

Minnesota Diesel Replacement Program

Volkswagen NO_x Mitigation Settlement Phase 2

Level 2 Electric Vehicle (EV) charging stations

FY 2023

Methodologies

This document outlines the methods used for project selection for the MPCA's Level 2 EV charging station grant. As part of Minnesota's [plan for its VW settlement funds](#), the MPCA established overarching goals for the program. Those goals are:

- Achieve significant emissions reductions of nitrogen oxides (NO_x), fine particles (PM_{2.5}), and greenhouse gases (GHGs)
- Benefit all parts of the state
- Reduce exposures to harmful air pollutants and maximize health benefits
- Help people and places disproportionately affected by air pollution
- Balance cost effectiveness with other goals

As part of the MPCA's efforts to achieve these goals, we have developed methods to help select projects that advance these priorities. We have worked with the Minnesota Department of Health (MDH) and the MPCA's Environmental Justice Advisory Group on these methods. We plan to continue to review and improve the methods as necessary for future grant rounds. The methods used for the Level 2 electric vehicle charging station Request for Proposal are outlined here.

Environmental justice

The MPCA is committed to making sure that pollution does not have a disproportionate impact on any group of people – the principle of [environmental justice](#). Environmental Justice means that pollution does not harm one group of people more than another, that all Minnesotans benefit from the same level of environmental protection, and that everyone has equal opportunity to participate in decisions that may affect their environmental health. MPCA modeling and various studies show that communities of lower socio-economic status and communities of color are both disproportionately at greater risk from air pollution. The MPCA is committed to investing at least 20% of all the Volkswagen Settlement funds in areas disproportionately affected by air pollution and in areas of historic disinvestment in the Twin Cities Metro region, and another 20% of funds in those areas in Greater Minnesota.

The MPCA considers **areas of concern for environmental justice** to be:

- Census tracts where more than 50% of residents are people of color or American Indians
- Census tracts where more than 40% of the households have an income of less than 185% of the federal poverty level
- Tribal lands

An interactive map of areas of concern for environmental justice in Minnesota can be found [here](#).

In their application, applicants identify the address at which the equipment primarily operates. The project will receive allotted points based on whether it is in an area of concern for environmental justice or within one half-mile (0.5 mi) radius of the census tract border. If a project does not fall within an area of concern for environmental justice or within one half-mile (0.5 mi) of the border, the project will not receive any points for environmental justice consideration.

Vulnerable populations

Up to 3 points will be awarded to each charger based on whether the written responses to the three vulnerable population questions listed on Part 1 of the application reasonably describe how the charger will benefit one or more of the vulnerable populations. Applicants should answer all three questions for each charger.

Health

To consider the potential health benefits of reduced diesel pollution in a community, an inter-disciplinary team at MDH worked to develop a science-based method for identifying areas of the state overburdened with air quality-related health concerns. MDH relied on multiple MDH data sources, covering representative health conditions that can either be worsened by air pollution exposure or make individuals more vulnerable to air pollution exposure.

MDH considered a variety of health indicator data and among these selected indicators that best and most uniquely represent health vulnerability to air pollution exposure. The four health indicators they selected – respiratory and cardiovascular diseases, adverse birth outcomes, and obesity – are summarized in Table 1. For data privacy reasons, health data is available at the ZIP code level for the Twin Cities Metropolitan Area, but only at the county level in Greater Minnesota.

Table 1. Indicators included in health vulnerability index

Health indicator	Years	Greater MN counties	Metro ZIP codes
Asthma emergency department visit rate, all-ages, age-adjusted	2013-2017	✓	✓
Heart attack hospitalization rate, among adults over 35, age-adjusted	2013-2017	✓	✓
Premature (< 37 weeks gestation) birth rate, among singleton births	2012-2016	✓	✓
Obesity or overweight rate, among 8 th , 9 th , and 11 th grade students	2016	✓	
Obese or overweight rate, among children enrolled in the MDH Women, Infant & Children (WIC) Information System*	2013-2017		✓

* Note that data sources for the obese/overweight indicator are different for Metro ZIP codes versus Greater Minnesota counties, due to data availability and resolution.

MDH staff determined that a health burden index was the best way to combine multiple important conditions in a single health metric for scoring project applications. They calculated the index using standard public health methods. They calculated quartiles for each indicator, and assigned a 1, 2, 3, or 4 depending on the quartile, with 4 being the highest health burden category.

For example, if the rate of asthma emergency department visits in a given county fell above the overall statewide 75th percentile, then that county would be assigned a score of 4 for the asthma indicator. The quartiles were calculated separately for Greater MN counties and Twin Cities Metro ZIP codes. The scores assigned for each of the four indicators were then summed for each geographic area. The index range is 4 to 16, with higher scores indicating higher health vulnerability to air pollution. For simplicity, MDH compressed the index to three score categories – 0, 5, and 10 – each containing the same number of counties or zip codes. Each Greater Minnesota ZIP code was analyzed to determine its primary county (the county making up the majority of its area) and was assigned the same score as its primary county. Detailed information about each of the health data sources can be found on the [MN Public Health Data Access Portal](#).

In their application, applicants are asked to identify the address at which the charging station will be located. Based on the ZIP code of the address, charging stations are awarded either 10, 5, or 0 points accordingly. If an address is missing from an application, the project will automatically receive zero points for health benefits, as MPCA will be unable to evaluate it.

Air pollution concentrations

Reducing emissions anywhere is beneficial for the environment and human health but reducing emissions in areas that tend to have more air pollution than others has the additional benefit of decreasing the level of exposure to pollution in those areas. To consider the locational benefits of reduced NO_x and PM_{2.5} emissions in different parts of the state, the MPCA developed a method to score projects based on modeled air pollution concentrations in areas where an electric vehicle charger will be located and help to reduce emissions from vehicles.

Because it is not feasible to monitor air quality on every block in the state, the MPCA uses its MNRISKS model to understand potential air pollution concentrations at a fine scale. The MNRISKS model uses reported and estimated air pollution emissions from all kinds of sources, including traffic, along with meteorological and topographic conditions and modeled understanding of chemical reactions in the atmosphere to estimate air pollution levels across the state. Using MNRISKS, MPCA produced two modeled air pollution concentration maps for the state: one for NO_x and one for PM_{2.5}. Using federal Air Quality Index (AQI) breakpoints, MPCA classified the modeled concentrations of each pollutant into the six AQI categories: “good”, “moderate”, “unhealthy for sensitive groups”, “unhealthy”, “very unhealthy”, and “hazardous”. The breakpoints used are pollutant-specific, and are established by the EPA through the National Ambient Air Quality Standards (NAAQS). Each ZIP code in Minnesota was then analyzed to determine the proportion of its area covered by each AQI category. ZIP codes were assigned 0 to 2.5 points (at half-point increments) for each pollutant depending on how much of its area fell within each category. AQI categories corresponding to higher modeled concentrations were assigned more points. The points each ZIP received for each pollutant was summed for a maximum possible total of 5 points for air pollution benefits. Each ZIP code’s point value was then scaled by a factor of 2 so that air pollution benefits could be evaluated on a 10-point scale.

Table 2: EPA AQI pollutant concentration breakpoints

AQI category	PM _{2.5} (micrograms/m ³) 24-hour average	NO ₂ (parts per billion) 1-hour average	Points (if covering >50% of a ZIP’s area)
Good	0–12	0–53	0
Moderate	12.1–35.4	54–100	0.5
Unhealthy for sensitive groups	35.5–55.4	101–360	1.0
Unhealthy	55.5–150.4	361–649	1.5
Very unhealthy	150.5–250.4	650–1,249	2.0
Hazardous	250.5 or higher	1,250 or higher	2.5

In their application, applicants are asked to identify the address where a charging station will be located. Based on the ZIP code of the address, charging stations are awarded 0 to 10 points (in 1-point increments) accordingly. If an address is missing from an application, the project will automatically receive zero points for air pollution benefits, as MPCA will be unable to evaluate it.

Other scoring criteria

Charger capacity points are based on the charger output. The breakdown is on the scoring sheet.

Proximity to other Level 2 charging stations

The proposed charging station will receive 5 points for 5 to 9.9 miles away and 10 points if it is located more than 10 miles away from another Level 2 charging station. Locations of other Level 2 charging stations are determined by the list of charging stations on the Alternative Fuels Data Center’s website. The list of public Level 2 EV charging stations available on November 18, 2022 will be used to determine whether the proposed location is within 10 miles of another charging station. The list can be found [here](#). The stations that are not open 24 hours per day or are temporarily unavailable will not be counted as operating public stations.

Renewable energy

Renewable Energy: Powering the charging stations with electricity generated from renewable sources will contribute toward the State's goals of reducing greenhouse gas and other air pollutant emissions. This option can be met by signing up for a utility wind or solar program, or community solar program or the installation of a solar array in proximity to the charging stations. If a utility renewable energy program does not exist where the charging station is installed, wind or solar renewable energy certificates (RECs) can be purchased online.

Solar Array Option: Points awarded if in addition to a utility renewable program, the site has a new or existing solar array connected to the grid or charger that produces a minimum of 20 percent of charger power output. If final site plan does not match the application for size of solar array for which the applicant was scored, the grantee will be disqualified.

Tie breaker process

In the event of tie scores, the stations will be chosen as follows:

1. Higher capacity chargers
2. Site with the highest number of plugs
3. Higher amount of renewable energy
4. Blind draw