

West Virginia Electric Auto Association
South Charleston, WV

May 17, 2019

Mr. Perry J. McCutcheon
West Virginia Department of Highways
Charleston, WV

RE: Comments on the State of West Virginia Beneficiary Mitigation Plan for the Volkswagen Environmental Mitigation Settlement (Mitigation Plan)

The West Virginia Electric Auto Association (WVEAA) greatly appreciates the inclusion of Light Duty Zero Emission Vehicle Supply Equipment in the state's draft Mitigation Plan. Our club members, with more than 100 years of combined experience as builders and drivers of electric vehicles (EV), take our responsibility seriously to share our expertise with Mitigation Plan's authors. We hope our comments will help align the Mitigation Plan's high-level vision with the goals of maximizing public health and environmental benefits.

WVEAA endorses the 10% spending portion shown on page 10 of the Mitigation Plan, and strongly urges the maximum 15% Electric Vehicle Supply Equipment (EVSE) allocation be adopted. EVSE provides power via a variety of connectors to electric vehicles. WVEAA believes the installation of a network of public Direct Current Fast Charging (DCFC) EVSE stations will best mitigate the VW NO_x emissions while also substantially reducing harmful air pollutants beyond nitrogen oxides (including CO, SO_x, hydrocarbons and sub-PPM 2.5 particulates). DCFC stations are able to charge EVs from about 10% to 80+% in about 30 minutes and on up to 100% with another 30-45 minutes.

WVEAA members have found that a reliable network of DCFC stations enables travel throughout West Virginia. WVEAA members do most of their EV charging at home, but a reliable DCFC network enables long distance travel away from home. WVEAA believes the installation of a public DCFC network at key highway intersections across West Virginia will induce private purchases of additional EVs and private business investment in destination-style "Level 2" EVSE stations. "Level 2" EVSE or destination chargers are able to charge EVs from about 10% to 100% in 7-8 hours and are generally located where an EV would be parked for several hours while their owners work, seek recreation, or stay overnight. Based on April 2019 data obtained from the public web sites "supercharge.info" and "insideevs.com", WVEAA calculates that an existing US-based private DCFC network supports a fleet of 65 EVs at each DCFC station charging stall.

WVEAA has identified eight key highway intersections and the nearby cities in West Virginia where DCFC EVSE stations would facilitate EV travel throughout the state. These locations are all located in the prioritized geographic areas identified on the map shown on page 8 of the Mitigation Plan. In addition, at least half of the recommended locations are near the campuses of West Virginia University (WVU), Marshall University, and their satellite campuses as described in Priority 4 of the Mitigation Plan. A summary of WVEAA's recommended location cities and their attributes are described here.

- Morgantown – Located near the main WVU campus and the intersection of I-79 and I-68. This location is in the green geographic area shown on the page 8 map.
- Weston – Located near the intersections of I-79, US Rt. 33 and US Rt. 19. This location allows north-south traffic to bypass Charleston via US Rt. 19 and facilitates access to the West Virginia highlands. This location is in the red geographic area shown on the page 8 map.
- Charleston – Located near the South Charleston campus of Marshall University and the intersections of I-77, I-64, I-79, US Rt. 60 and Appalachian Corridor “G” (US Rt. 119). This location is in the yellow geographic area shown on the page 8 map.
- Huntington – Located near the main Marshall University campus and the intersection I-64 and US Rt. 52. This location is in the yellow geographic area shown on the page 8 map.
- Beckley – Located near the WVU-Tech Beckley campus and the intersections of I-77, I-64 and US Rt. 19. This location is in the blue geographic area shown on the page 8 map. WVEAA has long advocated that EVSE stations should be located at Tamarack along the West Virginia Turnpike near Beckley.
- Parkersburg – Located near the WVU-Parkersburg campus and the intersection of I-77 and US Rt. 50. This location is in the pink geographic area shown on the page 8 map.
- Wheeling – Located near the intersections of I-70, I-470 and OH Rt. 7. This location is in the tan geographic area shown on the page 8 map. As well as supporting EVs in the northern West Virginia panhandle, this location facilitates travel between Pittsburgh, PA, and Columbus, OH.
- Martinsburg – Located near the intersection of I-81 and WV Rt. 9. The Martinsburg location also facilitates north-south travel between multiple states on I-81. This location is in the purple geographic area, the area of highest VW diesel vehicle concentration, shown on the page 8 map.

If funding is not available for all eight recommended locations, WVEAA recommends priority be given to the Morgantown, Charleston, and Beckley locations, as those locations, sited near the major interstate intersections, are key to travel throughout West Virginia. If EVSE funding is available after the eight locations are supplied,

WVEAA recommends destination type Level 2 EVSE stations be installed on the Marshall University and WVU campuses.

WVEAA believes each of the recommended eight DCFC locations should be equipped with 2 EVSE stalls at each station to provide reliability and to mitigate long wait times for charging. Each stall should be equipped with the two types of open (or public) standard plugs, the CHAdeMO plug and the CCS plug. WVEAA does not recommend providing DCFC charging capability for proprietary (non-public) plug types or any plug types generally not used in the US.

Based on the current DCFC loading shown above of 65 EVs per EVSE stall, WVEAA calculates the 16 recommended DCFC installations (2 EVSE stalls each at eight locations) will support a minimum of 1040 EVs in West Virginia. This count of 1040 EVs will be the basis of the WVEAA tailpipe NOx emissions reduction estimates. As WVEAA member experience shows that most DCFC EVSE stations in the US are seldom congested, the recommended installations will likely accommodate higher usage numbers in West Virginia than the 1040 EVs used for emissions calculations.

The installation of the recommended DCFC EVSE stations will also benefit out-of-state EV drivers. On-line forums have developed elaborate work arounds to avoid West Virginia's lack of DCFC coverage, and these new stations will make those alternate routes unnecessary, bringing more traffic and retail sales to West Virginia.

A survey of select WVEAA members has shown that the purchase of a new EV has resulted in EV owners selling their fossil fueled vehicles or driving their fossil fueled vehicles less. The primary motivation for this pattern were described as reduced EV operating cost and reduced EV emissions. Based on this survey, WVEAA has decided to base EV emissions reduction on a one-to-one replacement of fossil fueled vehicles with EVs. Also, the WVEAA has decided to base the calculations on the web-based AFLEET tool from the Argonne National Laboratory based near Chicago, Illinois.

The emissions reductions expected by the installation of the recommended DCFC EVSE stations are shown here.

- Carbon monoxide (CO) - 28 tons / year
- Nitrogen oxides (NOx) - 2.7 tons / year
- Volatile Organic Compounds (VOC) - 2.2 tons / year
- PPM 2.5 particles - 0.08 tons / year

The installation of EVSE stations across West Virginia can be an important factor in improving the economy of West Virginia. EVs are fueled by electricity made from West Virginia resources, primarily coal and natural gas. In contrast, internal combustion engine vehicles use fuels which are produced from petroleum that is extracted and refined outside of West Virginia. There are no major gasoline or diesel refineries in West Virginia.

We have added a link to the West Virginia Beneficiary Mitigation Plan to the WVEAA website www.wveaa.org.

Sincerely,

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Scott Hamilton
Treasurer - West Virginia Electric Auto Association