



State of Oregon Department of Environmental Quality

Recommendation for Using VW Appendix D Funds for Light Duty EV Charging Infrastructure

Contact: Cory-Ann Wind
700 NE Multnomah Street, Suite 600

As directed by Governor Kate Brown's Executive Order on Zero Emission Vehicles¹ (ZEV EO), DEQ, in partnership with ODOT, ODOE and OHA (collectively referred to the ZEV Interagency Workgroup or ZEVIWG), developed a straw [proposal](#) to use a portion of the VW Appendix D funds (up to 15 percent of the state's allocation) to develop and maintain light duty electric vehicle (EV) charging stations. In Oregon, 15% of the VW's total settlement is approximately \$10.9 million.

The proposal included three parts:

- Part A - Upgrading the West Coast Electric Highway (WCEH);
- Part B - Installing Level 2 (L2) chargers at Multi-Unit Dwellings (MUDs); and
- Part C - Filling in Gaps in the Charging Network with New Direct Current (DC) fast chargers.

DEQ specifically requested feedback from stakeholders, guided by the following key questions:

1. How would you allocate the money among the three parts? Are there other projects or categories of projects not listed that would be a better use of these limited funds?
2. Do you have an alternative to Part A of the proposal for upgrading the WCEH?
3. Do you have an alternative to Part B of the proposal for providing Level 2 chargers at MUDs?
4. Do you have an alternative to Part C of the proposal for establishing new DC fast-chargers in underserved areas?
5. What criteria, data or other information should be used to help identify underserved areas, low-income populations and areas of the state disproportionately impacted by air pollution for which relief could be provided by electric charging infrastructure?

DEQ opened a public comment period from June 5 to July 25, 2018, seeking comments on the proposal. This document serves to summarize those comments at a high level and changes to the proposal as a result of those comments. This final version is a non-binding recommendation from the participating agencies, as directed by the ZEV EO. The Oregon Legislature must act to approve future uses of VW Appendix D funds in Oregon and this process is intended to inform their consideration.

Summary of comments

DEQ received comments from 78 different entities (individuals and organizations). Of those comments, 69 were supportive of using up to 15% of the VW Appendix D fund for EV charging

¹ No. 17-21, available here: https://www.oregon.gov/gov/Documents/executive_orders/eo_17-21.pdf

infrastructure and 8 recommended all of the VW Appendix D funding be used for mitigating emissions from diesel engines. In addition, approximately 728 Sierra Club members commented via email in support of using up to 15% of the VW Appendix D fund for EV charging infrastructure. All comments can be found [here](#).

The comments are sorted into ten major categories, as follows:

Category	Summary
1	General support of the straw proposal
2	Do not support the straw proposal: <ul style="list-style-type: none"> • Use funds to maximize diesel particulate matter (PM) reductions • Electrify America will invest in chargers • Retrofit or replace dirty diesel engines • EV not the most cost-effective in low income communities • EV only after all available avenues for diesel reductions are exhausted
3	Consider these factors when developing the formal plan: <ul style="list-style-type: none"> • Support the ZEV EO (i.e. be able to be implemented by 2020) • Statewide EV charging infrastructure plan • Other similar efforts (i.e. Electrify America) • Use of Congestion Mitigation for Air Quality (CMAQ) funds to match • Public-private partnerships
4	Engage with these parties when developing the formal plan: <ul style="list-style-type: none"> • Utilities • Current hosts • Charging providers • Communities
5	Consider these factors when designing charging stations: <ul style="list-style-type: none"> • CHAdeMO, combined charge standard (CCS), Tesla & L2 capabilities • Multiple hook-ups • Future-proofed (i.e. up to 350kW) • Flexible payment options • Demand-response ready (i.e. for smart applications) • High-utilization scenarios (i.e. TNC)
6	Several suggestions for specific locations to site charging infrastructure.
7	Consider these factors for MUDs: <ul style="list-style-type: none"> • What is the best technology (L1 vs. L2 vs. DC) • Limits to access (just residents vs. public) • Charges • Grants vs. paying for chargers • Complement Charge Ahead Rebate program • Require MUDs w/ parking to provide charging • Use light poles • Focus on non-attainment areas • Be coupled with energy efficiency projects

8	<p>Suggestions for additions to the straw proposal:</p> <ul style="list-style-type: none"> • Hydrogen fueling infrastructure • Focus on government properties • Focus on workplaces • Focus on key destinations
9	<p>Comments on Equity Considerations:</p> <ul style="list-style-type: none"> • Emphasis on equity might result in underutilized chargers • Accessible to disabled persons • Additional criteria to identify communities (federal poverty level & % area-median income) • Consider # of residents that own an EV, # of chargers available, % residents commuting to work outside the community, average length of commute, # of diesel vehicles violating emission standards, # of electric public transit buses and other transportation options, projected # of EVs sold over 10-year period • Consult with community-based organizations, local governments, housing authorities • Use EJScreen
10	<p>Comments outside the scope of straw proposal:</p> <ul style="list-style-type: none"> • Increase budget for operations & maintenance • Fund education & outreach activities • Consider VW Settlement Appendix C investments • Electrification of heavy duty vehicles • Compressed natural gas infrastructure • No EV chargers until more roads are built • Incentive to upgrade residential charging to L2 • Fund deployment of ZEVs • Consider public health and social cost of carbon to calculate return on investment for projects that are funded

General response to comments

DEQ thanks all of the commenters for their input and perspective. DEQ and our partner agencies have considered all of your comments and made modifications to the proposal described below. Your time and energy in this effort are appreciated. We received ample responses to the key questions that were posed to stakeholders and feel that we are better informed to recommend a final proposal as we move forward.

The Changing Context for EV Infrastructure Investments in Oregon

Since the proposal was released for comment, the following actions have taken place that are related to investments in EV charging infrastructure:

- As of the end of 2018, [Electrify America](#) has opened or will soon be opening 10 new locations along I-5 and I-84. Some of these locations overlap with those in the WCEH network.

- The SB 1547 Transportation Electrification plans for the two largest utilities are now being implemented and both contain investments for new EV infrastructure. Among other activities, [Portland General Electric](#) will partner w/ TriMet to provide charging equipment for their new electric buses and create 6 multi-charger public charging pods in the style of their Electric Avenue in downtown Portland. [PacifiCorp](#) will install up to 7 public charging sites and provide grants to non-residential customers to install chargers.
- The [UM 1826 Clean Fuels Program plans](#) for Portland General Electric and PacifiCorp must be submitted to the Oregon Public Utility Commission by March 31, 2019 and may contain additional EV infrastructure projects.
- ODOT has completed additional analysis with respect to the West Coast Electric Highway. In the initial proposal, ODOT proposed upgrading all 44 locations to include both CHAdeMO and CCS connectors and adding new DC fast chargers to 12 of the network's highest-utilization locations. This is now referred to as Option 1 and is shown here:

Option 1			
Upgrades to the WCEH		Capital & Installation	8 Years Operation & Maintenance
Upgrades - Single Charger	32	\$1,971,000	\$1,338,000
Upgrades - Dual Chargers	12	\$2,098,000	\$753,000
Subtotal		\$4,069,000	\$2,091,000
Appendix D Funds (80%)		\$4,928,000	
Matching Funds (20%)		\$1,232,000	
Total Project Cost		\$6,160,000	

Since then, ODOT has also proposed a second option which represents adding the CCS connectors but no additional locations. This is Option 2 and is shown here:

Option 2			
Upgrades to WCEH		Capital & Installation	8 Years Operation & Maintenance
Upgrades - Single Charger	44	\$2,711,000	\$1,840,000
Appendix D Funds (80%)		\$3,640,800	
Matching Funds (20%)		\$910,200	
Total Project Cost		\$4,551,000	

While this level of upgrades would not address queuing at high-usage locations via the installation of a second charger, it would ensure that the network is accessible to the range of EVs that will be deployed on Oregon roads in the years to come, and would sustain the operation of the network for an additional eight years according to ODOT's analysis.

- DEQ has begun to implement parts of the Oregon Clean Vehicle Rebate Program approved by the 2017 Legislature. The [Standard EV Rebate](#) provides up to \$2,500 towards the purchase or lease of a new full-battery or plug-in hybrid EV and the [Charge Ahead Rebate](#) provides low- and moderate-income households up to an additional \$2,500 towards the purchase or lease of a new or used full-battery EV. Charge Ahead complements the standard rebate and aims to promote the adoption of EVs by underserved and lower-income communities so that they can benefit from the cheaper fuel, lower operating costs, and improved air pollution associated with EVs. At least \$1 million per year is set aside to fund this program, potentially reaching 400 low- and moderate-income households. Charge Ahead funds can only be used towards the vehicle so it is critical to identify other funds, such as the VW Appendix D fund, that can be used to develop and deploy the EV charging infrastructure needed to complement this program.

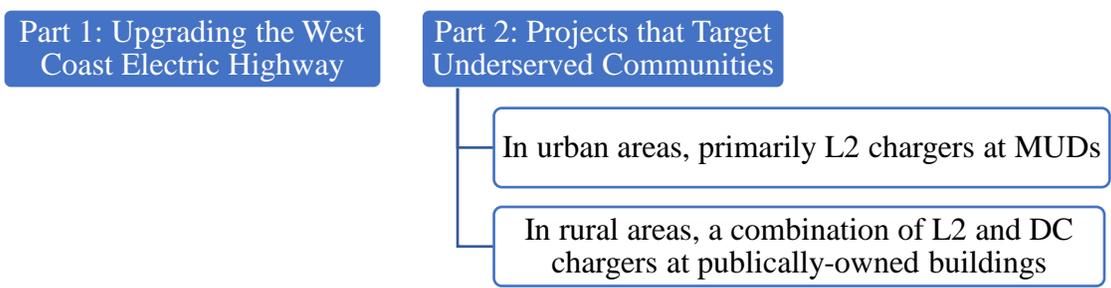
Taken together, these developments in the existing and anticipated investments in EV charging infrastructure clarified the gaps the VW Appendix D funds could fill.

Changes to the Proposal

The comments received from stakeholders are mostly supportive of the opportunity to use up to 15% of the VW Appendix D funds towards light duty EV infrastructure. Key differences in the comments came in the details about what factors to consider and who to collaborate with should the legislature move to authorize the remaining VW Appendix D funds. The revised proposal reflects a greater emphasis on supporting underserved communities throughout Oregon.

The ZEVWIG also researched information about where priority populations in Oregon live and how to promote equity in access to EV charging for people across the state. A preliminary analysis indicates that the need for EV charging infrastructure differs greatly between urban and rural areas. In urban areas, chargers are needed at or near multi-unit dwellings such as apartment complexes; and in rural areas, chargers are needed at publicly-owned buildings such as city halls, libraries, health clinics, etc. Further analysis would be required to identify specific areas to site EV chargers.

Based on these considerations, together with ODOT’s analysis of options for upgrading the West Coast Electric Highway, the proposal was reorganized to focus on two main areas instead of the original three.



This table lays out two potential scenarios for the funds to be divided:

Total Budget	Part 1: Upgrading the WCEH		Part 2: Projects that Target Underserved Communities
\$10,900,000	Option 1	\$6,160,000	\$4,740,000
	Option 2	\$4,551,000	\$6,349,000

Under Option 1, the \$6.16 million investment in the West Coast Electric Highway results in upgrades to the 44 existing chargers and 12 new chargers, leaving \$4.74 million to support projects targeting underserved communities out of the total \$10.9 million (15% of the VW Appendix C funding).

Under Option 2, the \$4.551 million investment in the West Coast Electric Highway results in upgrades to the 44 existing chargers, leaving \$6.349 million to support projects targeting underserved communities out of the total \$10.9 million (15% of the VW Appendix C funding).

Cost Assumptions

The above scenarios assume the approximate per-charger cost for a Level 2 charger is \$5,000 with 60% (\$3,000) funded by VW Appendix D funds and the remaining 40% (\$2,000) covered by matching funds. This amount would cover installations at a multi-unit dwelling or at a publically-owned building. The approximate per-charger cost for a DC fast charger is \$41,816 with 80% (\$33,453) funded by VW Appendix D funds and the remaining 20% (\$8,363) covered by matching funds. The following table represents the maximum number of chargers that could be funded by VW Appendix D funds:

	Level 2 Chargers	DC Fast Chargers
Appendix D Funds	\$3,000/charger	\$33,453/charger
\$4,740,000	Max 1,580	Max 142
\$6,349,000	Max 2,116	Max 190

Next steps

This recommendation will be posted on [DEQ's Clean Diesel webpage](#) and used to inform future discussions about the use of the VW Appendix D funds.

Alternative formats

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.