Submitted via email to paula.wilson@deq.idaho.gov

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RE: ADOMANI Comments on Idaho's Use of Volkswagen Settlement Funds

Dear Ms. Wilson –

The Environmental Mitigation Trust (EMT) and the $17.3 million it will yield for Idaho represents an unprecedented opportunity to support long-term investments toward a zero-emission transportation sector while simultaneously prioritizing children and clean air. As the President and CEO of ADOMANI, Inc. (ADOMANI), I have outlined recommendations that addresses how Idaho can support innovative and transformative all-electric vehicle projects, which will reduce nitrogen oxide (NOx) and greenhouse gas (GHG) emissions, deliver air quality benefits to disadvantaged communities and areas disproportionately affected by diesel pollution, and reduce our dependence on petroleum fuels.

Specifically, we commend the Volkswagen Environmental Mitigation Plan Advisory Committee on its proposed allocation of 35 percent of state funds for medium- and heavy-duty trucks and school, shuttle, and transit bus projects. However, for the reasons outlined below, we recommend that the state increase this amount in order to better address localized air quality and environmental justice issues in priority counties.

ADOMANI manufactures the zero-emission All American RE electric bus chassis for the Blue Bird Corporation, which is part of our premier product line of medium- and heavy-duty all-electric vehicles. Our All American RE school bus offers battery capacities between 100 kWh and 150 kWh, with an expected 80- to 100-mile range on a single charge. ADOMANI has demonstrated experience in the new and conversion markets, the latter of which helps our customers cost-effectively repower to all-electric or hybrid drivetrains. As a testament to our team's long-standing industry leadership, ADOMANI takes pride in our relationships with trusted service partners to address customers' specific needs.

While the EMT gives Idaho the flexibility to fund a variety of conventional and alternative fuel on- and off-road vehicle projects, **we believe that all-electric school bus projects will provide the most comprehensive suite of benefits**. This includes zero emission vehicle operations in direct proximity to sensitive receptors and disadvantaged communities, reduced operating costs for budget-constrained school districts, no need for diesel fuel storage or procurement, and improvements to public health, particularly among children.

The market for advanced transportation technologies has grown steadily in recent years and we hope to support Idaho continue this trend with the deployment of all-electric vehicles. Our recommendations below outline how your state can do just that and we look forward to working with your team to ensure a successful roll-out of funds.

The EMT Provides Idaho with the Opportunity to Fund Innovative and Transformative Transportation Projects

The medium- and heavy-duty diesel transportation sector is the leading source of mobile source NOx emissions from vehicles in Idaho, accounting for 55 percent of the total.[1] By directing funds towards projects that reduce these emissions sources, Idaho can most effectively mitigate these emissions' harmful air quality and health impacts.

While aging diesel-fueled vehicles generate the most mobile source NOx emissions, some medium- and heavy-duty fleets have turned to gaseous fuels, such as compressed natural gas (CNG) and propane autogas, to help mitigate NOx emissions. These, however, are temporarily solutions – President Barack Obama, in his 2014 State of the Union address, referred to natural gas as a "bridge fuel."[2] Fortunately, there are now commercially available all-electric and hybrid-electric medium- and heavy-duty vehicles on the other side of the bridge. Recent technology advancements in the electric vehicle technology market have allowed technology providers heretofore unprecedented access to these markets and fleets can now select from an increasing array of zero-emission and hybrid options.

States across the U.S. have taken strides to fund the advancement of clean transportation solutions. Incentive programs, such as California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) and the New York Truck – Voucher Incentive Program (NYT-VIP), catalyze the growth of the electric vehicle market, while providing significant air quality and climate benefits. ADOMANI encourages Idaho to recognize the merits of these programs and recommends that you support their proliferation by creating a similar program with your state's allocation of Volkswagen funds.

All-Electric School Buses Improve Air Quality and Public Health for Children and Adults via Unparalleled NOx Reductions

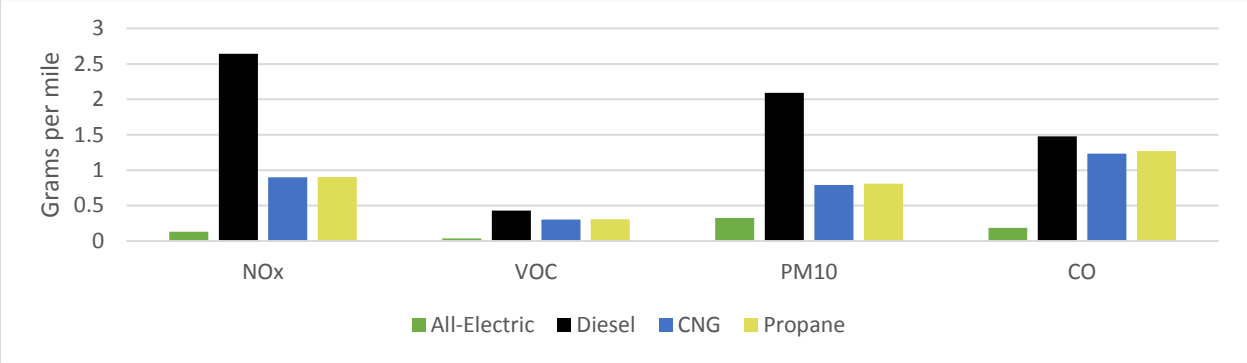
By supporting the conversion of school bus fleets to all-electric operations, ADOMANI will support your state's efforts to dramatically reduce NOx emissions. ADOMANI's school buses deliver immediate NOx and GHG emissions reductions, thus improving air quality for child passengers and adult vehicle operators, which are otherwise exposed to respiratory irritants on a regular basis.

[1] "2014 National Emissions Inventory (NEI) Data". United States Environmental Protection Agency. https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data.

[2] "President Barack Obama's State of the Union Address". The White House, Office of the Press Secretary, January 28, 2014. https://obamawhitehouse.archives.gov/the-press-office/2014/01/28/president-barack-obamas-state-union-address.

Most relevant to the Volkswagen funds, we find it important to first focus on the settlement's main objective: reduce NOx emissions. Figure 1 below compares the performance of various fuel types in heavy-duty school buses, which makes clear that electric vehicle technologies should be a top priority.

Figure 1: Emissions Benefits (grams per ton) of All-Electric Heavy-Duty School Bus vs. Other Fuel Types[3]



These emissions reductions correlate directly with air quality and public health benefits. According to the EPA's Diesel Emissions Quantifier, the replacement of just one diesel school bus with an all-electric model will generate $20,000 in public health benefits each year.[4] These benefits represent the dollar value of health benefits generated from reducing the population's exposure to PM2.5 emissions and include the reduction of premature mortality, chronic bronchitis, asthma attacks, non-fatal heart attacks, and other health problems. In school bus applications, these emissions reductions are particularly important, given that children's exposure to harmful air pollutants may be 5-15 times higher inside the bus.[5]

A recent study by the University of Delaware evaluated the costs and benefits associated with a V2G-capable electric school bus compared to a traditional diesel school bus.[6] The study looked at a variety of data points and metrics to compare the fuel types in a school bus application and found that diesel school buses created public health costs of $0.08 per mile. This is 800% more expensive than the public health costs of an all-electric bus, which is just $0.0149 per mile.

Idaho Should Prioritize Projects that Deliver Total Cost of Ownership Benefits to State School Districts

All-electric school buses deliver total cost of ownership benefits that far exceed any of its conventional and alternative fuel competitors. We have provided the infographic below to demonstrate these benefits.

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[3] Figure 1 contains the best available current data from seventeen different studies and air emission analyses, including emissions data reported by the U.S. Environmental Protection Agency, U.S. Department of Energy, and Argonne National Laboratory.

[4] "Diesel Emissions Quantifier." U.S. Environmental Protection Agency, https://www.epa.gov/cleandiesel/diesel-emissions-quantifier-deq. Analysis assumes MY 2000 diesel school bus; annual diesel fuel consumption of 1,360 gallons, annual VMT of 14,084, and 107 idling hours per year (these are EPA DEQ default values).

[5] "Electric School Buses Feasibility in Vermont". Vermont Energy Investment Corporation, May 2016. https://www.veic.org/docs/resourcelibrary/veic-electric-school-bus-feasibility-study.pdf, page 6.

[6] Noel, L. and McCormack, R. "A Cost Benefit Analysis of a V2G-Capable Electric School Bus Compared to a Traditional Diesel School Bus". University of Delaware, 2014. https://www1.udel.edu/V2G/resources/V2G-Cost-Benefit-Analysis-Noel-McCormack-Applied-Energy-As-Accepted.pdf.

ADOMANI

ALL-ELECTRIC SCHOOL BUSES

PURCHASE

	ALL-ELECTRIC*	DIESEL**
o **MSRP** (including 8% tax)	$347,750	$139,100
o **VW Settlement Incentive Amount** (at Incremental Cost)	($208,650)	N/A
o **Customer Cost**	$139,100	$139,100

$0

Additional Investment Required
(for Zero-Emission Buses)

OPERATIONS

	ALL-ELECTRIC*	DIESEL**
o **Maintenance**	$1,770	$9,075
o **Diesel Fuel**	N/A	$5,930
o **Battery Power**	$2,714	N/A
o **Cost of Ownership** (Annual)	$4,484	$15,005

$10,521

Annual Zero-Emission Savings
(Versus Diesel)

SAVINGS

	ALL-ELECTRIC*	DIESEL**
o **Cost of Ownership** (Over 15 Years)	$67,260	$225,075
o **New Battery** (at Year 8)	$45,600	N/A

$112,215

Zero-Emission Savings
(Over 15-year Lifetime Versus Diesel)

Your state can provide the incentives required to deploy all-electric vehicles at no additional cost to consumers, which will generate substantial annual and full-life total cost of ownership benefits

* Blue Bird All American RE Electric Bus

** Conventional Diesel Bus

As shown above, Idaho has the opportunity to provide incentive funding capable of generating tremendous annual cost savings for school districts throughout the state. In other words, for every dollar invested in all-electric school buses, Idaho can mitigate public health concerns for the most susceptible of disadvantaged communities, generate cost savings for budget-constrained school districts, and support the advancement of innovative clean transportation technologies.

Idaho Should Account for the "Beyond Transportation" Benefits of All-Electric and Hybrid-Electric Vehicles

All-electric vehicles provide benefits beyond emissions reductions and safe transportation. These vehicles' battery systems serve as a valuable and reliable energy resource that can be exported from the vehicles. In other words, ADOMANI's all-electric vehicles can provide utilities and homeowners with access to power during emergencies or peak demand. Indeed, recent research has shown that vehicle-to-grid (V2G) systems can decarbonize transportation, support load balancing, and increase revenues for electricity companies and create new revenue streams.[7] V2G and other strategies, including vehicle-to-load and off-grid storage, will play a key role in your state's energy infrastructure future. We hope to support that future with ADOMANI's all-electric and hybrid vehicle technologies.

Conclusion – Prioritize our Children and Clean Air

The market for all-electric and hybrid vehicles has grown steadily in recent years due to technology advancements and greater private sector involvement. Furthermore, production costs continue to decrease and battery capabilities have improved.[8] We anticipate that the demand for these vehicles will continue to grow as further advancements continue to drive down prices.

ADOMANI works closely with industry leaders to develop technologies that meet consumer needs and exceed their expectations. The team behind the design, development, and deployment of our vehicles has decades of experience in the school and transit bus and commercial vehicle industries.

Importantly, we have relationships with key school and electric utility officials in Idaho, which will allow the ADOMANI team to work hand-in-glove with local school transportation officials to ensure their drivers and maintenance personnel are fully trained on the successful operation and ownership of these technologically advanced vehicles. We are also able to work with the local electric utility to advise on any needed vehicle charging infrastructure. Our goal is nothing less than 100% satisfaction for our customers and a seamless integration of these vehicles into local fleets.

Recognizing the need for Idaho to reduce NOx emissions, generate economic benefits, and deliver environmental justice benefits while also providing fleets with total cost of ownership benefits, ADOMANI

[7] Sovacool, B. et al. "The Future Promise of Vehicle-to-Grid Integration: A Sociotechnical Review and Research Agenda". Annual Review of Environment and Resources, Volume 42, 2017. http://www.annualreviews.org/doi/abs/10.1146/annurev-environ-030117-020220.

[8] Schlosser, N. "Can Electric School Buses Go the Distance?" School Bus Fleet, May 23, 2016. http://www.schoolbusfleet.com/article/713421/can-electric-school-buses-go-the-distance.

recommends that you create competitive funding opportunities for all-electric and hybrid-electric vehicles.

We offer our support in the rollout of the Environmental Mitigation Trust funds and, towards that end, we request the opportunity to meet with you to discuss our recommendations further. Should you have any follow-up questions please contact me at (949) 200-4613 or via email at jim.r@adomanielectric.com.

Sincerely,

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Attachment - Public Input to the Idaho Beneficiary Mitigation Plan

1. *Should Idaho consider using trust funds on government as well as non-government owned vehicles and/or facilities?*

Yes, Idaho should allocate trust funds for municipal and government fleet projects provided that these projects align with the state's goals of providing significant emissions reductions for high vulnerability communities such as those served by school districts and transit fleets. Further, we encourage Idaho to make the funds competitive in that applicants should be motivated to propose the highest cost-share feasible in order to stretch the state's dollars.

2. *How can Idaho best maximize the air quality benefits resulting from the trust?*

All-electric vehicles fully reduce tailpipe emissions and electric propulsion is especially important for school buses, as emissions levels may be ten to fifteen percent higher inside the vehicles. In addition, Idaho can help stimulate further adoption of zero-emission technologies by incentivizing first movers in the medium- and heavy-duty vehicle market, thereby creating long-lasting benefits beyond the Volkswagen settlement funds. When considering the air quality benefits of a project, we commend Idaho on its plan to prioritize projects that take place in higher population areas or regions which do not meet national air quality standards.

3. *Should Idaho fund projects at the maximum amount eligible under the trust or should Idaho fund some or all projects at a lesser amount in order to best maximize the use of funds?*

Idaho should fund projects at the level which will realistically encourage technology adoption and remove significant barriers to adoption. For example, public fleets that service a large percent of the population may have limited capital funds; thus, lowering the capital barrier to entry will be a huge boon to these fleets and provide the most benefits directly to the most people. With that in mind, we recommend that Idaho allow the applicants to propose their own cost-share levels in funding applications. We feel that this will create the most competitive funding programs and increase the cost-effectiveness of the state's funds.

4. *Should Idaho set aside funds for particular categories of projects or applicants?*

Yes, Idaho should prioritize projects that benefit the most vulnerable populations. Further, school bus fleets service a particularly vulnerable portion of the population – children. Idaho should take steps to ensure that they receive the direct benefits from this funding.

5. *Should preference be given to certain fuels, such as diesel, compressed natural gas, propane, hydrogen fuel cell, or battery electric?*

Yes, Idaho should prioritize zero-emission projects, such as battery electric vehicles. New diesel engines only provide marginal improvements in emissions for the amount of money invested, and even then, produce the largest amount of dangerous PM2.5 emissions of any of the eligible fuel types. While we appreciate that gaseous fuel projects provide emissions improvement over diesel, they still release NOx

and PM and do not significantly innovate Idaho's transportation sector. Thus, the most viable solution is the prioritization of zero-emission vehicle technologies.

6. *What are the costs and benefits of replacing or repowering vehicles with "alternate fueled" or "all-electric" engine technologies, as defined by Appendix D-2 of the Consent Decree?*

The most significant barrier to entry for all-electric vehicles is capital cost, though each year has in succession seen dramatic decreases in this hurdle due to innovations in battery size and drivetrain design. Further, these high initial costs are mitigated by dramatically reduced operating and maintenance costs, compared to both conventional and alternative fuel vehicles. There are multiple benefits of all-electric vehicles: lower fuel costs, which helps put money back in the pockets of fleets; non-transportation benefits, such as vehicle-to-grid and load balancing capabilities; and complete elimination of tailpipe emissions and their associated human health costs.

7. *What percentage of trust funds, if any, should Idaho devote to light-duty ZEV supply equipment?*

While the Volkswagen settlement is largely focused on medium- and heavy-duty vehicles, we do appreciate the role that light-duty vehicles play in the state's overall emissions profile. We thus encourage the state to allocate the maximum fifteen percent of its funds towards light-duty ZEV supply equipment. Successfully doing so will not only help reduce range anxiety and spur the adoption of future electric vehicle sales, but it will also parallel with the deployment of larger electric vehicles in the medium- and heavy-duty markets.

8. *Should Idaho expend trust funds on the DERA option?*

The VW mitigation fund is a once-in-a-generation opportunity for Idaho to remove barriers and gain momentum towards a clean transportation sector. Idaho should focus funding on projects that not only provide emission reductions, but also help Idaho revolutionize and set itself up for future success in technology adoption and cleaner air. Historically, the DERA option has primarily funded diesel replacement and retrofit projects, such as low rolling resistance tires, idle reduction technology, auxiliary power units, etc. We therefore recommend against the use of the DERA option and instead urge the state to implement funding programs that best advance the goal of a clean energy future.

In our experience, rebate programs, such as California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) and the New York Truck – Voucher Incentive Program (NYT-VIP), have proven the most effective in quickly and efficiently allocating money to viable projects. We recommend that Idaho replicate the successes of these programs and implement a similar structure.

9. *What is the best method or approach to determine whether a proposed project will benefit areas that have been disproportionately impacted by emissions of NOx or other pollutants (and information about such impacts in particular areas of Idaho)?*

As noted earlier, we commend Idaho on its efforts to prioritize projects by geography and population impacts. In particular, we find the state's proposed project evaluation matrix to be transparent and effective in its design. We raise the following two questions about the matrix:

- What threshold will be given to determine the level of cost-effectiveness? In other words, how will Idaho objectively determine what is “least,” “middle,” and “most” cost-effective?
- Similar to the previous question, how will Idaho objectively determine the population impacted?

10. *How should the State of Idaho conduct public outreach (e.g., in-person public meetings, presentations to stakeholder groups, Facebook posts, tweets, written comments, and traditional media)?*

We commend Idaho on its transparency and its public outreach efforts. We urge the state to continue along this path and, for all future public comments, recommend that Idaho allow stakeholders to join virtually via webinar or conference call.

11. *What additional factors, if any, should the State of Idaho consider in its public outreach?*

When conducting outreach, Idaho should strongly consider the full range of benefits that funding different technologies and vehicle types will provide. The VW funding is more than an opportunity to provide emission reductions; Idaho has the opportunity to commit itself to healthy air for its citizens, adapt to the quickly changing transportation landscape, and make wise energy investment decisions that will put provide total cost-of-ownership benefits to fleets. Idaho should also ensure that the most vulnerable populations are reached through its public outreach.