

DRAFT

Target Rule Review Report

Review of Metropolitan Greenhouse Gas Reduction
Targets and Scenario Planning

DRAFT REPORT

*Please note that this is a **draft report** intended for public review and comment. Questions and comments on the report should be directed to Bob Cortright (bob.cortright@state.or.us or 503.934.0020). LCDRC will receive a briefing on the draft report at its March 12th meeting and is scheduled to decide whether amendments to the Target Rules are warranted at its May 21-22 meeting. The Department requests any written comments on the draft report be submitted by April 17th.*



Oregon Department of Land Conservation and Development

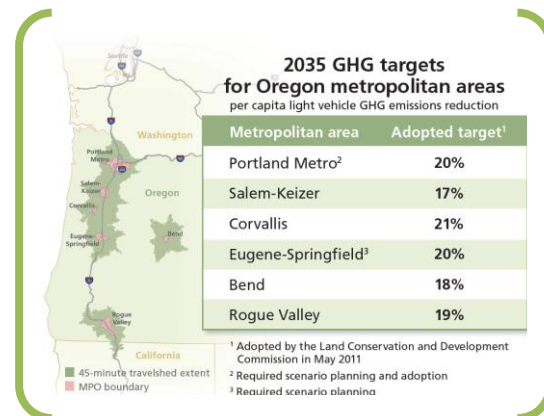
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Executive Summary

In 2011, the Land Conservation and Development Commission (LCDC) adopted greenhouse gas (GHG) emission reduction targets to guide scenario planning by the state's metropolitan areas. The targets – and scenario planning – ask metropolitan areas to evaluate what changes to local and regional land use and transportation plans and programs would be needed to reduce GHG emissions from light vehicle travel by 20% per capita by 2035 – the planning horizon for most regional transportation plans. LCDC committed itself to review the targets in 2015 and decide whether amendments to the targets are warranted. This report is intended inform the commission's evaluation and decision.



SCENARIO PLANNING RESULTS

Over the last three years, three metropolitan areas (Portland Metro, Eugene-Springfield and Corvallis) and ODOT (through the Statewide Transportation Strategy) have conducted scenario planning projects. The four efforts reached consistent conclusions:

- Targets, which call for a 17-21% reduction in emissions per capita by 2035, are achievable.
- Meeting targets will require a comprehensive, coordinated strategy that includes a combination of complementary state, regional and local efforts that promote walkable communities and expand transportation options to reduce amount of driving people need to do.
- Substantial efforts and new funding to expand transportation options will be needed to:
 - Expand public transit
 - Provide incentives and price signals to promote options
 - Make walking and cycling more convenient
 - Promote compact, mixed use development
 - Better manage parking
- Policies and actions that reduce GHG emissions provide significant benefits to Oregon citizens, businesses, communities and the transportation system because they:
 - reduce household energy and transportation costs
 - improve air quality and public health, and
 - reduce congestion and improve operation of the transportation system
- Existing plans move us in the right direction but additional efforts - to expand transit and other transportation options, better manage parking and promote compact land use - will be needed to achieve targets.



NEW INFORMATION

Targets were set in 2011 based on direction from the Legislature and available forecasts about greenhouse gas emissions from light duty vehicles through the year 2035. Recent studies and new federal and state laws and programs provide an improved picture of future vehicle technology, fleet and fuels in 2035 and beyond. New information indicates:

- Fuel economy and per mile CO₂ emissions are close to 2011 estimates
- Electric cars (EVs) and plug-in hybrids (PHEVs) are expected to come on line faster than previously forecast
- Fleet turnover will be slower than expected

Recalculating targets based on this new information would likely change the targets for 2035 but only slightly. However, metropolitan areas are now starting to look beyond 2035 as they conduct plan updates, with most looking out to 2040. Additional reductions will be needed to keep the state “on track” to meet 2050 goals.

NEXT STEPS: AMENDING TARGETS?

LCDC is required to decide by June 1, 2015, whether the GHG reduction targets should be amended. This report identifies three factors that indicate changes to the targets are warranted:

- There is new information about vehicle technology, fleet and fuels that could lead to adjustments in metropolitan area targets
- The state’s metropolitan areas are – or soon will be - be updating long-range plans to accommodate growth beyond 2035. If targets and scenario planning are to be useful and relevant to these plans, then new targets for 2040 and potentially beyond will be needed.
- Two new metropolitan areas (MPOs) have been designated in the state (Albany and Grants Pass areas) and these areas do not currently have GHG targets.

This review also provides an opportunity to evaluate lessons learned from scenario planning and consider logical next steps to advance state, regional and local efforts to reduce GHG emissions. Scenario planning efforts are providing consistent answers about the set of programs and actions that are cost-effective in reducing emissions and that make Oregon communities more livable and Oregonians better off. These include expanding transit, using technology to better manage the transportation system, planning for more mixed use development, managing parking and adding incentives and pricing.

Moving forward the question will increasingly shift to figuring out how the broad strategies called for in scenario planning should be carried out. For example, scenario planning demonstrates the benefits of expanded transit service, but more detailed planning will be needed to decide where and how expanded transit service should be provided. At the same time, it is important to recognize that updating and refining plans is only part of what will be needed. Implementation will also require additional action by local, regional and state governments to expand transportation funding, especially for alternative modes, and put in place new programs to provide transportation options and incentives.

Background

House Bill (HB) 2001, adopted by the 2009 Legislature, and SB 1059 adopted by the 2010 Legislature, directed the Land Conservation and Development Commission (LCDC) to adopt greenhouse gas emission reduction targets to guide the state's metropolitan areas as they conduct land use and transportation scenario planning.

Target Rules

In May 2011, the Land Conservation and Development Commission (LCDC) adopted administrative rules, OAR 660 - 044¹, setting targets to guide long range planning by Oregon's largest urban areas to reduce greenhouse gas emissions from auto travel. The rule calls for metropolitan areas to explore ways to reduce emissions from auto and light truck travel by 17 percent to 21 percent per person by 2035.

The greenhouse gas reduction targets are intended to help guide the state's metropolitan areas; Portland, Salem-Keizer, Corvallis, Eugene-Springfield, Rogue Valley and Bend as they update land use and transportation plans. Targets identify the level of reductions areas should seek to achieve. Except for the Portland metropolitan area planning to meet the targets is voluntary.

Targets and scenario planning are one part of state, regional and local efforts to substantially shrink the state's carbon footprint over the next 40 years to meet the state's 2050 goal. The Legislature directed LCDC to set targets to identify the amount of greenhouse gas reduction metropolitan areas need to achieve in order for the state to meet its overall reduction goal. The state's long term goal, established by Oregon lawmakers in 2007, is to reduce the state's greenhouse gas emission to 75% below 1990 levels by 2050. While the statewide goal is to reduce GHG emissions from all sources, targets are focused on emissions from light vehicle travel in metropolitan areas.



¹ OAR 660-044 http://arcweb.sos.state.or.us/pages/rules/oars_600/oar_660/660_044.html

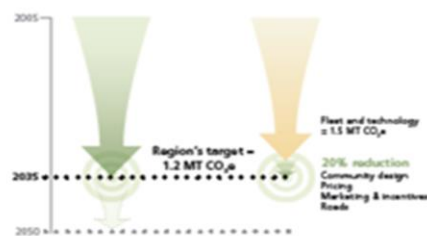
Legislative Direction

The development and adoption of target rules by the commission in 2011 was guided by provisions of HB 2001 and SB 1059.² In determining whether amendments to the targets are warranted, the commission may also want to consider the legislature's direction for setting targets. In brief, the two statutes require that the metropolitan emission reduction targets:

- Must be consistent with achieving Oregon's greenhouse gas emissions reduction goals;
- Must be for 2035;
- Must be for light vehicle travel;
- May be different for each metropolitan area;
- Must equitably allocate responsibility for meeting targets considering differences in population growth rates;
- Must consider expected improvements in vehicle technologies and fuels; and
- Should be informed by the information and recommendations from the ODOT, DEQ and the Oregon Department of Energy.

Targets

GHG reduction targets set the amount of GHG reduction that metropolitan plans should seek to achieve by the year 2035. Targets are for reductions in addition to reductions that are expected to occur from improvements in fuel efficiency, vehicle technology and changes in the vehicle fleet over the next 20 years. These fleet and technology changes are expected to significantly reduce emissions and get us close to meeting state goals.



² SB 1059 guided target setting for the state's metropolitan areas outside Portland Metro (Eugene-Springfield, Salem-Keizer, Rogue Valley, Bend and Corvallis):

".... on or before June 1, 2011, the Land Conservation and Development Commission, after consultation with and in cooperation with the Oregon Transportation Commission, local governments and metropolitan planning organizations, shall adopt rules identifying a reduction target for greenhouse gas emissions caused by motor vehicles with a gross vehicle weight rating of 10,000 pounds or less to be met by each region served by a metropolitan planning organization. The rules must reflect the greenhouse gas emissions reduction goals set forth in ORS 468A.205 and must take into consideration the reductions in vehicle emissions that are likely to result by 2035 from the use of improved vehicle technologies and fuels. The rules must also take into consideration methods of equitably allocating reductions among the metropolitan areas given differences in population growth rates. ... "(SB 1059, Section (5))

Agencies Technical Report (2011)

In 2010-2011, ODOT, DEQ and the Oregon Department of Energy prepared the Agencies' Technical Report to fulfill their responsibilities under HB 2001 and SB 1059 to provide information and recommendations to support target setting. The full text of the report is available at:

<http://www.oregon.gov/LCD/docs/rulemaking/2009-11/trac/techrpt.pdf>

Target Rulemaking Advisory Committee (TRAC) Report (2011)

The Commission's work to develop targets was supported by the Target Rulemaking Advisory Committee (TRAC). TRAC reviewed the Agencies Technical Report and assisted the department in developing the Targets Rule (OAR 660-44). TRAC produced a report and recommendations to the Commission, including the recommendation that the commission conduct regular reviews of the target rule. http://www.oregon.gov/LCD/docs/rulemaking/2009-11/trac/trac_report_to_lcdc.pdf

The target rule includes assumptions developed in the 2011 Agencies Technical Report and recommended by the Target Rulemaking Advisory Committee (TRAC)³.

³ Target Rules, OAR 660-044-0010(2)(B) http://arcweb.sos.state.or.us/pages/rules/oars_600/oar_660/660_044.html

Target Rule Review Requirements

In developing the target rules, the department and commission recognized that the information relied upon to set targets was the commission was subject to change as additional studies are done and as new state and federal programs to reduce emissions from light vehicles are put in place. In addition, the department and commission anticipated that results of scenario planning efforts would provide valuable information about how targets might be adjusted to most effectively GHG reduction and other goals. For these reasons, the target rules require the commission to regularly review the targets to reflect new information and the results of various planning efforts to reduce greenhouse gas emissions.

Section 0035 of the target rules require the commission, by June 1, 2015, to review the target rules and determine whether or not amendments to the target rules are “warranted.” Section 2 of the rule lists a series of factors that the commission is to consider in its evaluation. The department is charged with preparing a report to assist the commission in conducting this review. The relevant rule requirements are as follows:

660-044-0035 Review and Evaluation of Greenhouse Gas Reduction Targets

(1) The commission shall by June 1, 2015, and at four year intervals thereafter, conduct a review of the greenhouse gas emissions reduction targets in OAR 660 044 0020 and OAR 660 044 0025.

(2) The review by the commission shall evaluate whether revisions to the targets established in this division are warranted considering the following factors:

(a) Results of land use and transportation scenario planning conducted within metropolitan planning areas to reduce greenhouse gas emissions from light vehicles;

(b) New or revised federal and state laws or programs established to reduce greenhouse gas emissions from light vehicles;

(c) State plans or policies establishing or allocating greenhouse gas emissions reduction goals to specific sectors or subsectors;

(d) Policies and recommendations in the Statewide Transportation Strategy adopted by the Oregon Transportation Commission;

(e) Additional studies or analysis conducted by the Oregon Department of Transportation, the Department of Environmental Quality, the Oregon Department of Energy or other agencies regarding greenhouse gas emissions from light vehicle travel in metropolitan areas, including but not limited to changes to vehicle technologies, fuels and the vehicle fleet;

(f) Changes in population growth rates, metropolitan planning area boundaries, land use or development patterns in metropolitan planning areas that affect light vehicle travel in metropolitan areas;

- (g) Efforts by local governments in metropolitan areas to reduce greenhouse gas emissions from all sources;
- (h) Input from affected local governments and metropolitan planning organizations;
- (i) Land use feasibility and economic studies regarding land use densities;
- (j) State funding and support for scenario planning and public engagement; and
- (k) The share of light vehicle travel within a metropolitan area not attributable to residents of that area.

Results of metropolitan scenario planning

Review Factor

“The commission shall consider results of land use and transportation scenario planning conducted within metropolitan planning areas to reduce greenhouse gas emissions from light vehicles;” (OAR 660-044-0035(2)(a))

Background

The purpose of targets is to guide metropolitan areas as they conduct scenario planning to evaluate what combination of policies, programs and actions would be need to achieve GHG reductions.

(3) Land use and transportation scenario planning is intended to be a means for local governments in metropolitan areas to explore ways that urban development patterns and transportation systems would need to be changed to achieve significant reductions in greenhouse gas emissions from light vehicle travel. Scenario planning is a means to address benefits and costs of different actions to accomplish reductions in ways that allow communities to assess how to meet other important needs, including accommodating economic development and housing needs, expanding transportation options and reducing transportation costs.

(4) The expected result of land use and transportation scenario planning is information on the extent of changes to land use patterns and transportation systems in metropolitan areas needed to significantly reduce greenhouse gas emissions from light vehicle travel in metropolitan areas, including information about the benefits and costs of achieving those reductions. The results of land use and transportation scenario planning are expected to inform local governments as they update their comprehensive plans, and to inform the legislature, state agencies and the public as the state develops and implements an overall strategy to meet state goals to reduce greenhouse gas emissions.

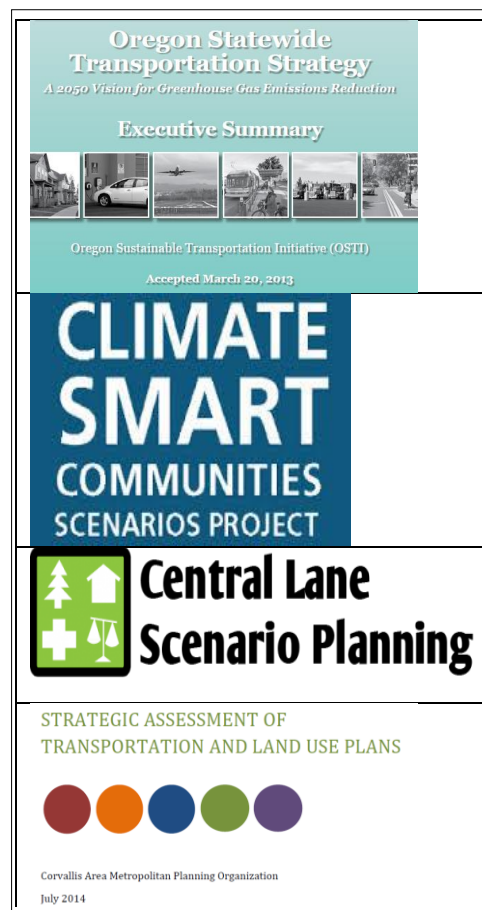
Targets were set for 2035 to correspond with the 20-25 year planning horizon of most metropolitan plans, with the expectation that metropolitan areas would conduct scenario planning in conjunction with updates of regional transportation plans. Because it was uncertain whether targets could reasonably be met or what combination of measures might be needed to meet targets, stakeholders asked that the commission consider how the results of scenario planning might inform targets.

Analysis

Scenario Planning Efforts

Over the last three years, four scenario planning efforts have been conducted to evaluate how land use and transportation plans can aid in reducing GHG emissions from light vehicle travel in metropolitan areas.

- In 2013, ODOT completed the Statewide Transportation Strategy (STS).
- Between 2011 and 2014, Metro conducted the Climate Smart Communities project which initially evaluated 144 scenarios and included extensive public outreach throughout the project. In December 2014, Metro adopted a preferred scenario that is expected to reduce GHG emissions by 29% per capita by 2035.
- Since 2012, the Central Lane MPO and jurisdictions within the Eugene-Springfield area have conducted the Central Lane Scenario Planning project.
- In 2014, the Corvallis Area MPO conducted a “strategic assessment”⁴ of the region’s adopted plans – the first steps toward more detailed scenario planning.



Results

Each of the scenario planning efforts conducted reached similar conclusions about “what it would take” to meet the GHG reduction targets. In general, each effort found:

- Targets are achievable. Metro’s Climate Smart Communities Scenarios effort anticipates that the region can reduce GHG emissions by 29% per capita by 2035, exceeding the 20% target set in the target rules.
- Meeting GHG targets will require increased public investment – especially in public transit and alternative modes – as well as new programs to provide options and incentives, to manage and price parking, and to realize mixed use development.
- New state policies and programs will be essential to achieving emission reductions. These include a shifting from the gas tax to a vehicle miles traveled (VMT) based road fee, pay-as-you-drive insurance, and new state and local programs to promote eco-driving and car-sharing. These state actions have a significant effect on reducing emissions and enhance the effectiveness of local and regional actions that expand transportation options.

⁴ A “strategic assessment” is a first step in scenario planning. The strategic assessment uses the modeling tools developed for scenario planning (ODOT’s Regional Strategic Planning Model – RSPM) to forecast the likely outcomes from existing adopted regional land use and transportation plans. The results of a strategic assessment are intended to help a metropolitan area decide whether and how the region might conduct more involved scenario planning – or take other steps.

- Actions and programs that reduce GHG emissions result in significant benefits to Oregon citizens, businesses and communities. These include improving public health, reducing household energy and transportation costs, and improving performance of the transportation system. Adopted land use and transportation plans have moved Oregon's metropolitan areas in the right direction – by planning for a combination of increased transit, transportation options and compact, mixed use development.
- State and federal programs to improve vehicle fuel economy, promote the electrification of the vehicle fleet and reduce the carbon content of fuels are critical to meeting overall state goals to reduce GHG emissions from light vehicle travel. Without these efforts, much greater reductions in vehicle miles traveled (VMT) would be needed to meet GHG reduction goals.

Appendix A includes a summary of key assumptions and findings from the three metropolitan planning efforts.

Scenario Planning Results Summary

Since 2011 four scenario planning efforts have been conducted to evaluate actions and programs that metropolitan areas can implement to meet state targets to reduce GHG emissions by about 20% per capita by 2035. The four efforts have reached similar conclusions about the combination of regional and local plans and policies that are effective in reducing GHG emissions. (A more complete summary of assumptions and analysis is provided in the Appendix to this report.)

| ODOT Statewide Transportation Strategy | Portland Metro Climate Smart Strategy⁵ | Central Lane Scenario Planning | Corvallis Area Strategic Assessment |
|--|--|---|--|
| Expanded Transit Service | | | |
| Percent increase in transit service from 2010-2035 | | | |
| 1.25x-6x | 92% | 38% | no change |
| Compact Urban Growth | | | |
| UGB expansion from 2010-2035 (Percent relative to population growth) | | | |
| UGB area expands at about 15% pop. growth rate | 14% (+12,000 acres) | 24% (+3,121 acres) | 0% (+0 acres) |
| Mixed Use Development | | | |
| Percent of households living in mixed use neighborhoods | | | |
| 2010 20% | 26% | 13% | 14% |
| 2035 30% | 37% | 14% | 15% |
| Increased Cycling and Walking Outcomes | | | |
| Share of shorter trips (<10 miles) that shift from drive alone travel to bike travel 2010/2035 | | | |
| 2010 <10% | 9% | 6% | 9% |
| 2035 15%-30% | 17% | 7% | 12% |
| Annual bike miles per capita | | | |
| 2010 -- | 110 | 99 | 146 |
| 2035 110 (0.3/day) | 174 | 193 | 183 |
| Annual walk trips per capita | | | |
| 2010 -- | 150 | 120 | 131 |
| 2035 142 | 196 | 123 | 134 |
| Transportation Options and Incentives | | | |
| Percent of workers participating in employer-based commuter programs | | | |
| 2010 5%-20% | 20% | 3% | 2% |
| 2035 15%-40% | 30% | 3% | 2% |
| Percent of households participating in travel options programs (individualized marketing) | | | |
| 2010 5% | 9% | 1% | 1% |
| 2035 10%-70% | 45% | 2% | 5% |
| Parking Management | | | |
| Percent of workers that pay for workplace parking | | | |
| 2010 0%-15% | 13% | 5% | 2% |
| 2035 5%-30% | 30% | 5% | 16% |
| GHG Target Reduction Outcome⁶ | | | |
| Percent reduction in roadway GHG emissions per capita from 2005 to 2035 | | | |
| -- | -29% | -13% | -19% |

⁵ Values shown for Central Lane and Corvallis MPOs reflect their "Reference Case" analyses, while Metro values reflect the region's adopted "Preferred Scenario." The values shown are from the metropolitan versions of the GreenSTEP model.

⁶ Each of the efforts listed assumed a set of state policies and actions would be implemented to reduce GHG emissions, such as: pay-as-you-drive insurance, programs to promote Eco-driving, a shift from the gas tax to a mileage-based road user charge, and other state-led actions.

Metropolitan Transportation Plan Updates

Targets were set for 2035 so they could be used by metropolitan areas for scenario planning conducted in conjunction with the update of long range regional transportation plans (RTPs). Metropolitan Planning Organizations (MPOs) report they are now anticipating plan updates that look beyond 2035. If targets are to be useful and relevant to metropolitan planning it would make sense to consider updated targets that correspond with MPO planning horizons.

| Metropolitan Transportation Plan Updates | | |
|---|----------------------------|----------------------------------|
| Metropolitan Area | Next RTP Update Due | Next RTP Planning Horizon |
| Portland Metro | December 2018 | 2040 |
| Salem-Keizer | May 2015 | 2035 |
| Central Lane | December 2015 | 2040 |
| Corvallis Area | March 2017 | 2041-2042 |
| Rogue Valley | March 2017 | 2042 |
| Bend | September 2015 | 2040 |
| Middle Rogue (Grants Pass) ⁷ | March 2016 | 2040 |
| Albany Area | March 2016 | 2040 |

Implications for Target Update

The scenario planning work that has been done indicates that programs and actions adopted as part of metropolitan land use and transportation plans are a feasible and effective way to achieve the state's GHG emission reduction goals. These efforts also show that policies and actions that reduce emissions also generate significant additional benefits or Oregon communities and citizens.

Since targets are intended to be used as metropolitan areas update their plans, it is important to recognize that metropolitan areas are starting to look beyond 2035. If targets are to be useful and relevant to metropolitan planning and to achieving the state's GHG reduction goal, it would make sense to update targets to identify reductions needed by 2040 and potentially beyond.

⁷ The Middle Rogue and Albany Area MPOs were designated as MPOs in 2013 and are currently preparing their first regional transportation plans.

State and federal laws to reduce GHG emissions from light vehicles

Additional studies by ODOT, DEQ, ODOE about light vehicle emissions

Review Factors

“The commission shall consider

- New or revised federal and state laws or programs established to reduce greenhouse gas emissions from light vehicles; (OAR 660-044-0035(2)(b))
- Additional studies or analysis conducted by the Oregon Department of Transportation, the Department of Environmental Quality, the Oregon Department of Energy or other agencies regarding greenhouse gas emissions from light vehicle travel in metropolitan areas, including but not limited to changes to vehicle technologies, fuels and the vehicle fleet;” (OAR 660-044-0035(2)(e))

Background

The Legislature, through HB 2001 and SB 1059, directed that targets identify the level of GHG reduction that each metropolitan area needs to achieve in order for the state to be on a trajectory to meet its 2050 goal of reducing emissions to 75% below 1990 levels. In addition, the Legislature directed that targets should identify the emission reduction needed above and beyond the reductions expected from improvements in vehicle technology and fuels and changes to the vehicle fleet. Accordingly, the target rules adopted in 2011 include detailed assumptions about the vehicle technology, fleets and fuels expected to be in place in 2035. State and federal laws and regulations set requirements that affect each of these factors. Targets were based on information and analysis available in 2011 as set forth in the Agencies' Technical Report. The resulting baseline assumptions included in the rule are shown in Tables 1 and 2 from the target rules reproduced below:

Table 1. Baseline Assumptions for Vehicle Technologies for Use in Land Use and Transportation Scenario Planning

| Vehicle Technologies | | | |
|---|-----------------|-----------------|-----------------|
| Characteristic | 1990 Model Year | 2005 Model Year | 2035 Model Year |
| Auto fuel economy—internal combustion engine | 28 mpg | 28 mpg | 68 mpg |
| Light truck fuel economy—internal combustion engine | 20 mpg | 20 mpg | 48 mpg |
| Auto fuel economy—plug-in hybrids in charge sustaining mode | — | — | 81 mpg |
| Light truck fuel economy—plug-in hybrids in charge sustaining mode | — | — | 56 mpg |
| % of autos that are plug-in hybrids or electric vehicles | — | — | 8% |
| % of light trucks that are plug-in hybrids or electric vehicles | — | — | 2% |
| Plug-in hybrids battery range | — | — | 35 miles |
| Electric vehicles battery range | — | — | 175 miles |
| Vehicle Fuels | | | |
| Characteristic | 1990 | 2005 | 2035 |
| % reduction in fuel carbon intensity from current levels | — | — | 20% |
| Electric power sources compared to current Renewable Portfolio Standard | — | — | Meet |
| Vehicle Fleet | | | |
| Characteristic | 1990 | 2005 | 2035 |
| Average vehicle replacement rate | 10 years | 10 years | 8 years |

Table 2. Additional Metropolitan Area Baseline Assumptions for Use in Land Use and Transportation Scenario Planning

| Metropolitan Area | % of Fleet that are Light Trucks | | | Light Vehicle Emission Rates (grams CO ₂ e per mile) | | |
|--------------------|----------------------------------|------|------|--|------|------|
| | 1990 | 2005 | 2035 | 1990 | 2005 | 2035 |
| Bend | 37% | 55% | 36% | 594 | 513 | 180 |
| Corvallis | 31% | 45% | 30% | 596 | 494 | 174 |
| Eugene-Springfield | 32% | 47% | 31% | 585 | 503 | 173 |
| Portland Metro | 30% | 43% | 29% | 590 | 514 | 184 |
| Rogue Valley | 35% | 50% | 34% | 605 | 507 | 181 |
| Salem-Keizer | 33% | 47% | 31% | 592 | 510 | 177 |
| Weighted Average | — | — | — | 590 | 511 | 182 |

In adopting the target rules, the commission anticipated that forecasts of future vehicle technology, fuels and fleet mix would likely change, as new information became available and as new programs are adopted at the state and federal level. The results of this work can help refine or revise assumptions used to set targets.

(5) The greenhouse gas emissions reduction targets in this division are intended to guide an initial round of land use and transportation scenario planning over the next two to four years. The targets are based on available information and current estimates about key factors, including improvements in vehicle technologies and fuels. Pursuant to OAR 660-044-0035, the commission shall review the targets by June 1, 2015, based on the results of scenario planning, and updated information about expected changes in vehicle technologies and fuels, state policies and other factors. (OAR 660-044-0000)

Analysis

In preparing this report, DLCD conferred with ODOT, DEQ and the Oregon Department of Energy to assess the effect of new laws, programs and regulations as well as additional studies conducted by the agencies – or other groups – regarding future forecasts for emissions from light vehicles. The results of this review are summarized and discussed below.

New Information about Vehicle Technology, Fleet and Fuels

The Targets adopted in 2011 were based on detailed estimates about vehicle technology, fleet and fuels that will be in place by 2035. In 2012 and 2013, ODOT conducted additional analysis as it prepared the Statewide Transportation Strategy (STS) indicating that some assumptions have changed.

| Change in outlook for 2035 | Forecasts for 2035 | |
|--|------------------------------------|--|
| | Target Rule (2011) | Statewide Transportation Strategy (STS) (2013) |
| More Electrics (EVs) and Plug In Hybrids (PHEVs) | 8% of new cars 2% of new trucks | 23% of new cars 20% of new trucks |
| Slower fleet turnover | 8 years | 9 years |
| More pickups/ SUVs | ~30% fleet | ~33% of fleet |
| Fewer CO ₂ per VMT | ~180 grams per mile | ~170 grams per mile |

Vehicle Technology/ Fuel Economy

New regulations that affect vehicle fuel economy have been put in place at both the state and federal level.

- In 2012 and 2013, Oregon DEQ, EPA and USDOT adopted closely harmonized greenhouse gas emission and fuel efficiency standards for automobiles and light trucks through the 2025 model year. At the end of that period, new vehicles are required to have a fleet average CO₂ equivalent fuel efficiency of 54.5 mpg.
- In 2013, the Oregon Department of Environmental Quality (DEQ) joined eight other states by adopting California's Zero Emission Vehicle (ZEV) standards that require increasing percentages of new vehicle sales to be emission free vehicles.

These new regulations have allowed the agencies involved to make more detailed estimates of future trends in vehicle technology and likely emissions outcomes:

- In adopting the Low Emission Vehicle Rules, DEQ concluded that the new requirements would by 2025 result in a fleet average fuel efficiency for light-duty cars and trucks of more than 50 miles per gallon.⁸ This improvement is consistent with estimates used in the 2011 Target Rulemaking.
- DEQ anticipates that Oregon's decision to opt for California emission standards is likely to result in much more rapid adoption of battery electric vehicles (EVs) and plug-in hybrid vehicles (PHEV) than previously expected, which over time will produce corresponding reductions in emissions.

The California Air Resources Board (CARB) publically projects that meeting AB32 by 2050, new light duty vehicle sales need to be 100% ZEVs. That means all Battery Electric and Fuel Cell Vehicles. Oregon has adopted California's LEV and ZEV programs and is required by the Clean Air Act to maintain requirements identical to California's. Therefore, if Oregon continues to implement California's rules it's possible we may reach 100% ZEV sales by 2050. However, California's ZEV regulation often includes provisions that reduce the stringency of ZEV requirements in the states that "opt in" to the California program. If that practice continues, we might expect the ZEV requirements to be about 15% less effective in Oregon.

While there is no guaranty Oregon will continue to implement the ZEV program, it is worth noticing that lifecycle ZEV costs are comparable to conventional vehicles with gasoline at \$4 per gallon. In addition ZEV performance is increasing and ZEV costs are decreasing. The economics of ZEVs coupled with Oregon's strong environmental ethic make this goal plausible.

The AB 32 Climate Change Scoping Plan Update issued May 2014 shows the fleet average GHG targets for the light duty fleet to be 125 g CO₂/mi. in 2030 and 100 g

⁸ http://www.oregon.gov/deq/EQC/Documents/2013AgendaDocs/December2013/P_LEV_StaffReport_final.pdf

CO₂/mi. in 2035. Those figures equate to new vehicle fleet average fuel efficiencies of 71 mpg in 2030 and 89 mpg in 2035.⁹

Fuels

The target rules are based in part on estimates of the carbon content of the fuels by light vehicles. Forecasts for 2035 are based on assumptions about the mix of fuels that Oregon motorists are expected to use and estimates of carbon emissions associated with those fuel sources. Estimates include both tailpipe emissions, and emissions from production and transportation of energy (i.e. the full “wells-to-wheels” estimate of carbon emissions.) ODOE and DEQ monitor and forecast Oregon’s energy sources and their carbon footprint.

ODOE advises that the sources of Oregon’s motor vehicle fuels are getting and expected to get “dirtier” as the state’s oil source shifts from cleaner Alaskan oil to other sources, including Bakken formation shale oil. This shift in fuel source is expected to increase carbon emissions per mile in 2035.

The 2011 target rules assume that the carbon content of fuels will be reduced by 20% by 2035. The reduction in carbon content is expected largely to occur through the state’s adoption and implementation of the Clean Fuels Program, which is Oregon’s version of California’s Low Carbon Fuel Standard (LCFS).

On January 7, 2015, the Oregon Environmental Quality Commission approved the rules which lay out the next phase of the Oregon Clean Fuels Program. The rules took effect February 1, 2015. The approved rules:

- Establish clean fuel standards to reduce greenhouse gas emissions from Oregon’s transportation fuels by 10 percent over a 10-year period, implementing House Bill 2186, which the Oregon Legislature passed in 2009.
- Require importers of transportation fuels – owners of the fuel when it crosses into Oregon – to reduce the average carbon intensity of fuels they provide in Oregon to meet the annual clean fuel standards. To meet the standards, regulated parties can choose a variety of strategies, including incorporating more lower-carbon biofuels, natural gas, biogas, propane or electricity into their fuel mix, or purchase clean fuel credits from providers of clean fuels.
- Allow providers of clean fuels to generate and sell clean fuel credits for the fuels they provide in Oregon.
- Establish fuel supply and fuel price deferrals to contain the program’s cost.
- The Clean Fuels Program currently has a required sunset date of Dec. 31, 2015. The 2015 Oregon Legislature will consider whether or not to remove the sunset. If the Legislature removes the sunset, DEQ will continue to implement the program beyond 2015. If the Legislature does not remove the sunset, the program cannot be implemented.¹⁰

⁹ See page 47, paragraph 4. at: <http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm>

¹⁰ DEQ, Oregon Clean Fuels Program, <http://www.deq.state.or.us/aq/cleanFuel/>

Vehicle Fleet

No new state or federal programs have been adopted that guide composition of the vehicle fleet (i.e. percentage of automobiles v. light trucks (pickups and sport utility vehicles or the rate of fleet turnover (measured by the average age of light vehicles).

In preparing the STS, ODOT concluded that changes to the vehicle fleet were likely to be slower than those assumed in the target rules. Several factors contribute to this change:

- The eight-year fleet turnover forecast anticipated a shift from current trends in Oregon (of a 10-year turnover) to shorter turnover reflecting experience in the Northeastern US, where use of road salt causes vehicles to wear out more quickly.
- Since 2008, fleet turnover has been slow. The recent recession has caused people to hold on to vehicles longer. In addition, with households driving fewer miles per year, vehicles last longer and need to be replaced less often.
- The target rules also assumed a reduction in the share of the light vehicle fleet made up of light trucks. With a slowing of fleet turnover, the transition from light trucks to passenger cars has also slowed.

More recent analysis confirms that changes in the vehicle fleet are occurring more slowly than expected:

- In 2014, the federal Bureau of Labor Statistics (BLS) found that the average age of vehicles increased from 10.1 years in 2007 to 11.3 years in 2012.¹¹
- Also in 2014, IHS Automotive forecast that this trend would continue with the average age of vehicles likely to remain at 11.4 years through 2015, then rise to 11.5 years by 2017 and 11.7 years by 2019.¹²

One encouraging trend, A growing share of light truck sales are made up of more fuel efficient “crossovers” or crossover utility vehicles (CUVs) – vehicles built on a car platform that include features of sport utility vehicle (SUV). Crossovers are generally smaller and get better mileage than other light trucks (i.e. pickup trucks, full size vans and sport utility vehicles.)

Addressing Uncertainty

It is worth noting that detailed forecasts of future vehicle technology, fleet and fuels are based on a series of assumptions about how the future will unfold. While the assumptions that were used to develop the target rules and the STS are believed to be reasonable, a range of outcomes are possible that would affect the forecasts of VMT and GHG emissions. Here are several examples to illustrate how different assumptions might affect outcomes:

Demographics: Higher population could lead to more VMT, even at constant VMT per capita

Economy: Higher income could lead to higher VMT per capita, and affect ability to purchase new vehicles

Fuel Price: Low fuel prices could increase VMT per capita and reduce demand for high MPG

¹¹ Bureau of Labor Statistics, America’s Aging Autos, Beyond the Numbers, May 2014, p. 1

¹² IHS Automotive, Average Age of Vehicles on the Road Remains Steady at 11.4 years, June 9, 2014.

vehicles

Vehicle Technology: EV efficiency and range or lack of supporting infrastructure might dampen market demand.

Fleet mix: Slower than expected reduction in share of light trucks given 10.5 year historical fleet turnover

Liquid Fuels: Delay in implementation of Oregon Low Carbon Fuel Standard would result in less reduction in carbon emissions per mile.

Electric Power Generation Emissions: Higher carbon intensity of electric generation would increase carbon emissions per mile.

Land Use: Low operating costs (fuel, improved MPG) might result in more dispersed development patterns and higher VMT

Technology: Adoption of autonomous/driverless vehicles might change travel behavior and land use patterns.

Implications for Target Rule Update

Targets identify emission reductions that are needed above and beyond expected reductions from improvements to reduce vehicle emissions (i.e. improvements to vehicle technology, fleet and fuels).

The results of scenario planning confirm that state and federal programs to improve vehicle fuel economy, promote the electrification of the vehicle fleet and reduce the carbon content of fuels are critical to meeting overall state goals to reduce GHG emissions from light vehicle travel. Without these efforts, metropolitan targets would likely need to be much higher in order to meet the state's GHG reduction goals. Consequently, new or revised forecasts about vehicle technology, fleet and fuels are key factors to consider in assessing whether targets are adequate to keep the state 'on track' to meeting its 2035 and 2050 goals.

Information provided by ODOT, DEQ and ODOE indicate a mix of positive and negative changes. Since 2011 the outlook for vehicle technology and fuel economy has improved, while expectations for changes to the vehicle fleet have become more conservative. More detailed analysis is needed to identify the net effect of these changes and to set targets for 2040 or beyond.

State plans setting GHG emission reduction goals

Review Factor

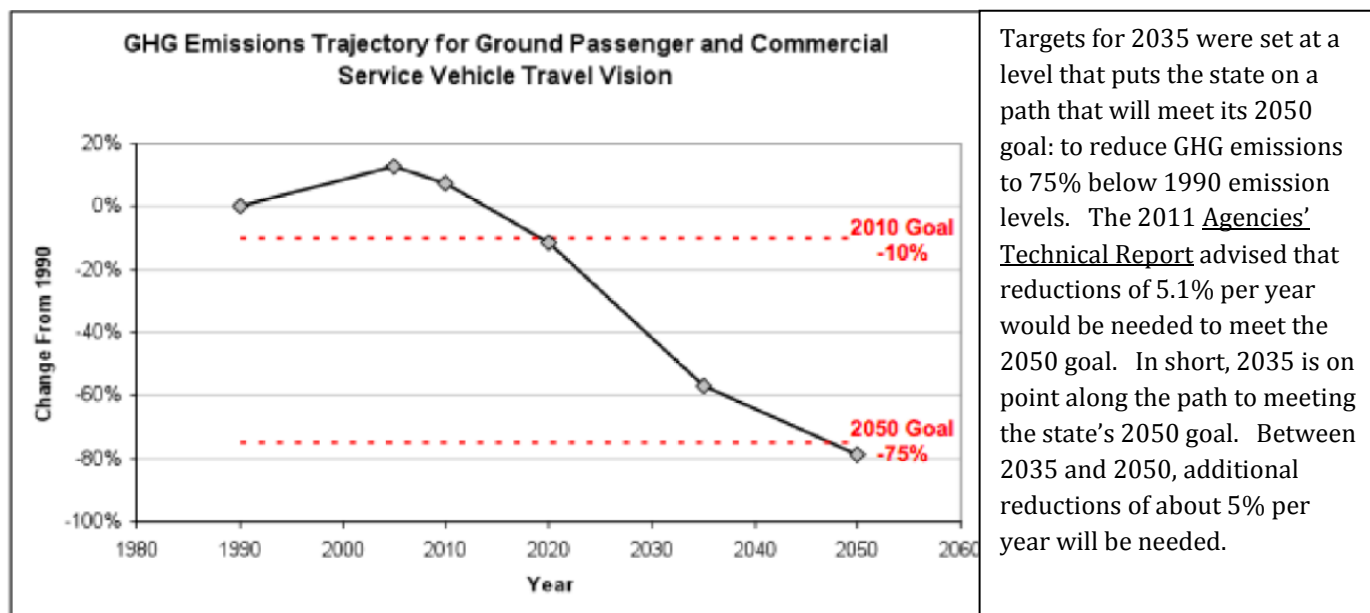
“The commission shall consider State plans or policies establishing or allocating greenhouse gas emissions reduction goals to specific sectors or subsectors;” (OAR 660-044-0035(2)(c))

Background

Targets and scenario planning are viewed as part of a statewide effort to meet the state’s adopted goal of reducing greenhouse gas emissions to 75% below 1990 levels by 2050. State goals for GHG reduction are set forth in HB 3543 adopted by the 2007 Legislature.

The 2011 Targets were set at levels that assume that emissions from light vehicle travel in metropolitan areas will be reduced in proportion to the share of emissions generated by light vehicles in 1990. The commission agreed that this was a reasonable assumption absent any broader state policies or plans that set different goals for individual sectors or subsectors. The Commission anticipated that targets may need to be revised if statewide plans or policies set a different goal for either the transportation sector as a whole, or for light vehicles or metropolitan areas.

The 2035 GHG targets were also set at a level that would put the state on a path or trajectory that would meet the state’s 2050 goal of reducing greenhouse gas emissions to 75% below 1990 levels. In the 2011 Agencies’ Technical Report, ODOT, DEQ and ODOE recommended that targets assume a steady, year-by-year reduction in emissions to meet the target goal. They calculated that a 5.1% per year reduction in emissions would be needed for the state to reach the 2050 goal. The recommendation is reflected in the following chart:



Analysis

While the state has not developed a formal plan or set of policies that allocate responsibility for meeting the statewide GHG reduction goal to specific sectors, several notable efforts have occurred over the last three years.

- In December 2012, Governor Kitzhaber released a 10-Year Energy Action Plan. The plan presents three core strategies in which the state can play a lead role in innovation, policy development and market transformation:
 1. Meeting 100 percent of new electric load growth through energy efficiency and conservation.
 2. Enhancing clean energy infrastructure development by removing finance and regulatory barriers to attract new investment and pursue promising new technologies.
 3. Accelerating the market transition to a more efficient, lower-cost and cleaner transportation system, including strategies for fleet vehicle conversion and access to cleaner-burning and more efficient vehicles.¹³

The transportation element of the plan endorses continuation of the OSTI program to support metropolitan scenario planning as an effective strategy to reduce GHG emissions from the transportation sector while creating healthier, more livable communities and greater economic opportunity. The relevant Action Item in the plan calls for:

The state, including DLCD, DEQ, and ODOT will continue to partner with MPOs to use scenario planning to quantify and forecast potential economic, environmental and equity impacts from different approaches as we look to reduce greenhouse gas emissions from the transportation sector.¹⁴

- In July 2012, the Oregon Department of Energy (ODOE) produced a detailed economic analysis of alternative actions for reducing energy use and GHG emissions to support the Governor's 10-Year Energy Action Plan.¹⁵ The study evaluated the cost-effectiveness of a broad range of strategies in reducing GHG emissions and energy use. Findings from the study indicate that a number of the key actions called for in scenario planning and the Statewide Transportation Strategy are among the most cost effective means available to reduce greenhouse gas emissions on a \$/per ton abated. Key actions found to be highly cost effective include: carsharing, pay-as-you-drive insurance (PAYD), increasing walking and biking mode share; parking management, transportation demand management, eco-driving, and land use strategies supporting infill, mixed use and transit oriented development.
- In 2013, the Oregon Global Warming Commission (OGWC) submitted its most recent report to the legislature. The report summarizes state efforts and provides recommendations to the legislature.¹⁶ Overall, the OGWC finds that the state is "on track" to meet its emissions goal in large part because the great recession has reduced economic activity. The GWC concludes that a recovering economy means Oregon will not be on track to meet its 2020 and 2050 goals.
- In March 2013, the Oregon Transportation Commission (OTC) accepted the Statewide Transportation Strategy (STS), which outlines a series of actions for further consideration to

¹³ Governor's Ten-Year Energy Action Plan, December 2012, http://www.oregon.gov/energy/pages/ten_year/ten_year_energy_plan.aspx

¹⁴ 10-Year Energy Action Plan, December 2012, page 35

¹⁵ The Center for Climate Strategies, 10-Year Energy Action Plan Modeling, Greenhouse Gas Marginal Abatement Cost Curve Development and Macroeconomic Foundational Modeling for Oregon, July 2012.

¹⁶ Oregon Global Warming Commission: Report to the Legislature 2013.

reduce GHG emissions. In preparing the STS, ODOT and OTC found that the passenger subsector could meet the state's 75% reduction goal by 2050, but that other transportation subsectors (i.e. air and freight movement) would likely be unable to meet the 75% goal. However, the STS did not recommend specific goals or targets for individual subsectors.

- In March 2014, ODOT developed an STS Short-Term Implementation Plan that calls for continued support of metropolitan scenario planning and related efforts as a key element of STS implementation.

Implications for Target Rule Update

While the state has not yet adopted a statewide plan that formally allocates responsibility for meeting GHG reduction goals, the state's commitment to achieving the 2050 GHG reduction goal remains in place. In addition, the state through the STS and the Governor's 10-Year Energy Action Plan has reaffirmed the importance of metropolitan planning efforts to reducing emissions.

Without additional state-level policy direction about how responsibility for meeting GHG goals will be met, it's unclear whether the share of emissions reduction to be accomplished from light vehicle travel in metropolitan areas should be changed.

Policies and recommendations in the Statewide Transportation Strategy

Review Factor

“The commission shall consider ... Policies and recommendations in the Statewide Transportation Strategy adopted by the Oregon Transportation Commission;” (OAR 660-044-0035(2)(d))

Background

SB 1059, which directed LCDC to adopt targets to guide scenario planning by metropolitan areas, also directed ODOT and the OTC to prepare a Statewide Transportation Strategy (STS), identifying a set of state level actions and policies to support state efforts to meet the state’s greenhouse gas emissions goals for the transportation sector.

In adopting the targets, the commission recognized that a combination of state and local efforts, including the Statewide Transportation Strategy, would be needed to reduce greenhouse gas emissions:

(6) Success in meeting the targets will require a combination of local, regional and state actions. State actions include not only improvements in vehicle technology and fuels, but also other statewide efforts to reduce greenhouse gas emissions from light vehicle travel. These efforts—which are programs and actions to be implemented at the state level—are currently under review by the Oregon Department of Transportation as part of its Statewide Transportation Strategy to reduce greenhouse gas emissions. As metropolitan areas develop scenario plans to reduce greenhouse gas emissions and compare them to the targets in this division, it is incumbent that metropolitan areas and the state work as partners, with a shared responsibility of determining how local and statewide actions and programs can reach the targets. (OAR 660-044-000)

Metropolitan areas use assumptions about statewide policies and programs, such as gas taxes, pay-as-you-drive insurance and eco-driving, as inputs to their analysis towards meeting GHG reduction targets.

Analysis

In March 2013, the Oregon Transportation Commission accepted the Statewide Transportation Strategy (STS) developed by ODOT.¹⁷ The STS identifies a range of policies, programs and actions that, if implemented, would result in significant reductions in GHG emissions from the transportation sector.

The STS looks out to 2050 and covers the entire transportation sector. The STS finds that the “passenger” subsector, which included metropolitan light vehicle travel, is likely to meet state’s reduction goal, but that air and freight sectors are not likely to reach 75% reduction by 2035.

The STS also confirms the need for a comprehensive and coordinated set of actions to reduce GHG emissions from light vehicle travel in metropolitan areas. The STS identifies a number of strategies that affect metropolitan areas, or that would be implemented in large part through metropolitan

¹⁷ <http://www.oregon.gov/ODOT/TD/OSTI/Pages/STS.aspx>

transportation and land use plans. The key strategies affecting metropolitan area planning are summarized in the following table.

| Trajectories for Key STS Strategies | | | |
|---|--|---------------------------------------|--|
| The STS developed by ODOT identifies a range of land use and transportation strategies that would be effective in reducing greenhouse gas emissions from passenger travel. The STS includes “trajectories” that show the rate of implementation of key strategies that would be needed over the next 30-40 years to meet the state’s GHG reduction goal. While adopted metropolitan transportation and land use plans would make progress in carrying out each of these strategies, substantial new efforts would be needed in most areas, including funding public transit, and increasing bike and pedestrian travel. | | | |
| STS Strategies | 2010 | 2035 | 2050 |
| Strategy 14 – Urban Growth Boundaries Create full-service healthy urban areas to accommodate most expected population growth within existing Urban Growth Boundaries (UGB) through infill and redevelopment | | | |
| UGB expansion | UGBs expand at 15% rate of population growth | | |
| Strategy 9 – Intracity Transit Growth and Improvements Investing in public transportation infrastructure and operations to provide more transportation options and help reduce single-occupancy vehicle travel. | | | |
| % increase in miles of service per capita over 2010 | -- | Metro – 100% Other MPOs – 125-600% | Metro -350% Other MPOs – 150% - 1000% |
| Strategy 10 – Bicycle and Pedestrian Network Growth Encourage local trips, totaling twenty miles or less round-trip, to shift from single-occupant vehicle (SOV) to bicycling, walking, or other zero emission modes. | | | |
| Share of short trips made by walking, cycling | Less than 10% | 15-30% | 30-40% |
| Strategy 13 – Compact, Mixed-Use Development Promote compact, mixed-use development to reduce travel distances, facilitate use of zero- or low-energy modes (e.g., bicycling and walking) and transit, and enhance transportation options. | | | |
| % of urban households living in compact, mixed use neighborhoods | 20% | 30% | More than 30% |
| Strategy 7 – Transportation Demand Management Support and implement technologies and programs that manage demand and make it easier for people to choose transportation options. | | | |
| % of urban area employees in TDM programs | 5-20% | 15-40% | 25-50% |
| % of urban households in TDM programs | 5% | 10-70% | 20-80% |
| Strategy 5 – Parking Management Promote better management and use of parking in urban areas to support compact, mixed-use development and use of other modes, including transit, walking and bicycling. | | | |
| % of workers in MPOs that pay for parking | 0-15% | 5-30% | 15-50% |
| Strategy 3 - Operations and Technology Fully optimize the transportation system through operations and technology, including Intelligent Transportation System technology, including incident response, ramp-metering, and coordination of traffic signals. | | | |
| % of drivers practicing eco-driving | - | 60% | 70% |
| % arterial streets with coordinated traffic signals | - | - | 95% |

While the STS does not direct any specific actions or policies, the ODOT has developed a short-term implementation plan¹⁸ to consider several of the actions identified in the STS over the next five years. One action element of the Short-Term Implementation Plan is a commitment to support scenario planning and strategic assessments by metropolitan areas:

Program #4: Strategic Assessments and Scenario Planning. Actions: Work with metropolitan planning organizations (MPOs) and associated jurisdictions on Strategic Assessments and scenario planning efforts, providing technical assistance and negotiating financial support.

ODOT will also be preparing a mid-range implementation plan, outlining additional actions to be considered between 2017 and 2032.

Implications for Target Rule Update

Targets measure the combined effect of state and local policies to reduce greenhouse gas emissions from light vehicle travel in metropolitan areas. The results from the STS and metropolitan scenario planning indicate that state policies and actions have a significant effect in reducing emissions and are complementary to regional and local actions that encourage reduced driving and increased use of alternative modes.

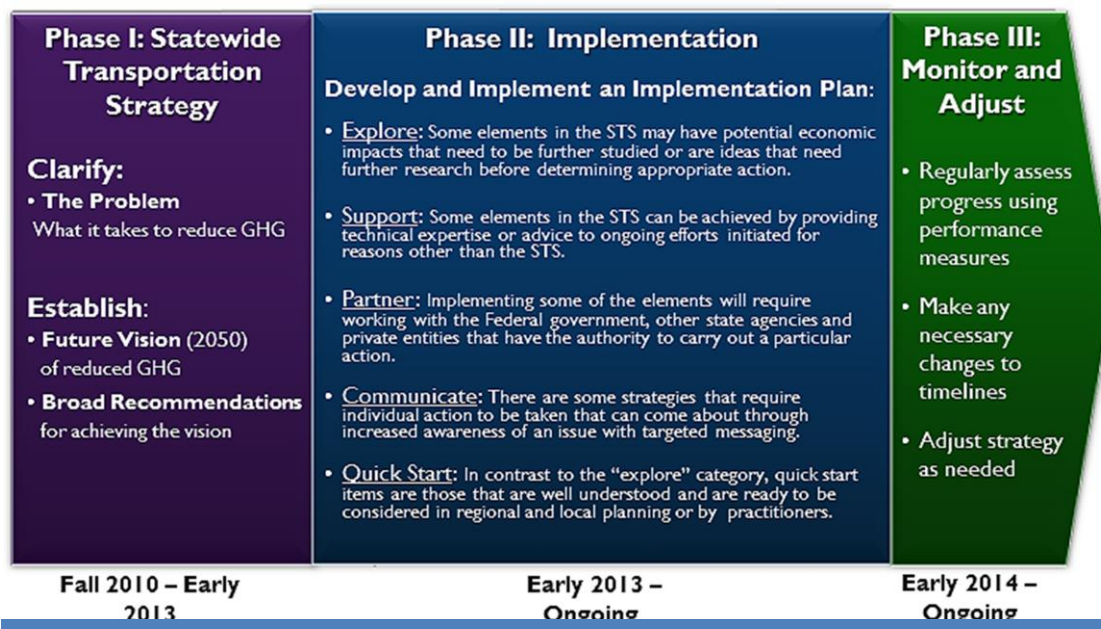
¹⁸ http://www.oregon.gov/ODOT/TD/OSTI/docs/STS/AttachA_STS%20Short-Term%20Implementation%20Plan_20140127.pdf

Statewide Transportation Strategy

The Oregon Statewide Transportation Strategy (STS): A 2050 Vision for Greenhouse Gas Emissions Reduction, was accepted by the Oregon Transportation Commission on March 20, 2013. It is a state-level scenario planning effort that examines all aspects of the transportation system, including the movement of people and goods, and identifies a combination of strategies to reduce greenhouse gas (GHG) emissions.

The STS identifies the most effective GHG emissions reduction strategies in transportation systems, vehicle and fuel technologies, and urban land use patterns. Beyond reducing GHG emissions, these strategies appear to lead to other benefits, including improved health, cleaner air, and a more efficient transportation system. These strategies will serve as the best tools available to help meet the state's GHG reduction goals while supporting other societal goals such as livable communities, economic vitality and public health. The STS is neither directive nor regulatory, but rather points to promising approaches that should be further considered by policymakers at the state, regional, and local levels. As summarized below and illustrated in the following graphic, the STS includes the following three phases:

- **Phase I** was the development of the STS document and public outreach. This phase concluded with the OTC's acceptance of the STS in March 2013.
- **Phase II** includes the development and execution of a series of implementation plans that define what STS strategies ODOT will pursue, how, and when. For activities outside the jurisdictional authority of ODOT, other agencies and organizations will need to determine their own course forward. Read additional information on [STS implementation](#).
- **Phase III** is the monitoring and adjustment phase which includes the tracking of progress over time and the periodic assessment and modification of the STS. Phase III is anticipated to be an on-going process.



Changes in population, metropolitan boundaries, land use and development patterns

Review Factor

“The commission shall consider Changes in population growth rates, metropolitan planning area boundaries, land use or development patterns in metropolitan planning areas that affect light vehicle travel in metropolitan areas;” (OAR 660-044-0035(2)(f))

Background

Targets are based in part on expected population growth and are set on a *per capita* basis, representing the reduction needed to achieve a level of GHG emissions that is 75% below 1990 levels by 2050. Targets were based on forecasts of state and metropolitan population growth available in 2011. Changes to metropolitan area boundaries and development patterns might affect growth of emissions in individual metropolitan areas or the ability of metropolitan areas to achieve emissions reduction.

Analysis

State population growth. The state population forecast for 2035 has been revised downward. The Agencies’ Technical Report (prepared in 2011) assumed Oregon’s population in 2035 would be 5.9 million. In December 2013, the Office of Economic Analysis (OEA) produced a new forecast, which indicates state population in 2035 will be 5.5 million, or 400,000 fewer residents than previously forecast.¹⁹ OEA forecasts lower growth due to slowing of in-migration to Oregon. While official forecasts have been lowered, there is speculation that population will grow more rapidly than expected because Oregon will be less affected by climate change than other areas of the country.²⁰

Metropolitan population growth. Change in metropolitan share of total growth / change in shares of individual metropolitan areas.

New metropolitan areas. In 2013, two new metropolitan areas were designated within Oregon: Albany Area, and Middle Rogue (Grants Pass area).

Changes to MPO boundaries. Minor changes in MPO boundaries have been made.

Metropolitan development patterns. Outside the Portland metropolitan area, there is limited information is available about changes in development patterns within metropolitan areas.

Implications for Target Rule Update

Slightly lower population growth forecast for 2035 means slightly less reduction in emissions will be needed to meet state GHG reduction goals. At the same time, MPO transportation plans are now looking beyond 2035, many to 2040. Goals or targets for 2040 have not been set, but would need to reflect continued year by year reductions in emissions to keep the state on track to meet its 2050 goals. In addition, the commission should decide whether or not to set GHG reduction targets for the state’s two new metropolitan areas.

¹⁹ http://www.oregon.gov/DAS/OEA/docs/demographic/County_forecast_March_2013.xls

²⁰ http://www.oregonlive.com/opinion/index.ssf/2014/09/david_sarasohn_prepare_for_cli.html

Other efforts by metropolitan areas to reduce GHG emissions

Review Factor

“The commission shall consider Efforts by local governments in metropolitan areas to reduce greenhouse gas emissions from all sources;” (OAR 660-044-0035(2)(g))

Background

During the target rulemaking process, local governments and others expressed concern that targets for reducing emissions from light vehicle travel were overly prescriptive about reducing auto travel as a means to achieve GHG reduction. Several suggested that the state targets should give local governments more flexibility about how to achieve reductions in greenhouse gas emissions, for example, through improved energy conservation efforts or better home and building insulation. This factor asks that the commission evaluate whether other efforts by local governments are helping to achieve the state’s overall goal to reduce GHG emissions.

Analysis

Several local governments have adopted local goals or programs to reduce greenhouse gas emissions.

- In 2009, the Portland and Multnomah County adopted a Climate Action Plan²¹. The plan sets a 40-year goal and roadmap for reducing community-wide GHG emissions by 80%. A 2012 progress report outlines specific actions that the city and county have taken and are considering to achieve this goal. The adopted plan includes objectives for 2030 to reduce VMT per capita by 30% from 2008 levels and create neighborhoods where 80-90% of city and county residents can walk or bicycle to meet daily needs. An update of the plan is currently in process.
- In July 2014, Eugene adopted a Climate Recovery Ordinance (CRO)²². The ordinance sets a city-wide 2030 goal of reducing fossil fuel use by 50% below 2010 levels. The ordinance directs the city council to adopt numerical two and five year targets and benchmarks for achieving the goal. In addition, city staff is directed to report on progress every two and five years, to assess progress and advise the council about the need for additional actions to achieve the benchmarks. A comparison of Eugene’s CRO Goals with the target rules indicates that the CRO goals, which call for a 50% reduction in fuel consumption by 2030, is somewhat more ambitious than the 20% GHG reduction target.²³
- In Corvallis, a community group - the Corvallis Climate Action Plan Task Force – has developed and proposed a Climate Action Plan for adoption by the city. The draft plan is similar to the Eugene plan in that it proposes that the city adopt a goal to reduce fossil fuel use.
- Several cities have been worked with ODOT and state agencies to install electric vehicle charging stations.

²¹ The Portland and Multnomah County Climate Action Plan website: <https://www.portlandoregon.gov/bps/49989>

²² <http://www.eugene-or.gov/archive.aspx?amid=&type=&adid=3237>

²³ Josh Roll, Central Lane MPO, “Relating the state GHG reduction target to Eugene Climate Recovery Ordinance”, September 10, 2014. Roll concludes meeting GHG targets will reduce fuel use by 43-45% by 2030, short of the city’s 50% reduction goal.

Implications for Target Rule Update

While there have been some notable efforts by local governments in the last several years to acknowledge the problem of climate change and to take steps to reduce emissions, these efforts are not widespread. Local efforts like the Portland-Multnomah County Climate Action Plan and Eugene's Climate Recovery Ordinance are encouraging. For example, the planning and monitoring framework established by the CRO, if implemented, would be an effective approach to achieving emission reductions at the local level.

While there continue to be opportunities for local governments to reduce emissions from other sectors, it's not clear at this time that such efforts would replace or reduce the need to reduce emissions from the transportation sector. In addition, the economic analysis that has been done indicates that efforts to reduce vehicle emissions are feasible, cost effective and create other important benefits for Oregon communities and citizens.

Input from local governments and MPOs

Review Factor

“The commission shall consider input from affected local governments and metropolitan planning organizations;” (OAR 660-044-0035(2)(h))

Background

Targets and the voluntary approach to scenario planning set forth in SB 1059 were developed in close coordination with local governments and metropolitan areas. SB 1059 was drafted in response to a 2010 report by the MPOGHG Task Force, which included representatives from each of the state’s metropolitan areas. Likewise, Target Rulemaking Advisory Committee (TRAC) included many of the same individuals. Both processes reflect an agreement that strong cooperation between local governments and the state is the most appropriate way to make progress:

Success in meeting the targets will require a combination of local, regional and state actions.As metropolitan areas develop scenario plans to reduce greenhouse gas emissions and compare them to the targets in this division, it is incumbent that metropolitan areas and the state work as partners, with a shared responsibility of determining how local and statewide actions and programs can reach the targets.²⁴

Analysis

In preparing this report, the department met with and interviewed metropolitan area planning staff, and met with the Oregon MPO Consortium. In addition, the department is providing a draft of this report to metropolitan local governments and MPOs to obtain their comments and suggestions about whether amendments to the target rules or other actions are warranted.

- Overall, local governments and MPOs have expressed support for continuation of the state’s current voluntary approach to scenario planning. There is also consensus that a Metro-like requirement to adopt and implement a preferred scenario that meets state targets is not appropriate. And, while they favor the voluntary approach metropolitan areas continue to express concern about the adequacy of resources provided and available to for metropolitan areas for land use and transportation planning. Some suggested that the state should, in addition to supporting voluntary efforts, add financial incentives to encourage metropolitan areas to engage in scenario planning and carry out other actions to reduce greenhouse gas emissions.
- There is broad agreement that scenario planning is most effective when it evaluates a broad range of outcomes, beyond GHG emissions, including public health, air quality, household transportation costs, energy use, etc. Metropolitan areas that have conducted scenario planning indicate that the public and decision-makers are much more supportive of efforts to reduce GHG emissions when they are able to understand the full range of outcomes and benefits to the community.

²⁴ Target Rule, OAR 660-044-0000(6)

- The metropolitan areas that have conducted scenario planning indicate that additional work should be done to integrate efforts to reduce greenhouse gas emissions into the ongoing regional transportation process. “Mainstreaming” GHG reduction into regional plan updates would make efficient use of the limited resources available for metropolitan planning.
- Local governments observe that scenario planning shows that increased funding (especially for transit) as well as new and expanded state programs and incentives to promote transportation options are needed to achieve GHG emission reduction goals. MPOs and local governments are looking to ODOT and the state to provide leadership on providing needed funding and carry out state-level programs and actions that are identified in the State Transportation Strategy.
- The metropolitan areas that have conducted scenario planning indicate that there is a need for additional planning and state support to translate the high-level strategic recommendations from scenario planning, for actions like more transit service, or expanded employer transportation incentives, into specific local plans and actions.
- MPOs and local governments are also interested in developing modeling or analysis tools (or adapting existing travel or emissions models) to enable them to conduct a more precise analysis of GHG outcomes as they update metropolitan transportation plans. (GreenSTEP and RSPM, are *strategic* models, which have been helpful in identifying an overall approach for GHG reduction, but are operate too high a level to be useful for implementation of a preferred strategy through transportation system planning.)

Implications for Target Rule Update

Because scenario planning is conducted by metropolitan local governments and MPOs, their views about various factors used to set targets and guide scenario planning are important.

Local decision-makers continue to be concerned about new state mandates and adequacy of funding to long range metropolitan planning efforts and needed improvements to the transportation system.

Land use feasibility and economic studies

Review Factor

“The commission shall consider Land use feasibility and economic studies regarding land use densities;” (OAR 660-044-0035(2)(i))

Background

During development of the target rules, several stakeholders expressed concern that the higher density land use patterns that might be needed to accomplish emission reductions would not be economically feasible or practicable, especially in Oregon’s smaller metropolitan areas.

Analysis

National Studies

An increasing number of national studies indicate changing demographics and consumer preferences are leading to increased demand for multifamily housing and a preference for more walkable, compact mixed use development patterns.

In 2013, a Federal Reserve report indicated that long-term demographic changes are causing a fundamental shift in housing demand in favor of multifamily housing:

The longer term outlook is especially positive for multifamily construction, reflecting the aging of the baby boomers and an associated shift in demand from single-family to multifamily housing. By the end of the decade, multifamily construction is likely to peak at a level nearly two-thirds higher than its highest annual level during the 1990s and 2000s. Notwithstanding renewed growth, the level of single-family construction is likely to remain moderate. By the end of the decade, it is likely to peak at a level comparable to what prevailed just prior to the housing boom. Thereafter, single-family construction is projected to contract at a moderate rate.²⁵

A National Association of Realtors Survey in 2013 found that:

Most Americans now want to live in a walkable neighborhood where they can walk to shops and restaurants and parks, and many are willing to give up a large yard to do so. There is also a strong interest in having access to public transportation.

What is most revealing as an indicator of the current state of the real estate market is that the walkable community was preferred by recent movers (those who moved in the past three years) by 20 points (58% to 38%); and for those who plan to move in the next three years, the walkable neighborhood was preferred by an 18 point margin (57% to 39%).²⁶

In 2014, the Environmental Protection Agency (EPA) reached similar conclusions:

Several trends point to a sustained increase in demand for infill development and a market opportunity for developers. Consumer preferences for the amenities that infill locations offer are likely to grow as changing demographics affect the housing market. In the next 20 years,

²⁵ Jordan Rappaport, The Demographic Shift from Single-Family to Multifamily Housing, Federal Reserve Bank of Kansas City, Economic Review, 2013.

²⁶ Joseph Molinaro, National Association of Realtors 2013 Community Preference Survey. <http://www.realtor.org/reports/nar-2013-community-preference-survey>

the needs and preferences of aging baby boomers, new households, and one-person households will drive real estate market trends— and infill locations are likely to attract many of these people. As more people choose to live in infill neighborhoods, employers are following, and vice versa. Many corporations are moving to infill locations, in part because they recognize the competitive advantages of being closer to the central city.²⁷

Oregon Studies

Studies of changes in development trends and the outlook in Oregon's metropolitan areas are limited. The most detailed work has been done for the Portland metropolitan area by Metro.

- In September 2014, Metro released its most recent Urban Growth Report²⁸. The report indicates that development over the last six years (from 2007-2012) showed a shift toward more infill, multifamily development and higher densities. Metro reports:
 - 58 percent of the net new residential units built inside the UGB were through redevelopment (46 percent) or infill (12 percent) and 42 percent were on vacant land.
 - new residential development was evenly split between multifamily and single-family units with a total of 12,398 single-family and 12,133 multifamily residences built
 - The average density of new single-family development was 7.6 units per acre (5,766 square foot average lot size) and multifamily development was 41.8 units per acre.
- State Office of Economic Analysis agrees housing demand will shift increasingly in favor of multifamily housing: “Economists and real estate experts agree that a larger share of multifamily is to be expected, certainly relative to the single family boom of the 1990s and 2000s. With credit availability still tight and a changed perspective on ownership following the bubble, expectations are that the higher share of the population in rental units will continue.”²⁹
- The Department of Land Conservation and Development has commissioned an analysis of historical land use efficiency in Oregon's cities in conjunction with the preparation of administrative rules to implement the new urban growth boundary amendment process set forth in ORS 197A.300 through ORS 197A.320, adopted by the Oregon Legislature in 2013. The analysis has been prepared by the University of Oregon Community Service Center. Preliminary results of the analysis show that residential densities for single-family residential development in Oregon outside of the Portland Metropolitan Region have shown steady increase since 1990. This trend is apparent throughout the state, and is especially pronounced in larger cities. Additional research conducted by DLCDC staff using decennial census data and building permit information from larger cities within the state shows that the percentage of multi-family development within these cities has been increasing as a result of development approved and built during the 2000 to 2013 period. One of the goals of the rules to be adopted to implement the new urban growth laws codified at ORS 197A.300 through ORS 197A.320 is to continue these trends toward greater efficiency of new residential development within the state.

²⁷ Smart Growth and Economic Success, EPA Office of Sustainable Communities, February 2014, p i.

²⁸ Metro, 2014 Urban Growth Report, Revised Draft, September 2014, <http://www.oregonmetro.gov/sites/default/files/2014-urban-growth-report-Revised-Draft-FINAL.pdf>

²⁹ Josh Lerner, Office of Economic Analysis, “Portland Housing Outlook”, Oregon Economic News, November 6, 2014. <http://oregoneconomicanalysis.com/2014/11/06/portland-housing-pt-4-outlook/>

Implications for Target Rule Update

The STS and scenario planning work done by Metro and Central Lane show that compact, mixed use development patterns are an important element of an overall strategy to reduce emissions. National studies indicate that market trends are supportive of increased densities and walkable mixed use development. Detailed study in Oregon is limited to the Portland metropolitan area, but that result is positive, indicating that higher density, mixed use development is increasingly economically feasible. Much less data is available for Oregon's other metropolitan areas, although each area can point to individual mixed use developments in downtowns and town centers.

State support for scenario planning and public engagement

Review Factor

“The commission shall consider State funding and support for scenario planning and public engagement;” (OAR 660-044-0035(2)(j))

Background

In developing the target rules, the commission recognized that without additional state funding from metropolitan areas would lack resources needed to conduct scenario planning. HB 2001 and SB 1059 committed the state to provide funding to support scenario planning work by the Portland and Eugene-Springfield metropolitan areas, and to support voluntary efforts by other metropolitan areas.

Analysis

ODOT and DLCD through the Oregon Sustainable Transportation Initiative (OSTI), have provided financial and technical assistance to metropolitan areas to support scenario planning.

Technical Support

ODOT has developed modeling tools to help metropolitan areas estimate greenhouse gas emission reductions and other important outcomes, such as transportation and energy costs for households and public health impacts. This includes the state-level GreenSTEP model, and a newer version, the Regional Strategic Planning Model (RSPM)³⁰ designed for use by metropolitan areas. Both models are designed to evaluate high level combinations of policies and actions aimed at reducing greenhouse gas emissions.

Support for Public Engagement

ODOT has provided funds to Metro and Central Lane to conduct public outreach as part their scenario planning work. Metro’s work included a broad range of public involvement efforts over a four year period, including polling, on-line surveys, workshops and focus groups as well as more than 70 public meetings to develop and review its proposed scenario. Central Lane’s two-year public outreach process has included public meetings, a telephone survey, stakeholder workshops and development of an online scenario feedback tool called “Future Builder.”

In addition, ODOT has prepared a GHG Communications Best Practices guide³¹ to help local jurisdictions and MPOs frame conversations about GHG reduction in ways that resonate with people.

Support for Scenario Planning and Strategic Assessments

- As provided in HB 2001, ODOT – has provided substantial funding support for Metro’s Climate Smart Communities Scenario project and Central Lane’s scenario planning. ODOT has also provided funding for a “strategic assessments” in Corvallis (completed in July 2014) and in the Rogue Valley (now getting underway.)

³⁰ Regional Strategic Planning Model,

http://www.oregon.gov/ODOT/TD/OSTI/Pages/tools.aspx#Regional_Strategic_Planning_Model

³¹ <http://www.oregon.gov/ODOT/TD/OSTI/docs/Media/Primer6.pdf>

- In 2012, ODOT and DLCD, working together through the Oregon Sustainable Transportation Initiative (OSTI) produced Scenario Planning Guidelines³² and an online GHG Emissions Reduction toolkit³³.
- In reports to the 2013 and 2014 Legislatures, ODOT has expressed its continued commitment to provide funding to metropolitan areas to support voluntary scenario planning. In February 2014, through the Short-Term Implementation Plan for the STS, ODOT committed to provide continued support for strategic assessments and scenario planning over the next five years (2014-2019). The Short-Term Implementation Plan commits ODOT to work with metropolitan areas and negotiate financial support on a case by case basis.

| <i>Program #4: Strategic Assessments and Scenario Planning</i> ODOT STS, Short Term Implementation Plan, February 2014 | |
|--|--|
| Actions | Work with metropolitan planning organizations (MPOs) and associated jurisdictions on Strategic Assessments and scenario planning efforts, providing technical assistance and negotiating financial support. |
| Level of Effort | <p>Moderate to High. Although the level of technical expertise of each MPO varies, the amount of support needed from ODOT for individual assessments is generally low. If all four MPOs (Corvallis, Bend, Salem-Keizer, and Rogue Valley) simultaneously request to engage in this process, the level of effort increases.</p> <p>ODOT evaluates requests for funding on a case-by-case basis and must consider available resources at the time of the request and will negotiate funding levels with each MPO. Funds support MPO data gathering and reporting.</p> <p>ODOT commits technical staff resources (as available) to run the analysis and produce results (approximately one-quarter of one position for a six month period for each Strategic Assessment). DLCD helps with data collection and reporting from their budget.</p> <p>If an area is interested in full-scale scenario planning ODOT will evaluate the amount of support available and negotiate accordingly. The level of effort for ODOT would be high with any full-scale scenario planning project, including significant staff and financial resources.</p> |

Implications for Target Rule Update

State funding and support have been and continue to be essential to enabling metropolitan areas to conduct scenario planning. Metropolitan areas are fully subscribed with work needed to meet other federal and state planning requirements. Since scenario planning is voluntary, without state support, local efforts to engage in or pursue scenario planning are likely to be limited.

³² Scenario Planning Guidelines, <http://www.oregon.gov/ODOT/TD/OSTI/Pages/Scenarios.aspx>

³³ GHG Reduction Toolkit, <http://www.oregon.gov/ODOT/TD/OSTI/Pages/Scenarios.aspx>

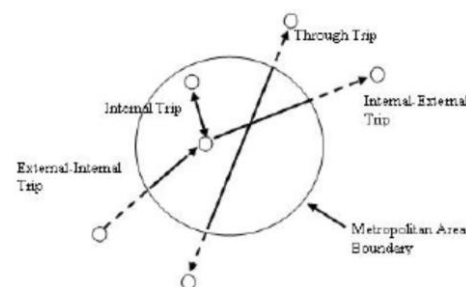
Light vehicle travel from outside metropolitan areas

Review Factor

“The commission shall consider The share of light vehicle travel within a metropolitan area not attributable to residents of that area;” (OAR 660-044-0035(2)(k))

Background

HB 2001 and SB 1059 directed that targets address emissions from “light vehicle travel in metropolitan areas”. This includes travel that begins and ends within metropolitan areas, as well as “external trips” (i.e. trips that either pass through the metropolitan area or begin or end outside of the metropolitan area). Metropolitan areas have expressed concern that they have little ability to affect external trips, and asked that the commission consider this issue further as it evaluates the target rules. Detailed information about external travel was not available at the time targets were set, but the issue was expected to be evaluated in subsequent efforts, including by ODOT as part of the Statewide Transportation Strategy.



Targets are for emissions from “light vehicle travel in metropolitan areas”. This includes trips made within metropolitan areas as well as that portion of “through” trips and trips to or from nearby areas that occurs within a metropolitan area.

Analysis

There is little new information available about external travel patterns near metropolitan areas.

ODOT reports that it did not conduct additional study of external travel as part of its modeling for the Statewide Transportation Strategy.

Metro Urban Growth Report estimates that Metro’s “capture rate” – the percentage of housing in the seven county area that includes Metro will occur within Metro’s UGB – will decline slightly for single family homes and increase slightly for multi-family homes. “The forecast distribution indicates 4% decrease in the total number of single-family units captured by local governments inside the UGB (from 68% in 2010 to 64% in 2035, and a slight (1%) increase in the number of multifamily units captured by local governments inside the UGB (from 83% in 2010 to 84% in 2035.”³⁴

Scenario planning has not produced more detailed information. Models developed by ODOT to support metropolitan planning (GreenSTEP, RSPM) estimate travel by metropolitan area households. Non-metropolitan travel is estimated “off model” by factoring growth of non-metropolitan households based on current trends using traffic count information.

ODOT has suggested that the commission may want to consider changing the targets to apply to what its models are designed to measure – travel by metropolitan households. In addition, metropolitan areas with high levels of external trips – such as the Salem-Keizer area – remain concerned that targets that include external trips will make it more difficult for them to meet targets than areas with lower rates of external travel.

³⁴ Metro, Staff Report to Ordinance 12-1292, November 2012, p.5

Implications for Target Rule Update

Estimating the amount of metropolitan GHG emissions that come from external travel remains a perplexing but important issue.

Emissions from external travel are important because metropolitan travel patterns clearly extend beyond metropolitan area boundaries. While metropolitan areas have limited ability to affect external travel, metropolitan area policies do have some effect. For example, it is important to understand whether metropolitan efforts to reduce GHG emissions might push development to outlying areas or increase travel to and from outlying areas.

The factoring approach used to estimating travel by non-metropolitan households appears to work reasonably well. Nonetheless, the scenario planning work that has been done to date has provided little new information about the effect of external travel on metropolitan area GHG emissions. Without better information, it is unclear how the targets should be changed.

Additional studies or analysis to evaluate how GHG emission outcomes differ for external and internal travel would be helpful.

Appendix A: Summary of Metropolitan Scenario Planning Analysis

| Scenario Planning Summary: METRO MPO & Statewide Transportation Strategy | | | | |
|--|----------------|------------------------------------|-------------------------------------|--|
| Variable - Input/Output Factor | PORTLAND METRO | | | STS |
| | 2010 Base | 2035 SCENARIO A (Recent Trends) | DRAFT 2035 PREFERRED SCENARIO | 2035 Trajectory Statewide Transportation Strategy |
| Greenhouse Gas (GHG) Emission Levels | | | | |
| Target Rule GHG Reduction - Percent Per Capita By 2035 | -- | 20% | 20% | N/A |
| Local MPO Target Reduction Level | -- | 1.2 | 1.2 | N/A |
| All Light Duty GHG Vehicle Emissions - Metric Tons CO ₂ e Per Capita Per Year | 3.7 | 1.3 | 1 | 1.33 |
| GHG Reduction Percent in Addition to Reduction from Fleet & Technology (below 2005 levels) | -- | 12% | 29% | N/A |
| GHG Reduction from Local Actions | -- | N/A | N/A | N/A |
| GHG Reduction Percent Per Capita from Local PLUS State/Fed Actions | -- | N/A | N/A | N/A |
| Miles Traveled & Fuel Consumption | | | | |
| Gasoline Fuel Price Per Gallon | \$ 2.43 | \$ 6.43 | \$ 5.53 | \$ 5.53 |
| Household VMT Per Day Per Capita | 20 | 17 | 16 | N/A |
| Percent Increase/Decrease in VMT Per Capita | -- | -13% | -20% | N/A |
| Annual Vehicle Delay Per Capita (Hours) | N/A | N/A | N/A | N/A |
| Annual Vehicle Delay - Percent Travel Time Spent in Congestion | 13% | 21% | 14% | N/A |
| Annual Fuel Consumption Per Capita (gallons) | 760 | 310 | 250 | N/A |
| Annual Vehicle Operating Cost Per Household Per Year | \$ 2,600 | \$ 2,700 | \$ 2,790 | N/A |
| Total Annual Vehicle Ownership Cost Per Household Per Year | \$ 3,400 | \$ 3,300 | \$ 4,910 | N/A |
| Community Design & Land Use | | | | |
| Percent Households (HH) Living in Mixed Use Areas* | 26% | 36% | 37% | 30% |
| Workers Participating in Employer-Based Commuter Programs | 20% | 20% | 30% | N/A |
| UGB Expansion Acres | -- | 28,000 acres | 12,000 acres | 15% of the rate of metro area population growth |
| Alternative Modes | | | | |
| Daily Transit Revenue Miles Per Capita | 1.0 (Base) | 0.8X | 1.4X | 1.25 - 6 times current levels |
| Daily Transit Revenue Hours | 4,900 | 3,600 | 9,400 | N/A |
| SOV to Bike Trips Shift (<10 Miles one way) | 9% | 10% | 17% | 15% - 30% |
| Annual Walk Trips Per Capita | 150 | 180 | 196 | 142 |
| Annual Bike Miles Per Capita | 110 | 110 | 174 | 110 |
| Bicycle Mode Share | N/A | N/A | N/A | N/A |
| Pricing, Marketing and Fleet | | | | |
| State Gas Taxes Per Gallon | \$0.42 | \$0.48 | \$0.48 | \$0.55 |
| Average Parking Costs Per Day (2005\$) | \$5.00 | \$5.00 | \$4.00 | \$9.00 |
| Percent Employees Paying to Park | 13% | 13% | 30% | 5% |
| Percent Non-Work Trips Paying to Park | 8% | 8% | 30% | N/A |
| Household Pay As You Drive Insurance (\$0.06/mile & \$0.05/mile in preferred scenario) | 0% | 20% | 40% | ≤ 100% |
| Percent Households Participating in Targeted Marketing Programs | 9% | 30% | 45% | 10%-70% |
| Car Sharing (# of Vehicles) | 1% | 1% | 2% | 2%-4% |
| Share of Light Trucks | 43% | 29% | 29% | 14% Decrease |
| Fuel Efficiency (mpg) New Cars + Light Trucks by Model Year Average | 29.2A/20.9LT | 68.5A/47.7LT | 68.5A/47.7LT | 53 |
| Electric/Hybrid Vehicles Market Share (autos) | 1% | 8% | 8% | 8% |

Model Inputs in ITALICS; Model Outputs in REGULAR type.

*Mixed Use Area Households is both an input, and an output sensitive to assumed district densities.

SOURCES:

- 1 - METRO data: Phase 1 Metro GreenSTEP Scenarios Technical Documentation, January 2012; CSC Scenarios First Look At Results, November 13, 2013; Shaping the Preferred Approach, April 2014; Phase 3 draft approach modeling input, June 16, 2014; Update from Metro staff, Jan. 2015
- 2 - STS data: Oregon STS, Vol. 2, Technical Appendices; OAR 660 Div. 044, Table 1

NOTE: The Regional Strategic Planning Model (RSPM) was formerly known as GreenSTEP. The name change reflects expanded capabilities for metropolitan area planning applications, while addressing a more general set of transportation and land use considerations in addition to greenhouse gas emissions.

| Scenario Planning Summary: CLSP & Statewide Transportation Strategy | | | | |
|---|----------------------|---------------------|--------------------------------------|--|
| Variable - Input/Output Factor | CENTRAL LANE | | | STS |
| | 2010 Base | 2035 REFERENCE CASE | 2035 Preferred Scenario ¹ | 2035 Trajectory Statewide Transportation Strategy |
| Greenhouse Gas (GHG) Emission Levels | | | | |
| Target Rule GHG Reduction - Percent Per Capita By 2035 | -- | 20% | 20% | -- |
| Local MPO Target Reduction Level* | -- | 1.05 | ? | -- |
| Households Only GHG Vehicle Emissions - Metric Tons CO ₂ e Per Capita Per Year | 3.49 | 1.28 | ? | 1.33 |
| All Light Duty GHG Vehicle Emissions - Metric Tons CO ₂ e Per Capita Per Year | not provided | 2.5% | ? | -- |
| GHG Reduction from Local Actions | -- | 2.3% | ? | -- |
| GHG Reduction Percent Per Capita from Local PLUS State/Fed Actions** | -- | 12% | ? | -- |
| Miles Traveled & Fuel Consumption | | | | |
| Gasoline Fuel Price Per Gallon | \$2.43 | \$ 5.53 | \$ 5.53 | \$ 5.53 |
| Household VMT Per Day Per Capita | 21.7 | 22.2 | ? | -- |
| Percent Increase/Decrease in VMT Per Capita | -- | 2.3% | ? | -- |
| Annual Vehicle Delay Per Capita (Hours) | 30.0 | 41.0 | ? | -- |
| Annual Fuel Consumption Per Capita (gallons) | 340 | 150 | ? | -- |
| Annual Vehicle Operating Cost Per Household Per Year | \$ 2,388 | \$ 2,218 | ? | -- |
| Total Annual Vehicle Ownership Cost Per Household Per Year | \$ 5,529 | \$ 6,489 | ? | -- |
| Community Design & Land Use | | | | |
| Percent Households (HH) Living in Mixed Use Areas*** | 12.9% | 14.4% | 7% | 30% |
| Workers Participating in Employer-Based Commuter Programs | 2.5% | 3.0% | ? | -- |
| UGB Expansion Acres | -- | 3,121 acres | 3,121 acres | 15% of the rate of metropolitan area population growth |
| Alternative Modes | | | | |
| Daily Transit Revenue Miles Per Capita | 13 | 18 | ? | 1.25-6 times current levels |
| SOV to Bike Trips Shift (<10 Miles one way) | 6% | 7% | ? | 15-30% |
| Coburg | 0.00% | 0.01% | ? | -- |
| Eugene | 7.70% | 15.00% | ? | -- |
| Springfield | 2.20% | 6.00% | ? | -- |
| Annual Walk Trips Per Capita | 120 | 123 | ? | 142 |
| Daily Bike Miles Per Capita | 0.27 | 0.53 | ? | 0.3 |
| Pricing, Marketing and Fleet | | | | |
| Federal, State and Local Gas Taxes Per Gallon | \$0.46 | \$0.54 | \$0.55 | \$0.55 |
| Average Parking Costs Per Day (fee payers only) | \$3.19 | \$2.74 | ? | \$5.00 |
| Percent Employees Paying to Park | not provided: 2005 # | 5% | 7% | 5% |
| Coburg | 4.0% | 4% | 7% | -- |
| Eugene | 8.0% | 7% | 7% | -- |
| Springfield | 5.0% | 4% | 7% | -- |
| Percent Non-Work Trips Paying to Park | not provided: 2005 # | 2% | 7% | -- |
| Coburg | 0.0% | 0% | 7% | -- |
| Eugene | 4.0% | 4% | 7% | -- |
| Springfield | 1.0% | 1% | 7% | -- |
| Household Pay As You Drive Insurance (\$0.05/mile) | 0% | 0% | 7% | ≤ 100% |
| Percent Households Participating in Targeted Marketing Programs | 1% | 2% | 7% | 10%-70% |
| Car Sharing # of Vehicles | 3 | 3 | ? | 2%-4% of all |
| Share of Light Trucks | 49% | 31% | ? | 14% Decrease |
| Fuel Efficiency (mpg) Cars + Light Trucks Average | 24 | 54 | 53 | 53 |
| Electric Vehicles Share of All Autos | 1% | 8% | 7% | 8% [Target Rule] |

Model Inputs in ITALICS; Model Outputs in REGULAR type.

1 - Central Lane Preferred Scenario currently under development. Preferred Scenario selection expected mid-2015.

*See Central Lane Scenario Planning documentation, July 2014

**Includes state-led policies: pay-as-you-drive insurance, road user fee, social cost recover, electricity renewables, ecodrives, low roll tires, household MPG optimization

***Mixed Use Area Households is both an input, and an output sensitive to assumed district densities.

SOURCES:

1 - CLMPO data: Central Lane Scenario Planning (CLSP), Greenhouse Gas Reduction Policies, January 21, 2014;

2 - CLSP Reference Case Results and Assumptions, March 11, 2014

3 - STS data: Oregon STS, Vol. 2, Technical Appendices; OAR 660 Div. 044, Table 1

NOTE: The Regional Strategic Planning Model (RSPM) was formerly known as GreenSTEP. The name change reflects expanded capabilities for metropolitan area planning applications, while addressing a more general set of transportation and land use considerations in addition to greenhouse gas emissions.

Print Date: 19 FEB 2015

| Strategic Assessment Summary: CAMPO & Statewide Transportation Strategy | | | | |
|---|-----------|---|--|--|
| | CORVALLIS | | | STS |
| Variable - Input/Output Factor | 2010 Base | 2035 REFERENCE CASE | 2035 Preferred Scenario ² | 2035 Trajectory Statewide Transportation Strategy |
| Greenhouse Gas (GHG) Emission Levels | | | | |
| Target Rule GHG Reduction - Percent Per Capita By 2035 | -- | 21% | 21% | -- |
| Local MPO Target Reduction Level* | -- | 0.7 | 0.7 | -- |
| Households Only GHG Vehicle Emissions - Metric Tons CO ₂ e Per Capita Per Year | 3.6 | 1.37 | -- | 1.33 |
| All Light Duty GHG Vehicle Emissions - Metric Tons CO ₂ e Per Capita Per Year | 2.2 | 0.90 | -- | -- |
| GHG Reduction from Local Actions | -- | 2.1% | -- | -- |
| GHG Reduction Percent Per Capita from Local PLUS State/Fed Actions** | -- | 18.50% | -- | -- |
| Miles Traveled & Fuel Consumption | | | | |
| Gasoline Fuel Price Per Gallon | \$ 2.43 | \$ 5.53 | \$ 5.53 | \$ 5.53 |
| Household VMT Per Day Per Capita | 22.0 | 22.7 | -- | -- |
| Percent Increase/Decrease in VMT Per Capita | -- | 3% | -- | -- |
| Annual Vehicle Delay Per Capita (Hours) | 20.2 | 23.0 | -- | -- |
| Annual Fuel Consumption Per Capita (gallons) | 374 | 173 | -- | -- |
| Annual Combined Vehicle Operating & Ownership Costs Per Household Per Year | \$ 8,344 | \$ 9,882 | -- | -- |
| Community Design & Land Use | | | | |
| Percent Households (HH) Living in Mixed Use Areas*** | 14.4% | 14.7% | 30% | 30% |
| Workers Participating in Employer-Based Commuter Programs | 2.1% | 2.2% | -- | -- |
| UGB Expansion Acres | -- | No Expansion 21% Pop. Growth 2010-2035 | -- | 15% of the rate of metropolitan area population growth |
| Alternative Modes | | | | |
| Daily Transit Service Miles Per Capita | 6.24 | 6.24 | -- | 1.25-6 times current levels |
| SOV to Bike Trips Shift (<10 Miles one way) | 9% | 12% | -- | 15-30% |
| Annual Walk Trips Per Capita | 131 | 134 | -- | 142 |
| Daily Bike Miles Per Capita | 0.4 | 0.5 | -- | 0.3 |
| Bicycle Mode Share (RTP) | 9.00% | 12% | 12% | -- |
| Pricing, Marketing and Fleet | | | | |
| Federal, State and Local Gas Taxes Per Gallon | \$0.42 | \$0.48 | \$0.48 | \$0.55 |
| Average Parking Costs Per Day (fee payers only) | \$3.30 | \$3.35 | \$3.35 | \$5.00 |
| Percent Employees Paying to Park | 1.5% | 16.0% | 16.0% | 5% |
| Percent Non-Work Trips Paying to Park | 6.5% | 13.7% | 13.7% | -- |
| Household Pay As You Drive Insurance (\$0.05/mile) | 0% | 0% | 0% | <100% |
| Percent Households Participating in Targeted Marketing Programs | 1% | 5% | 5% | 10%-70% |
| Car Sharing # of Vehicles | 2 | 50 | 50 | 2%-4% of all |
| Share of Light Trucks | 37% | 30% | 30% | 14% Decrease |
| Fuel Efficiency (mpg) Cars + Light Trucks Average | 24 | 54 | 54 | 53 |
| Electric Vehicles Share of All | 2% | 8% | 8% | [8% Target Rule] |

Model Inputs in ITALICS; Model Outputs in REGULAR type.

* See Corvallis Strategic Assessment, Table 2, Pg. 16

**Includes state-led policies: pay-as-you-drive insurance, road user fee, social cost recovery, electricity renewables, eco-drive, low roll tires, household MPG optimization

***Mixed Use Area Households is both an input, and an output sensitive to assumed district densities

SOURCES:

- 1 - CAMPO data: Strategic Assessment (July 2014) and appendices; Strategic Assessment Presentation to Policy Committee, July 9 2014
- 2 - CAMPO Scenario Planning now underway. Results expected late 2015.
- 3 - STS data: Oregon STS, Vol. 2, Technical Appendices; OAR 660 Div. 044, Table 1

NOTE: The Regional Strategic Planning Model (RSPM) was formerly known as GreenSTEP. The name change reflects expanded capabilities for metropolitan area planning applications, while addressing a more general set of transportation and land use considerations in addition to greenhouse gas emissions.