



December 23, 2016

Wayne Killen
Senior Director, Charging Infrastructure Planning and Operations, Electrify America, LLC
VOLKSWAGEN Group of America, Inc.
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Herndon, VA 20171

Dear Mr. Killen,

As the Governors of the States of Oregon and Washington, we are pleased to jointly submit the “Pacific Northwest Zero Emission Vehicles Investment Proposal.” To date, our states have shown a strong market interest and early adoption of electric vehicles, with the second- and third-highest market shares for electric vehicles (EVs) in the nation. This proposal outlines a vision for a transformative investment that can drive the market for EVs in our states from early adoption into the mainstream.

Oregon and Washington offer this joint vision for zero-emission vehicle (ZEV) investment in the Pacific Northwest to build on our history of regional partnership and coordination on electric vehicles and supporting infrastructure. Through efforts like the Pacific Coast Collaborative, Oregon and Washington have worked with California and British Columbia to set common greenhouse gas reduction goals and identify strategies for meeting them, including by electrifying the transportation sector. Among the many commitments in the *Pacific North America Climate Leadership Agreement*, which we signed with the Governors of California, Premier of British Columbia, and six West Coast mayors on June 1, 2016, we committed to “create a comprehensive Pacific Coast charging network along major highway systems from Southern California to British Columbia and accelerate the deployment of residential, workplace, and public charging infrastructure in major population centers.” This commitment builds on our coordinated development of the West Coast Electric Highway, a first-of-its-kind corridor initiative to install a network of 56 DC fast chargers along major highways. Since its installation, the network of chargers in Oregon alone has powered more than 1.5 million miles of low-emission electric driving.

However, there is still much work to be done in expanding access to EV travel. Additional investments in DC fast-charging infrastructure will contribute to a robust and reliable charging network that covers more of our states’ travel corridors. Education and outreach efforts will help communicate the benefits of EVs to consumers who are still unfamiliar with these new vehicle technologies. A pilot program to

place EVs in ride-sharing applications can bring electric transportation to even more consumers, including those who face some of the greatest transportation challenges.

This proposal is not intended to stand alone as a list of projects we believe Volkswagen should consider. It comes accompanied by a wide network of state agencies, utilities, private businesses, local and municipal governments, NGOs, and a coalition of stakeholders in the ZEV ecosystem we built in the Pacific Northwest over the years that stands ready to assist in implementing this vision for the region. We offer the wealth of knowledge and experience among all our ZEV partners in the Pacific Northwest, knowing that by working together, our vision for clean, low-carbon transportation is attainable.

This investment proposal is therefore the first step in what we hope will be an ongoing partnership to grow the regional market for EVs, expand the EV charging network, and spur the transition to a sustainable transportation system in our states.

Sincerely,



Kate Brown
Governor of Oregon



Jay Inslee
Governor of Washington

ATTACHMENT:
Pacific Northwest Zero Emission Vehicle Investment Proposal

Pacific Northwest

Zero Emission Vehicle

Investment Proposal

Prepared by:

The State of Oregon
The State of Washington

12/23/16

Executive Summary

Oregon and Washington propose a roadmap for Volkswagen (VW) to promote zero emission vehicle (ZEV) adoption and accelerate the build-out of a comprehensive regional charging network in the Pacific Northwest. VW can rapidly develop shovel-ready infrastructure projects in the Northwest both as a new owner-operator charging company and by coordinating with other ZEV efforts already underway in the region. Washington and Oregon offer to facilitate access to the wide network of state agencies, utilities, nonprofit organizations, and private companies that are working to implement a shared vision for ZEVs, and can help to collaborate on a West Coast regional strategy for accelerating the transition to electric transportation.

1. Introduction

The States of Oregon and Washington appreciate the opportunity to provide input on Volkswagen's National ZEV Investment Fund. Our proposal offers a roadmap for VW to build out high-utilization charging along key corridors and in population centers in Washington and Oregon, while promoting accelerated adoption of zero emission vehicles (ZEVs) through innovative outreach and hands-on user experience. Working with California and British Columbia as regional partners through the Pacific Coast Collaborative—an agreement among the leaders of our four West Coast jurisdictions to create a vibrant low-carbon regional economy—our roadmap will create an integrated West Coast charging network that VW can leverage towards its vision of a national network of DC fast chargers. Oregon and Washington have already made strong initial investments in transportation electrification; the projects in this proposal would push the Northwest ever closer to a tipping point of rapid ZEV adoption by providing additional crucial charging links and density within the current system. Building out a comprehensive and regionally-integrated system will give drivers a seamless customer experience as they live, commute, and travel throughout the West Coast.

Proposed investments include:

- Over 150 specific charging sites along 15 transportation corridors and at high-utilization transportation facilities

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- Charging at high-utilization commuter infrastructure, including park-and-rides and workplace charging sites
- Charging in high-density urban areas, aligned with ambitious transportation electrification plans in Portland and Seattle, including increasing mobility in low-income areas
- Rapid acceleration and expansion of existing consumer outreach and education initiatives

Many of the proposed infrastructure sites are shovel-ready, which VW can rapidly develop as a new owner-operator charging company or in a coordinated effort with other charging providers. Proposed investments have been vetted for location and the support of enthusiastic site hosts. Recognizing that the landscape is rapidly evolving and new opportunities will continue to emerge, we also offer VW access to a strong and growing network of state agencies, utilities, nonprofit organizations, and businesses in the Pacific Northwest that are aligned around a shared vision of accelerated transportation electrification. Our state leaders and agencies can act as efficient liaisons to key partners, serving as conduits and aggregators of additional project investment opportunities. For example, we are ready to facilitate conversations with major retailers and grocery stores about additional high-utilization charging sites at their facilities.

Oregon and Washington have been early leaders in ZEV deployment, with over 30,000 battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) sold to date in our two states. Through efforts like the West Coast Electric Highway and the Pacific Coast Collaborative, our two states have pursued a policy of close collaboration on ZEV deployment, coordinating our fast charging infrastructure and setting common goals for transportation electrification and reduction of greenhouse gas emissions. In the spirit of our ongoing partnership, our states are submitting this joint Pacific Northwest ZEV Investment Proposal, which outlines a comprehensive package of near-term opportunities to transform the transportation system in the Pacific Northwest. These recommendations resulted from discussions between numerous state agencies and other regional ZEV partners, and comprise a list of projects that we hope will maximize the effect of the Investment Fund for both Volkswagen and the traveling public of the Pacific Northwest.

Oregon and Washington Provide Access to a Network of Partners Sharing a Vision of Accelerated Transportation Electrification

- State transportation, energy, and environmental agencies in Washington, Oregon, California, and British Columbia
- Washington Utility and Transportation Commission
- Oregon Public Utilities Commission
- Washington Alternative Fuels & Vehicles Technical Advisory Group
- Drive Oregon
- Public and Private utilities
- Clean Cities Coalitions
- NESCAUM

With some of the lowest electricity costs in the nation and some of the highest rates of ZEV adoption outside of California, Washington and Oregon are natural targets for a transformative investment in ZEV infrastructure. To date in 2016, Oregon and Washington have had the second- and third-highest rates of ZEV adoption in the country behind California, according to a sales dashboard published by Global Automakers.¹ Last year, the U.S. Department of Energy announced that Washington and Oregon were

¹ Global Automakers. "Driving ZEV: Sales." Available at: drivingzev.com/sales

tied for second highest rate of conventional hybrid adoption in the U.S.² The proven willingness of our citizens to embrace advanced, fuel-efficient, and low emission vehicle technology shows that the region is well-positioned to electrify its light-duty transportation sector, and Volkswagen's investment can help to secure the foundation for large-scale regional adoption of ZEVs.

Pacific Coast Vision for Transforming Transportation

Washington and Oregon envision a future where our citizens and economy benefit from an extensive and integrated electric transportation system along major Pacific Northwest transportation corridors and within population centers. As developments in battery technology extend the range of ZEVs and make them more affordable, we have the opportunity—along with our Pacific Coast Collaborative partners, California and British Columbia—to accelerate the transition to a low-carbon transportation system from San Diego to Vancouver, BC. As our regional economy grows, so will our transportation needs. It is imperative that we transition to electric transportation to lower our impact on the environment while we ensure the competitiveness of our economy and provide citizens with a range of mobility options.

Fully electrified transportation corridors, with stations every 25 to 50 miles on long-distance routes, will give ZEV drivers confidence that recharging is available when they travel between communities, make long-distance road trips, and commute to work. Knowing that charging is easy and convenient helps encourage residents and businesses to buy and drive ZEVs. Increasing market demand accelerates the adoption of ZEVs, reducing emissions from the transportation sector and dependence on foreign oil. Charging infrastructure leverages our clean power sector, which is increasingly powered by renewable sources.

Our ambition matches our vision. Through Oregon's adoption of California's Zero Emission Vehicle program, and participation in the multi-state ZEV Memorandum of Understanding, the state plans to have tens of thousands of ZEVs on the road by 2025. As a founding partner of the International Zero Emission Vehicle Alliance, Oregon has further pledged to strive to make all passenger vehicle sales in the state ZEVs as fast as possible, and no later than 2050. The uptake of ZEVs by consumers will be a main driver of Oregon achieving its goals under the state's Clean Fuels Program, which targets a 10% cut in the carbon intensity of its transportation mix by 2025. The increasing adoption of electricity as a transportation fuel has been estimated to provide 15% of the carbon intensity reductions needed for program compliance over the next ten years.

In Washington's EV Action Plan, the state has set a goal of 50,000 EVs on the road by 2020. Committed to leading by example, the Washington Governor's Electric Fleet Initiative ensures that 20% of all new state vehicle purchases are EVs beginning in 2017 and implements bulk procurement efforts across the state. Moreover, Washington state is working to expand its highway corridor fast charging network through the state's \$1 million EV Infrastructure Pilot Program funded by ZEV drivers. As outlined in Appendix A, Washington offers financial incentives to advance ZEV adoption through sales tax

² U.S. Department of Energy. "Hybrid Electric Vehicle Penetration by State." Available at: energy.gov/eere/vehicles/fact-875-june-1-2015-hybrid-electric-vehicle-penetration-state-2014

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exemptions on the purchase or lease of new ZEVs and on the installation of EV charging equipment. It's also working to increase charging at home and at work through utility incentives, and require ZEV readiness in buildings through building code changes.

The U.S. Department of Transportation Federal Highway Administration (FHWA) designated Interstate 5 as an Electric Vehicle Charging Corridor in Washington, Oregon, and California. The 1,350-mile EV Charging Corridor is the longest and most robust "signage ready" route in the nation with ZEV charging located at least every 50 miles. FHWA also designated parts of US 101 and other roadways as national EV Charging Corridors in Oregon and California.

Interstate-5 Highlights



- Interstate 5 (I-5) travels 1,350 miles through Washington, Oregon and California
- Between 71,000 and 300,000 vehicles travel on I-5 daily
- I-5 has been designated as an EV "Signage-Ready" Alternative Fuel Corridor by the US Federal Highway Administration
- EV charging available every 50 miles

Through the Pacific Coast Collaborative, we have established ambitious commitments for the entire West Coast on ZEV infrastructure, fleet procurement, and market availability and access. We have made a down payment on these commitments through the West Coast Electric Highway—an extensive, coordinated inter-state network of DC fast charging stations along major roadways and interstates from Vancouver, BC, to Baja California—towards the goal of developing a seamless regional network that enables reliable ZEV travel from border to border. Similarly, we are working together with our West Coast partners to implement West Coast Electric Fleets, a regional initiative providing technical support and tools to expand the use of ZEVs in public and private fleets.

Our efforts in Oregon and Washington are fully aligned with our regional partners, California and British Columbia. As in Oregon and Washington, California's near-term investment priorities are public ZEV infrastructure and consumer outreach. California is encouraging investments that are complementary and additional to existing or planned charging infrastructure, with a preference for workplace charging, DC fast charging, and multi-unit dwelling charging. California seeks to enhance existing awareness campaigns (e.g. California PEV Collaborative) and accelerate experiential marketing, such as ride and

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drive opportunities and displays. California also encourages significant electric transportation investments in low- and moderate-income communities across the state.

British Columbia's 10-year transportation plan includes the Clean Energy Vehicle Program, which provides strong incentives for EVs supported by aggressive charging infrastructure installations. These efforts have led to the purchase of 2,700 electric and hydrogen fuel cell vehicles and the development of over 1,100 charging stations in the province. British Columbia leads Canada in clean energy vehicle sales per capita. Transportation electrification is a vital component of the province's low carbon fuel requirement, which is driving innovation and growing the diversity of commercially available low carbon fuels, leading to the avoidance of over 2.3 million tons of GHG emissions between 2010–2012.

Our proposal, together with these ambitious plans by California and British Columbia, will create a “tipping point” for West Coast transportation, accelerating consumer adoption of ZEVs throughout the region.

For detailed information on significant steps Oregon and Washington have taken to support ZEVs through state policy, see Appendix A (pg. 19).

Regional Principles for Investing in Transportation

As we build on our existing work and commitments, several principles ensure that additional investment accelerates the trend toward our vision of a connected, low carbon, and equitable transportation system:

- Leverage early, visible opportunities for investment
- Leverage considerable state matching funding for infrastructure
- Attract new private sector engagement and investment
- Emphasize investments that are complementary and additional to existing or near-term public and private sector investments
- Fill gaps in connectivity among urban centers and deepen deployment in high-population areas
- Leverage existing regional networks of early ZEV adopters
- Spur innovation to transform access to electric mobility services in urban areas
- Expand existing public-private partnerships that increase access to EVs and other mobility solutions, including among lower income communities
- Utilize innovative, proven programs to build awareness and communicate benefits
- Accelerate market penetration through an integrated set of purchasing incentives and investments and infrastructure

Filling the Gaps

While Oregon and Washington have made great strides towards transportation electrification, there are still significant challenges to overcome in order to achieve true mass market adoption of ZEVs in the Pacific Northwest. The West Coast Electric Highway network of CHAdeMO DC fast chargers needs to be supplemented with SAE Combo stations. We need to extend our existing fast charging network to reach more of our citizens, allowing more people to choose to drive a ZEV. Additional Level 2 charging at retail, hospitality, and transit locations will provide ZEV drivers with convenient places to charge. We also need

to continue addressing the information gap on EVs, and the findings of recent surveys show that even after several years on the market, awareness of ZEV technology and the range of available ZEV models remains low.

This proposal provides a narrative that corresponds to the three investment areas for the National ZEV Investment Fund: Infrastructure, Consumer Outreach and Education, and Ridesharing/Ride-Hailing Applications. For this round of funding, Oregon and Washington are mainly focusing on proposed projects in the first two areas, although some early thinking relating to ridesharing is also discussed. Each section will give an overview of the current state of that topic area, offer some principles that will lead to successful and effective investments in the region, and then outline specific projects that we believe will contribute to a transformative shift towards electric vehicles.

2. Infrastructure

Public charging infrastructure is a key component of ZEV deployment. While ZEV drivers mainly charge at home for most of their day-to-day driving, Level 2 charging at retail locations and workplaces ensures that there are a range of convenient places to charge a vehicle away from home. Level 2 charging at hospitality locations can be offered as an amenity to electric vehicle drivers, who may choose their accommodations knowing that they can charge their vehicle overnight. A robust DC fast charging network allows ZEV drivers to quickly recharge their vehicles during longer trips, provides an emergency charging option for drivers low on range, and provides charging for “garage orphans” without access to home charging, as well as high-mileage ridesharing and ride-hailing EVs that may need to charge up mid-day. Eventually, a national charging network with high-power charging will grant EVs the same fueling coverage that gasoline provides for conventional vehicles today.

This section gives an overview of the existing charging infrastructure in Oregon and Washington, as well as some design principles that can be used to maximize the effectiveness of infrastructure investments, and descriptions of proposed infrastructure projects in the region.

Existing Infrastructure in the Pacific Northwest

Oregon and Washington have been early leaders in DC fast charging infrastructure deployment, having installed a network of 56 CHAdeMO stations across the two states as part of the West Coast Electric Highway. However, the DC fast charging network will also need to be expanded to more parts of our states, enabling ZEV travel for more Oregon and Washington citizens. Additionally, the increasing deployment of vehicles using the SAE Combo charging standard will require that the existing network be supplemented with dual-standard DC fast chargers.

There are currently 97 CHAdeMO fast chargers across 76 locations in Oregon and 59 CHAdeMO fast chargers in Washington. The greatest concentration in Oregon is in the Portland area, but the West Coast Electric Highway installations in Oregon cover the length of I-5, US 101, and I-84 between Portland and The Dalles, with stations approximately every 50 miles. Additional installations on OR 22, OR 126, and US 26 allow access to Madras and Bend in Central Oregon. In Washington, the greatest

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concentration of CHAdeMO is in the Seattle area, and West Coast Electric highway installations approximately every 40 miles connect Seattle to Portland to the south and Vancouver, BC, to the north along I-5, and connect Seattle and Everett to Eastern Washington communities such as Ellensburg and Wenatchee along I-90 and US 2.

The network of SAE Combo/CCS charging stations is not as extensive, with 32 chargers across 20 locations in Oregon and 48 chargers at 20 Puget Sound area locations in Washington. In Oregon,

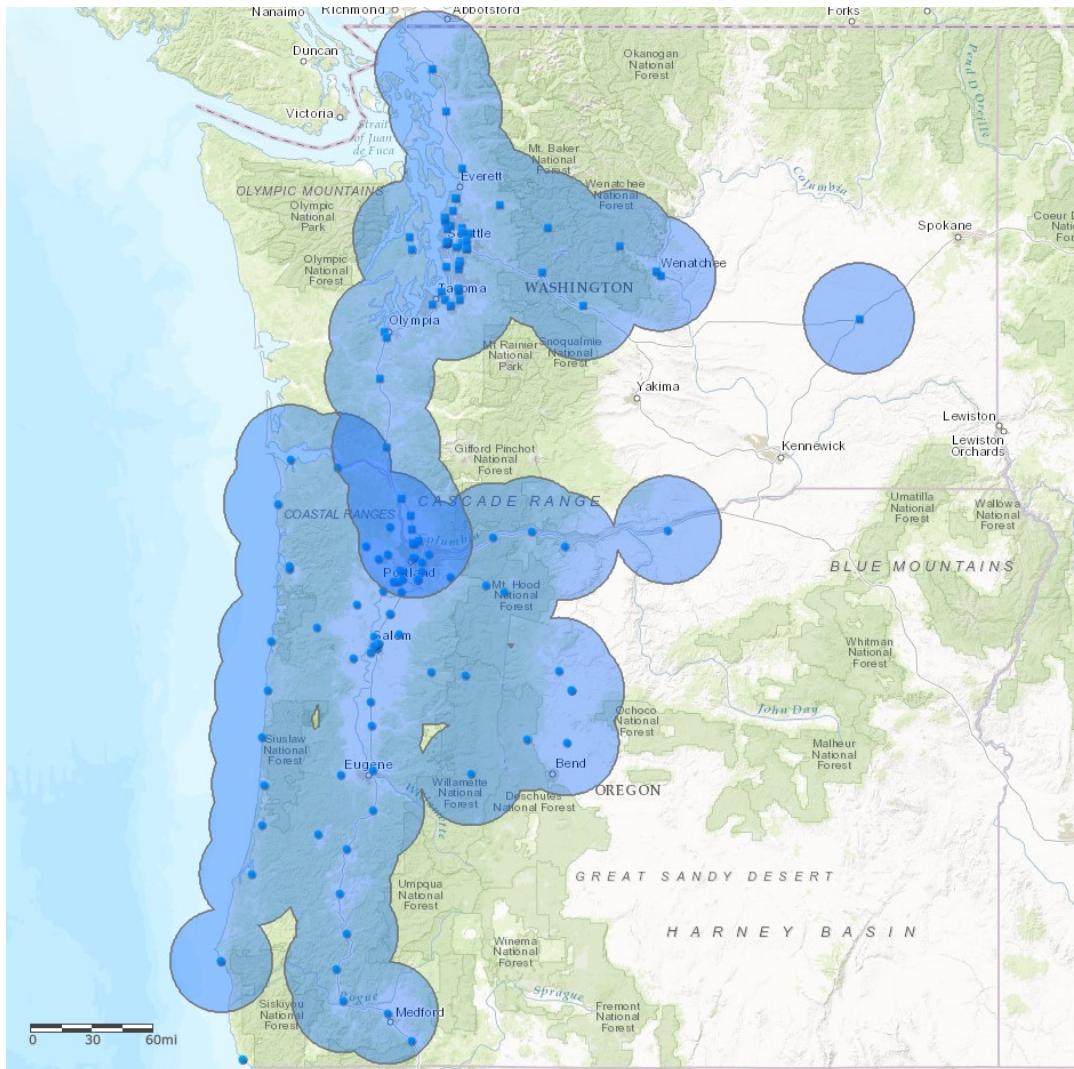


Figure 1. CHAdeMO DC Fast Chargers in Oregon and Washington
(Circles show 25-mile radius; gaps indicate more than 50 miles between chargers)

these chargers are primarily clustered in the Portland area, although a recent joint project between BMW, Volkswagen, and ChargePoint deployed seven fast chargers along the length of I-5. Two additional stations are located in Arlington and Madras, but these stations are well over 100 miles from other SAE Combo stations and are therefore isolated from the rest of the network for the current generation of BEVs. In Washington, the SAE Combo stations are clustered in the Puget Sound area in

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Western Washington. There is a 114-mile gap on I-5 between the SAE Combo chargers in Tacoma and the closest one further south in Woodland. Additionally, there is one dual-standard charger on the east side of the state in Ritzville, Washington, but it is also isolated from the rest of the network, as the closest SAE Combo charger in Washington is 191 miles away. Closing these gaps is critical to ensuring that drivers of SAE Combo vehicles are able to travel on this important north-south corridor.

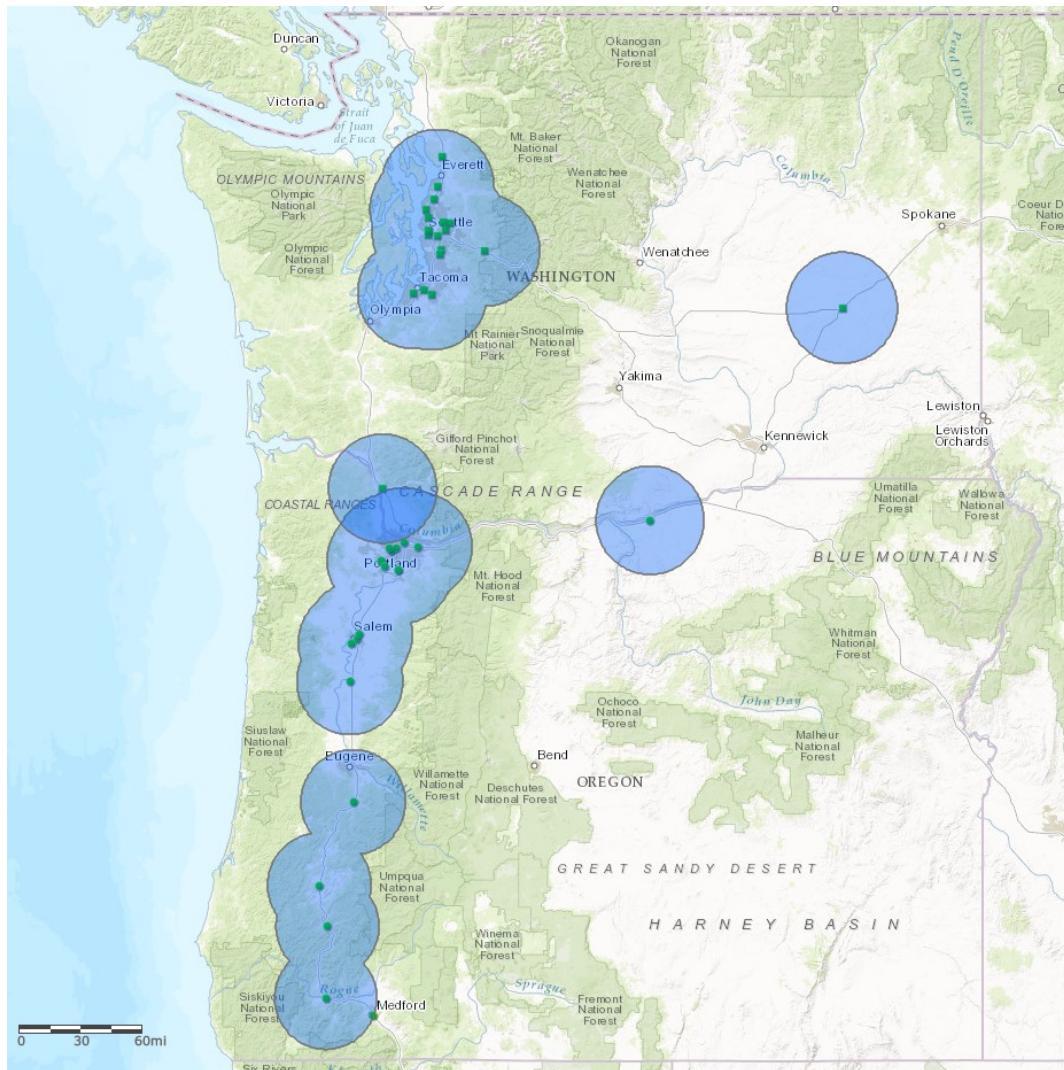


Figure 2. SAE Combo/CCS DC Fast Chargers in Oregon and Washington
(Circles show 25-mi radius; gaps indicate more than 50 mi between chargers)

Principles for New Infrastructure

Washington and Oregon are interested in supporting a network of chargers that will expand access to ZEV travel in our states while also anticipating future increases in the number of ZEVs and advances in charging technology. New fast charger installations should take into account that they may eventually serve much larger numbers of EVs that charge at faster rates than those of today. A few important design principles can maximize the usefulness and service life of new DC fast charging installations:

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- Dual standard (CHAdeMO and SAE Combo)
- Publicly accessible 24/7
- Level 2 EVSE for plug-in vehicles not equipped with fast charging capabilities
- 50 kW minimum, 150 kW ready
- Open source software or ability to support multiple charging networks
- Room to expand with multiple units

As such, entities installing fast chargers should, where possible, select sites with the space and electrical service to eventually support multiple chargers, and 150 kW chargers, even if near-term deployments have fewer chargers or operate at lower power. Being mindful of likely future charging needs when siting charging station installations will maximize the usefulness and service life of new installations, enabling site owners and operators to upgrade or expand existing sites in response to future demand. Additionally, stations should use open source software, or should be capable of operating across the range of ZEV charging networks, in order to ensure that the station can continue to operate even if it's no longer supported by the original system operator.

Proposed Infrastructure Projects

Expanding the West Coast Electric Highway

There are several near-term opportunities for expanding the DC fast charging network in Oregon and Washington. AeroVironment, which operates the West Coast Electric Highway stations, is interested in partnering with Volkswagen to upgrade the existing network of 56 CHAdeMO chargers to dual-standard units, and installing additional dual-standard units in areas with high utilization and sufficient electrical service. These upgrades would ensure that the West Coast Electric Highway can be used by all ZEV drivers, including those whose vehicles use the SAE Combo charging standard.

In some cases, due to electrical service and space constraints, sites may be unable to accommodate an additional charger or would only be able to support a fairly low power, 24 kW charger. As such, Volkswagen could also install DC fast chargers at alternate sites identified during the buildup of the West Coast Electric Highway. Oregon and Washington have already completed detailed site assessments for multiple alternate locations for nearly all West Coast Electric Highway stations, including locations of transformers and access to electrical service, estimates of electrical and trenching costs, and names and contact information for site hosts. Our states are happy to share this information with Volkswagen to accelerate the deployment of additional DC fast charging infrastructure.

Proposed new charging locations are detailed in the following table.

Table I: Proposed Infrastructure Projects

Corridor	Number and type of Installations	Brief Description
I-5 (Oregon)	8 DC Fast Chargers	I-5 is currently served by both CHAdeMO and SAE Combo DC fast charging stations, but many stretches only have a single station or charge at relatively low power. I-5 is the primary north-south corridor through our region and needs additional chargers, as well as charging sites than can accommodate the numbers of chargers and ZEVs that will be deployed in the future.
US 101 & Cave Junction (Oregon)	21 DC Fast Chargers	US 101 is the coastal highway that serves Oregon's seaside communities, and is important both for residents and visitors to the Oregon Coast. This highway is currently served with CHAdeMO charging through the West Coast Electric Highway, but does not currently have any SAE Combo charging. Adding a complementary network of Combo stations would enable all ZEV drivers to travel this corridor. A dual-standard fast charger installation in Cave Junction, which is not currently served by DC fast charging, would provide a link between I-5 and the northern stretch of US 101 in California, for which the California Energy Commission will soon be funding DC fast charger installations.
I-84 (Oregon)	9 DC Fast Chargers	The West Coast Electric Highway extends as far east as The Dalles on I-84, the primary East-West corridor through the state. Dual-standard charger installations in the three cities served by the West Coast Electric Highway would enable all ZEV drivers to make this trip. Six additional chargers could complete coverage of I-84 out to the Idaho border.
US 26, US 22, and OR 126 (Oregon)	11 DC Fast Chargers	Dual-standard fast charger installations at nine locations on US 26, OR 22, and OR 126 going into central Oregon, plus two additional installations in Bend. West Coast Electric Highway network allows drivers of CHAdeMO vehicles to reach this area, but it is currently not served by SAE Combo fast chargers. The Bend area is an important travel destination.
Portland International Airport parking garage	2 DC fast chargers	2 dual-standard DC fast chargers in the Portland International Airport short-term parking facility
Retail and hospitality locations (Oregon)	7 Level 2 Chargers (more to follow)	Travel Oregon, the state's tourism commission, has developed "electric byways" which combine Oregon tourism with sustainable travel. Additional Level 2 chargers can expand the network of hotels and

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Corridor	Number and type of Installations	Brief Description
		businesses that offer ZEV charging as an amenity to environmentally-conscious travelers.
I-5 (Washington)	8 DC Fast Chargers	I-5 is currently served by both CHAdeMO and SAE Combo DC fast charging stations, but many stretches only have a single station or charge at relatively low power. I-5, the primary north-south corridor through our region, needs additional chargers, as well as charging sites that can accommodate the numbers of chargers and ZEVs that will be deployed in the future.
US-2 (Washington)	5 DC Fast Chargers	US 2 has been dubbed the nation's first ZEV-friendly charging byway. Travelers from Canada and the Puget Sound region use the route to reach key tourist destinations such as the Bavarian town of Leavenworth. Several resorts and hotels along the route have installed Level 2 charging and the highway is currently served with 4 CHAdeMO chargers through the West Coast Electric Highway. Adding a complementary network of SAE Combo stations would enable all ZEV drivers to travel this corridor.
I-90 (Washington)	7 DC Fast Chargers	I-90 is Washington's primary East-West corridor. The West Coast Electric Highway extends as far east as Cle Elum and there is one dual-standard charger in Ritzville. Adding dual-standard charger installations in 7 communities along the route would enable all ZEV drivers to travel between Seattle and Spokane.
US-101, Olympic Peninsula (Washington)	11 DC Fast Chargers	US 101 is the scenic highway stretching along the coast in California, Oregon, and Washington. The 361-mile segment in Washington traverses around the Olympic Peninsula and down the Pacific Coast. Currently residents and visitors do not have ZEV access to key locations along the route, such as Port Angeles and the Olympic National Park.
I-82 and US-395 (Washington)	6 DC Fast Chargers	I-82 and US-395 are major corridors serving the Tri-Cities area of south-central Washington State. EVITA, a consortium of Washington State not-for-profit public utilities, is working to establish ZEV charging every 40 miles along major transportation corridors in this area through utility investment and public-private partnerships. "Quick win" sites are identified in Connell, Pasco, Kennewick, Richland, and Prosser.
I-95 and Spokane (Washington)	7 DC Fast Chargers	Avista, an Investor-Owned Utility, is planning to install DCFC at 7 locations in eastern Washington. For "future-proofing," Avista is installing a single DCFC at each of its 7 stations, but placing conduit to add a second DCFC in the future. VW could support these installations by installing

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Corridor	Number and type of Installations	Brief Description
		a second DCFC at each planned location and/or work with Avista to identify additional charging sites. Four DCFC sites will be commissioned in 2017.
US-12, road to Mt. Rainier National Park (Washington)	4 DC Fast Chargers	US 12 is an east-west corridor spanning the entire state of Washington. The 430-miles route starts near the Pacific Ocean and crosses the Cascade Range over White Pass, south of Mount Rainier National Park. ZEV drivers would benefit from dual-standard equipment located between the coast and I-5 in Aberdeen, between I-5 and the national park in Morton and Packwood, and at the national park entrance in Longmire.
Seattle to Mt. Rainier National Park corridor (Washington)	2 DC Fast Chargers	Installing 2 DC fast charging locations between Seattle and Mount Rainier would allow ZEV drivers from Canada and the Puget Sound to drive ZEVs to the national park. Partners, including National Parks Foundation, have identified locations in Enumclaw and Eatonville.
Washington State Ferry Terminals	Up to 20 DC Fast Chargers	Washington State Ferries (WSF) operates the largest fleet of automobile and passenger ferries in the nation. WSF has 22 vessels, carrying more than 23 million passengers per year. It runs ten routes serving 20 terminals located around Puget Sound and in the San Juan Islands and is designated as part of the state highway system. The ferry terminals are ideal locations for ZEV charging.
Washington State highway rest areas	46 Level 2 Chargers	Washington has 48 safety rest areas, with Level 2 EVSE at two rest areas along the I-5 corridor. The rest areas are strategically placed along all major roadways and serve millions of motorists each year. Although federal law prohibits commercial activity at rest areas, ZEV charging is allowed as long as travelers are not charged a fee to use the equipment. FHWA is currently gathering comments on eliminating restrictions. The high visibility and low-electricity costs might prove a good investment for range extension and public outreach.

Please note: *Several of the proposed projects that appear in the table above are associated with “quick-win” investments. See Appendix B for a list of these and other “quick-wins” in Oregon and Washington State.*

In addition to the projects above, we propose installing a demonstration 150 kW DC fast charger by the end of the first 30-month period. While most of today’s ZEVs charge at a rate of 50 kW, advances in battery technology and the demand for quicker charging is leading auto manufacturers to pursue higher power charging. A 150 kW charger could restore approximately 150 miles of range in 20 minutes, enabling ZEV drivers to drive further distances with fewer stops and less time spent charging.

Workplace Charging and ZEV Commuting Support

Workplace charging and support for ZEV commuting provides a unique leverage point for encouraging daily use of EVs in fleets and commuter vehicles. It completes the charging infrastructure picture and fulfills one of the most common charging patterns for ZEV users—charging at work. Our vision is that all commuters have the opportunity to “plug in” at work, and that as many commuter ridesharing programs as possible go electric. Workplace charging can also provide a predictable high level of use while functionally extending range and usefulness of EVs. Charging at work also performs an educational function as people witness coworkers driving ZEVs and have the opportunity to informally learn about the vehicles from their owners.

The following are examples of near-term infrastructure projects to advance workplace charging and make ZEV commuting common practice for workers in the Pacific Northwest:

- **Workplace Charging at Public Facilities.** State-owned facilities are leading by example, offering employees workplace charging and supporting state fleet electrification. For example, Washington has identified nearly 220 state-owned facilities for one or more ZEV charging stations in support of the Governor’s target of converting 5% of employee and visitor parking at these facilities to EVs. Washington’s departments of Enterprise Services and Corrections have developed a “quick wins” list of 100 sites that are EVSE-ready for a total of 576 Level 2 and 24 DCFC that would serve both the state workforce and the public. The Port of Seattle proposes adding charging at parking stalls at Sea-Tac airport employee parking lot, and King County (Seattle area) is pursuing charging at its airport and county buildings. The city of Bellevue has identified four sites ready for charging equipment replacement and two new locations. Extending workplace charging to the private sector, Avista utilities has identified over 150 public and workplace charging locations in Eastern Washington.
- **Park-and-Ride and Transit Hub Charging.** Oregon Department of Transportation has identified several high utilization park-and-rides and transit hubs around the state. Additionally, TriMet would like to upgrade an existing Level 2 charger installation to a dual-standard DC fast charger at its Tacoma park-and-ride location. In Washington, Sound Transit park-and-ride locations in the Seattle area and Pierce Transit facilities in the Tacoma area offer high-utilization charging opportunities.
- **Electrified Commuter Ridesharing.** Programs like King Country Metro Van Pool and other commuter ride-sharing programs are increasingly offering ZEV options and predictable, high-utilization opportunities for charging infrastructure in urban, suburban, and rural population centers.

These investments in workplace charging infrastructure can be complemented by investments in programs to promote electric commuting, such as support for expansion of Drive Oregon’s Northwest workplace charging campaign.

High Utilization Urban Charging

Urban charging infrastructure contributes to a robust ZEV charging ecosystem, provides good visibility for EVs, and combats range anxiety among potential ZEV owners and drivers. Urban charging will also

aid ride-sharing and ride-hailing services that are active in Seattle and Portland metro areas (e.g., Uber, Lyft, Car2Go, and ReachNow) in adopting more EVs into their fleets. Low income and minority residents who disproportionately bear the effects of harmful tailpipe pollution perhaps stand to gain the most from ZEV uptake in their communities. Washington and Oregon encourage VW to seek out opportunities to invest in ZEV promotion, ride-sharing programs, and charging infrastructure in areas that struggle with atmospheric pollution. Our states are working in collaboration with our major cities to accelerate their plans for electrified transportation:

- **City of Portland.** To achieve Portland's Climate Action Plan goal of reducing carbon emissions 80 percent from 1990 levels by 2050—and recognizing that transportation accounts for 40% of emissions—Portland has set ambitious goals for electrifying transportation. By 2020, the city seeks to replace at least 10,000 gas or diesel-powered vehicles with ZEVs in the urban area and surrounding county and double the number of Level 2 and DC fast chargers available to the public. Portland is also deeply committed to creating mobility solutions that are equitable, with a particular emphasis on outreach and ZEV access in communities of color and with low-income populations. Specific, near-term opportunities to support Portland's plans include:
 - Upgrading or replacing worn DCFC units in the Portland metro area
 - Building new DCFC infrastructure in areas with high ZEV counts
 - Pilot program for ZEV charging infrastructure at Portland-area multi-unit dwellings for low and moderate income residents in collaboration with Hacienda, a community development corporation
- **City of Seattle.** As part of its Drive Clean Seattle program to power a new generation of clean cars with carbon-neutral electricity, Seattle has one of the most comprehensive plans in the country to electrify transportation at scale. With ambitious ZEV targets for 2025 and a focus on equitable participation in the electrified transportation economy, Seattle is developing plans to install over 200 new charging stations in the city. Specific, near-term opportunities to support Seattle's plans include:
 - 20 new DCFC stations in Seattle City Light's utility service territory
 - DCFC and Level 2 charging infrastructure at 10-14 multi-modal mobility hubs to be installed in the next several years in the city, including two to three in 2017
 - Infrastructure to support affordable housing ZEV car-share programs and improve access to EVs for low and moderate income families throughout King County cities

2. Outreach and Education

Existing Outreach and Education Efforts

Washington and Oregon have conducted substantial outreach around our corridor charging initiatives, including developing a strong and recognizable brand around the West Coast Electric Highway and participating in dozens of events to raise public awareness of the system and more broadly about ZEVs. Travel Oregon, the state's tourism agency, has also sought to raise awareness of ZEVs by highlighting

“electric byways” – trips to some of Oregon’s most popular destinations that can be made in an ZEV. Washington has conducted significant media and public outreach including seven ribbon cuttings and dozens of press events. Washington’s Governor Jay Inslee has joined private businesses for special events including a ZEV driver 100,000-mile celebration, national drive electric week, and the launch of ZEV tourist season.

Principles for Outreach and Education Projects

The following design principles guide our outreach and education projects to maximize the impact of investments on consumer awareness and ZEV adoption. We believe these principles align with VW’s expressed interest in increasing awareness and fostering education through venues that include “ride-and-drives, multi-channel advertising, website, social media, and educational programs:”³

- Leverage existing programs and state/federal investment for outreach and education
- Utilize innovative, proven programs to build awareness and communicate benefits
- Emphasize direct driver experience, for example through ride-and-drive opportunities
- Complement investments in infrastructure by emphasizing outreach and education in areas with substantial charging infrastructure

Proposed Outreach and Education Projects

Accelerate and Expand Northwest Electric Showcase

In September 2016, Drive Oregon was awarded nearly \$1 million by the U.S. Department of Energy to launch innovative regional marketing campaigns over the next three years to engage consumers and promote the benefits of ZEVs. The project will involve a permanent showcase of ZEVs and charging equipment near PGE’s existing “Electric Avenue” urban charging pod. Experienced staff and trained volunteers will offer brand-neutral education, outreach, test drives, and long-term ZEV rentals via peer-to-peer car sharing platforms. This permanent showcase will be complemented by “pop-up” showcases in Oregon and Washington in partnership with electric utilities and other regional partners. The project will also deploy creative multimedia marketing to promote EVs and encourage consumers to visit the showcases. This project creates an excellent opportunity for VW to match DOE funding to expand the depth and breadth of outreach in Oregon and Washington, including:

- Additional permanent showcases throughout the Pacific Northwest, e.g. in the Seattle area
- Additional “pop-up” showcases with regional partners, beyond the six per year planned for each state
- Additional ride-and-drive and direct public engagement events in Oregon and Washington communities
- Additional focused marketing campaigns targeting fleets, workplaces, and other key markets
- Stronger regional marketing partnerships and campaigns
- Additional community and media events for high-visibility projects

³ From <https://www.electrifyamerica.com/our-plan>

Develop everGREEN Avenue showcase in Olympia, WA

This project would provide a permanent ZEV showcase with DC fast charging, battery storage, and solar canopies in Washington's capitol city. The "everGREEN Avenue" at Capitol Gateway Park will increase both awareness and charging capacity. Because it is the primary route to the state capitol campus from Interstate 5, Capitol Gateway Park provides high visibility. The Park's proximity to the highway will make the project accessible to state employees and serve the public as a stop on the Washington State segment of the West Coast Electric Highway.

Similar to Oregon's Electric Avenue, Washington's everGREEN Avenue will provide a permanent showcase for a variety of charging technology. The centerpiece of the project will be a pair of solar-assisted fast chargers with integrated battery storage. Modeled after the University of California at San Diego's Stationary Storage Plus Electric Charging (SSPEC) Initiative, the Capitol Gateway project will test the viability of integrated solar power, battery storage, and fast charging in a marine climate. The capital portion of the project will be funded with a combination of state, utility, and private funding. EV Everywhere funding will complement this capital investment with an information and education component consisting of signage and kiosks at the project site.

Fund for Consumer Education

Surveys have shown that, despite the increasing variety of plug-in electric vehicles, many consumers continue to have low levels of familiarity with the technology. Reaching consumers across multiple channels is an important tactic for communicating information about EVs, so in addition to pursuing the NW Electric Vehicle Showcase and everGREEN Avenue opportunities, ZEV states and the U.S. automotive industry have established a public-private partnership through the "Collaboration for ZEV Success" agreement to develop and launch a multi-dimensional campaign that will engage consumers with convincing narrative that will familiarize them with the benefits and features of EVs and inspire them to take action. Through an RFP process, the Collaboration for ZEV Success hired a firm to conduct market research and develop a campaign strategy that will include: a situation analysis; target audience profiles; strategies and tactics, including appropriate media channels and mix for target audiences; branding and messaging recommendations; detailed budgets for two or more scenarios; an activity matrix and timeline; and metrics to track and evaluate campaign outcomes.

This initiative is on track to provide a blueprint for a brand-neutral ZEV outreach and education campaign by the end of the first quarter of 2017. Given the clear overlap between this initiative and the provisions in Appendix C requiring VW to invest in brand neutral education and public outreach, VW should utilize its investments to leverage contributions and support from other campaign partners. Moreover, implementing the campaign developed by the Collaboration for ZEV Success would allow VW to hit the ground running with a fully developed campaign strategy that is broadly supported by the ZEV states and major automakers.

3. Ridesharing and Ride-hailing

Ridesharing and ride-hailing applications will be important avenues for providing potential consumers with exposure to ZEV technology. While this area is not a focus of Volkswagen's initial 30-month investment period, there are near-term opportunities for ZEVs in ridesharing applications that are worth considering. In the longer term, electric vehicles, and especially those operating in shared and potentially autonomous ride-hailing applications, have the potential to significantly decrease urban vehicle miles traveled (VMT) and emissions.

Proposed Ridesharing Pilot in Portland

ZEVs in ridesharing applications can be used to improve mobility for low income citizens and residents of multi-unit dwellings. Often, these communities are also those which experience greater mobility challenges, are exposed to worse air quality, and are unable to purchase new vehicles, including EVs. The Hacienda Community Development Corporation, Honda, Drive Oregon, and others are collaborating to deploy the Community Electric Vehicle (C-EV) demonstration project in Portland to address these barriers. The C-EV project will place several off-lease compact vehicles, donated by Honda, as well as the charging infrastructure to support them, at locations poorly served by transit in partnership with low-income housing managers and community-based organizations. The vehicles will then be made available to local citizens through peer-to-peer car-sharing services.

Volkswagen could expand on this program by providing e-Golf vehicles and charging infrastructure in similar applications. The existing network of project partners stands ready to help Volkswagen consider how and where to expand on this model to extend the benefits of electric travel to communities around the Northwest.

Ridesharing in Seattle and Puget Sound Region

Washington's seven million residents and half million businesses are changing the way people communicate, connect, transact, and travel. With a projected population growth of more than 25 percent during the next 20 years, the state is creating new partnerships between communities, government agencies and service providers to provide more transportation options. King County Metro manages the largest publicly-owned commuter van program in the nation, which includes a fleet of 25 Nissan Leafs and EV charging equipment in buildings and at transportation hubs such as Park & Ride lots, ferry terminals, and private employer worksites. The city is exploring ways to increase electric vehicle use for commuters including:

- DCFC (with paired L2) for use by eTaxis and eTNCs as they wait for fares at existing and future Transit center parking lots.
- L2 EVSE for exclusive use by carshare services such as Car2Go and ReachNow so their vehicles can be parked at existing and future Transit center parking lots.
- L2 EVSE for the exclusive use of carshare vehicles
- Workplace charging for City of Seattle employees to support electric shared mobility program (van and car pools) for downtown commuters.

- L2 EVSE to support VanPool electrification. Chargers would be located in existing VanPool parking spots in Seattle.

4. Conclusion

This proposal outlines a comprehensive package of near-term opportunities to transform the transportation system in the Pacific Northwest, contributing to a coordinated West Coast-wide investment in fully electrified regional transportation and VW's envisioned national charging network. These projects will help VW maximize the effect of the Investment Fund for both the company and the traveling public of the Pacific Northwest. Leveraging the leadership, policy environment, and significant early investment of Oregon and Washington in charging infrastructure and ZEV adoption, the efforts proposed here will allow VW and the Northwest region to rapidly scale toward a tipping point of ZEV adoption and market transformation.

Appendix A: State Policies to Promote Transportation Electrification

Our state governments have taken significant steps to support electric vehicles by implementing policies that accelerate the shift towards EVs.⁴ Oregon has adopted the California ZEV Program, requiring manufacturers to progressively increase sales of zero emission vehicles, and expects that manufacturers will place tens of thousands of vehicles in the state over the next decade to comply with the program. To date, Oregon sales have significantly exceeded program requirements, with manufacturers collectively holding a surplus of more than 30,000 ZEV and TZEV credits that can be used in future years.

Oregon has also implemented a Clean Fuels Program, requiring a 10% reduction over 10 years in the average carbon intensity of transportation fuels used in the state. Providers of low carbon fuels, which have lower carbon intensity than the target in each program year, are eligible to generate credits under the program. Credits can then be sold to regulated parties who exceed annual targets in order to assure program compliance. In Oregon, electricity provides a more than two-thirds reduction in GHG emissions relative to gasoline, enabling providers of transportation electricity to generate and sell credits under the program.

In 2016, the Oregon legislature passed Senate Bill 1547, a measure that includes a requirement for investor-owned utilities (IOUs) to submit transportation electrification plans to the state public utility commission. Oregon's three regulatory utilities—Portland General Electric (PGE), Pacific Power, and Idaho Power—will submit plans by December 31st, 2016 outlining their plans to accelerate ZEV adoption. These plans will likely include some component of public ZEV charging infrastructure and outreach and education. While these efforts will be limited to each utility's service area, they will complement other efforts to support a robust and diverse charging network in the state. PGE also offers a ZEV electrical rate for customers who drive a ZEV. Under SB 1547 utilities will also act as trusted advisors as they educate their customers about EVs, thereby reinforcing the public awareness efforts of others.

Oregon also supports installation of ZEV charging infrastructure through a tax credit offered by the state. Until the end of 2017, business owners and others may be eligible for a tax credit of 35% of eligible costs for qualified ZEV charging infrastructure projects through the Oregon Department of Energy's Energy Incentive Program. Oregon additionally offers a tax credit for 50% of project costs, up to \$750, for residential ZEV charging equipment and installation.

Washington has also adopted a range of policies to support ZEV adoption. ZEVs are exempted from sales tax in Washington, making it more affordable to own or lease a ZEV. Through the Washington State EV Infrastructure Pilot Program, the Washington State Legislature has provided \$1 million in funding to encourage private investment in ZEV fast charging. In Spring 2017, the Washington State Department of Transportation plans to award grants to qualifying government agencies such as cities, town, counties, transit agencies, and tribes who partner with the private sector to install ZEV fast charging stations along

⁴ The U.S. Department of Energy Alternative Fuels Data Center provides a list of laws and incentives to support the advancement of EVs in Washington and Oregon.

- Link to Washington Incentives: http://www.afdc.energy.gov/laws/state_summary?state=WA
- Link to Oregon Incentives: http://www.afdc.energy.gov/laws/state_summary?state=OR

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key transportation corridors in Washington State. Washington is considering investing the maximum allowed charging component of Volkswagen settlement funds (15%) in the EV Infrastructure Pilot Program, providing more than \$15 million in additional funds.

Washington has prepared an EV Action Plan that creates a statewide strategy to coordinate state, local, and public-private partnerships and investments. Electrification of the state fleet is also a priority. The Washington Governor's Electric Fleet Initiative is one of the leading bulk procurement efforts in the country. Washington has developed state contracts offering a range of passenger electric and alternative fuel vehicles. Washington is also one of the first states in the nation to offer electric vehicle supply equipment through a state contract including Level 2 and DC Fast Charging equipment and installation services. Both of the contracts are available for state agencies, local governments, universities, transit systems, and federally tax-exempt nonprofit organizations.

Washington is also pursuing heavy-duty transportation electrification. The Washington State departments of Enterprise Services (DES) and Transportation (WSDOT) partnered to develop a procurement process to provide transit systems with readily-available electric buses at competitive prices. This contract is available to all Washington government agencies and transit systems, as well as other states including Oregon.

Several Washington utilities are also offering programs to promote ZEV use. The Washington State Utilities and Transportation Commission and investor-owned utilities are taking a leadership role in ZEV infrastructure. Recent legislation allows investor-owned utilities to use rate payer funds and realize a small return on investment on ZEV infrastructure. Avista Utilities is installing public, workplace, and home charging in Eastern Washington, including 7 public DC fast charging locations. Puget Sound Energy offers a \$500 rebate on qualified Level 2 home chargers.

Public and municipal utility districts are also investing in ZEV charging infrastructure. Seattle City Light is installing 20 DC publicly-accessible fast chargers in Seattle and is conducting a residential charging pilot that offers customers access to home charging for a monthly fee. These efforts lay the foundation for additional partnerships to expand residential and workplace charging infrastructure.

Appendix B: Detailed Oregon and Washington State “Quick-Wins” Lists

Submitted along with this proposal is an Excel file with a working list of specific charging locations that can be developed in Oregon and Washington the near-term. This file is a resource for VW and an indicator of “quick win” infrastructure opportunities in Oregon and Washington consistent with the types of projects included in this proposal.