

Frequently Asked Questions for Local Governments

FLEETS

What vehicles are available to purchase in Minnesota?

PlugInConnect posts an updated guide on electric vehicles available for purchase in the Midwest. It covers both battery electric vehicles and plug-in hybrid electric vehicles. The guide can be accessed at www.pluginconnect.com/mnpevmodels

Which electric vehicles are the most commonly sold in Minnesota?

The Tesla Model S is the most frequently sold EV in Minnesota, but its high cost can make it unattractive for city fleets. There are many battery electric vehicles and plug-in hybrid electric vehicles with fewer sales but are fantastic for fleet use. More affordable examples include the Nissan Leaf, Chevy Bolt, and Mitsubishi Outlander, to name a few.

Which electric vehicles are the best ones for Minnesota's cold climate?

Don't let the front-wheel drive fool you, electric vehicles (EVs) can perform better in icy conditions compared to gasoline vehicles due to the more consistent acceleration and lower center of gravity. However, cold weather can impact battery charge with the most bitterly cold days (-10 F) reducing the charge by 40 percent. In those rare cases, features like heated seats and a heated steering wheel can keep you warm and lessen the drain on the battery. Additionally, keep in mind that Norway and Iceland are currently leading the world in the number of EVs sold, and they have much colder climates than ours!

What vehicles are covered in the State Contract?

Vehicles included in the state contract can be found on the [Minnesota Office of State Procurement website](#) and can only be purchased by Cooperative Purchasing Venture members. To find out if your organization is already a CPV member, review the [CPV Member List](#). Once your member status is confirmed, you will have to sign in to the secure area of the site to access the list of vehicles covered by the state contract (release number A-175(5)). If you need help navigating the site, please contact the Office of State Procurement at (651) 296-2600.

Should I lease or purchase?

Whether you should lease or purchase an EV is ultimately up to you and what fits your needs best. However, if you are a Sourcewell member, you can take advantage of the federal electric vehicle tax credit while leasing. To learn more about Sourcewell and how to become a member, visit www.sourcewell-mn.gov/become-member

This document was developed as part of Cities Charging Ahead!, a peer cohort of 28 cities that worked together across Minnesota to explore electric vehicle readiness. Participating cities received technical assistance focused on actions and best practices, based on the GreenStep Cities program, that can accelerate the adoption of electric vehicles. CCA was led by the Great Plains Institute and Clean Energy Resource Teams. Funding was provided through the Carolyn Foundation, Energy Foundation, and in partnership with Xcel Energy, which provided resources and support in line with the company's long-term clean energy plan to electrify transportation. Learn more at driveelectricmn.org/cities-charging-ahead



ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)

What are the differences in charging infrastructure?

There are three basic types:

Type of Charger	Plugs into	Professional installation required	Miles of range per hour of charge
Level 1	120 V	No	2-5 miles
Level 2	240 V	Yes	10-20 miles
DC Fast Charger	Industrial Line	Yes	180-240 miles

Level 1

Charging a vehicle at “Level 1” means plugging into a standard 120-volt supply. All drivers can charge their EV at Level 1, which requires no extra equipment or installation. On average, a Level 1 supply provides 2 to 5 miles of vehicle range per hour the vehicle is connected.

The best use cases for a Level 1 charger is [workplaces](#) and [homes](#).

Level 2

Charging a vehicle at “Level 2” means plugging into a 240-volt supply (think home appliances like refrigerators and dryers). Homeowners may decide to have a charging station professionally installed – also known as Electric Vehicle Supply Equipment (EVSE) – in their garage. On average, Level 2 stations provide 10 to 20 miles of range per hour the vehicle is connected.

Locations where owners will be staying for two hours or more are great use cases for Level 2 chargers. Examples include workplaces and destinations like hotels, zoos, aquariums, and parks.

DC Fast Charger

The three main standards for DC Fast Chargers include CHAdeMO, SAE Combo plug (or CCS), and Tesla Superchargers. Fortunately, an increasing number of fast chargers have outlets for both SAE and CHAdeMO fast charging. Tesla’s Supercharger system can only be used by Tesla vehicles and is not compatible with vehicles from any other manufacturer. However, Tesla vehicles can use CHAdeMO connectors through a vehicle adapter. DC Fast Chargers can deliver 60-80 miles of charge in only 20 minutes of the vehicle being connected.

Locations where owners will be staying for about 20 minutes are great use cases for DCFC. Examples include shopping centers, grocery stores, restaurants, and along highway corridors.

Do different electric vehicles/batteries charge differently?

Yes and no. All electric vehicles charge due to the flow of electrons from a charging station to the vehicle. The main differences are in charging time and plugs. Tesla vehicles are the only vehicles able to charge using Tesla Supercharger or NEMA 14-50 (Level 2) plugs. All other

This document was developed as part of Cities Charging Ahead!, a peer cohort of 28 cities that worked together across Minnesota to explore electric vehicle readiness. Participating cities received technical assistance focused on actions and best practices, based on the GreenStep Cities program, that can accelerate the adoption of electric vehicles. CCA was led by the Great Plains Institute and Clean Energy Resource Teams. Funding was provided through the Carolyn Foundation, Energy Foundation, and in partnership with Xcel Energy, which provided resources and support in line with the company’s long-term clean energy plan to electrify transportation. Learn more at driveelectricmn.org/cities-charging-ahead



electric vehicles (full or plug-in hybrid) in the United States plug into the J-1772 (Level 2) and CCS/SAE or CHAdeMO (DCFC) plugs. By using an adapter, Tesla vehicles can also utilize these plugs.

As mentioned above, charging times differ based on the level of charger being used (Level 1, Level 2, or DCFC) and battery size. Larger batteries, like those in a Chevy Bolt with a 238-mile electric range, take longer to charge than smaller batteries, like those in a Chevy Volt with a 53-mile electric range.

What is the difference between “smart” and “dumb” charging stations?

“Smart” charging stations come equipped with the capability to require payment for use and to track and customize a wide variety of usage statistics (time of charging, length of charging, number of unique users, variable pricing), often with the use of cloud network services. These services have an ongoing subscription cost to their services, so “smart” chargers are often more expensive to maintain than “dumb” ones. “Dumb” stations behave like a standard outlet and do not offer data tracking or payment collecting capabilities.

How much does it typically cost for a city to purchase, install, and operate a Level 2 charger?

Installation costs can run anywhere from \$500-2,000, depending on the location and how much work is needed to bring electric service to where the charger will be located. The charger itself can be as little as \$400 for a “dumb” charger (no ability to make users pay for use) or as much as several thousand for a “smart” charger (credit card swiping, data collection, ability to control charging rates, etc.).

How many people will use my charger?

At present, there isn’t an easy answer for this. EV adoption is increasing, and demand for public charging will continue to increase. Generally, EV owners perform about 80% of their charging at home. To encourage the highest use, our recommendation is to locate chargers at places where traffic is highest, such as highly used shopping centers or along interstates.

Should I give away electricity or charge user fees?

For Level 2 chargers, it’s generally preferable to give away electricity as opposed to charging people. It’s much more expensive to install a “smart” charger with the capability of charging user fees than it is to install a “dumb” charger without this capability. Installation costs combined with the ongoing operation and maintenance fees of “smart” chargers generally outweigh the income received through public Level 2 chargers. This is largely because EV owners primarily charge at home. While usage at public Level 2 chargers is lower than home chargers, they nevertheless play a crucial role in increasing EV adoption.

For DCFC, it’s preferred to charge user fees due to the expensive installation cost. Installing a DCFC generally costs around \$60,000 for a 50kW station, and there are ongoing operating and maintenance expenses to consider.

This document was developed as part of Cities Charging Ahead!, a peer cohort of 28 cities that worked together across Minnesota to explore electric vehicle readiness. Participating cities received technical assistance focused on actions and best practices, based on the GreenStep Cities program, that can accelerate the adoption of electric vehicles. CCA was led by the Great Plains Institute and Clean Energy Resource Teams. Funding was provided through the Carolyn Foundation, Energy Foundation, and in partnership with Xcel Energy, which provided resources and support in line with the company’s long-term clean energy plan to electrify transportation. Learn more at driveelectricmn.org/cities-charging-ahead



Where can I find chargers or businesses with chargers?

PlugShare (<https://www.plugshare.com/>) has an ever-expanding map of chargers across the country. They have filters to view different types of chargers, plugs, and networks. They also have a mobile app that can be used to locate chargers.

How many publicly available charging stations should be located in a city?

A 2017 study by the United States Department of Energy entitled “National Plug-In Electric Vehicle Infrastructure Analysis” recommends 36 publicly available Level 2 station plugs per 1,000 electric vehicles and 1.5 DC Fast Chargers per 1,000 electric vehicles to meet future demand in cities. If your city is near a major highway corridor, providing a DC Fast Charger offers major benefits. By having a DC Fast Charger, anyone stopped to use the charger will spend at least 20 to 30 minutes engaging with surrounding businesses. This offers new customers, increased business traffic, and ample advertising opportunities.



This document was developed as part of Cities Charging Ahead!, a peer cohort of 28 cities that worked together across Minnesota to explore electric vehicle readiness. Participating cities received technical assistance focused on actions and best practices, based on the GreenStep Cities program, that can accelerate the adoption of electric vehicles. CCA was led by the Great Plains Institute and Clean Energy Resource Teams. Funding was provided through the Carolyn Foundation, Energy Foundation, and in partnership with Xcel Energy, which provided resources and support in line with the company’s long-term clean energy plan to electrify transportation. Learn more at driveelectricmn.org/cities-charging-ahead

