



# How to Electrify Your Fleet: Lessons from Cities

## FLEET STUDY 101

Through the Cities Charging Ahead effort, the Minnesota cities of Bloomington, Faribault, Fridley, Hastings, Inver Grove Heights, St. Louis Park, White Bear Lake, Winona, and Woodbury completed fleet studies funded by Xcel Energy, and Coon Rapids completed a fleet study funded by Connexus Energy. Each city worked with a company called FleetCarma to install telematics devices in chosen fleet vehicles and analyze that data. The telematics devices tracked various vehicle usage statistics, including idle time, acceleration patterns, and daily miles of any given vehicle equipped with a device.

Following the FleetCarma analysis, each city received a report about which of their fleet vehicles were the best fit to be replaced with electric vehicles (EVs) based on the total cost of ownership savings over the life of the vehicle. FleetCarma calculated the difference in the cost to operate and maintain an existing vehicle in each fleet compared to a hypothetical EV replacement. The following are the major takeaways from those analyses.

### LESSONS LEARNED

**By analyzing data trends, we identified three key lessons when looking for vehicles to swap out:**

- 1. More miles driven = more savings.**
- 2. Look for vehicles that take many short trips.**
- 3. Switch vehicles that idle a lot.**

## LESSON 1: MORE MILES DRIVEN = MORE SAVINGS

The studies in Minnesota cities found that average miles driven in a day held the strongest correlation with overall dollar savings for switching to an EV. The two biggest reasons for the lower cost of driving an EV (compared to a traditional internal combustion engine car) are lower fuel costs and significantly lower maintenance costs (e.g., no oil changes, spark plugs, belts, etc.). Simply stated, the savings from driving an EV vs. an internal combustion engine car stack up over time.

Also, every vehicle studied had an average daily usage of under 180 miles, which is well within the range of most modern battery EVs. Because EVs are most commonly charged overnight and begin each day at full power, if a city employee's day of driving does not exceed the maximum range of the vehicle, they will never have to worry about charging or refueling during the day. If a fleet vehicle is being driven each day, but rarely has days exceeding 200 miles, it is likely a perfect fit to be replaced with an EV.

## LESSON 2: LOOK FOR VEHICLES THAT MAKE A LOT OF SHORT TRIPS

A high frequency of trips paired with small average trip distance is a clear indicator of a good fit for an electric replacement. Small, short trips achieve the highest possible fuel efficiency in EVs, and the savings quickly add up. These shorter trips are generally low speed (which maximizes battery range) and likely indicate high idle time in city fleet vehicles (see lesson 3). With a daily workload within the 200-mile range, electric fleet vehicles performing this kind of work can be easily charged overnight, dependably perform each day, and save fuel.

## LESSON 3: SWITCH VEHICLES THAT IDLE A LOT

Because EVs do not require an engine to run while they idle, they do not waste fuel when idling. Additionally, during Minnesota winters, the vehicle interior can be kept warm at a fraction of the fuel cost of an internal combustion engine vehicle. Public safety vehicles that are required to idle frequently to keep power flowing to police and fire equipment, for example, have suitable hybrid options, which rely on electric batteries and power to keep the safety equipment operational and can turn off the engine to save on fuel. Employees that prefer to leave their air conditioning or heat on or want to leave the vehicle running while making a short stop will cut their fuel cost drastically by switching to an EV.

## CONCLUSION

Replacing fleet vehicles that have high daily mileage, take a lot of trips, and/or idle frequently will save cities and organizations money over the life of the vehicle. While EVs do have slightly higher upfront costs, the return on investment is high as the savings from fuel and maintenance stack up. Some vehicles in city fleets will not be suitable to be replaced with an EV at this time, and the EV market is still developing truck and SUV options (although there are several exciting options on the horizon).

The general trends that have come out of the Cities Charging Ahead fleet studies are informative and useful, but each fleet is different. By applying the lessons learned through the Cities Charging Ahead studies to your fleet, you can save money, reduce emissions, and support achieving a decarbonized energy system.

Read our full blog post on How to Electrify your Fleet at <https://www.driveelectricmn.org/how-to-electrify-your-fleet-lessons-from-cities-charging-ahead-fleet-studies/>



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CLEAN ENERGY RESOURCE TEAMS

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. Cities Charging Ahead! 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](https://www.driveelectricmn.org/cities-charging-ahead).