

ROBCO ELECTRIC,
LAS VEGAS ELECTRIC VEHICLE ASSOCIATION &
THE TESLA OWNERS CLUB OF LV
PRESENT:

HOW DO I CHARGE THIS CAR?

Electric Vehicle Charging for Beginners



SO MANY QUESTIONS!!!!!!

You're not alone.

EVERY SINGLE PERSON who has thought of buying an EV is full of questions! Today, we have answers!



CHARGE YOUR CAR 3 WAYS

LEVEL 1 - CHEAP & EASY!

Charging at home using a regular household 120v outlet. Often called **Trickle Charging**, this method uses the charging cable that ships with most cars and a household outlet. It's no different than plugging in your cell phone. You'll gain 2 to 5 miles of range per hour the car is plugged in.

This method is GREAT for folks who drive less than 20 miles a day. 4 or 5 hours in the garage while you're sleeping and you wake up to a full "tank" every day!



CHARGE YOUR CAR 3 WAYS



LEVEL 2 - 240V

Level 2 charging uses a 240 volt outlet or a wall connector. It is considerably faster than Level 1.

A Level 2 charge can add 12 to 50 miles of range for every hour it is plugged in.

A 240 volt circuit can provide anywhere between 20 and 100 amps of electricity. The charging speed you get depends on the car's onboard charging controls AND the current from the outlet.

The preferred 240v outlet for an EV is a NE-MA 14-50.



CHARGE YOUR CAR 3 WAYS



USING AN EV OUTLET

Most cars come with a mobile charging cable (or one can be ordered). An adapter can be used to convert the cable end from standard household 120v to 240v use.

Make sure you match the adapter to the outlet type you have. Check the outlet face plate for the number or match the prongs to the illustrations on the ordering site.

This is the SWEET SPOT for a lot of people as it meets their needs for daily charging at a low cost.





HOW MUCH DOES A 240V OUTLET COST?

SOMEWHERE BETWEEN
\$900 AND \$1500

This price includes **labor, materials, permit, GFI breaker and inspection by the City.**

WHY SHOULD I TO HIRE A LICENSED ELECTRICIAN
AND NOT JUST PAY "SOME GUY" \$250?

Lots of handy folks/handyman can do an EV outlet, but remember this is HIGH VOLTAGE and it's being added to your home's main electric panel. Incorrect grounding of the wiring, the wrong gauge of wire, an incorrectly seated breaker or an overloaded panel could cause the outlet to overheat and catch fire. **Saving a few bucks by hiring "Joe the Handyman" to do your outlet for \$250 might not be worth it in the long run.**



WHY DO I NEED A PERMIT?

DON'T SKIP THE PERMIT!

Anytime you add load to your electric panel, all Las Vegas jurisdictions require a Permit be pulled. **Opting to get a permit is a form of insurance.** You hope you NEVER need it, but if there is trouble with the outlet install and your home catches on fire or there is damage to your car's charging port, **an unpermitted outlet is JUST THE EXCUSE** your homeowner's insurance or car manufacturer needs to deny paying the claim!

Owner Builder Permit: City of LV = \$262

Electrician Permit: \$375 to \$400

An electrician is required to submit a full load calculation and detailed set of stamped plans. This takes about 2 hours to prepare. When the electrician pulls the permit, you are paying for this prep time and the expertise to make sure the job is done up to code and correctly.

**WAIT... I
HAVE A PLUG
THAT LOOKS
LIKE THAT
ALREADY!
CAN I USE IT?**



**PROBABLY.
ANY 240V OUTLET CAN BE USED.**

If you already have a 240v outlet for say an electric dryer, a welder, an RV or something else in your garage, you can probably use it to charge your car. You'll just need to get the right adapter for the plug to work with your mobile charging cable or wall charger.



CAN I CHARGE 2 EVS AT ONCE?



➤ WELL, DO YOU HAVE ROOM FOR TWO 50 AMP BREAKERS?

Most residential electric panels in Las Vegas are 200 amps. The house generally is using about 100 amps, so adding one 50 AMP breaker for an EV is usually not a problem, but when you try to cram in a 2nd 50 amp breaker for the 2nd EV outlet you run into problems with the load calculations. In this case, **sharing a wall outlet/charger or using a splitter** is FAR less expensive than upgrading your main electric service, which can run anywhere from \$3,400 to \$25,000!

There is a new federal tax credit in the Inflation Reduction Act of 2022 that can help pay this cost.



CAN I SHARE AN OUTLET?



SPLITTERS TO THE RESCUE!

An outlet splitter lets you share an outlet with two devices...like a dryer and your EV or two different EVs. If one of them wants power, the other side shuts off. Once the first device is done, the power to the 2nd device is restored. These devices can also "share" the outlet's power between the two devices.

NeoCharge: Get your NeoCharge Smart Splitter today using the **discount code "EFORELECTRIC"** at <https://bit.ly/3iqK9Hb>

Dryer Buddy:
<https://www.bsaelectronics.com/collections/dryer-buddy>



CHARGE YOUR CAR 3 WAYS



USING A WALL CONNECTOR

A Wall Connector is a "nice to have," not really a necessity. The charging speeds on the various wall connectors are only going to be a few miles an hour faster than the mobile connector with an adapter for the 240v outlet.

Wall Connectors allow you to have some added functions like App control of charge start and stop times or setting TOU rates. They can be installed inside or outside the garage.. The cost to install can be cheaper than an outlet because the connectors already have a GFI breaker included.



WHAT DOES A WALL CONNECTOR COST?



➤ BUYING THE CONNECTOR

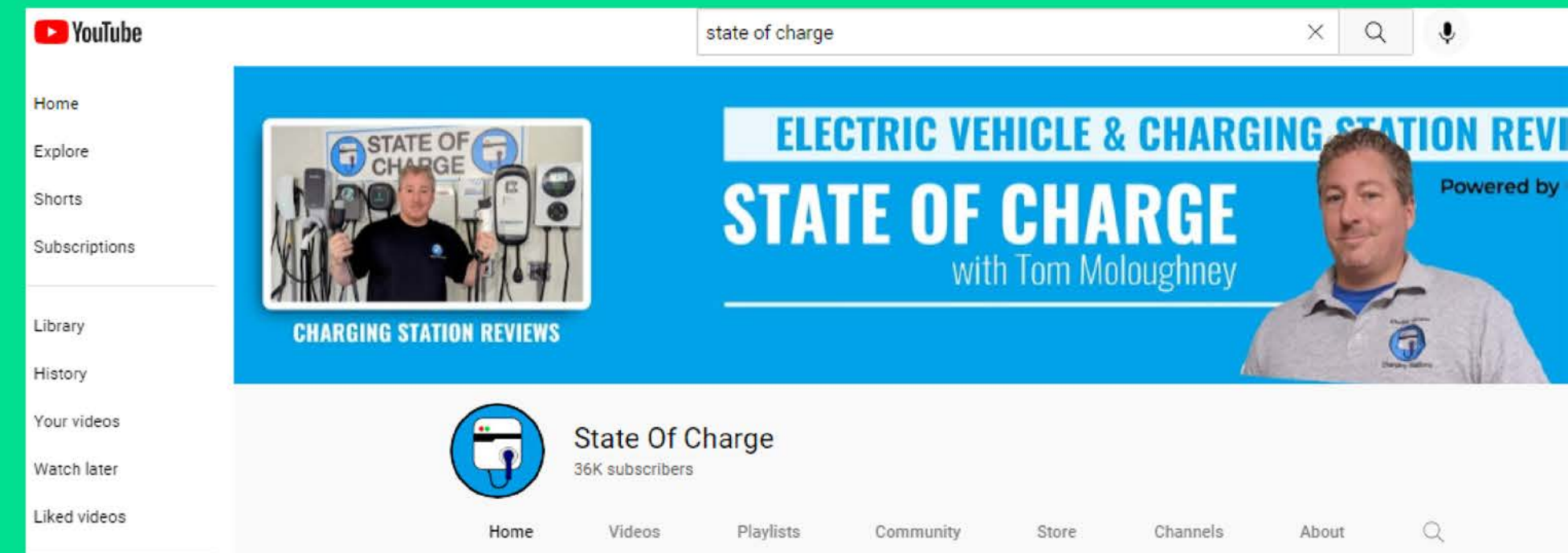
These usually run between \$400 and \$1500.

➤ INSTALLATION

Some connectors plug into your existing 240v outlet and some are hardwired. If it needs to be hardwired, a licensed electrician will generally quote about \$800 with the permit, depending on how far away from the panel you want it.

➤ HOW DO I PICK ONE?

The State of Charge Youtube channel has in-depth reviews on just about EVERY wall charger on the market.



TAX CREDITS & REBATES!

CASH IN ON YOUR CAR & YOUR CHARGER!

Some (but not all) EVs qualify for the **federal EV Tax Credit of up to \$7,500**.
Check if your car maker still qualifies:
<https://www.irs.gov/businesses/irc-30d-new-qualified-plug-in-electric-drive-motor-vehicle-credit>

The Federal EV Charging credit is generally **the smaller of 30% of the property's cost or \$1,000**.

<https://www.irs.gov/pub/irs-pdf/i8911.pdf>

[Need a Main Panel Upgrade for EV Charging?](#)

The Inflation Reduction Act of 2022 has a new credit of up to \$4,000.



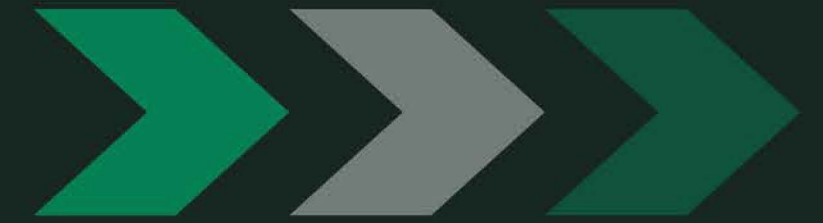
PUBLIC CHARGING

LEVEL 3 DC FAST CHARGING & DESTINATION CHARGING

98% of your charging needs will be met in your own garage or driveway, but if you have a really busy day with a lot of driving you may want to "top off" at a fast charger. Maybe you live in a place where you can't charge at home or are on a road trip. You can use DC Fast Charging or public Level 2 Destination Chargers anytime you're out and about.



CAN EVERY CAR USE EVERY FAST CHARGER?



TESLA SUPERCHARGERS

Most Tesla Superchargers & Urban chargers can only be used by Teslas. Tesla has just opened up select Superchargers with the Magic Dock to non-Tesla EVs.



MODEL S
75

19.6 mi
Since [unreadable]

44.0 mi
Since [unreadable]

52
Od [unreadable]

5:55

Time Remaining
11 min

234 mi/hr + 4 mi 70 kW

charging High-usage Supercharger station
Charging limit set to 80%, adjust limit if needed

CAN EVERY CAR USE EVERY FAST CHARGER?



CCS COMBO
Most non-Tesla EVs on the market today use the CCS COMBO connector. Stations such as Electrify America and EV Go offer this standard. You can now order a CCS Combo adapter for Teslas to use these stations.

CAN EVERY CAR USE EVERY FAST CHARGER?



CHADeMo

This standard is **ONLY** used by Nissan Leafs here in the US. EV Go offers these connectors.



15 min remaining

⚡ 119 mi



159 kW

650 mi/hr

+29 mi

Charge limit: 223 mi

HOW MUCH FASTER IS LEVEL 3?

Level 3 chargers can refill an drained EV battery from 10% to 80% (restoring over a hundred miles of range!) in as little as 20 minutes! Just enough time to stretch your legs and use the facilities while the car refills.





WHY CAN'T I HAVE A LEVEL 3 CHARGER IN MY GARAGE?

TOO MUCH POWER!

Level 3 chargers use 440 or 880 amps. Residential electrical panels are generally 200 or 400 amps. They just cannot handle that load!



LEVEL 2 PUBLIC CHARGING



FILL UP WHILE YOU SHOP. EAT OR TAKE IN A SHOW!

Lots of businesses now offer public Level 2 chargers. These chargers generally use the J-1722 connector that is compatible with pretty much every EV out there. *Tesla Mobile Connectors come with an adapter that you fit over the J-1722 end of the charge cable to plug into your Tesla's port.*

ARE THEY FREE TO USE?

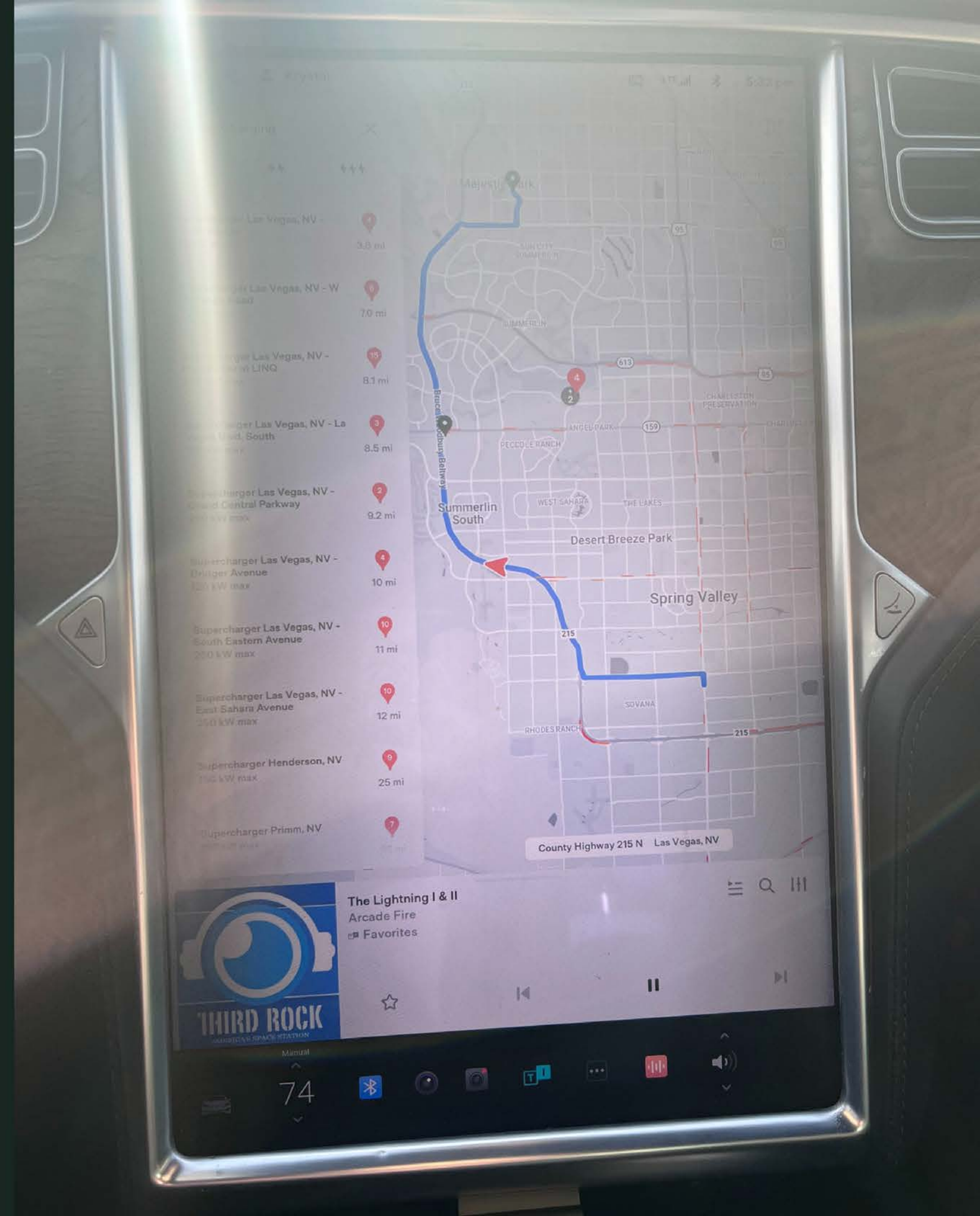
Sometimes they are. You'll generally need to download an App to your phone to use these chargers. There might be a fee per by the minute or by the kwh. Some networks offer prepay or subscription plans.



HOW DO I FIND PUBLIC CHARGING?

IN CAR NAVIGATION OR BY USING AN APP

Most EVs offer in car navigation systems that will locate public charging stations for you. There are also Apps like **A BETTER ROUTE PLANNER**, **CHARGEPOINT** and **PLUGSHARE** that will help you find chargers. The apps will often tell you if they are free, what they cost and if they are working.



Average Daily Electric Usage

Average Daily Cost this month **\$0.46**

Delivered kWh Received kWh

\$16.11

Additional time is provided to pay this bill. Please pay the amount due by Apr 18, 2021 to avoid a 1.5% late fee or deposit.

Account: **3000215762716462919**

Customer Number: **2157627**

Premises Number: **1646291**

Billing Date: Mar 23, 2021

Next Read Date: Apr 19, 2021

Account Summary

Previous Account Balance 60.09 CR

Electric Charges 13.20

Miscellaneous 63.00

Current Amount Due \$16.11

HOW MUCH DOES IT COST TO CHARGE AT HOME?

IT DEPENDS ON HOW MUCH YOU DRIVE EVERY DAY

Most cars get about 2.5 miles of travel per kwh, so if you drive 30 miles a day, $30/2.5 = 12 \text{ kwh} \times .1444 = \text{\$1.73 a day!}$

Same daily trip in an ICE CAR?
Gas = 1.25 gallons x \$4.00 = \$5

Nov Dec

Estimated usage

Month	Usage
Nov	722
Dec	1,277
Jan	555
Feb	0
Mar	1,587

Thank you for choosing net metering. If you have any questions about your bill, our customer service representatives are here to help. Please call us at (702) 402-2330, Monday through Friday between 8am - 5pm or email CustomerService@nvenergy.com.

Thank you for maintaining an excellent payment record. We look forward to serving you in the future.

Excess Energy Credit/carryover 2.14 CR

Temp. Green Power Financing 722.000 kWh x 0.00075 0.54

Excess Energy Credit/carryover 722.000 kWh x 0.000000 CR 0.00 CR

HOW DOES AN EV "FUEL" & MAINTENANCE COMPARE TO GAS?



EV

12,000 miles a year / 2.5 miles per kwh = 4,800 kwh

$4,800 \text{ kwh} \times .1444 = \693.12

NO OIL CHANGES!

NO TUNE UPS!

\$693.12 ANNUAL TOTAL

ICE CAR

$12,000 / 25 \text{ mpg} = 480$ gallons of gas

$480 \times \$4.50 \text{ gallon} = \$2,160$

2x Oil Changes = \$60

1 tune up or scheduled

service = \$200

\$2,420 ANNUAL TOTAL

GET IT EVEN CHEAPER!

Switching your power to TIME OF USE billing on the EV rate rewards you for charging overnight with 9 cents a kwh power!

$4,800 \times .09 = \$432!$

<https://www.nvenergy.com/account-services/energy-pricing-plans/electric-vehicle>

SOLAR + EV: THE ULTIMATE FREE RIDE!

IF YOU PAIR ROOFTOP SOLAR
WITH YOUR NEW EV, YOU'LL
ONLY PAY YOUR BASIC
CONNECTION FEE FOR POWER...
EVEN IF YOU DRIVE A HUNDRED
MILES A DAY!



HOW MUCH SOLAR DO I NEED FOR MY EV?



SIZE YOUR SOLAR

**ANNUAL LOAD / AVG. YEARLY OUTPUT =
NUMBER OF PANELS NEEDED**

4,800 kwh / 600 kwh per panel = 8 panels

Robco uses very high efficiency 400+ watt solar panels. Their average yearly output per year is 600 kwh. If you are considering a different brand, ask your Solar Consultant for the average annual output of the panel they are proposing.



WHEN SHOULD I CHARGE MY CAR?



BE A GOOD NEIGHBOR AND CHARGE AT NIGHT!

An EV uses a lot of power to charge. With our massive power demands in the summer, adding that load to your local grid at 3pm in the afternoon when EVERY AC IN LAS VEGAS needs juice is just inconsiderate. Be a good neighbor and limit your home charging to overnight hours during the summer. That really helps NV Energy keep the power flowing as that is when power demand is a lot lower.

Of course, if you have rooftop solar, you might want to use your solar during the day, but **remember, EV batteries charge better when it's cooler, so you may still want to charge at night.**



Electrical • Solar • Low Voltage

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