



ELECTRIC VEHICLES 101: AN OVERVIEW FOR THE BALTIMORE METROPOLITAN REGION

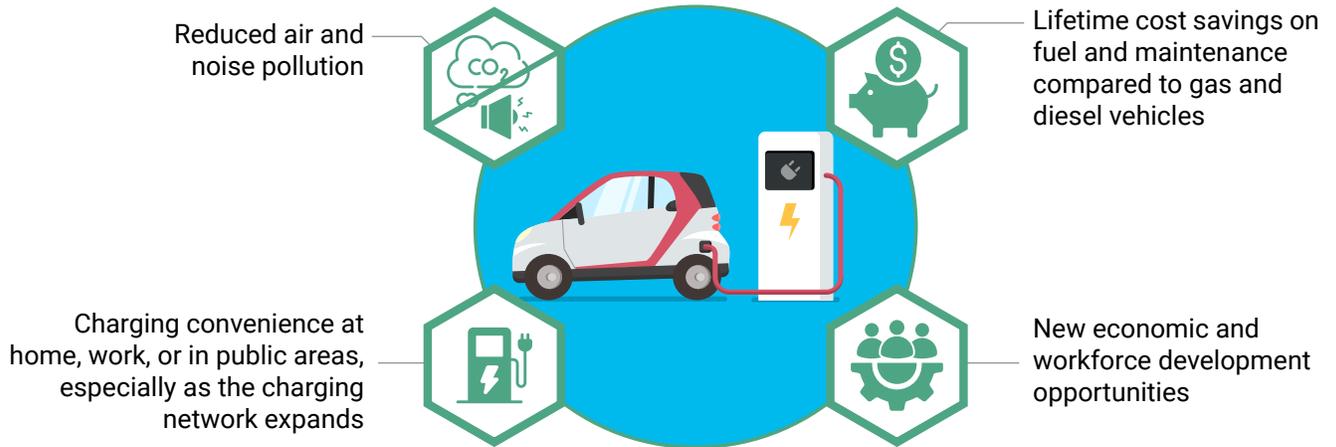


The Current State of Electric Vehicles (EV) in Maryland

- Zero-emission vehicles (ZEVs) help reduce transportation-related climate impacts.
- Maryland anticipates a rapid increase in Electric Vehicle (EV) registrations. Today, EVs make up about 1% of all registered vehicles in Maryland.
- By 2035, 100% of passenger car and light truck sales in Maryland need to be electric ([Advanced Clean Cars II program](#)). That's a lot of EV growth!

Benefits of EVs

Individual users and their communities can experience the following benefits of EVs:



Making EVs More Accessible



Eliminate charging deserts & prioritize areas with limited access to at-home charging



Optimize charger placement with focus on areas most impacted by air pollution



Make EV chargers accessible to all vehicles, including those with varied plug locations or pulling trailers.



Offer EV-related workforce training and employment



Ensure charging is accessible to multilingual users, those with disabilities, and those needing cash payment options.

EV Charging Basics

- There are three levels of EV chargers for passenger vehicles.
- The charger level determines the charging speed and associated costs.

Characteristics	Level 1	Level 2	Level 3/Direct Current Fast Charger (DCFC)
Voltage	120-volt AC circuits found in homes and businesses	208- or 240-volt AC circuits used for clothes dryers	480-volt AC connections to direct current
Speed	Full charge in up to 24 hours	Full charge in 8 to 12 hours	Full charge in 60 to 90 minutes
Average Cost	\$0.13/kWh	\$0.20/kWh	\$0.35/kWh
Common Locations	Residential	Parking garages, grocery stores, malls, hotels, workplaces	Adjacent to major interstate highways to enable EV road-trips

Table 1. Summary of EV Charging Levels ([USDOT](#), [FreeWire Technologies](#))

- Every major auto manufacturer in the US has announced plans to use the North American Charging Standard (NACS) plug by model year 2026. Until then, some EVs will need an adapter to use different plug types.
- EV charging costs are measured in cost per kilowatt-hour (kWh).
- Usage costs vary based on the charger level, the source of electricity, and time of day.
 - Cost increases as charger level increases from Level 1 to 2 to 3.
 - Cost will depend on the source of electricity—which might come from the power company, solar panel, or both.
 - Costs may be higher during hours of peak demand or in areas with high demand.

Matching Land Use and EV Charging Levels

Land use plays a large role in determining which type of EV charger to install.



Residential – Level 1 or Level 2 Chargers

EVs are likely parked for 8 or more hours in the same location (like at home or work). *Similarly, Level 1 or Level 2 chargers at a community charging hub near transit will work for people who are leaving their vehicles while they commute and work for 8 or more hours.*



Commercial – Level 2 Chargers

People can park their cars for a few hours and charge their vehicles while running other errands. *Consider offering a mix of Level 2 and Level 3 chargers.*



Adjacent to Interstate Highways – Level 3 chargers/DCFC

Users need a quick charge and most likely will not be leaving their vehicles. *Consider offering amenities like bathrooms or convenience stores within walking distance of the chargers.*

More Information/Resources

BMC is continuing to study how to best support EVs in the Baltimore metropolitan region. Be on the lookout for more information at: <https://baltometro.org/transportation/planning-areas/multi-modal-planning/emerging-technologies>

