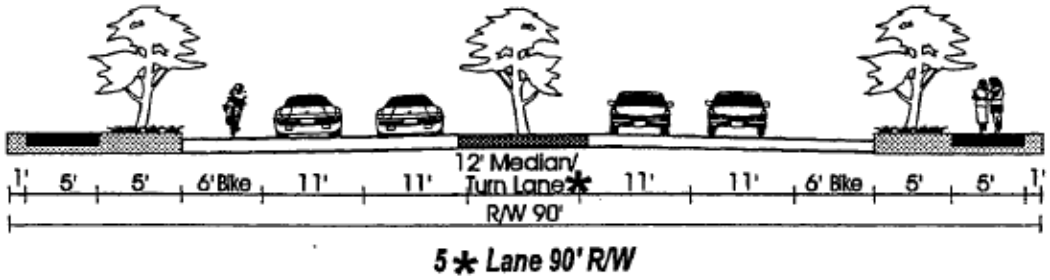
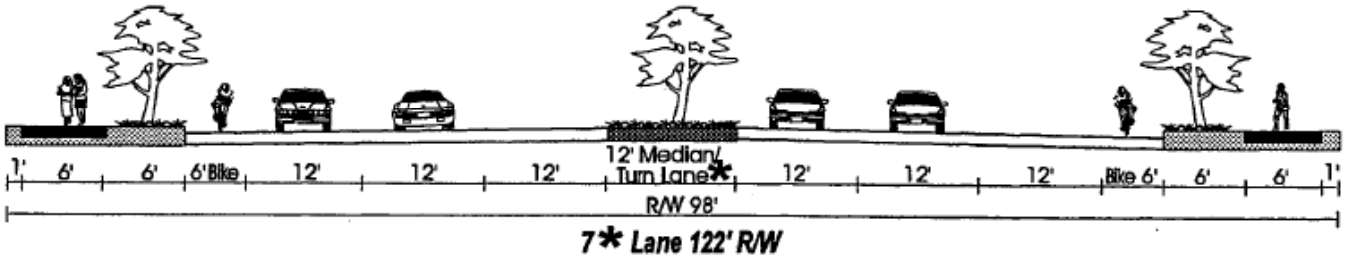


Proposed Cross Section for 253rd Ave

Attachment 3.



Proposed Cross Section for Butler Dr



Proposed Cross Section for Brookwood Pkwy and Cornelius Pass Rd

Attachment 3.

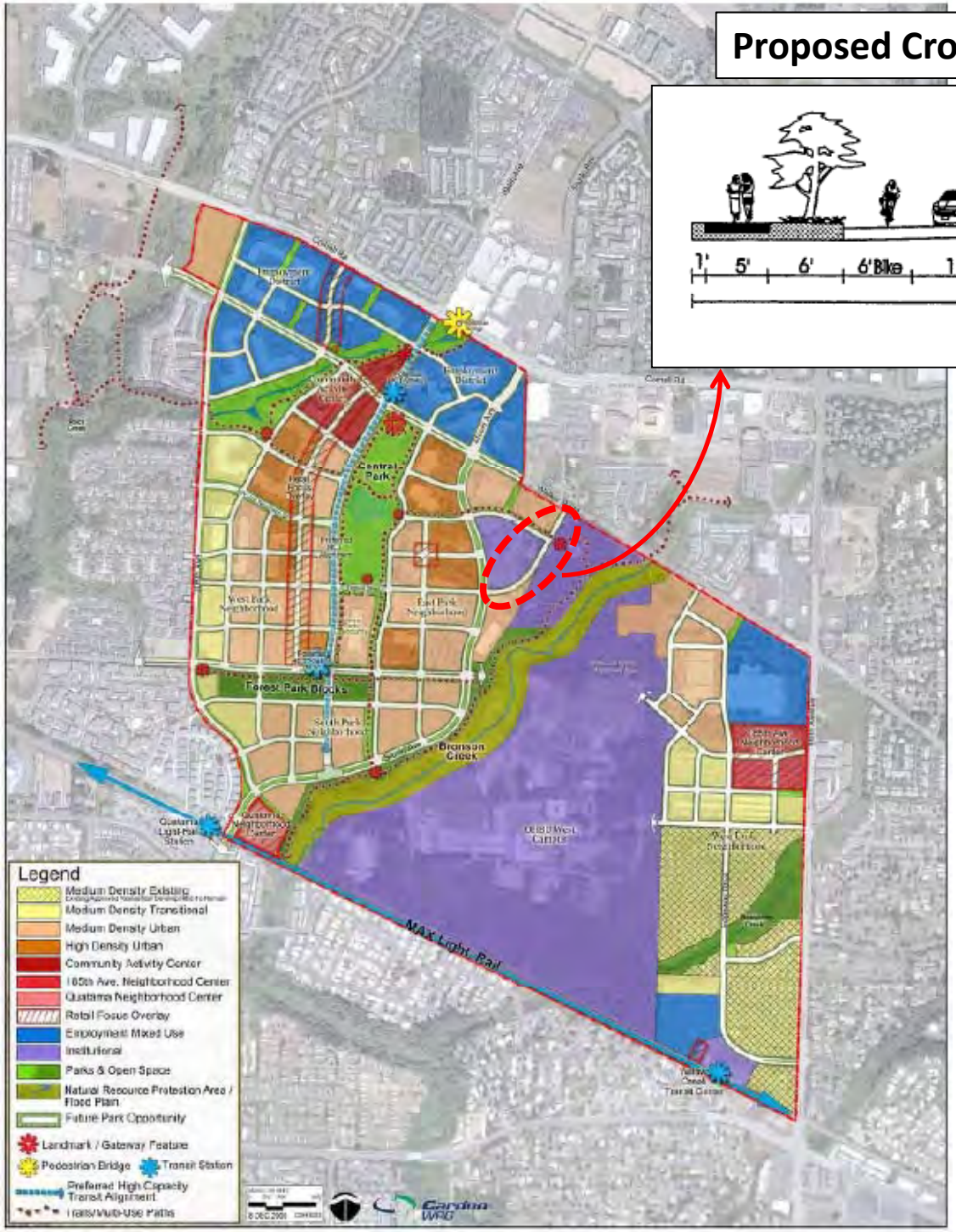
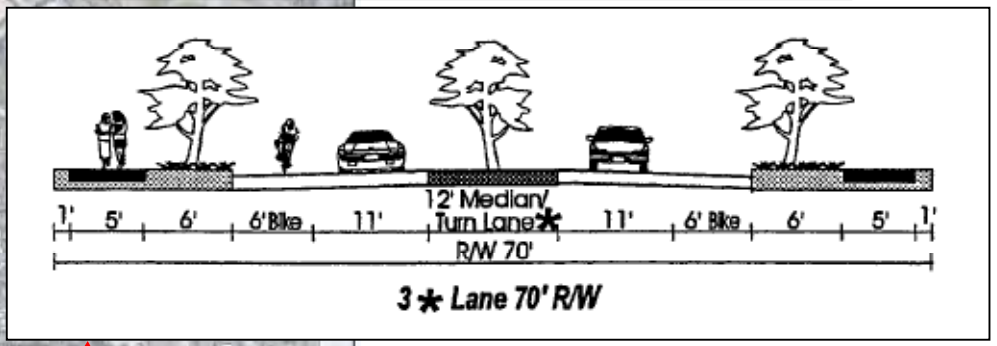


Figure 2-1: AmberGlen Community Plan Land Use Concept Map

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:

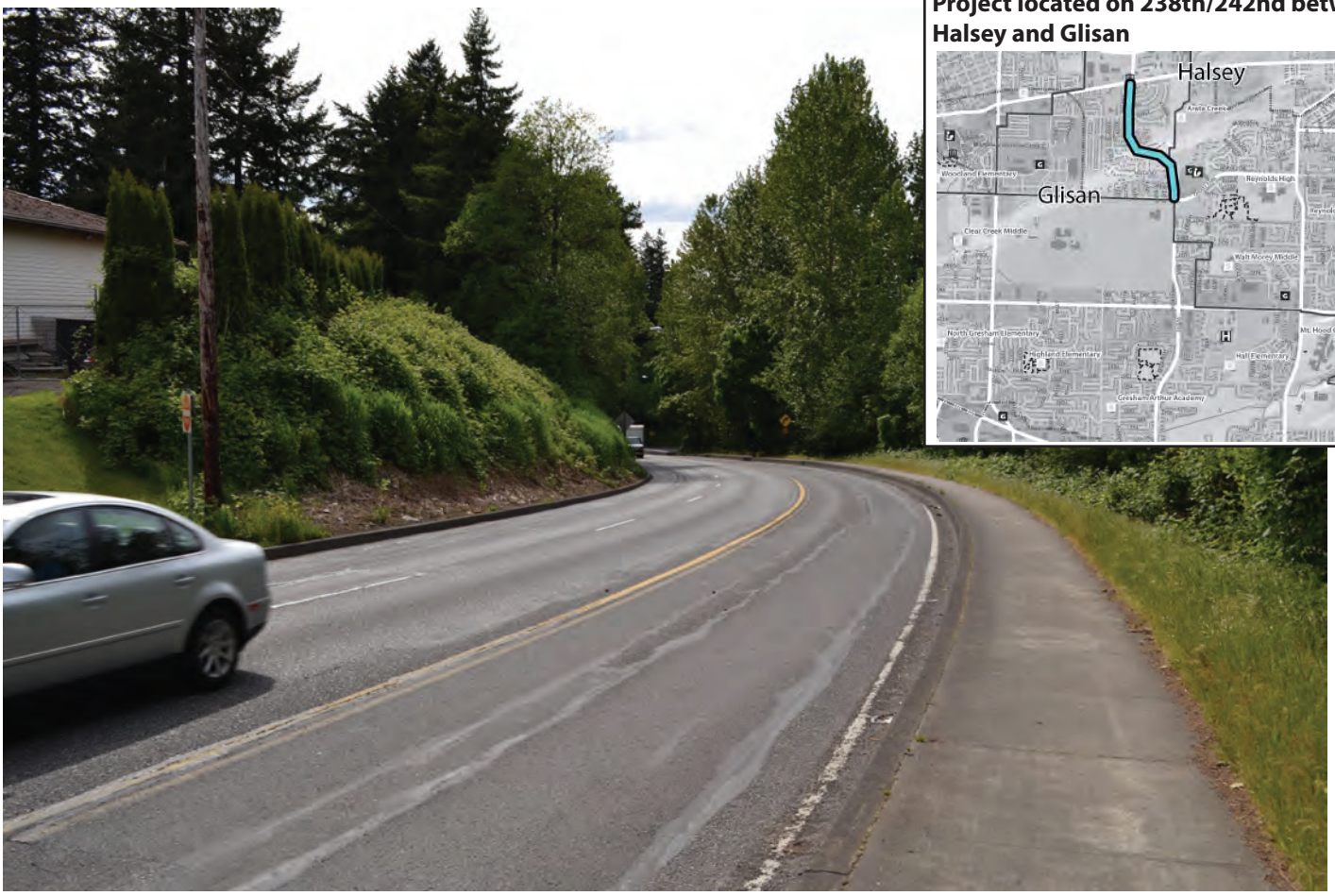
- The RTP freight network map (RTP figure 2.20) will be amended to reflect the proposed East Metro Connections Plan "freight grid", including main roadway routes and road connectors. Projects developed on the "freight grid" will be designed for safe freight movement.
- These changes will include updates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

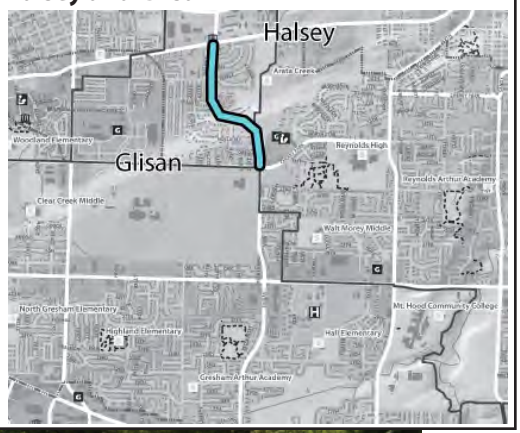
- The East Metro Connections Plan recommends adding a new proposed trail alignment to the regional trail plan. The Sandy River to Springwater Trail would connect the "Sandy River Connections Plan" Trail concept to Mt. Hood Community College, Springwater District, and Springwater Corridor Trail. Future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

Attachment 4.

Existing 238th - looking north

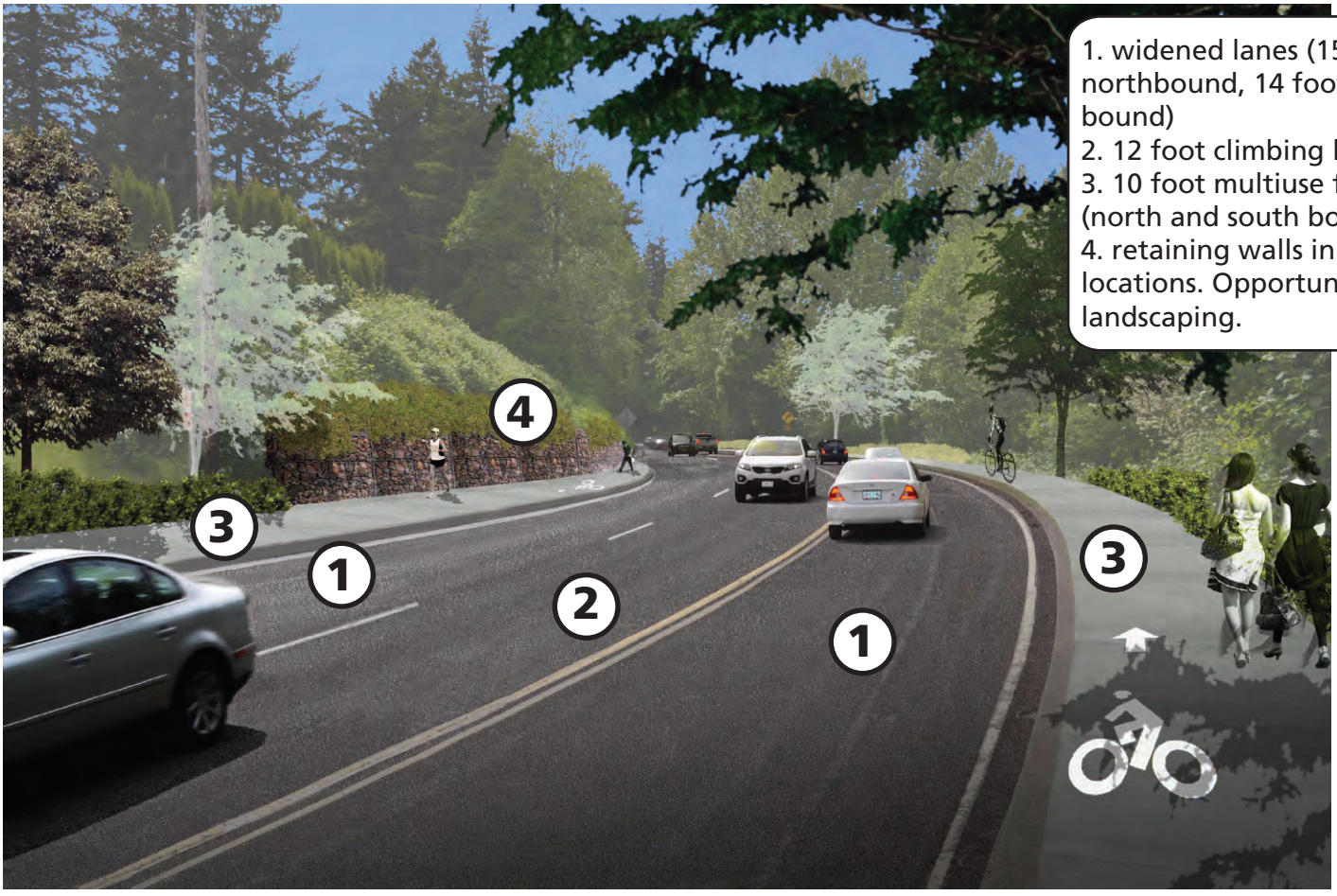


Project located on 238th/242nd between Halsey and Glisan



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.

Attachment 4.

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.

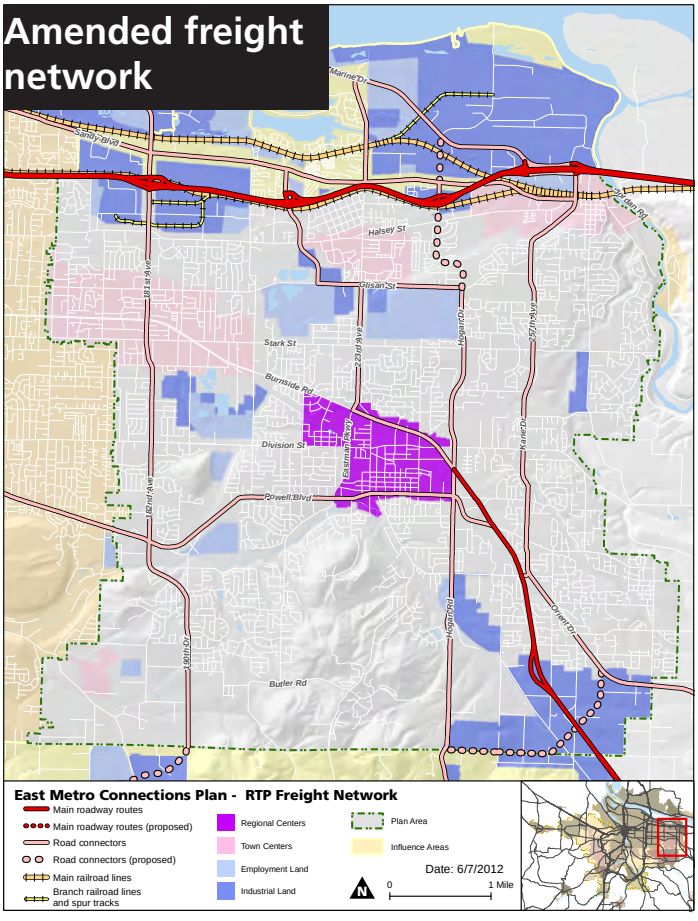
- Proposed freight network roads could see projects that increase their mobility (reducing stops/starts and travel time), that increase safety of other users and projects that accommodate trucks.

- 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.

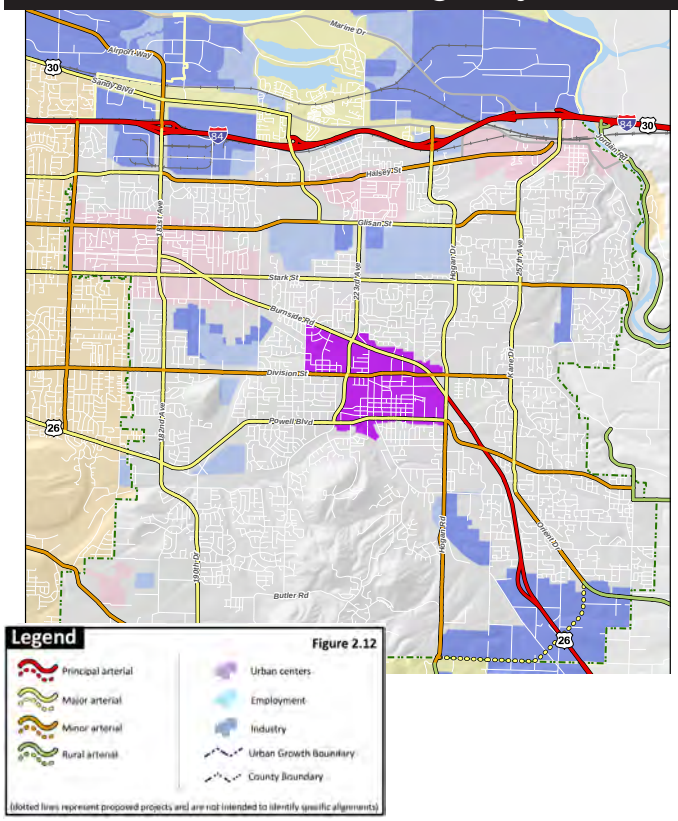
Updates to other RTP road networks

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).

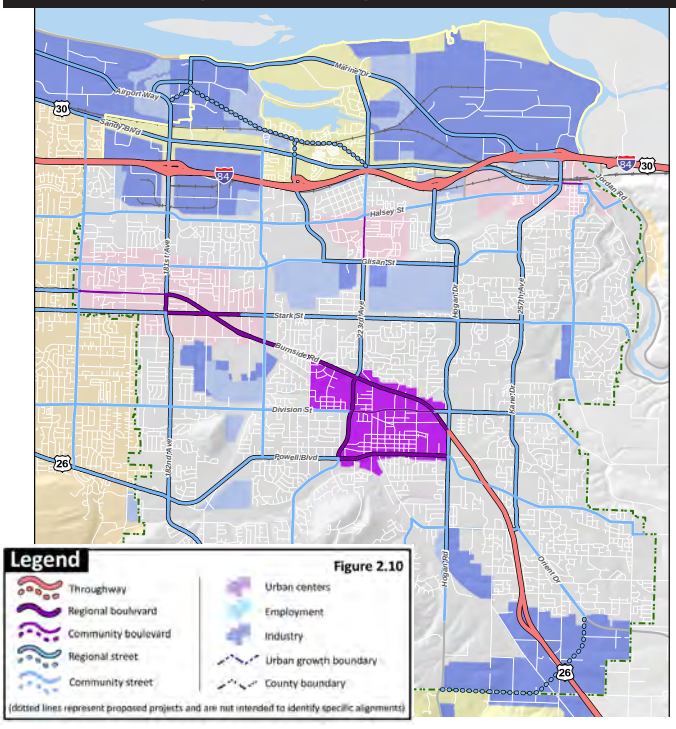
Amended freight network



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.

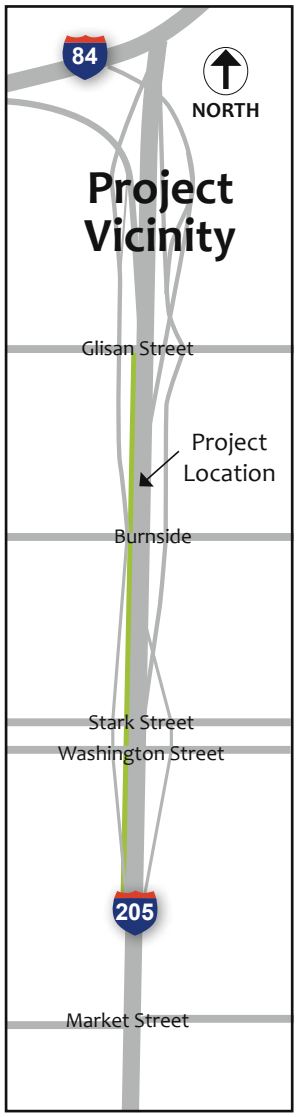
Please don't hesitate to contact me if you have questions or concerns about this request,
Cordially,

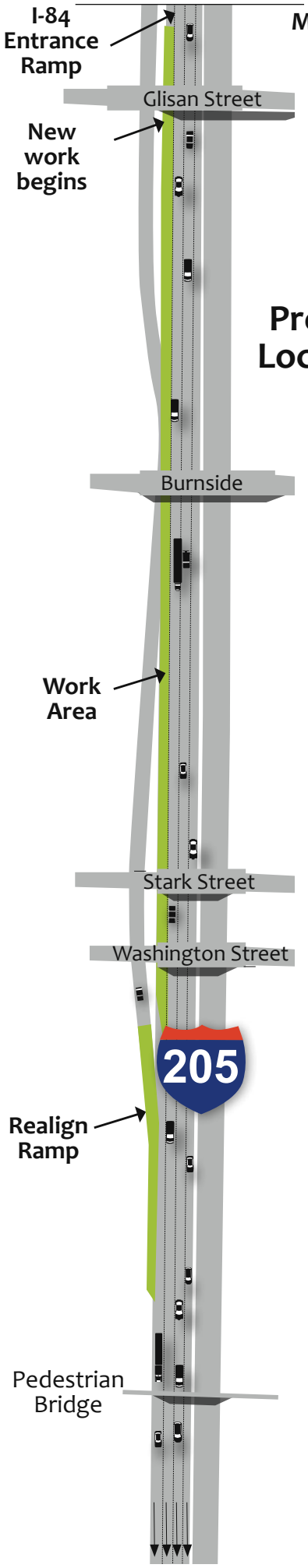
Andrew Johnson
Major Projects Manager
ODOT, Region 1

Attachments

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

Attachment 5.



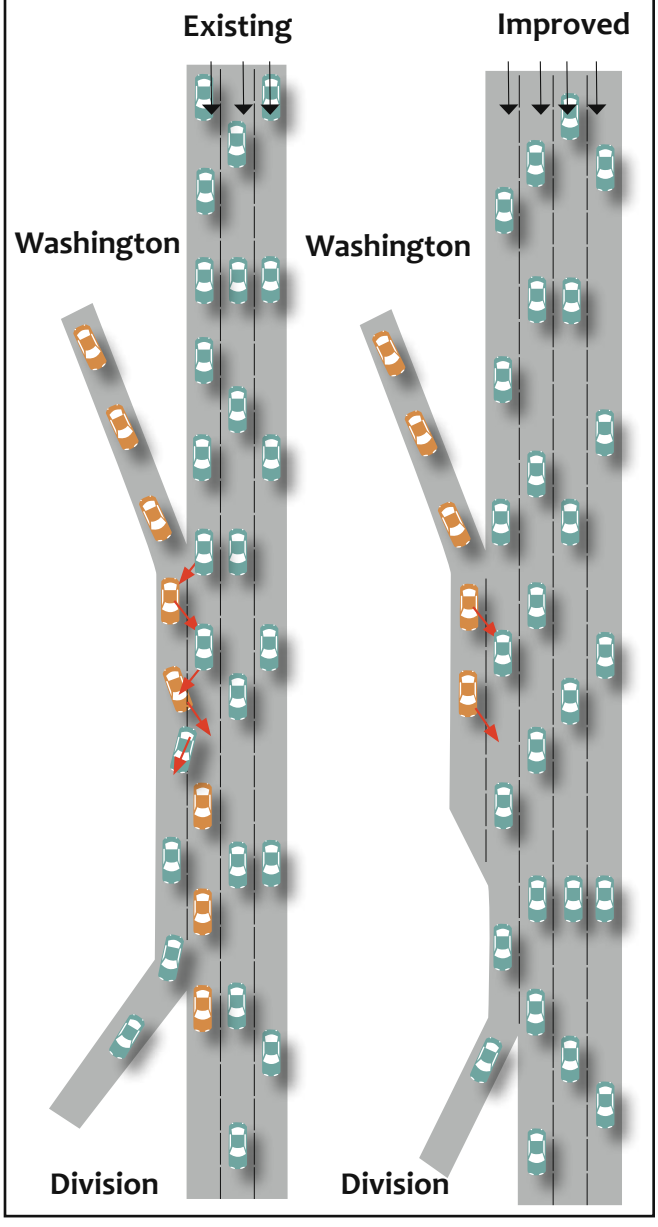


I-205 Southbound

I-84 to Stark/ Division Streets Auxiliary Lane

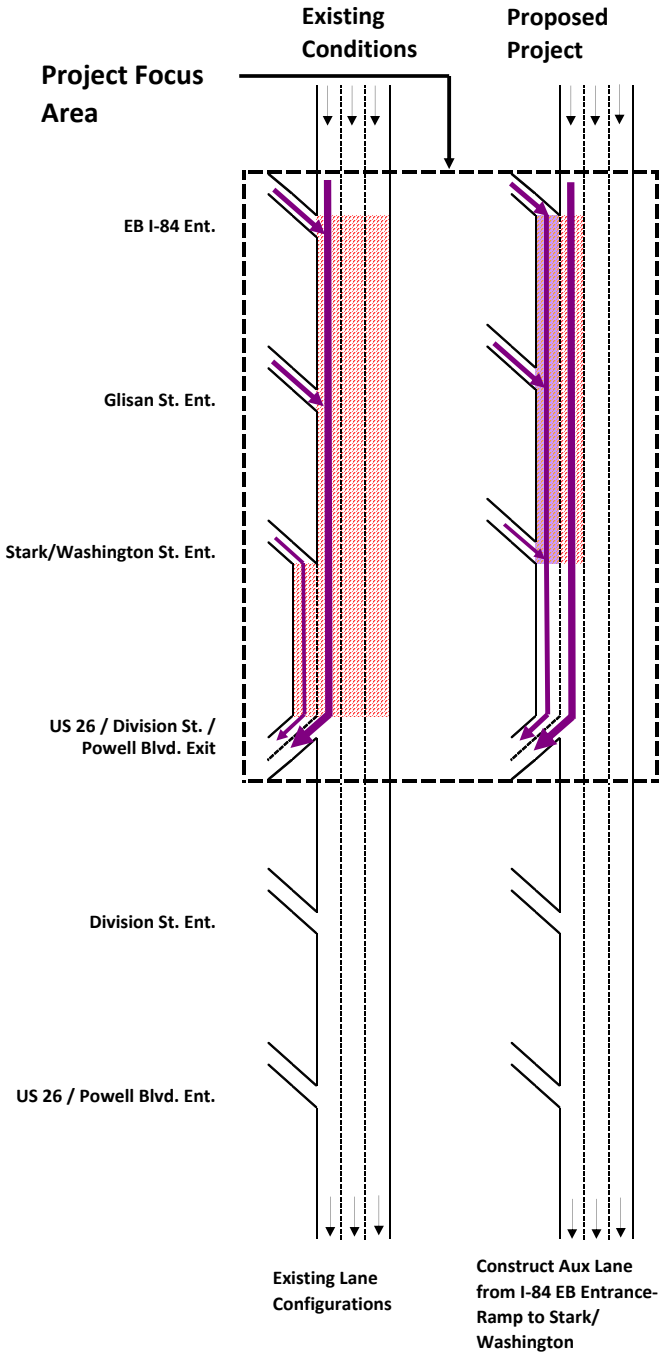
Oregon Department of Transportation

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.

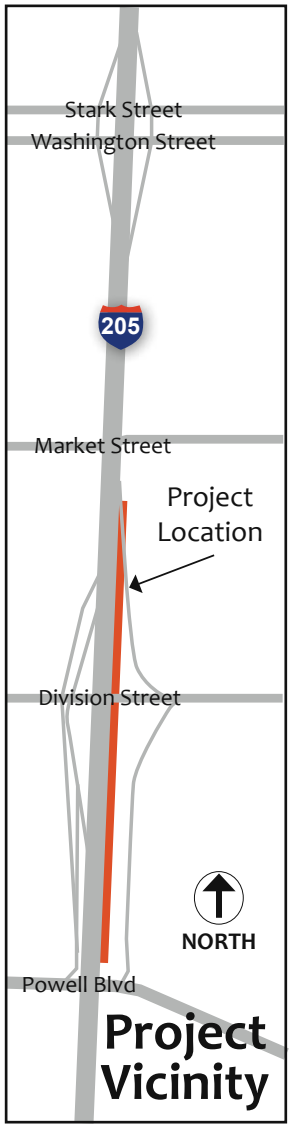
Project Estimated Cost:

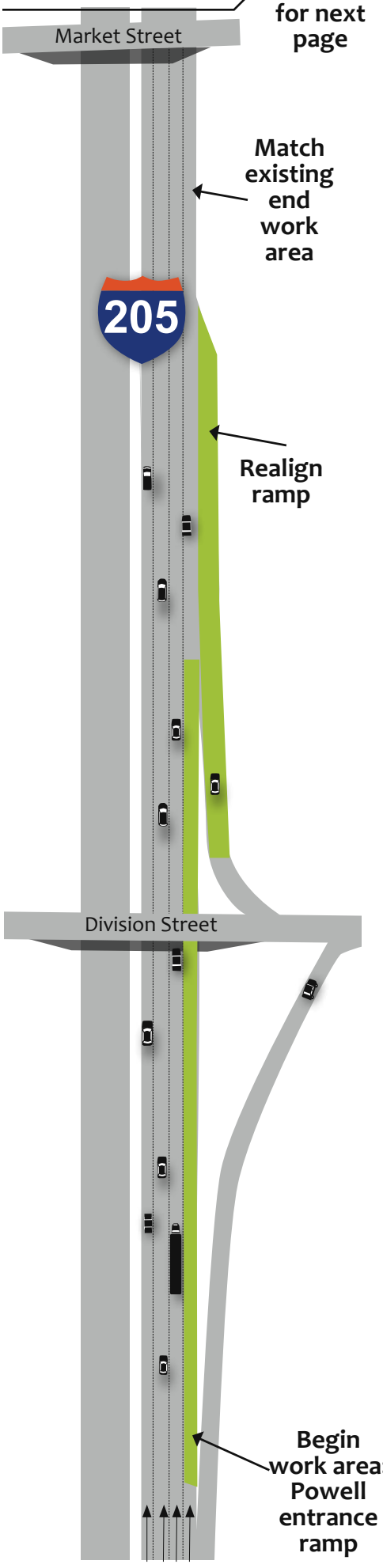
$7.0M - $8.5M

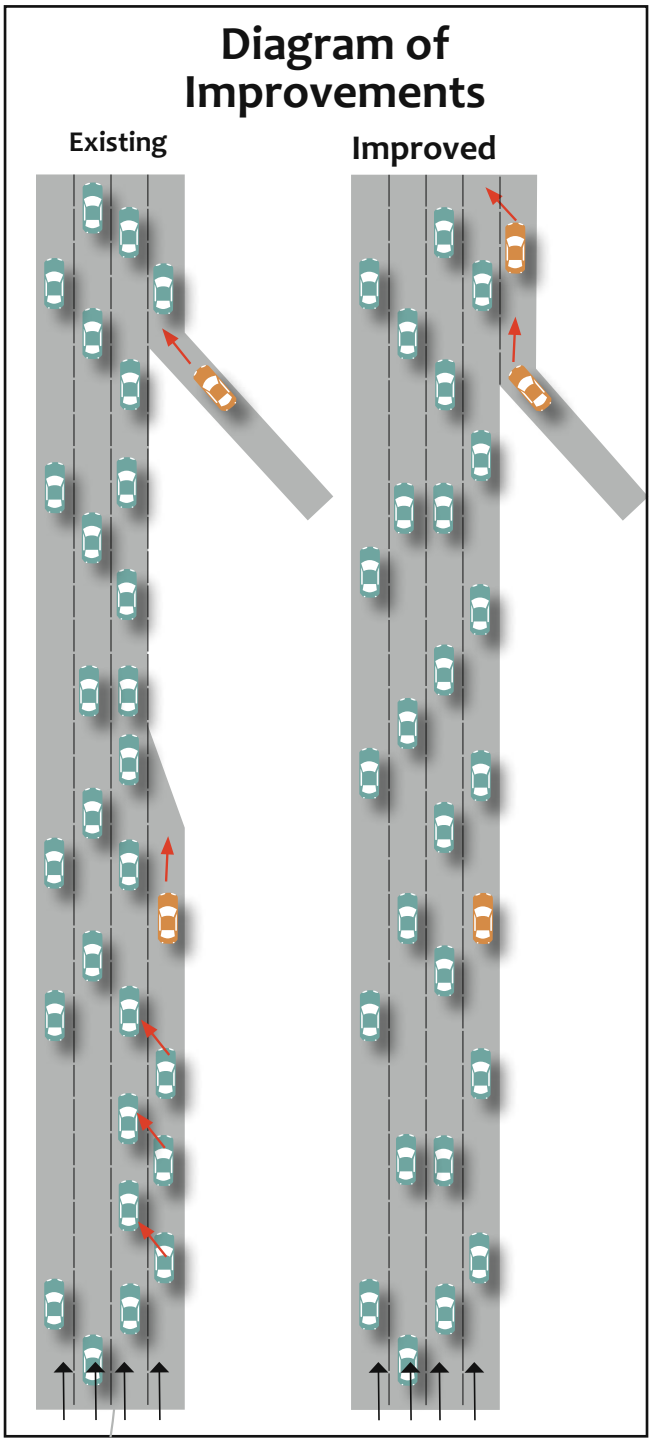
Oregon Department of Transportation

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

Attachment 5.





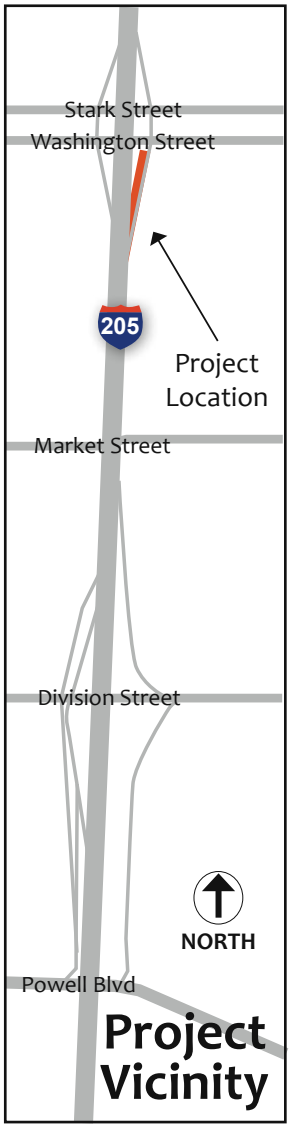


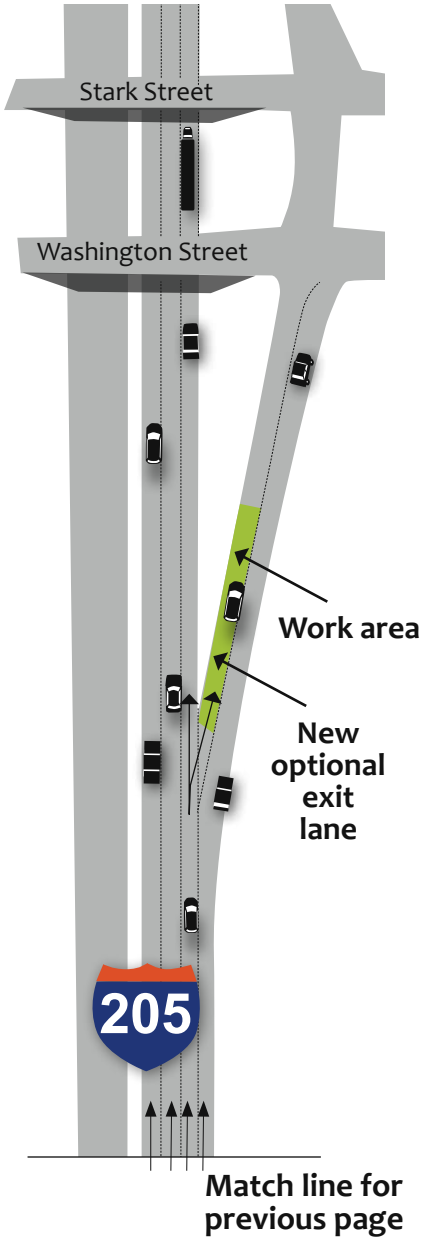
I-205 Northbound

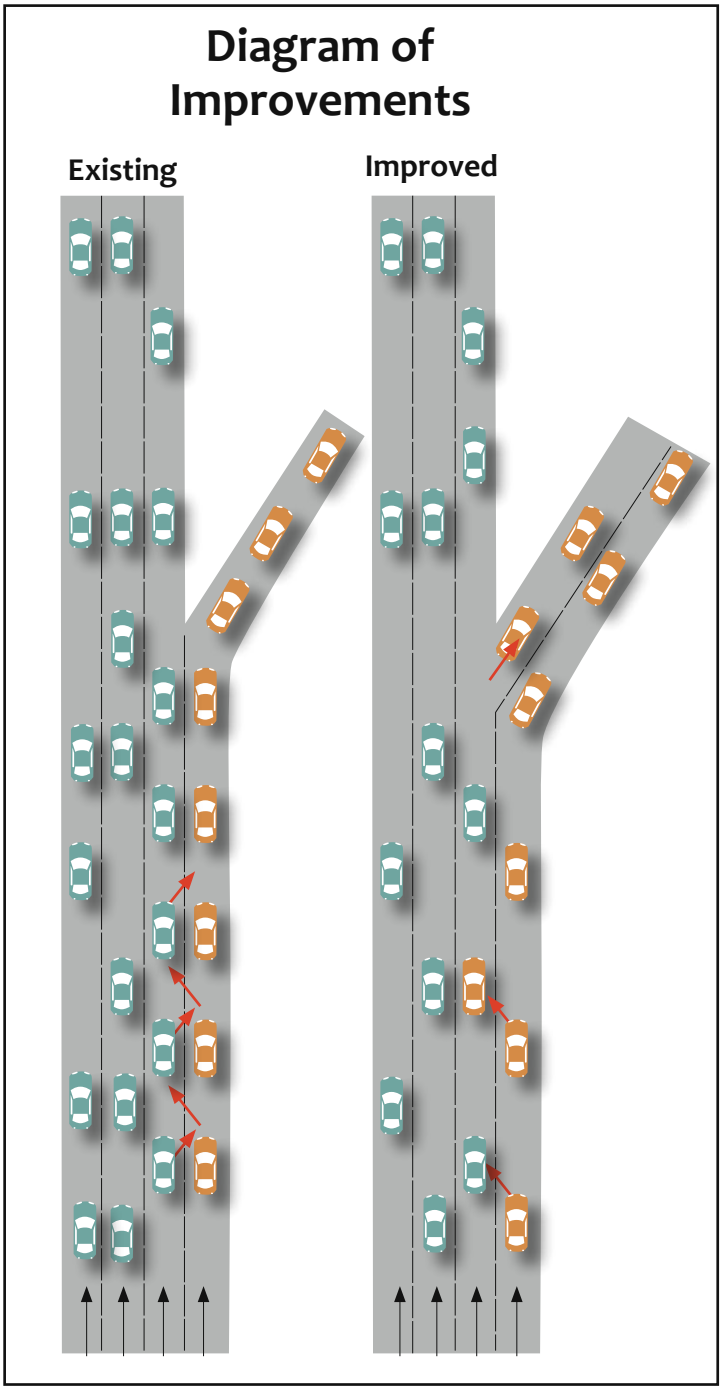
Powell Blvd to Washington St Auxiliary Lane

Oregon Department of Transportation

Attachment 5.







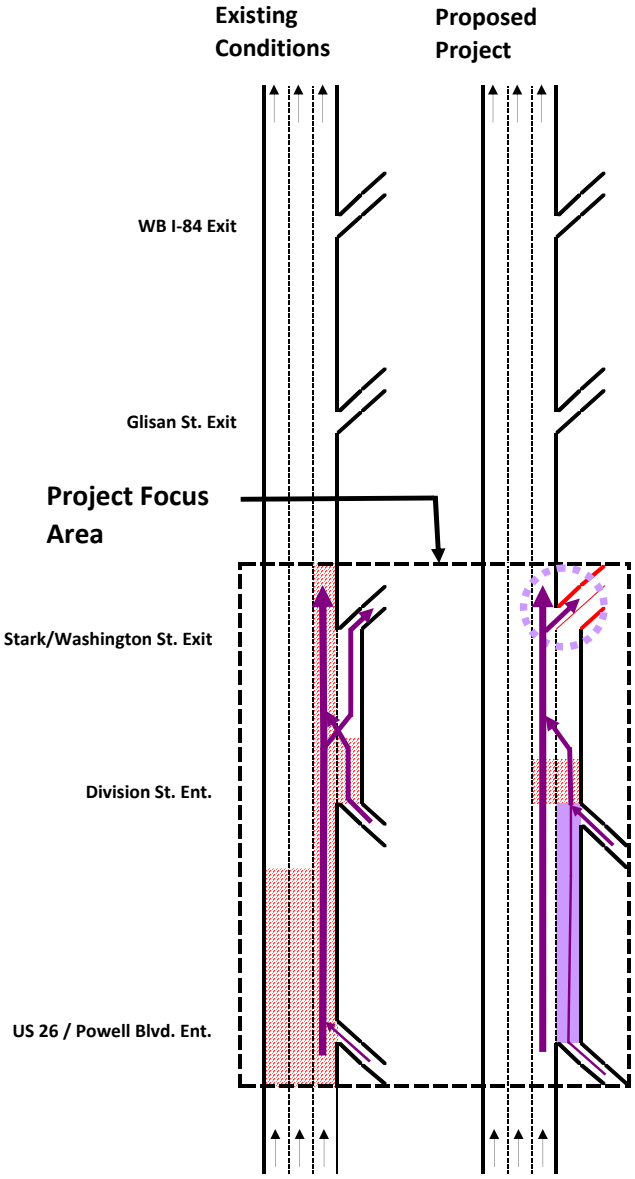
I-205 Northbound

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

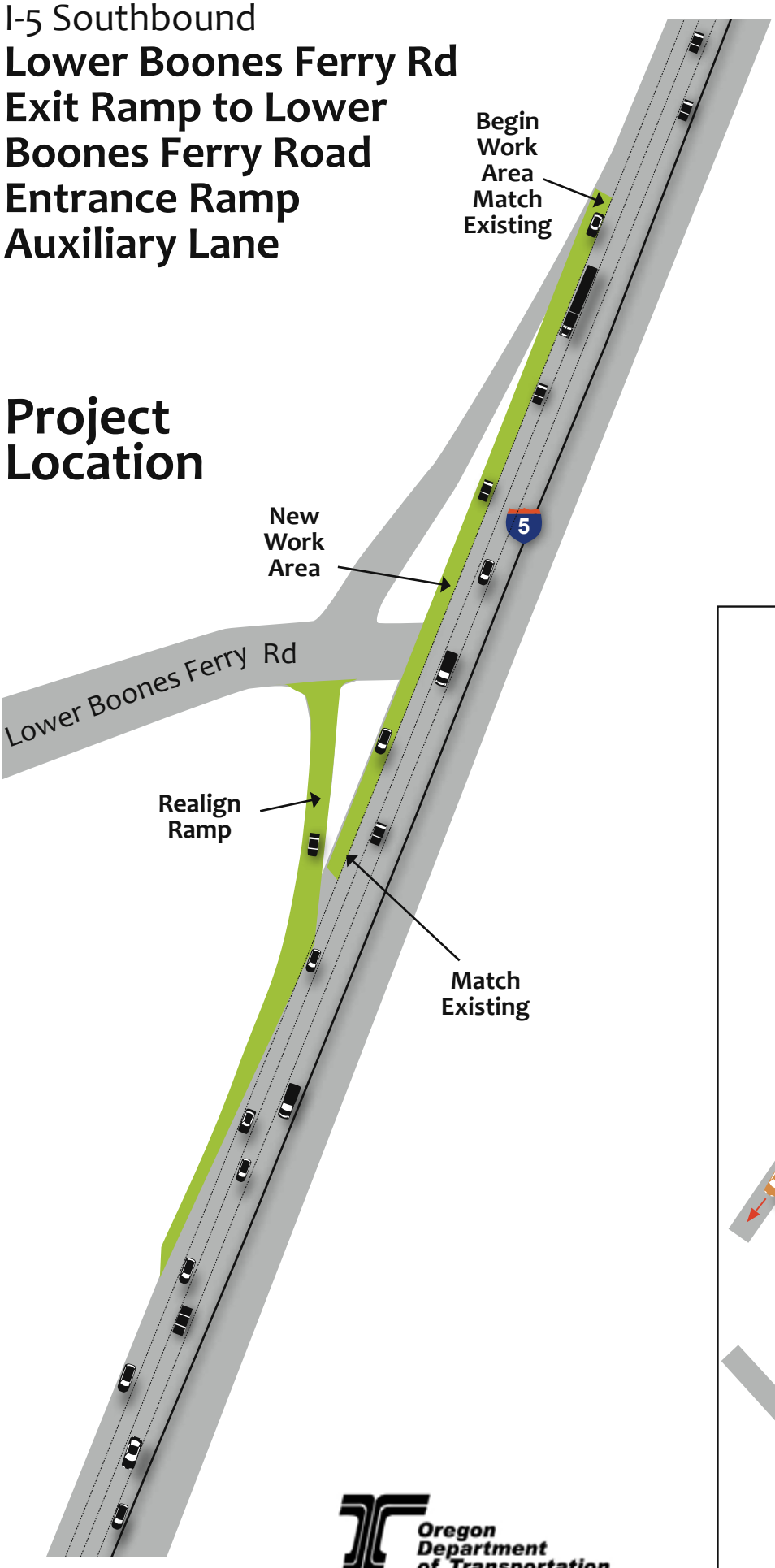
I-205 NB: US 26/Powell Blvd Entrance-ramp to Division Entrance-ramp Auxiliary Lane and Stark/Washington St. Exit-ramp

Attachment 5.

I-5 Southbound

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

Project Location



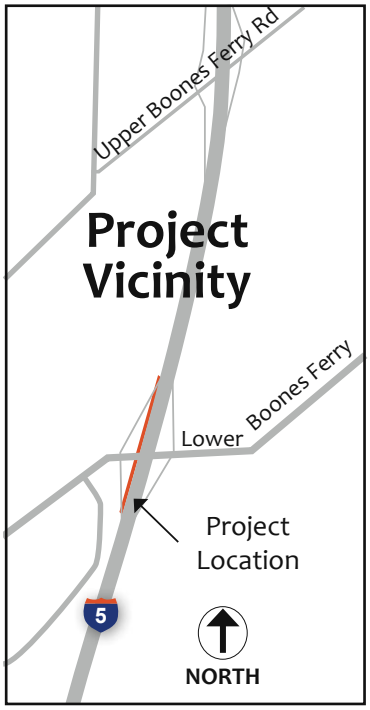
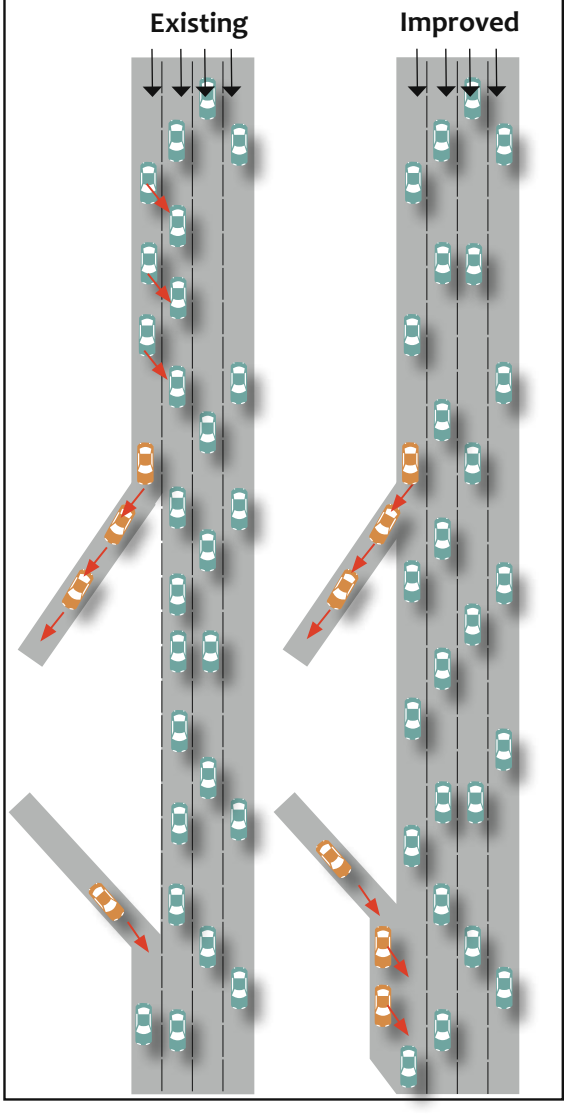


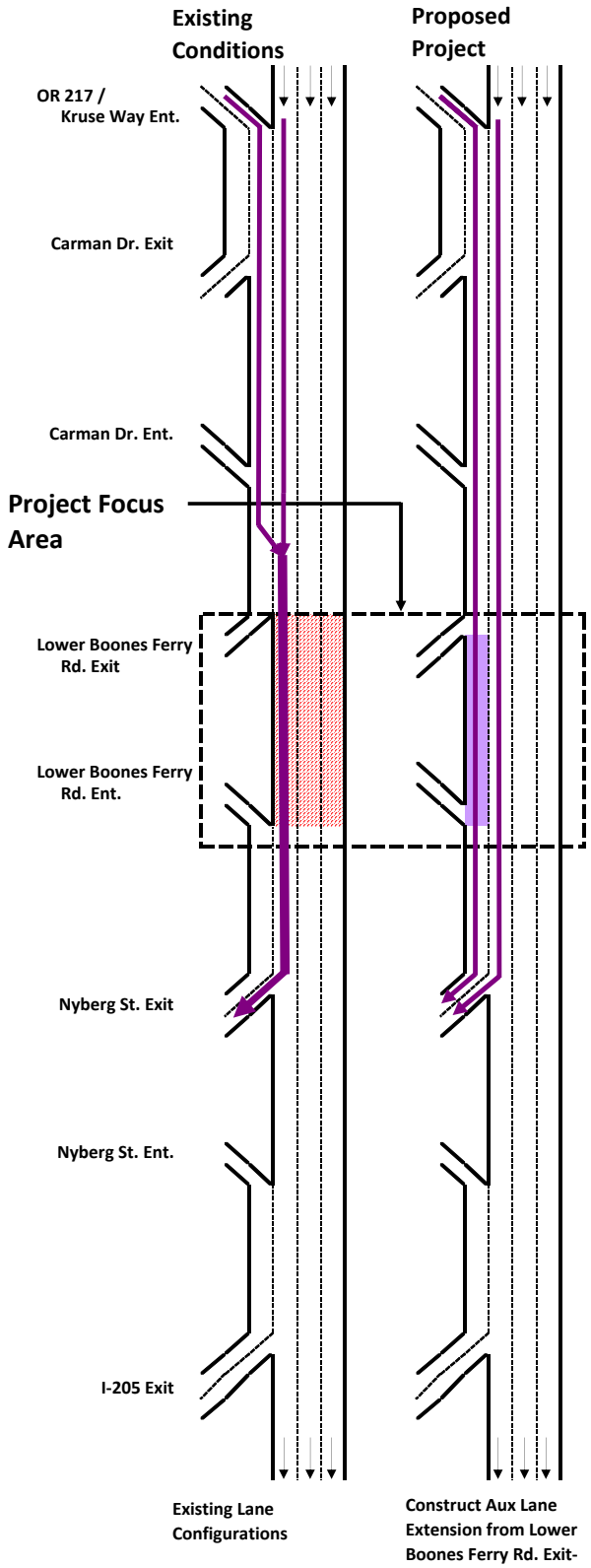
Diagram of Improvements



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

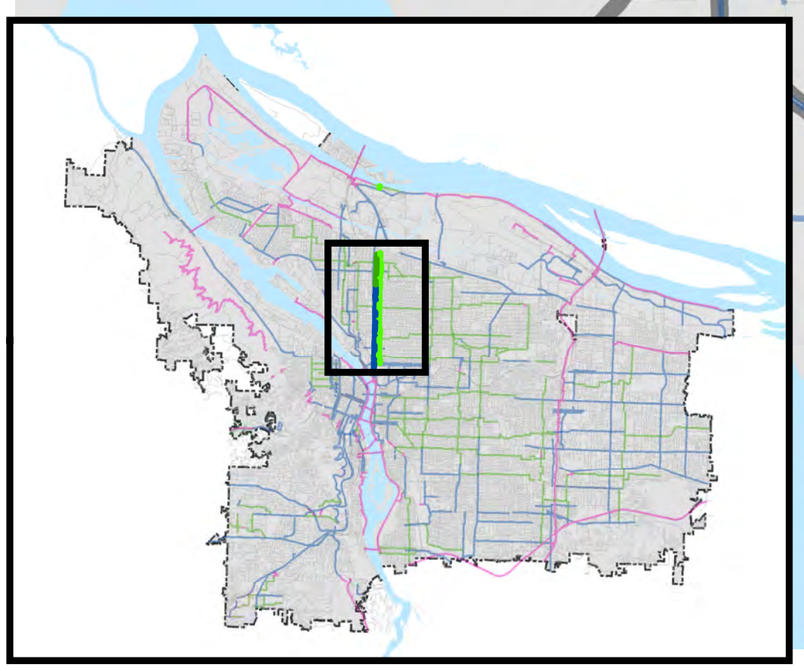
NE PRESCOTT ST

N Williams proposed Safety Improvements

NE FREMONT ST

NE BROADWAY

NE WEIDLER ST



Attachment 6.

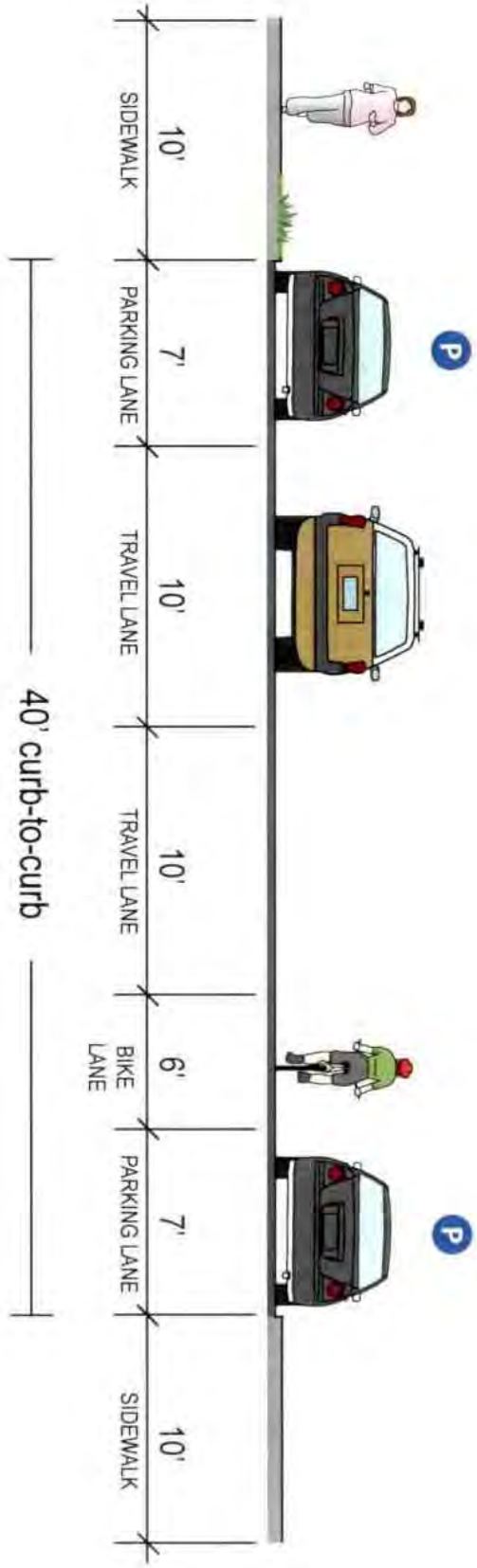
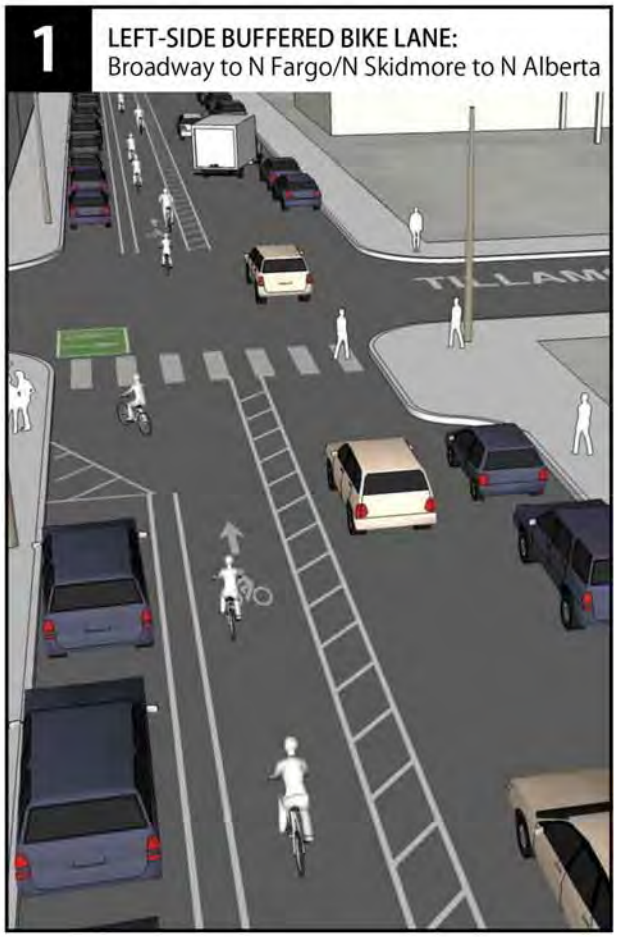
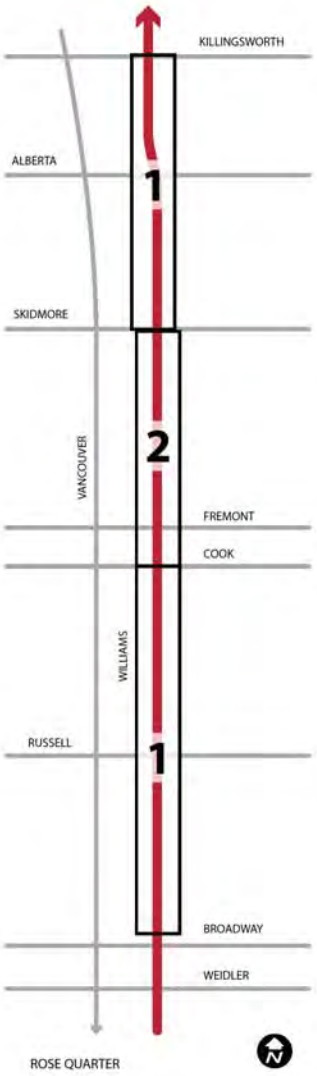
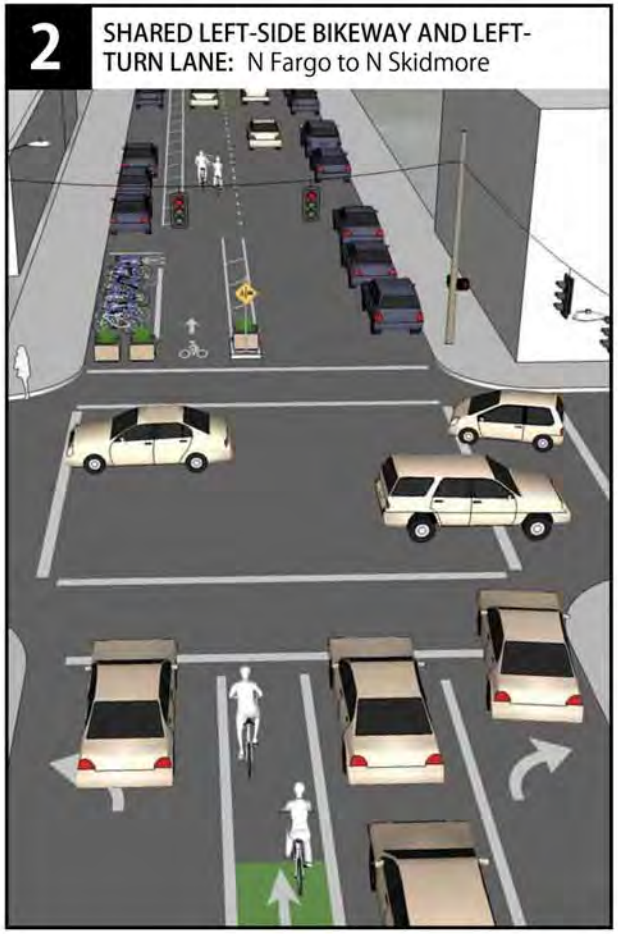


FIGURE 1: Existing street cross section between Hancock Street and Killingsworth Street

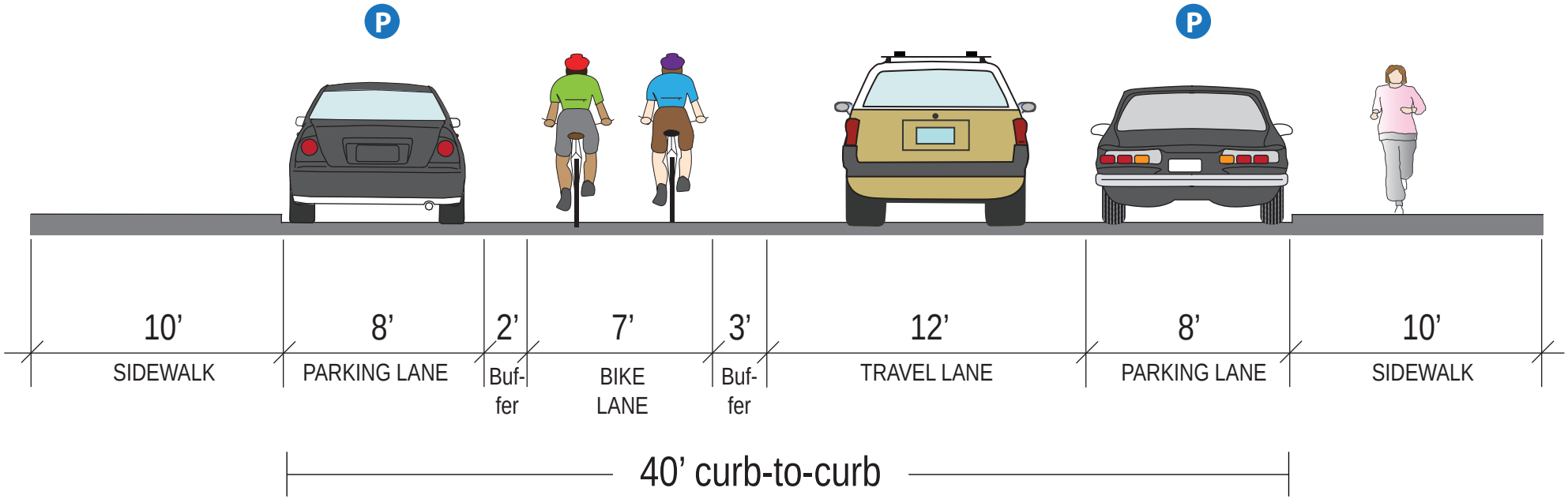
N Williams Traffic Safety and Operations Project
Typical Cross-sections







LEFT-SIDE BUFFERED BIKE LANE CROSS SECTION



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

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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

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.

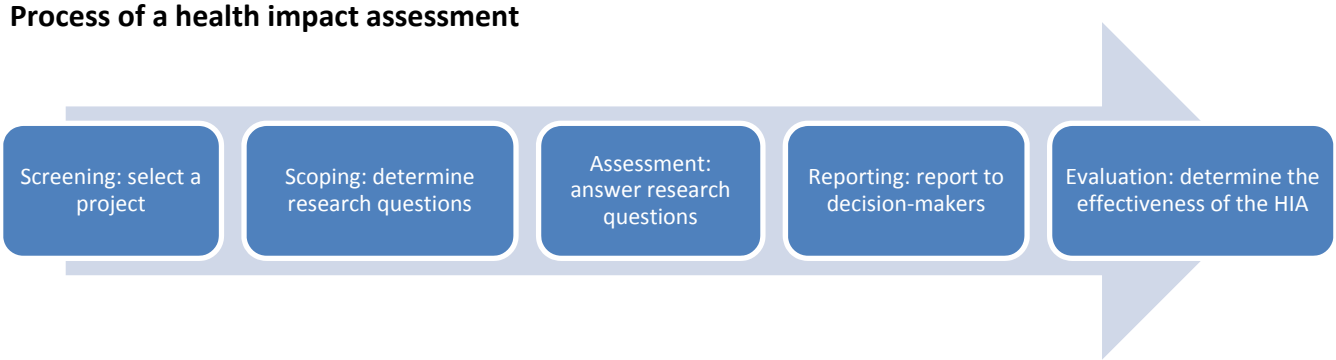
The key element that makes HIA different from traditional public health assessment is that its approach is prospective. Ideally, the health impacts of a proposal are assessed before a final decision is made, allowing the results of the HIA to be considered in the decision-making process. The ultimate 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



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.

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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.

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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Environmental Scorecard Workshop Report

A Summary of the Climate Smart Communities Scenarios Project Workshop of July 17, 2012

November 2012

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Equity and Environmental Justice Scorecard Workshop Report

A Summary of the Climate Smart Communities Scenarios Project Workshop of July 31, 2012

November 2012

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CLIMATE SMART COMMUNITIES SCENARIOS PROJECT



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.

MAKING A GREAT PLACE

Metro

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.

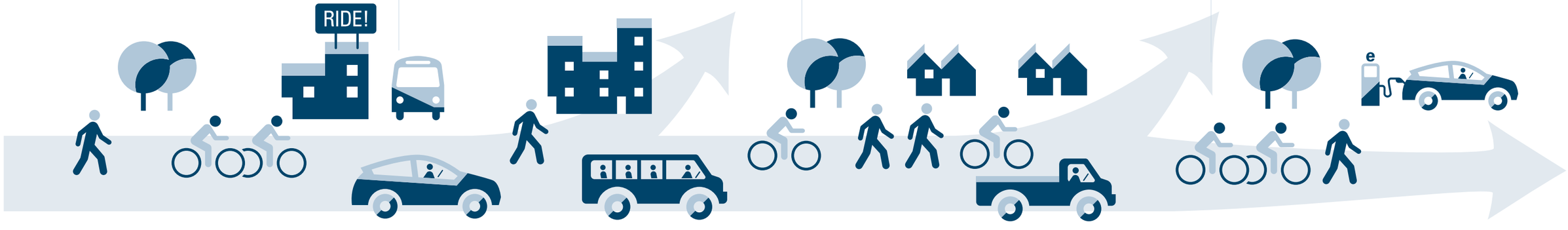
CLIMATE SMART COMMUNITIES SCENARIOS PROJECT TIMELINE

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





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.

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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.

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April XX, 2013

Congressman Earl Blumenauer
1111 Longworth House Office Building
Washington, DC 20515

Dear Congressman Blumenauer:

On behalf of the Joint Policy Advisory Committee on Transportation (JPACT) and the Metro Council, who as you know are jointly responsible for establishing and implementing transportation policy for the Portland metropolitan region, we applaud your leadership in proposing Discussion Draft legislation to establish a carbon tax. We endorse your efforts and support moving forward with the proposal.

In February of this year, JPACT and the Metro Council approved Resolution No. 13-4412 endorsing a regional position on federal transportation policy. Resolution 13-4412 includes the following policy position on a carbon tax:

> *"Congress should increase the gas tax in the short term and consider enacting a carbon tax in the long term to eliminate the need for a general fund subsidy and increase investment in the future economic prosperity of regions, states and the nation."*
>
> *"The gas and oil industry is coming to the conclusion that a stable, rational carbon tax is better than the current patchwork pattern developing globally. As Congress considers development of a carbon tax, recognition of the substantial contribution from the transportation sector must be reflected in the dedication of a portion of this resource back to transportation infrastructure. In addition, further efforts should be supported to implement less carbon intensive transportation options including alternative modes to reduce vehicle travel, increased use of electric and highly fuel efficient vehicles and reduced carbon content of fuels."*

Our region is engaged in a strategic planning process to identify how to meet state greenhouse gas reduction targets. Through our work to date, we have learned that local actions to implement our existing land use and transportation plans will result in a reduced level of vehicle travel, and will contribute greatly to meeting our emissions reductions targets. We have also recognized the importance of meeting greenhouse gas reduction targets in the context of a prosperous and livable region with the additional benefits of improving mobility and safety of the transportation system.

However, we have also learned that to meet our emissions reductions targets, local actions must be supported by federal actions. One important step, establishing more aggressive CAFÉ standards, is now being implemented. An important next step is a carbon tax that has the combined effect of incentivizing the reduced use of carbon and increasing funding for needed investments in the transportation system.

As your solicitation of comment notes, there are numerous unresolved questions, particularly about the carbon tax rate and how the revenues from such a tax would be used to benefit the American people. As resources to help answer these questions, please reference three useful, recent sources of information:

- The Northwest Economic Research Center (NERC) at Portland State University has released a very timely report examining the potential for a carbon tax in Oregon. It can be accessed at: http://www.pdx.edu/nerc/sites/www.pdx.edu.nerc/files/carbontax2013.pdf

- British Columbia has already implemented a carbon tax and has some very useful experience to share. Their information can be accessed at: http://www.fin.gov.bc.ca/tbs/tp/climate/carbon_tax.htm

- Research completed by Cambridge Systematics for the Oregon Statewide Transportation Strategy to provide a guide for addressing climate change in the transportation sector should be useful to help answer some of the policy questions that you have posed. In particular, Technical Appendix 6 itemizes the various costs of transportation (including the cost of the system itself, user costs and secondary cost to society), and recommends an approach to assigning that cost on a per mile, per gallon or per ton of CO_2 basis. The document can be accessed at: http://www.oregon.gov/ODOT/TD/OSTI/docs/sts/STS_TechAppendices.pdf

Regarding the use of the revenues from a carbon tax, it is important to note that the amount collected from transportation sources could be over 50% (according to the NERC report) and therefore a substantial portion of the collected revenues should be dedicated to transportation purposes, both as infrastructure investments and development of modes of transportation and improvements in technology that reduce carbon emissions. One concept to consider would be to first dedicate the amount needed to fully fund the Highway and Transit Trust Funds and eliminate the subsidy from the General Fund. An additional increment should be dedicated to the Trust Fund to significantly grow the elements of the transportation program that are intended to reduce carbon emissions (e.g. transit, active transportation and electric vehicle charging stations) or are neutral for carbon emissions (e.g. state of good repair, system management and safety). In this manner, Congress could adopt a more robust replacement for MAP-21 when it expires in less than two years based upon these increased revenues and only have to look to a gas tax increase for the remaining highway elements of the program.

Regarding the potential rate of a carbon tax, please consider the following:

- The rate should be set at an initial level sufficient to eliminate the General Fund subsidy to the Trust Fund and then phased in to grow the elements of the program that reduce or are neutral to carbon emissions through a replacement of MAP-21 that substantially increases funding.
- British Columbia implemented a carbon tax starting at $10 per ton, and then increased that rate by $5 per year until it reached a maximum of $30. Most of these revenues are rebated back to individuals and businesses through other tax cuts.
- The NERC report evaluated a carbon tax starting at $10, increasing by $10 per year to a maximum of $60.
- On page 163 of the ODOT document, the societal cost of greenhouse gas emissions contributing to climate change is called out as $30 per ton of CO_2 equivalent in 2010, increasing to $50 per ton in 2030. If your intent is to have the carbon tax reflect the full cost to society, this is a useful benchmark.

Regarding how a federal carbon tax should interact with state programs, like the gas tax and the income tax, there should be an allowance for implementing a carbon tax at the state and local level.

We appreciate the spirit of your solicitation of comments as a tool to raise the policy issues that need to be answered and begin crafting proposals to implement these details. Please accept these suggestions in that light.

Sincerely,

Carlotta Collette, Chair
Joint Policy Advisory Committee
On Transportation and Metro
Councilor, District 2

Tom Hughes, President
Metro Council

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Metro | *Memo*

Date: March 26, 2013

To: JPACT members and interested parties

From: Josh Naramore, Senior Transportation Planner

Subject: 2016-18 Regional Flexible Funds Allocation (RFFA) Project Applications

During fall of 2012, Metro staff worked with the JPACT to develop a policy framework to allocate approximately $95 million of federal transportation dollars to projects across the region. The 2016-18 RFFA process will fund projects in three steps. Step 1 includes Region wide programs. The Step 2 process includes community investments in both Active Transportation/Complete Streets and Green Economy/Freight Initiatives. Step 3 establishes a Regional Economic Opportunity Fund (REOF), structured on the federal TIGER process.

Applications for Steps 1, 2 and 3 were due to Metro on March 15. Table 1 lists all of the project applications that were received. The regional public comment process for all of the project applications is scheduled to run from May 8 – June 7. Comments will be distributed to the project applicants and applicants will need to respond and address comments as the projects move through the local evaluation and prioritization process.

All of the project applications will be evaluated and prioritized by each of the three county coordinating committees and the City of Portland during summer 2013 in collaboration with Metro. A local public input process will take place in all four sub areas during that same time prior to the recommendation to JPACT and Metro Council of the 100 percent project list.

Metro staff will be back at the May 9 JPACT meeting discuss the next steps of the public comment process and project evaluation process. If you have any questions or need any additional information, contact Josh Naramore at 503-797-1825 or joshua.naramore@oregonmetro.gov.

Table 1 - List of Regional Flexible Fund Applications

Nomination Framework	No.	Project	Sponsor	RFFA Competition Area	Requested Funds
Step One	1	Regional MPO Planning	Metro	Regionwide Program	$3,630,000
	2	Transportation System Management and Operations	Metro	Regionwide Program	$4,640,000
	3	Regional Travel Options	Metro	Regionwide Program	$7,010,000
	4	Transit-Oriented Development	Metro	Regionwide Program	$9,190,000
	5	Corridors and Systems Planning	Metro	Regionwide Program	$1,540,000
Step Two	1	Hogan Road: Powell Boulevard to Rugg Road	City of Gresham	Active Transportation and Complete Streets and Green Economy and Freight	$3,644,000
	2	Sandy Boulevard: NE 181st Avenue to East Gresham City Limits	City of Gresham	Active Transportation and Complete Streets and Green Economy and Freight	$3,644,000
	3	Canyon Road Streetscape and Safety Project	City of Beaverton	Active Transportation and Complete Streets	$3,525,000
	4	Downtown Accessibility Project	City of Hillsboro	Active Transportation and Complete Streets	$3,000,000
	5	BCT Crescent Connection: Westside Trail to SW Hocken Avenue	THPRD	Active Transportation and Complete Streets	$4,247,649
	6	Concept Development for Hwy 217 Overcrossing at Hunziker Street	City of Tigard	Green Economy and Freight	$800,000
	7	Fanno Creek Trail (Woodard Park to Bonita Rd and 85th Ave to Tualatin)	City of Tigard	Active Transportation and Complete Streets	$3,700,000
	8	Merlo/170th Complete Corridor Design Plan	Washington County	Active Transportation and Complete Streets	$445,000
	9	Pedestrian Arterial Crossings	Washington County	Active Transportation and Complete Streets	$3,585,000
	10	Silicon Forest Green Signals	Washington County	Green Economy and Freight	$1,895,700
	11	Tonquin Road/Grahams Ferry Road Intersection	Washington County	Green Economy and Freight	$983,480
	12	Clackamas County Regional ITS Project Phase 2B	Clackamas County	Green Economy and Freight	$1,233,967
	13	Jennings Ave: OR99E to Oatfield Rd Sidewalk and Bikelane	Clackamas County	Active Transportation and Complete Streets	$3,415,728
	14	Trolley Trail Historic Bridge Feasibility Study: Gladstone to Oregon City	City of Gladstone	Active Transportation and Complete Streets	$201,892
	15	SE 129th Avenue Bike Lane & Sidewalk Project	City of Happy Valley	Active Transportation and Complete Streets	$2,720,644
	16	Molalla Avenue - Beavercreek Rd. to HWY 213 (Oregon City)	City of Oregon City	Active Transportation and Complete Streets	$4,588,000
	17	OR99W: SW 19th Avenue to SW 26th Way (Portland) Barbur Boulearvd Demonstration Project	City of Portland	Active Transportation and Complete Streets	$2,000,000
	18	Portland Central City Multi-Modal Safety	City of Portland	Active Transportation and Complete Streets	$6,000,000
	19	Foster Road: SE Powell to SE 90th: Pedestrian/Bicycle/Safety Phase 2	City of Portland	Active Transportation and Complete Streets	$2,000,000
	20	Powell-Division Corridor Safety & Access to Transit	City of Portland	Active Transportation and Complete Streets	$2,918,020
	21	South Rivergate Freight Project	City of Portland	Green Economy and Freight	$3,772,000
	22	St Johns Truck Strategy Phase II	City of Portland	Active Transportation and Complete Streets	$2,927,813
	23	Southwest in Motion (SWIM)	City of Portland	Active Transportation and Complete Streets	$272,000
Step Three	1	NE 238th Dr: Halsey St to Glisan St Freight and Multimodal Project (PE Only)	Multnomah County	Regional Economic Opportunity Fund	$1,000,000
	2	Troutdale Industrial Access Project	Port of Portland	Regional Economic Opportunity Fund	$8,000,000
	3	US 26/Brookwood Interchange - Industrial Access Project	City of Hillsboro	Regional Economic Opportunity Fund	$8,267,000
	4	Sunrise System: Industrial Area Freight Access and Multimodal Project	Clackamas County	Regional Economic Opportunity Fund	$8,267,000
	5	East Portland Access to Employment and Education Multimodal Project	City of Portland	Regional Economic Opportunity Fund	$8,267,000

SPRING 2013

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Your spring guide to great places and green living

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Metro | *Making a great place*

Metro purchases 22 acres at Canemah Bluff, creating a 330-acre natural area above the Willamette River

The view upriver, atop Canemah Bluff

Walkers at Canemah Bluff's oak prairie in early summer

When out hiking or bird-watching, you might never guess that putting a natural area together can be a bit like assembling a jigsaw puzzle. It is. Land gets purchased and protected piece by piece, sometimes over many years, ultimately creating one cohesive, scenic picture.

And there's no better example than at Oregon City's Canemah Bluff Natural Area, where Metro filled a "hole" this winter, purchasing 22 acres that had split two large areas of voter-protected land into unconnected sections. With the new addition, Metro now owns a continuous expanse of 330 acres overlooking the Willamette River.

"There are very few places where you can get up on a cliff and see upstream and downstream, and in the spring, very few places that have so much camas lily that the place just turns blue," said Metro Councilor Carlotta Collette, who represents that part of the region.

Visitors can already explore more than 100 acres of the natural area, accessing it at Oregon City's Canemah Neighborhood Children's Park. Now, with the connecting purchase, Metro can plan for public access on an additional 200 acres.

Metro purchased the missing parcel at a foreclosure auction in January for $124,000, capping 17 years of work to protect Canemah Bluff. Land was acquired in 10 separate transactions as opportunities arose. The total investment, using funds from two natural areas bond measures, was just under $7 million. Purchases made with bond measure funds protect water quality, wildlife habitat and opportunities to enjoy nature. As with all purchases made with these funds, Metro bought land from willing sellers, at market value.

As Canemah Bluff Natural Area has grown, Metro has worked to welcome visitors. New signs at the park explain Canemah Bluff's history and habitats. A site plan developed with community input calls for more signage and trails, some trail closures, and a safety railing at the steep bluffs above the river.

> "I don't think there's any place in the Willamette River basin – and I'm thinking of the whole river basin – that is more spectacular."
>
> Metro Councilor Carlotta Collette

Last fall, Metro restored Oregon white oak habitat at the bluff by strategically removing trees that competed with the oaks for sunlight and food. The work was part of a statewide effort to reverse the decline of oak woodlands and savannas, which now occupy less than 10 percent of their historic range in the Willamette Valley.

With this gap now filled at Canemah Bluff, Collette said, "This creates a huge, connected piece of habitat."

Metro Councilor Carlotta Collette on a tour at Canemah Bluff Natural Area

Explore historic Canemah from river to bluff

The Canemah Bluff Natural Area, along with the streets of the Canemah Historic District below, make for an "oh-wow!" half day of exploration in one of Oregon's most intriguing locales.

Begin exploring Canemah Bluff at the Canemah Neighborhood Children's Park, 815 Fourth Ave., Oregon City. Here, children once attended Canemah School. It closed in 1928 when the town of Canemah was annexed by Oregon City.

Signs around the park tell of the Clackamas people who once lived here, and of their fishing traditions at Willamette Falls. Beyond the park, trails continue along the bluff into the natural area. This prairie habitat was once the Rakel property, a farm with two springs that were Canemah's drinking water source until 1928. From March to July, the native wildflower show is at its peak.

The land on the bluff was logged long ago, primarily for steamboat fuel but also for construction of homes and boats, many built in Canemah. On the prairie are spirea and sedges – evidence of vernal pools, water that perches on the impermeable basalt, forming shallow winter pools that persist into early summer.

After traveling along the bluff top with views over the Willamette and across to West Linn, the trail heads away from the river. From here you can explore Cemetery Road, which leads to the private Canemah Cemetery; its graves date to 1864. More trails lead into the natural area's diverse habitats, including a mixed conifer-hardwood forest, ash forested woodlands and Oregon white oak woodlands.

Good to know

As with any oak habitat, poison oak is present at Canemah Bluff. Even when leaves are absent, its oils can irritate the skin. Avoid walking off-trail and wear long pants. Except for Cemetery Road, which is on private property, dogs are not allowed at Canemah Bluff Natural Area.

Mother's Day at Canemah

Explore the views and wildflowers of Canemah Bluff this Mother's Day, May 12 with Metro naturalist Dan Daly. See page 6 for details.

Camas (Camassia). Camas bulbs were an important food of local Native Americans. Many traditional camas gathering sites have been converted to agriculture.

To learn more about Canemah Bluff Natural Area, visit **www.oregonmetro.gov/canemah**.

To learn more about the Canemah Historic District, visit **www.orcity.org/planning/canemah-national-register-district**.

Willamette Falls, looking toward Canemah. These falls were a major trade site for Native Americans throughout the Northwest.

Canemah: the backstory

Canemah comes from "canim" or "canoe" in Chinook jargon. Situated just upstream of massive Willamette Falls, the riverside area of Canemah is where hundreds of generations of Native Americans beached their canoes to portage around the falls.

Settlers in Canemah, beginning in 1844 with Absalom Hedges, built warehouses and offered stevedoring and other services to move freight and steamboat passengers around the falls. The area along the river below Canemah Bluff soon became a shipbuilding and transportation center, with steamboats running between Canemah and upstream farming communities. Names of the earliest settlers, including Absalom Hedges, live on in Canemah street names.

The boom ended in 1873 when the Willamette Falls Locks were built across the river; no longer did freight have to be unloaded upstream and reloaded downstream of the falls. Canemah's heyday was past. What's left today is a gorgeous slice of river, old streets, blufftop views and rare habitats.

Metro grant helps launch Adelante Conservación

Habitat restoration, stream and floodplain improvements, and conservation education opportunities are taking shape across the region with support from Metro's Nature in Neighborhoods restoration and enhancement grants. Metro is especially interested in projects like Adelante Conservación that foster innovative partnerships and serve low-income communities and communities of color.

Here, Tualatin Riverkeepers executive director Monica Smiley reflects on planting the seeds of Adelante Conservación – a new collaboration between Adelante Mujeres and Tualatin Riverkeepers that grew from a Metro grant.

Four women gathered around a table in autumn 2012, two Spanish speakers and two English speakers trying to say "Conservación" like it's a tongue twister. They were meeting for the first time to create Adelante Conservación, a program to blend nature awareness skills with education opportunities for Latinas and migrant youth.

For 10 years, Adelante Mujeres, a Forest Grove nonprofit, has offered education and empowerment programs for Latinas and their children, including English language, kindergarten readiness and leadership programs for middle-school girls.

When Adelante Mujeres wanted to add a conservation component to its education programs, they called their longtime partners at Tualatin Riverkeepers. While Adelante Mujeres has participated in Tualatin Riverkeepers' environmental education and outdoor recreation programs for 10 years, last autumn's meeting marked the first time the two organizations collaborated to build a program to meet their common goals.

Each organization can be classified differently – Tualatin Riverkeepers as environmental, Adelante Mujeres as human services. But both need each other to accomplish their shared values and missions: healthy water and healthy people. In addition to the Metro grant to help launch Adelante Conservación, this partnership has also been fostered by the Center for Diversity and the Environment, a national organization to mentor racially and ethnically diverse leaders in the U.S. environmental movement.

Learn more:
www.adelantemujeres.org
www.tualatinriverkeepers.org
www.oregonmetro.gov/grants

Clear Creek Canyon natural area gets a boost from neighboring school kids

In the city, good neighbors invite you to their holiday party, lend you a tool or bring in the mail while you're on vacation. At Metro's Clear Creek Canyon natural area near Carver, neighborly kindness recently took a different form. In February, students from Springwater Environmental Sciences School helped restore the 580-acre natural area next door. They planted 1,140 Douglas fir trees and 1,000 Oregon grape shrubs – a big boost for Clear Creek. In exchange for their frequent volunteer work, the students benefit from an outdoor learning laboratory that has been protected by two voter-approved natural areas bond measures. Clear Creek is home to Coho and Chinook salmon, deer, coyote, beavers, otters and more.

Learn about Clear Creek Canyon and other Metro natural areas:
http://ournature.oregonmetro.gov/

Spring calendar of Metro events

Family Nature Explorers: See what's out there!

Family Nature Explorers is a series of spring-through-fall field trips in Metro's regional parks and natural areas. It is designed for families with children ages 4 and older.

The outings are all about nature, learning and community. Kids meet other kids who like to get down to an eye-level, hands-on relationship with bugs, plants, birds, animal tracks or mushrooms.

Outings are about three hours, one Saturday or Sunday per month. Each covers one or two topics, plus any nature experience that presents itself that day. Many trips are to areas that are not yet open to the public. Some walking is off-trail. Metro supplies equipment and first aid supplies. See the calendar for details on upcoming outings.

Wetlands bird walks
9 to 11:30 a.m. Saturdays, April 13 and June 22
During spring about 30 bird species migrate through Smith and Bybee Wetlands or join year-round residents for nesting. From April through June, migration and nesting peak. Learn to identify birds by sight and song with Metro naturalist James Davis. Bring binoculars or borrow a pair on site. Suitable for ages 10 and older. Registration and payment of $6 per adult or $11 per household required in advance; see page 7.

Wetlands painted turtle walks
1 to 2:30 p.m. Saturdays, April 13 and June 22
Smith and Bybee Wetlands is home to one of the state's largest Western painted turtle populations. See these beautiful reptiles with the help of Metro naturalist James Davis. Take a close look with a telescope, learn about the turtles' natural history and examine turtle shells found in the wetlands. Suitable for ages 5 and older. Registration and payment of $6 per adult or $11 per household required in advance; see page 7.

Family Nature Explorers – Mount Talbert Nature Park
10 a.m. to 1 p.m. Saturday, April 20
Travel to a lava butte near, of all things, Clackamas Town Center! Mount Talbert's forest habitats are spectacular with wildflowers like fawn lily and blue iris. Join Metro naturalist James Davis at this beautiful island of nature at a time when bird activity hits a peak. Mount Talbert also offers good animal tracking. Suitable for ages 4 and older. Registration and payment of $11 per family required in advance; see page 7.

Polar bear talk
7 to 8 p.m., Thursday, April 25
In this after-hours talk at the Oregon Zoo, learn about maternal den studies from world-renowned polar bear researcher Dr. Tom Smith of Brigham Young University and Polar Bears International. Suitable for all ages. $10 or $8 for zoo members and students with valid ID. Optional drop-off class for ages 6 to 12 for additional fee. Register at oregonzoo.org.

Spring bird walks on Cooper Mountain
8:30 to 11:30 a.m. Saturdays, April 27 and June 1
Spring is the easiest time to see and identify birds of Cooper Mountain Nature Park: they are in their best breeding plumage and singing up a storm. Beginning and intermediate birders, join Metro naturalist and expert birder James Davis. Bring binoculars or borrow a pair on site. Dress for standing on an open hilltop (think: cold wind). Suitable for ages 10 and older. Registration and payment of $10 required in advance; call 503-629-6350. *Metro with Tualatin Hills Park & Recreation District*

Looking for lazulis and lilies
10:30 a.m. to 12:30 p.m. Sunday, April 28
At Cooper Mountain Nature Park, controlled burns mean a proliferation of native wildflowers. Explore the mountain's flowers with Metro naturalist and animal tracker Deb Scrivens. Search for the elusive lazuli bunting or Western bluebird. Suitable for all ages. Terrain is somewhat steep in places. Children must be accompanied by a registered adult. Registration and payment of $10 required in advance; call 503-629-6350. *Metro with Tualatin Hills Park & Recreation District*

Family Nature Explorers – Clear Creek Canyon
10 a.m. to 1 p.m. Saturday, May 4
Explore this 580-acre jewel "behind the scenes" with a Metro naturalist. Search its prairies for interesting plants and bugs and look for river otter or wild salmon in Clear Creek. Some off-trail walking. Suitable for ages 4 and older. Registration and payment of $11 per family required in advance; see page 7.

Blooms for beginners
5:30 to 6:30 p.m. Monday, May 6
Would you like to be able to identify common trees and shrubs? Join Metro naturalist Deb Scrivens to tour the Oregon Zoo after hours and get hands-on with native plants. Ride MAX to the Washington Park station, or park at the zoo for $4. Suitable for all ages. Registration and payment of $6 per person or $11 per household required in advance; see page 7.

Mother's Day birds and blooms – Oxbow Regional Park
1 to 3 p.m. Sunday, May 12
Instead of taking flowers to your mom, why not take her to the wildflowers? Hike with Metro naturalist Deb Scrivens through Oxbow's forests to see and learn about common woodland wildflowers. Terrain is steep in places. Suitable for all ages. Children must be accompanied by a registered adult. $5 per vehicle ($7 per bus) fee. Registration and payment of $6 per person or $11 per household required in advance; see page 7.

Mother's Day birds and blooms – Canemah Bluff Natural Area

1 to 3 p.m. Sunday, May 12

Walk with Metro naturalist Dan Daly and learn about common wildflowers. Enjoy the serenade of nesting songbirds and views of the Willamette River and historic Canemah Cemetery. Bring binoculars or borrow a pair on site. The walk covers 2 miles over uneven trails, mostly flat with some inclines. Suitable for ages 6 and older. Children must be accompanied by a registered adult. Registration and payment of $6 per person or $11 per household required in advance; see page 7.

Sandy River Spey Clave

All day Friday to Sunday, May 17, 18 and 19

Come to Oxbow Regional Park for the largest gathering of anglers devoted to two-hand fly rod fishing in the western hemisphere. Enroll in the free Spey casting college. View on-the-water demonstrations. Meet Northwest fly fishing legends. Free with a $5 per vehicle ($7 per bus) fee. Want to camp at Oxbow? Visit www.oregonmetro.com/oxbow for details about online reservations. Pets and alcohol are not allowed in Metro parks or natural areas. For information, visit www.flyfishusa.com/spey-clave. *Fly Fishing Shop with Metro*

Animal tracking workshop

10 a.m. to 1:30 p.m. Saturday, May 25

Oxbow Regional Park is a tracker's paradise in spring, when beavers, otters, fox, mink, mice and deer leave their stories in the sand. With practice, beginners can learn to read the ground like an open book. Seasoned tracker Terry Kem covers basics of track identification and awareness skills needed to watch wildlife at close range. Suitable for all ages. $5 per vehicle ($7 per bus) fee. Registration and payment of $11 per adult required in advance; see page 7.

Drop-in family fun at Blue Lake Natural Discovery Garden

1 to 5 p.m. Fridays, Saturdays and Sundays, May 31 through Sept. 1

Gather ideas to make your yard pesticide-free, safe and fun for kids, songbirds, lakes and streams. All ages can explore an active worm bin, dig for "fossils," discover, rub and sniff plants, find the softest leaves, and see what wildlife have to say about natural gardening. Come for the garden and stay to enjoy the park's many recreational activities. Free with $5 per vehicle ($7 per bus) fee, free for bicycles and pedestrians.

Backyard Makeover exhibit at the Oregon Zoo

10 a.m. to 2 p.m. Fridays through Mondays, May 31 through Sept. 30

Enjoy family activities in a wildlife-friendly garden tucked between the Insect Zoo and Lorikeet Landing, and learn how to cultivate native habitat in your own backyard with guidance from Oregon State University Extension Service Master Gardeners. Kids can dig in a worm bin and play games. Activity books and crayons are available when the exhibit is staffed, along with free publications that help you protect kids, pets, water and wildlife while growing a healthy and abundant yard. Free with zoo admission. Ride MAX to the Washington Park station, or park at the zoo for $4.

Family Nature Explorers – Oxbow Regional Park

10 a.m. to 1 p.m. Sunday, June 23

Bring your family into the woods for nature games with Metro staff and volunteer naturalists. Kick off your shoes, run in the grass, use your "owl eyes," stalk like a fox and play "nutty squirrels." Suitable for ages 4 and older. $5 per vehicle ($7 per bus) fee. Registration and payment of $11 per family required in advance; see page 7.

Bird language series

7 to 9 p.m. Thursday, April 18

8:30 a.m. to noon, Saturday, April 20

8:30 a.m. to noon, Sunday, May 5

Would you like to see more wildlife, such as mink, foxes and owls? Start seeing what you've been missing! Songbirds are in constant dialogue about the whereabouts of predators. You can learn their language. With naturalists Dan Daly, Deb Scrivens and Patty Newland, explore the art and science of interpreting bird movements, songs and calls. Plan to attend all three sessions. The introductory class is at Laurelwood Public House and Brewery. The last two are field trips at Clear Creek Canyon natural area and Cooper Mountain Nature Park. Suitable for teens and adults. Registration and payment of $33 per person required in advance; see page 7.

Wetlands wildlife explorations

Want to explore the natural wonders of Smith and Bybee Wetlands but don't have a boat? We've got you covered! NW Discoveries provides boats, paddles and personal flotation devices while Metro naturalist James Davis offers tours featuring the wetlands' wildlife and natural history. Expect to see big birds like bald eagles, osprey and great blue herons.

Kayak tour

8:30 to 11:30 a.m. Saturday, May 11

Some kayaking experience recommended. Suitable for ages 14 and older; paddlers under 17 must be accompanied by an adult. All kayaks are solo except for a few tandem kayaks available upon request. Registration and payment of $25 per person required two weeks in advance; see page 7.

Canoe and kayak tour

8:30 to 11:30 a.m. Saturday, June 8

Select a solo or tandem kayak or two-person canoe. Two adult canoers can add up to two children to ride in the middle. Registration and payment of $25 per adult (ages 14 and older) and $5 per child (ages 5 to 13) accompanied by paid adult required two weeks in advance; see page 7.

Canoe bimaran tour

12:45 to 3:15 p.m. Saturday, June 8

A bimaran – two canoes lashed together with 2 x 6 boards – creates a stable pontoon boat, perfect for young children and inexperienced or nervous paddlers. Registration and payment of $10 per adult (ages 14 and older) and $5 per child (ages 5 to 13) accompanied by paid adult required two weeks in advance; see page 7.

How to register for Metro nature activities

For all events (except those listed with a phone number), register and pay online by visiting **www.oregonmetro.gov/calendar**. Find your event by searching or browsing and then follow the instructions.

Questions?

Call 503-220-2781.

Cancellation policy

Metro's program fees are nonrefundable. If you must cancel a registration, you may request to transfer credit to another class.

No dogs policy

Due to a conflict with wildlife, dogs are not allowed at Metro parks or natural areas.

Get out there!

Cooper Mountain Nature Park C. Bruce Forster photo

Blue Lake Regional Park
20500 NE Marine Drive, Fairview
503-665-4995 option 0

Cooper Mountain Nature Park
18892 SW Kemmer Road, Beaverton
503-629-6350

Graham Oaks Nature Park
11825 SW Wilsonville Road, Wilsonville
503-665-4995 option 0

Howell Territorial Park
13901 NW Howell Park Road, Sauvie Island
503-665-4995 option 0

Metro's Natural Techniques Garden
6800 SE 57th Ave., Portland
503-234-3000

Mount Talbert Nature Park
10695 SE Mather Road, Clackamas
503-742-4353

Oregon Zoo
4001 SW Canyon Road, Portland
www.oregonzoo.org
503-226-1561

Oxbow Regional Park
3010 SE Oxbow Parkway, east of Gresham
503-663-4708

Smith and Bybee Wetlands Natural Area
5300 N. Marine Drive, Portland
503-665-4995 option 0

Jerome Hart photo

Ready, set, reserve

Oxbow Regional Park is now offering online camping reservations through Metro's new partnership with the State of Oregon Parks and Recreation Department. Reserve your spot at scenic Oxbow Regional Park with one mouse click. Campsites can be reserved up to nine months in advance. Visit the new online reservation system at **www.oregonmetro.gov/oxbow** or call Reservations NW at **1-800-452-5687**.

Find your next adventure

Discover the adventures outside your door, and check out upcoming classes, walks, tours and events on The Intertwine's searchable, interactive map and easy-to-use calendar.

THE INTER TWINE

Enter the portal to nature in the city:
www.theintertwine.org

MAKING A GREAT PLACE
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.

On the cover
Camas bloom. Girls plant a Douglas fir at Clear Creek Canyon natural area.

If you have a disability and need accommodations, call 503-972-8543, or call Metro's TDD line at 503-797-1804. If you require a sign language interpreter, call at least 48 hours in advance. Activities marked with this symbol are wheelchair accessible:

Bus and MAX information
503-238-RIDE (7433) or www.trimet.org

To be added to the GreenScene mailing list or to change your mailing information, call 503-797-1650 option 2.

Stay in touch with news, stories and things to do.

www.oregonmetro.gov/connect

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Portland, OR 97232-2736

More biology, **less chemistry.**

Keep your family and your yard healthy and safe.

As gardening season starts up, you want to protect your plants from bugs, weeds and diseases. Be sure to protect your family and your pets, too.

Metro and Oregon State University Extension Service Master Gardeners™ offer guidance for healthy lawn and garden care without toxics. Find trained volunteers at farmers markets, fairs and plant sales regionwide. Bring your plants, bugs and questions and get free home gardening information, coupons and publications – or call a Master Gardener near you:

Clackamas County	503-655-8631
Multnomah County	503-445-4608
Washington County	503-821-1150

See this issue's calendar for places to enjoy drop-in hands-on gardening fun for the whole family.

Ask Metro about family programs, learning gardens, presentations, e-news, coupons for free pesticide disposal and more. Call **503-234-3000** or visit **www.oregonmetro.gov/garden**.

Kent Derek photo

Materials following this page were distributed at the meeting.

2035 Regional Transportation Plan (RTP) Amendments

JPACT

April 4, 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

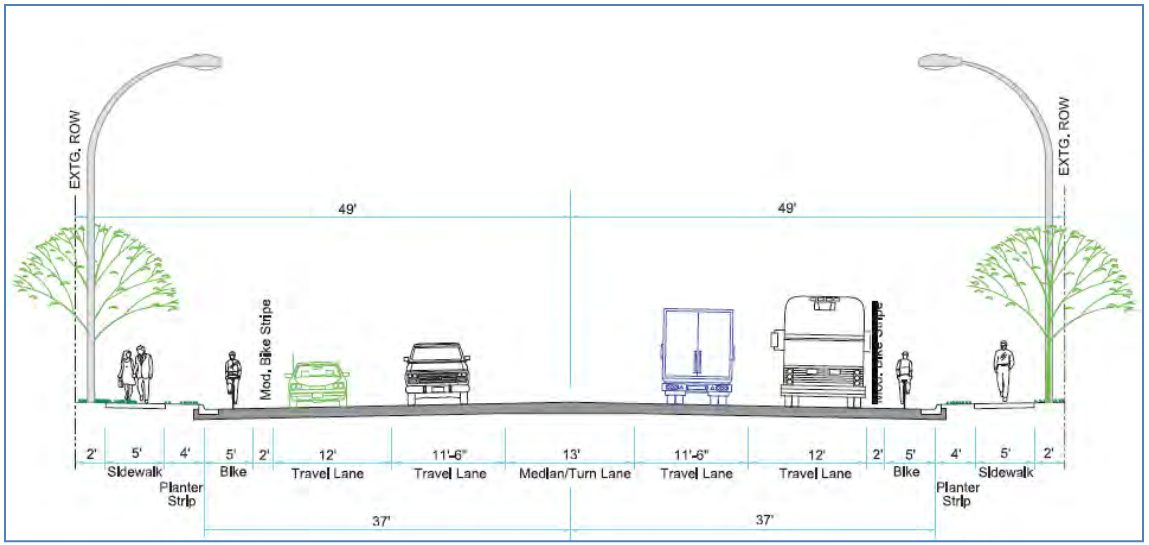
Criteria

- 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

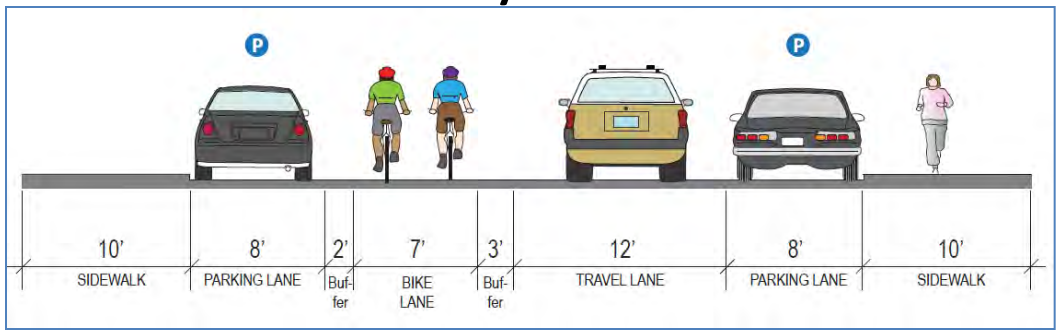
- Extend aux lane on **I-205 SB** from I-84 entrance ramp to Stark/Washington

- 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?

John Mermin

503-797-1747

John.mermin@oregonmetro.gov

Presentation to the Joint Policy Advisory Committee on Transportation

Climate Smart Communities Scenarios HIA

Jae Douglas and Andrea Hamberg
Oregon Health Authority, Public Health Division
HIA and EPHT Programs
April 4, 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

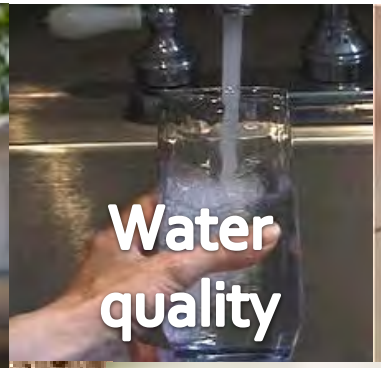
Health determinants

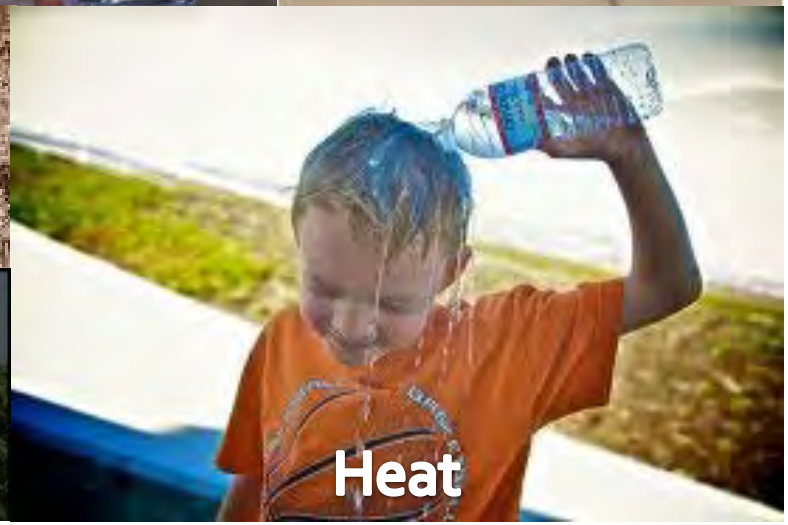
Social and Environmental Determinants of Health

CSCS HIA Advisory Committee

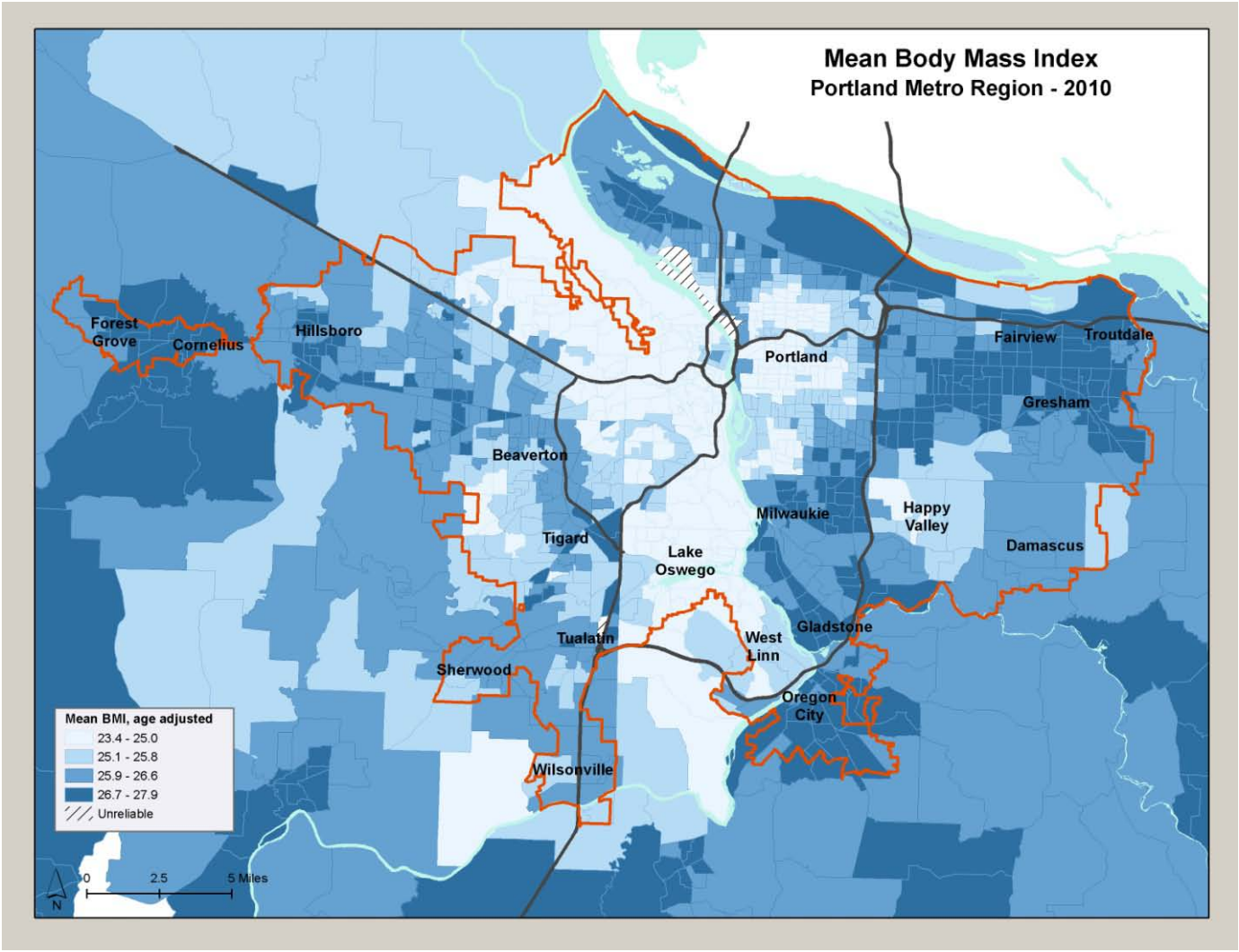
1000 Friends of Oregon
DEQ
DLCD
City of Beaverton
City of Gresham, Urban Design and Planning Department
City of Forest Grove
City of Hillsboro
City of Milwaukee
City of Oregon City
City of Portland
City of Tualatin
Coalition for a Livable Future
Metro
Multnomah County Health Department
Multnomah County 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





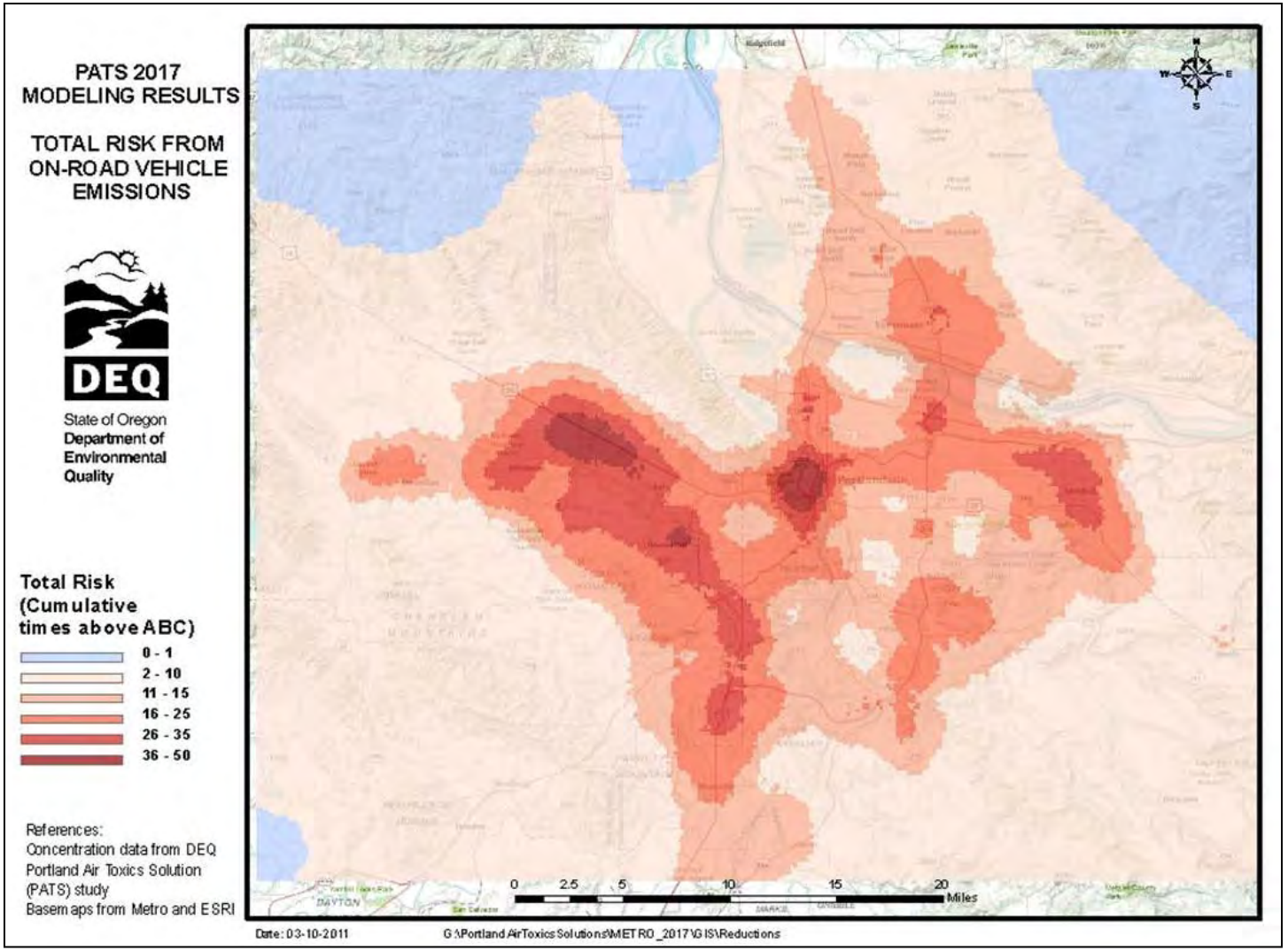
Physical activity



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
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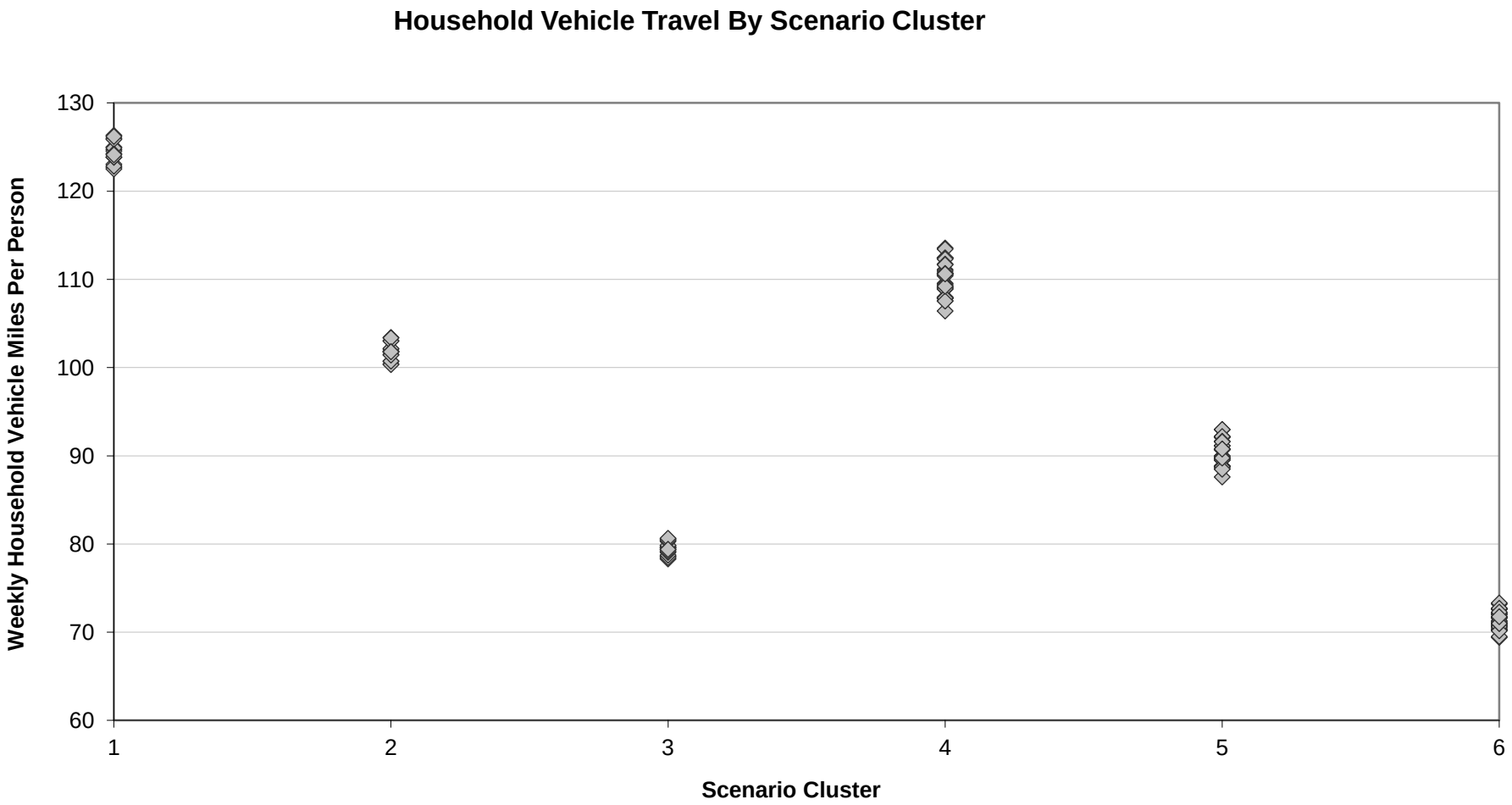
Modeling the health outcomes of representative scenarios

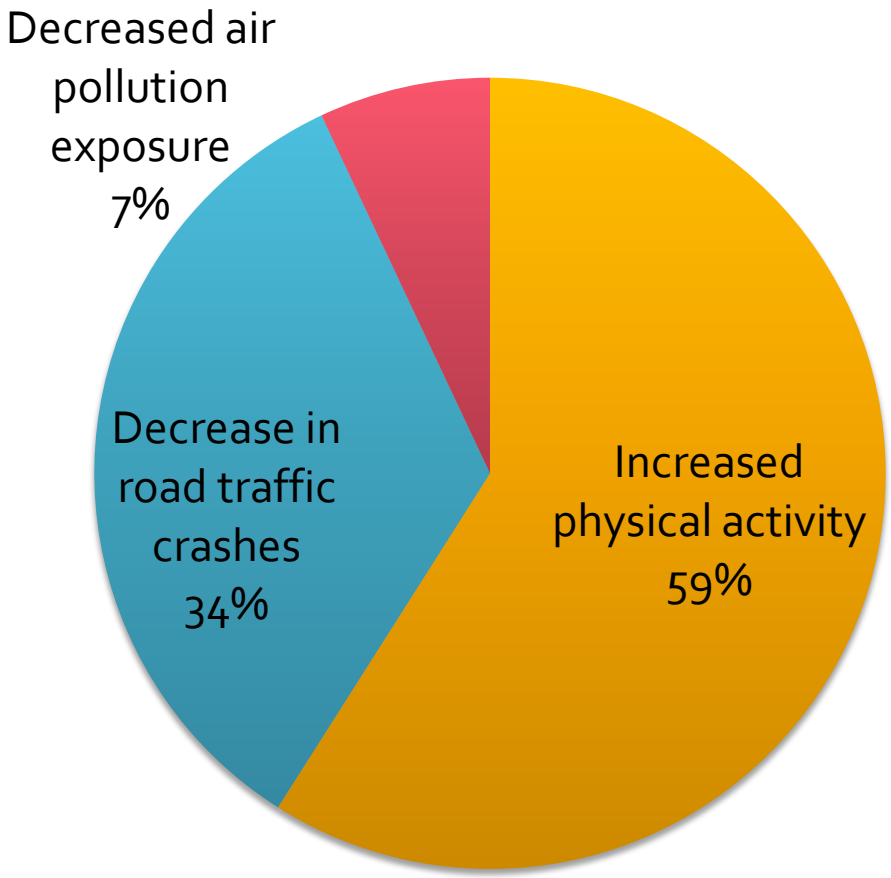


Scenario 6 health impacts by 2035

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
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Acknowledgements:

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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.

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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].

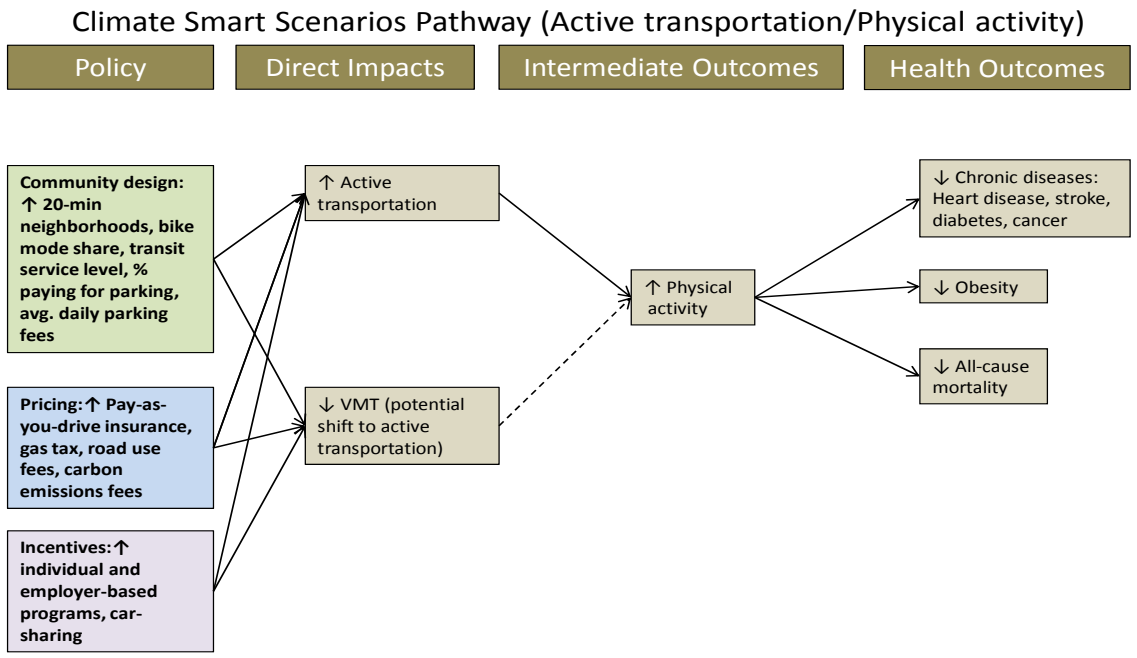
Screening and Scoping

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



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

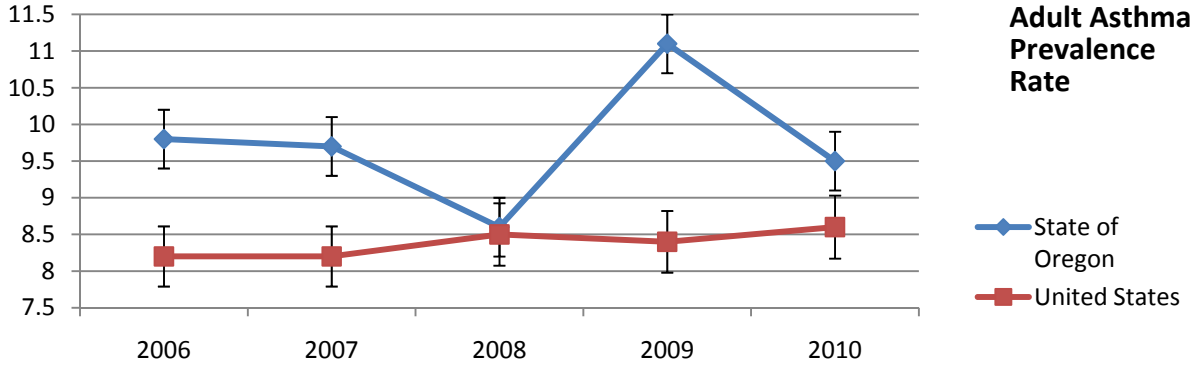
Chronic health diseases such as asthma, diabetes, stroke, heart disease, and cancer, along with factors such as obesity, are significant contributors to illness and death for all Oregon and Portland metropolitan region residents and many of the proposed policies designed to reduce GHG emissions would 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].

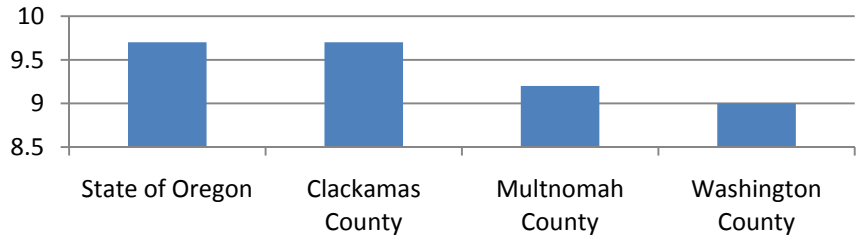
Figure 1. Percent of adult population with asthma, Oregon and U.S.



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].

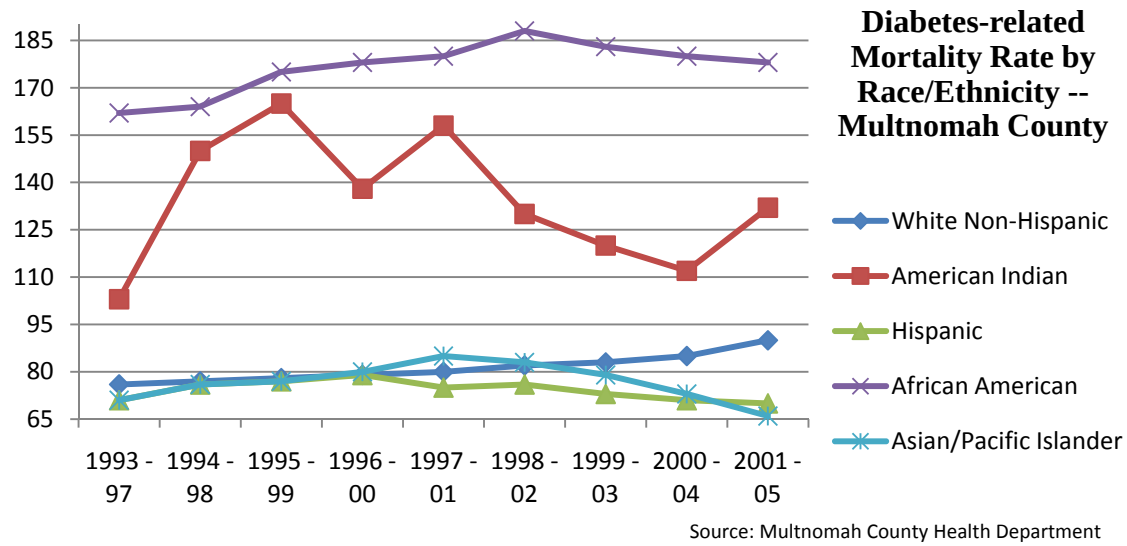
Diabetes

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: Multnomah County Health Department

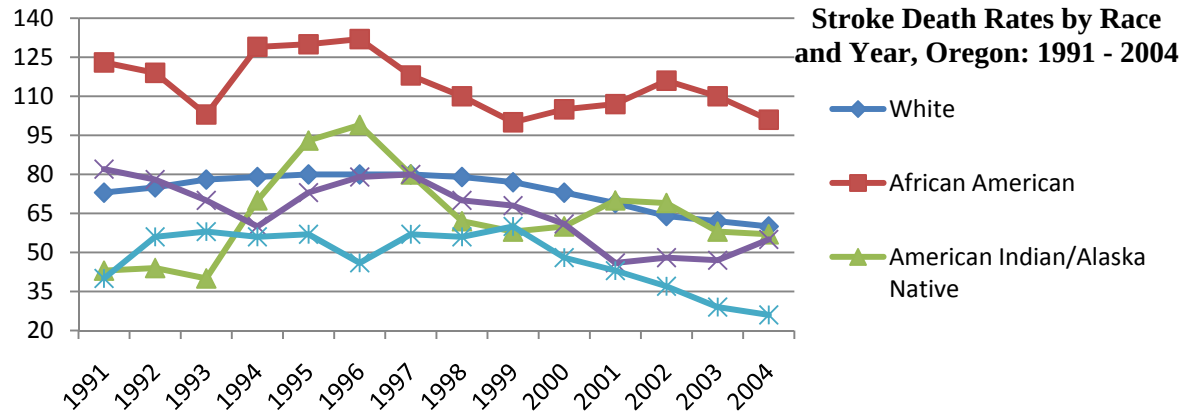
Source for above image: http://web.multco.us/sites/default/files/health/documents/winter2009_diabetes.pdf

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: Oregon Heart Disease and Stroke Prevention Program.

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

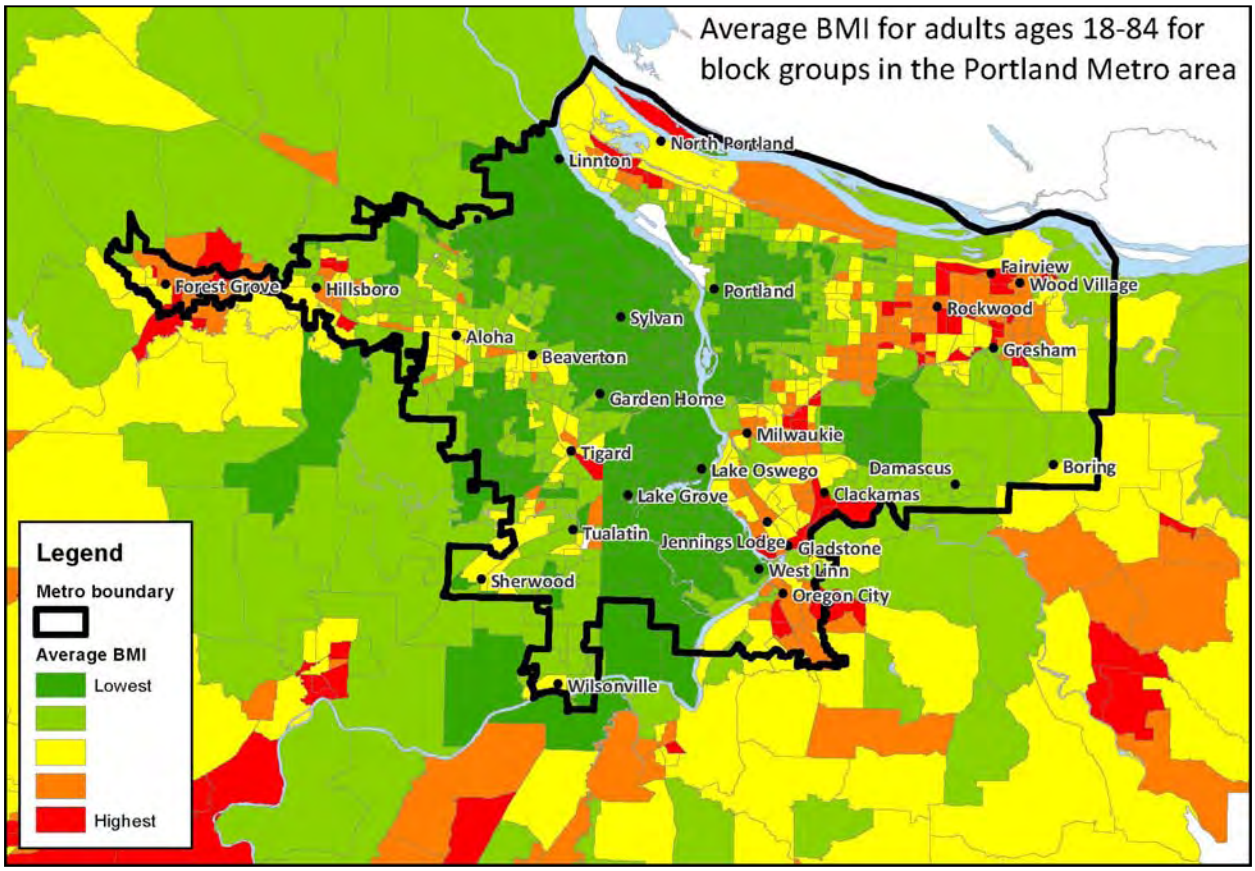
Cancer is the leading cause of death in Oregon and in the Portland metropolitan region [42, 58-60]. With a 2009 death rate of nearly 179 per 100,000 individuals, Oregon ranks in the top quarter of states with the highest cancer death rate in the nation [60, 61]. Additionally, except for lung and colorectal 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



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

This map shows average body mass index (BMI) for adults ages 18-84, based on self-reported height and weight information on driver licenses and ID cards issued by the State of Oregon from 2003-2010. BMI is expressed in units of kg/m2, is the standard measure used for population-based obesity surveillance. Higher mean values indicate heavier populations. Data are aggregated by block groups based on 2010 Census definitions and age-adjusted to the 2000 U.S. Census standard population. Block groups are classified into quantiles based on all block groups in Oregon.

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.

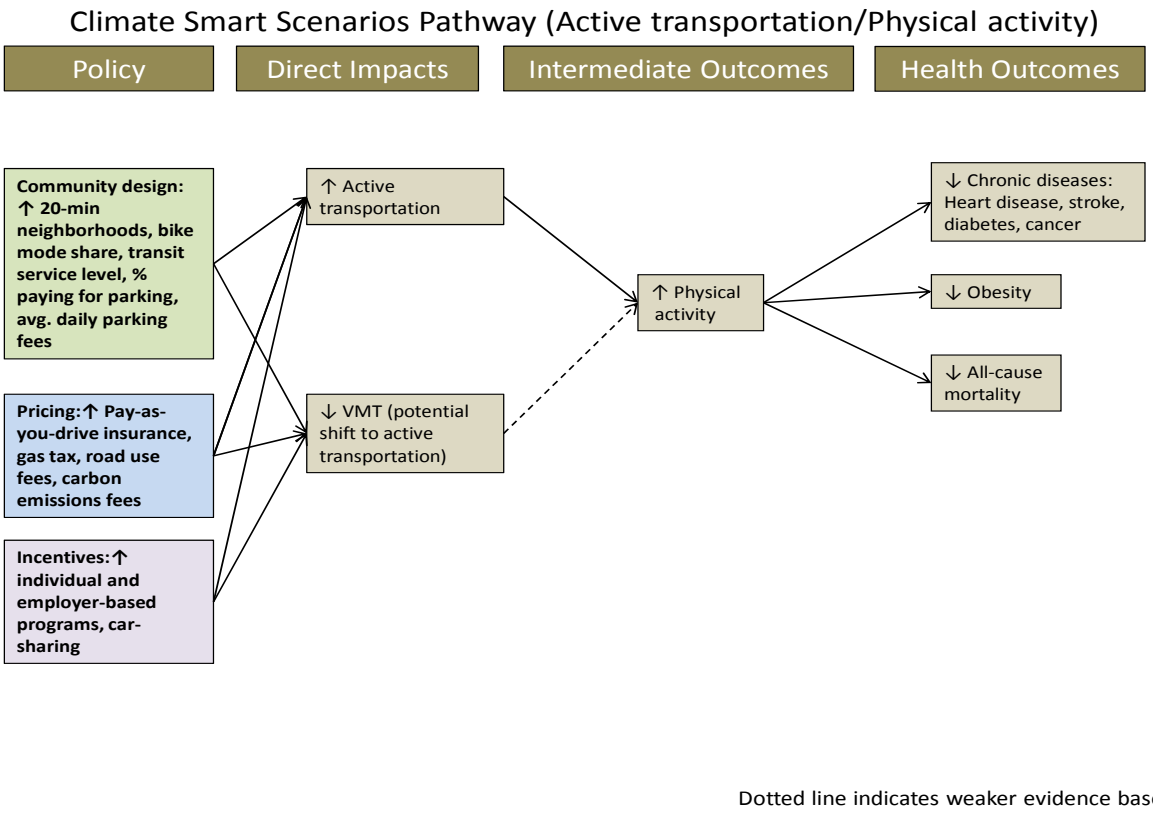
When considering the main health outcome measure (DALYs) between baseline and Scenario 6, the majority (59%) of the health benefit can be accounted for by increased levels of physical activity, followed by decreased road traffic crashes (34%) and decreases in particulate air pollution exposure (7%).

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

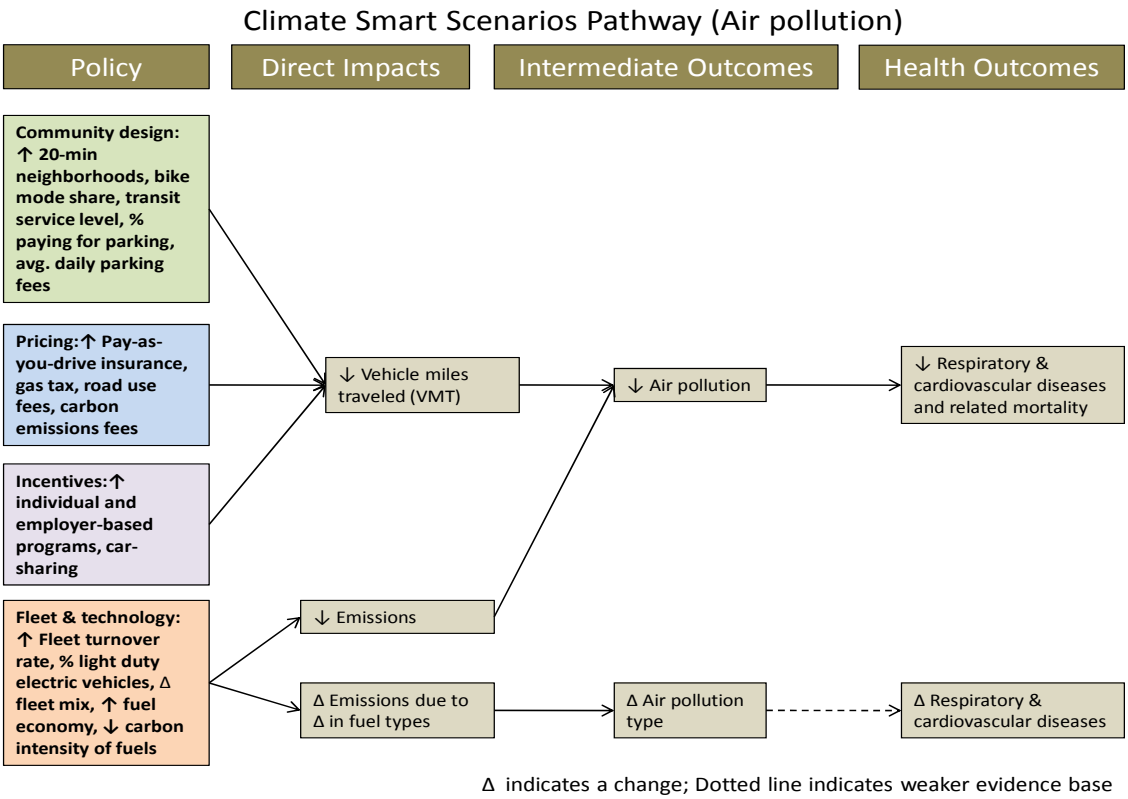
Grade	Risk Factor	Clackamas %	Multnomah %	Washington %	Oregon %
8th	Overweight	14.3	15.4	13.8	15.2
	Obese	9	10.9	10.2	10.7
	Met PA recommendations	53.9*	52.7*	50.8*	57.1
11th	Overweight	13.3	12.8	12.2	14.2
	Obese	9.8	11	10	11.3
	Met PA recommendations	49.8	38.4*	46.2	49.2

*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].

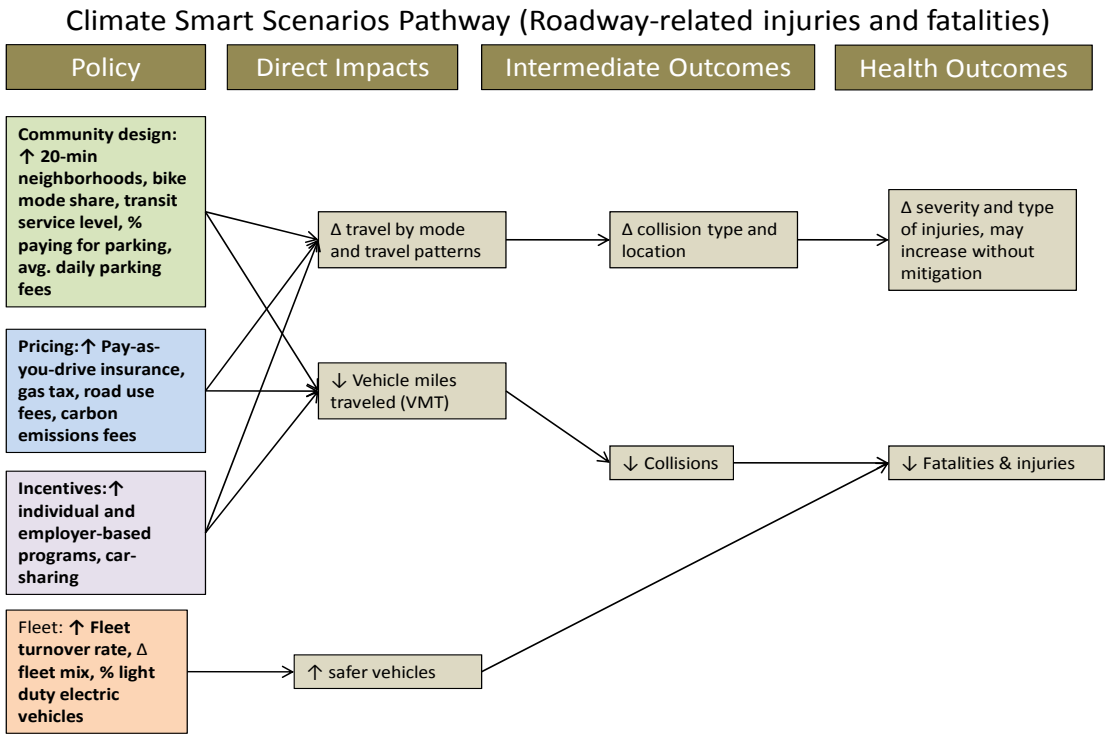
Context

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 In addition to the 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, many of which have the potential to impact health. To maximize the health benefits of these investments and minimize any potential health risks, OHA makes the following recommendations.

Findings and Recommendations

Air quality

Findings:
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.

Recommendation:
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

Findings:

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%).

Recommendation:

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

Findings:

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.

Recommendation:

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.

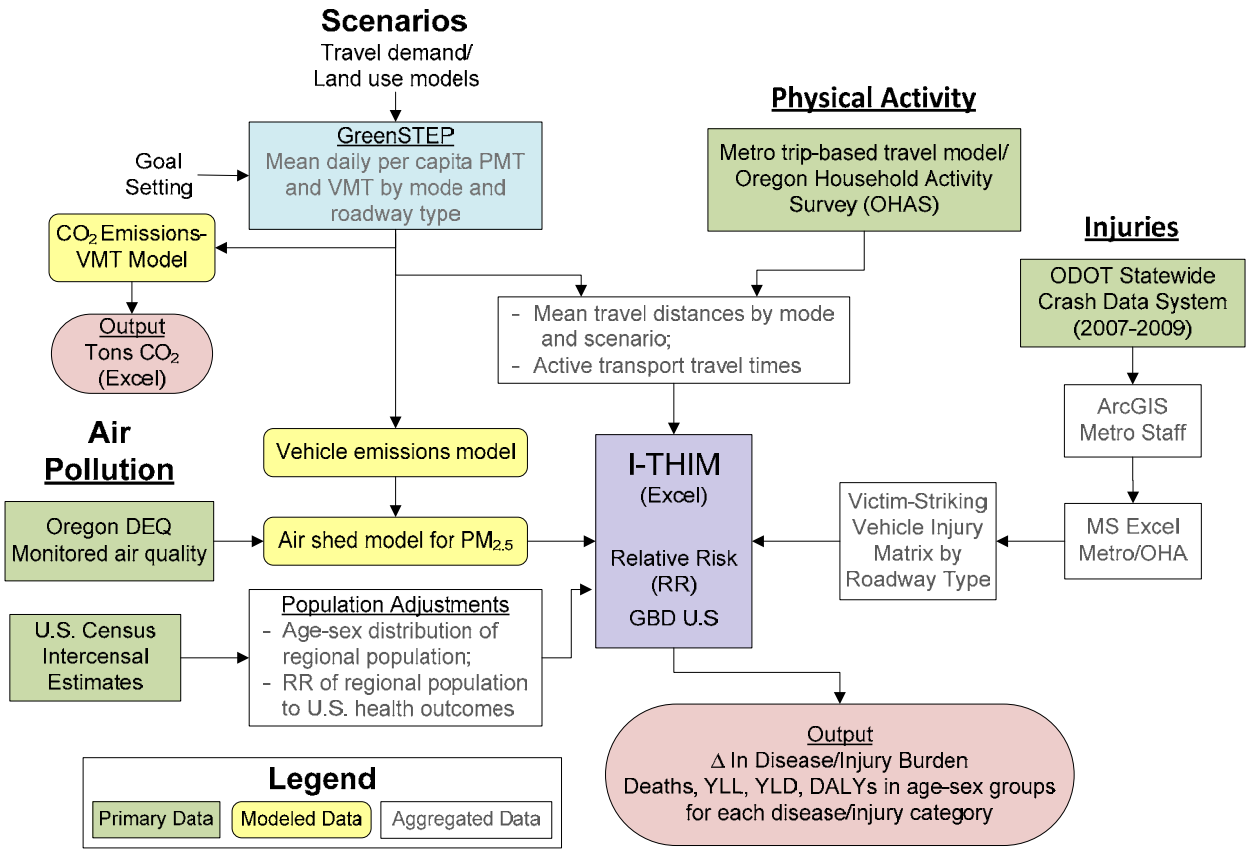
Table 3. Annual mean miles traveled per person by mode and percent mode share for Base Year (2010) and Scenario Clusters 1-6 (2035)

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

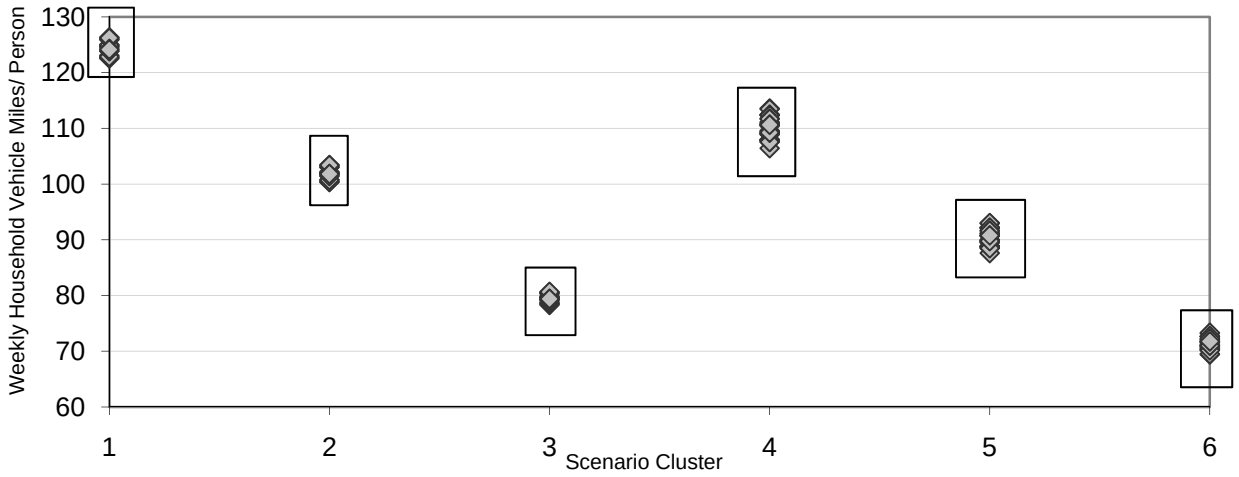
OHA obtained data from various sources for the ITHIM data inputs. These sources and more detailed descriptions of the data follow.

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.

References

1. Frumkin, H., et al., *Climate change: the public health response.* Am J Public Health, 2008. **98**(3): p. 435-45.
2. Semenza, J.C., et al., *Heat-related deaths during the July 1995 heat wave in Chicago.* N Engl J Med, 1996. **335**(2): p. 84-90.
3. Luber, G. and M. McGeehin, *Climate change and extreme heat events.* Am J Prev Med, 2008. **35**(5): p. 429-35.
4. Frank, L.D., et al., *Carbonless footprints: Promoting health and climate stabilization through active transportation.* Preventive Medicine 2010. **50**: p. S99 - S105.
5. Graeme, L., A. Macmillan, and A. Woodward, *Moving urban trips from cars to bicycles: impact on health and emissions.* Austrailian and New Zealand Journal of Public Health, 2011. **35**(1): p. 54 - 60.
6. Metro Regional Government. *Climate Smart Communities Scenarios (CSCS)*. [cited 2013]; Available from: http://www.oregonmetro.gov/index.cfm/go/by.web/id=36945.
7. North American HIA Practice Standards Working Group (Bhatia R, B.J., Farhang L, Lee M, Orenstein M, Richardson M). *Minimum Elements and Practice Standards for Health Impact Assessment, Version 2.*, North American HIA Practice Standards Working Group, Editor. November 2010: Oakland, CA.
8. Agency for Healthcare Research and Quality, *Fact sheet: Rating the strength of scientific research findings*, U.S. Department of Health and Human Services, Public Health Service.
9. Woodcock, J., et al., *Public health benefits of strategies to reduce greenhouse-gas emissions: urban land transport.* Lancet, 2009. **374**(9705): p. 1930-43.
10. Maizlish, N., *Health co-benefits and transportation-related reductions in greenhouse gas emissions in the Bay Area: Technical report*. 2011.
11. Metro Regional Government, *State of Safety Report*. 2012: Portland, OR.
12. Metro Regional Government, *Regional Active Transportation Plan Existing Conditions Report*. August 28, 2012.
13. U.S. Census Bureau, *2010 Census of Population by City and County* 2010.
14. Institute of Portland Metropolitan Studies and Metro Regional Government. *Vehicle Miles Traveled*. Greater Portland Pulse 2011 [cited; Available from: http://portlandpulse.org/vehicle_miles_traveled.
15. Metro Regional Government, *2035 Regional Transportation Plan*. 2010: Portland.
16. TriMet, *Facts about TriMet*. 2012.
17. TriMet, *TriMet Service and Ridership Information*. 2012.
18. TriMet. *Dirty Words*. 2012 [cited; Available from: http://TriMet.org/sustainable/dirtywords.htm.
19. Oregon Public Broadcasting, *Public Transit*, in *Think Out Loud*. November 30th, 2010, Oregon Public Broadcasting,: United States.
20. City of Portland, *Portland Bicycle Plan for 2030*. 2010: Portland.
21. Metro Regional Government, *Adoption Draft: Portland metropolitan area, Federal fiscal year 2012-2015*. 2012, Metropolitan Transportation Improvement Program: Portland OR.
22. Metro Regional Government, *RLIS Live, Geographic Information System Data, Sidewalk Inventory*.
23. Metro Regional Government, *Existing Conditions, Findings and Opportunities Report: Regional Active Transportation Plan*. 2012: Portland, OR.
24. *Oregon Household Activity Survey*. 2011.

25. Metro Regional Government. *Active Transportation Program*. [cited March 25th, 2013]; Available from: http://www.oregonmetro.gov/index.cfm/go/by.web/id/30078.
26. Morency, P., et al., *Neighborhood Social Inequalities in Road Traffic Injuries: The Influence of Traffic Volume and Road Design.* American Journal of Public Health 2012. **102**(6): p. 1112-1119.
27. Metro Regional Government, *State of Safety Report: A compilation of information on roadway-related crashes, injuries, and fatalities in the Portland Metro region and beyond*. April 2012: Portland, OR.
28. Oregon Department of Environmental Quality. *Air Quality and Toxics*. [cited 3/25/13]; Available from: http://www.deq.state.or.us/aq/toxics/pats.htm.
29. Oregon Department of Environmental Quality, *Portland Air Toxics Solutions Committee Report and Recommendations*. 2012.
30. Samet, J.M. and R.H. White, *Urban air pollution, health, and equity.* J Epidemiol Community Health, 2004. **58**(1): p. 3-5.
31. Multnomah County Health Department, *Report Card on Racial and Ethnic Health Disparities*. 2011.
32. Chen, H., M.S. Goldberg, and P.J. Villeneuve, *A systematic review of the relation between long-term exposure to ambient air pollution and chronic diseases.* Rev Environ Health, 2008. **23**(4): p. 243-97.
33. Hankey, S., J.D. Marshall, and M. Brauer, *Health impacts of the built environment: within-urban variability in physical inactivity, air pollution, and ischemic heart disease mortality.* Environ Health Perspect, 2012. **120**(2): p. 247-53.
34. U.S. Census Bureau, *Profile of General Population and Housing Characteristics: 2010*. 2011, U.S. Census Bureau,.
35. U.S. Census Bureau, *2006-2010 American Community Survey [Oregon]*. 2011, U.S. Census Bureau,.
36. Oregon Asthma Program, *The Burden of Asthma in Oregon: 2010*. 2010.
37. U.S. Department of Health and Human Services. *What is Asthma?* 2012 [cited; Available from: http://www.nhlbi.nih.gov/health/health-topics/topics/asthma/.
38. Centers for Disease Control and Prevention. *Asthma: Basic Information*. 2012 [cited; Available from: http://www.cdc.gov/asthma/faqs.htm.
39. Centers for Disease Control and Prevention, *Prevalence and Trends Data*. ND.
40. Oregon Health Authority, *Oregon BRFSS County Combined Dataset 2006-2009: Age-Adjusted and Unadjusted Prevalence of Selected Chronic Conditions among Adults, by County, Oregon 2006-2009*. 2010.
41. Williams, D.R., M. Sternthal, and R.J. Wright, *Social Determinants: Taking the Social Context of Asthma Seriously.* Pediatrics, 2009. **123**(Supplement March): p. S174 - S184.
42. Portland Bureau of Planning and Sustainability, *The Portland plan: Human health and safety*. 2010.
43. Podobnik B, *Portland Neighborhood Survey: Report on Asthma Rates in Northeast, Southwest, and West Portland*. 2002: Portland, OR.
44. Centers for Disease Control and Prevention. *Basics About Diabetes*. 2012 [cited; Available from: http://www.cdc.gov/diabetes/consumer/learn.htm.
45. Centers for Disease Control and Prevention, *National Diabetes Fact Sheet, 2011*. 2011.
46. U.S. Department of Health and Human Services. *Oregon: Focus on Diabetes*. 2010 [cited; Available from: http://statesnapshots.ahrq.gov/snaps11/diabetes_prevalence.jsp?menuId=23&state=OR&level=9.

47. U.S. Department of Health and Human Services and Office of Disease Prevention and Health Promotion, *Healthy People 2010 Final Review*: Washington, DC.
48. Multnomah County Health Department, *Diabetes Mortality and Morbidity*. 2009.
49. Oregon Health Authority, *Vital Statistics Annual Report: Total Death Rates for Selected Causes by Age, Oregon Residents, 2010*. 2010.
50. Oregon Health Authority, *Vital Statistics Annual Report: Deaths by Cause, Singleton Race and Ethnicity, Oregon Residents, 2010*. 2010.
51. Oregon Heart Disease and Stroke Prevention Program, *The Burden of Heart Disease and Stroke in Oregon: 2007*. 2007.
52. Centers for Disease Control and Prevention. *Prevalence of Stroke – United States, 2006 – 2010* 2011 [cited; Available from: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6120a5.htm.
53. Oregon Health Authority, *Heart Disease and Stroke in Oregon: Update – 2010*, Office of Disease Prevention and Epidemiology, Editor. 2011.
54. American Heart Association, *Heart Disease and Stroke Statistics – 2012 Update: A report from the American Heart Association*. 2012.
55. Centers for Disease Control and Prevention. *Stroke Mortality Atlas*. 2003 [cited; Available from: http://www.cdc.gov/dhdsp/atlas/stroke_mortality_atlas/docs/Section_one.pdf.
56. Coordinating Council for Heart Disease and Stroke Prevention and Care, *Oregon's Statewide Plan for Heart Disease and Stroke Prevention and Care: Working for a Heart-Healthy and Stroke-free Oregon*. 2005.
57. Centers for Disease Control and Prevention, *Prevalence of Coronary Heart Disease --- United States, 2006--2010.* Morbidity and Mortality Weekly Report (MMWR), 2011. **60**(40): p. 1377-1381.
58. Clackamas County Health Division, *Clackamas County Community Health Division: Public Health Services 2012 – 2014 Triennial Plan*. 2011.
59. Washington County Health and Human Services, *Local Public Health Authority: Comprehensive Plan for FY 2010-2013 for Washington County*. 2009.
60. Oregon Health Authority, *Mortality: Causes of death*. 2012.
61. Centers for Disease Control and Prevention. *Cancer Rates by State*. 2012 [cited; Available from: http://www.cdc.gov/cancer/dcpc/data/state.htm.
62. U.S. Cancer Statistics Working Group, *United States Cancer Statistics: 1999–2008 Incidence and Mortality Web-based Report*. 2012, Centers for Disease Control and Prevention, .
63. U.S. Environmental Protection Agency, *EPA-COUNCIL-08-001*, Office of the Administrator Science Advisory Board, Editor. 2008: Washington DC.
64. National Cancer Institute, *State Cancer Profiles*. 2012.
65. Oregon Health Authority, *Oregon overweight, obesity, physical activity and nutrition facts*. 2012: Portland, OR.
66. Metro Regional Government, *Climate smart communities scenarios project: Understanding our land use and transportation choices, Phase 1 findings report*. 1/12/2012: Portland, OR.
67. Upstream Public Health, *Health Impact Assessment on transportation policies in the Eugene climate and energy action plan*. August, 2010.
68. Upstream Public Health, *Health Impact Assessment of Policies to Reduce Vehicle Miles Traveled*. May 2009: Portland, OR.
69. Oregon Department of Transportation, *Greenhouse Gas Strategic Transportation Energy Planning Model*. 2011.
70. Oregon Department of Transportation. *Oregon Travel Activity Survey*. 2008-2011 [cited; Available from: http://www.oregon.gov/ODOT/TD/TP/pages/travelsurvey.aspx.

71. Oregon Department of Transportation, *Statewide Crash Data System: Motor Vehicle Traffic Crash Analysis and Code Manual*. 2007.
72. World Health Organization, *The global burden of disease: 2004 update.*, WHO Press, Editor. 2008: Geneva, Switzerland.
73. Woodcock, J., M. Givoni, and A. Morgan, *Health impact modelling of active travel visions for England and Wales using an Integrated Transport and Health Impact Modelling tool (ITHIM).* PLoS One, 2013: p. Accepted for publication.
74. West, S.E., *Equity implications of vehicle emissions taxes.* Journal of Transport Economics and Policy, 2005. **39**(1): p. 1 - 24.
75. Sipes, K.N. and R. Mendelsohn, *The effectiveness of gasoline taxation to manage air pollution.* Ecological Economics, 2001. **36**: p. 299 - 309.
76. Litman, T., *Pay-as-you-drive pricing for insurance affordability*. 2011, Victoria Transport Policy Institute: Victoria.
77. Patterson, B.J., et al., *Living with disability: patterns of health problems and symptom mediation of health consequences.* Disabil Health J, 2012. **5**(3): p. 151-8.
78. Jamoom, E.W., et al., *Age at disability onset and self-reported health status.* BMC Public Health, 2008. **8**: p. 10.
79. Lehning, A.J., *City governments and aging in place: community design, transportation and housing innovation adoption.* Gerontologist, 2012. **52**(3): p. 345-56.
80. Garcia-Snell, A., et al., *Washington County Bicycle and pedestrian facility design health impact assessment*. 2012, Washington County Health and Human Services: Hillsboro, OR.
81. Berrigan, D., et al., *Active transportation increases adherence to activity recommendations.* American Journal of Preventive Medicine, 2006. **31**(3): p. 210 - 216.
82. Genter, J.A., et al., *Valuing the health benefits of active transport modes*, in *New Zealand Agency Research Report*. 2008, New Zealand Transport Agency.
83. Gordon-Larsen, P., et al., *A walk (or cycle) to the park. Active transit to neighborhood amenities, the CARDIA study.* American Journal of Preventive Medicine, 2009. **37**(4): p. 285-292.
84. Alliance for Biking and Walking, *Bicycling and Walking in the United States*. 2012, Alliance for Biking and Walking: Washington D.C.
85. Gordon-Larsen, P., M.C. Nelson, and K. Beam, *Associations among active transportation, physical activity, and weight status in young adults.* Obesity Research, 2005. **13**(5): p. 868 - 875.
86. Dill, J., *Bicycling for Transportation and Health: The Role of Infrastructure.* Journal of Public Health Policy, 2009. **30**: p. S95 - S100.
87. Litman, T., *Evaluating public transportation health benefits*. 2011, Victoria Transport Policy Institute for the American Public Transportation Association.
88. Badland, H. and G. Schofield, *Health associations with transport-related physical activity and motorized travel to destinations.* International Journal of Sustainable Transportation, 2008. **2**: p. 77-90.
89. Nelson, M.E., et al., *Physical activity and public health in older adults: Recommendation from the American College of Sports Medicine and the American Health Association.* Medicine and Science in Sports and Exercise, 2007. **39**(8): p. 1435 - 1445.
90. Lee, I.M., et al., *Physical activity and weight gain prevention.* JAMA. **303**(12): p. 1173-9.
91. U.S. Centers for Disease Control and Prevention, *Physical activity and health: A report of the Surgeon General*. 1999, Center for Disease Control and Prevention.
92. Brownson, R.C. and T.K. Boehmer, *Patterns and trends in physical activity, occupation, transportation, land use, and sedentary behaviors*, in *TRB Special Report: Does the built environment influence physical activity? Examining the evidence*. ND, Transportation Research Board.

93. Casey, A.A., et al., *Impact of the food environment and physical activity environment on behaviors and weight status in rural U.S. communities.* Preventive Medicine, 2008. **47**(6): p. 600.
94. Ewing, R., L.D. Frank, and R. Kreutzer, *Understanding the relationship between public health and the built environment*. 2006.
95. Frank, L.D., et al., *Stepping towards causation: Do built environments or neighborhood and travel preferences explain physical activity, driving, and obesity?* Social Science & Medicine, 2007. **65**: p. 1898 - 1914.
96. Frank, L.D., T.L. Schmid, and M.A. Andresen, *Obesity relationships with community design, physical activity, and time spent in cars.* American Journal of Preventive Medicine, 2004. **27**(2): p. 87.
97. Frumkin, H., L.D. Frank, and R. Jackson, *Urban sprawl and public health : Designing, planning, and building for healthy communities*. 2004, Washington, D.C.: Island Press.
98. Lopez-Zetina, J., H. Lee, and R. Friis, *The link between obesity and the built environment. Evidence from an ecological analysis of obesity and vehicle miles of travel in California.* Health & Place, 2004. **12**: p. 656 - 664.
99. Rosso, A.L., A.H. Auchincloss, and Y.L. Michael, *The urban built environment and mobility in older adults: a comprehensive review.* J Aging Res, 2011.
100. Ewing, R. and R. Cervero, *Travel and the built environment: A meta-analysis.* Journal of the American Planning Association, 2010. **76**(3): p. 265-94.
101. Mendoza, J.A., et al., *Active commuting to school and association with physical activity and adiposity among US youth*. Journal of Physical Activity and Health, 2011. **8**(4): p. 488 - 495.
102. Sirard, J.R., et al., *Changes in physical activity from walking to school.* Journal of Nutrition Education and Behavior, 2008. **40**(5): p. 324 - 326.
103. Saksvig, B.I., et al., *Travel by walking before and after school increases physical activity among adolescent girls.* Archives of Pediatrics and Adolescent Medicine, 2007. **161**(2): p. 153 - 158.
104. Watson, M. and A.L. Dannenberg, *Investment in safe routes to school projects: Public health benefits for the larger community.* Preventing Chronic Disease, 2008. **5**(3): p. 1 - 7.
105. Lubans, D.R., et al., *The relationship between active travel to school and health-related fitness in children and adolescents: a systematic review.* International Journal of Behavioral Nutrition and Physical Activity, 2011. **8**(5).
106. Morency, C. and M. Demers, *Active transportation as a way to increase physical activity among children.* Child care, health and development, 2009. **36**(3): p. 421 - 427.
107. U.S. Environmental Protection Agency, *Integrated science assessment for particulate matter (final report)*. 2009: Washington, D.C.
108. McConnell, R., et al., *Traffic, susceptibility, and childhood asthma.* Environ Health Perspect, 2006. **114**(5): p. 766-72.
109. Brunekreef, B., et al., *Air pollution from truck traffic and lung function in children living near motorways.* Epidemiology, 1997. **8**(3): p. 298-303.
110. Kim, J.J., et al., *Residential traffic and children's respiratory health.* Environ Health Perspect, 2008. **116**(9): p. 1274-9.
111. Roberts, J.D., *Have "green" U.S. automobile drivers made an impact on greenhouse gases? .* Natural Resources and Environment, 2009. **24**(2): p. 28.
112. Harley, R.A., D.S. Hooper, and A.J. Kean, *Effects of Reformulated Gasoline and Motor Vehicle Fleet Turnover on Emissions and Ambient Concentrations of Benzene.* Environmental Science & Technology, 2006. **40**(16): p. 5084-5088.
113. Shindell, D., et al., *Climate, health, agricultural and economic impacts of tighter vehicle-emission standards.* Nature Climate Change, 2011. **1**.

114. U.S. Department of Energy, *Report on the First Quadrennial Technology Review: Technology Assessments*. 2012.
115. Frank, L.D., B. Stone, and W. Bachman, *Linking land use with household vehicle emissions in the central puget sound: Methodological framework and findings.* Transportation Research Part D Transport and Environment, 2000. **5**(3): p. 173 - 196.
116. Kuzmyak, J.R., *Land use and traffic congestion*. 2012, Arizona Department of Transportation.
117. Litman, T., *Smart congestion relief: Comprehensive analysis of traffic congestion costs and congestion reduction benefits*. 2012, Victoria Transport Policy Institute
118. Rank, J., J. Folke, and P.H. Jespersen, *Differences in cyclists and car drivers exposure to air pollution from traffic in the city of Copenhagen.* Sci Total Environ, 2001. **279**(1-3): p. 131-6.
119. Kaur, S., M.J. Nieuwenhuijsen, and R.N. Colvile, *Fine particulate matter and carbon monoxide exposure concentrations in urban street transport microenvironments.* Atmospheric Environment, 2007. **41**(23): p. 4781-4810.
120. Gulliver, J. and D.J. Briggs, *Personal exposure to particulate air pollution in transport microenvironments.* Atmospheric Environment, 2004. **38**(1): p. 1-8.
121. Figliozzi, M., et al., *School Commute Air Quality: Understanding Variation in Pollutant Exposure for Students Traveling to School by Auto, Bus, or Walking*. 2012, Portland State University: Portland, OR.
122. de Hartog, J., et al., *Do the health benefits of cycling outweigh the risks?* Environmental Health Perspectives, 2010. **118**: p. 1109-1116.
123. Rojas-Rueda, D., et al., *The health risks and benefits of cycling in urban environments compared with car use: health impact assessment study.* BMJ. **343**: p. d4521.
124. Gauderman, W.J., et al., *The effect of air pollution on lung development from 10 to 18 years of age.* The New England Journal of Medicine, 2004. **351**(11): p. 1057-67.
125. Health Effects Institute, *Traffic-related air pollution: A critical review of the literature on emissions, exposure, and health effects*. 2010, Health Effects Institute.
126. World Health Organization, *Health aspects of air pollution with particulate matter, ozone and nitrogen dioxide: Report on a WHO working group*. 2003, World Health Organization: Bonn.
127. Dockery, D., et al., *An association between air pollution and mortality in six U.S. cities.* The New England Journal of Medicine, 1993. **329**(24): p. 1753-1759.
128. Vineis, P., et al., *Lung cancers attributable to environmental tobacco smoke and air pollution in non-smokers in different European countries: a prospective study.* Environmental Health, 2007. **6**(7).
129. Laumbach, R.J. and H.M. Kipen, *Acute effects of motor vehicle traffic-related air pollution exposures on measures of oxidative stress in human airways.* Annals of the New York Academy of Sciences, 2010. **1203**: p. 107 - 112.
130. Pope III, C.A., M. Ezzati, and D. Dockery, *Fine-particulate air pollution and life expectancy in the United States.* The New England Journal of Medicine 2009. **360**: p. 376 - 386.
131. Brunekreef, B., et al., *Effects of long-term exposure to traffic-related air pollution on respiratory and cardiovascular mortality in the Netherlands: the NLCS-AIR study.* Res Rep Health Eff Inst, 2009(139): p. 5-71; discussion 73-89.
132. Brook, R.D., et al., *Particulate matter air pollution and cardiovascular disease: An update to the scientific statement from the American Heart Association.* Circulation, 2010. **121**: p. 2331-2378.
133. U.S. Environmental Protection Agency, *Second Prospective Study of Costs and Benefits of Implementation of the Clean Air Act Amendments.* 2011, U.S. Environmental Protection Agency; 2011. Office of Air and Radiation.: Washington, D.C.

134. Retting, R.A., S.A. Ferguson, and A.T. McCartt, *A review of evidence-based traffic engineering measures designed to reduce pedestrian-motor vehicle crashes.* Am J Public Health, 2003. **93**(9): p. 1456-63.
135. Koepsell, T., et al., *Crosswalk markings and the risk of pedestrian-motor vehicle collisions in older pedestrians.* JAMA, 2002. **288**(17): p. 2136-43.
136. Howard, A.W., *Keeping children safe: rethinking how we design our surroundings.* CMAJ, 2009. **182**(6): p. 573-8.
137. Lopez, D.S., et al., *Using trauma center data to identify missed bicycle injuries and their associated costs.* J Trauma Acute Care Surg, 2012.
138. Zhang, T., S. Genslar, and R. Garcia, *A Study of the Diffusion of Alternative Fuel Vehicles: An Agent-Based Modeling Approach.* J PROD INNOV MANAG, 2011. **28**: p. 152-168.
139. Moudon, A.V., et al., *The risk of pedestrian injury and fatality in collisions with motor vehicles, a social ecological study of state routes and city streets in King County, Washington.* Accid Anal Prev, 2011. **43**(1): p. 11-24.
140. Marshall, W.E. and N.W. Garrick, *Street network types and road safety: A study of 24 California cities*. 2008, University of Connecticut: Storrs. p. 1 - 34.
141. Wier, M., et al., *An area-level model of vehicle-pedestrian injury collisions with implications for land use and transportation planning.* Accid Anal Prev, 2009. **41**(1): p. 137-45.
142. Jacobsen, P.L., *Safety in numbers: more walkers and bicyclists, safer walking and bicycling.* Inj Prev, 2003. **9**(3): p. 205-9.
143. Bhatia, R. and M. Wier, *"Safety in Numbers" re-examined: can we make valid or practical inferences from available evidence?* Accid Anal Prev, 2011. **43**(1): p. 235-40.
144. Hoffman, M.R., et al., *Bicycle commuter injury prevention: it is time to focus on the environment.* J Trauma, 2010. **69**(5): p. 1112-7; discussion 1117-9.
145. Emergency Medical Services and Trauma Systems Program, *Oregon Trauma Registry Report, 2010-11*. 2012, Oregon Health Authority,.
146. Centers for Disease Control and Prevention, *Web-based Injury Statistics Query and Reporting System (WISQARS)*. 2009, US Department of Health and Human Services.
147. Oregon Health Authority, *Oregon Injury Prevention Plan: 2011 - 2015*. September 2010, Injury Prevention and Epidemiology Program.
148. Oregon Department of Transportation. *ODOT Performance Dashboard* 2011 [cited; Available from: http://cms.oregon.gov/ODOT/CS/PERFORMANCE/docs/2011dashboard.swf.
149. U.S. Department of Transportation, *Traffic Safety Facts: 2010 Motor Vehicle Crashes Overview*. 2012.
150. Centers for Disease Control and Prevention, *Motor Vehicle Crash Deaths in Metropolitan Areas — United States, 2009.* Morbidity and Mortality Weekly Report (MMWR), 2012. **61**(28): p. 523-528.
151. Oregon Department of Transportation, *Washington County 10-Year Traffic Crash Data (2001-2010).* 2011.
152. Oregon Department of Transportation, *Clackamas County 10-Year Traffic Crash Data (2001-2010)*. 2011.
153. Oregon Department of Transportation, *Oregon Traffic Safety Performance Plan: Fiscal Year 2011.* 2012.
154. Oregon Department of Transportation, *Multnomah County 10-Year Traffic Crash Data (2001-2010).* 2011.
155. Centers for Disease Control and Prevention. *Fatal Injury Mapping*. 2010 [cited; Available from: http://wisqars.cdc.gov:8080/cdcMapFramework/.

156. Bunn, F., et al., *Area-wide traffic calming for preventing traffic related injuries.* Cochrane Database Syst Rev, 2003(1): p. CD003110.

CLIMATE SMART COMMUNITIES SCENARIOS PROJECT

www.oregonmetro.gov/climatescenarios

Investment Choices Evaluation Approach

Joint Policy Advisory Committee on Transportation

April 4, 2013

Kim Ellis, project manager

Where We've Been and Where We Are Headed

PHASES 1 AND 2

Understand Choices
2011-2012

Shape Choices
Jan.-Sept. 2013

PHASE 3

Shape Preferred Scenario
Oct. 2013-Mar. 2014

Select Preferred Scenario
April-Dec. 2014

WE ARE HERE

Three-part discussion

March - Kick-off

- Investment choices to test
- Questions to answer
- Draft assumptions

April - discussion

- Community leaders' input on outcomes to evaluate
- Questions to answer
- Draft criteria

May - Action

- Request support to move forward with evaluation

Investment choices evaluation approach

INVESTMENT CHOICES TO TEST

Recent trends

Adopted plans

New plans and policies

QUESTIONS TO ANSWER

Cost? What can we afford? Most cost-effective? Impact on public health, economy, business, social equity and the environment? Public support? Feasibility?

OUTCOMES TO MEASURE

VMT, physical activity, delay, GHG emissions, air pollution, land consumption, housing and transportation costs by income, infrastructure costs, etc.

Today's discussion

What do you want to *learn?*


Jobs and housing


Environment


Economy


Public health


Cost


Feasibility


Travel


Social equity

- ***Are there other topics we should include?***
- ***Do you have specific questions within these topics?***

Table 1 - List of Regional Flexible Fund Applications

Nomination Framework	No.	Project	Sponsor	RFFA Competition Area	Requested Funds
Step One	1	Regional MPO Planning	Metro	Regionwide Program	$3,630,000
	2	Transportation System Management and Operations	Metro	Regionwide Program	$4,640,000
	3	Regional Travel Options	Metro	Regionwide Program	$7,010,000
	4	Transit-Oriented Development	Metro	Regionwide Program	$9,190,000
	5	Corridors and Systems Planning	Metro	Regionwide Program	$1,540,000
Step Two	1	Hogan Road: Powell Boulevard to Rugg Road	City of Gresham	Active Transportation and Complete Streets and Green Economy and Freight	$3,644,000
	2	Sandy Boulevard: NE 181st Avenue to East Gresham City Limits	City of Gresham	Active Transportation and Complete Streets and Green Economy and Freight	$3,644,000
	3	Canyon Road Streetscape and Safety Project	City of Beaverton	Active Transportation and Complete Streets	$3,525,000
	4	Downtown Accessibility Project	City of Hillsboro	Active Transportation and Complete Streets	$3,000,000
	5	BCT Crescent Connection: Westside Trail to SW Hocken Avenue	THPRD	Active Transportation and Complete Streets	$4,247,649
	6	Concept Development for Hwy 217 Overcrossing at Hunziker Street	City of Tigard	Green Economy and Freight	$800,000
	7	Fanno Creek Trail (Woodard Park to Bonita Rd and 85th Ave to Tualatin)	City of Tigard	Active Transportation and Complete Streets	$3,700,000
	8	Merlo/170th Complete Corridor Design Plan	Washington County	Active Transportation and Complete Streets	$445,000
	9	Pedestrian Arterial Crossings	Washington County	Active Transportation and Complete Streets	$3,585,000
	10	Silicon Forest Green Signals	Washington County	Green Economy and Freight	$1,895,700
	11	Tonquin Road/Grahams Ferry Road Intersection	Washington County	Green Economy and Freight	$2,132,000
	12	Clackamas County Regional ITS Project Phase 2B	Clackamas County	Green Economy and Freight	$1,233,967
	13	Jennings Ave: OR99E to Oatfield Rd Sidewalk and Bikelane	Clackamas County	Active Transportation and Complete Streets	$3,415,728
	14	Trolley Trail Historic Bridge Feasibility Study: Gladstone to Oregon City	City of Gladstone	Active Transportation and Complete Streets	$201,892
	15	SE 129th Avenue Bike Lane & Sidewalk Project	City of Happy Valley	Active Transportation and Complete Streets	$2,720,644
	16	Molalla Avenue - Beavercreek Rd. to HWY 213 (Oregon City)	City of Oregon City	Active Transportation and Complete Streets	$4,588,000
	17	OR99W: SW 19th Avenue to SW 26th Way (Portland) Barbur Boulearvd Demonstration Project	City of Portland	Active Transportation and Complete Streets	$2,000,000
	18	Portland Central City Multi-Modal Safety	City of Portland	Active Transportation and Complete Streets	$6,000,000
	19	Foster Road: SE Powell to SE 90th: Pedestrian/Bicycle/Safety Phase 2	City of Portland	Active Transportation and Complete Streets	$2,000,000
	20	Powell-Division Corridor Safety & Access to Transit	City of Portland	Active Transportation and Complete Streets	$2,918,020
	21	South Rivergate Freight Project	City of Portland	Green Economy and Freight	$4,272,000
	22	St Johns Truck Strategy Phase II	City of Portland	Active Transportation and Complete Streets and Green Economy and Freight	$2,927,813
	23	Southwest in Motion (SWIM)	City of Portland	Active Transportation and Complete Streets	$272,000
Step Three	1	NE 238th Dr: Halsey St to Glisan St Freight and Multimodal Project (PE Only)	Multnomah County	Regional Economic Opportunity Fund	$1,000,000
	2	Troutdale Industrial Access Project	Port of Portland	Regional Economic Opportunity Fund	$8,000,000
	3	US 26/Brookwood Interchange - Industrial Access Project	City of Hillsboro	Regional Economic Opportunity Fund	$8,267,000
	4	Sunrise System: Industrial Area Freight Access and Multimodal Project	Clackamas County	Regional Economic Opportunity Fund	$8,267,000
	5	East Portland Access to Employment and Education Multimodal Project	City of Portland	Regional Economic Opportunity Fund	$8,267,000