### Metro | Agenda

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### CALL TO ORDER AND ROLL CALL

2 PM	1.	DISCUSSION OF AGENDA FOR COUNCIL REGULAR MEETING, SEPTEMBER 30, 2010/ADMINISTRATIVE/CHIEF OPERATING OFFICER COMMUNICATIONS	
2:15 PM	2.	CONTEXT FOR TODAY'S WORK SESSION - <u>INFORMATION</u>	Jordan
2:20 PM	3.	GREENHOUSE GAS EMISSIONS ANALYSIS TOOLKIT - INFORMATION	Hoglund
2:30 PM	4.	CLIMATE CHANGE PREPARATION FRAMEWORK – INFORMATION/DISCUSSION	Rahn Soll Williams
3:15 PM	5.	CLIMATE SMART COMMUNITIES SCENARIOS PROJECT – INFORMATION/DISCUSSION	Ellis
3:55 PM	6.	COUNCIL BRIEFINGS/COMMUNICATION	

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Agenda Item Number 2.0

### CONTEXT FOR TODAY'S WORK SESSION

Metro Council Work Session Tuesday, Sept. 28, 2010 Metro Council Chambers

Agenda Item Number 3.0

### GREENHOUSE GAS EMISSIONS ANALYSIS TOOLKIT

Metro Council Work Session Tuesday, Sept. 28, 2010 Metro Council Chambers

#### METRO COUNCIL

#### Work Session Worksheet

Presentation Date: 9/28/10 Time: 2:20 p.m. Length:  $10 \text{ minutes}^1$ 

Presentation Title: Greenhouse Gas Analysis Toolkit

Service, Office, or Center: Research

Presenter: <u>Mike Hoglund</u>

#### WORK SESSION CONTEXT

The Greenhouse Gas Emissions Analysis Toolkit is one component of Metro's Climate Change Initiative work plan established through Metro Council Resolutions 08-3931 and 08-3971. The Metro Council directed the agency to take steps to define its role in reducing regional greenhouse gas (GHG) emissions and to coordinate its efforts internally and with its regional partners. Subsequent discussions led to development of a work plan that included the following components:

- 1. <u>Development of a regional greenhouse gas emissions inventory, which was completed</u> earlier this year.
- 2. <u>Development of greenhouse gas emissions analysis tools</u> to apply to all Metro planning initiatives. The agency's most significant application of these tools will be in meeting the requirements of House Bill 2001 to develop two or more land use and transportation scenarios designed to reduce greenhouse gas emissions from light-duty vehicles.
- 3. <u>Investment in on-the-ground projects</u>. Metro has invested in retrofitting the regional refuse fleet to reduce particulate matter and carbon soot. The Lloyd Eco-District Declaration of Cooperation can also be considered a commitment to such an on-the-ground investment.
- 4. <u>Alignment of Metro communications</u> on greenhouse gas reduction with those of key Metro initiatives such as Making the Greatest Place, Climate Smart Communities scenario planning, and waste reduction efforts. Staff is currently developing an overall climate change communications plan.
- 5. <u>Regional engagement</u>, which has included numerous discussions with JPACT and MPAC, including the committees' joint climate change retreat in April 2010 focusing on the upcoming Climate Smart Communities (HB 2001) scenario planning effort.
- 6. <u>Regional collaboration</u>, which has included the Climate Prosperity Project and work with the University of Oregon and other partners to develop a framework for climate change preparation in the Lower Willamette River Basin. In addition, staff have participated in the state's Global Warming Commission to develop a roadmap to meet the greenhouse gas reduction targets for 2020.

The September 28 Council work session will include updates on three major climate activities: The Greenhouse Gas Emissions Analysis Toolkit, Climate Change Preparation (Adaptation) Framework, and Climate Smart Communities.

<sup>&</sup>lt;sup>1</sup> An introduction to the Greenhouse Gas Emissions Analysis Toolkit will be provided at the work session, with a full presentation scheduled for the September 30 Council meeting.

#### ISSUE & BACKGROUND (Greenhouse Gas Emissions Analysis Toolkit)

The Metro Council has recognized the need to incorporate climate change considerations into our regional planning efforts, given the unprecedented intervention that is required at all levels of government and society in order to reduce the impacts of, and adapt to, climate change. Critical to these interventions is the need for accurate and effective decision support tools that consistently meet stakeholder needs. This *Greenhouse Gas Emissions Analysis Toolkit* is the first step in providing transparent guidance on the tools currently available to Metro staff and Council, how and when to use these tools, and a process for ongoing updates and improvements.

Climate change is a dynamic and multifaceted issue that can be viewed as a feedback loop between our past decisions and our future options; how we live, where we work and the products we use all have implications for greenhouse gas (GHG) emissions. Because the decisions made today impact the choices available in the future, it is important to understand the implications of various actions. The *Greenhouse Gas Emissions Analysis Toolkit* is intended to help Metro quantify and report the GHG emissions related to our work.

The Toolkit represents current best practices, and is not intended to be a static document but rather a snapshot in time of those tools currently available and practicable. The toolkit will be updated quarterly to reflect the dynamic nature of the climate analysis field.

Developing rigorous, consistent and credible GHG analysis is needed to support internal management practices, external reporting purposes, and policy development as accounting needs continue to evolve. In the absence of federal or international protocols and standards, a growing number of states and urban areas are beginning to require local governments and communities to meet GHG reduction targets. This Toolkit establishes procedures for estimating GHG impacts for Metro-related activities.

The absence of federal or international reduction protocols and standards has resulted in public and private entities developing various GHG methodologies and decision support tools, which causes confusion when looking to compare emissions impacts across geographic or economic scales. Metro staff are working to develop accurate decision support tools in the absence of standardized protocols. This toolkit is the first step in the process of developing a consistent framework within the agency.

The toolkit is intended for use by Metro employees when developing policies and projects that go before the Metro Council. It should be used to integrate a GHG criterion when evaluating project alternatives. The toolkit could also be used by local governments and state and regional agencies, as well.

The development of this toolkit was guided by the following objectives:

- Establish a process and the tools to consistently report and evaluate Metro projects, programs and policies.
- Engage elected officials in clear and consistent discussions around regional priorities and processes to address climate change.

#### **Development of the Toolkit**

A cross-departmental work team underwent a reporting and evaluation process to identify the type and quality of tools currently used to evaluate greenhouse gas emissions at Metro. Nine tools were evaluated during the process, all of which vary in complexity, application scale (from individual facility to regional community analysis), ease of use and cost.

The first step in the analysis process was to assess the range of Metro's responsibilities and organize them into four primary categories: 1) transportation planning, 2) land use planning, 3) materials management, and 4) facility operations (internal agency operations). Metro staff currently using greenhouse gas emissions tools were then identified as the project work team and a set of tools for GHG analysis were recommended.

After submitting detailed information for each of the GHG emissions tools, the project team reviewed the tools against a set of evaluation criteria to assess the scope and accuracy of the current suite of resources available. The team then conducted a needs assessment to inform the gap analysis of our current emissions impact assessment tools.

In addition to the analysis described above, the emissions factors and coefficients utilized by each tool were assessed to ensure methodological consistency. The relative novelty of this analytical field presented significant challenges for considering various tools and methods: not only must staff select the appropriate accounting approach for a wide variety of tasks, but must further consider the intended audience's level of familiarity with the topic generally.

#### Use of the Toolkit

The result of this cross-departmental effort was the *Greenhouse Gas Emissions Analysis Toolkit*. Its recommended that the toolkit be used in the following instances: 1) Where required by state or federal statute (e.g., St. Johns landfill emissions reporting; 2) Where required by a condition of funding (e.g., a TOD grant); 3) Where requested by the Metro Council; 4) As identified through a project scoping effort.

Use of the Toolkit should be consistent with the business practice for a particular department and the costs and benefits of using a tool should be considered. Staff must also consider the newness of these tools and methods, and the additional burden that newness places on communication, outreach, and stakeholder engagement.

The toolkit should be seen as a dynamic document that will continue to be updated as new tools and GHG accounting methodologies become available.

#### **OPTIONS AVAILABLE**

The Metro Council has directed staff to analyze Metro activities for their GHG impacts. Options include utilizing the Toolkit, testing various components, recommending tool enhancements, or identifying alternative analysis methods or approaches.

#### IMPLICATIONS AND SUGGESTIONS

Staff will begin utilizing the toolkit, as appropriate, for various Metro projects. Appropriate tools and methods will be considered during project scoping.

Metro staff will explore opportunities for sharing the toolkit with regional partners for broader application.

#### **QUESTION(S) PRESENTED FOR CONSIDERATION**

- 1. What additional **information** or background do you need to integrate climate change tools into major policy, program, and decisions?
- 2. What opportunities does Council see for **partnering with our local governments and others** for the use of the toolkit?

### LEGISLATION WOULD BE REQUIRED FOR COUNCIL ACTION \_\_Yes X No DRAFT IS ATTACHED \_\_Yes \_\_No

Agenda Item Number 4.0

### CLIMATE CHANGE PREPARATION FRAMEWORK

Metro Council Work Session Tuesday, Sept. 28, 2010 Metro Council Chambers

### METRO COUNCIL

### Work Session Worksheet

Presentation Date	: 9/28/10	Time:	2:30 p.m.	Length:	45 minutes
Presentation Title	: <u>Climate Ch</u>	ange Prepar	ation Framewo	ork_	
Service, Office, o	r Center: <u>Sust</u>	<u>ainability C</u>	enter, Planning	and Develop	oment
Presenters: <u>Heic</u>	<u>li Rahn 797-1</u>	535, Jonatha	an Soll, 797-17	27, John Wil	liams 797-1635

### **PURPOSE**

The purpose of this work session agenda item is to share information about climate change impacts across our natural, built, economic, human and cultural systems as a result of increasing temperature, changes in precipitation, and loss of snowpack. In addition, staff hopes to receive input from Council on information needs and opportunities for partnerships with local governments and others to implement management strategies that help build and sustain resiliency to climate impacts.

### **ISSUE & BACKGROUND**

In addition to reducing our emissions of climate-damaging carbon emissions (mitigation), society must also anticipate and prepare for the unpreventable social, economic and ecological consequences of climate change.

All levels of government, communities, non-profits, and the private sector must prepare for more extreme weather events, heat waves, droughts, and altered ecological systems resulting from rising global surface temperatures. Effective climate preparedness will require new forms of planning and governance. This includes enhanced approaches to information generation, scenario planning, decision-making, resource allocation, policy development and stakeholder involvement.

Preparedness, in this case, means taking proactive steps to anticipate and consciously build resistance and resiliency for the range of climate change-induced stresses that can be reasonably expected to occur during this century.<sup>1</sup>

In 2010, the Climate Leadership Initiative, a research collaborative between the Resource Innovation Group and University of Oregon's Institute for a Sustainable Environment, convened more than 200 experts throughout the Mid and Lower Willamette Subbasins to achieve the following objectives:

- Assess regional climate change projections provided by the Oregon Climate Change Research Institute,
- Identify likely impacts to the region, and
- Propose recommendations to prepare for those impacts.

Metro staff participated in the advisory committee for this regional effort and attended community workshops that took place in Cornelius, Gresham, Oregon City, and Portland. Building off of the results from the community engagement, a delegation of Metro,

<sup>&</sup>lt;sup>1</sup> Climate Leadership Initiative, University of Oregon. http://climlead.uoregon.edu/node/37

Portland and Eugene staff was invited to participate in a national Climate Leadership Academy planning workshop on climate preparation. The delegation returned with a proposed action plan and will seek additional feedback from regional partners on how to move forward.

A summary of the projected climate impacts and the management recommendations from the community workshops is attached (see "Building Climate Resilience in the Lower Willamette Subbasin of Western Oregon").

### **OPTIONS AVAILABLE**

Metro could be, and in some cases already is, a potential partner or lead in implementing many of the recommended Climate Change Preparation management strategies, including but not limited to, the following:

- Use a landscape scale approach to conservation
- Protect existing, high quality habitat
- Reduce impervious surfaces
- Improve collaboration and communication
- Update and improve water and sewer infrastructure
- Plan for changes to transportation infrastructure
- Protect floodplains
- Improve energy efficiency, promote renewables, and protect building infrastructure
- Promote compact housing and protect the urban growth boundary
- Plan for shifts in transportation of freight
- Strengthen local social networks
- Improve community outreach systems
- Increase response systems capacity

### **IMPLICATIONS AND SUGGESTIONS**

Staff is seeking to inform the Metro Council about the potential regional impacts of climate change and receive input from Council on information needs and opportunities for collaboration and partnerships to assess, prioritize, and incorporate the management recommendations into existing planning and policy efforts.

Future work sessions may focus on more specific policy questions and options for Council consideration.

### **QUESTION(S) PRESENTED FOR CONSIDERATION**

- 1. What **additional information or background** do you need to integrate climate change planning into major policy and program decisions?
- 2. What opportunities do you see for **partnering with local governments and others** to integrate climate change in major policy and program decisions?

### LEGISLATION WOULD BE REQUIRED FOR COUNCIL ACTION \_\_Yes X\_No DRAFT IS ATTACHED \_\_\_Yes \_\_No

### BUILDING CLIMATE RESILIENCE IN THE LOWER WILLAMETTE SUBBASIN OF WESTERN OREGON

### **Initial Summary of Findings: Projected Impacts and Recommendations**

Climate Leadership Initiative, September 2010 Contact: Steve Adams (scadams@uoregon.edu) & Stacy Vynne (stacy@trig-cli.org)

### **Background**

In 2010, the Climate Leadership Initiative initiated a series of workshops to engage over 200 experts in the Mid and Lower Willamette Subbasins, collectively referred to as the Lower Willamette (including the eight county region of Benton, Clackamas, Linn, Marion, Multnomah, Polk, Washington and Yamhill counties) with the following objectives:

- To assess regional climate change projections provided by the Oregon Climate Change Research Institute,
- To identify likely impacts to region, and
- To propose recommendations to prepare for those impacts.

The Climate Leadership Initiative (CLI) purposely uses a whole systems approach to building resilience in order to integrate strategies across natural, built, economic, human and cultural systems to ensure that climate change preparedness actions produce complementary benefits and reduce conflicting costs. Workshop participant expertise fully reflected these many disciplines.

This document provides an initial summary of findings from CLI's 2010 Lower Willamette project. CLI staff is currently completing a draft final report for review by all 200 participants after which a final report will be made available to policy makers and the general public. The draft presentation of impacts and recommendations contained in this document will be strengthened. Those strategies that also support greenhouse gas emissions reduction are labeled with a thermometer symbol.

### **Overview of Projected Climate Impacts**

Based on modeling of two possible future scenarios of global climate change through 2100, the Oregon Climate Change Research Institute developed downscaled projections of impacts for the Lower Willamette Region. These projections, coupled with other local research, provided the basis for the CLI Lower Willamette project. Key impacts include:

• The overall trend for **temperature** shows warming for the entire Lower Willamette by the end of the century. The most intense warming of 10-15° F is during the summer. There is also warming during the winter months, but it is less extreme than in the summer (about 3-5° F).

- **Precipitation** is one of the most difficult variables for climate models to project, particularly for the Pacific Northwest. An increase in precipitation is likely in the winter, with less change in the spring, and mixed results in the summer (some models show severe drought, others show little change).
- Vegetation projections show a decline of Maritime Evergreen Needleleaf species (coastal spruce and fir) and likely increase in Temperate Evergreen Needleleaf species (Douglas fir, true fir, and ponderosa pine). Subtropical Mixed Forest species (hardwoods, mixed pines, madrones, and live oaks) are also likely to increase. (Data provided by Ray Drapek, Pacific Northwest Research Station.)
- Severe decrease in **snow water equivalent** (water content in snow) with near disappearance (greater than 80% loss) is projected by the end of the century. (Data provided by Heejun Chang, Portland State University.)
- **Streams** are likely to become flashier (more frequent and severe high floods) in the winter and early spring, with moderate decrease compared to historical summer flows.

These impacts will impact natural systems, which in turn will impact human systems and the built environment. The following sections detail likely impacts in each sector assessed by CLI with local experts and recommendations for building climate resilience across the Lower Willamette region.

### **Impacts and Recommendations for Natural Systems**

### Likely Impacts to Natural Systems

*Increase in flooding and "flashier" storm events.* Increased flooding and intense storm events may result in simplification of river and stream channels, impacting drinking water availability by reducing groundwater storage levels, resulting in impairment of springs (a source of cold water inputs), and affecting insect communities by scouring streambeds and destroying eggs and larva. Riparian areas will likely be degraded over time, leading to more flooding of agricultural land and housing developments.

*Reduced water quality.* Flashier storm events will likely result in more erosion and pollutants draining into streams. Increasing stream temperatures may also lead to decreased water quality from nutrient loading and algae blooms, and increased potential for waterborne disease.

*Loss of sexual diversity*. Reptiles may experience changes in male to female ratios, since gender is temperature dependent: females are produced at higher incubation temperatures than males.

*Loss of adequate 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.

*Key thresholds likely crossed*: Elevated summer temperatures are likely to push streams past thermal limits and create barriers to migration as well as lead to egg mortality, possibly threatening salmon and steelhead survival.

*Change in fire regime*. Fires are likely to become more intense under warming conditions and drier summers. This may result in periods of intense smoke, affecting both wildlife and human communities. Further, young forests are likely to experience more rapid burning and cause increased sediment loading to streams.

*Change in wind patterns*. Wind patterns are likely to change in the future; however, characteristics of this change are unknown. Changing wind patterns will effect seed dispersal, increase smoke presence in urban environments and increase the frequency and intensity of hailstorms and tornadoes, with the thunderstorms that contribute to tornado formation increasing in intensity as well.

*Loss of adequate habitat and refugia*. Forest amphibians that rely on soil and ground cover may experience habitat loss. The northern spotted owl may experience further habitat fragmentation.

*Loss of prairies*. The Lower Willamette was historically dominated by prairie and oak habitat. Presently, only 1%, or 10,000 acres, of the original 1 million acres of prairie lands and 7% of the original 400,000 acres of oak habitat remain. Climate change will threaten these habitat types further as they are likely to become more fragmented, impacting prairie-dependent species migration.

*Impacts on avian migration*. Changes in avian migration timing and range are being documented globally and locally in the Lower Willamette, such as increased populations of overwintering geese. Shifts in egg-laying dates are also likely and have been found to be five days earlier in bald eagles and likely in other species.

*Reduction in ecosystem services.* Climate change is likely to reduce ecosystem services currently provided within the region, including water storage in the Lower Willamette due to reductions in stream length and complexity.

*Increase in extreme weather events.* With greater precipitation in a shorter period of time and more extreme weather events, some areas of the Lower Willamette may become more vulnerable to landslides. Changes in weather patterns may also overwhelm storm systems.

*Loss of genetic diversity*. Many projected impacts may put species and systems at risk by increasing stress, leading to localized extinctions and a loss of genetic diversity.

*Loss of specialist and low mobility species.* Species that specialize in a particular habitat or prey are very susceptible to climate change. Low mobility species and those that must travel long distances to reach suitable habitat will be most at risk.

*Increase in invasive species expansion.* An increase in fire will make some ecosystems less resilient to invasive species colonization following disturbance. Existing invasive species in the Lower Willamette are likely to expand and new invasives are likely to enter the region.

*Shift in migration patterns and habitat range*. With changes in vegetation, species may migrate or shift historic ranges. Raptors may become more common with wetter winters, negatively impacting prey species. In addition, butterfly ranges may also shift.

*Shift in life history timing and food web*. Key timing for life history requirements may lose synchrony for some species, including the timing of food availability for migrations.

*Changes in intra-species relationships/interactions.* With changes in vegetation, symbiotic relationships between benthic, aquatic, and terrestrial organisms will change, likely to the detriment of many native species. Other interactions that might be impacted include those between insects and insectivorous birds, butterflies and host plants, pollinators and flowering plants (including crops), and soil fungus and associated plant communities.

### **Recommendations for Natural Systems**

*Protect floodplains*. Connections between floodplains should be maximized along with increased efforts to create and maintain deep water and off channel habitats. In particular, floodplain policies throughout the basin need to be strengthened.

*Increase the complexity of streams.* Changes in local regulations, reallocation of water rights, removal of passage barriers, and changes in land use planning can support the restoration of stream complexity. The Water Resource Department, Department of Land Conservation and Development, local governments, Soil and Water Conservation Districts, and watershed councils can play a strong role in engaging landowners.

*Restore beaver presence in riparian communities*. Beavers are keystone species for their disproportional influence on ecosystems as a result of their dam-building and feeding activities. ODFW and watershed councils can work to educate landowners on the value of beavers, provide incentives or change regulations.

*Protect genetic diversity and recovery opportunities for fish*. Harvests should be carefully managed to avoid the tails of runs, and attentive to which fish are targeted. Hatcheries should use local brood stocks and rearing practices and strategies should be changed to mimic natural situations. Habitat availability for fish should be maximized and passage barriers eliminated to the extent possible. More coldwater

refugia and stepping stones for cold water species will need to be created by watershed councils, ODF&W and landowners through restoration projects.

*Safeguard and protect water recharge areas.* The Oregon Water Resources Department has mapped areas that are suitable for underground water storage, but will need to consider that with increasing precipitation and runoff, there will need to be new surface water management to store water in these areas for use during times of shortage. The Water Resources Department as well as individual jurisdictions may need to consider options for water storage, including aquifer storage and recovery.

& *Reassess allocation of water rights*. Many of the systems in the region, especially the Mid Willamette, are over appropriated. The Oregon Water Resources Department may need to consider water rights buy-outs or reassessments for distribution. Various "water banking" programs now being implemented in the Klamath Basin and elsewhere may serve as important models.

Incorporate climate change preparation strategies into watershed management plans. Watershed councils and local governments should develop, adopt, and begin implementing local watershed management plans that set objectives for hydrology, physical habitat, water quality, and biological communities.

*Restore natural fire regime*. Federal and state land managers should work with the Oregon Department of Forestry to increase prescribed burning, particularly in lower elevation areas.

*Use a landscape scale approach to conservation*. To maximize protection of habitat, a landscape scale approach is needed. Conservation-focused organizations and watershed councils should work with private landowners to create habitat networks.

*Reduce impervious surfaces.* Local governments should minimize impervious surfaces wherever possible to protect the water quality of streams.

*Expand carbon sequestration efforts.* Carbon sequestration should be considered as an objective under improved land management efforts with standards set by the state Department of Forestry for approved sequestration species that will improve native processes and systems.

*Establish markets for ecosystem services*. An ecosystem services market provides a mechanism for the buying and selling of quantified ecosystem services in the form of credits and can provide market incentives for actions that build resilience.

*Protect existing, high quality habitat.* Habitat protection policies under local, regional and state regulation (as well as nongovernmental organizations) should be revised to protect high quality habitat. Increasing connectivity between habitats and buffers,

anchors, and corridors should be encouraged with ample consideration for preventing the rapid spread invasives and diseases.

*Revise species management.* ODFW and USFWS must reconsider current management practices for invasives and Threatened, Endangered and Sensitive (TES) species. Invasives will become resident species while local TES species extinctions will become inevitable as the conditions change. Species management should also focus on preparing for species that will be migrating from the south into the Lower Willamette.

*Focus protection on keystone or umbrella species*. Protection efforts by nongovernmental organizations, watershed councils, as well as local, regional and state government should focus on the species, habitats, and/or processes that provide general ecological benefits, as opposed to a species by species approach.

*Increase Early Detection Rapid Response (EDRR) efforts.* Amplifying EDRR efforts used by governmental agencies and nongovernmental organizations increases the likelihood of keeping invasive species populations under control or eradicating them before they become widespread.

*Increase and refocus monitoring*. Shifting conditions under climate change increase the importance and need for adaptive management and monitoring. Monitoring efforts should focus on umbrella or keystone species which can act as indicators for the health of the ecosystem and other wildlife species.

*Improve collaboration and communication*. The challenges posed by climate change require greater communication and collaboration between researchers and resource managers in federal, state, and local agencies.

### **Impacts and Recommendations for Built Systems**

### Likely Impacts to Built Systems

*Damage to water and sewer infrastructure*: Much of the current water and sewer infrastructure in the Lower Willamette region is aging and in need of repair. Growing population and more frequent extreme weather events are likely to increase system failures.

*Decline in road conditions*: Increased extreme storm events and a growing population will strain the region's road network. Roads degraded by increased temperatures, fire, or flood may cause interruptions in emergency response and decreases in worker productivity. The incidence of large sediment increases from forest road blowouts will likely increase without closures or enhanced maintenance. *Bridge failure*: Structural soundness of these bridges may be compromised with climate impacts – particularly "flashier" floods following heavy precipitation events.

*Air and rail disruptions*: Rail lines may be affected by sea level rise 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. Additionally, 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 and more needed in summer due to warmer temperatures. 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 heat events and high use.

*Consequences for floodplains and development*: Many areas are at risk for flooding under future conditions.

*Wildland-Urban interface and wildfire* risk: Of the 11 western states, Oregon is ranked third in the amount of forested public land with homes built next to these lands. With increased fire frequency and intensity under climate projections, additional infrastructure is at risk.

### **Recommendations for 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.

*Floodplain restoration*: Floodplain management plans must consider the impacts of a changing climate to reduce infrastructure flood damage and relocation of critical infrastructure in newly flood-prone areas.

*Changes to 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. To reduce heat impacts, landscape design should include natural shade for cooling and buildings should be sited to capture wind for cooling – government buildings should act as an example by improving the energy efficiency of their buildings and purchasing renewables for the energy used. A comprehensive assessment of public buildings is needed to evaluate cooling under increasing temperatures. Energy forecasts should incorporate climate change impacts and increased populations into their analysis of future energy needs.

*Update land use codes*: Impacts to land use from climate change can be reduced or prepared for by taking into consideration future flood and population projections in planning strategies. The Department of Land Conservation and Development as well as local and regional governments should consider increasing the density of cities prior to expanding the urban growth boundary; employing disincentives for development in flood or fire prone areas; revising development policies to minimize impacts in sensitive areas; avoiding development in forested areas to prevent fire risk; and integrating multi-use green spaces within all developed areas.

*Promote compact housing and protect the urban growth boundary*: Metro's urban growth boundary and growth policies build climate resiliency and should be replicated by other regional and local governments throughout the Lower Willamette.

### **Impacts and Recommendations for Economic Systems**

### Likely Impacts to Economic Systems

*Vulnerability of small businesses*: Small businesses are likely to have the most trouble recovering from a climate change event such as a flood or a fire. Small business (firms of less than 20 employees) accounts for approximately 90% of all businesses in the Lower Willamette.

*Changes in food prices and loss of crops for agriculture*: Agriculture and food processing will be impacted by climate change, likely resulting in increased in food prices and availability of local food due to greater fuel costs, vector management

costs, water availability, and crop temperature limits. There will be an increase in pests as temperatures rise; thus, some crops will be impaired or lost and farmers will be spending more money on vector control. An increase in the frequency of extreme weather events, such as heat, flood, or cold, may prevent plant recovery in the short term or impair adjustment over the long term.

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

*Shifts in timber species and productivity*: Climate change may alter the species of 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.

*Loss of 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.

*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 increase as risks for floods and wildfires increase. There are homes and businesses located in floodplains and in areas that may be susceptible to wildfire in the future. In 2009, Oregon homeowners in high-risk areas saw double-digit increases in insurance rates due to high catastrophic claims and replacement costs.

### 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 those that work outdoors.

### **Recommendations for Economic Systems**

*Business diversification*: Economic diversification is needed in order for the economy to recover more easily from a natural disaster. Both small and large businesses should be promoted in the region state economic development agencies, regional economic development agencies and Chambers of Commerce.

*Crop diversification*: Current crops may need to change, and planting and harvesting seasons may shift. OSU-Extension and the State Department of Agriculture should invest in research on crops that tolerate higher temperatures and drought. Farmers should take into account climate change projections when considering new crops and methods.

*Change industrial forest management practices*. Timber practices should focus on planting a diverse mix of species, increasing buffers, and reducing 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.

### **Impacts and Recommendations for Human Systems**

### Likely Impacts to Human Systems

*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 weather in the Lower Willamette 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*: Air quality is expected to worsen as pollens, molds, and dust are expected to increase. These increased air pollutants, in combination with the higher likelihood of forest fires, threaten the respiratory health of the population. Furthermore, respiratory disorders, which are caused by particle pollution (haze) from wildfires, dust, and dry soils, may be aggravated by increased concentrations of ground-level ozone (smog). Ground-level ozone is projected to increase, increasing the number of air quality alerts due to ozone.

*Reduced water quality*: Projections for increased precipitation and an increased number of extreme heat events both threaten water quality in the Lower Willamette.

*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:

- <u>Vector Borne Disease</u>: 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.
- <u>Water Borne Disease</u>: 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.
- <u>Food Borne Disease</u>: With both warmer weather and increased precipitation, food borne diseases threaten the Lower Willamette. 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*: Climate projections for the Lower Willamette region forecast an increased incidence of extreme heat events. These events are marked by several consecutive days of temperatures of 90° F or higher, unusually warm nighttime lows in the 60s and low 70s, and stagnant, warm air.

*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 Human Systems**

Identify and focus on vulnerable populations: State and local health departments and social service providers should assess the scope and needs of vulnerable populations. Actions to promote energy efficiency can reduce the vulnerability of low-income, elderly, and geographically marginalized populations in the region. Stronger social and community networks should be established to ensure a stable network of support and care for those most vulnerable and least resilient to negative climate change impacts.

*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 response systems capacity*: Emergency management plans and resources should be evaluated by local and regional governments and updated to address the specific risks of climate change. Updated plans should incorporate coordinated, regional management and involve contiguous jurisdictions to craft response strategies. In addition, FEMA should re-evaluate flood plains with respect to climate change impacts and update education programs accordingly. Emergency management systems should utilize community organizations as additional sources of support and integrate schools, social service agencies, and private organizations into emergency response planning. To increase emergency response capacity with diminishing resources, emergency services should develop centralized distribution systems for emergency resources and improve coordination of emergency response systems to conserve resources expended.

*Improve preparedness outreach*: Communities should focus on increasing individual emergency response capacity as well.

*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 and farmers should adopt measures to increase local food production and decentralize food sources. Expanding both farmers markets and food donation

programs may increase the amount of local food available during emergencies. Enhancing urban agriculture can support climate change preparedness by providing greater adaptability, access, and mobility compared with rural agriculture. Increasing cities' capacities to produce food can enhance the food security for low-income urban populations and ensure greater access to food during emergencies.

*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*: On-site and neighborhood water storage should be encouraged by state and local agencies. Schools and hospitals should develop on-site water storage systems to ensure access to potable water during emergencies. In addition, home water purification systems and decentralized (household or neighborhood) water storage systems may prevent scarcity and contamination issues during disasters. Local governments should evaluate current regulation of greywater and rain catchment sources. 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 adopt these recommendations as policies, supported by state funding to local jurisdictions.

*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 help 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 must 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 vectorborne, 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.

*Conduct Health Impact Assessments (HIAs):* Including climate change projections in health impact assessments for the Lower Willamette will help establish preparedness strategies necessary for planning for impending climate changes. This will also help provide guidance for future healthcare needs in the event of an increase in population.

*Promote preventative health*: Educating individuals on preventative health will create a population more resilient to disease. Encouraging regular doctors visits, exercise, and healthy living is also 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.

### **Impact and Recommendations for Cultural Systems**

### 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 specifically affected by changes in temperature, precipitation, and aquatic environment.

*Deterioration or destruction of historical architecture*: The National Register of Historic Places lists 954 historical structures, buildings, and districts "worthy of cultural preservation" in the Lower Willamette. These sites attract significant tourism revenue, provide opportunities for community education, and preserve regional heritage. Temperature changes may require architectural upgrades and weatherization. Fragile building material and structures without foundations and structural support are threatened by increasing extreme weather events.

*Conflicts with climate refugees*: The Pacific Northwest is likely to experience relatively minor impacts from climate change compared to the rest of the country. Human migration patterns are likely to shift with the result being that the Willamette Basin will experience growth from climate refugees. An influx of refugees displaced by global climate change impacts may 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. It may be that 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 for mitigation as well as resistance and resilience to natural, human, economic and cultural 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.

*Loss of governability*: Scarcity of resources, rising fuel costs, and the growing threat of climate impacts may foster an increased conservation ethic in the Lower Willamette. At the same time, competition for increasingly scarce resources may result in heightened tension between many groups in the Lower Willamette. As climate change impacts accrue, conflicts stemming from economic and social equity issues, land use, water, fuel costs, and governance may escalate. In addition, population growth and changing agricultural capacity may exacerbate tension in the urban-rural fringe with "edge" communities at risk for greater conflict surrounding land use, pollution, governance, resource allocation, and competing cultural values.

### **Recommendations for Cultural Systems**

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

Lencourage resource conservation and energy independence: Tribal communities may wish to prevent social tension surrounding scarce resources through conservation, renewable energy production and energy efficiency measures. Cooperatives and resource sharing schemes may foster community connectivity

while easing competition for resources. Tribal communities should consider investments in wind, solar, geothermal, and biomass energies. Governments in the region should consider programs to subsidize and provide technical assistance for alternative energy projects on tribal lands. New climate change policies should incorporate revenue-raising mechanisms to finance native community resource conservation and adaptation.

*Prepare for increased human population*. The Pacific Northwest may see an influx of people escaping less tolerable climates. This potential change in population and demographics should be considered when planning for water, land use, and transportation. Additional research and modeling of projections by universities as well as state and local agencies for population growth should be supported.

*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.

Agenda Item Number 5.0

### CLIMATE SMART COMMUNITIES SCENARIOS PROJECT

Metro Council Work Session Tuesday, Sept. 28, 2010 Metro Council Chambers

### METRO COUNCIL

### Work Session Worksheet

	Presentation Date:	9/28/10	Time:	3:40 p.m.	Length:	40 minutes
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Presentation Title: <u>Climate Smart Communities Scenarios Project</u>

Service, Office, or Center: Planning and Development

Presenters: <u>Kim Ellis (797-1617 or kim.ellis@oregonmetro.gov)</u>

### **PURPOSE**

The purpose of this work session agenda item is to share information about the Climate Smart Communities Scenarios Project and receive input from Council on information needs and opportunities for collaboration and partnerships with local governments and other partners. A summary of major tasks and decision points for the project is provided for reference.

### ISSUE & BACKGROUND

A number of climate-related activities are being conducted at the local, regional and state levels to mitigate and prepare for the impacts of climate change. Addressing the climate change challenge will take collaboration and partnerships in the public and private sectors, requiring meaningful policy and investment discussions and decisions by elected leaders, stakeholders and the public. By working together and combining resources, the region can make real progress toward successful achievement of the region's desired outcomes.

The first 6 to 8 months of the project will identify the most promising and effective land use and transportation policy options that were presented at the April climate change retreat. Staff will prepare a series of white papers that synthesize the latest empirical research relevant to this work. Land use and transportation strategies (e.g. locating jobs closer to homes and expanding bus and high capacity transit) as well as operational and management strategies (e.g. traffic signal timing, parking pricing and other user-based fees) will be tested using local case studies and regional-level scenarios. The results of the white papers and scenario planning will be reported to the Legislature in January 2012, and guide future phases of the project.

The 2040 Growth Concept establishes a vision and set of policies that national studies have shown will reduce greenhouse gas emissions. While this effort will have similarities to the 2040 Growth Concept scenario planning process conducted in the 1990's, this scenario planning effort will be outcomes-based and focused on meeting an ambitious and specific performance target. This project will build on and advance existing 2040 implementation efforts and consider bold land use and transportation policy options not before tested in the region.

The data, tools and methods developed through this project will inform future policy discussions on how the region should move forward to meet the state's greenhouse gas emissions reduction targets for cars and light trucks. The project will result in adoption of a "preferred land use and transportation" strategy and implementation of changes to policies, investments, tools and actions at the regional and local levels to realize the adopted strategy.

The process and results will also inform the work being conducted by the Oregon Department of Transportation (ODOT) and the Department of Land Conservation and Development in response to Senate Bill 1059<sup>1</sup>, including development of guidelines for scenario planning, state GHG reduction targets and a statewide transportation strategy.

### **OPTIONS AVAILABLE**

In 2007, the Legislature established statewide targets 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 Oregon Legislature passed House Bill 2001, which directed Metro to develop at least two land use and transportation scenarios designed to meet targets for greenhouse gas emissions reductions from cars and light trucks while accommodating population growth, and to later adopt one scenario after public review and consultation with local governments. Finally, it requires local governments to adopt comprehensive plan and land use regulations consistent with the adopted regional scenario.

In August, Metro signed an intergovernmental agreement with ODOT that grants State funds to complete this work. The state funding will supplement existing Metro funding.

### IMPLICATIONS AND SUGGESTIONS

Staff is seeking to inform the Metro Council about the proposed scenario planning approach and receive input from Council on information needs and opportunities for collaboration and partnerships.

Future work session discussions will focus on more specific policy questions and options for Council consideration.

### **QUESTION(S) PRESENTED FOR CONSIDERATION**

- 1. What **additional information or background** do you need to lead this project with local and regional partners?
- 2. What opportunities do you see for **partnering with local governments and others** through this project?

### LEGISLATION WOULD BE REQUIRED FOR COUNCIL ACTION \_\_Yes X No DRAFT IS ATTACHED \_\_Yes \_\_No

<sup>&</sup>lt;sup>1</sup> For more information, go to http://www.oregon.gov/ODOT/TD/TP/SB1059.shtml

### Metro | Making a great place

### **Climate Smart Communities Scenarios Schedule**



Communication and outreach milestones and events

### DISCUSSION DRAFT

= State scenario planning and policy development milestones

Materials following this page were distributed at the meeting.



### Climate Smart Communities 2010-11 ACTIVITIES

#### **Regional outcomes**

People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.

Current and future residents benefit from the region's sustained economic competitiveness and prosperity.

People have safe and reliable transportation choices that enhance their quality of life.

The region is a leader in minimizing contributions to global warming.

Current and future generations enjoy clean air, clean water and healthy ecosystems.

The benefits and burdens of growth and change are distributed equitably

### Research and reporting

Climate Smart Communities | Land use and transportation scenarios planning Climate Smart Communities | Greenhouse gas emissions analysis

### Policy framework

Climate Smart Communities | Climate prosperity partnership Climate Smart Communities | Preparedness framework Climate Smart Communities | State framework Climate Smart Communities | Materials management planning

### Tools

Climate Smart Communities | Greenhouse gas emissions analysis toolkit Climate Smart Communities | Materials management toolkit for local government

### Actions

Climate Smart Communities | Clean fleet waste transport project Climate Smart Communities | Low impact development



### Talking about climate change

#### What is climate change?

Climate change occurs when we put too much carbon into the atmosphere. The three greatest sources of carbon emissions in the Portland metropolitan area are:

- goods and food consumed
- energy used in homes and buildings
- transportation by car, truck and public transit.

Nearly half of the region's greenhouse gas emissions come from the resource extraction, manufacturing and distribution associated with materials, goods and food used in homes and businesses.

#### Why should we be concerned?

Climate affects just about everything in our lives:

- the ability to grow the food we eat
- the kinds of infectious diseases and pests that can thrive in our region and affect our health
- the amount of water we have for drinking and maintaining our property
- the quality of the air we breathe
- how we travel for work, recreation and to manage our everyday lives.

#### We have a choice of action.

We are at a crossroads, with a choice between responsibly addressing the problem together now or ignoring it and dealing with more serious consequences later.

#### What Metro is doing.

As a regional government with responsibility for land use and transportation planning as well as waste reduction and disposal, Metro is providing leadership in reducing greenhouse gas emissions through partnerships, legislative action, education and data provision.

Because we realize the impact we can have, Metro is examining all of its planning efforts, programs, projects, policies and internal operations for the potential impact each can have on climate change. Collectively, these actions are identified as our broad climate action effort called Climate Smart Communities.

#### What you can do.

Each of us has the opportunity to affect climate change in the simple choices we make everyday including:

- where we choose to live
- how we travel for work, recreation and to manage our everyday lives
- how we manage resources (water, electricity, gas) in our home, workplace, schools and community
- the choices we make when shopping for the things we need
- how and if we convey values and practices that support responsible action toward climate change to our children
- learning more about and participating in programs and policies that reduce the region's greenhouse gas emission.

Together, we can have an impact on our quality of life today and for future generations.



# **Climate Smart Communities Preparedness**

Addressing climate change in the Portland region

Heidi Rahn, Jonathan Soll, John Williams

Metro Council Work Session Briefing September 28, 2010



# **Climate change preparedness**



- Process overview
- Climate change projections
- Potential impacts
- Recommendations to prepare
- Discussion

## **Climate preparedness process**



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## **Lower Willamette River Basin**





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# **Projected future conditions**



- Temperature increase
- Precipitation increase (winter)
- Vegetation changes
- Snow decrease
- Stream flooding increase

Projected changes will impact **natural systems**, which in turn will impact **human systems** and the **built environment**.

# Natural system impacts and recommendations









# **Regional conservation strategy**



# **Regional conservation partners**

- Audubon Society
- Columbia Land Trust
- Nature Conservancy
- Urban Greenspaces Institute
- Wetlands Conservancy
- United States Fish and Wildlife Service

- City of Portland
- Clark County
- Clean Water Services
- Metro
- Oregon Biodiversity Information Center
- Oregon Dept. of Fish and Wildlife
- City of Vancouver

Developing a well managed and **effectively connected system** of natural areas is the most important action we can take to ensure continued delivery of many key ecosystems services.

# Community system impacts and recommendations



Changing climate conditions will **transform** natural **systems** and stimulate shifts in the region's economy, infrastructure, human health, and culture.

# **Community system management**

- Integrate climate change preparation planning
- Plan for variability
- Consider multi-sectoral impacts
- Identify and prioritize co-beneficial, no-regret strategies

A whole systems view is needed to recognize the interconnectivity of our actions and integrate climate change planning into all of our decision-making processes.

# **Questions for Council discussion**



- Additional information or background needed?
- Opportunities for partnering with others?





### Climate Smart Communities Scenarios Addressing climate change with

land use and transportation

Kim Ellis, Project Manager

Metro Council Work Session Briefing September 28, 2010

Metro | People places. Open spaces.

### Mandated state climate work



- Set statewide transportation strategy
- Set targets for light vehicles in metropolitan areas
- Develop scenario guidelines & toolkit
- Prepare estimates of future vehicle and fuel technology
- Public outreach campaign
- Report to 2011 and 2012 Legislatures

More information: http://www.oregon.gov/ODOT/TD/TP/SB1059.shtml

### Achieving 2040: Six desired outcomes

- Sustained economic prosperity
- Safe and reliable transportation choices
- Vibrant, walkable communities
- Minimal contributions to global warming
- Clean air, clean water and healthy ecosystems
- Benefits and burdens of growth shared equitably throughout the region



### **Emissions sources: project focus**



# Proposed scenario planning approach



- Illustrate key driving forces
- Evaluate cause and effect relationship of choices
- Compare a "base case" trend with one or more alternatives
- Test combinations of feasible actions – "strategy bundles"
- Inform state work

# Building on past innovation and successes



- 1995: Region 2040
- 2010: Making a Great Place
  - Six Desired Outcomes
  - Regional Transportation Plan
  - Urban and Rural Reserves
  - Community Investment Strategy



### **Potential role of built environment** Land use and transportation strategies



### **Potential role of management & operations** Demand and system management strategies



- Combining trips, ridesharing
- Commuter benefits programs
- Traffic signal timing
- Incident management
- Pricing and tolling
- Financial incentives
- User-based strategies

Drive less. Save more.

Packages of policies and actions

Testing "strategy bundles"



### Assessing benefits and impacts







- Greenhouse gas emissions
- Travel behavior
  - Walking, biking and transit
  - Vehicle miles traveled
  - Freight reliability
- Jobs and households
- Economy
- Public health and equity
- Cost and affordability

### Key 2010 and 2011 Activities Understanding the choices

- Literature review on latest research
- Sketch-level scenario planning
  - Local case studies
  - Regional scenarios
- Tools, data and model development
- Opinion research and targeted outreach
- Report to 2012 Legislature



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### **Communication plan**

### Objective-driven engagement





- Collaborate with state and regional partners
- Use existing Metro policy and technical committees
- Identify environmental justice and economic development implications and opportunities
- Conduct opinion research
- Create project website, fact sheets and print media

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#### Scenario planning process 2012 2010-11 2013-14 **Scenario** Preferred Alternative framing, scenario research and scenario analysis and tool analysis selection development Nov. 2012 Jan. 2012 June 2014 **Report to Confirm preferred** Adopt preferred scenario elements Legislature strategy and begin on findings local implementation and rec'ds 14

### **Questions for Council discussion**



- Additional information or background needed?
- Opportunities for partnering with others?



### **Total Estimate PERS Rate**

as of 2/1/10

		PERS Rat	e Cycle 1	PERS Ra	te Cycle 2	PERS Ra	te Cycle 3
		Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17
Worst Case Assumptions:							
Employer Rate	3.00%	10.50%	10.50%	16.50%	16.50%	19.50%	19.50%
Employee Pick-up	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
PERS Bond Recovery	3.00%	3.00%	3.00%	3.20%	3.20%	3.20%	3.10%
Total Estimated PERS Rate	12.00%	19.50%	19.50%	25.70%	25.70%	28.70%	28.60%
Median Case Assumptions:							
Employer Rate	3.00%	8.50%	8.50%	13.00%	13.00%	17.50%	17.50%
Employee Pick-up	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
PERS Bond Recovery	3.00%	3.00%	3.00%	3.20%	3.20%	3.20%	3.10%
Total Estimated PERS Rate	12.00%	17.50%	17.50%	22.20%	22.20%	26.70%	26.60%
Best Case Assumptions:							
Employer Rate	3.00%	7.75%	7.75%	10.75%	10.75%	13.75%	13.75%
Employee Pick-up	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
PERS Bond Recovery	3.00%	3.00%	3.00%	3.20%	3.20%	3.20%	3.10%
Total Estimated PERS Rate	12.00%	16.75%	16.75%	19.95%	19.95%	22.95%	22.85%

		PERS Rat	e Cycle 1	PERS Ra	te Cycle 2	PERS Ra	te Cycle 3
		Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17
Estimated eligible PERS salary base	\$54,236,100	\$55,863,183	\$57,539,078	\$59,265,251	\$61,043,209	\$62,874,506	\$64,760,741
Estimated cost of each 1% of PERS rat	\$542,361	\$558,632	\$575,391	\$592,653	\$610,432	\$628,745	\$647,607
Estimated Annual PERS Cost							
Worst case assumption	\$6,508,332	\$10,893,321	\$11,220,120	\$15,231,170	\$15,688,105	\$18,044,983	\$18,521,572
Median case assumption	\$6,508,332	\$9,776,057	\$10,069,339	\$13,156,886	\$13,551,592	\$16,787,493	\$17,226,357
Best case assumption	\$6,508,332	\$9,357,083	\$9,637,796	\$11,823,418	\$12,178,120	\$14,429,699	\$14,797,829

NOTE: The above analysis assumes that all base salaries are eligible for the Metro employer paid employee pick up rate of 6%

Using median case scenario for five-year forecasting analysis.

### PERS Summary rate adjustments as of 9/27/10

<b>Tier 1/2</b>	2.49%	8.67%	
OPSRP for	<b>3.16%</b>	7.04%	
budget	3.00%	<8.5%	pending
	current	new	
Tier 1	<1996		
Tier 2	1996 - 200	03	
OPSRP	>2003		