



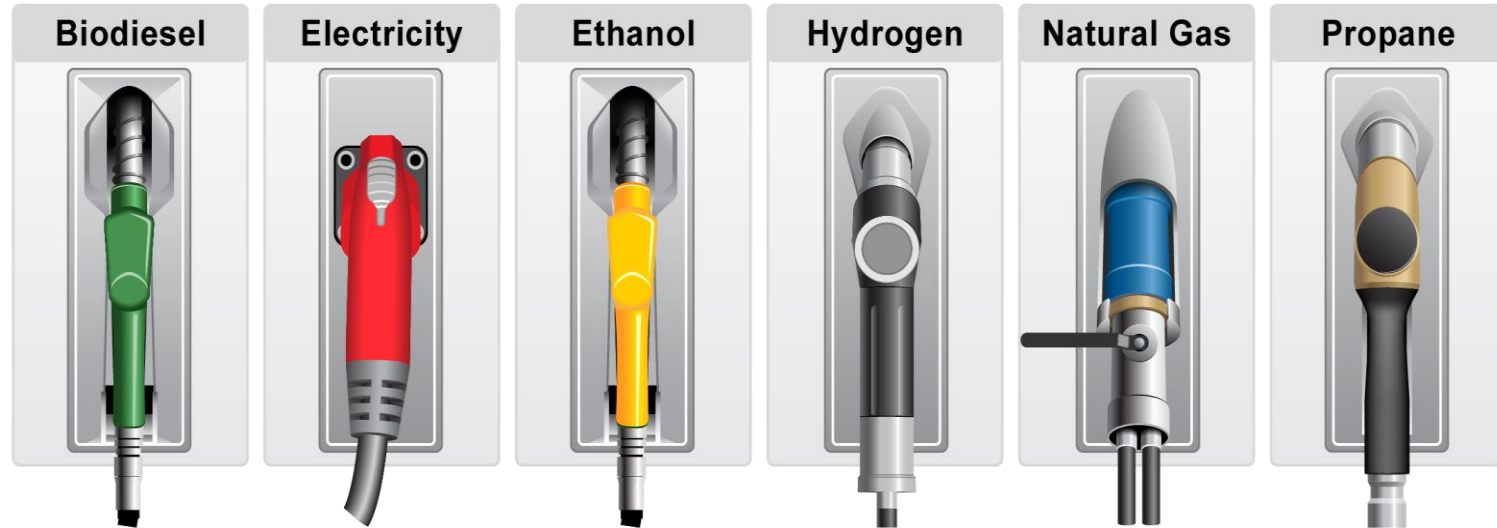
# Electric Vehicle User Webinar

March 28, 2022

Speaker: Jon Shevelew, Founding Member – Tesla Owners Club of Pennsylvania



CLEAN CITIES COALITION  
NETWORK





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# The Electric Evolution/Revolution

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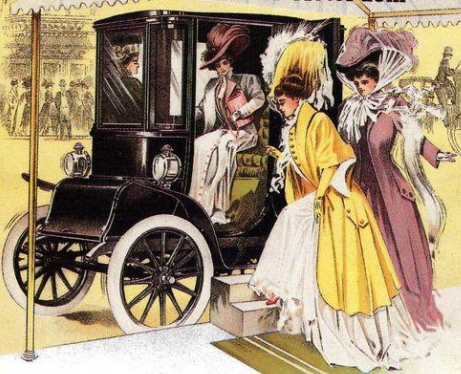
# A Brief History of the Electric Car

- 1832 Robert Anderson invents the first electric



- 1891 – William Morrison of Des Moines, Iowa develops the first successful consumer electric car.

**Baker Electric Vehicles**  
The Aristocrats of Motordom



**The Electric that Meets Every Need of the SOCIETY WOMAN**

You can learn to run The Baker in 30 minutes. It far exceeds all other electrics in simplicity, safety, as well as mileage and speed. It is noiseless and clean; having a battery capacity of 70 to 100 miles, it is unequalled for city and suburban use.

**Write for Our Handsome Booklet**


It clearly explains the many advantages of Baker Electrics, and gives full information regarding the elegant 1910 MODEL Coupes, Broughams, Victorias, Landaulets, Roadsters, etc.

**THE BAKER MOTOR VEHICLE CO., 39 WEST 80TH STREET, CLEVELAND, OHIO**

**THE 100-MILE FRITCHLE ELECTRIC**  
Is Guaranteed

to travel 100 miles on the single charge over city streets or country roads.

We are now ready to close 1909 deliveries. Write for our brochures.



**VICTORIA PRAXTON**  
BATTERY  
Complete your battery of wheels with our 100 guaranteed.

**CENTRAL GARAGE**  
1000-1010 10th Ave. N.W.  
MINNEAPOLIS, MINN.  
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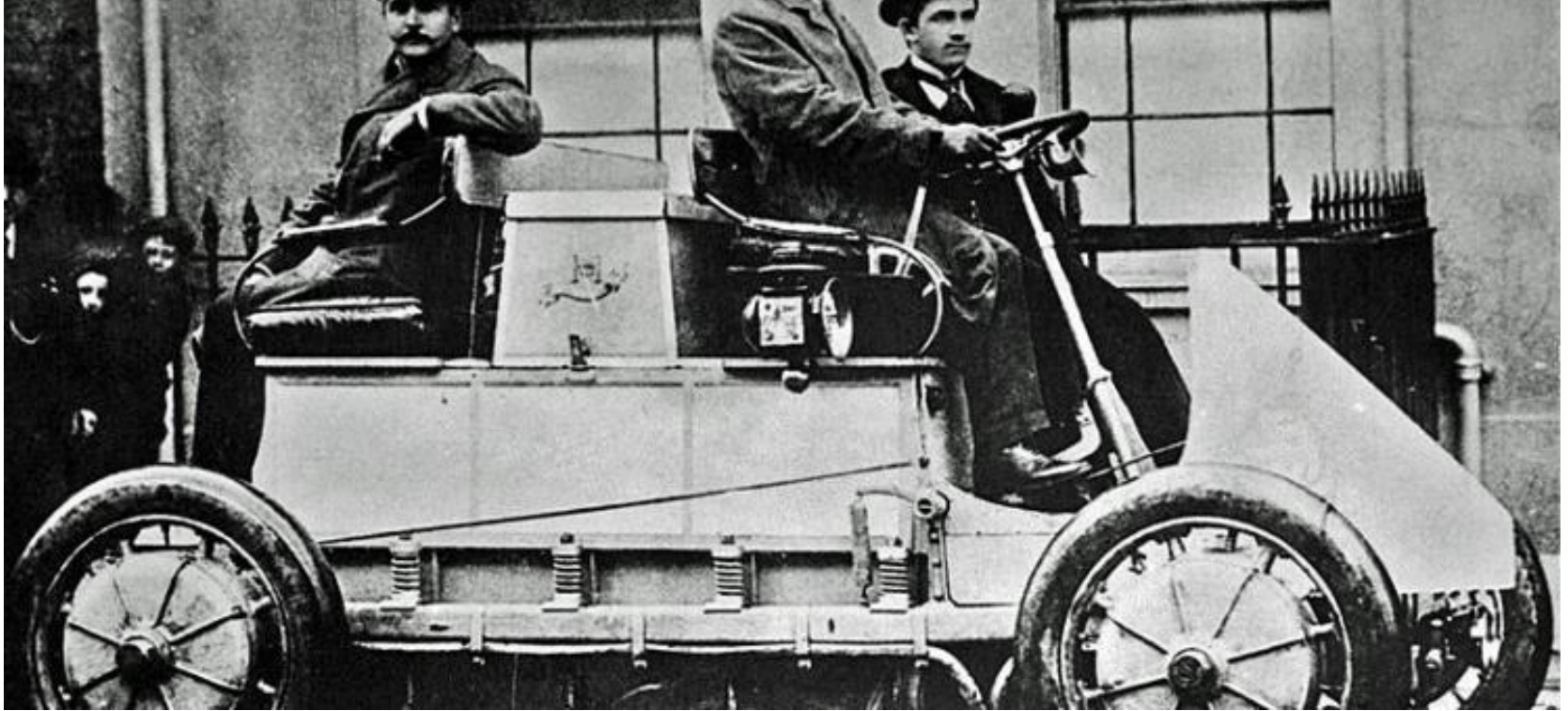
**THE FRITCHLE AUTOMOBILE & BATTERY COMPANY**  
1000-1010 10th Avenue North, MINNEAPOLIS, MINN.

The above letter is respectfully submitted as evidence of our 100-mile guarantee. It is our guarantee to you, and we are proud to have you as a Fritchle Electric owner. Immediately after the completion of an equipped car, being delivered to you, we will send you a letter of guarantee, and we will send you the 100-mile guarantee.

# When Electric Vehicles Ruled!!!

- 1901 – Edison improves battery technology, makes rechargeable batteries practical
- 1901-1912 – 30% of all cars are electric
- 1901 Ferdinand Porsche develops the first hybrid gas/electric car

# Porsche Hybrid



# SO WHAT HAPPENED!!

- 1908 – Henry Ford begins mass producing the Model T and invents the ***electric starter***.
- 1920 – Cheap gas, better roads and gas stations take over.
- 1935 – By 1935, electric cars disappear.

# But they weren't gone for good.....

- The rising cost of fossil fuels in the 70's – 90's began a wake up call.
- Recognition that fossil fuels are a finite resource.
- Recognition that climate change is real and damaging to the planet
- Recognition that air quality effects everyone's health
- All these along with massive improvements in battery technology, created renewed interest in using electric motors for transportation



# GM EV1 1996-1999, BEV's make a comeback!



# GM EV1

- First mass produced electric vehicle of the modern era
- 1,117 cars put in service on leases with overwhelming positive response from owners
- Gen1 cars had lead acid batteries with a range of about 78 miles.
- Gen2 cars had NiMH batteries with about 160 miles of range.
- Chevron buys the patent for NiMH batteries and refuses to allow them to be used for transportation (expired in 2018)

Claiming issues with the NiMH patent and low consumer interest GM takes back the leased cars and.....



# Which brings us to.....

- 2008 Tesla introduces the electric roadster
- 2010 Nissan introduces the Leaf
- 2011 Chevrolet introduces the Chevy Volt
- 2012 The Tesla Model S goes into production
- 2016 The Tesla Model X goes into production
- 2016 The Chevy Bolt is introduced
- 2018 The Tesla Model 3 goes into production
- 2020 The Tesla Model Y goes into production
  
- 2021 Tesla delivers over 930,000 cars

So How Does All of this Work!!



# What are some of the perceived weaknesses of electric vehicles?

- Range – They can't go very far between charges.
- Endurance – It takes a long time to charge.
- Speed – They're not very fast.
- Price – They are expensive.

# Why “Range” isn’t an issue

- Small car range: 350-400 miles.
- Midsize car range: 375-425 miles.
- BEV (Tesla MS 100D - 405 miles, Lucid Air – 500 miles)
- Tesla Model 3 LR 370 miles.
- Really not an issue because the average daily commute is 30 miles.
- Range for all vehicles depends primarily on speed but also on other factors like terrain and weather.

# Why “Endurance” isn’t an issue

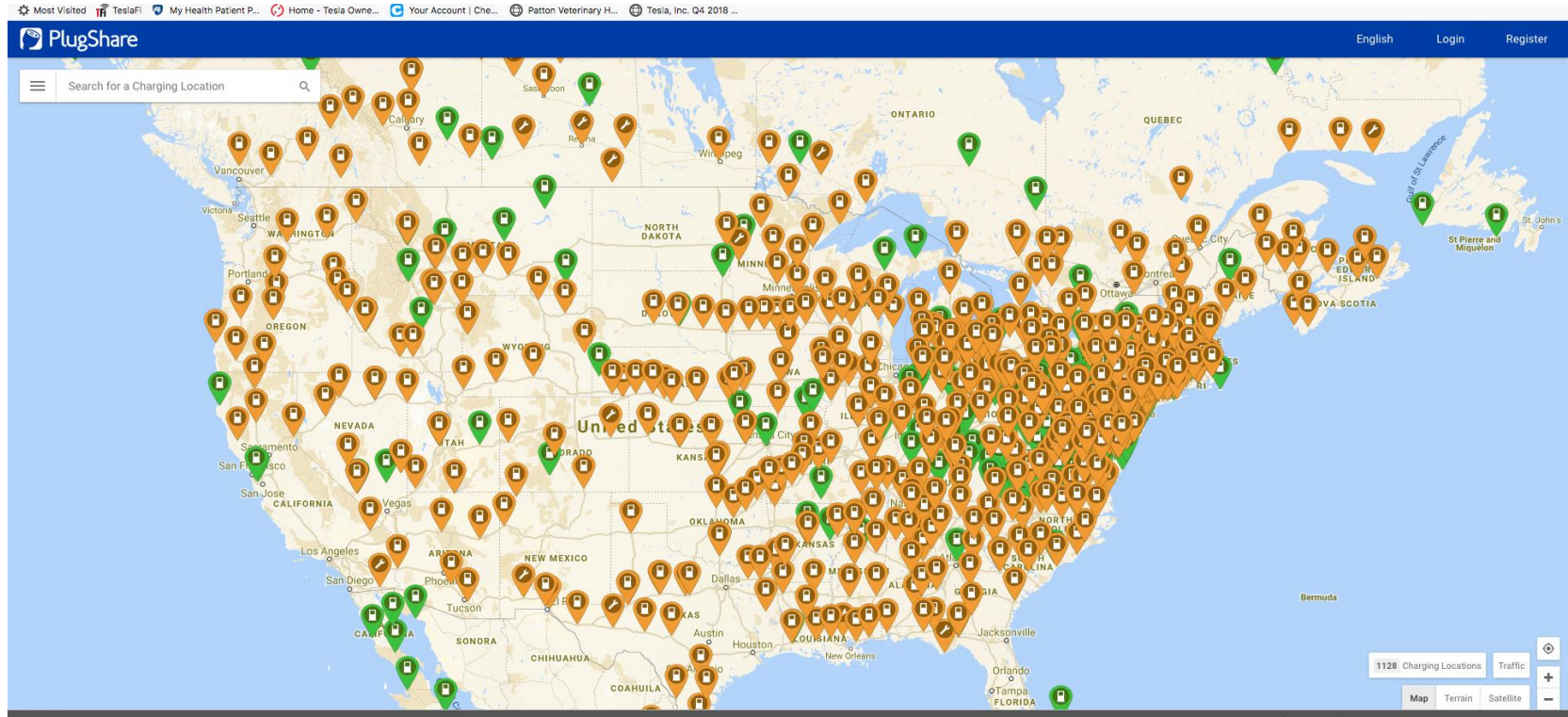
Key factor! Most electric cars are charged at home, at night while you sleep. You leave with a “full tank” every morning.

Good for the electric grid, off-peak charging!

- But what about lengthy road trips where you can’t charge at home?
  - Plugshare shows all public and private charging locations
  - As of today, there are over 30,000 Tesla Supercharging stations globally
  - Electrify America will have 800 charging locations with 3500 stations by the end of 2022



# Plug Share Network



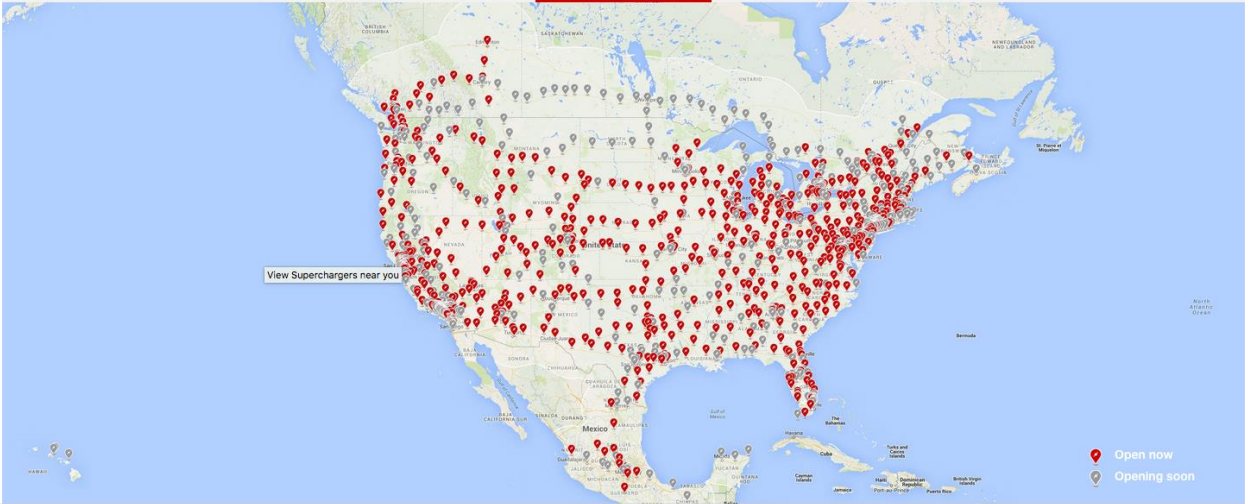
# Tesla Supercharger Network

1,441 Supercharger Stations with 12,888 Superchargers

Asia

North America

Europe & Middle East



On the Road

Request Financing & Trade In

# Why “Speed” isn’t an issue

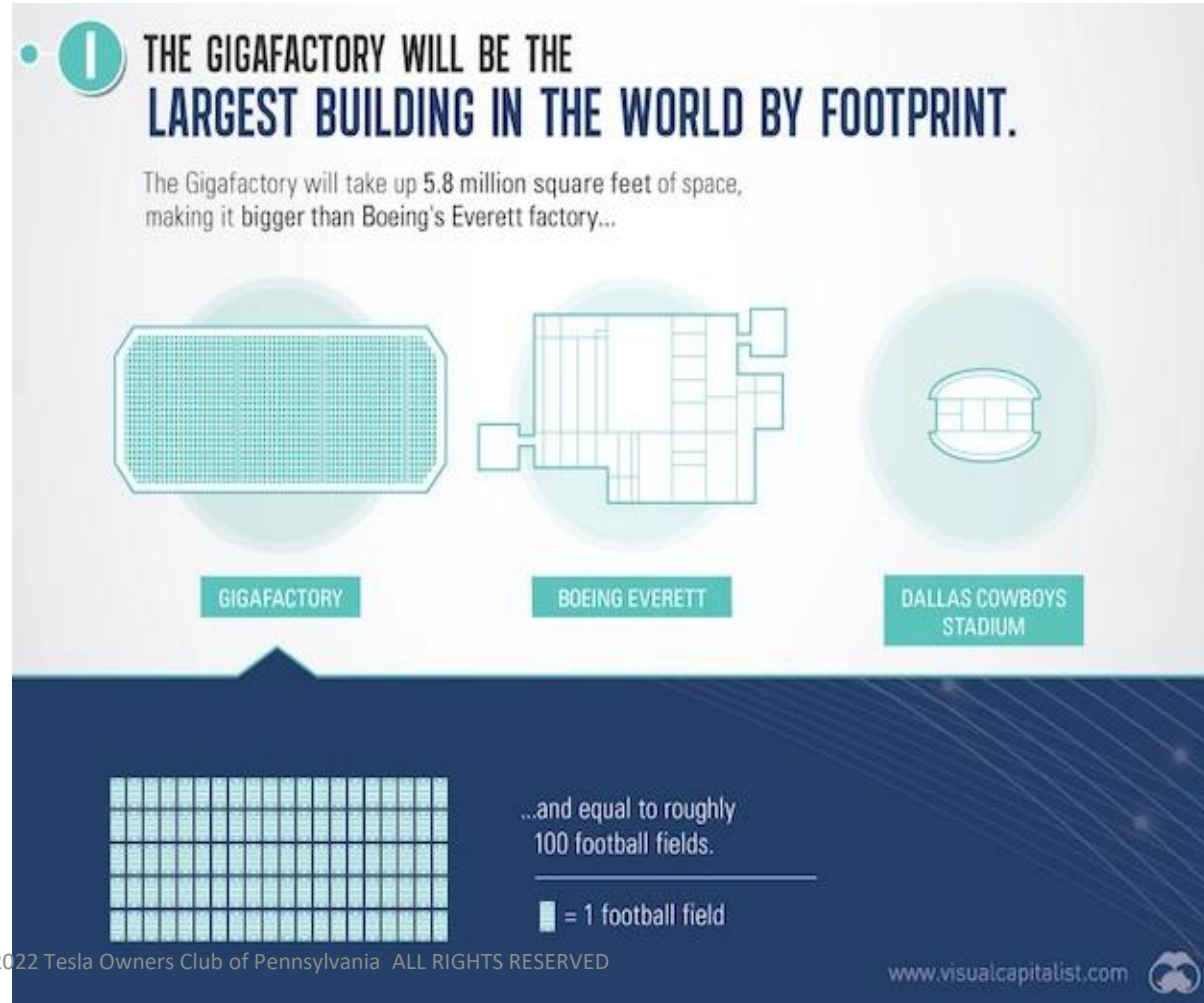
- #1 You should always obey traffic laws, so you should never drive a car unsafely at excessive speed.
- But some people do take their cars to the racetrack where they can go faster than allowed on the highway.
- Quarter mile times have long been the standard of what is considered fast.
  - Fastest 0-60 acceleration by a street-legal gasoline vehicle: 2014 by a Porche 918 Spyder – **2.2 seconds**
  - Fastest 0-60 acceleration by an electric vehicle: 2021 by a Tesla Model S Plaid - **2.1 seconds**
  - Fastest quarter mile by a street-legal gasoline vehicle: 2011 by a Bugatti Veyron Super Sport – **9.7 seconds**
  - Fastest quarter mile by an electric vehicle: 2021 by a Tesla Model S Plaid – **8.994 seconds**

# Why “Price” IS an issue

- Electric cars have a large battery. The battery gets bigger as you increase range, endurance and speed.
- Tesla's contain over 7,000 battery cells.
- Batteries power most devices today. They are expensive. Estimates are that the battery is about 33% of the cost of a Tesla.
- However, studies have now shown that the overall cost of ownership for an electric vehicle including maintenance and fuel is 40-50% less than an internal combustion vehicle.
- And thanks to the Gigafactory, Tesla battery costs are now below \$100 per kwh. This is a over a 50% reduction in costs over the last 10 years. This cost reduction trend is expected to continue.

# Gigafactory - Tesla & Panasonic partnership, Sparks NV

- 3,000 acres
- Reduce costs by 50%



# Electric cars, batteries and pollution: Is the smokestack better than the tailpipe?

- In a 2015 report from the Union of Concerned Scientists:
  - Over their lifetime, battery electric vehicles produce far less global warming pollution than their gasoline counterparts—and they're getting cleaner.
  - Because electric cars store power in large lithium-ion batteries, which are particularly material- and energy-intensive to produce, their global warming emissions at this early stage usually exceed those of conventional vehicles.
  - Battery electric cars make up for their higher manufacturing emissions within eighteen months of driving—shorter range models can offset the extra emissions within 6 months—and continue to outperform gasoline cars until the end of their lives.
  - By the end of their lives, gas-powered cars spew out almost twice as much global warming pollution than the equivalent electric car (when factoring in fuel and manufacturing). Disposing of both types of vehicles (excluding reusing or recycling their batteries) produces less than a ton each.

# How Far Do They Really Go?

- Tesla Model S LR – 405
- Chevy Bolt – 238
- BMW i7 – 300
- Nissan Leaf – 149
- Toyota RAV4 EV – 173
- Ford Mach E - 247
- Lucid Air – 500
- Mercedes Benz EQS 450 - 422

# So where do we go from here?

- Commercial Semi-Trucks
  - Pickup Trucks
  - School Buses
- Public Transportation
  - Delivery Vans



# Semi Trucks





# Hylion – Electric conversions for fossil fueled vehicles





# Rivian Pick Up Truck



# Ford F150 Lightning





# Bluebird School Bus



# Public Transportation



# Mercedes e-Sprinter





# Tesla Roadster 2023



# Questions

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412-735-4114



# Tesla Owners Club of Pennsylvania

Susquehanna Valley, Lehigh Valley, King of Prussia, State College, Wilkes Barre/Scranton & Pittsburgh Chapters



**[www.tocpa.club](http://www.tocpa.club)**

- Owners committed to supporting Tesla's mission through education, community events and having fun together.
- **Owner Support Program (OSP)**: Monitored email to answer questions along with a HOTLINE for more immediate needs.
- **Copilot Program** – Pairing up new owners with experienced members.
- **Virtual Education** – Boot Camps, Tech Talks, Tesla ABC's
- In person events and gatherings!