

SIOUX FALLS ELECTRIC VEHICLE READINESS STUDY

EV 101

Preparing for electric vehicles in Sioux Falls



The City of Sioux Falls is conducting an **Electric Vehicle (EV) Readiness Study** to identify ways to help the City prepare for an anticipated growth in EV usage over the next decade. Given the expected growth of EVs manufactured by national automakers, the adoption of EVs is anticipated to increase. Regulatory changes are also driving growth in EV charging infrastructure across both South Dakota and the U.S.

The City's preparedness to meet the demands of this new technology and to capture the benefits that EVs and charging infrastructure offer to help maintain Sioux Falls as an investible community to live and work.

Study Considerations

The study will include the following items to help prepare the community for this new technology:

- Analyzing Sioux Falls' local EV sales projections and corresponding charging station needs
- Studying how EV growth will affect the city's electric grid
- Offering ways for the City to keep current on code and policy for EV charging
- Reviewing lessons learned from other states and cities with comparable EV adoption rates

Study Timeline



Driving Growth



U.S. electric car sales jumped from **0.2 percent of total car sales in 2011 to 7.7 percent in 2022** (International Energy Agency). EV sales continue to grow in the U.S. as automakers build more options.



Considering changes in government policies and the auto manufacturing industry, many forecasts anticipate a strong increase in EV adoption. This study will help us identify what long-term EV sales projections may look like in Sioux Falls and plan accordingly. There were nearly **500 electric vehicles registered in Minnehaha County at the end of 2022**, which is 26 percent of the state's total EVs.

SCAN ME!



SHARE your input about EVs in an engagement questionnaire at siouxfalls.org/EVstudy

What is happening with EVs?

The electric vehicle market is evolving rapidly, with models available in a range of vehicle types, from compact cars and sedans to sport utility vehicles (SUVs) and pickup trucks.

Auto Manufacturers

Toyota	plans for electric and hybrid vehicles to constitute 70 percent of its U.S. sales by 2030.
Hyundai	aims to increase the number of eco-friendly car sales up to 80 percent by 2035. By 2040, they intend to change over to 100% electric vehicles and hydrogen-electric vehicles.
Nissan	is investing about \$14 million to develop their own batteries and EVs over the next five years, to increase electric vehicle sales to 50 percent by 2030.
Subaru	wants 40 percent of its sales to be electric vehicles or hybrids by 2030.
Volvo	has pledged that 50 percent of its vehicle offerings will be EV by 2025, and it will be a fully electric car company by 2030.
General Motors	has pledged that all light-duty cars and SUVs will be EV by 2035.
Ford	expects that 40 percent of global sales will be EV by 2030.
Volkswagen	expects that 50 percent of US sales will be EV by 2030.
Jeep/Chrysler/Dodge	aims for 50% of its lineup and retail sales to be electric vehicles by 2030.

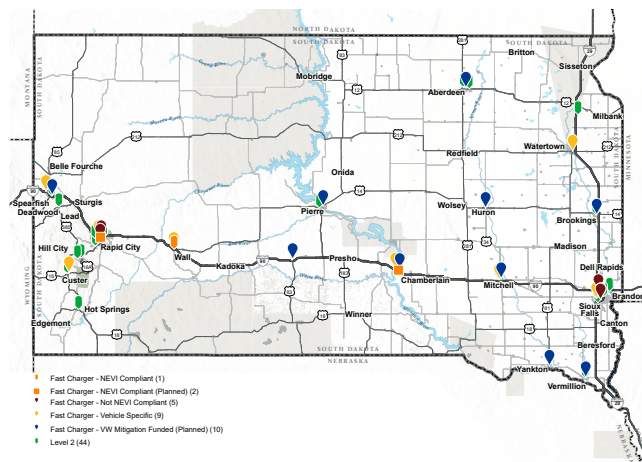
Regulatory Changes: National Electric Vehicle Infrastructure (NEVI) Program

Given the expected growth in EVs and the need for more charging stations across the country, the Federal government is using the National Electric Vehicle Infrastructure (NEVI) Program to jumpstart the investment in charging infrastructure. The program will provide funds to install fast chargers along designated corridors.

In 2022, the state of South Dakota created an EV Fast Charging Plan.

The plan provided recommendations to deploy EV infrastructure across the state to provide convenient, reliable, affordable, and accessible charging for EV drivers. The plan allowed the state to meet the Federal requirements to obtain NEVI funds.

The Sioux Falls EV Readiness Study will consider the findings from the South Dakota EV Fast Charging Plan.



Electric Vehicles in Sioux Falls | By the Numbers



496 EVs registered in Minnehaha County in **2022**

17 charging locations in **20-mile** vicinity

EV Infrastructure

EV Infrastructure is also referred to as charging stations or Electric Vehicle Supply Equipment (EVSE). There are three types of EV charging technologies currently available for passenger vehicles.



LEVEL 1

- Standard wall outlet charging
- Slower charging speed: up to 40 hours for a full charge



LEVEL 2

- Slower charging speed: 4-10 hours for empty to 80 percent charge
- Short-range travel (commuting)
- Currently accounts for ~80 percent of all charging demand



LEVEL 3

- Fast charging speed: ~30 minutes to 80 percent charge
- Long-range travel

Getting to Know the Basics

Terms and Acronyms

 **EV**
Electric Vehicle

 **BEV**
Battery Electric Vehicle

 **PHEV**
Plug in Hybrid Electric Vehicle

 **EVSE**
Electric Vehicle Supply Equipment

 **DCFC (Level 3)**
Direct Current Fast Charging

 **ICE**
Internal Combustion Engine

Types of EVs

Electric vehicles are a rapidly evolving technology. They are fueled and propelled differently from Internal Combustion Engine (ICE) vehicles. Here is an overview of EV types.

1

Battery Electric Vehicle (BEV)

- Battery-only population; no ICE backup
- Up to 400 mile range, depending on make and model
- Fuel with electricity only

2

Plug-In Hybrid Electric Vehicle (PHEV)

- ICE and electric motor
- Relatively short range on full battery (~40 miles), and then the ICE automatically starts
- Not limited in range by battery

3

Hybrid Electric Vehicle (HEV)

- ICE and electric motor
- Battery allows for smaller engines
- Battery charges by regenerative braking or using engine as a generator

EV Benefits



Improved air quality, lower emissions



Lower fuel costs



Less vehicle maintenance, fewer moving parts



Noise pollution reduction



Energy independence and use of renewables; better energy efficiency

Let's Chat about EVs...

- Yes - EVs are safe.
- All vehicles, regardless of whether they operate on gasoline or electricity, must meet Federal Motor Vehicle Safety Standards.
- EV batteries must meet testing standards and are designed with additional safety features.
- Fires involving EVs are not considered to be any more dangerous or likely to occur than in conventional vehicles. The City of Sioux Falls is working to develop policies that support fire safety.

“
Are electric vehicles safe?
”

- EVs can operate in hot and cold weather, but extreme conditions can decrease their range.
- Impact on range depends on the model, so drivers should do research and plan accordingly during extreme weather conditions.

“
How do electric vehicles work in harsh weather conditions?
”

- Newer recycling processes can recover up to 95% by weight of a lithium-ion battery.
- Research is underway to improve the percentage of a battery that can be recycled and lower the cost of recycling batteries.

“
Can you recycle an electric vehicle battery?
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- Current research indicates that the power grid has sufficient capacity to support EV charging.
- The power level and time of day when vehicles are charged can impact grid capacity and electricity rates.
- Grid updates and additional generation may be required as EV numbers increase.
- Sioux Falls area electric utilities are working on strategies to ensure the power grid is adequately prepared for the coming growth.

“
Is the current power grid ready to support electric vehicles?
”

EV Technology Trends Currently Being Monitored



Increased Battery Power Density



Increased Battery Lifetime (Recharge Cycles)



Higher Battery Voltages



Decreased Charging Time



Decreased Battery Cost (\$ / kWh)