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CENTRAL LANE SCENARIO PLANNING

Scenario planning methodology

Kristin Hull and Ryan Farncomb, CH2M HILL

In 2009, the Oregon Legislature passed House Bill 2001, the Jobs and Transportation Act (JTA). Section 38 of the JTA directs the Central Lane MPO to undertake scenario planning and for the local governments in central Lane County to cooperatively select a preferred land use and transportation scenario. The state set a greenhouse gas (GHG) emissions reduction target of 20% for the MPO; while this target must be considered in the scenario planning process, the final selected scenario is not required to meet this target. This memo summarizes the scenario development and evaluation process that will aid the governments of central Lane County in selecting a preferred scenario.

Scenario development and selection process

The scenario planning process begins with development of evaluation criteria, which allow for objective comparison of scenarios. While GHG emissions reductions will be a key criterion, other local priorities will be incorporated into the evaluation framework. The project technical team (LCOG and consultant staff) will use the state's GreenSTEP emissions model and other tools to quantify some criteria. Evaluation criteria are discussed later in this memo.

A reference case was previously developed as the baseline to which alternative scenarios are compared; it approximates the future if current policy direction is carried out without significant changes. The reference case represents our best assumptions about how current policy direction could be implemented over the next 25 years. The reference case, coupled with evaluation criteria, allow for a comparison between the alternative scenarios. While the reference case was previously evaluated only with the measures produced by GreenSTEP, the technical team and PMT will evaluate alternative scenarios with GreenSTEP as well as other economic development, public health and equity-related criteria.

The PMT and technical team will then develop future alternative scenarios to understand the long-term effects of a variety of transportation policy decisions. For purposes of this process, a "scenario" is a set of transportation-related policies and strategies. Alternative scenarios will be evaluated and compared to the reference case. Through adjustment of the policy decisions in

these alternative scenarios, the PMT will eliminate some scenarios and refine others. After further refinement and evaluation, a final scenario, will be evaluated. The PMT is tasked with cooperatively selecting a preferred scenario at the end of this process.

The public, stakeholders and elected officials will be engaged throughout the process. The *Central Lane Scenario Planning Stakeholder and Public Involvement Plan* details how the public will be informed about the project, and how and when public input will be incorporated into the process.

Overview

The technical team will develop five to seven scenarios that meet, or approach, the GHG reduction target. The scenarios will be evaluated with the GreenSTEP model and with a weighting process. In conjunction with the PMT the team will narrow those five to seven down to three to five using GreenSTEP, qualitative techniques, and the ITHIM public health model. The technical team will present results for discussion, and the PMT will select one scenario. The PMT may make final adjustments to the scenario to enhance its benefits and to best reflect the values of their respective jurisdictions.

Step 1: Frame choices

Reference Case

The reference case provides a baseline for comparison of alternative scenarios. The reference case also sets the policy "floor" for developing alternative scenarios. Under the reference case, the region's greenhouse gas emissions from light vehicles decreases by 1% from 2005 levels when fleet and technology changes are not included. If fleet and technology changes are included, the reduction is more than 60%. The 20% GHG emissions reduction target set by the state excludes the effects of fleet and technology changes; that is, the CLSP process must consider policy changes that approach the 20% reduction target independent of fleet and technology changes.

GreenSTEP sensitivity testing

Sensitivity testing refers to the process of determining how different policies affect GHG reduction at different levels of implementation. Sensitivity testing will be performed with the GreenSTEP model to understand which policies, or combinations of policies, result in GHG emissions reductions that approach or meet the 20% GHG reduction goal set by the state. This testing will help answer the following kinds of questions:

- Which policy "levers" individually have the greatest effect on reducing GHG emissions? For instance, does increasing transit service alone result in large GHG emissions reductions?

- Which policy "levers" in combination have the greatest effect on reducing GHG emissions? Do some policies, when applied together, actually become less effective?
- At what implementation *level* are policies most effective? That is, how aggressive or ambitious do policies need to be? At what level do policies cease to create additional GHG reductions?

Individual policies are grouped into five categories (consistent with GreenSTEP):

- Community Design: housing mix, transit service, etc.
- Pricing: congestion pricing, vehicle miles travelled taxes, etc.
- Marketing and Incentives: transportation demand management programs and policies
- Roads: intelligent transportation system (ITS) technology, road improvements, etc.
- Fleet/Technology: future fleet and technology assumptions made by the state.

Policies could be implemented at to three levels (Figure 2). "Level 1" approximates a level of implementation equivalent to that of the reference case; the policies included in Level 1 represent existing policies or policy direction implemented over the 20 year planning horizon. "Level 2" and "Level 3" represent changes to existing policies; for example, within the "Pricing" category, Level 1 for "proportion of work parking charged" is 3%, while Level 3 is 14%. Levels 2 and 3 represent more aggressive implementation, based on the range of implementation seen in other regions and professional judgment as to the range of possibility for the region.

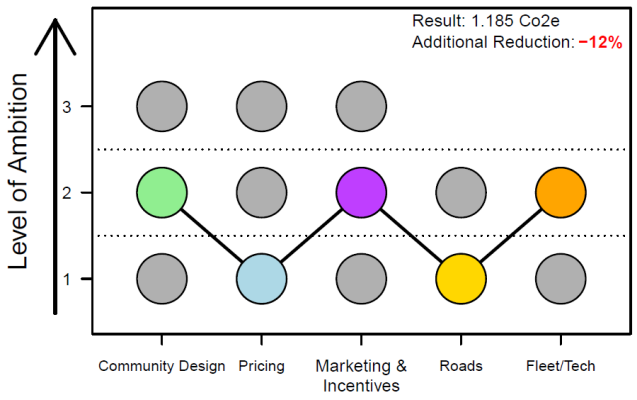

Figure 2. Example sensitivity testing diagram. This diagram shows different levels of policy actions being implemented with Community Design at Level 2, for example.

Table 1 describes, in brief, the range of GHG reduction strategies/policies that were considered during sensitivity testing.

TABLE 1
Policy bundles

Policy Bundle	Specific Policies
Community Design	Transit Supply, Bicycling, Mixed Use Development
Pricing	Cost to Park, Pay as you Drive Insurance, VMT Fee, Carbon Fee, Externalities Costs to Drive
Marketing and Incentives	TDM Programs, Work Commute Options, Individualized Marketing Programs, Car Share, Eco-driving, Low-rolling Resistance Tires, Vehicle Optimization
Roads	Freeway and Arterial Lane Miles, ITS Strategies including Signal Prioritization, Access Management, Incident Response, Ramp Metering
Fleet and Technology	Proportion of Fleet Light Trucks, % Fleet Electric, % Fleet Plug-in Hybrid Electric , % Fleet Hybrid

The strategies/policies in Table 1 represent the range of policy assumptions that were tested during sensitivity testing. However, the policies and strategies presented in the table are not exhaustive; the PMT may wish to consider other strategies or policies that are not captured in the table during scenario development.

Step 2: Develop and evaluate scenarios

The technical team will produce five to seven themes, which describe some possible sets of future trends. These themes will be presented to the PMT for discussion. The PMT will select three to five to advance for development into *scenarios*. Each will scenario will be populated with a different mix of policies designed to approximate those necessary to achieve reductions that meet or approach the 20% goal set by the state.

Each scenario will be scored. After seeing the evaluation results, the PMT will weight each indicator, suggesting its relative importance to them. The weighted scores will suggest to the group which of the scenarios can be dropped or advanced.

After identifying the scenarios to advance the technical team will develop a suite of policies and implementation actions for PMT review. The PMT may use the discussion of implementation actions to refine the scenarios. Table 2 provides two examples of how policies are translated into implementation actions. A full list of implementation actions is included in Appendix A.

TABLE 2
Example policies and implementing actions

Policy	Level (1, 2, or 3)	Possible Implementing Actions
Parking pricing - proportion of work parking charged	2 (14%)	Establish parking maximums for certain land uses; encourage employers to reduce parking subsidies and increase subsidies for other modes (e.g., transit passes, cycling gear, etc.)
Carbon pricing	3 ($50 per ton)	Enact a per-gallon fuel surcharge in the amount of $X.00

The PMT may add, remove, or modify policies or policy *implementation levels* within individual scenarios. The technical team will then evaluate the refined scenarios. The PMT will use this evaluation to identify a single scenario to advance to the refinement step.

Step 3: Refine single scenario. After identifying a single scenario to advance, the PMT will define realistic implementing actions, refine policy levels where necessary, and adjust the scenario with additional versions if needed. The technical team will support the refinement process by conducting additional GreenSTEP, ITHIM or qualitative evaluation as necessary. At this step, the PMT will develop locally-acceptable implementation actions that could support policies contained in the emerging scenario. Through this process, the PMT will move toward recommendation of a preferred scenario.

Step 4: Select a preferred scenario

Once the PMT identifies a recommended preferred scenario the technical team will complete a final evaluation of that scenario to support documentation of the expected impacts and benefits associated with the preferred scenario. This scenario will be presented to the Springfield City Council, Eugene City Council, Coburg City Council and the Lane County Board of Commissioners to meet the legislative mandate to cooperatively select a preferred scenario.

Evaluation criteria

Evaluation criteria presented below were derived from goals and objectives expressed in the following plans:

- Eugene-Springfield Metropolitan Area General Plan (Metro Plan)
- Envision Eugene
- Springfield 2030
- Cascades West Economic Development District Comprehensive Economic Development Strategy

- Regional Prosperity Economic Development Plan
- Regional Transportation Plan
- Eugene-Springfield Regional Transportation System Plan (TransPlan)
- Eugene-Springfield Consolidated Plan
- Lane County Public Health Authority Comprehensive Plan
- Oregon Health Improvement Plan
- Coburg Transportation System Plan (in development)
- Eugene Transportation System Plan (in development)
- Lane County Transportation System Plan (current)
- Springfield Transportation System Plan (in development)
- Lane Public Transit Human Services Transportation Plan
- Community Climate and Energy Action Plan for Eugene

From this review, seven broad evaluation categories emerge:

- Economy and Prosperity
- Energy and Greenhouse Gas (GHG) Emissions
- Transportation Outcomes
- Air Quality
- Feasibility
- Health
- Equity

Appendix B contains a full list of plan policies, goals, objectives, and measures that informed development of the evaluation categories.

Performance criteria

Within each of the above categories will be several *evaluation criteria*. The way in which each will be measured will vary. Some criteria, like "public acceptability," will be assessed qualitatively, because the criterion is not something that can be expressed quantitatively or we do not have the available resources or tools to measure the criterion quantitatively. Others will measured in quantitative units (e.g., dollars, tons, miles, etc). Each criterion has a unit of measure associated with it (Table 3). For example, the criterion "greenhouse gas emissions per capita" has the unit called "tons of CO2 per year."

These criteria reflect the commitment of the Central Lane MPO government partners to address health, equity, and economic development issues during the scenario development process. The

Focus Areas section below provides more detail on how these three subject areas will be addressed in the process.

TABLE 3

Scenario evaluation criteria

Key Scenario Modeling Assumptions				
Assumed urban growth boundary (UGB)expansion, in acres				
Housing mix: single family and multi-family				
Population density, in persons per acre				
Mixed-use development, in acres				
Evaluation Category	**Questions to answer**	**Evaluation criteria**	**Unit of measure**	**Tool**
Economy & prosperity	How will household and business budgets be impacted?	Driving costs as percentage of household income	% of average HH income	GreenSTEP
		Average household income by housing type	$	GreenSTEP
	How will regional livability be affected?	Parking costs	Average regional daily parking cost	GreenSTEP
		Value of time lost to congestion	$	GreenSTEP
Energy consumption and GHG emissions	How will our choices affect energy consumption and climate change?	GHG emissions per capita	Tons CO2/year	GreenSTEP
		Petroleum fuel consumption	Gallons/capita	GreenSTEP
Transportation outcomes	How will our choices affect how we get around the region?	Vehicles miles travelled	VMT/capita	GreenSTEP
		Transit service	Revenue miles/capita	GreenSTEP
		Bicycle travel	Bicycle miles travelled per capita	GreenSTEP
		Pedestrian travel	Walk miles travelled per capita	GreenSTEP
		Transit ridership	Total annual ridership	Travel demand model
		Vehicle ownership	Average no. of vehicles per HH	GreenSTEP
		Hours of congestion	Hours per capita per year	GreenSTEP
Air Quality	How will our choices affect air quality?	Criteria air pollutant emissions	% reduction or increase in pollutants	GreenSTEP
Feasibility	What can we afford?	Legal, legislative, or regulatory barriers to implementation	Qualitative assessment	Qualitative assessment
		Public/private infrastructure costs	Qualitative assessment	Qualitative assessment
	Are our choices implementable, given legal, legislative, policy, or other constraints?	Local gas tax revenue	$	GreenSTEP
		Political or public acceptability	Qualitative assessment	Qualitative assessment
Health	How will our transportation and land use choices affect public health?	Physical activity per capita	Average minutes per capita per week	GreenSTEP
		Chronic illness incidence	% reduction or increase	I-THIM public health model
		Cost savings due to reduced disease burden	$	I-THIM public health model, sketch planning model
		Change in fatal or injury accidents	% reduction or increase in pedestrian/bicyclist injuries and fatalities	I-THIM public health model
Equity	Will our choices disproportionately benefit or impact certain groups?	Those evaluation measures, highlighted above, where impacts can be measured across population groups (age, income) will be assessed qualitatively to determine if disproportionately negative impacts will occur to certain groups.		

Evaluation tools

The technical team will use several models and tools to assess the benefits and drawbacks of scenarios.

GreenSTEP

The GreenSTEP model was developed by the ODOT Transportation Planning Analysis Unit (TPAU) as a strategic modeling tool to assess the effects of a large variety of policies and other factors on transportation sector GHG emissions and other land use and transportation outcomes. The model allows for manipulation of many different policy inputs; for example, gas taxes, carbon taxes, and other pricing tools can all be adjusted.

The GreenSTEP model is comprehensive in scope, addressing the following factors, in addition to many others:

- Changes in population demographics (age structure);
- Changes in personal income;
- Relative amounts of development occurring in metropolitan, urban and rural areas;
- Urban form in metropolitan areas (proportion of population living in mixed use areas with a well interconnected street and walkway system);
- Auto and light truck proportions by year;
- Pricing – fuel, vehicle miles traveled (VMT), parking;
- Demand management – employer-based and individual marketing;
- Carbon production from the electric power that is generated to run electric vehicles.

Integrated Transport and Health Impact Modeling Tool (ITHIM)

The ITHIM tool allows for the comparative assessment of three major transportation-related metrics including crash injuries and fatalities, air pollution, and physical activity from active transportation. Metro (Portland, Oregon) has successfully used the ITHIM tool in their scenario planning work to better understand the connection between transportation GHG reduction policies and health outcomes. ITHIM models crash injuries and fatalities using risk, travel distance, and speed parameters. Physical activity is modeled by comparing weekly physical activity under different scenarios.

Travel demand model

LCOG's travel demand model may be utilized to calculate specific measures, such as transit ridership. The travel model integrates demographics, land use, and transportation features to produce an estimate of travel demand for different modes (single occupant drivers, carpooling, transit, etc.) and assigns trips to the transportation network to show how the network will

function in a given future year. The travel demand model is expected to only be used in a limited way for the scenario evaluation process.

Qualitative assessments

Three measures will be evaluated qualitatively because there is no reasonable method of calculating their value quantitatively. Qualitative evaluation relies on the experience and knowledge of the technical team and PMT to accurately assess the following measures:

- Legal, legislative, or regulatory barriers to implementation
- Public/private infrastructure costs
- Political or public acceptability

The technical team in conjunction with the PMT will score each scenario based on its relative performance within each of these categories. Qualitative measures may be expressed as a numeric score (0 to 100, for example) or in relative terms (high, medium, or low).

Focus Areas

The local government partners in the Central Lane MPO agreed to consider how scenario planning could be used to develop policies to improve equity, health and economic development in the region. Through the Lane Livability Consortium, the local government partners explored how GHG reduction policies could be developed to produce these "co-benefits" and how scenarios can be evaluated based on equity, health and economic development criteria.

Economic development

The technical team and PMT will assess the following economic indicators during the process:

- Driving cost as a percentage of household income
- Average household income by housing type
- Parking costs
- Value of time lost to congestion

While "economic development" encompasses a wide range of possible subject areas and outcomes, these four measures provide a reasonable assessment of the impacts of different transportation choices on households and businesses. The *value of time lost to congestion* measure provides an estimate of the impact of different scenarios on both personal travel and freight mobility within the region.

Equity

Equity refers to the distribution of benefits and burdens of policies and projects across different populations. The Central Lane Scenario Planning Project Management Team convened a sub-

committee of the Technical Advisory Committee (TAC) to provide input on equity considerations. Outcomes from Equity Sub-TAC meetings inform an approach to scenario evaluation, scenario development and implementation strategies, and outreach and public involvement strategies.

The Equity Sub-TAC acknowledged the importance of developing measurable indictors that track outcomes based on the incorporation of equity into the scenario planning process. In developing the preferred evaluation approach, the technical team considered measurable outcomes that address equity across community concerns of economic prosperity, transportation access and affordable housing, and community health. Evaluations of equity outcomes across each category rely on measurable indicators such as income, race/ethnicity/, age, and cost burden.
The technical team will assess three quantitative measures of equity:

- Driving costs as a percentage of household income
- Average household income by housing type
- Physical activity per capita by income quintile

These measures provide a snapshot of how different scenarios affect different economic groups. Equity analysis generally includes race/ethnicity, income and age. The GreenSTEP model that underlies the scenario planning evaluation process does not produce results based on age or race/ethnicity. For this reason, the equity evaluation focuses on how benefits and impacts are distributed among income groups. Policy implementation and public participation, two other aspects of the scenario planning process, will consider race/ethnicity and age.

Ultimately, the Central Lane MPO's equity-based approaches to scenario planning will consider regional demographic resources, equity criteria and approaches to GHG reduction strategies, approaches to evaluating the outcomes of equity-based policies, and an approach to public involvement and outreach. The *Approach to Equity in Scenario Planning* provides specific approaches to evaluating equity in the scenario planning process.

Public Health

Transportation and land use decisions have a demonstrated effect on public health outcomes, in addition to other social determinants (like income level). For this scenario planning process, only transportation and some minor land use policies will be varied, and only the link between transportation and public health outcomes will be examined. The public health criteria listed below focus on the link between increased use of active transportation modes and positive health outcomes:

- Physical activity per capita
- Chronic illness incidence
- Cost savings due to reduced disease burden

- Change in fatal or injury accidents

The technical team will use the ITHIM health model and GreenSTEP to evaluate these indicators. ITHIM was successfully used in Portland Metro's scenario planning process. The Oregon Health Authority will provide training to LCOG and Lane County Public Health Department staff on how to apply the ITHIM model.

Appendix A - Central Lane Scenario Planning GHG Reduction Strategies							
Strategy	Description	Strategy approach type	Effectiveness	Timing [a]	Local Implementation		
Community Design					Implementation Method	Public Cost [b]	Implementation Issues
Mixed use development	"Mixed-use development" means development that incorporates a variety of uses, including retail goods and services, employment opportunities, and residences. Mixed-use development reduces the need for car travel by allowing for everyday needs to be met in close proximity to one's home. Can be achieved through re-zoning, and developer incentives like reduced system development charges. Public agencies can also support development through infrastructure construction.	Regulatory; potential capital expenditure	5 - 25 percent reduction in VMT, depending on population density and availability of alternate modes.(1)	Short term	1. Allow mixed-use zoning	$	May require re-zoning of land; potential resident resistance to neighborhood change.
				Short term	2. Provide developer incentives (grants, fee waivers, etc.)	$ - $$	Outcomes may be realized in the long term (10 years or more).
				Medium term	3. Provide supportive public infrastructure (sidewalks, streetscape improvements, transit stations)	$$-$$$	Time frame is dependent on time needed to program projects in relevant transportation plans and project costs.
Active transportation	Increase cycling and walking; improve walking and cycling access to transit.	Regulatory; capital expenditure	5 - 15 percent reduction in VMT, depending on population density and quality of cycling and walking facilities. (1)	Short term	1. Enact regulations that require bicycle parking, cycling/walking frontage improvements, etc.	$	Low-impact strategy; generally improves cycling and walking conditions as new development occurs.
				Medium term	2. Construct cycling and walking infrastructure; street amenities like lighting and landscaping	$$-$$$	Time frame is dependent on time needed to program projects in relevant transportation plans and project costs.
Improve public transit	Transit service can be improved a variety of ways, like increasing the number of routes (coverage), increasing frequency, decreasing fares, adding park-and-rides and other facility/vehicle improvements. Transit improvements are most effective when implemented in and between high density/high activity areas.	Programmatic; capital expenditure	1 - 8 percent reduction in GHG emissions, depending on level of service improvement, density, etc. (1)	Short term	1. Improve transit stop and station amenities, e.g., provide real-time transit information, bus shelters, benches, lighting, etc.	$$	
				Short term	2. Reduce transit fares. Impacts vary - for example, a 10% decrease in fares can result approximately 4% increase in ridership (dependent on many factors) (2)	$$	Fiscal impacts to transit agencies dependent on level of fare recovery and other factors.
				Medium term	3. Improve transit service by increasing the number of routes (coverage) and/or by increasing service frequency; implementing transit signal priority, and other programs. Service becomes most attractive generally at 15 minute headways or less.	$$-$$$	
				Long term	4. Provide high quality, high frequency, fixed-guide way transit service such as bus rapid transit.	$$$	

Strategy	Description	Strategy approach type	Effectiveness	Timing [a]	Local Implementation		
Pricing							
Parking Pricing	Parking pricing includes workplace parking fees, public street or garage parking fees, residential parking permits, and parking supply management.	Regulatory	Up to 20 percent reduction in commute trips; 5 - 12% VMT reduction when parking supply is limited. Dependent on the number of employers that programs would apply to and parking supply. (1)	Short term	1. Establish parking maximums; reduce or eliminate parking minimums for some development.	$	May encounter developer, lender, or public opposition to reduced parking availability.
				Short term	2. Create or enhance support for workplace commuter programs, like parking cash-outs, which allows employees to opt out of having a subsidized parking spot and instead receive compensation.	$	Implementation requires actively recruiting local employers.
Congestion pricing or cordon pricing	With congestion pricing, vehicles are charged a variable toll depending on congestion levels to help manage traffic flow. With cordon pricing, vehicles are charged a toll once they cross a line (cordon); cordon pricing has not been employed in the US, but has been successfully implemented internationally.	Regulatory	0.8 - 1.8% GHG emissions reduction, depending on the scale of deployment. (3)	Long term	Create a congestion pricing or cordon pricing system	$$$	There are no precedents for congestion pricing at the metropolitan scale. Congestion pricing may require sophisticated in-vehicle technology, traffic management systems, etc. Cordon pricing may be more achievable at the regional scale, but is also difficult to implement. Cordon pricing has only been implemented outside North America.
Mileage fee	This program would charge drivers a flat per-mile for every mile driven on public roads. The mileage fee concept has been explored at the state level as a potential replacement system for the state gas tax.	Tax	1 to 5 percent reduction in GHG emissions. (1)	Long term	Enact a mileage fee system	$$$	Mileage fee systems have been explored mainly at the state and national levels, as they are generally not practical to implement at the local or regional level.
Increase gas tax	Increasing the state or local gas tax affects the price of fuel and directly influences VMT. Revenue from a local gas tax could be used for transportation projects in the region.	Tax	A 1% increase in the price of fuel results in a 0.05% to 0.35% decrease in annual VMT. (4)	Short term	Enact or increase local gas tax	$	Gas taxes are relatively easy to implement; the local tax is levied per gallon on fuel dealers. However, the effectiveness of a local gas tax on reducing VMT may be negligible unless it is relatively substantial. There is no statutory limit on local gas taxes. Most jurisdictions in Oregon that assess a local gas tax charge $0.01 to $0.05 per gallon.

Strategy	Description	Strategy approach type	Effectiveness	Timing [a]	Local Implementation		
Carbon pricing	Carbon pricing levies a tax, usually per ton, on carbon dioxide emissions production. With regard to transportation, this is typically applied as an additional tax on gasoline (5). Vehicle registration fees could also include tiered carbon pricing, based on the EPA fuel efficiency of the registered vehicle, or class of vehicle. These registration fees may also incent purchase of more efficient vehicles or induce less overall vehicle ownership. The revenues from carbon pricing are not typically devoted to transportation improvement projects.	Tax	A 1% increase in the price of fuel results in a 0.05% to 0.35% decrease in annual VMT. (4) A 10% increase in vehicle fees results in 0.6% reduction in vehicle ownership over the long term. (4)	Medium term	1. Enact a carbon tax on fuel	$	Gas taxes are relatively easy to implement; however, in international applications, revenue from carbon taxes is generally not used to improve roads or highways, making them potentially controversial. May require significant time to build public support for this program.
				Medium term	2. Enact an additional vehicle registration fee based on vehicle type or fuel economy	$	Registration fees are easy to collect, but opposition to tiered fees based on vehicle type may be high. May unfairly penalize those who cannot afford more efficient vehicles. May require significant time to build public support for this program.
Pay-as-you-drive (PAYD) insurance	PAYD insurance charges customers a per-mile insurance fee as opposed to an annual or semi-annual flat rate. PAYD uses an on-car device to track mileage. PAYD insurance is currently offered in Oregon by a limited number of insurers.	Outreach campaign	Limited studies show 1 - 3% reduction in GHG emissions (with majority of drivers participating) (1)	Medium term	Work with private insurers to increase PAYD insurance options and driver awareness	$	Public sector involvement generally limited to recruiting PAYD insurers and promoting PAYD insurance and its benefits to the public. While PAYD insurance is currently available in the Portland Metro region, it may take considerable time before PAYD insurers enter the Central Lane market and achieve a significant share of drivers.
Education & Marketing							
Travel options education/Individualized marketing	These programs, like Portland's Smart Trips, provide information and incentives to encourage drivers to use alternate forms of transportation. Programs can target specific geographic areas, provide financial incentives for using alternate modes, and provide targeted information (e.g., map showing bike trails in one's neighborhood).	Education program; financial incentives	Decreases regional VMT; dependent on participation	Short term	Create a travel options education program, similar to Portland Smart Trips or enhance existing programs to reach a greater share of drivers.	$	
Efficient driving	Educating drivers about the ways in which they can reduce inefficiencies when they drive - like avoiding rapid acceleration and braking, reducing speeding, etc. - can improve fuel economy.	Education program	5 - 33 percent increase in fuel economy when practicing efficient driving (1)	Short term	Educational campaign to increase driver awareness about efficient driving techniques, or enhance existing educational programs to reach a greater share of drivers.	$	
Carpooling and ridesharing programs	Rideshare programs, like DriveLess-Connect, and LTD's Point 2 Point program, facilitate ridesharing and use of alternate modes.	Program	Decreases single occupant vehicle trips; dependent on participation	Short term	Enhance existing ridesharing programs to reach a greater share of drivers.	$	
Telecommuting	Encourage workplaces to allow workers to telecommute	Outreach program	Up to 6% reduction in commute trips; dependent on level of employer participation (1)	Short term	Create or enhance telecommuting programs.	$	
Carsharing	Carsharing programs, like Car2Go and Getaround, allow subscribers to use cars for (mostly) short trips. Carsharing programs are diverse in organization and scope. These programs reduce the need for individual auto ownership.	Regulatory; education	GHG emissions reductions highly dependent on level of participation	Medium term	Encourage private carsharing providers to start programs in the region; support outreach/education efforts to increase driver awareness of the program.	$	Public sector involvement generally limited to ensuring regulations allow for carsharing and educating drivers about carsharing options.

Strategy	Description	Strategy approach type	Effectiveness	Timing [a]	Local Implementation		
Traffic and Incident Management							
Ramp metering	Improves traffic flow and reduces congestion on major routes; reduces fuel wasted from congestion. Impact on GHG emissions is relatively low, but also imparts cobenefits like reduced fuel costs and reduced congestion.	Capital expenditure	Decreases fuel wasted un congestion; some effect on auto trip demand	Medium term	Install ramp meters at strategic locations along the region's major highways.	$$	Time frame is dependent on time needed to program projects in relevant transportation plans and project costs.
Traffic signal coordination	Coordinating traffic signals smoothes traffic flow, reduces delay at intersections, and increases vehicle speeds. Impact on GHG emissions is relatively low, but also imparts cobenefits like reduced fuel costs and reduced congestion.	Capital expenditure	Dependent on current level of signal coordination	Short term	Coordinate traffic signals within and between jurisdictions.	$$	Requires interjurisdictional coordination.
Incident management	Coordinated process to detect, respond to, and remove traffic incidents from the roadway as safely and quickly as possible. Reduces non-recurring roadway congestion. Impact on GHG emissions is relatively low, but also imparts cobenefits like reduced fuel costs and reduced congestion.	Program; capital expenditures	Varies; dependent on regional impacts from non-recurring delay (40-50% of congestion nationally is caused by incidents) (1)	Medium term	Implement incident management system. May include infrastructure (CCTV cameras, in-pavement detection loops) and administrative costs (traffic management/dispatch center).	$$-$$$	Time frame is dependent on time needed to program projects and on the extent and sophistication of the program.

NOTES:

(a) Short-term = Fully implementable within 5 years
Medium-term = Fully implementable within 5-10 years
Long-term = Fully implementable within 10 - 20 years, or longer

(b) $ = <$100,000 in cost
$$ = $100,000 to $1,000,000 in cost
$$$ = >$1,000,000 in cost

SOURCES:

(1) Metro. “Climate Smart Communities: Strategy Toolbox for the Portland metropolitan region.” <http://library.oregonmetro.gov/files/planning_and_development_-_regional_trans_reduction_strategies_and_the_benefits_they_bring_to_the_region_-_october_2011.pdf>, 2011.
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(3)Cambridge Systematics. “Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.” <http://www.busadvocates.org/articles/environment/movingcooler.pdf>, 2009.
(4)Litman, T. “Understanding Transport Demands and Elasticities.” Victoria Transport Policy Institute, <http://www.vtpi.org/elasticities.pdf>, 2013.
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Appendix B - Regional Plans Reviewed

Plan	Category 1	Category 2	Category 3	Goals	Objectives	Measures
A community climate and energy action plan for Eugene	Energy consumption & greenhouse gas emissions			Reduce community-wide greenhouse gas emissions 10% below 1990 levels by 2020		
A community climate and energy action plan for Eugene	Energy consumption & greenhouse gas emissions			Reduce community-wide fossil fuel use by 50% by 2030		
A community climate and energy action plan for Eugene	Energy consumption & greenhouse gas emissions			Identify strategies that will help the community adapt to a changing climate and increasing fossil fuel prices		
Cascades West Economic Development District 2010---2015 Comprehensive Economic Development Strategy	Economy & prosperity			Advance economic activities that provide a range of employment opportunities		
Cascades West Economic Development District 2010---2015 Comprehensive Economic Development Strategy	Economy & prosperity			Build on the region's entrepreneurial culture and assets		
Cascades West Economic Development District 2010---2015 Comprehensive Economic Development Strategy	Economy & prosperity			Support infrastructure assistance to communities and support capacity building efforts		
Cascades West Economic Development District 2010---2015 Comprehensive Economic Development Strategy	Economy & prosperity			Partner to improve workforce training and education		
Coburg Transportation System Plan	Equity				Promote fair distribution of benefits and adverse impacts to different populations	
Coburg Transportation System Plan	Feasibility				Projects align with current funding opportunities	
Coburg Transportation System Plan	Feasibility				Cost effectiveness	
Coburg Transportation System Plan	Economy & prosperity			Support, sustain, and enhance community livability and protect the quality and integrity of residential and business areas in Coburg. Accommodate and anticipated future development assumptions for Coburg.		
Coburg Transportation System Plan	Natural resources			Minimize or avoid adverse impacts on natural and social resources within Coburg.		
Coburg Transportation System Plan	Natural resources	Transportation outcomes			Minimize land use impacts	
Coburg Transportation System Plan	Natural resources				Minimize environmental impacts to ground and surface water	
Coburg Transportation System Plan	Natural resources				Minimize impacts to natural resources	
Coburg Transportation System Plan	Transportation outcomes				Provides redundant emergency access	
Coburg Transportation System Plan	Transportation outcomes				Promote safe and convenient bicycle and pedestrian circulation	
Coburg Transportation System Plan	Transportation outcomes				Increase network connectivity	
Coburg Transportation System Plan	Transportation outcomes				Reduce traffic congestion	
Envision Eugene	Energy consumption & greenhouse gas emissions			Plan for climate change and energy resiliency	Reduce physical and economic risks to people and property arising from climate change and energy price volatility.	

Plan	Category 1	Category 2	Category 3	Goals	Objectives	Measures
Envision Eugene	Feasibility			Provide for adaptable, flexible and collaborative implementation		
Envision Eugene	Economy & prosperity			Provide ample economic opportunities for all community members		
Envision Eugene	Economy & prosperity			Protect, repair and enhance neighborhood livability		
Envision Eugene	Land Use & housing	Economy & prosperity		Provide housing affordable to all income levels		
Envision Eugene	Land Use & housing	Transportation outcomes		Promote compact urban development and efficient transportation options	Meet all of the 20-year multi-family housing and commercial job needs within the existing UGB.	
Envision Eugene	Natural resources			Protect, restore and enhance natural resources		
Eugene Transportation System Plan (Draft)	Energy consumption & greenhouse gas emissions	Economy & prosperity		Strengthen resilience for changes in climate, energy prices, economic fluctuations by adapting the transportation network.		
Eugene Transportation System Plan (Draft)	Equity			Distribute benefits and impacts of transportation fairly and address needs of all communities and disadvantaged populations		
Eugene Transportation System Plan (Draft)	Equity					Impacts on low-income, mintory, and elderly populations
Eugene Transportation System Plan (Draft)	Feasibility					Funding competitiveness
Eugene Transportation System Plan (Draft)	Economy & prosperity	Equity	Health	Improve economic vitality, environmental health, social equity, and well being		
Eugene Transportation System Plan (Draft)	Natural resources	Transportation outcomes				Reduction in airborne pollutants
Eugene Transportation System Plan (Draft)	Natural resources					Net increase (or decrease) in impervious surface area
Eugene Transportation System Plan (Draft)	Natural resources					Impacts to habitat, other environmental features
Eugene Transportation System Plan (Draft)	Transportation outcomes			Create an integrated, multimodal safe and efficient transportation system		
Eugene Transportation System Plan (Draft)	Transportation outcomes	Transportation outcomes				Percentage of commute trips taken by pedestrian, cyclists, and transit
Eugene Transportation System Plan (Draft)	Transportation outcomes					Quality and availibility of active transportation modes
Eugene Transportation System Plan (Draft)	Transportation outcomes	Health				Address known safety concerns
Eugene Transportation System Plan (Draft)	Transportation outcomes	Land Use & housing				Access to daily destinations within a 20-minute walk, bike, or bus trip
Eugene Transportation System Plan (Draft)	Transportation outcomes					Connectivity improvements
Eugene Transportation System Plan (Draft)	Transportation outcomes					EMS response time
Eugene Transportation System Plan (Draft)	Transportation outcomes					Congestion relief
Eugene Transportation System Plan (Draft)	Transportation outcomes					Cost-benefit analysis
Eugene Transportation System Plan (Draft)	Transportation outcomes					Vehicle miles travelled (VMT) reduction

Plan	Category 1	Category 2	Category 3	Goals	Objectives	Measures
Eugene-Springfield Consolidated Plan 2010	Equity			Support a human services delivery system that helps low and moderate income persons achieve dignity, well-being, and self-sufficiency		
Eugene-Springfield Consolidated Plan 2010	Land Use & housing			Increase the supply of affordable housing		
Eugene-Springfield Metro Area General Plan	Land Use & housing			Use urban, urbanizable, and rural lands efficiently		
Eugene-Springfield Metro Area General Plan	Land Use & housing			Encourage orderly and efficient conversion of land from rural to urban use		
Eugene-Springfield Metro Area General Plan	Land Use & housing			Protect rural land best suited for non-urban uses from urban encroachment		
Eugene-Springfield Metro Area General Plan	Transportation outcomes	Land Use	Economy & prosperity	Provide an integrated transportation and land use system that supports choices in modes of travel		
Eugene-Springfield Transportation System Plan (TransPlan)	Economy & prosperity			Enhance the metropolitan area's quality of life and economic opportunity by providing a transportation system that is balanced, accessible....		
Eugene-Springfield Transportation System Plan (TransPlan)	Economy & prosperity				Support transportation strategies that improve the economic vitality of the region and enhance economic opportunity.	
Eugene-Springfield Transportation System Plan (TransPlan)	Public Involvement				Provide citizens with information to increase their awareness of transportation issues, encourage their involvement in resolving the issues, and assist them in making informed transportation choices.	
Eugene-Springfield Transportation System Plan (TransPlan)	Transportation outcomes	Land Use & housing		Integrated transportation and land use system		
Eugene-Springfield Transportation System Plan (TransPlan)	Transportation outcomes				Provide adequate levels of accessibility and mobility for the efficient movement of people, goods, and services within the region.	
Eugene-Springfield Transportation System Plan (TransPlan)	Transportation outcomes				Improve transportation system safety through design, operations and maintenance, system improvements, support facilities, public information, and law enforcement efforts.	
Eugene-Springfield Transportation System Plan (TransPlan)	Transportation outcomes	Energy consumption & greenhouse gas emissions			Provide transportation systems that are environmentally responsible.	
Lane County Public Health Authority Comprehensive Plan	Health	Equity		Improve accessibility to public health services		
Lane County Transportation System Plan	Land Use & housing	Feasibility		Ensure that transportation projects comply with state land use requirements regarding urban and rural land uses, and other federal, state, and local land use requirements.		
Lane County Transportation System Plan	Transportation outcomes			Support and encourage improved public transportation services and alternatives to single occupancy vehicle travel between the Eugene---Springfield Metropolitan Area and outlying communities.		
Lane Public Transit Human Services Transportation Plan	Equity			Offer a network of transportation services that strive to meet different transportation needs		
Lane Public Transit Human Services Transportation Plan	Transportation outcomes			Respond to emerging community [transit] needs		
Oregon Health Improvement Plan	Equity	Health		Achieve health equity and population health by improving social, economic and environmental factors		

Plan	Category 1	Category 2	Category 3	Goals	Objectives	Measures
Regional Prosperity Economic Development Plan	Economy & prosperity			Create 20,000 net new jobs		
Regional Prosperity Economic Development Plan	Economy & prosperity			Reduce local unemployment rate to the state average, or below		
Regional Prosperity Economic Development Plan	Economy & prosperity			Increase average wage to the state average, or above		
Regional Transportation Plan (2011)	Energy consumption & greenhouse gas emissions				Consider strategies to reduce transportation sector greenhouse gas emissions in compliance withcurrent legislation and as aligned with the region's other transportation system goals and objectives.	
Regional Transportation Plan (2011)	Equity				Conduct planning, analysis, and public involvement to ensure that the benefits and impacts of transportation decisions are distributed fairly to all people.	
Regional Transportation Plan (2011)	Health				Expand transportation decision-making to meet related public health objectives, including reduced crashes, cleaner air, and increased physical activity.	
Regional Transportation Plan (2011)	Economy & prosperity	Equity	Health	Support regional sustainability by providing a transportation system that considers economic vitality, environmental health, and social equity.		
Regional Transportation Plan (2011)	Economy & prosperity	Transportation outcomes			Support transportation strategies that improve the economic vitality of the region, enhance economic opportunity, and increase the reliability and efficiency of our freight system.	
Regional Transportation Plan (2011)	Land Use & housing	Transportation outcomes	Economy & prosperity	Integrate transportation and land use to support transportation choices, promote all modes of transportation, reduce our reliance on any single mode of travel, and enhance community livability.		
Regional Transportation Plan (2011)	Natural resources				Provide a transportation system that reflects our commitment to environmental quality.	
Regional Transportation Plan (2011)	Public Involvement				Provide citizens with information to increase their awareness of transportation issues, encourage their involvement in resolving the issues, and assist them in making informed transportation choices.	
Regional Transportation Plan (2011)	Transportation outcomes				Support an interconnected multi-modal transportation system that provides residents with access to a range of transportation choices.	
Regional Transportation Plan (2011)	Transportation outcomes				Provide adequate levels of accessibility and mobility for the efficient movement of people, goods, and services within the region.	
Regional Transportation Plan (2011)	Transportation outcomes				Improve safety for users of all transportation modes through design, operations, maintenance, improvements, public information, and law enforcement.	
Regional Transportation Plan (2011)	Transportation outcomes				Provide an effective and efficient transit system with stable capital and operating resources.	
Regional Transportation Plan (2011)	Transportation outcomes				Promote Oregon's development of reliable and efficient rapid passenger rail as part of the Cascadia rail corridor from Eugene to Vancouver, BC.	
Springfield 2030	Land Use & housing			Promote compact, orderly and efficient urban development by guiding future growth to planned		

Plan	Category 1	Category 2	Category 3	Goals	Objectives	Measures
Springfield 2030	Land Use & housing			Encourage a pattern of mixed land uses and development densities that will locate a variety of different life activities...in convenient proximity, to encourage and support multiple modes of transportation		
Springfield Transportation System Plan (Draft)	Energy consumption & greenhouse gas emissions				Reduces GHG emissions from passenger travel	
Springfield Transportation System Plan (Draft)	Economy & prosperity	Equity	Land use & housing	Provide an efficient, sustainable, diverse and environmentally sound system that supports the economy and land use patterns		
Springfield Transportation System Plan (Draft)	Economy & prosperity	Transportation outcomes			Support safe and efficient multi-modal access to major developable employment centers	
Springfield Transportation System Plan (Draft)	Economy & prosperity				Maintain economic vitality of existing commercial and industrial areas	
Springfield Transportation System Plan (Draft)	Economy & prosperity	Feasibility			Prioritize investments that provide maximum benefit for the associated cost	
Springfield Transportation System Plan (Draft)	Land Use & housing	Economy & prosperity			Minimize negative impacts to existing neighborhoods	
Springfield Transportation System Plan (Draft)	Natural resources				Minimizes impacts on natural resources	
Springfield Transportation System Plan (Draft)	Transportation outcomes			Preserve, maintain and enhance Springfield's transportation system through safe, efficient and cost-effective transportation system operations and maintenance techniques for all modes		
Springfield Transportation System Plan (Draft)	Transportation outcomes			Enhance and expand the transportation system design to provide a complete range of mode choices		
Springfield Transportation System Plan (Draft)	Transportation outcomes				Enhances connectivity	
Springfield Transportation System Plan (Draft)	Transportation outcomes				Reduce trip lengths for all users	