

Technical Background for Target Rules Advisory Committee Meeting: August 23, 2016

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To: Oregon Department of Land Conservation and Development

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Target Background

The metropolitan area greenhouse gas (GHG) reduction targets adopted by LCDC in OAR 660-044 establish the percentage reductions (from 2005 to 2035) in metropolitan area light vehicle GHG emissions beyond the reductions expected to occur due to changes to light vehicles and the fuels they use. The establishment of these targets was informed by technical analysis performed by ODOT, DEQ, and ODOE as directed by provisions of HB 2001 and SB 1059. In short, the analysis made recommendations on:

1. An overall light vehicle **per capita emissions reduction goal**.¹
2. A range of forecasts for **reductions in light vehicle emission rates** due to changes in light vehicles and the fuels they use.²
3. The **target** percentage reductions needed to meet the per capita emissions reduction goal given the vehicle emission rate forecasts.

Development of the targets was supported by the Target Rulemaking Advisory Committee (TRAC) in 2011. The TRAC selected an emissions rate forecast they thought to be sensible and would result in achievable metropolitan area targets. This forecast and the resulting targets were then adopted in the target rules.

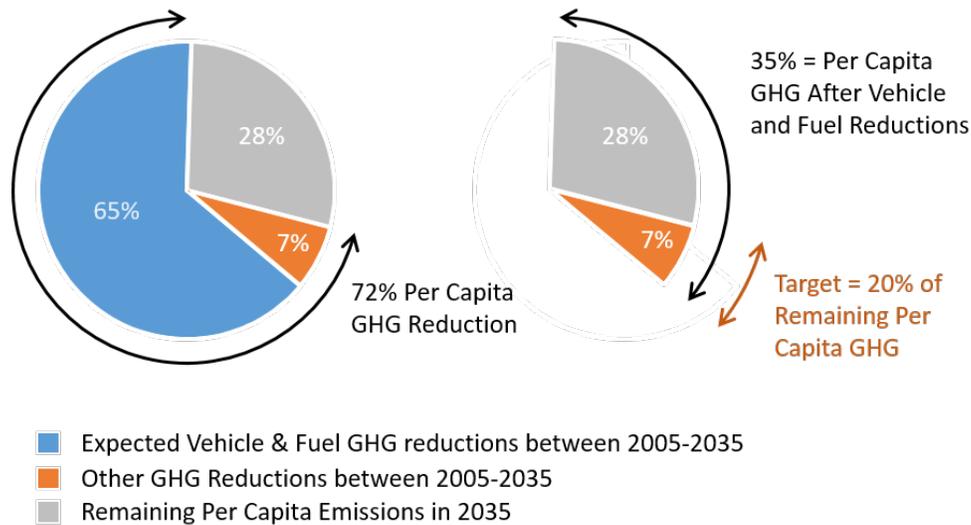
Figure 1 illustrates how a metropolitan area GHG reduction target is calculated from the per capita emissions reduction goal and the forecast for reduction in the light vehicle emissions rate. The circle represents total metropolitan area per capita emissions in 2005 while the grey slice shows per capita emissions in 2035 given the emissions reduction goal. Since the goal is to reduce per capita emissions by 72% from 2005 to 2035, the per capita emissions in 2035 would be 28% of the 2005 emissions. The blue slice indicates the reduction in per capita emissions due to the forecasted change in the light vehicle emissions rate. Since forecasted change in the emission rate would reduce per capita emissions by 65%, the emissions in 2035 would be 35% of the 2005 emissions if only the forecasted changes to light vehicles and the fuels they use occur. An additional 7 percentage point reduction is necessary to meet the 72%

¹ The goal was established as the percentage reduction in per capita emissions rather than the percentage reduction in total emissions to account for different metropolitan area population growth rates. The units of measure are metric tons of carbon dioxide equivalents per person per year. Since several types of molecules are greenhouse gases and each has different warming potential, the measure is standardized by putting it in terms of the equivalent amount of carbon dioxide that has the same warming potential.

² A range of forecasts was made because at the time there was little policy guidance to rely on. That has now changed. Oregon has joined with 7 other states to adopt California's zero emissions vehicle (ZEV) rules. In March of 2012, the California ZEV rules were extended to include model years out to 2025 and beyond. Also in August of 2012, the U.S. Environmental Protection Agency and the U.S. Department of Transportation adopted fuel economy and GHG emission (CAFE) standards covering vehicle model years out to the year 2025. The units of measure for vehicle emissions rates are grams of carbon dioxide equivalents per mile of travel.

reduction goal (72% – 65%). That is 20% of the remaining emissions (7% ÷ 35%). This is the target; the percentage reduction in emissions beyond the reductions expected from changes in vehicles and fuels.

Figure 1. Calculating Metropolitan Area Target from the Goal for Reducing 2005 Per Capita GHG Emissions and the Forecast for Emissions Reductions from Vehicle and Fuel Changes



A number of things have happened since the target rules were adopted in 2011:

- MPOs, DLCD, and ODOT gained experience in implementing the targets:
 - Metro adopted its Climate Smart Strategy.
 - The Central Lane MPO completed its scenario planning.
 - The Corvallis and Rogue Valley completed strategic assessments.
- ODOT completed a Statewide Transportation Strategy (STS) for reducing GHG emissions as required by statute.
- New federal and state vehicle emissions standards were adopted.

As a result of these events and the experience gained during rule implementation, the Core Tech Team (DLCD, ODOT, DEQ, & ODOE) identified several issues to be considered in the target rule update:

1. Whether or not to distinguish targets among metropolitan areas;
2. Potential targets for the two new MPOs: Albany Area, and Middle Rogue (Grants Pass);
3. Using findings from the STS for future assumptions;
4. Developing targets for interim years between 2035 and 2050;
5. The effect of newer 2050 population growth assumptions (MPO share); and,
6. Different ways of expressing the targets.

This memo provides analysis regarding the first two issues: whether or not to distinguish targets among metropolitan areas, and potential targets for the two new MPOs. The other issues will be addressed in subsequent memos.

Distinguishing Targets among Metropolitan Areas

The target rules established individual MPO targets. These targets were based on a common goal for reducing per capita GHG emissions from 1990 to 2035 by 74%. Much of the difference in the targets resulted from shifting the target reference year from 1990 to 2005.³ Differences also resulted from individualized forecasts of changes in light vehicle emissions rates.

The approach of making the 1990-based goal the same for all metropolitan areas and then adjusting the goal individually for each metropolitan area deserves additional thought. The adjustment process assumed that the per capita emissions estimates for 1990 and 2005 were relatively accurate for each metropolitan area, but the accuracy of the metropolitan area estimates depended substantially on the accuracy of a number of key calculation inputs which were difficult to obtain for 1990. This was particularly a problem for the Corvallis and Bend metropolitan areas which didn't become MPOs until the year 2000. Given uncertainties about the 1990 metropolitan area estimates it might have made more sense to adjust the 1990-based per capita emissions goal to be a uniform 2005-based goal rather than to make individual metropolitan area adjustments. Similarly, the calculation of metropolitan area-specific percentage changes in light vehicle emissions rates depended on metropolitan area light vehicle data for 1990 that were uncertain in a number of respects.

It might also be reasonable for the targets to vary because of differences in the capabilities of metropolitan areas to reduce emissions. In particular, the Portland metropolitan area is substantially larger than all other metropolitan areas combined and can implement policies that would be difficult to implement in other metropolitan areas. For example:

- Portions of the Portland metropolitan area will achieve much higher densities than the other metropolitan areas will ever achieve in the foreseeable future.
- Parking is inherently limited in dense central areas of the Portland metropolitan area, so parking pricing is easier to implement there.
- The Portland metropolitan area public transit network is much more extensive.

Following are three options for addressing this issue:

1. Establish the same target for all metropolitan areas;
2. Establish one target for the Portland metropolitan area and another target for all other metropolitan areas; and,
3. Establish a set of different targets for each metropolitan area.

³ Since 1990 is the statutory reference year for GHG emission reduction goals, it was used as the reference year for establishing the per capita emissions reduction goal. However, it became apparent during the development of the target rules that 1990 would be a difficult year for the MPOs to model because of missing data. The target reference year was established as 2005 because much better metropolitan area data would be available for 2005 than for 1990, and because 2005 corresponded more closely to then current metropolitan area plans. Although 2010 would have been a more current year to use, it was not used because some economic data needed to estimate 2010 benchmarks was not yet available, and because the lingering effects of the great recession could make 2010 a poor benchmark year.

Option 1: Establish the same target for all metropolitan areas

The first option would be the easiest to implement and would result in the simplest rules. It would also avoid the need to establish targets for new MPOs since the same set of targets would apply to all metropolitan areas. The main disadvantage of this approach is that would probably result in more stringent standards for the non-Portland metropolitan areas than would be the case if separate standards were developed because:

- The STS forecasted that the Portland metropolitan area could reduce per capita emissions more than other metropolitan areas; and,
- The Portland metropolitan area is forecasted to have a larger population than all other metropolitan areas combined.

A cursory examination of the STS modeling results indicates that the emissions reduction goal for non-Portland metropolitan areas could be a few percentage points higher with this option than with the second option. The per capita goal for the Portland metropolitan area would be about a percentage point lower than it would be with the second option.

Option 2: Establish one target for the Portland metropolitan area and another target for all other metropolitan areas

The second option would be a little more difficult to implement and would be somewhat more complex because two sets of targets would need to be produced; one for the Portland metropolitan area and another for all other metropolitan areas. As with the first option, this option would avoid the need to establish targets for new MPOs. The targets would be easier for the smaller metropolitan areas to achieve than with the first option, but harder for the Portland metropolitan area to achieve. It is worth noting that Metro found with its Climate Smart Strategy that the metropolitan area could achieve significantly more than the target reduction if their plans are adequately funded. On the other hand, three smaller MPOs have found meeting the targets to be a more substantial challenge. A cursory examination of the STS modeling results indicates that the emissions reduction goal for non-Portland metropolitan areas could be a few percentage points lower with this option than with the first option. The per capita goal for the Portland metropolitan area would be about a percentage point higher than it would with the first option.

Option 3: Establish a set of different targets for each metropolitan area

The third option would be the most difficult to implement and would produce a significantly more complex set of rules. A substantial amount of analysis would be required in order to justify differences in targets for the smaller metropolitan areas. It would not be advisable to just use STS analysis because the STS was developed to be a statewide strategy, not a strategy for each metropolitan area individually. Analysis similar to what has been done for the strategic assessments for the Corvallis and Rogue Valley metropolitan areas would need to be done for each of the metropolitan areas in order to get the information needed to compare individual metropolitan area capabilities for reducing light vehicle GHG emissions. This analysis could easily take a year to complete and would require cooperation and effort on the part of each of the MPOs. Whether or not better targets would result from this option than from Option 2 could not be determined until the analysis is completed.

Potential Targets for Two New MPOs

In 2013, two new metropolitan areas were designated within Oregon: Albany Area, and Middle Rogue (Grants Pass area). These MPOs were not included in the original target rule making, and in May 2015, LCDC directed the advisory committee to address whether or not targets should be set for these two new metropolitan areas.

There are several aspects to this issue:

1. Is it fair to have targets for other metropolitan areas and not these metropolitan areas?
2. Would excluding these metropolitan areas make much difference to GHG emission reduction?
3. How difficult would it be to set targets for these metropolitan areas?

The first question is a policy question and therefore not addressed in this memo.

The second question is one for which some rough estimates can be made, but would require a substantial amount of time and effort to be more specific because of a lack of specific information on light-vehicle GHG emissions from these areas. We can get a rough idea by comparing the STS 2050 forecast of per capita household light-vehicle emissions for metropolitan and non-metropolitan urban populations in Linn and Josephine counties with the corresponding forecast of per capita emissions for the non-Portland metropolitan area households.⁴ If the 2050 per capita emissions for the Albany and Grants Pass metropolitan areas were reduced to be the same as the small metropolitan area forecast average, the GHG emissions for those areas would decrease by about 18%. Given that the 2050 forecasted urban populations in those counties is about 3% of the forecasted total state population, and that the metropolitan area populations in the counties would be less than the total urban populations, the effect of the per capita GHG reduction would be to reduce total state GHG from light vehicle travel by about half of a percent. If instead of reducing the statewide emissions forecast, the metropolitan area targets were relaxed so as to keep the forecasted state emissions unchanged, the metropolitan area targets would be reduced by less than a percentage point. The amount of change would be much less than what would occur with small changes to a number of state and federal policies that affect GHG emissions.

The answer to the third question depends on the decision that is made regarding the establishment of individual or separated metropolitan area targets. If either the 1st or 2nd option is chosen, then the two new metropolitan areas would have the same targets as the existing metropolitan areas and therefore would not be difficult to establish. If the 3rd option is chosen however, then a substantial amount of effort would be required to evaluate the capabilities for those areas to make reductions compared to the capabilities of other metropolitan areas to make reductions. The analysis would likely take a year to complete and would require the cooperation and staff involvement of the Albany Area and Middle Rogue MPOs as well as the other MPOs. Whether that process would improve the result would not be known until the analysis has been completed.

⁴ Estimates of light vehicle emissions on roadways within metropolitan areas are made from estimates of metropolitan area household emissions using metropolitan area-specific factors that convert metropolitan area household travel to metropolitan area roadway travel. The STS analysis did not identify the Albany and Grants Pass metropolitan areas and therefore did not include roadway factors for those areas. Moreover, the STS analysis does not distinguish between metropolitan and non-metropolitan urban areas in Linn and Josephine counties. Therefore, as of now, it is only possible to make approximations using forecasts of GHG emissions for urban area populations of those counties.