

Appendix C. Motor Vehicle Emissions Budget Methodology

A motor vehicle emissions budget (MVEB) is that portion of the total allowable emissions in the SIP that is allocated to onroad mobile sources, such as cars, trucks, and buses. It is the level of onroad emissions that the area can have and still meet the SIP's goals. Budgets are established in the applicable SIP as part of the air quality planning process.

In order to demonstrate transportation conformity, projected emissions from highway and public transportation use must be less than or equal to the budgets. In other words, the budget acts as a ceiling on emissions from the onroad transportation sector. This must be demonstrated regularly as a part of approval of a region's Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP).

The 2017 and 2026, onroad emissions presented in the proposed maintenance plan inventory are based on data from travel demand modeling from PSRC's current RTP: *Transportation 2040 Update*, adopted May 29, 2014.¹ The travel demand model assumptions include proposed transportation projects, user fee and other financial assumptions, and transit investments that meet the goals of the long range plan.

The MVEB cannot be exceeded, so care must be taken to develop the MVEB. The emissions inventory is a realistic starting point, but it does not take into account the uncertainty of future projections. Uncertainty could arise from versions and inputs associated with both the EPA emissions model and PSRC's travel demand model, as well as the status of available funding over time to implement the aspirational vision of Transportation 2040.

The emissions inventory was developed using MOVES2010b. EPA is planning to release MOVES2014 in the summer of 2014, and EPA will likely release subsequent MOVES versions before the final year of the maintenance plan, 2026. In addition to EPA's assumptions built into the model algorithms, Ecology regularly updates the local input files used to run the MOVES model. Local data includes fleet and fuel characteristics, travel estimates, and control programs.

The vehicle miles traveled (VMT) data used for the emissions inventory was developed using PSRC's current travel demand model. This version was used for all modeling included the *Transportation 2040 Update*. Periodically, as new data becomes available, as new methods advance from theory to practice, and as computer resources become more productive, the PSRC travel model is subject to upgrades and improvements to better represent travel conditions. Not only do the tools evolve, but the roadway network that is modeled evolves with every update. Modifications may be made to reflect specific projects or region-wide assumptions related to policy decisions and economic effects.

To address the uncertainty of projecting future emissions, the MVEB was developed by adding a portion of the safety margin to the onroad inventory projections. A safety margin is the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions for 2011, the attainment year.

The uncertainty was calculated with the following methodology. An additional ten percent of the projected onroad emissions from 2017 was added to the 2017 MVEB to account for potential changes to the modeled transportation network, and the evolution of regional policy and economic conditions over time. This was based on the alternatives analysis that was included as part of the *Transportation 2040 Final Environmental Impact Statement (FEIS)* conducted in 2010. The range of emissions and the range of VMT was roughly 10 percent among all alternatives.

An additional 5 percent of the projected onroad emissions from 2017 was added to the 2017 MVEB to account for evolving model versions and inputs by PSRC, Ecology, and EPA. A total of 15 percent of the projected onroad emissions was therefore added to account for uncertainty.

The same methodology was applied to the 2026 MVEB. These assumptions were reviewed with the region’s Air Quality Consultation Partners.

Table 1 summarizes the proposed motor vehicle emissions budgets for 2017 and 2026 for PM_{2.5} and NO_x. These values represent the maximum pounds per day of emissions that will be allowed from onroad mobile sources. The table also demonstrates the 15 percent uncertainty described above is within the available safety margin.

Onroad Motor Vehicle Emissions Budgets (Pounds per winter day)

Year	PM _{2.5}	NO _x
2017 Onroad Inventory	1,642	36,339
2017 Available Safety Margin	662	26,452
2017 Safety Margin Allotted to MVEB	246	5,451
2017 Safety Margin Allotted to MVEB (%)	37%	21%
2017 MVEB	1,888	41,790
2026 Onroad Inventory	1,149	19,896
2026 Available Safety Margin	382	44,592
2026 Safety Margin Allotted to MVEB	172	2,984
2026 Safety Margin Allotted to MVEB (%)	45%	7%
2026 MVEB	1,321	22,880

¹ Puget Sound Regional Council, 2014, “Transportation 2040 Update Report,” <http://www.psrc.org/assets/10550/T2040Update2014.pdf>