



# Identifying 3 challenges to fleet electrification

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# Introduction

The electric vehicle revolution has begun. The federal government has devoted \$5 billion<sup>1</sup> to building out a national electric vehicle charging network with the goal of enabling up to 50% of new vehicle sales to be electric by 2030<sup>2</sup>. America has its sights set on winning the EV race, and now there is no turning back.

Perhaps the largest impact of the EV revolution will be to fleets. The list of challenges ahead is lengthy and ranges from regulatory changes to vehicle availability to the significant investment electrification requires. Among the most pressing challenges are how, where and when to charge vehicles. But electrification also requires operational changes and new acquisition and maintenance strategies.

Although we are face-to-face with the advent of the EV age, only 17% of fleets say they use electric vehicles today,<sup>3</sup> which means many changes are ahead for the majority of fleets.

Electric vehicle fleet management comes with new challenges fleets will need to prepare for — and soon. Understanding the most significant challenges and taking time to develop a strong electrification strategy will help fleets win their own EV race.

<sup>1</sup><https://www.energy.gov/articles/president-biden-doe-and-dot-announce-5-billion-over-five-years-national-ev-charging>

<sup>2</sup><https://driveelectric.gov/>

<sup>3</sup>2023 Fleet Technology Trends Report

# Challenge #1: Identifying vehicle and charging infrastructure options and availability

Charging infrastructure has long been a barrier to EV adoption. Although federal dollars are allotted to build a national charging network, most fleets won't be able to rely on this alone and will need to invest in their own charging stations.

Charging infrastructure is a large investment that can seem overwhelming. Breaking it down into the key decisions you must make can simplify the task.

## What types of EVs will you add to your fleet?

Before you decide how you will charge vehicles, you'll need to know what vehicles you'll be charging. The charging equipment you select will depend on the type of vehicles you operate as well as how many you need to charge.

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**TIP: Before you flip the switch on your program, pilot a smaller number of vehicles to ensure your expectations and requirements are met.**

Understanding your charging needs starts with the vehicle. If you haven't placed your EV order yet, you'll want to make that decision based on the requirements of your existing fleet units. Factors to consider include:

- Application
- Daily mileage needs
- Carrying capacity
- Idle time
- Duty cycle

If the EV you purchase can't match the performance of the internal combustion engine (ICE) vehicle it replaces, range will become a problem. Don't forget to factor in the environment the vehicle will operate in, as external factors like climate, terrain and driving habits can impact range.

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**TIP: Understanding the needs of your drivers, customers and technicians can also aid in vehicle selection.**

## Will the EVs we want be available?

In today's environment, available EV inventory can hinder your implementation timeline. The same kinds of supply chain challenges slowing production of ICE vehicles exist for EVs too. Adding to the strain are legislative mandates and incentives that are driving a demand for EVs that exceeds supply.

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**TIP: Long order timelines can work in your favor. While you wait for EVs to arrive, you'll have time to install charging infrastructure and when your vehicles arrive, you'll be able to have them up and running immediately.**

## What factors impact range?



**Climate:** Hot and cold weather can dramatically affect EV range. In addition, running the heater, air conditioning and operating wiper blades can drain the battery.



**Terrain and elevation:** It takes more energy for a car to drive on rough surfaces.



**Tire pressure:** Underinflated tires have a greater rolling resistance, which draws more energy from the battery.



**Bad driving habits:** Speeding and aggressive driving waste power just like they waste traditional fuels.



**Payload and towing:** The more weight you pull or carry, the more taxing it is on the battery.

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**TIP: EV range could be different from the OEM spec based on the duty type, so you'll want to monitor and normalize the range for your vehicle duty type.**



### **Does your charging infrastructure availability coordinate with vehicle delivery?**

Installing charging infrastructure may require new construction. These projects can take time, and it will be important for chargers to be in place before new EV arrive. Aligning procurement planning with project management can help orchestrate the right timing and ensure the power needs of new EVs don't exceed charging capabilities.

### **Where will drivers charge their EVs?**

Fleet vehicles could be charged at a shop, a depot, company headquarters, or a driver's home. This will depend on the nature of your workforce.

For example, if a pharmaceutical rep works from home and returns there each night, you might consider funding the installation of a Level 1 (120 volt) or Level 2 (240 volt) plug so they can charge their vehicles at home overnight.

If you have crews that meet at a central location, then travel together to a worksite, you might consider a centralized location where they can pick up the vehicle for work, then drop it off at night to charge.

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**TIP: Be sure to account for the time it takes to charge EVs in your plan. The amount of time it takes to charge an EV will depend on whether you use a Level 1, Level 2 or DCFC charger. Plug-in hybrid electric vehicles (PHEVs) will take less time to charge to 80% from empty than a battery electric vehicle (BEV).**

### **Is sufficient power available at the location(s) where you want to charge vehicles?**

Before making a final decision on where to install chargers, call the local utility company and find out if enough power is available to handle the increased load. If not, a utility upgrade will be needed to deliver more power to the site.

Be sure to assess the cost associated with a power upgrade. The closer chargers are located to an electrical panel, the less you'll spend on installation. It's also easier to install chargers near a utility pole. If the utility company must install a new transformer or dig a trench and lay wire to connect to the grid, the cost could be steep enough to consider another site.





## What are the different charger types?

### Level 1

- Designed for home use.
- Charges through a common residential 120-volt (120V) AC outlet.
- Can take 40-50+ hours to charge a Battery Electric Vehicle (BEV) to 80 percent from empty and 5-6 hours for a Plug-in hybrid electric (PHEV)

### Level 2

- Used for home, workplace and public.
- Offers higher-rate AC charging through 240V (in residential applications) or 208V (in commercial applications) electrical service.
- Level 2 chargers can charge a BEV to 80 percent from empty in 4-10 hours and a PHEV in 1-2 hours.

### Direct Current Fast Charging (DCFC)

- Designed for public use, especially at stations along heavy-traffic corridors.
- Provides rapid charging: Can charge a BEV to 80 percent in 20 minutes to 1 hour.
- Most PHEVs currently on the market do not work with fast chargers.

Source: <https://www.transportation.gov/rural/ev/toolkit/ev-basics/charging-speeds>

## What type of charger should you use?

The answer to this question depends on what types of vehicles you need to charge and where they are located. In addition to those factors, it's important to keep in mind that EVs charge at different speeds depending on the type of charger you use. For that reason, make sure vehicles have enough downtime to charge at the rate your charger provides.

## When will you charge vehicles?

The answer to this question depends on what types of vehicles you need to charge and where they are located.

In addition to those factors, it's important to keep in mind that EVs charge at different speeds depending on the type of charger you use. For that reason, make sure vehicles have enough downtime to charge at the rate your charger provides.

The primary concern about when to charge vehicles is when it won't affect vehicle availability. Within those parameters, you'll want to find out how your utility company charges for electricity.

The billing structure that can impact fleets most is a time-of-use rate, where utility companies charge customers higher rates during peak times, for example, from 8 am to 10 am and 4 pm to 8 pm. In general, rates are lowest overnight, but devising a plan to charge during off hours will help keep charging costs in check.

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**TIP: Be sure to make a plan to power vehicles if the grid goes down. This could include off-grid electrical services, generators, solar power, etc.**





## Challenge #2: (Re)defining fleet policies and procedures

Electrifying your fleet will bring forth operational changes that require new or revised fleet policies and procedures.

### **Driver training**

Before deploying EVs, drivers should receive training. Some drivers, especially those who have never driven an EV, will have questions and concerns. Questions may be as basic as “Can I charge my vehicle in the rain?” and “Is it safe to drive an EV in the rain?,” so quelling those concerns and making sure all drivers know how to operate their vehicles will be important.

Drivers may also need instruction and practice on one-pedal driving, where operators accelerate and brake using only the gas pedal. This helps extend battery range and brake life.

EV drivers will have new responsibilities, like understanding when and where to charge, taking care of charging cables and using charging-related apps, so policies for these circumstances should be covered in the training as well.

### **Carpooling/vehicle sharing policies**

Carpooling and vehicle sharing policies will need to include provisions for EVs, like where to pick them up (which could be a new location with charging infrastructure), where to charge them, how to pay for charging (if applicable), what factors affect range and battery life and the battery level at which a vehicle must be charged or returned.

### **Paying for charging**

Fleets should also consider how they will have visibility into fleetwide charging expenses, including home charging. This includes creating and documenting policies about where and when to charge as well as who pays for home and public charging, and how. You might consider developing an employee reimbursement program for these types of expenses.

### **Tracking progress toward sustainability goals**

One reason fleets adopt EVs is to reduce GHG emissions to comply with environmental regulations and/or to help achieve their organization's environmental goals, so you'll want to track that progress. Some OEMs and charging vendors offer platforms that track key metrics like CO2 reductions. Fleet management software can also track and report on important EV metrics.

### **The communication plan**

Embarking on your EV journey takes a surprising amount of support from your organization and community, so be sure to establish relationships with the partners in your organization who you'll need for a successful implementation. Develop check-in points to get their feedback early and often.

For instance, you may need to work with your real estate team to find space for charging infrastructure. Your finance team may assist with finding funding, grants and incentives. Outside parties, like the OEM, regulators, the utility company and your telematics provider can offer advice based on their experience helping other fleets with these same challenges.

Getting budget and strategy approval often comes down to your leadership, so communicate early and often to get their buy-in as well. If you've established relationships with your partners in finance, real estate and operations, include them in those touchpoints. Having a united front can help leadership understand the validity of your plan.

## **EV implementation stakeholders:**

- Real Estate (charging)
- Operations (reporting)
- Procurement
- Drivers
- HR (policies)
- Safety & Risk Management
- Electrical utility companies
- Fleet Maintenance & Repair
- Vehicle suppliers
- Finance (funding, grants and incentives; performance reporting)
- Regulators
- Learning partners (industry, government and technology organizations)





## Challenge #3: Electric vehicle maintenance

Although EVs don't require oil changes and have fewer mechanical parts, they do have unique maintenance needs.

### **Safety in the shop**

EVs have high-voltage energy systems that can deliver a fatal electric shock if not handled correctly. For this reason, you'll need to develop elevated safety protocols for technicians and ensure they receive training on how to work on EVs.

### **Certified mechanics**

If you outsource maintenance (or if your technician(s) can't access certification training), you'll need to find mechanics who are certified to work on electric vehicles.

### **Tools and equipment**

You may need to invest in new tools and technology to support maintenance and repairs for EVs. You'll need to perform some research to update your shop parts and equipment inventory.

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**TIP: Don't forget to factor in upfit maintenance on your new EVs as well.**

### **Battery life**

EV batteries are expensive, so determining the battery life for your EVs will be critical for uptime and budgeting. Although OEMs may provide model-specific information about battery life, it can vary dramatically based on the conditions under which the EV operates. For instance, in moderate climates today's batteries last about 12 to 15 years. But when an EV operates in an extreme climate, battery life drops to 8 to 12 years.<sup>4</sup>

<sup>4</sup>[https://afdc.energy.gov/files/u/publication/electric\\_vehicles.pdf?4efbe6d174](https://afdc.energy.gov/files/u/publication/electric_vehicles.pdf?4efbe6d174) (Page 4) and [https://afdc.energy.gov/fuels/electricity\\_benefits.html](https://afdc.energy.gov/fuels/electricity_benefits.html)





# How fleet management technology can help

**Verizon Connect is continuously listening, growing and adapting based on feedback from our customers, and this includes developing solutions to support the growing population of fleets with EVs.**

Our fleet management solutions can help fleets seeking to electrify with:

- **Vehicle selection.** Telematics data helps fleet managers determine which vehicles make ideal candidates to be replaced by EVs.
- **Total cost of ownership (TCO).** GPS fleet tracking technology can give fleet managers insight into how much they're spending on fuel and maintenance and compare total cost of ownership of ICE vehicles and EVs.
- **Battery status.** Fleet managers can use GPS tracking technology to see the battery status in all their EVs, so they know which vehicles are ready to go.
- **Vehicle suitability.** Telematics can give organizations the insights about which vehicles can complete certain jobs.

We continue to work and integrate with electric vehicle partners as we evolve the technology of electric vehicle management and simplify and scale solutions for our customers.

## Electric vehicle enhancements for Verizon Reveal customers

### Electric vehicle suitability tool

Verizon Reveal's new electric vehicle suitability tool is designed to make adding EVs to your fleet easier by showing which current vehicles could be good candidates for replacement.

- **Suitability Summary** – a quick snapshot that includes the percentage of suitable vehicles available, total fuel cost savings and estimated CO2 reduction by pursuing EV conversion.
- **Recommendations** – a list of the most suitable internal combustion engine vehicle candidates to replace with EVs.
- **Savings** – a tool that shows the expected CO2, fuel and cost savings from converting suitable vehicles.

### Live map updates

Verizon Reveal continues to grow with the fleet industry, including the journey to electrification. To better meet the needs of customers with EVs or who manage a mixed fleet, we've enhanced the Reveal platform with these Live Map updates:

- NEW charging icons on the Live Map make it easier to see which EVs are currently charging and where they're located
- Vehicle balloon displays battery information for the selected vehicle
- EV summary report
- EV low battery alert
- EV view battery charges

# The benefits of EVs for fleets

**Adopting electric vehicles effectively takes work, but doing so comes with benefits:**

- Reduced fuel and maintenance costs
- Compliance with emissions regulations
- Improved sustainability and environmental stewardship
- Elevated public perception

**Visit [www.verizonconnect.com/features/electric-vehicle-fleet](http://www.verizonconnect.com/features/electric-vehicle-fleet) or schedule a demo to learn more about electric vehicle fleet solutions from Verizon Connect.**

