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Metro | *Agenda*

Meeting: Metro Policy Advisory Committee (MPAC)
Date: Wednesday, March 9, 2011
Time: 5 to 7 p.m.
Place: Council Chambers

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5 PM	**1.**		**CALL TO ORDER**	**Charlotte Lehan, Chair**
5:02 PM	**2.**		**SELF INTRODUCTIONS & COMMUNICATIONS**	**Charlotte Lehan, Chair**
5:05 PM	**3.**		**CITIZEN COMMUNICATIONS ON NON-AGENDA ITEMS**	
5:10 PM	**4.**	*	**Consideration of the MPAC Minutes for Feb. 23, 2011**	
5:12 PM	**5.**		**COUNCIL UPDATE**	
	6.		**INFORMATION / DISCUSSION ITEMS**	
5:20 PM	6.1	*	Building Climate Resiliency: Putting Protection and Preparedness in Place to Address Impacts Our Region Can Expect from a Changing Climate – DISCUSSION Outcomes: • Learn about the potential climate impacts to the region and recommendations for specific actions that policymakers can take now. • Discuss how these impacts may affect your community and share examples of what your community is already doing.	**Steve Adams, Climate Leadership Initiative**
5:50 PM	6.1	*	Creating a Climate Smart Communities Strategy through Scenarios – DISCUSSION Outcome: • Discuss range of land use and transportation strategies for testing.	**Kim Ellis** **Mike Hoglund**
6:55 PM	**7.**		**MPAC MEMBER COMMUNICATION**	
7 PM	**8.**		**ADJOURN**	**Charlotte Lehan, Chair**

* Material included in the packet.
\# 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 503-797-1700x.

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2011 MPAC Tentative Agendas

Tentative as of March 2, 2011

MPAC Meeting March 9 (annual JPACT DC trip) • Creating a Climate Smart Communities Strategy through Scenarios • Building Climate Resiliency (Steve Adams, Climate Leadership Initiative)	**MPAC Meeting** March 23 (spring break week)
Joint MPAC/JPACT Meeting April 1 (8 am – 12 noon, Oregon Convention Center) • Climate Leadership Summit (information on opinion research results and local case studies; provide input on the combinations of land use and transportation strategies to be tested during the summer)	
MPAC Meeting April 13 • Climate Smart Communities: Discussion of April 1 summit and scenarios evaluation approach • Greenhouse Gas emissions reduction targets for the Portland region (Richard Whitman) • *MPAC bylaws (action/recommendation to council)*	**MPAC Meeting** April 27 • Greater Portland/Vancouver Indicators project (Hoglund) • State of the Centers II Report • MTAC Appoints • *Interim HCT System Expansion Policy Guidance draft*
MPAC Meeting May 11 • Climate Smart Communities: Direction on scenarios evaluation approach and strategies to test	**MPAC Meeting** May 25
MPAC Meeting June 8	**MPAC Meeting** June 22

MPAC Meeting July 13	**MPAC Meeting** July 27
MPAC Meeting August 10	**MPAC Meeting** August 24
MPAC Meeting September 14	**MPAC Meeting** September 28
MPAC Meeting October 12 • *Outcomes-based Urban Growth Management/Urban Growth Boundary (discussion)*	**MPAC Meeting** October 26 • *Outcomes-based Urban Growth Management/Urban Growth Boundary (recommendation to Council)*
MPAC Meeting November 9 • Climate Smart Communities Scenarios Findings and Recommendations to 2012 Legislature (discussion)	**MPAC Meeting** (Note date change: November 16) • Climate Smart Communities Scenarios Findings and Recommendations to 2012 Legislature (Recommendation) (or Dec 14)
MPAC Meeting December 14 • Climate Smart Communities Scenarios Findings and Recommendations to 2012 Legislature (Recommendation) (or Nov 16)	

Projects to be scheduled:

- Southwest Corridor Plan
- East Metro Connections Plan
- Community Investment Initiative
- Intertwine System Development
- Industrial and employment areas for development-ready land for job creation
- Affordable housing/housing equity
- Downtowns, main streets, station communities development implementation
- Solid Waste Road Map

Parking lot:

* Planning areas adjacent to UGB
  (e.g., hamlet in undesignated areas)
* Invasive species management

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METRO POLICY ADVISORY COMMITTEE
February 23, 2011
Metro Regional Center, Council Chambers

MEMBERS PRESENT	AFFILIATION
Matt Berkow	Multnomah County Citizen
Jody Carson	City of West Linn, representing Clackamas Co. Other Cities
Pat Campbell	City of Vancouver
Steve Clark	TriMet Board of Directors
Dennis Doyle	City of Beaverton, representing Washington Co. 2nd Largest City
Andy Duyck	Washington County Commission
Kathryn Harrington	Metro Council
Charlotte Lehan, Chair	Clackamas County Commission
Annette Mattson	David Douglas School Board, representing Governing Body of School Districts
Keith Mays	City of Sherwood, representing Washington Co. Other Cities
Marilyn McWilliams	Washington County Special Districts
Doug Neeley	City of Oregon City, representing Clackamas Co. 2nd Largest City
Shirley Craddick	Metro Council
Wilda Parks	Clackamas County Citizen
Loretta Smith, Second Vice Chair	Multnomah County Commission
William Wild	Clackamas County Special Districts
Richard Whitman	Oregon Department of Land Conservation & Development
Jerry Willey, Vice Chair	City of Hillsboro, representing Washington County Largest City

MEMBERS EXCUSED	AFFILIATION
Sam Adams	City of Portland
Ken Allen	Port of Portland
Shane Bemis	City of Gresham, representing Multnomah Co. 2nd Largest City
Nathalie Darcy	Washington County Citizen
Michael Demagalski	City of North Plains, representing Washington Co. outside UGB
Amanda Fritz	City of Portland
Jack Hoffman	City of Lake Oswego, representing Clackamas Co. Largest City
Carl Hosticka	Metro Council
Steve Stuart	Clark County, Washington Commission
Mike Weatherby	City of Fairview, representing Multnomah County Other Cities

ALTERNATES PRESENT	AFFILIATION
Peter Truax	City of Forest Grove, representing Washington Co. Other Cities
Stanley Dirks	Wood Village, representing Multnomah County Other Cities

STAFF: Janna Allgood, Dick Benner, Aaron Brown, Heather Coston, Andy Cotugno, Chris Deffebach, Alison Kean-Campbell, Kim Ellis, Robin McArthur, Kelsey Newell, Sherry Oeser, Ken Ray, Ted Reid, Dylan Rivera, John Williams

1. CALL TO ORDER AND DECLARATION OF A QUORUM

Chair Charlotte Lehan declared a quorum and called the meeting to order at 5:07 p.m.

2. SELF INTRODUCTIONS AND COMMUNICATIONS

Audience and committee members introduced themselves.

3. CITIZEN COMMUNICATIONS ON NON-AGENDA ITEMS

Councilor Jeff Gudman, speaking as a citizen, shared his concern for the Lake Oswego to Portland Streetcar project, and gave the committee written testimony detailing his apprehension to the project's cost.

4. CONSIDERATION OF THE MPAC MINUTES FOR JANUARY 12, 2010

MOTION: Mayor Doug Neeley moved, and Mayor Jerry Willey seconded, to approve the November 10, 2010 MPAC minutes.

ACTION TAKEN: With all in favor, the motion passed.

5. COUNCIL UPDATE

Councilor Shirley Craddick updated the committee on:

- The Council voted to appoint Barbara Roberts to the council to fill the vacancy in District 6. She will be sworn in on Thursday, February 24, and will serve until January 2013.
- Governor John Kitzhaber appointed Metro COO Michael Jordan to become the first-ever Chief Operating Officer for state government.
- On April 1, Metro will be hosting their Climate Smart Communities event at the Oregon Convention Center. Councilor Craddick strongly encouraged MPAC members to attend.
- The Seven Rules for Sustainable Communities event will be held on March 29 in the Council Chamber at the Metro Regional Center.
- Metro's innovative new online tool, Opt In, is a research panel that will garner public opinion from residents in the Portland-Vancouver metropolitan area. Councilor Craddick reminded MPAC members to join the panel and complete Opt In's monthly surveys.

Councilor Kathryn Harrington updated the committee that on Tuesday, February 22, Metro and Washington County released a revised urban and rural reserves map for Washington County. That map is now available online at www.oregonmetro.gov/reserves and will be the focus of a public hearing in Hillsboro on Tuesday, March 15.

6. ACTION ITEMS

6.1 Election of Second Vice Chair

Commissioner Loretta Smith, representing Multnomah County, was nominated for the Second Vice Chair position by Mayor Denny Doyle. The action was seconded by Mayor Neeley.

MOTION: Councilor Jody Carson moved, and Mayor Keith Mays seconded, to appoint Commissioner Smith as the Second Vice Chair of MPAC for 2011.

ACTION TAKEN: With all in favor, the motion passed.

7. INFORMATION / DISCUSSION ITEMS

7.1 Proposed MPAC and MTAC Bylaw Amendments

Mr. John Williams of Metro presented a set of potential changes to the MPAC and MTAC bylaws. These proposed changes would provide minor updates to MTAC's membership to help MTAC more effectively fulfill its technical assistance role to MPAC. The changes in MTAC's membership include reducing the number of private utility positions, specifically designating a water provider position, and adding a parks provider to the committee.

Ms. Kelsey Newell of Metro presented a second series of proposed changes to the MPAC bylaws, changes that would streamline a series of inefficiencies with the MPAC member appointment and recruitment processes ad update roles and responsibilities for the COO and Council President.

Committee discussion included:

- The difficulty of recruiting three representatives from private utilities to serve on MTAC, and the viability of MTAC recruiting only one private utility representative.
- Whether or not the Fire Departments should have a regional representative on the MPAC/MTAC boards, and if their presence is necessary on a biweekly basis.
- The value of regionally elected officials to recommend various stakeholders, organizations or nonprofits that are qualified for MPAC/MTAC to Metro staff.
- Striking the right balance between the needs of MPAC/MTAC to represent all of the necessary perspectives with the needs to keep the committees at a manageable size.
- The current effectiveness of MTAC, the committee's relationship to MPAC and how changes in both personnel and format would affect both committees.
- Changing the language of the bylaw proposal to reflect that some members of MPAC are appointed specifically by mayors of municipalities, rather than by "consensus of governing bodies" as the bylaw proposal currently indicates.

MPAC voiced their general support for the changes proposed by the bylaw amendments, and encouraged the Office of Metro Attorney to begin examining draft legislation for the formal amendment. Metro staff explained that any formal procedure to officially change the bylaws will require majority approval from the MPAC members and a thirty day comment period.

7.2 2011 MPAC Work Program and Calendar

Mr. Williams outlined the 2011 goals and work program for MPAC, outlining a series of topics that will guide the discussions throughout the year. While MPAC will have fewer formal votes on legislative actions and recommendations in 2011, the primary focus of MPAC will be to help identify investment options and advise the council on a variety of issues.

The letter to MPAC from Mr. Williams and Ms. Robin McArthur of Metro list the planned topics MPAC will address in 2011.

Metro staff also solicited the advice, opinions and general input from MPAC members about other issues, topics, and questions that they'd like to see discussed throughout the calendar year, and encouraged dialogue within the group and with the Metro Council.

Committee discussion included:

- The inherent interdependence of these varied issues, and the necessity of MPAC to holistically plan to meet all of the region's policy objectives.
- Other potential topics members were interested in discussing at future MPAC meetings, such as the future of the MPAC housing subcommittee, the presence of invasive species, and reconciling urban and rural boundaries.

Chair Lehan also refreshed MPAC on the roles and responsibilities of serving members, stressing the importance of maintaining quorum, coming to meetings prepared, and actively participating in the meetings.

7.3 Creating a Climate Smart Communities Strategy: How we get there from here

Ms. Kim Ellis of Metro explained that the Climate Smart Communities Strategy is a response to state mandates requiring the preparation for actions that would reduce greenhouse gases within the region.

The committee discussed Oregon's targets for greenhouse gas emission reduction as they relate to the goals of the state of Washington, and what role the emissions of Vancouver, Washington play in relation to the region's own targeted reductions, considering the shared air shed.

7.3.1 Putting protection and preparedness in place to address impacts our region can expect from a changing climate

This presentation was postponed, as Mr. Steve Adams was unable to attend the meeting due to inclement weather.

7.3.2 Making the Case for Climate Action: Leadership and innovation will be required to meet state climate goals

Mr. Angus Duncan of the Oregon Global Warming Commission gave a presentation explaining that our future infrastructure must represent the realities of the impacts to the state of Oregon of climate change. His presentation detailed the region's current successes and failures of reducing

the emission of greenhouse gases, but stressed that emission abatement must continue to accelerate to meet the target reductions set by House Bill 3543, passed in 2007. His presentation ended with a call for policy to embed carbon reductions into the planning and policy writing process.

7.3.3 Setting greenhouse gas emissions reduction targets for the Portland region

Mr. Richard Whitman of the Department of Land Conservation and Development gave a presentation specifically focusing on the efforts that the Portland region can make to successfully hit the emission targets that will be finalized by the state on June 1. He stressed that the region will have to continue its efforts on building transit-oriented development, promoting higher densities, and continuing compact regional planning to keep the region on tract to meet the greenhouse gas abatement targets. The goal targets will be released April 1, and receive public comment at a hearing on April 21. His presentation noted that the state of Oregon will undergo significant changes with a rise in global temperature, ranging from dominant vegetation to prevalence of fires to reliability of watershed for public use.

8. MPAC MEMBER COMMUNICATIONS

Mayor Neeley noted the closure of the Blue Heron Printing Company in Oregon City, which will result in a loss of 175 jobs.

9. ADJOURN

Committee Chair Lehan adjourned the meeting at 7:07 p.m.

Respectfully submitted,

Recording Secretary

ATTACHMENTS TO THE PUBLIC RECORD FOR 02/23/11**:**

The following have been included as part of the official public record:

ITEM	DOCUMENT TYPE	DOC DATE	DOCUMENT DESCRIPTION	DOCUMENT NO.
3.	Handout	02/23/11	To: MPAC From: Jeff Gudman Re: Lake Oswego to Portland Streetcar	22311m-01
7.2	Handout	n/a	MPAC Rules and Responsibilities – February 2011	22311m-02
7.3.2	Powerpoint	02/23/11	Slideshow Presentation to MPAC: "Making the Case for Climate Action: Leadership and innovation will be required to meet state goals" Angus Duncan, Oregon Global Warming Commission	22311m-03
7.3.3	Powerpoint	02/23/11	Slideshow Presentation to MPAC: "Setting greenhouse gas emissions reduction targets to the Portland region" Richard Whitman, Department of Land Conservation and Development	22311m-04

MPAC Worksheet

Agenda Item Title: Putting protection and preparedness in place to address impacts our region can expect from a changing climate

Presenter: Steve Adams, Climate Leadership Initiative

Contact for this worksheet/presentation: Kim Ellis (797-1617)

Council Liaison Sponsor: n/a

Purpose of this item (check no more than 2):

Information	__X__
Update	_____
Discussion	__X__
Action	_____

MPAC Target Meeting Date: _____March 9, 2011_____

Amount of time needed for:

Presentation	_10_
Discussion	_20__

Purpose/Objective:
The purpose of this item is to prepare MPAC for an April 1 climate change retreat with the Joint Policy Advisory Committee on Transportation (JPACT) and other elected officials and business and community leaders.

Steve Adams will present a recently released report describing potential climate impacts to the region and recommended actions.

Action Requested/Outcome:
- Learn about the potential climate impacts to the region and recommendations for specific actions that policymakers can take now.
- Discuss how these impacts may affect your community and share examples of what your community is already doing.

Background and context:
The Climate Leadership Initiative's new report, Building Climate Resiliency in the Lower Willamette Region of Western Oregon caps an 18-month project to engage local experts and stakeholders in how to prepare the Lower Willamette region for a changing climate. Modeling provided by the Oregon Climate Change Research Institute projects that the region's average summer temperature will increase 10 to 15°F this century, along with more extreme weather events and a loss in snowpack approaching 80 percent below current levels.

While these climate impacts will have significant regional effects on the local economy, social welfare, environment and quality-of-life, more than 200 local stakeholders found ample opportunity for government, private businesses, and individuals to reduce harm by preparing now. Stakeholders provided 40 recommendations including hardening infrastructure, reducing energy use, encouraging preventative health, diversifying the local businesses and restoring floodplains and wetlands. These measures will enhance existing sustainability initiatives, create the basis for a resilient regional economy, and assure continued prosperity for the region.

A more in depth webinar will be held on Wednesday, February 23rd from 10-11am PST. To register, go to: https://www3.gotomeeting.com/register/637338878

What has changed since MPAC last considered this issue/item?
This is a new informational item.

What packet material do you plan to include?
- Building Climate Resiliency in the Lower Willamette Region of Western Oregon: Summary For Decision-makers (January 12, 2011)

For more background information and to download the full report go to:
http://www.theresourceinnovationgroup.org/building-climate-resiliency/

What is the schedule for future consideration of item?
This item is not currently scheduled for future discussion or consideration.

Building Climate Resiliency

in the Lower Willamette Region of Western Oregon

Summary for Decision Makers

The Resource Innovation Group's
Climate Leadership Initiative

January 2011

Acknowledgments

A special thank you to those who participated on the advisory or science teams and contributed to the drafting of the report:

Jeff Weber, Heejun Chang, Vivak Shandas, Michael Armstrong, Dianne Riley, Holly Michael, John Fazio, Sarah O'Brien, Lorna Stickel, Kat West, Heidi Rahn, Lori Hennings, Kari Lyons, Dan Blue, Michael Heumann, Eric Hesse, Dave Waffle, Ethan Rosenthal, Eben Polk, Linda Modrell, Charlie Fautin, John Sechrest, Dave Ecker, Charlie Tomlinson, Peter Kenagy, Wes Hare, Greg Burn, Ali Bonakdar, Theresa Conley, Tara Davis, Xan Augerot, Brad Withrom-Robinson, Claire Puchy, Anita Morzillo, Doug Drake, Char Corkran, Georgia Edwards, Andy Walker, Brian Finneran, Bobby Cochran, Martin Nugent, Gary Galovich, Dana Sanchez, Mary Coolidge, Frank Isaacs, Michael J. Adams, Lily House-Peters, Jordannah Baker, Tiffany Danielson, Beteher Nedi, and Jamie Stephenson.

We greatly appreciate the cities and their staff that hosted workshops, including Oregon City, Clackamas County, Gresham, Cornelius and Albany. Thank you to the numerous participants that provided extensive review and comments on the draft report.

CLI University of Oregon Research Interns: Hannah Satein (Bachelors in Planning, Public Policy and Management, 2010), Elena Fracchia (Masters in Public Administration, anticipated 2011), Caroline Moore (Masters in Public Administration, anticipated 2011), Monique Garcia Lopez (Masters in Community Regional Planning, anticipated 2012).

Layout and design by Holly Spencer.

Our sincere appreciation to the following for making this project possible:

Bullitt Foundation
Harder Foundation
Kresge Foundation
Lazar Foundation
Oregon Watershed Enhancement Board

The Resource Innovation Group (TRIG)

TRIG is a 501(c)(3) that provides innovative solutions to the challenges of sustainability, climate change and other social, economic and ecological concerns. TRIG was founded in 1996, as an affiliate of the Portland State University Hatfield School of Government. In 2005, TRIG established the Climate Leadership Initiative (CLI) with a specific mission of fostering the development and application of innovative thinking and approaches to the complex causes and solutions to climate change. From 2001 through 2010 TRIG had an affiliation with the Institute for a Sustainable Environment at the University of Oregon. Today, TRIG is engaged in partnerships with a number of academic institutions, non-profits, private companies and government agencies nationwide.

Building Climate Resiliency

in the Lower Willamette Region of Western Oregon

A Report on Stakeholder Findings and Recommendations

Summary for Decision Makers

The Resource Innovation Group's Climate Leadership Initiative

Written by: Stacy Vynne, Steve Adams, Roger Hamilton, Bob Doppelt

January 2011

A program of The Resource Innovation Group
PO Box 51182 ▪ Eugene, OR ▪ 97405
www.theresourceinnovationgroup.org

Introduction

In 2010, the Climate Leadership Initiative (CLI) engaged over 200 experts from the Lower Willamette region of western Oregon in a series of workshops called Climate Futures Forums. Individuals from the following counties participated: Benton, Clackamas, Linn, Marion, Multnomah, Polk, Washington and Yamhill. Forum participant expertise expanded across the following systems: natural, built, economic, human and cultural.

Based on Intergovernmental Panel on Climate Change (IPCC 2007) modeling of two possible future emissions scenarios ("Business as Usual" and a greener scenario) for mid and end of century, the Oregon Climate Change Research Institute (OCCRI) developed downscaled projections of impacts for the Lower Willamette. These projections, coupled with other local research, provided the basis for the CLI Lower Willamette project.

The Climate Futures Forums had the following objectives:

- Assess regional climate change projections;
- Identify likely impacts to systems throughout the region; and
- Recommend strategies to prepare for those impacts.

CLI facilitated participant discussion to integrate strategies across the natural, built, economic, human and cultural systems and ensure that climate change preparedness actions produce complementary benefits the different sectors within the systems as well as reduce conflicting costs.

This document provides policy and decision makers with a summary of findings from CLI's 2010 Lower Willamette project. The full report, which contains a detailed description of the Climate Futures Forums, the modeling process and projections, and the impacts and recommendations, is available at www.theresourceinnovationgroup.org. The complementary modeling projections report from OCCRI is also available.

While this summary and the accompanying report identify a number of consequences from climate change in the Lower Willamette, many opportunities are also presented. Climate change may bring new prospects for locally focused businesses, increased self-sufficiency among residents, and innovative networks to support vulnerable populations. These responses will make the region more resilient not only to climate change impacts, but could also buffer the local economy to rising energy costs and turbulent global markets.

The Climate Futures Forums and the results presented in this summary are only the beginning. Forum participants and stakeholders in the Lower Willamette must begin to assess the recommended strategies, identify priorities based on benefits and costs, and begin implementation. Effective implementation depends on broad coordination and collaboration across the many jurisdictions within Lower Willamette region: state and federal agencies, the private sector, institutions of higher learning, and non-profit organizations. Individuals from each of these institutions are encouraged to use the report to initiate dialogue on building resilience to the impacts of climate change in the Lower Willamette.

The people and institutions of the Lower Willamette have the capacity and innovation needed to effectively prepare for climate change. The region is likely one of the more resilient in the country. By initiating a process now to prepare the natural, built, economic, human, and cultural systems for climate change, the Lower Willamette will continue to prosper well into the future.

Overview of Findings and Recommendations

Key Projections

Key projections participants responded to include:

- Overall warming trend, with an increase of 10-15° F in summer under the Business as Usual emissions scenario;
- Changes in precipitation patterns (more rain, more precipitation falling in a shorter amount of time);
- Change in conditions to favor warmer vegetation types;
- Significant loss of snowpack in the Cascades of about 80% compared to current conditions by end of century;
- Higher stream runoff in winter and early spring (due to more precipitation falling as rain and in shorter periods), and decreased flows in summer for some locations; and
- Higher intensity and increased distribution of fires.

Key Impacts

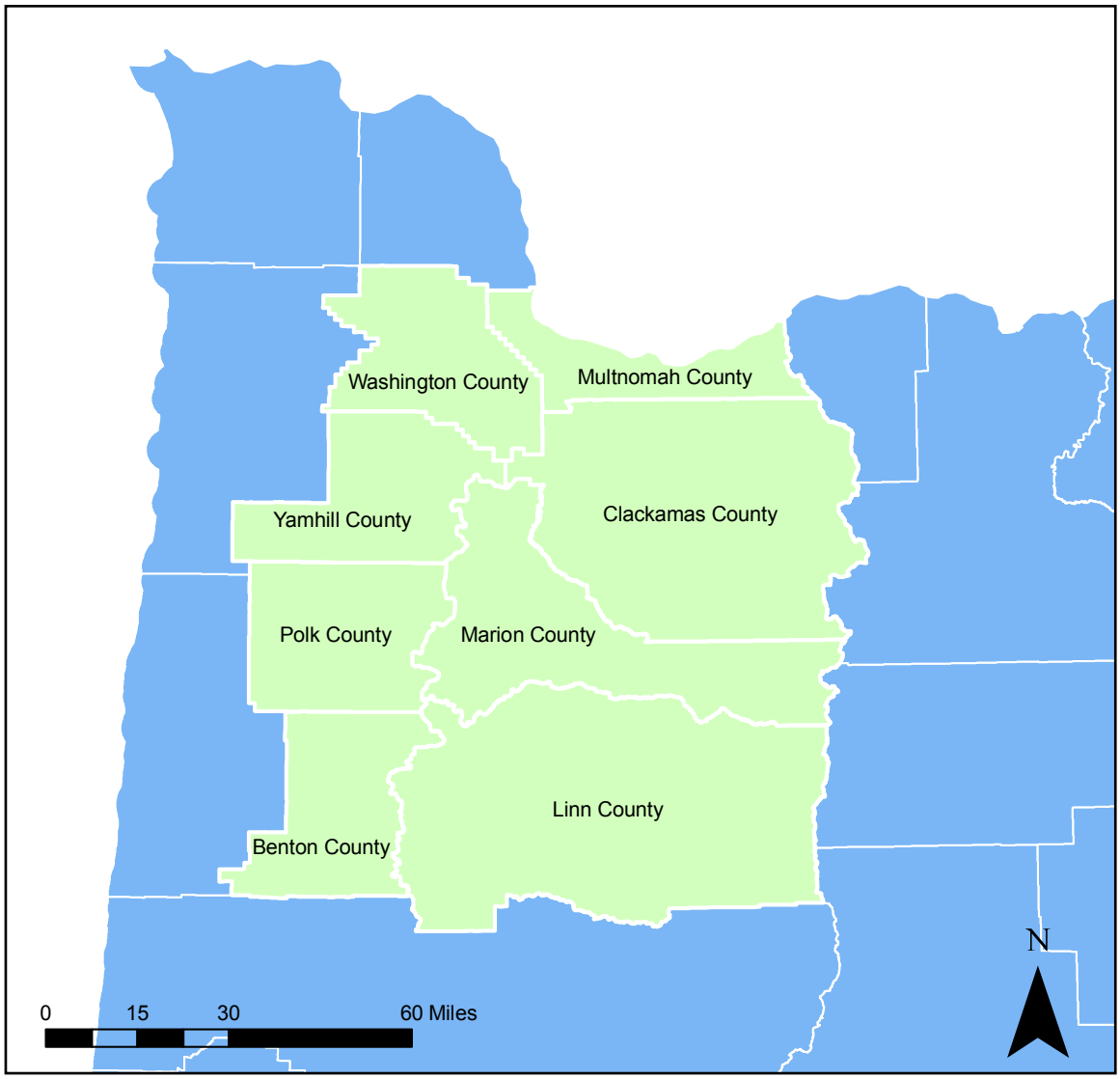
Common themes of impacts identified by participants include:

- Reduced water quality and shifts in water availability (i.e. more in winter, less in summer);
- Mis-match in life history timing of many species, possibly leading to population decline due to diminishing availability of essential resources when needed by each species;
- Decline in efficiency of, and potentially significant damage to, public works, transportation, and communication infrastructure;
- Extended duration and shifts in timing of seasonal peak water demands;
- Diminished productivity or total loss of some agricultural commodities, but potential opportunities for new crops and longer growing seasons;
- Increases in number of invasive, non-native plant and animal species (i.e. additional species coming into the area), and expansion of ranges (i.e. spread) of others.
- Increased instances of heat illness, vector- and water-borne disease, mental health illness, respiratory distress; and
- Loss of cultural resources (e.g. salmon) and historical landmarks (e.g. covered bridges, century old barns and iconic natural features).

Key Recommendations

Common themes of recommendations identified by participants include:

- Protect floodplains, wetlands, and groundwater recharge areas;
- Further assess anticipated habitat changes in order to preserve existing high quality habitat and promote restoration where feasible;
- Preserve, expand, and connect existing high quality habitat and restore habitat of lesser quality that is crucial to species' survival;
- Update infrastructure with projections for future population growth and climate change;
- Anticipate increased energy needs and provide incentives for efficiency and conservation;
- Diversify businesses, as well as agricultural and timber crops;
- Increase preventative health initiatives, notification and warning systems, and diversify health and emergency management partnerships; and
- Protect key cultural resources and improve historical architecture resiliency to extreme events.



The counties of focus for this report are presented here. The Oregon Department of Environmental Quality (DEQ) defines the Mid Willamette as the Willamette River at Canby, including the North and South Santiam, Yamhill, and Molalla-Pudding subbasins, and the Lower Willamette as the region around the mouth of the Willamette River and the Tualatin and Clackamas subbasins. Willamette Falls (located between Oregon City and West Linn in Clackamas County) is the upper end of tidal influence. Map courtesy of Kathie Dello, Oregon Climate Change Research Institute.

Impacts and Recommendations for Natural Systems

Likely Impacts to Natural Systems

Shifts in stream flow. Extreme precipitation events could result in short- and long-term changes to river and stream morphology (i.e. shape and pattern), with a potential long-term shift to a different hydrologic regime such as timing and magnitude of flow. Some aquatic experts project increasing 'flashiness' of streams (a high stream flow lasting for a short period- typically less than six hours- following rainfall or snowmelt) due to increased warming and rainfall. These events may reshape the stream systems. While some aquatic organisms and habitats are adapted to flashiness, typically these events result in increased erosion, flushing of organisms due to excessive flows, scouring of streambeds, and loss of opportunity for ground water recharge.

Reduced air quality. Climate change amplifies air pollution problems in both rural and urban areas, increasing ground level ozone and particulate matter concentrations. Reduced air quality can disrupt regional ecosystem processes and genetic and population diversity, cause extensive damage to vegetation, and also lead to acidification of ecosystems. This could result in Clean Air Act noncompliance.

Reduced water quality. Increased precipitation events and runoff could lead to erosion and increased nonpoint pollutant loading to streams. Increasing stream temperatures may also lead to decreased water quality from nutrient loading and algae blooms. This could result in Clean Water Act noncompliance.

Loss of genetic diversity and shift in species gender balance. Reptiles such as the western pond turtle and western painted turtle may experience changes in male to female ratios, since gender is temperature dependent: females are produced at higher incubation temperatures than males. Cold water aquatic species or high alpine terrestrial species are also at greater risk by increasing stress, possibly leading to localized species extinctions and a loss of genetic diversity.

Shifts in quality of habitat and refugia. Wetlands are likely to experience increased drying during the summer months, impacting local amphibian and turtle populations, mammals, native vegetation and birds. Prairie habitat will be threatened with further fragmentation risk through shifting precipitation patterns and increased fire, impacting the ability of prairie-dependent species to migrate. Forest species that rely on soil and ground cover may experience habitat loss, as well as species that require extensive habitat (impacting species management under the Endangered Species Act).

Reduction in ecosystem services. Climate change may impact the natural storage, filtration and pollination services provided by the systems of the Lower Willamette.

Shifts in extreme events. Extreme events, such as precipitation, fire, and wind, are expected to increase with climate change. These events will pose threats and opportunities for natural systems in the Lower Willamette.

Increased intensity of urban heat island effect. Urban areas with substantial impervious surfaces and concrete, devoid of vegetation and wetlands that moderate warming, may experience a more rapid warming compared to rural forested areas and smaller communities. This would lead to greater negative climate impacts on urban forests, parks, waterways, fish, wildlife, and vegetation.

Loss of specialist and low mobility species. Species that specialize in a particular habitat, prey, or whose current populations are rare, unhealthy or isolated, are very susceptible to climate change impacts. Species that must travel long distances to escape heat or find water are susceptible to changes in climate.

Increase in invasive, generalist, and heat tolerant plant and animal species. An increase in high intensity fire may make some ecosystems less resilient to invasive species colonization following disturbance (however, fire can also act as a control for invasives). Invasives may be more adapted to soil disturbances associated with fire and extreme events, as well as to warmer climate. Species that thrive in a variety of habitats and on a variety of food sources (i.e. generalist) may not be impacted severely with climate change.

Shift in migration patterns and habitat range. Generalist butterflies are expanding their ranges under current climate changes whereas specialist

butterfly species have been moving northward or are being squeezed out of their ranges. For birds, potential changes include species no longer present in Oregon during the summer, summer ranges expanding or contracting, and species without a current presence coming to Oregon in the summer. With warmer winters, there may also be an increase in resident waterfowl, leading to overgrazing of grasslands.

Changes in intra-species interactions and life history timing. With changes in vegetation, symbiotic relationships between benthics (bottom dwelling), aquatics, and terrestrial species will change, likely to the detriment of many native species. Key timing for life history requirements may become out of sync for some species, such as food availability not matching ingrained migration timing.

Loss of culturally important species and landscapes. Warmer temperatures and changing vegetation conditions may lead to a loss of species of tribal and general public importance. Scenic areas considered to be part of Oregon's identity might also be impacted (e.g. the glaciers of Mount Hood).

Recommendations for Resilient Natural Systems

Protect and restore floodplains and connect them to their rivers. Maximizing connections between streams and their floodplains will reduce impacts from flooding on human and natural communities and encourage water storage. Management should focus on creating and maintaining off-channel habitats and reserves for deep-water storage in order to support resiliency of the floodplain system during extreme events. Local government, in collaboration with the state, can strengthen floodplain restoration policies and non-structural flood storage to improve flood control and reduce vulnerability to extreme flooding. Zoning and building codes can also be used to reduce development impacts on floodplains. Levee and other flood control management efforts should be integrated with natural systems protection to achieve win-win solutions in adapting to climate change.

Increase the complexity of streams. Stream complexity restoration is an effective strategy for ensuring coldwater availability and reducing stream flashiness. Recruitment of large wood to stream systems supports this, but may require a shift in Oregon Forest Practices to encourage interplanting of evergreens in Riparian Management Areas. The Oregon Water Resources Department, Department of Land Conservation and Development, local governments, Soil and Water Conservation Districts, Department of Forestry and Fish and Wildlife, irrigation districts and watershed councils can all play a role in reviewing and revising local stream policies and restoration projects to identify opportunities for improvement.

Protect, expand and connect (where appropriate) existing, high quality habitat and restore and connect (where appropriate) habitats of lower quality. Habitat protection policies under local, regional and state management, as well as habitat managed by conservation organizations, should prioritize protection and expansion of high quality urban and rural habitat with greater resilience to climate change. Increasing connectivity between habitats using buffers, anchors, and corridors should be encouraged. However, managers should also prevent "highway" corridors through which invasives and diseases can spread rapidly.

Use a landscape approach to conservation. To maximize protection of habitat and increase resiliency of species and ecosystems to climate change impacts, a landscape approach is needed to integrate efforts happening at a more localized scale with broader regional approaches (please see the full report for a more detailed description of landscape approach). ODFW, in coordination with the USFWS, should consider how invasives, as well as Threatened, Endangered and Sensitive (TES) species are identified and managed under a climate change future.

Revise species management. To increase effectiveness and avoid duplication of species management programs and policies, greater communication and collaboration is needed between researchers and land managers. Federal, state, and local species management agencies should increase coordination efforts. Species protection efforts under the federal Endangered Species Act (ESA) will need to be evaluated in light of a changing climate, including the possibility or likelihood that species' current habitats may have limited ability to support these species in the future.

Restore and manage beaver presence in riparian communities. Restoration of beavers will support aquatic habitat resilience, as they are a keystone species with a strong influence on ecosystems as a result of their dam-building and feeding activities. The benefits of beavers will need to be weighed with some of the negative impacts of beaver dams, which can thraten private structures and public infrastructure. Stormwater management facilities will need to plan for beavers, and enact road crossings.

Reassess allocation of water rights. Overappropriation of streams in the region negatively affects water quality and quantity. The Oregon Water Resources Department may need to consider a review of water rights and potential shifts in regulation.

Incorporate climate change preparation strategies into watershed management plans. If not already doing so, watershed councils and local governments should develop, adopt, and begin implementing local watershed management plans that set climate resiliency objectives for hydrology, physical habitat, water quality, and biological communities.

Increase riparian vegetation. Supporting riparian vegetation growth (along river margins and banks) could help to protect water quality from increased erosion and associated pollutants. Increased riparian vegetation will also improve water quality through shading, habitat diversity, and cover for wildlife.

Restore natural fire regime. Natural fire regimes should be restored to build the resilience of ecosystems to climate impacts, as fires maintain diverse assemblages of vertebrate species and forest types.

Reduce impervious surfaces. Local governments should minimize the extent of impervious surfaces to protect the water quality of streams, improve infiltration, and reduce stream flashiness.

Increase and refocus monitoring efforts. Monitoring will need to be more adaptive and integrated with management regimes as a result of shifting climate conditions.

Natural Systems			
Recommendation	**Who**	**Co-Benefits/Costs**	**Mitigation Benefits**
Protect and restore floodplains, connect to rivers	FEMA, local government, private landowners	Reduce damage to infrastructure, increase water storage	
Increase stream complexity	WRD, DLCD, local governments, SWCD, DOF, DFW, irrigation districts and watershed councils, OWEB	May require removal of infrastructure and limit development, supports commercially and culturally valuable species, may reduce health risks	
Protect high quality, restore lower quality habitat	Regional jurisdictions, state agencies, nongovernmental conservation organizations, lottery funds	May limit development, provides ecosystem services, may boost property values, improves air and water quality, supports recovery of culturally important species	Yes, if sequestration
Use landscape approach	Conservation organizations, watershed councils, private landowners, and state and federal agencies	May limit some development	
Revise species management	ODFW, USFWS, watershed councils, and landowners		
Restore beavers	ODFW, USFWS, watershed councils, storm water managers, and landowners	May cause damage or restructuring of water infrastructure, benefits to other species and stream complexity	
Reassess allocation of water rights	WRD	Reduce strain on water infrastructure	Yes, if conserves water
Incorporate climate change preparation strategies into watershed management plans	watershed councils and local governments		
Increase riparian vegetation	watershed councils, landowners	Improve air quality	Yes
Restore natural fire regime	Oregon Department of Forestry, federal and state land manager	Reduce catastrophic fire damage to infrastructure, may impact timber production, supports recovery of culturally important species	
Reduce impervious surfaces	Local governments	Reduce flashflooding events, support species and ecosystem recovery, improves water quality for human use, may limit new development	Yes
Increase and refocus monitoring	conservation organizations, watershed councils, state and federal governmental agencies	Supports recovery of culturally important species as well as commercially valuable crops	

Impacts and Recommendations for Community Systems (Built, Economic, Human and Cultural)

Likely Impacts to Built Systems

Damage to water and sewer infrastructure. The greatest strain on water and sewer infrastructure may be felt during early winter and spring, when projections show an increased likelihood of intense rain events. The possible consequences of system failure due to extreme events include sewage system backup, submersion of sewage treatment plants, overwhelming of filtration systems from silt and other debris, and reduced availability of safe-drinking water through raw sewage leakage. As water utilities face longer summer-demand seasons from their customers, plus reduced summer flows in some or many of their surface water sources, they will increasingly turn towards groundwater as a supplemental source.

Strain on public transportation and road conditions. Roads may buckle due to increased temperatures, fire, or flood. This could cause interruptions in emergency response, as well as decrease worker productivity. With increased storms and runoff there may be large sediment increases in streams from blowouts of forest roads. If climate refugees move to the region as anticipated, the carrying capacity of roads may reach its limit and maintenance and repair may need to be done more frequently

Bridge failure: Structural soundness of these bridges may be compromised with climate impacts, particularly from "flashier" floods following heavy precipitation events.

Air and rail disruptions: Sea level rise may impact rail lines as many miles of railroad are along tidal rivers and streams. Rail lines are also susceptible to icing from winter storms, as well as significant temperature increases. The Portland International Airport (PDX) may experience increasing flight delays or cancellations as a result of extreme weather events.

Impacts to utility transmission and meeting energy demand: Electricity demand will be impacted by changes in future temperature. Less energy may be needed in winter with milder temperatures, while warmer temperatures may increase demand in summer. Power outages may occur on very hot days when peak demand exceeds capacity. Population growth may further exacerbate energy demand and reduce availability. Further, transmission lines may be at risk due to climate change events such as fires or excessive heating during extreme temperatures and high use.

Interruptions in communications infrastructure. Above-ground communication infrastructure (internet, phone, television, etc) is at risk to high temperatures, flooding, fires, and extreme storm events such as wind and precipitation. Interruptions may put communities at greater risk during extreme events due to lack of information from emergency service providers.

Impacts to buildings. Homes, essential service infrastructure, and businesses located in floodplains are at risk to damage from floods. With projections showing wildfire likely to increase in frequency, intensity, and distribution, homes in the wildland-urban interface are likely to be damaged.

Recommendations for Resilient Built Systems

Update and improve water and sewer infrastructure: Water and sewer infrastructure must be designed to cope with bigger and more frequent storm events. In addition, updates to infrastructure by local utilities, state and local governments should consider projections for future population growth, including the likely influx of climate refugees. Storm water management should incorporate catchment from gutters, green rooftop designs, increased green space, and separate storm water and wastewater systems with new pipe systems and upgrades. For cities experiencing low flow impacts, grey water reuse and stronger water conservation policies should be deployed. In addition, water pricing may need to be considered in order to deal with shortages and provide capital investment for system upgrades. To diversify sources, providers can integrate groundwater as a supplemental supply source and conjunctive water management such as Aquifer Storage and Recovery (ASR).

Identify critical infrastructure in floodplains and relocation needs. Floodplain management plans need to consider the projected impacts of a changing climate, while agencies producing maps (such as FEMA) need to update maps for likely floodplain areas.

Improve and safeguard transportation infrastructure. ODOT should explore new paving technologies for transportation infrastructure that reduce the impacts of increased temperatures. Communities will need to plan for mixed-use zones, such as employment clusters and mass transit located near condensed residential areas, as well as integrated land use, transportation, and development codes. Cities will require improved mass public transit, such as with high-speed rail. New transportation infrastructure development will need to consider future floodplain conditions and rerouting of major roads to prevent flood damage. Some airports will also need to consider relocation of runways under future projections for flooding, particularly at the Portland International Airport.

Improve energy efficiency, promote renewables, and protect building infrastructure: Energy efficiency education and outreach programs must grow to reduce the strain on hydropower systems and the potential for black/brownouts. City energy codes need vigorous enforcement while encouraging more LEED certifications. Government buildings should act as an example by improving the energy efficiency of their buildings and purchasing renewables (wind, solar, etc) for the energy used.

Identify back-up communication sources. City and county emergency service providers, in collaboration with communications companies, should identify alterative sources of communication during times of emergency events

Update land use codes to prevent flood and fire damage to infrastructure. Planning strategies should consider potential impacts to communities by incorporating future flood, fire and population projections. Participants recommended that the Department of Land Conservation and Development as well as local and regional governments consider: increasing the density of cities prior to expanding the urban growth boundary to prevent further risk if the UGB is expanded to fire- or floodprone areas; employing disincentives for development in flood or fire prone areas; requiring individuals to reduce risk (such as flow-through design, or fire-suppression sprinkler systems) when development is allowed in flood or fire prone areas; and revising development policies to minimize impacts in sensitive areas, especially along floodplains and riparian areas.

Promote compact housing and protect the urban growth boundary. Limiting future growth and promoting compact housing reduces the strain on emergency services, assists in neighborhood cohesion during major events, and reduces dependency on transportation infrastructure. However, higher density living may require a cultural shift, as many western communities are not accustomed to compact living: some regions of the Willamette have faced pushback from residents regarding infill development.

Built Systems			
Recommendation	**Who**	**Co-Benefits**	**Mitigation Benefits**
Update and improve water and sewer infrastructure	Local government, utility providers	Prevents contamination of drinking water and ecosystems	Yes, if improves efficiency, lowers energy use
Identify critical infrastructure in floodplains and relocation needs.	State and local jurisdictions	Reduces risk to human health	
Improve and safeguard transportation infrastructure	Amtrak, ODOT, Portland International Airport, and the Federal Railroad Administration	Improves reliability of food delivery and economic stability	
Improve energy efficiency of buildings	Business owners, government, community organizations	Reduces utility costs, improves air and water quality, improves worker productivity, provides urban habitat	Yes
Identify back-up communication sources	Government (local and state), communication service providers	Improves reliability of emergency services during events	
Update land use codes to prevent damage to infrastructure	Department of Land Conservation and Development, local jurisdictions	Protects natural systems, improves water quality	
Promote compact housing and protect the urban growth boundary	Local jurisdictions	Strengthens local businesses, protects agricultural and timber land, reduces strain on emergency services, protects ecosystems, may reduce urban habitat	Yes

Likely Impacts to Economic Systems

Vulnerability of small businesses: Compared to larger businesses, small businesses may face greater challenges in recovering from climate change events such as a flood or fire. Their limited supply and demand chain may be at risk from interruptions to transportation, resources, and infrastructure.

Changes in food prices and agricultural crops. Agriculture and food processing will likely incur higher expenses for managing drought, extreme precipitation events, higher temperatures, and increases in disease outbreaks. Food being imported from other regions may be sold at higher prices due to increases in management costs, while imported food may be at risk to transportation disruptions or disease. Locally grown food may be impacted by an increase in the frequency of extreme weather events, such as heat, flood, or cold. On the other hand, opportunities may emerge in the Willamette for crops tolerant of warmer climates.

Changes in grape variety and yield. Climate change will impact the region's wine production because of narrow varietal bands of temperature tolerance, and climate being one of the most significant factors in determining quality and style of wine. An increase in temperature may alter the types of wine grapes grown, quality of grapes, and profitability of the region.

Shifts in timber species and productivity. Climate change may alter the species of commercially viable trees that are able to grow in the region. Trees such as coastal and Douglas firs yield larger profits than other species. Projections show that climate change will favor the warmer species such as ponderosa pine and hardwoods.

Shifts in tourism and recreation. Climate change may impact recreational activities including wine tours, hot air ballooning, river rafting, camping, agri-tourism, among others. Reduced snowpack will impact the skiing industry; however, longer summers may allow for more summer recreational activities such as camping, water sports, and fishing (likely for different fish species).

Interruptions to freight transportation. Freight transportation is vulnerable to flooding and landslides: some roads are in floodplains and at the same time are old and deteriorating. Rail is also essential to the movement of freight. Rail lines in the Lower Willamette are vulnerable to icing during winter storms, high temperatures, and flooding; disruptions in service due to these weather events lead to economic losses.

Increasing insurance rates. Insurance rates may rise as risks for floods and wildfires increase. Homes and businesses located in flood and fire prone areas may be impacted.

Impacts to health care:

Access: Current healthcare infrastructure in the Lower is robust, but climate change may reduce access and availability to healthcare. Emergency management services may be stressed with increased populations, reducing the ability of the healthcare system to efficiently respond.

Insurance: As extreme events exacerbate the spread of disease, diminish air quality, and reduce the health resiliency of the population, health insurers and public programs such as Medicare and Medicaid will likely see increases in claims.

Cost: A number of risks associated with climate change are expected to increase the cost of healthcare in Oregon, including costs related to new diseases, increased respiratory ailments, increased incidence of water- and food-borne diseases, and decline in nutrition and sanitation.

Unintended consequences: While healthcare costs accumulate under changing climate conditions, secondary costs will also affect the Lower Willamette including reductions in workforce productivity, particularly for vulnerable individuals and outdoor workers.

Recommendations for Resilient Economic Systems

Diversify and promote risk management. Economic diversification (functionality, size and scale) will support the economy to recover more easily from a disaster. Regional economic development agencies, Chambers of Commerce, or State economic development agencies can promote climate risk assessment, monitoring, and preparation for all businesses to improve their resilience.

Research and invest in climate tolerant crops. Growers may want to consider diversifying the crops they are growing, reassessing planting and harvesting seasons, and changing the scale of their harvesting. OSU–Extension and the State Department of Agriculture should invest in research on crops tolerant to higher temperatures and

drought. Growers and producers of food, nursery, grass seed, and wine grapes that are considering new crops should take into account climate change projections for warmer temperatures.

Shift industrial forest management practices. Timber practices should focus on planting a diverse mix of species, increasing buffers to prevent disease and fire, and limiting clearcuts to prevent erosion and landsides.

Plan for shifts in transportation of freight. City, state and regional planners should identify roads most vulnerable to landslides, flooding, and fire, and have a preparedness plan available of the safest and most cost-effective alternate routes for freight travel.

Meet insurance requirements. Insurance prices will continue to rise as risks increase due to climate change events such floods and fires. Laws and building codes must be modified in order to discourage building on floodplains or in close proximity to the wildland-urban interface.

Prepare health care

Education: Increasing opportunities and incentives for individuals to join the primary care field will help prepare for an influx in population and associated health needs. Because the Lower Willamette already has a number of professional health institutions, there is an opportunity to build on existing institutions and programs. In particular, building the preventative care workforce now can reduce the economic strain on health care and insurance in the long run.

Comparative risk assessments and health impact assessments: Insurers, governments and local health providers should incorporate climate change preparedness into their long-term planning and needs assessments.

Preventative healthcare: Policymakers, educational institutions, and health providers should emphasize preventative healthcare strategies to manage future healthcare cost and access.

Economic Systems			
Recommendation	**Who**	**Co-Benefits**	**Mitigation Benefits**
Diversify and promote risk management	Regional economic development agencies, Chambers of Commerce, State economic development agencies, individual businesses	Strengthens local economy, increase job opportunities	
Research and invest in climate tolerant crops	OSU–Extension and the State Department of Agriculture, growers	Promotes diversity of species, may reduce impact on soils and water needs, maintains nutritional value of food	Possibly, if less water and fertilizer needed
Shift industrial forest management practices	ODF, Weyerhaeuser and other timber companies	May reduce development in some areas, may promote diversity of tree species, improve air quality	Yes
Plan for shifts in transportation of freight	City, state and regional planners, ODOT	Reduced impact on infrastructure, maintains local economy during events, ensures food and supply delivery	
Meet insurance requirements	Emergency managers, local jurisdictions, insurance agencies, homeowners, businesses	Reduce impact on floodplains	
Prepare health care for change	Insurance agencies, cities, counties, educational institutions, health providers, individuals		Possibly through prevention strategies.

Likely Impacts to Human Systems

Amplified risks to vulnerable populations. Projected increases in storm intensity, flooding, and wildfire, may render residents with limited access to healthcare, transportation, and property insurance more vulnerable to disasters. Severe summer heat and changes in precipitation may leave those without access to air conditioning, limited food and water availability, and with inadequate access to healthcare vulnerable to disease.

Overwhelmed emergency response systems capacity. Projected increases in the frequency and intensity of extreme weather events, outbreaks of vector-borne disease, and extreme heat is likely to place greater stress on existing emergency response systems.

Inadequate individual response capacity. Individual and community emergency response capacity may not be adequate as emergency events increase in number and intensity. According to workshop participants, many residents in the region are not aware of emergency protocols or the availability of emergency resources.

Food and water scarcity: The projected frequency and severity of emergency events along with expected changes in global food supply leave the Lower Willamette vulnerable to food and water scarcity. Emergency food systems, particularly in rural areas, are already widely utilized under non-emergency situations, and the need for emergency food is increasing.

Stressed social services: The absence of care and support within communities may strain local and state social services as populations deal with the effects of climate change. Large and growing elderly and low-income populations in the region will further stress social services.

Public safety concerns: Hotter summers and increasingly extreme events may amplify local crime rates.

Outdated education: A lack of quick adaptability in education systems suggests that curricula may not be responsive to new climate change concepts and job requirements.

Public health concerns:

Reduced air quality: Increased air pollutants (mold, ozone, pollen, haze, etc), in combination with the higher likelihood of forest fires, threaten the respiratory health of the population.

Reduced water quality: Projections for increased flooding and an increased number of extreme heat events threaten drinking water quality.

Increased mental health concerns: The stress of extreme climate events on a population can exacerbate already stressful lifestyles, especially with displacement and/or the loss of a home.

Disease outbreaks:

- Vector Borne Disease: There are mixed projections about the spread of disease under climate change. Some studies and local experts suggest that areas that have been able to control diseases in the past will have a high likelihood of continuing to do so. Some local experts expect an increased threat of insects that carry disease in the area, such as mosquito-borne diseases like malaria, filariasis, dengue fever, yellow fever, and West Nile virus.
- Water Borne Disease: Disease outbreaks can occur when bacteria, viruses, and protozoa contaminate water. During the summer months, outbreaks of toxic blue-green algae can result in public health threats.
- Food Borne Disease: With both warmer temperatures and increased precipitation, food borne disease outbreaks may become more common. While the Lower Willamette may be impacted less by climate change compared to other regions of the United States, preparedness strategies are important to determine the potential for outbreaks as well as prepare for potential diseases that may arrive in imported food.

Increased heat events: Several consecutive days of temperatures of 90° F or higher, and unusually warm nighttime lows in the 60s and low 70s, can lead to heat illness for populations without access to air conditioning, well insulated homes, or cooling centers.

Reduced access to healthcare: Climate refugees are expected to increase in the Pacific Northwest including the Lower Willamette. With increased population levels, resources and trained healthcare providers will be stretched, as will hospital space, pharmaceuticals, and medicine.

Cumulative impacts: While emergency responders and healthcare providers are able to tend to the needs of the community currently, there is significant concern among some local experts that the increased need for healthcare under climate change conditions will stress public health systems beyond their capabilities.

Recommendations for Resilient Human Systems

Identify and build resiliency of vulnerable populations. State and local health departments and social service providers should assess the scope and needs of vulnerable populations. Mechanisms to promote self-resiliency, resource conservation, and efficiency measures may reduce the vulnerability of low-income, elderly, and geographically marginalized (i.e. rural) populations in the region.

Strengthen local social networks: To alleviate potential stress on the region's social services, local governments and NGO's should work to strengthen local social networks through events and organizations to encourage community members to meet their neighbors and fortify networks of support.

Improve community outreach systems: Public, private and non-profit outreach should ensure the delivery of diverse, culturally sensitive, and multi-lingual resources to the public to convey the public health and economic benefits of adaptation.

Increase capacity of emergency and social service response systems. Emergency management plans and resources should be evaluated for climate resiliency and updated to address the specific risks of climate change by local and regional governments as well as nongovernmental organizations. Updated plans should incorporate coordinated, regional management and involve contiguous jurisdictions to craft response strategies, recognizing that disasters do not adhere to jurisdictional boundaries.

Increase individual response capacity. Local governments and community-based organizations can work with individuals and social networks to build the preparedness capacity of individuals, therefore reducing the strain on emergency services.

Enhance local food security. To prevent food scarcity during emergency events and in the face of changing global food production, the Lower Willamette should develop more resilient local food systems. Localities, working with nongovernmental organizations, can adopt measures to increase local food production for all seasons, opportunities for food preservation, reduce dependence on food imports, and decentralize food sources.

Increase residential water conservation: To minimize water scarcity during emergencies, localities should adopt policies to promote water conservation. Education and incentive programs should be expanded to encourage water saving practices including leak repairs and the installation of high efficiency fixtures.

Decentralize home and community water storage. Localities should ensure access to adequate systems to disseminate emergency water storage information. Localities should reevaluate current regulation on greywater and rain catchment sources (see below). Information and installation assistance for on-site residential rainwater collection and storage systems should be provided by local water utilities and/or building departments. The Oregon Water Resources Department should consider these recommendations with state funding to local jurisdictions for implementation. However, caution should be taken as there are a number of public health and equity issues associated with decentralized systems.

Revise job codes and education certificates system: Oregon's system for updating job codes and certificates should be revised to more quickly adapt to address changing technologies and the skills required to meet the demands for green jobs. New jobs in installation and operation of distributed renewable technologies, energy and water efficiency installations, flood and fire management, and environmental restoration should be incorporated into state job codes and linked to public and private educational curricula, including high schools, community colleges and universities.

Build ecological and climate literacy into the education system: State and local education agencies should develop and incorporate standards for ecological and climate literacy, building from the standards developed by NOAA.

Preparing public health:

Action-oriented education: Local and state officials should educate the public about health impacts resulting from climate change to reduce fear and panic, while building self-sufficiency to reduce public dependence on health services.

Protect water quality: Local and state agencies should focus on water quality protection against events associated with climate change including more stringent pesticide standards will improve water quality and reduce chemical runoff, increased monitoring of water systems particularly at peak weather events, and a reassessment of water systems to ensure they can handle increased amounts of water to reduce the threat of contamination.

Expand mental health services: Local and state health agencies should incorporate mental health trauma needs into emergency response systems so that service providers recognize and treat symptoms early before they are exacerbated.

Air quality notification: Local and state agencies should ensure that communities, particularly vulnerable populations, are effectively notified of poor air quality events.

Disease outbreak monitoring: Local governments must prepare for increased vector-borne, water-borne and food-borne disease by increasing monitoring, testing and public alert systems.

Heat-wave alert systems and education for vulnerable populations: Establishing warning and alert systems within communities will aid in spreading knowledge of extreme heat days.

Promote preventative health: Educating individuals on preventative health will create a population more resilient to disease. Encouraging regular doctor visits, exercise, and healthy living is important for strengthening the health of the community. Prevention will reduce risks to vulnerable populations and lower the economic and capacity strain on the public health sector.

Human Systems			
Recommendation	**Who**	**Co-Benefits**	**Mitigation Benefits**
Identify and build resiliency of vulnerable populations	State and local health departments, community organizations, social service providers	Reduced energy demand, less building in flood prone areas	Yes
Strengthen local social networks	Cities, neighborhood associations, churches, community-based organizations, etc.	Decrease long term disaster recovery costs	
Improve community outreach systems	Local jurisdictions, community organizations		
Increase capacity of emergency and social service response systems	Local jurisdictions, Red Cross, Salvation Army, schools, private companies (e.g. grocery and hardware stores) and faith-based organizations	Reduce long term disaster costs, reduce flood damage to infrastructure	
Increase individual response capacity	Local jurisdictions, emergency and social service providers	Reduce strain on emergency services	
Enhance local food security	Local jurisdictions, famers markets and local food banks	Builds local economy, may provide habitat for pollinators	Possibly, if reduce food transportation emissions
Increase residential water conservation	Individuals, local jurisdictions, businesses, farmers	Protect natural water bodies, reduce impact on water infrastructure	Yes
Decentralize home and community water storage	Local jurisdiction, Oregon Water Resources Department, individuals, businesses, water providers, public health	Decrease strain on water infrastructure, may have health conflicts	Possibly, if reduce energy use for pumping and treating water
Revise job codes and education certificate system	State, high schools, community colleges and universities, businesses		
Build ecological and climate literacy into the education system	State and federal education departments	Builds support for resiliency initiatives	
Prepare public health	Public health providers, local jurisdictions, neighborhood associations, individuals	Increased activity (reduced obesity, chronic diseases), use of public transportation	Yes, for some preventative measures

Likely Impacts to Cultural Systems

Loss of traditional resources: Natural resources, namely salmon, represent the cultural, social, nutritional and economic cornerstone of native communities in the Pacific Northwest. Salmon populations are especially affected by changes in temperature, precipitation, and aquatic environments.

Deterioration or destruction of historical architecture: Historical structures, buildings, and districts "worthy of cultural preservation" attract significant tourism revenue, provide opportunities for community education, and preserve regional heritage. Fragile building material and structures without foundations and structural support are threatened by increasing extreme weather events.

Conflicts with climate refugees: The region may experience an influx of refugees displaced by global climate change impacts. This could exacerbate cultural tension stemming from competing values and identities, scarce water and other resources, which may further strain social services. Currently, no research exists on likely population growth in the Willamette associated with climate change. Climate refugees with the financial means to immigrate to the area may also have the means and skills to contribute positively to the Willamette Valley economy.

Environmental justice concerns: While low-income, rural, and native populations may contribute less to anthropocentric climate change, they are the least likely to have the resources to prepare for impacts. Greater awareness of environmental justice issues may become a prevailing source of cultural tension in the Lower Willamette as these impacts manifest more severely.

Recommendations for Resilient Cultural Systems

Protect key resources for tribal communities: Native communities may need to consider diversification of crops and livestock as well as changes in timing of harvest, hunting and gathering. This will support preparation for changes in temperature and precipitation patterns as well as loss of snowpack. Outreach on climate change impacts to tribal communities, particularly to livelihood resources and public health, can improve self-sufficiency and reduce strain on social and emergency services.

Encourage resource conservation and energy independence in tribal areas. Measures should be taken by tribal communities to encourage energy conservation in order to reduce dependency on unreliable hydropower systems. Technologies and programs to better inform the public about their consumption habits through energy monitors, water heater timers, and separate utility bills, may reduce the strain on resources. Cooperatives and resource sharing schemes may foster community connectivity while easing competition for resources. Policies involving scarce resources should encourage conservation movements with incentives, rather than restrictions and penalties. Policymakers can utilize these tools to take advantage of changing social values, while curbing governability issues and cultural tension.

Prepare for increased human population. Water, land use, and transportation planners should consider shifts in population and demographics. Population growth research and modeling by universities as well as state and local agencies should be expanded to consider potential climate change impacts. Planning commissions may need to re-examine urban growth boundaries and lot-size requirements in accord with increased population projections (see section above on land use planning).

Proactively address current cultural tensions and prepare for new cultures: Communities should address and mediate current cultural tension before climate change-related stressors and demographic changes exacerbate problems. In addition, equity and environmental justice issues must be addressed now with outreach and empowerment programs. Outreach programs should be tailored to marginalized and vulnerable populations, in multiple languages and through multiple streams of communication.

Cultural Systems			
Recommendation	**Who**	**Co-Benefits**	**Mitigation Benefits**
Protect key resources for tribal communities	Tribal communities, ODF, ODFW, USFS, USFWS	Improve nutritional health	Yes, if sequestration through planting or restoration
Encourage resource conservation and energy independence in tribal areas	Tribal communities, DOE, renewable energy providers	Reduce strain on utility infrastructure, improve air quality	Yes
Prepare for increased human population	Planners, universities	Reduces strain on infrastructure, builds local economy, reduces development in natural areas, reduces impact on health	Yes, if increase public/alternative transportation and density/walkability in planning
Proactively address current cultural tensions and prepare for new cultures	Local jurisdictions, community organizations		

MPAC Worksheet

Agenda Item Title: Creating A Climate Smart Communities Strategy: How We Get There From Here

Presenters: Kim Ellis, Project Manager and Mike Hoglund, Research Director

Contact for this worksheet/presentation: Kim Ellis (797-1617)

Council Liaison Sponsor: Councilor Collette

Purpose of this item (check no more than 2):

Information	_____
Update	_____
Discussion	__X__
Action	_____

MPAC Target Meeting Date: _____March 9, 2011_____

Amount of time needed for:

Presentation	_15__
Discussion	_10__

Purpose/Objective:
The purpose of this agenda item is to share information on the preliminary results of the statewide scenarios analysis[1] and receive input on the draft scenario approach and framework proposed for Phase 1 of the region's effort.

This item builds on the project overview and state target setting process as discussed by MPAC on February 23, 2011, and further prepares MPAC for an April 1 climate change retreat with the Joint Policy Advisory Committee on Transportation (JPACT) and other elected officials and business and community leaders.

Action Requested/Outcome:
- Learn about the results of statewide scenarios and a proposed approach for developing regional-level scenarios.
- Provide input on the guiding principles and proposed approach to be used to evaluate the region's land use and transportation scenarios this summer.

Background and context:
In 2007, the Legislature established statewide goals for greenhouse gas emissions (GHGs) – calling for stopping increases in emissions by 2010; a 10 percent reduction below 1990 levels by 2020 and a 75 percent reduction below 1990 levels by 2050. The targets apply to all emission sectors, including energy production, buildings, solid waste and transportation.

In 2009, the Legislature passed House Bill 2001, directing Metro to "develop two or more alternative land use and transportation scenarios" by January 2012 that are designed to reduce greenhouse gas emissions from light-duty vehicles. The legislation also mandates adoption of a preferred scenario after public review and consultation with local governments, and local government implementation through comprehensive plans and land use regulations that are consistent with the adopted regional scenario. The Climate Smart Communities Scenarios effort responds to these mandates.

[1] For more information, go to http://www.oregon.gov/ODOT/TD/TP/OSTI.shtml

In 2010, the Legislature approved Senate Bill 1059, providing further direction to GHG scenario planning in the Metro region and the other five metropolitan areas in Oregon. Aimed at reducing GHG emissions from transportation, the legislation mandates several state agencies to work with stakeholders to develop a statewide transportation GHG emission reduction strategy, metropolitan-level GHG emissions reduction targets for cars and light trucks, guidelines for scenario planning, and a toolkit of actions to reduce GHG emissions.

In 2010, Metro's Making the Greatest Place initiative resulted in Council adoption of six desired outcomes, the Community Investment Strategy, urban and rural reserves and an updated Regional Transportation Plan. All of these actions provide the policy foundation for better integrating land use decisions with transportation investments to create prosperous and sustainable communities and meet state climate goals.

What has changed since MPAC last considered this issue/item?
The Transportation Policy Alternatives Committee and the Metro Technical Advisory Committee discussed the proposed guiding principles and regional-level scenarios approach. Both committees supported the overall approach and provided the following comments and recommended refinements:

TPAC and MTAC suggested refinements to guiding principles

- Revise first bullet to reference we are starting with local plans and 2010 actions.
- Add concept of identifying unintended consequences and the need to clearly pose tradeoffs and consequences of different choices.
- Add concept of co-benefits – these need to be central to the communication and evaluation approach.

TPAC and MTAC Comments

- Analysis needs to consider benefits, costs and tradeoffs for individuals, businesses and local governments. There are many choices – the first phase should clearly pose the consequences of different choices (intended and unintended).
- Important to be realistic about pricing as a strategy given the lack of public acceptance.
- Public health and equity need to be meaningfully built into the evaluation, including impacts to transit dependent communities or places in the region that do not have well-connected street systems, sidewalks, and bicycle facilities.
- Move beyond current approaches for providing transit to consider role of bus rapid transit and paratransit.
- Look for ways to group complementary packages of strategies (e.g. mixed-use, expanded transit and parking management) in the analysis and assess how parking management resources could be used to help fund expanded transit or streetscape investments in downtowns and main streets.
- Overall consensus to not create 144 scenarios, but important start with the best performing statewide scenarios to begin defining the region's scenarios. May also need to refine state's technology assumptions.
- Think about adopting "interim" strategies before the final "preferred" scenario based on what we learn in 2012.
- Use case studies, visualization and illustration tools to communicate results and help make it real for policymakers and the public.

What packet material do you plan to include?

- Climate Smart Communities Scenarios Project: Discussion Draft Phase 1 Scenario Approach and Framework *(dated February 23, 2011)*.
- Memo: Creating a Climate Smart Communities Strategy Using Scenarios (dated March 2, 2011)

What is the schedule for future consideration of item?

March 16 and March 25 – **MTAC and TPAC** discussion on scenarios assumptions and evaluation framework.

March 29 - Council discussion on the Climate Smart Communities scenarios approach, evaluation framework and toolbox of strategies.

April 1 – **JPACT and MPAC Climate Leadership Summit** to learn about opinion research and local case studies and provide input on the combinations of land use and transportation strategies to be tested during the summer.

April 1 – **DLCD releases draft Metropolitan Greenhouse Gas Emissions Reduction Targets** rule and GHG emissions reduction target for Metro region and other metropolitan areas.

April 12 - Council work session to ask questions and provide comments to DLCD staff on the draft Metropolitan Greenhouse Gas Emissions Reduction Targets rule and Metro region targets. LCDC is expected to act on the draft rule at their May 19 meeting.

April - MTAC and TPAC discussion on scenarios assumptions and evaluation framework.

April 13 - MPAC discussion on April 1 summit and scenarios evaluation approach.

April 14 - JPACT discussion on April 1 summit and scenarios evaluation approach.

May 11 - MPAC direction on scenarios evaluation approach and strategies to test.

May 12 - JPACT direction on scenarios evaluation approach and strategies to test.

Fall 2011 - JPACT and MPAC Summit to learn about the results of the scenarios evaluation and shape recommendations to be reported to the 2012 Legislature.

February 23, 2011

CLIMATE SMART COMMUNITIES SCENARIOS PROJECT

DISCUSSION DRAFT Phase 1 Scenario Approach and Framework

PHASE 1. UNDERSTANDING CHOICES (JAN. – DEC. 2011)

SCENARIO FRAMING AND RESEARCH

WHAT IS A SCENARIO?

A scenario is a possible future, representing a hypothetical sequence of possible events or set of circumstances. Scenarios are often used to help see the potential impacts of different land-use and transportation decisions on future generations and their quality of life. Scenarios can be created around a set of themes or stories to test what might happen if the strategies assumed in the scenario are implemented. Scenarios can foster an understanding of the opportunities and challenges that the future might hold to inform development of a preferred strategy or course of action. Scenarios can also help manage uncertainty because scenarios are a range of possible futures.

The scenarios to be tested in this phase are for discussion and research purposes only, and do not represent a Metro Council, JPACT or MPAC endorsed policy proposal.

GUIDING PRINCIPLES:

- **Local and Regional Aspirations:** Start with local aspirations and 2010 actions.[1]
- **Show Cause and Effect:** Provide sufficient clarity to discern cause and effect relationships between policy levers.
- **Plausible**: Explore a range of possible futures to show the benefits and impacts of different choices.
- **Understandable:** Organize to be easily communicated so decision-makers and stakeholders can understand clear choices and tradeoffs.
- **Meet State Climate Goals:** Demonstrate what is required to meet state climate goals.
- **Outcomes-based and Focused on Making a Great Place:** Demonstrate how strategies affect realization of local and regional aspirations, as measured by progress toward the six desired outcomes.

The region's six desired outcomes – adopted by the Metro Council on December 16, 2010.

WHAT WE HOPE TO ACCOMPLISH:

- Learn what combinations of land use and transportation strategies are required to meet the state GHG targets.
- Show potential impacts and benefits through a comprehensive array of measures that link back to the six desired outcomes.
- Learn how well the strategies support local aspirations and the region's desired outcomes.
- Identify the potential risks and tradeoffs associated with different strategies and implications for the region and state.
- Report findings and make recommendations to the 2012 Legislature and future project phases.

DEFINING THE SCENARIOS:

- This approach would create scenarios for analysis using a metropolitan–level GreenSTEP model, with support from Envision Tomorrow, a sketch planning tool, the regional travel demand model and MetroScope.
- The first phase is not about 'picking a winner' from the set of scenarios evaluated, but to explore a range of possible futures and then discuss and agree on the associated opportunities, challenges and implications for the region and state.
- Scenario inputs will be based on different combinations of strategies and levels of implementation or investment, reflecting MPAC, JPACT and Metro Council direction.
- Scenarios will be created by applying different levels of implementation or investment.
  - Level 1 will serve as a "Reference Case" scenario – representing the most likely scenario given current plans, trends and policies.
  - Levels 2 and 3 represent progressively higher levels of implementation or investment for the strategies being tested.
  - Agreement is needed on how many levels should be evaluated for each category, and on what combination of strategies should be assumed within each level.
- Each scenario is intended to reduce the light vehicle travel greenhouse gas (GHG) emissions estimated from the Reference Case.
- The scenarios will be developed and analyzed with input from Metro's technical advisory committees during the summer 2011. Results will be presented to decision makers and stakeholders in the Fall 2011.

[1] In 2010, Metro's Making the Greatest Place initiative resulted in Metro Council adoption of six desired outcomes, the Community Investment Strategy, urban and rural reserves and an updated Regional Transportation Plan. All of these actions provide the policy foundation for better integrating land use decisions with transportation investments to create prosperous and sustainable communities and meet state climate goals.

February 23, 2011

DISCUSSION DRAFT Phase 1 Scenario Approach and Framework

This table is for discussion and research purposes only, and does not represent a Metro Council, JPACT or MPAC endorsed policy proposal.

- The table provides a framework for identifying regional-level scenario inputs for each GreenSTEP category.
- Each category includes a set of inputs that represent land use and transportation strategies that the GreenSTEP model is able to test. Each level represents an increased amount of implementation or investment.
- Agreement is needed on how many levels should be evaluated for each category, and on what combination of strategies should be assumed within each level.
- Scenarios would be created, reflecting different implementation/investment levels for each category of inputs.
- Each scenario is intended to reduce the light vehicle travel greenhouse gas (GHG) emissions estimated from the Reference Case (Level 1).

Green STEP Category	Implementation/Investment Levels			Potential GreenSTEP Inputs (indicated in bold)
	Level 1	Level 2	Level 3	
URBAN				Households in **mixed-use areas** with well-connected "complete" streets and active transportation networks [2] (percent)
				Urban growth boundary expansion
				Bicycle travel (mode share)
				Workers paying **parkin**g fees (percent)
				Household daily **parking fees**
				Bus and rail transit expansion (percent)
PRICING [3]				**Fuel use and emissions fees** [4]
				Vehicle travel fees [5]
				Pay-as-you drive insurance
MARKETING				Households participating in **individualized marking programs** (percent)
				Workers participating in **employer-based demand management programs** (e.g., transit fare reduction, carpool matching and other carpool programs, compressed work week) (percent)
				Households participating in **ecodriving** (percent)
ROADS				**Incident management** (percent of delay addressed)
				Freeway and arterial lane-mile **capacity** (e.g., traffic signal timing and other system management strategies, physical expansion, and bottleneck removal)
FLEET				Households participating in **carsharing** (percent)
	TBD in State Agency Technical Report			Level 2 and Level 3 inputs to be defined in State Agency Technical Report (includes, **auto/truck vehicle proportions** and **fleet turnover rate**/ages)
TECH	*TBD in State Agency Technical Report*			Level 2 and Level 3 inputs to be defined in State Agency Technical Report (includes **fuel economy**, **carbon intensity of fuels**, and **electric vehicles and plug-in hybrids market shares**)

[2] Existing zoning and forecasted population and employment held constant across all scenarios.
[3] Reflected as the cost per mile to drive. Fuel price held constant across all scenarios, reflecting market trends.
[4] Carbon fee, gas tax, or other instruments could be used.
[5] Vehicle miles traveled fee or other instruments could be used.

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Metro | *Memo*

Date: March 2, 2011

To: MPAC and interested parties

From: Kim Ellis, Principal Transportation Planner

Re: Creating A Climate Smart Communities Strategy Using Scenarios

PURPOSE

The purpose of this agenda item is to share information about the Climate Smart Communities Scenarios Project, preliminary results of the statewide scenarios effort and receive input on the draft scenario approach and framework proposed for Phase 1 of the region's effort.

BACKGROUND

In 2007, the Legislature established statewide goals for greenhouse gas emissions (GHGs) – calling for stopping increases in emissions by 2010; a 10 percent reduction below 1990 levels by 2020 and a 75 percent reduction below 1990 levels by 2050. The targets apply to all emission sectors, including energy production, buildings, solid waste and transportation.

In 2009, the Legislature passed House Bill 2001, directing Metro to "develop two or more alternative land use and transportation scenarios" by January 2012 that are designed to reduce greenhouse gas emissions from light-duty vehicles. The legislation also mandates adoption of a preferred scenario after public review and consultation with local governments, and local government implementation through comprehensive plans and land use regulations that are consistent with the adopted regional scenario. The Climate Smart Communities Scenarios effort responds to these mandates.

In 2010, the Legislature approved Senate Bill 1059, providing further direction to GHG scenario planning in the Metro region and the other five metropolitan areas in Oregon. Aimed at reducing GHG emissions from transportation, the legislation mandates several state agencies to work with stakeholders to develop a statewide transportation GHG emission reduction strategy, metropolitan-level GHG emissions reduction targets for cars and light trucks, guidelines for scenario planning, and a toolkit of actions to reduce GHG emissions.

In 2010, Metro's *Making the Greatest Place* initiative resulted in Council adoption of six desired outcomes, the Community Investment Strategy, urban and rural reserves and an updated Regional Transportation Plan. All of these actions provide the policy foundation for better integrating land use decisions with transportation investments to create prosperous and sustainable communities and meet state climate goals.

Work is underway at the state and regional level to respond to the legislative mandates and implement the 2010 Council actions.

The region's six desired outcomes – adopted by the Metro Council on December 16, 2010.

STATE RESPONSE – OREGON SUSTAINABLE TRANSPORTATION INITIATIVE[1]

The Oregon Department of Transportation (ODOT) and the Department of Land Conservation and Development (DLCD) are leading the state response through the Oregon Sustainable Transportation Initiative (OSTI). A factsheet about the state activities is attached for reference.

A draft Technical Report will be released on March 1, 2011 to support Metro's work and the DLCD metropolitan-level target setting process. The Land Conservation and Development Commission (LCDC) is expected to adopt GHG emissions reduction targets for the Metro region on May 19, 2011; draft targets will be released on April 1, 2011.

DLCD staff will brief MPAC on the draft targets at the April 13 meeting, providing a second opportunity for MPAC members to raise concerns and issues that should be considered as the target setting process moves forward.

REGIONAL RESPONSE – CLIMATE SMART COMMUNITIES SCENARIOS

The Climate Smart Communities Scenarios effort will build on the state-level work conducted to date and the 2010 Metro Council actions. The project presents an opportunity to learn what combination of land use and transportation strategies will be required to meet the state GHG targets and how well the strategies support all of the region's desired outcomes.

The project will use existing policy and technical advisory committees and lead to adoption of a "preferred" land use and transportation strategy by JPACT and Metro Council. The Metro Policy Advisory Committee (MPAC), JPACT and the Metro Council will make recommendations at key decision points based on input from the Transportation Policy Advisory Committee (TPAC), the Metro Technical Advisory Committee (MTAC) and the stakeholder engagement process.

- **Phase 1: Understanding the Choices** (**Scenario Framing and Research)**

  The first phase of regional-level scenario analysis will occur during Summer 2011 and focus on learning what combinations of land use and transportation strategies are required to meet the state GHG targets. Land use and transportation strategies (e.g. market incentives, mixed-use, transit supportive development and expanded transit service) as well as operational and pricing strategies (e.g. traffic signal timing, parking pricing and other user-based fees) will be evaluated through regional-level scenarios. Potential impacts and benefits will be identified through a comprehensive array of measures that link back to the six desired outcomes. The tools used for this analysis will limit the strategies, impacts and benefits that can be evaluated during this phase of the process.

  The April 1 MPAC and JPACT Climate Leadership Summit is aimed at gathering input from elected officials and business and community leaders on the combinations of strategies to be tested. Findings and recommendations from the analysis will be reported to MPAC, JPACT and the Metro Council in Fall 2011 before being finalized for submittal to the Legislature in January 2012. The recommendations will also guide future phases of the project, as shown in Figure 1.

- **Phase 2: Shaping the Direction** (**Alternative preferred scenario analysis)**

  In 2012, Metro and local government staff will further analyze alternative regional-level scenarios that apply the lessons learned and recommendations from Phase 1 in a more tailored manner to develop a "draft" preferred land use and transportation scenario. This phase provides an opportunity to incorporate strategies and new policies identified through local and regional planning

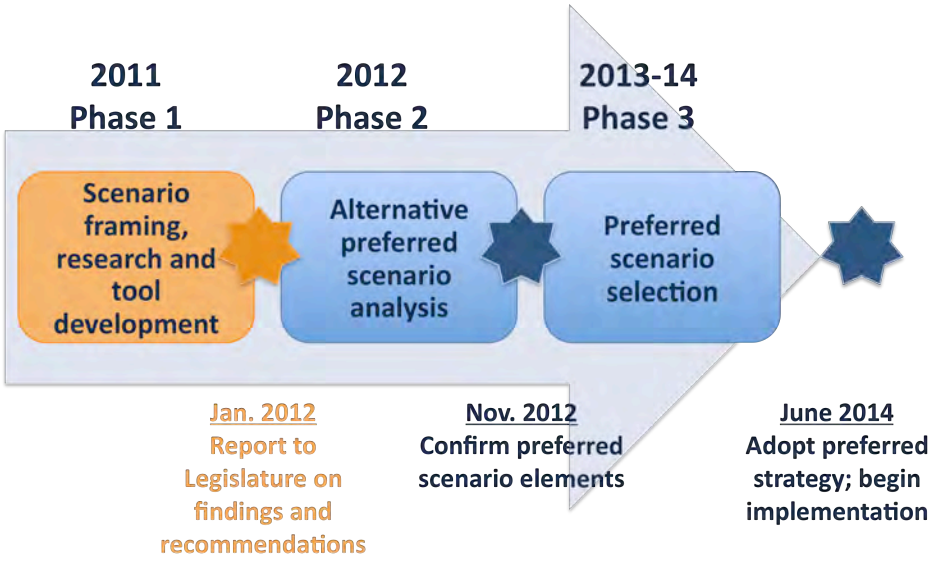
[1] For more information, go to http://www.oregon.gov/ODOT/TD/TP/OSTI.shtml

efforts that are underway in the region (e.g., SW Corridor Plan, East Metro Connections Plan, Portland Plan, and other local periodic review and transportation system plan updates). By the end of 2012, MPAC, JPACT and the Metro Council will be asked to confirm a "draft" preferred scenario that will be brought forward to the final phase of the process.

- **Phase 3: Building the Strategy and Implementation (Preferred Scenario Selection)**

  The final project phase, in 2013 and 2014, will lead to adoption of a "preferred" land use and transportation strategy. The analysis in this phase will be conducted using the region's most robust analytic tools and methods – the regional travel demand model, MetroScope and regional emissions model, MOVES. Additional scoping of this phase will occur in 2012 to better align this effort with mandated regional planning and growth management decisions. This phase will identify needed changes to regional policies and functional plans, and including updates to the Regional Transportation Plan and region's growth management strategy. Implementation of approved changes to policies, investments, and other actions would begin in 2014 at the regional and local levels to realize the adopted strategy.

Figure 1. Climate Smart Communities Scenarios Process



NEXT STEPS

A goal of this effort is to further advance 2040 implementation, local aspirations and the public and private investments needed to build great communities and meet state climate goals. Addressing the climate change challenge will take collaboration and partnerships in the public and private sectors and focused policy and investment discussions and decisions by elected leaders, stakeholders and the public.

Work is underway to compile a toolbox of strategies to be evaluated and develop analytic tools and methods to support the scenario analysis to be conducted this summer. Staff is also conducting stakeholder interviews and opinion research to further inform the project's communication and engagement strategy. The strategy is being coordinated with the state's climate activities, other Metro climate activities and implementation of Community Investment Strategy. Upcoming meetings will be focused on engaging and preparing the Metro Council, MPAC and JPACT members for the April 1

summit, and subsequent meetings to provide direction on the scenarios to be evaluated in Phase 1. A summary of upcoming policy discussions and milestones is provided for reference:

- **Feb. 23** – **MPAC** discussion on several climate-related topics: the Climate Smart Communities scenarios process and opportunities for coordination; a report on the potential climate impacts to the region and actions local governments can take now; the Oregon Global Warming Commission 2020 Roadmap recommendations; and setting GHG emissions reduction targets for the Portland region.
- **March 1 – ODOT releases Agency Technical Report**, describing the technology and fuels assumptions to be included in region's scenario analysis.
- **March 3** – **JPACT** discussion on the Climate Smart Communities scenarios approach, evaluation framework and toolbox of strategies; and setting GHG emissions reduction targets for the Portland region.
- **March 9** – **MPAC** discussion on the Climate Smart Communities scenarios approach, evaluation framework and toolbox of strategies.
- **March 29** - **Council** discussion on the Climate Smart Communities scenarios approach, evaluation framework and toolbox of strategies.
- **April 1** – **JPACT and MPAC Climate Leadership Summit** to learn about opinion research and local case studies and provide input on the land use and transportation strategies to be tested during the summer.
- **April 1** – **DLCD releases draft Metropolitan Greenhouse Gas Emissions Reduction Targets** rule and GHG emissions reduction target for Metro region and other metropolitan areas.
- **April 12** - **Council** work session to ask questions and provide comments to DLCD staff on the draft Metropolitan Greenhouse Gas Emissions Reduction Targets rule and Metro region targets. LCDC is expected to act on the draft rule at their May 19 meeting.
- **April 13 - MPAC** discussion on April 1 summit and scenarios evaluation approach and draft targets for the Portland region.
- **April 14 - JPACT** discussion on April 1 summit and scenarios evaluation approach and draft targets for the Portland region.
- **May 11 - MPAC** direction on scenarios evaluation approach and strategies to test.
- **May 12 - JPACT** direction on scenarios evaluation approach and strategies to test.
- **June – Aug. –** Scenarios development and evaluation with technical committees.

/Attachments

- Oregon Sustainable Transportation Initiative Overview *(dated February 1, 2011)*

Oregon Department of Transportation

Department of Land Conservation and Development

February 1, 2011

Reducing Greenhouse Gas Emissions in the Transportation Sector
— Oregon Sustainable Transportation Initiative Overview —

The Oregon Sustainable Transportation Initiative (OSTI) is an integrated statewide effort to reduce greenhouse gas emissions (GHG) from transportation while considering ways to improve the built environment for healthier, more livable communities and greater economic opportunity. The effort is the result of several pieces of legislation including HB 2001 and SB 1059, passed by the 2009 and 2010 Oregon Legislatures. OSTI is being led by the Oregon Department of Transportation (ODOT) and the Department of Land Conservation and Development (DLCD), in consultation with the Department of Environmental Quality (DEQ), the Oregon Department of Energy (DOE), and stakeholder committees. The effort is designed to help the state meet its 2050 goal of reducing GHG emissions by 75 percent below 1990 levels by curbing emissions from light vehicle travel and transportation.

OSTI has four main focus areas under development:

I. STS: Statewide Transportation Strategy

This process will develop Oregon's vision for transportation systems, vehicle and fuel technologies and urban form that reduce transportation sector greenhouse gas emissions. The STS vision will aid the state in the achievement of its greenhouse gas emission reduction goals.

II. Rulemaking

HB 2001 (2009) Sections 37 and 38 directed the Land Conservation and Development Commission (LCDC) to adopt rules setting GHG emission reduction targets for the Portland metropolitan area served by Metro. SB 1059 (2010) directed LCDC to adopt rules setting GHG emission reduction targets for the other Oregon metropolitan areas served by metropolitan planning organizations (the Bend, Corvallis, Eugene-Springfield, Rogue Valley and Salem-Keizer regions). LCDC has convened a Target Rulemaking Advisory Committee (TRAC) to assist in the development of targets that will be used to guide land use and transportation scenario planning in these areas.

Rules will set targets for reducing emissions from light vehicles (10,000 pounds or less) traveling in each of the state's metropolitan areas through the year 2035 and must be adopted by June 1, 2011. By March 1, 2011, ODOT, DEQ and DOE are required to provide technical estimates and recommendations to LCDC to inform this rulemaking effort.

III. Scenario Planning Guidelines

The Scenario Planning Technical Advisory Committee (SP TAC) is in the process of developing guidelines to help metropolitan areas with their land use and transportation planning, including a step-by-step technical guide to addressing GHG emissions reduction targets. This involves establishing a transportation and land use vision, goals and approaches for reducing GHG emissions from light vehicles.

Through scenario planning, metropolitan areas will be able to evaluate different ways to accommodate expected population and employment growth through 2035. They will be asked to identify a preferred approach that best reduces GHG emissions, while meeting a full range of community livability objectives.

IV. Toolkit

The toolkit will provide metropolitan areas and local governments with a comprehensive listing of programs and actions that can be implemented to reduce GHG emissions from light vehicles. The toolkit will allow each metropolitan area to select the most appropriate tools to meet local needs. In addition, the toolkit will include information on analysis tools such as modeling that can be used in scenario development and outreach, and will touch on public education and engagement techniques.

Reducing Greenhouse Gas Emissions in the Transportation Sector
— Oregon Sustainable Transportation Initiative Overview —

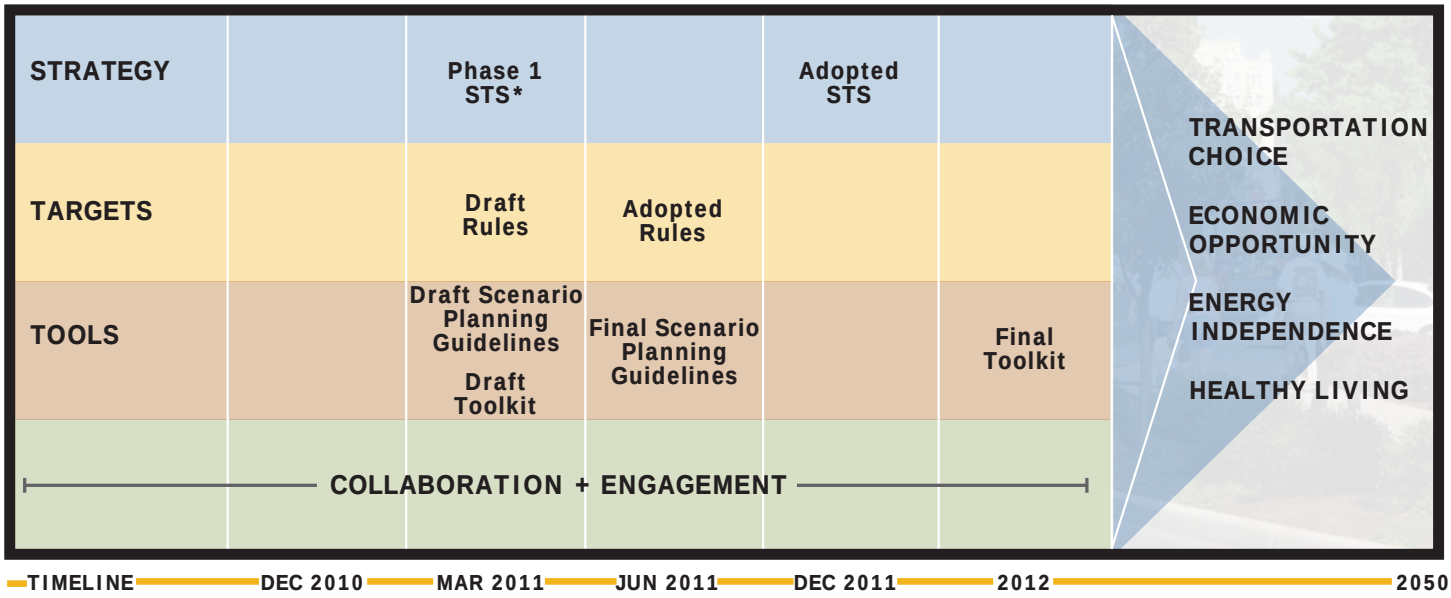
Stakeholder involvement
Coordination of the focus areas is being accomplished with the use of software and technology that supports cross-agency and multiple partner collaboration and communication. There is a strong focus throughout the development of OSTI on stakeholder involvement, including representation on advisory committees by staff from local jurisdictions, advocacy organizations and businesses. ODOT and DLCD are also working closely with Metro to link to work on HB 2001 Sections 37 and 38 with the work being done under SB 1059.

Timeline
Many of the requirements of SB 1059 and the Target Rulemaking required by HB 2001 Sections 37 and 38 are being implemented through OSTI simultaneously. Key dates include:

- **March 2011:** ODOT, DEQ and DOE provide LCDC with information necessary to determine proposed GHG emissions reductions targets for 2035.
- **June 2011:** LCDC adopts rules setting targets for each region served by a metropolitan planning organization.
- **December 2011:** Statewide Transportation Strategy is adopted.
- **March 2013:** ODOT and DLCD give a joint report to the Legislature on the progress of OSTI and meeting reduction targets.

For more information and to sign up for updates visit: www.oregon.gov/ODOT/TD/TP/OSTI.shtml

Oregon Sustainable Transportation Initiative Summary at a Glance



The Oregon Sustainable Transportation Initiative (OSTI) is an integrated statewide effort to create healthy, livable communities while reducing greenhouse gas emissions (GHG) from transportation. The effort includes ongoing work in a number of different areas.

STS: Statewide Transportation Strategy
This process will develop Oregon's vision for transportation systems, vehicle and fuel technologies and urban form that reduce transportation sector greenhouse gas emissions. The STS vision will aid the state in the achievement of its greenhouse gas emission reduction goals.

* Phase 1 includes light vehicle transportation within metropolitan areas and Phase 2 includes all transportation within the state including long distance and freight.

Rulemaking
The rules will set GHG reduction targets for each of Oregon's six metropolitan areas (the Bend, Corvallis, Eugene-Springfield, Portland, Rogue Valley and Salem-Keizer regions). These will be adopted by the Land Conservation and Development Commission (LCDC) in June 2011.

Scenario Planning Guidelines
The guidelines will provide step-by-step assistance for local governments to use in creating their own plans to meet GHG reduction targets.

Toolkit
The toolkit will be a resource of actions and programs local governments can adopt to facilitate transportation-related GHG reductions.

Materials following this page were distributed at the meeting.

SAVE THE DATE

CNU Cascadia Chapter Annual Summit
Portland, Oregon - March 25-27, 2011

SUSTAINABLE PLACEMAKING:

Creating Enduring and Resilient Cities




Welcome:

The Cascadia Chapter of the Congress for the New Urbanism invites you to participate in its annual Regional Summit. The goal of this year's summit is to establish the principles and best practices of urbanism's central role in the sustainability movement. Located for the first time in Portland, the summit will gather participants from Vancouver BC, Seattle, and Portland. Portland's leading role in advancing Sustainable Urbanism will be highlighted in presentations, discussions, and tours of nearby neighborhoods along the streetcar line.

Featured Speakers:

CNU Cascadia is proud to host Steve Mouzon and Kingston Heath as featured speakers. Steve is a Miami based architect, founder of the New Urban Guild and author of *The Original Green: Unlocking the Mystery of True Sustainability.* Kingston is Professor and Director of the graduate program of Historic Preservation at the University of Oregon. Hearing from national and regional speakers, we will explore the different ways our cities and regions approach sustainability through urban form and structure.

About Us:

The Cascadia Chapter is an alliance of more than 100 professionals and citizens united by the goal of sustainable placemaking. We are working together to promote the principles of the Charter of the New Urbanism in concert with the environmentally sustainable practices of our unique bioregion - Cascadia.

CONGRESS FOR THE NEW URBANISM

cascadia

Changing our Spots

We´ve got plans to make your zoo a better place for animals, people and the environment.

Visit with us to find out more!

Oregon Zoo Master Plan Public Open House

Oregon Zoo Skyline Room at the Main Entrance
4001 SW Canyon Road
Thursday March 31, 5:00-8:00 pm
Saturday April 2, 9:00 am-noon

Thanks to You
A BETTER ZOO
OREGON ZOO
A SERVICE OF METRO

Changing our Spots

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Thanks to You
A BETTER ZOO
OREGON ZOO
A SERVICE OF METRO

Metro 101 session

Learn how Metro works with cities and counties to plan for future growth and enhance the region's quality of life.

Metro works with local officials to address many areas that affect our communities:

- **How to attract and sustain quality jobs**
- **How to provide essential public services with limited resources**
- **How to enhance the quality of life in our communities as the population grows**
- **How communities will look in 20, 30 or even 50 years**







This event is free and open to the public. The information presented at this session is focused on local elected officials (mayors, city councilors and county commissioners) and planning commissioners.

The session is led by Metro councilors and staff. It provides attendees with an opportunity to meet and interact with other elected local officials, Metro councilors and planning commissioners throughout the region.

6:30 to 8:30 p.m. Wednesday, March 30
Happy Valley City Hall, 16000 SE Misty Drive

RSVP to Annierose Von Burg at annierose.vonburg@oregonmetro.gov or 503-797-1810.

Metro | *Making a great place*

Printed on recycled-content paper. 11306 3/2/11

Registration is required.

Joint Policy Advisory Committee on Transportation & Metro Policy Advisory Committee

Climate Leadership Summit

Working together to build livable, prosperous, equitable and climate smart communities

8 A.M. TO NOON FRIDAY, APRIL 1, 2011

JPACT and MPAC members, other elected officials, and business and community leaders will work together at this half-day event to identify strategies to reduce the region's greenhouse gas emissions and create great communities.

The summit is designed to help participants:

- Learn how local aspirations can help achieve climate goals and gain momentum from climate strategies.
- Provide input on the combinations of land use and transportation strategies that should be tested this summer.
- Learn about public attitudes about climate change.
- Discuss which land use and transportation strategies are most effective in reducing greenhouse gas emissions and what it may take to meet state targets.

Oregon Convention Center

Room F150 - 151
777 NE Martin Luther King, Jr. Blvd.
Portland

TriMet MAX light rail service at Convention Center stop. Bus route #6 stops at the front entrance. Covered bicycle parking available in Lloyd Blvd parking garage.

For more information, contact Dylan Rivera at dylan.rivera@oregonmetro.gov or call 503-797-1551.

For registration information, contact Kelsey Newell at kelsey.newell@oregonmetro.gov or call 503-797-1916.

Metro | *Making a great place*

Seven rules for sustainable communities

Discover how creating livable, sustainable communities can mitigate the effect of climate change with Patrick Condon, UBC professor and expert on sustainable communities.

11:30 A.M. TO 1 P.M. TUESDAY, MARCH 29

Patrick Condon believes changing the way cities are built and retrofitted can have a significant mitigating effect on climate change. In fact, he travels the country advising policymakers and planners on how to do just that. A dynamic speaker, Condon shares new ideas from his latest book, *Seven Rules for Sustainable Communities*. His combination of in depth research and case studies challenge and entertain anyone with an interest in creating livable, sustainable communities.

The Seven Rules

1. Restore the streetcar city
2. Design an interconnected street system
3. Locate commercial services, frequent transit and schools within a five-minute walk
4. Locate good jobs close to affordable homes
5. Provide a diversity of housing types
6. Create a linked system of natural areas and parks
7. Invest in lighter, greener and cheaper infrastructure

Metro Regional Center

Council chamber
600 NE Grand Ave.
Portland

Take TriMet MAX light rail service to the Convention Center stop. Bus route No. 6 stops on Grand Avenue at the front entrance. Bicycle parking available.

For more information, contact Janna Allgood at janna.allgood@oregonmetro.gov or call 503-813-7589.

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www.oregonmetro.gov

Metro | *Memo*

Date:	March 2, 2011
To:	JPACT, MPAC and interested parties
From:	Kim Ellis, Principal Transportation Planner
Re:	TPAC and MTAC comments on Discussion Draft Phase 1 Scenario Approach and Framework

PURPOSE

Staff presented the *Discussion Draft Phase 1 Scenario Approach and Framework* to the Transportation Policy Alternatives Committee (TPAC) and the Metro Technical Advisory Committee (MTAC) on February 28 and March 2, respectively. Both committees supported the proposed approach, recognizing more information and discussion is needed to define the combinations of land use and transportation strategies to be tested this summer. MTAC also recommended building in more opportunities for collaboration with TPAC throughout the scenario planning process.

This memo summarizes comments and refinements provided at those meetings.

TPAC and MTAC suggested refinements to guiding principles

- Revise first bullet to read, "**Build on existing efforts and aspirations**: Start with local plans and 2010 actions." The term "local aspirations" is too vague.
- Revise the fourth bullet to read, "**Relevant, Understandable and Tangible**."
- Add a new bullet – **"Consequences and tradeoffs."** The analysis needs to identify and clearly pose tradeoffs and consequences of different choices.
- Add concept of **"Co-benefits**." The strategies that are needed to reduce carbon emissions can help save local governments and the private sector money, grow local businesses and create jobs and build livable communities. The multiple benefits should be emphasized and central to the evaluation and communication of the results.

TPAC and MTAC comments on the evaluation approach

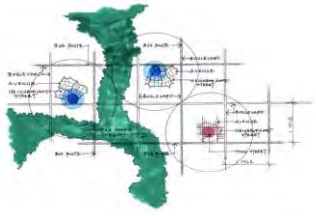
- **Good communication tools and methods are critical**. Use case studies, visualization and illustration tools to communicate results and make the choices real for policymakers and the public.
- **A comprehensive evaluation is needed**. Analysis needs to consider benefits, costs and tradeoffs for individuals, businesses and local governments. There are many choices – the first phase should clearly pose the consequences of different choices (intended and unintended).
- **Public health and equity need to be meaningfully built into the evaluation.** This should include assessing the impacts to transit dependent communities and places in the region that do not have well-connected street systems, sidewalks, and bicycle facilities.
- **Build on lessons learned from statewide scenarios.** There was consensus that 144 scenarios is likely too many to evaluate, but the region could use the attributes of the best performing statewide scenarios as a starting point for defining the region's scenarios.

- **Scrutinize the variables the state evaluated.** The region may want to consider different assumptions. For example, the scenarios could include more aggressive assumptions for deployment of electric vehicle and hybrid vehicles.
- **New public transit approaches should be evaluated.** The scenarios should move beyond current approaches for public transit service to consider role of bus rapid transit, more frequent bus service to more places and paratransit.
- **Develop complementary packages of strategies.** For example, combining mixed-use development, expanded public transit and parking management could make one scenario and combining industrial centers, travel demand management and vehicle travel fees could create another one.
- **Evaluate parking management as a potential resource to realize community investments.** Assess how parking management and other resources developed by the strategies could be used to help fund expanded transit or streetscape investments in downtowns and main streets.
- **Test realistic pricing strategies.** The scenarios need to be realistic about pricing as a strategy given the lack of public acceptance and current economic climate.

Climate Smart Communities Scenarios

Options for Reducing Light Duty Vehicle GHG Emissions

MPAC
March 9, 2011



Metro | *Making a great place*

Presentation Overview

1. Share results of statewide scenario planning & GHG target-setting
2. Describe possible similarity to upcoming Metro-wide scenario planning

State GHG scenario planning purpose

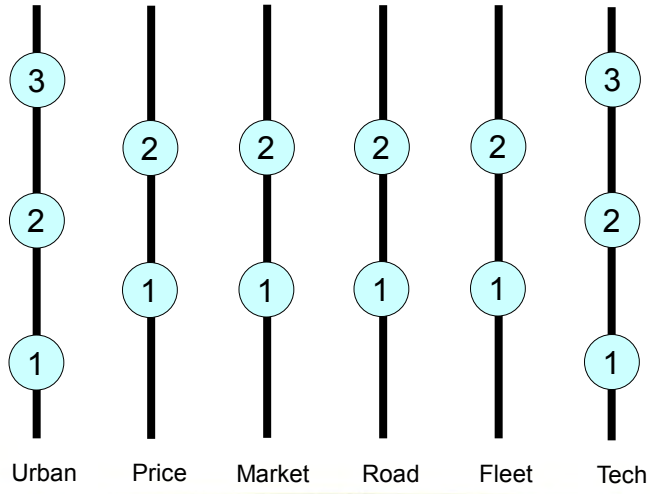
- Guide development of metropolitan area GHG targets
- Identify ***plausible/feasible*** policy options to reduce light-duty vehicle GHG emissions
- Test options
- Provide 2035 targets to Oregon metropolitan planning orgs. (MPOs)

State GHG scenario planning model

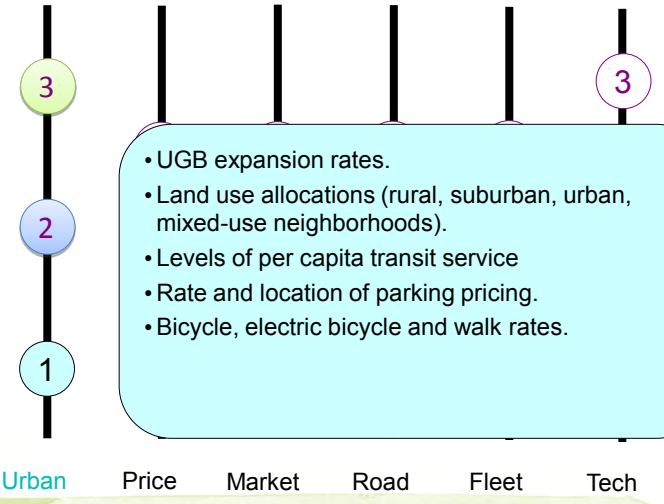
Greenhouse gas State Transportation Emissions Planning model (GreenSTEP)

Statewide GHG planning model with sensitivity to larger number of transportation vehicle, price, fuels and other inputs

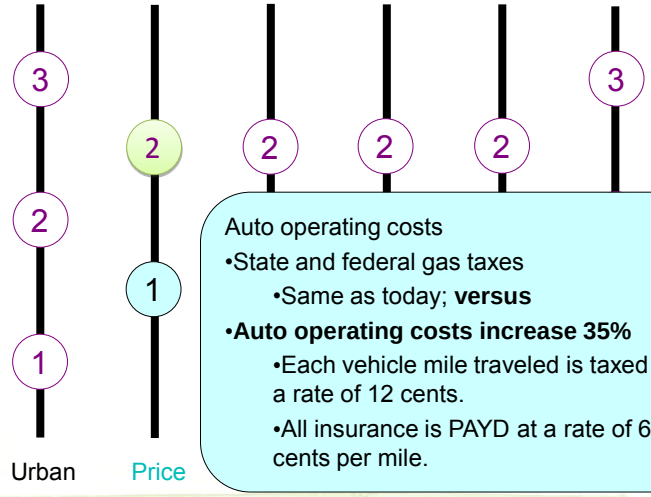
Policy levers: Levels for each factor grouping



Assumptions: Urban



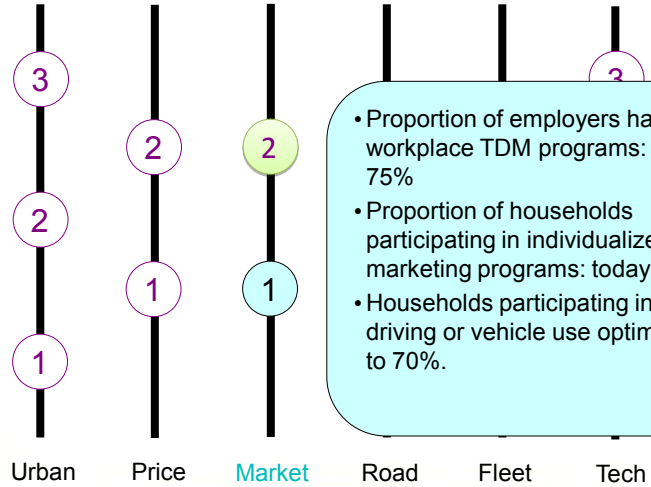
Assumptions: Price



Auto operating costs

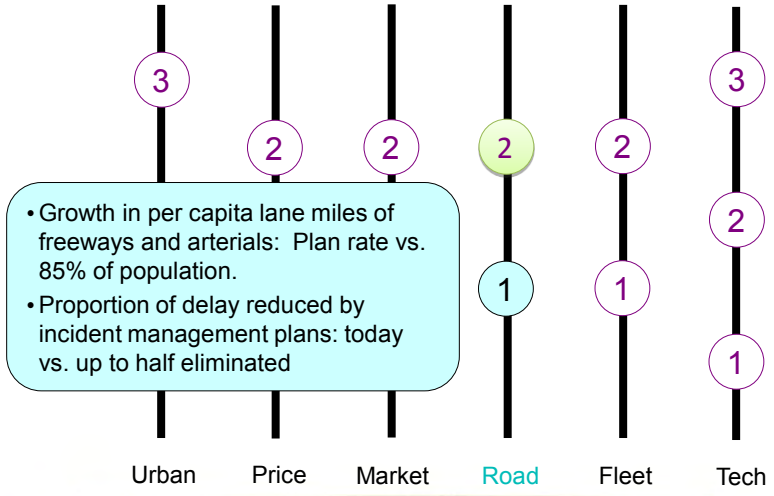
- State and federal gas taxes
  - Same as today; **versus**
- **Auto operating costs increase 35%**
  - Each vehicle mile traveled is taxed at a rate of 12 cents.
  - All insurance is PAYD at a rate of 6 cents per mile.

Assumptions: Market/Demand Mngt.



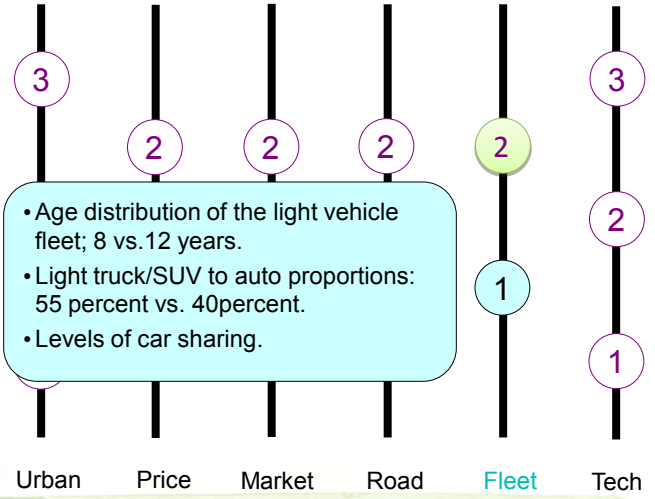
- Proportion of employers having workplace TDM programs: today vs. 75%
- Proportion of households participating in individualized marketing programs: today vs. 50%
- Households participating in eco-driving or vehicle use optimization: 0 to 70%.

Assumptions: Road/Highway System



- Growth in per capita lane miles of freeways and arterials: Plan rate vs. 85% of population.
- Proportion of delay reduced by incident management plans: today vs. up to half eliminated

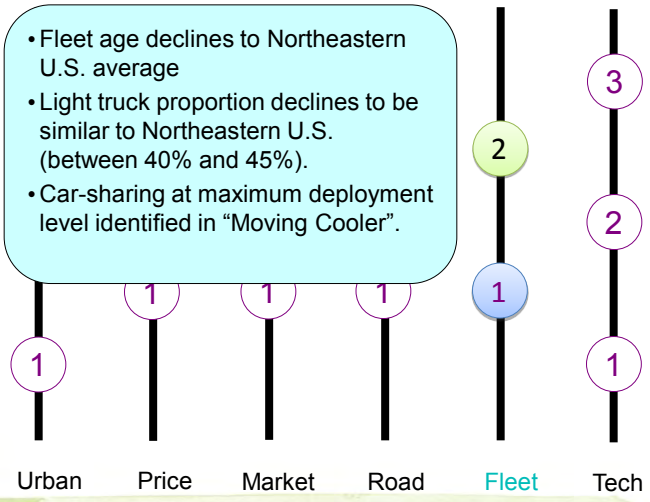
Assumptions: Fleet



- Age distribution of the light vehicle fleet; 8 vs.12 years.
- Light truck/SUV to auto proportions: 55 percent vs. 40percent.
- Levels of car sharing.

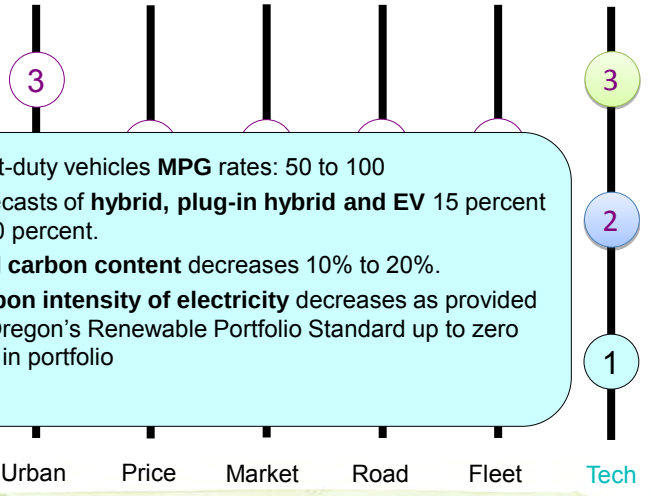
Fleet level 2 assumptions

- Fleet age declines to Northeastern U.S. average
- Light truck proportion declines to be similar to Northeastern U.S. (between 40% and 45%).
- Car-sharing at maximum deployment level identified in “Moving Cooler”.

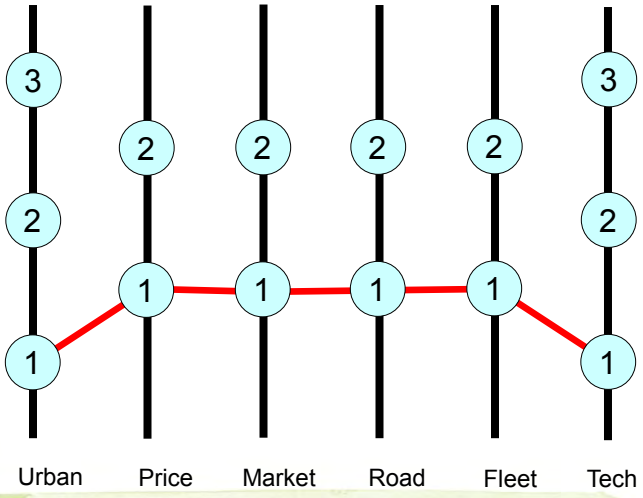


Assumptions: Technology

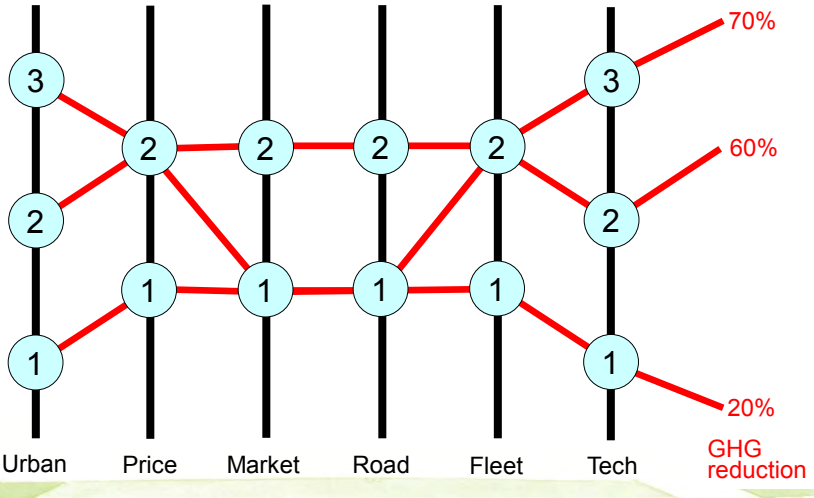
- Light-duty vehicles **MPG** rates: 50 to 100
- Forecasts of **hybrid, plug-in hybrid and EV** 15 percent to 90 percent.
- **Fuel carbon content** decreases 10% to 20%.
- **Carbon intensity of electricity** decreases as provided by Oregon’s Renewable Portfolio Standard up to zero coal in portfolio



Reference case = current policies



Statewide scenarios show a range of potential reductions (2050)



Preliminary statewide results…

Most effective = vehicle technology

- 70-100 miles/gallon required for 65-75% ghg reductions by 2050

Second most effective = urban

Least effective = additional lane miles

…preliminary statewide results

Results are estimated percentages (ordinal)

- No network or spatial modeling

Background conditions (controlled) vs. policy levers (uncontrolled)

- Ex. Gasoline price (background) and auto operating(policy lever)

State Evaluation Criteria… What else matters?

- Travel and System Performance
- Energy Consumption
- Economic Impact
- Land Use and Natural Resources
- Public Health
- Infrastructure/Implementation Costs
- Risk Assessment

Lessons for Metro Scenario Planning

- Potential targets achievable with aggressive, plausible policy and investment decisions
- Some actions more effective than others
- Levels of "aggressiveness" approach provides a useful understanding of key choices
- Results are ordinal estimates; additional refinement modeling and analysis will be necessary
- GHG emission analysis is an evolving field; estimates will change as precision increases
- Communication of results is key challenge

What's Next at State Level?

- **Target Rulemaking Advisory Committee**
  - Metropolitan Area Targets by June 1
    - For each of Oregon's six MPOs
    - Assumptions for fuels, technology, fleets
    - "VMT" target for each MPO
    - Per Capita based
  - Comment Period April/May
- **Statewide Strategy**
  - Heavy Duty, Inter-City, Toolkit

Questions?