



# Response to Comments

## Oregon Environmental Mitigation Plan

1. Open funding to other significant NO<sub>x</sub> sources. School buses have other funding opportunities but this is a once in a lifetime opportunity for heavy equipment and locomotives. Why limit Oregon's resources to only one category? Railyards operate next to schools and homes and can be a better opportunity for pollution reduction, especially when replacing with all-electric. (Commenter 1)

Response: DEQ agrees that a comprehensive program to reduce emissions from older diesel engines should take a broad view, evaluating against agreed upon criteria the optimal projects to support. Even within a given category, there can be a wide range of effectiveness and desirability, meaning that each project should be judged on its merits relative to the selection criteria. In the current circumstance, the statutory authorization to DEQ provides a narrow authority to focus on school bus replacement. We anticipate that future meetings of the legislature will revisit this issue and a broader range of authorized projects is likely.

2. Be objective and scientific when selecting projects, relying on criteria like cost effectiveness of money spent per ton of NO<sub>x</sub> reduced, particularly in environmental justice areas. (Commenter 1)

Response: DEQ agrees this is a critical factor in effectively expending the funds made available from the settlement. Although the state's allocation is significant amount of money, at best it may only be possible to replace about 2,000 vehicles out of an eligible universe of more than 70,000 heavy duty diesel powered vehicles and equipment based in Oregon.

3. Supports initial funding allocation and supports selection of subsequent projects via competitive process with a focus on cost effectiveness. Encourages the state to include programs for private fleets as well as public fleets. (Commenter 12)

Response: As noted above, there is a larger universe of vehicles and equipment potentially eligible for funding under the terms of the decree. A critical step in future consideration of expanding the scope of eligible projects will be the designation of selection criteria. Cost effectiveness is likely to be a factor. DEQ recognizes that public and private fleets can both be contributors to exposure issues associated with air pollution.

4. Idling of ambulances can be a serious problem, especially around health care facilities. Ambulances may idle for a reason, maintaining interior temperatures and keeping medical equipment in a state of readiness. Medidock is a system to address these needs without idling the ambulance's engines by providing a form of shorepower. This results in eliminated emissions and reduced operating costs for the ambulance company. These systems are in place in New England and the Midwest. The Ozone Transport Commission supports emission reductions in a study. (Commenter 4)

Response: DEQ acknowledges this can be a problem that is resolved by shorepower and onboard auxiliary power units, similar to those used by truckers in overnight stays. These

technologies are beyond the scope of the current Oregon authority for use of settlement funds. This is also not an Eligible Mitigation Action under the terms of the decree but could be considered for funding under the DERA funding option. The Commenter is encouraged to identify projects that could be funded under regional DERA selection processes that EPA typically announces each spring.

5. Airport ground support equipment are also eligible under the terms of the settlement and can be cost effective pollution reduction actions in disadvantaged communities. Airlines for America reiterates its support for the project selection criteria proposed by DEQ in the April 2017 draft plan. Lektro, located in Warrenton, Oregon is a manufacturer of electric powered ground support equipment, so this source category could also result in direct economic benefits for the state.

Response: Replacing diesel powered airport ground support equipment is an Eligible Mitigation Action but are not eligible for funding under the initial authorization for projects in Oregon. DEQ is pleased to learn about this manufacturer and is aware of at least one other electrical rebuilder of airport GSE in the state. This category may become eligible after future review of desired eligible mitigation actions. In the meantime, proposals could be developed for consideration under regional DERA solicitation opportunities.

6. Recommends using vouchers or rebates as compared to competitive selection for projects as airline budgetary plans require more certainty to move forward with projects.(Commenter 8)

Response: DEQ will consider vouchers in the future as a means of reimbursement for eligible activity. Vouchers can have several advantages over a grant including reducing administrative costs for both the agency and the recipient. Several issues need to be resolved, for instance, the appropriate voucher amount to offer and reconciling a voucher process with the decree requirement that all purchases comply with state purchasing statutes and rules.

7. Recommend allocating the VW funds based on population density and diesel particulate matter concentration based on the most recent National Air Toxics Assessment. Short haul trucks should be the targeted source category as indicated by the National Emissions Inventory in most at-risk neighborhoods. (Commenter 15)

Response: DEQ appreciates the work underlying the assessment of risk reported in this proposal. However, a focus on short haul trucks is beyond the scope of current authority. However, this information can become part of the evaluation criteria to be considered in future authorizations of expenditures for additional mitigation actions.

8. Provide the highest level of funding to applications that produce the largest share of NOx emissions (in most regions this means prioritizing for short-haul, regional-haul and refuse trucks). (Commenter 11)

Response: Maximizing pollution reduction with available funds is likely to be an important consideration in future competitively oriented selection processes, although NOx reductions, while desired, are not the only pollutant of concern from diesel engines.

9. Provide a larger incentive and greater overall funding for medium- and heavy-duty engines that deliver greater NO<sub>x</sub> reductions than currently required for new vehicles and engines. (Commenter 11)

Response: Particulate matter is a critical pollution reduction priority in Oregon. Fortunately, diesel vehicle replacement projects can deliver reductions in both NO<sub>x</sub> and PM simultaneously. In our current experience, grant offers of 25 percent towards the acquisition of a replacement vehicle appears to be sufficient to motivate scrapping of older vehicles and replacement with lower emission vehicles. In the future DEQ may evaluate whether an increase to the offer is required to meet pollution reduction goals.

10. Explore scrappage alternatives that could increase participation, as frequently companies will see this as a barrier to entry. For example, allow export of older vehicles out of the state, or transfer to a fleet with even older vehicles that would displace the older vehicle or allow a leasing company to receive funds but require scrapping vehicle in that fleet. Treat vehicle leasing like any other financing mechanism and allow fleets the opportunity to have equal access to program funding regardless of the financing mechanism. (Commenter 12)

Response: To date, scrapping requirements have not been raised by fleets as a barrier to participation. There remains sufficient interest and availability of qualifying vehicles to continue in the current paradigm. Exporting older vehicles and their emissions to other states is not a preferred policy outcome and may only temporarily resolve a problem for respirable pollutants in Oregon because it depends on continuing and effective compliance monitoring. This approach also does not provide desired climate benefits.

A vehicle owned by a leasing company that can be considered an early replacement can certainly be a desirable project, all other considerations equal. The burden to undertake that replacement is more appropriately made by the leasing company rather than the lessee. The leasing company, as owner of the vehicle, would have to authorize destruction of the vehicle.

11. Use vehicles emissions measurement tools that reflect current technologies and performance under real world operation duty cycles – Argonne National Laboratory's AFLEET tool is the most current. (Commenter 11)

Response: DEQ is considering the use of AFLEET for emission calculation purposes along with other available tools. AFLEET does offer a broader range of technology evaluation as compared to EPA's Diesel Emission Quantifier, for instance.

12. Accelerate the funding in the early years to maximize the NO<sub>x</sub> reduction benefits. (Commenter 11)

Response: DEQ agrees that air quality gains secured earlier, because of the cumulative value, are more valuable than those obtained later. We expect there will be an accelerating curve however as both the agency and recipients work through implementation issues associated with a program of this size.

13. Given that the Environmental Mitigation Fund was created because of NO<sub>x</sub> pollution associated with non-compliant diesel vehicles, we believe that the funding should be set aside

for clean, alternative fuel vehicle projects that focus on maximizing NO<sub>x</sub> reduction for the funds spent. (Commenter 11)

Response: Diesel engines emit a disproportionate amount of nitrogen oxides and particulate matter, each of which have harmful consequences in sufficient concentrations. In Oregon, diesel particulate matter is a more pressing concern with greater public health and climate impacts. Fortunately, replacing older diesels with newer engines, virtually regardless of the fuel type, provides simultaneous reductions.

14. Natural gas engines are the only zero emission equivalent or near zero emission engine certified for NO<sub>x</sub> emissions at 0.02 g/bhp-hr as compared to latest model diesels certified to 0.20 g/bhp-hr. If renewable natural gas is used, lifecycle greenhouse gas emissions are also reduced. “Clean” diesel engines, in practice, may also emit up to 5 times over the certification standard, particularly at idle or low speeds that can be common in school bus applications. Target funding for technologies that have demonstrated the ability to deliver actual lower in-use emissions when operated in real-world conditions. Prioritize funding for commercially available products that are ready for use. (Commenter 11)

Response: Natural gas engines have many environmental benefits. DEQ will fund natural gas school bus projects for those transportation supervisors presenting projects that otherwise meet program requirements.

15. Scale funding to incentivize the cleanest engines available – at a minimum, provide parity among alternative fuels by following a version of the Colorado VW Plan that funds non-diesel alternative vehicles in the private sector at 25% of the cost of the vehicle and public sector vehicles at 40%. Ensure that funding incentivizes adoption by both public and private fleets. (Commenter 11)

Response: At this point, public and private fleets will not be differentially funded, as both types of fleets, all other elements equal, are contributors to air pollution issues.

16. Prioritize projects that include partnerships that provide a match such as a CNG or LNG station being built in locations that will receive the VW funding (Commenter 11)

Response: Financial contributions from recipients and other project partners improves the cost effective use of the environmental mitigation funds available and will likely be an important consideration in a competitive selection process.

17. Prioritize funding for clean vehicles rather than fueling infrastructure. (Commenter 11)

Response: Funding lower emission vehicles is the priority. In Oregon, the Clean Fuels program can be a source of revenue used to offset fuel infrastructure costs oftentimes associated with lower carbon fuels.

18. Supports spending allowable 15 percent on light duty electric vehicle charging infrastructure and to spending remainder on replacing old diesel public buses with new, all-electric vehicles.(Commenter 9)

Response: While allowable under the decree, light duty zero emission vehicle fueling infrastructure is not an allowable expenditure category under current state authority. This will likely be revisited in future legislative sessions. In the meantime, users of low carbon fuels can otherwise receive revenue to offset low carbon fuel infrastructure costs under the Oregon Clean Fuels program.

19. To meet Governor Kate Brown’s goal for electric vehicle usage will require 10,000 more ports. Utilizing the full 15 percent set-aside will make a meaningful contribution. Recommend that Oregon “future-proof” the investment by supporting a mix of “smart” networked Level 2 and DC fast chargers to support more beneficial load on the grid. Investments should provide for growth in future power needs at built facilities that will likely be driven by larger batteries on future cars. Additionally seven other recommendations are made for project selection and implementation. (Commenter 10)

Response: The Governor has provided direction in Executive Order 17-21 to use up to 15 percent of Oregon’s environmental mitigation funds for light duty electric vehicle charging infrastructure. Current spending authority does not specifically allow for this use but we expect this issue to be reconsidered in future legislative sessions.

20. While majority of electric vehicle charging occurs at home, there is an urgent need to invest in charging infrastructure more broadly. Recommend prioritizing highway corridor DC fast-charging, workplace EV charging, multi-unit dwelling EV charging and public EV charging at key destinations. Encourage direct engagement with all electric utilities in strategic planning and execution of EV infrastructure. Engagement will ensure the most cost – effective and grid-responsible EV charging solutions. (Commenter 13)

Response: As noted above, light duty charging infrastructure is not part of the current authorized scope. DEQ appreciates the suggestions and will take these under consideration when the program moves in this direction.

21. Electric transit buses represent lower lifetime overall acquisition and operating costs than diesel according to an analysis based on the NY City Transit. Similar savings could be expected for electric school buses. Supports the initial focus on upgrading school buses but encourages DEQ to work to expand the focus to other project actions that result in electrification of vehicles. Transportation emissions now account for a majority of global warming emissions and these funds should be invested in decarbonized fuels like electricity and not diesel, natural gas or propane. Although constrained by the legislative direction, DEQ could exercise discretion in prioritizing districts looking to buy electric buses. (Commenter 9)

Response: Battery electric school buses have a number of considerable advantages, environmentally and operationally. DEQ will fund any electric bus proposal offered by a school district as a replacement strategy. However providing incentives to replace older diesels with late model diesel buses is still a reasonable choice, especially when considering cost effectiveness in reducing respirable and climate forcing pollutants.

An older diesel bus that is not well controlled for emissions can be a significant contributor to pollution harmful to human health. Substantial reductions in late model exhaust control

technology reduces the respiratory pollutants by over 90 percent, so that a 2018 school bus may emit only ½ pound of diesel particulate over a year's time. While a battery electric bus has zero tailpipe respirable emissions, this difference in a critical respirable pollutant is minimal. However, the cost to achieve those reductions can be considerably higher with battery electric vehicles.

Accounting for climate pollutant reduction benefits does not significantly alter this conclusion. Diesel black carbon particle is also considered a climate forcer that, along with the carbon dioxide emitted from petroleum fuel combustion, contribute to climate change. In an older bus, this combination amounts to 27.6 tons of carbon dioxide equivalent (CO<sub>2e</sub>) per year.

A battery electric bus, of course, emits no tailpipe pollution but does have climate forcing pollution associated with the Oregon electrical generation mix. On a similar duty cycle, the battery electric bus operation would result in 10.6 tons of carbon dioxide equivalent. The late model diesel bus with emission controls and improvement in fuel economy on the same duty cycle emits 13.8 tons CO<sub>2e</sub>.

While the battery electric bus is lower emitting, it costs considerably more to achieve those emissions because of the difference in purchase costs, \$130,000 for diesel versus \$400,000 for electric. Keep in mind the starting point for pollution reduction comes from the removal of older, higher emitting vehicles. The choice point for the use of incentive funds is tied to the cost effectiveness of replacement vehicle choices. By still offering incentive to support the purchase of late model diesel vehicles, more older vehicles can be scrapped with greater pollution reduction than by limiting funding only to battery electric vehicles. For instance, for every million dollars available, offering 30 percent towards the purchase of a new electric bus will fund turnover of 8 buses reducing 136.5 tons of CO<sub>2e</sub> but expending the same funding on late model diesel bus replacements would result in the scrapping of 25 older buses reducing 345 tons of CO<sub>2e</sub>.

22. In light of Oregon 2017 Global Warming Report and Governor Executive Order 17-21, 15 percent of Oregon's Mitigation Funds must be devoted to electric vehicle charging infrastructure. In addition, funds should be reserved to pay up to 40 percent of the incremental cost difference between diesel and transit electric buses. While replacing with "clean diesel" does cost less, it still results in carcinogenic emissions and is not identified as a strategy by the Oregon Global Warming Commission or the Governor's Executive Order. Zero emission vehicles have no emission at the tailpipe and the Oregon electric generation mix is getting cleaner over time. While Oregon is a pioneer in prioritizing PM over nitrous oxide emissions, it can also be a pioneer in integrating longstanding but unmet climate goals in VW funding decisions. (Commenters 5, 6)

Response: Global climate temperature is affected by a variety of gases and aerosols with both warming and cooling effects. As the science on climate change has developed, it has become clearer that effective action must consider the interaction of the range of climate forcing agents. Black carbon, a significant pollutant from diesel engines, had been identified as a positive climate forcer as early as 2002. The International Panel on Climate Change acknowledged the role of black carbon in atmospheric warming in their 2007 reports. EPA

published a literature review and analysis of the role of black carbon in global climate forcing in 2011.

Carbon dioxide is the focus, and rightly so, to reduce the human influence on climate change. Many reduction strategies have been identified and are in place. However many observers, including the Oregon Global Warming Commission, conclude that implementation has not been as comprehensive as is needed to achieve climate goals in the desired timeframe. The United Nations Environment Programme published a report in 2017 highlighting the gap between available and needed emission reductions in order to meet the goal to keep the global temperature increase below 2° Centigrade by 2100. This report highlights the need to incorporate additional strategies focusing on short-term climate forcers like black carbon and methane. Overall reductions in carbon dioxide are a critical and necessary step to maintain global temperatures within the range in which humans are adapted and thrive. Given the “emissions gap”, there is an urgency to address other forcers, with more immediate impacts, that can also play a critical role.

23. Supports the school bus replacement proposal but with a recommendation for prioritizing electric school buses. (Commenter 10)

Response: DEQ expects to see electric school buses among those projects that will be funded from the Mitigation Funds. DEQ will fund electric school bus projects as they are presented by districts participating in this program. As noted before, battery electric vehicles offer distinct advantages both environmentally and operationally.

24. Encourage funding a pilot project or two for electric school buses. Despite an initial cost differential, electric school buses will result in lower operating costs and of course are zero emission. Funding these pilots will drive the market resulting in lower costs. (Commenter 14)

Response: The Environmental Mitigation Funds can support a number of electric school buses presented as replacements for older diesel buses. DEQ welcomes these funding requests. The number of electric buses purchased will depend more on the number of school districts that see these buses serving their operational needs. DEQ expects the bus replacement program to be implemented over four years and that electric buses will increasingly be part of the mix as the vehicles gain greater acceptance among transportation supervisors.

25. Use the funds to only pay for electric school buses. Electric buses can travel up to 100 miles on a charge, serving most of the pupil transportation needs. Electric buses cost on average only \$0.22 per mile to run compared to diesel at \$0.66 per mile. Initial costs are recouped when considering health and welfare benefits. (Commenter 7)

Response: Electric buses have lower operating and maintenance costs. While several districts have expressed interest in them, it is not at all clear that there is current demand sufficient to fulfill the targeted goal. For the reasons cited earlier, the Mitigation Fund can and will be used to replace older diesel buses with lower emission alternatives, anticipating that battery electric buses will increasingly be part of replacement projects.

26. Supports initial targeted expenditure for school bus replacement but recommends the state should further target funding for electric school buses only. Recommends funding 110 percent of incremental costs for bus purchase and charging infrastructure. Given likelihood of future review by the Legislature, Proterra recommends setting aside the balance for electric transit buses as a better fit towards achieving the plan's stated goals. Park City Utah is an example of a location where electric transit buses have improved energy efficiency (electric at 22 MPGe as compared to 4 MPG for the diesel) and lower cost per mile (\$0.30 for electricity versus \$0.63 for diesel) while displacing ~32,000 gallons of diesel fuel in the first four months alone and associated emissions. (Commenter 3)

Response: Offering incentives that exceed the purchase cost is an extravagant and ineffective use of the limited funding available. As for future projects, replacement of older diesel transit buses with lower emission vehicles, including battery electric, is an eligible and attractive source category because of the heavy use in more densely populated areas. This will likely be a consideration when evaluating expanding the scope of fundable projects.

27. Encourages the state to consider selecting school districts other than random draw of numbers. Consider each district's ability to generate revenue (assessed value per student) and each district's poverty rate instead. These data have already been compiled by the Oregon Department of Education's Facilities Department and is available on the ODE website. (Commenter 2)

Response: The suggested financial scoring is used by the Department of Education to identify school districts that may be the most financially challenged in providing locally derived funds for capital improvement projects. While this is a useful tool for its intended purpose, the school bus replacement program affects a larger universe that include all owners of school buses, e.g., private schools and Head Start programs, not factored into the Department of Education's scoring. Nonetheless, DEQ assessed the financial scores of the selected districts for VW funded replacements as compared to those not selected and found there was no significant difference on financial scores between the two groups.

28. Cleaning up school buses is an appropriate first use. A lottery system for selecting districts does not acknowledge other important considerations like districts with higher populations of low-income and students of color. These students are more likely to live in areas with cumulative environmental health threats. (Commenter 14)

Response: This is an important point but it would require school districts to engage in an application process creating more work for both the district and the agency in preparing and assessing application materials with an added risk that small districts would not respond due to lack of resources. In fact, the Department of Education conducts annual surveys of school transportation activity and regularly finds that smaller districts are not always responsive to the survey requests. Diesel buses have been shown to be self-polluting, meaning that students everywhere regardless of other socioeconomic factors are at risk and a generally applicable program still delivers positive health results.