

INTRODUCTION

An electric vehicle (EV), is any vehicle that is powered by an electric motor or onboard battery that can be charged using an external electric source.

Currently, all-electric vehicles have a driving range of 80 to 300 miles, with ranges increasing as new models are introduced.

The key factor that separates an electric vehicle from a gas-powered vehicle is no tailpipe emissions (excluding PHEVs).

Today, there are two major types of electric vehicles -- battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV) -- and over 50 models on the market.

Compared to an internal combustion engine, BEVs have about 99% fewer moving parts that do not need maintenance. They can be charged overnight, providing enough charge for average daily travel. The typical charging time for an electric car can range from 30 minutes to over 12 hours, depending on charging station speed and battery size.

PHEVs are a combination of gasoline-powered and electric vehicles, which means they have a battery, electric motor, gas tank and an internal combustion engine. Typically PHEVs have a driving range

comparable to gasoline vehicles. This is a huge positive for traveling long distances as you have the ability to switch to traditional fuels rather than having to find charging stations to top off the battery.

Factors in choosing charging station locations for an EV network include local demand and distance between units. Communities where drivers are less able to charge at home -- such as neighborhoods with multi-unit dwellings -- will have a bigger need for public charging.

Another factor for charging stations is existing locations where people gather and park. For example, fast-charging stations at grocery stores can offer convenience. In fact, research shows that charging stations located at businesses tends to attract new customers.

Here are the three main types of charging stations:

- **Level 1 chargers** only require a standard 110V wall outlet using charging cords provided by the automaker. They provide three to five miles of range per hour of charging, which tends to be slow. Their most common locations are single-family homes, workplaces and parking garages.
- **Level 2 chargers** use a 240V line and provide faster charging. They require installation of an



EVSE (electric vehicle supply equipment) unit and wiring capable of handling the voltage. They provide 10 to 25 miles per hour of charge. Level 2 chargers are most sufficient for multi-unit dwellings, shopping malls, parking structures, business parks or anywhere people park for a few hours at a time.

- **DC fast chargers** use a 480V line and convert AC power to DC for direct storage in EV batteries. They can provide an 80 percent charge in 30 to 60 minutes, but they also have the highest installation cost. Their ideal location is highway rest stops, downtown cafes, fast food restaurants, gas stations, convenience stores and other destinations where drivers spend a short period of time over a long-distance road trip.

Municipalities should consider enacting parking ordinances that establish clear regulations and enforcement policies for EV parking. The ordinance can outline requirements for permitted locations, accessibility, design standards, fees, charging requirements associated with public parking spaces, and policies that specify towing of vehicles in violation.

As for requiring EVSE, communities should consider setting a minimum requirement for EV parking spaces for each land use or development type. For incentives, communities can count EV parking spaces toward the minimum requirements or reduce the minimum parking requirements when a developer includes EVSE installation in the design.

Municipalities can support EV and EVSE deployment by amend their codes to include EVSEs as a permitted use in some or all zoning districts.

BENEFITS

- Lower maintenance costs than gas-powered vehicles;
- Reduces emissions to help protect the environment.

DRAWBACKS

- EVs have a shorter range than gas-powered vehicles;
- Recharging batteries takes time;
- Limited number of charging stations.

RESOURCES

- [DEP: PA Electric Vehicle Roadmap 2021](#)
- [TCRPC Model Zoning Ordinance](#)
- [Alternative Fuel Data Center for PA](#)



- [Drive Electric Pennsylvania Coalition](#)
- [PennDOT: Electric Vehicles in PA](#)

RELATED FACT SHEETS ON PLANNINGTOOLKIT.ORG

- E-Scooters/E-Bikes

TIPS TO CONSIDER

- DETERMINE THE BEST LOCATIONS FOR EV CHARGING STATIONS IN YOUR COMMUNITY.
- TO SUPPORT ESVE ADOPTION IN LOCAL ORDINANCES, MUNICIPALITIES SHOULD CONSIDER PLANS THAT SPECIFICALLY IDENTIFY EV AND EVSE DEPLOYMENT.
- MUNICIPALITIES SHOULD CONSIDER ESTABLISHING DESIGN CRITERIA FOR EV PARKING SPACES, INCLUDING LIGHTING REQUIREMENTS, DIMENSIONS, CURB CLEARANCE, MAINTENANCE AND SIGNAGE.



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