The Estes Park Electric Vehicle Infrastructure and Readiness Plan (EV Plan)

Frequently Asked Questions

Thanks to Sarah Davis of SRD Consulting for compiling this list of frequently asked questions.

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1. **What's the difference between an internal combustion engine (ICE) vehicle, a plug-in hybrid (PHEV), and a battery-electric vehicle (BEV)?**
   The term "EV," electric vehicle, refers to cars that are primarily or secondarily powered by electricity versus a traditional vehicle reliant on internal combustion and gas or diesel fuel. Internal combustion engine (ICE) vehicles have an engine made of a number of component parts, which are powered by the combustion of diesel, gasoline, or natural gas. ICE vehicles also have a battery, which powers the starter.

   Battery-only electric vehicles (BEVs) have one power source – the battery – which is used to power the motor and everything else from lights to the wipers. Plug-in hybrid electric vehicles (PHEVs) have a small battery that usually only operates when the vehicle is below 25 mph and the rest of the time is gas- or diesel-powered. Sometimes the term EV is used to refer to bother battery-electric and plug-in hybrids, however, we are focusing on battery-electric vehicles primarily through this effort.

2. **Are electric vehicles really better for the environment?**

   Yes, full battery EVs have no tailpipe or direct emissions which impacts air quality locally. EVs have significantly lower carbon emissions over the course of their lifetimes than traditional internal combustion engine (ICE) vehicles, even when taking into account the source of the power used to charge the EV. When the energy EVs run on is powered by renewable sources such as solar or wind, their lifecycle emissions are further reduced.

   The one typically unaccounted for and often difficult to measure impact comes from the mining of precious and rare earth metals for the batteries. Manufacturers are constantly exploring new, more efficient, and less impactful battery chemistries.

3. **Are electric vehicles safe?**

   Yes, EVs must meet the same safety standards and undergo the same rigorous safety testing required for internal combustion engine (ICE) vehicles sold in the United States. Furthermore, EV-specific requirements include standards for limiting chemical spillage from batteries, securing batteries during a crash, and isolating the chassis from the high-voltage system to prevent electric shock. EVs tend to have a lower center of gravity than ICE vehicles due to the weight and placement of the battery. A lower center of gravity makes EVs less likely to roll and often improves handling in inclement weather such as snow.

   One safety concern specific to EVs is their silent operation; pedestrians and bicyclists may be less likely to hear an EV than an ICE vehicle. The National Highway Traffic Safety

Administration requires plug-in hybrids (PHEVs) and EVs traveling under 18.6 mph (30 km/h) to emit warning sounds that pedestrians must be able to hear over background noises.

4. **What are the benefits of owning and driving an electric vehicle?**

- Low maintenance costs - fewer mechanical parts
- No tailpipe or direct vehicle emissions
- No more pumping gas!
- Quiet drive
- Instant torque and high performance
- The knowledge that you aren't directly emitting emissions into the air locally.

5. **Can you tell the difference between a regular car and an electric one by sight?**

It can be a challenge. Unless you are paying close attention to EV makes and models, it can be almost impossible to distinguish them from internal combustion engine (ICE) vehicles by sight – the most noticeable difference is that EVs don't have a tailpipe for emissions.

6. **Are electric vehicles affordable?**

It depends. EV prices are largely determined by the cost of the battery. As technology improves and production increases, battery costs are steadily falling. Financial analysts predict that due to the falling cost of batteries, the purchase price of new EVs will be the same as (or less than) comparable gas cars by 2025 or earlier, even without incentives and subsidies.

The average price of a light-duty (gas-powered) vehicle in the US was $38,723 in September 2020, according to Kelley Blue Book. Many electric vehicles have a lower list price than that, including the:

- Nissan Leaf ($30k),
- Hyndai Ioniq Electric ($30k),
- Volkswagen eGolf ($32k),
- Fiat 500e ($33k),
- Tesla Model 3 ($35,400),
- Chevy Bolt EV ($36,600), and
- Hyundai Kona Electric SUV ($36,900).

Subtract another $7,500 for the federal tax credit and up to $4,000 for the Colorado tax credit (see here for the latest and breakdown by vehicle type and timeframe), and these EVs are in the less than $25,000 range.

"According to two Electric Vehicle Cost-Benefit Analyses done by M.J. Bradley, Coloradans could save an estimated $373 per vehicle per year in annual operating costs, compared with owning gasoline vehicles by 2050." -Western Resource Advocates

7. **What are the ongoing maintenance requirements of electric vehicles?**

   EVs are less mechanically complex and require significantly less maintenance over the course of ownership. No regular oil change is necessary, so other than balancing the tires and checking the brake pads it is mostly refilling the windshield wiper fluid - that's it!

   For more information check out this Consumer's Report article Electric vehicle owners spending half as much on maintenance compared to gas-powered vehicle owners, finds new CR analysis

8. **How far can I drive an electric vehicle before I have to charge?**

   It depends! Battery size and environmental conditions such as temperature can impact range or the distance an EV can go on a battery charge; however, most EVs sold today have a range of at least 200 miles. There are even some long-range electric vehicles with up to 380 miles depending on driving conditions. Electric vehicles continue to improve in range so that driving from Estes Park to Grand Lake over Trail Ridge Road is not a problem. Electric vehicles also benefit from something called regenerative braking. Regenerative braking is an energy recovery mechanism that slows down a moving vehicle by converting its kinetic energy into a form that can be either used immediately or stored until needed.

9. **What are the 3 different levels of charging?**

   Level 1 is a 110-volt charger that would take more than 24-hours to charge a pure electric vehicle. A Level 1 unit can charge a plug-in hybrid or extended-range electric vehicle.

   Level 2 is a 220-volt charger that would take 6-8 hours , which most electric-car owners will purchase to charge their cars overnight in their homes. A Level 2 charger can charge a pure electric car such as the Nissan Leaf, Mini-E, or the coming Ford Focus EV in 8 to 10 hours.

   Level 3 is known as direct current (DC) fast charging. These chargers will primarily provide direct current at up to 500 volts. Level 3 chargers will be installed in public places and can provide an 80 percent charge to a full electric car in under a half hour.

10. **What are the different plug or connector types?**

    SAE J1772: All EVs in North America except Tesla use the SAE J1772 connector for Level 1 and Level 2 charging, also known as the "J-plug." Tesla vehicles can charge on a J1772 by using an adapter cable that Tesla includes with the vehicle at sale.

    CHAdeMO: CHAdeMO is a connector for Level 3, DC (direct current) fast charging and was developed by the Japanese utility Tepco as the official standard in Japan. In North America, the only manufacturers currently selling electric vehicles that use CHAdeMO connectors are Nissan and Mitsubishi. Unlike the CCS system, CHAdeMO connectors do not share part of the connector with the J1772 inlet, so they require an additional ChadeMO inlet on the car so a larger charge port area is needed to accommodate two different charging connectors. Recently Nissan, a known CHAdeMO supporter released specs for an upcoming EV in their

fleet that will use a CCS connector, thus making CHAdeMO a legacy charging connector type.

CCS/SSA: The CCS is a connector for Level 3, DC (direct current) fast charging that uses the J1772 charging inlet, and adds two more pins that allow high-speed charging. CCS is the accepted standard in North America, and was developed and endorsed by the Society of Automotive Engineers (SAE). Just about every automaker today has agreed to use the CCS standard in North America, including: General Motors, Ford, Chrysler, Dodge, Jeep, BMW, Mercedes, Volkswagen, Audi, Porsche, Honda, Kia, Fiat, Hyundai, Volvo, smart, MINI, and others.

Tesla: Teslas use a proprietary connector only used by Tesla vehicles. The more streamlined design uses the same connector for level 1, level 2 and DC fast charging, accepting all voltage levels so there is no need to have a different connector specifically for DC fast charging as the other types require. Tesla operates a network of DC fast chargers called Superchargers across the globe. Tesla installed and maintains these stations, and they are for the exclusive use of Tesla customers. Even with an adapter cable, it would not be possible to charge a non-tesla EV at a Tesla Supercharger station due to the powerful charge, other vehicles are not designed to accept it. Furthermore, there is an authentication process that identifies the vehicle as a Tesla before it grants access to power. Currently, a seven stall Tesla Supercharger is located behind The Stanley in Estes Park.

11. How can I find a place to charge?

There are several well known networked charging providers including Electrify America, Tesla, EVGo, and ChargePoint. In addition to their apps, there are crowd sourced charging finders such as Plugshare and Chargehub EV.

12. Where can I charge in Estes Park?

There are two ChargePoint Dual-Port Level 2 chargers near the entrance to the Visitor Center’s parking structure, one ChargePoint Dual-Port Level 2 charger in the parking lot at Town Hall/ Library (along the back of the lot), and two ChargePoint Dual-Port Level 3 DC fast chargers are being installed in the main Estes Park Visitor Center surface lot this year.