

Choosing your Chargers



Electric Vehicle Supply Equipment (EVSE) is available in three different charging levels. To determine the proper mix of charging stations for your city, consider the costs, time to charge, locations and power requirements of each option and balance your needs with your available budget.

Use this chart to help you decide the proper mix:

	Level 1	Level 2	Level 3 (DC Fast Charge)
Voltage	120 volts	240 volts	480 volts
Amperage	15-20 amps	40-80 amps	85+ amps
Demand	1.2-1.92 kilowatts	3.3-6.6 kilowatts	50+ kilowatts
Charge Time	5-12 hours	1-4 hours	15-30 minutes
Power Requirements	Ground fault interrupted 120 volt AC dedicated branch electrical circuit	Hardwired dedicated branch circuit with 240-volt AC/single phase service with a 40 amp current rating	480-VAC/3-phase service with a 60 Amp breaker for 30 kW output or a 125 Amp breaker for 60kW output*

* Standards are still in development for DC Fast Charging

Tax Breaks

There are federal tax breaks (33% of costs, up to \$30,000) associated with EV infrastructure, with several vendors willing to consider methods to reduce these costs. Grants may also be available in the future, and have helped with charger deployments in Northern Virginia localities. There is a \$7,500 federal tax credit for the purchase of electric vehicles, with pending legislation to make this an immediate rebate.

Installation Costs

Cost and design elements of publicly available charging stations will vary significantly based on location. Costs vary with the amount of infrastructure work needed to support the chargers. Limited trenching, installation with planned parking lot or building construction, compatible electric panels, and reasonable locality permits will all help decrease costs of EVSE installation.

EVSE in a group residential garage will consist of installing a dedicated branch circuit from an existing premise distribution panel to an EV outlet receptacle (120-VAC) in the case of Level 1 charging or an EVSE (240-VAC) for Level 2 charging. Tax credit can be taken by facility manager.

Vehicle Communication

With the standard J1772 connector, the vehicle has the ability to communicate with the EVSE to determine the circuit rating and adjust the charge to the battery accordingly. For example, an EVSE that is capable of delivering 25 amps will deliver that current even though it may be connected to a 40 amp rated circuit.

Communication methods may be desired for publicly available charging stations, but differ by manufacturer and are not absolutely necessary. Communications systems may include those utilizing power lines, wired Internet or wireless Internet.

Siting Considerations



In addition to cost related siting mitigation efforts mentioned above, overall consideration should be given to maintaining a safe and secure area around the parking spaces containing the EVSE to avoid tripping hazards or impediments with other activities in the area. An electrical consultant can help with issues such as a load control plan to manage the EV charging load within the capacity of the existing electrical service to the building, in order to avoid an electrical service upgrade unless one is absolutely necessary to accommodate EV charging.

Advanced planning, such as locating near power, pre-installing conduit during parking lot refurbishment, can avoid costs of installing the conduit and EVSE later.

Safety and Maintenance

At all times, appropriate safety precautions and standard safety practices should be followed. Public EVSE should be maintained in order to operate consistently and effectively for public use. These EVSE should follow the national electric code (Section 625), the Americans with Disabilities Act, the Society of Automotive Engineers standards, such as NEMA or J-1772 connection ability, and be certified by Underwriter's Laboratory (UL). It is recommended that you check with an electrician prior to installation of EVSE infrastructure.

Resources

Public Maps of EVSE in Virginia can be found in the resources section at <http://www.virginiaev.org>

Please register EVSE online at http://www.afdc.energy.gov/afdc/progs/station_form.php or submit by phone to 540-568-8896 or by email aharned@hrccc.org

Information in this document comes from the Virginia Get Ready efforts and initial state plan. For more information, visit <http://www.virginiaev.org>

