

**Testimony of
Zachary Kahn
Senior Policy Advisor, Northeast
Before the
Pennsylvania State Senate Transportation Committee**

“Reforms and Investments to Advance Transportation Innovations in Pennsylvania”

Thank you Chairman Langerholc, Vice-Chair Scavello, Minority Chair Sabatina, and members of the committee for inviting Tesla to speak with you today on the important subject of advancing transportation innovation in Pennsylvania.

My name is Zach Kahn and I am a Senior Policy Advisor at Tesla. Tesla is an American manufacturer of the world’s most advanced electric vehicles and sustainable energy products. Its mission is to accelerate the world’s transition to sustainable energy. Tesla’s commitment to safety, quality and technology has generated demand for our vehicles around the world. Since its inception, Tesla has delivered more than 1,000,000 electric vehicles, including more than 15,000 to Pennsylvania residents. Tesla’s electric vehicles and direct-to-consumer business model have amplified public awareness of the benefits of all-electric vehicle technology and turned the company into the first successful new U.S. car manufacturer in more than 50 years.

Tesla was founded in 2003 by engineers seeking to end our country’s dependence on foreign oil. From the outset, Tesla’s plan has been to first introduce its innovative new powertrain technology in high end products with a goal to aggressively drive down price while iterating and improving the technology in subsequent product offerings. Like with many products (phones, TVs, computers), when innovative technology is first introduced, it is expensive. As technologies improve and as economies of scale are achieved, the prices drop. Tesla’s first car, the Roadster, was released in 2008 with a starting price above \$100,000. The Roadster paved the way for Tesla to introduce our luxury sedan, the Model S, and SUV, the Model X. These vehicles have won numerous safety and performance awards and demonstrated to the world that you can build electric vehicles that do not make any sacrifices in terms of performance, appearance, or safety. In 2017, Tesla introduced its first mass market electric vehicle, the Model 3, with a range of over 300 miles and a starting price of less than \$40,000. The Model 3 quickly became the most popular and best-selling electric vehicle in the world. Just last year, Tesla began deliveries of our mid-size SUV, the Model Y. With a 350+ mile range, and a starting price under \$50,000, the Model Y has quickly become one of the most popular EVs on the market. In fact, a recent article in Car & Driver reported that the Model Y was the highest selling EV in the United States in the first quarter of 2021, with the Model 3 in second place.¹

¹ <https://www.caranddriver.com/features/g36278968/best-selling-evs-of-2021/>

Safety is at the core of every Tesla vehicle, and every new model benefits from years of immense passion for safety. Since the launch of Model S in 2012, we have engineered every Tesla around the same advanced architecture that maximizes occupant safety. Every Tesla vehicle has earned a 5-star safety rating in every category from the National Highway Traffic Safety Administration (NHTSA). Every Tesla comes standard with advanced crash-avoidance and pedestrian protection features, including Automatic Emergency Braking, Lane Departure Warning and Forward Collision Warning, among others. By providing the most advanced equipment and technologies, our goal is to help customers prevent avoidable accidents whenever possible, and, when they are not avoidable, to help mitigate injury to the fullest extent possible. Indeed, we believe our cars to be among the safest vehicles available to consumers on the road.

To serve its customers, Tesla funds, builds and operates its own network of charging stations and operates these as a service to its customers. Every Tesla customer is, at the time of vehicle purchase, effectively investing in both a car and in the charging station network. In 2012, Tesla began developing its Supercharger network to enable customers to confidently make road trips with quick charging sessions on highly traveled routes. Tesla's charging network and vehicles utilize a Tesla connector which is capable of charging vehicles with both alternating current (Level 1 and Level 2 charging at 110 volts or 240 volts up to 80 amps) and direct current (currently up to 250 kW). When Tesla began developing its charging station network in 2012, other DCFC networks and connector types (CHAdeMO and Combo CCS) were limited to a 50 kW charge rate, thus necessitating the development of a connector and network capable of higher charging rates and quicker charger sessions.

Tesla currently has 30 Supercharger stations with a total of 234 Supercharger plugs in Pennsylvania. This includes six locations that we have completed or will soon complete on the Pennsylvania Turnpike. We also have more than ten Supercharger locations under development in Pennsylvania. In addition, we have 112 destination charging locations with a total of 242 destination chargers at public charging locations across the state, including near shopping centers, hotels, restaurants, ski resorts, etc.

Tesla is also introducing two other innovative electric vehicles with important implications for transportation in Pennsylvania. The first is Tesla's take on the classic pick-up truck, the Cybertruck, which is a complete reimagining of what a pickup truck can do and look like. The Cybertruck will come in 3 different models with the tri-motor all wheel drive model coming with 500+ range, 14,000+ lbs towing capacity and will go 0-60 in under 3 seconds. The Cybertruck is designed to provide better utility than a truck with more performance than a sports car. There is a tremendous amount of interest in this vehicle and we are happy to provide the committee with additional details on timing for delivery when they are available.

Second, Tesla is excited to launch the Tesla Semi truck later this year. The Tesla Semi will revolutionize freight movement in the United States and will be a critical advancement in

transportation innovation. As I mentioned earlier, Tesla is a mission driven company and we take this mission seriously and that is why in looking at the truck eco-system we chose to focus on class 8 trucks. While these trucks only make up 3-4% of the vehicles on the road today, they are responsible for close to 30% of the greenhouse gas emissions. These trucks drive a lot of miles with very low fuel economy due to the heavy pay loads they carry. This is a huge opportunity to offset a tremendous amount of pollution. Electrifying these trucks will also benefit the communities that have been overburdened by NOx and particulate matter pollution for decades, which is critically important from a public health perspective.

Since its inception one of Tesla's guiding principles has been to design, build and deliver vehicles that do not compromise. The Model S wasn't designed to be the best electric car, it was designed to be the best luxury sedan on the market, period. We took this principle to the Semi where we designed it to be best in class for all class 8 trucks. And this thinking has led to an electric truck with the best range, highest safety standards, best performance, lowest total cost of ownership, and highest reliability in the market. The last two are particularly important for our customer base in freight goods movement, where a truck must make economic sense, and be reliable because uptime is the key to profitability

The range options on the Tesla Semi will allow customers to handle virtually any duty cycle. We offer two models, a standard range with 300 miles range, and a long range with 500 miles of range. Trucking has evolved a lot in recent years and become much more regionalized. Today 70% of freight moves within a 300 or 500 mile radius. Production begins this year with initial deployments to some of our first customers and incorporating trucks into our own extensive fleet of trucks used in internal operations.

Tesla is focused on making charging for the Semi both convenient and fast. Charging must fit within a customer's existing operation, and Tesla is optimizing our charging with enough power to fit between shifts. Tesla has been working with a consortium of manufacturers, charging providers, and suppliers for several years with a goal of creating a global megawatt charging system standard to ensure the compatibility of connectors and inlet hardware from different manufacturers. This high-power charging system will allow Tesla Semis to go out for 8 hour shifts, come back for a 30 minute charge where they add 80% of range, and head back out for another 8 hour shift. Customers want to maximize their zero emission miles, not just because of the environmental benefits but because the economics just make sense with the costs per mile being significantly cheaper than diesel. Infrastructure will certainly be the most complicated and expensive piece of the puzzle when it comes to deploying electric trucks at scale and I look forward to working with this committee on developing policies that will encourage truck operators in Pennsylvania to transition to electric trucks.

One area where the Committee may want to focus is rate design and how that can impact the economics of charging both in terms of fleets and public fast charger locations. Traditional

electricity rates were not designed with the unique characteristics of DC fast charging in mind. There is a fundamental misalignment between how and when DCFCs operate and traditional rate designs. Current rate structures require high utilization rates to make economic sense, but DC fast chargers are not designed for high utilization. If a supercharger location had a utilization rate high enough to make economic sense in a traditional model, customers would be lining up waiting for chargers to open up throughout the day. This would be a bad outcome for our customers. I would be happy to follow up with this committee with additional details and examples of rate designs that are better suited to EV charging.

I would be remiss if I did not also mention the importance of opening up the Pennsylvania market to direct sales from electric vehicle manufacturers. Tesla chose the direct sales business model because we believed that doing so was essential for meeting our mission and transitioning away from fossil fuel powered vehicles toward zero emission vehicles. And the results speak for themselves, direct sales currently account for about 80% of annual battery electric vehicle sales in the United States, and 80%+ of the battery electric vehicles registered in Pennsylvania. Unlike, when Tesla first came to Pennsylvania in 2013, Tesla is no longer the only company utilizing this distribution model. Today there are numerous new entrants to the EV market like Rivian and Lucid that are building innovative electric vehicles of all model types that intend to sell them directly to customers. Tesla would like to be able to grow to meet the demand for our vehicles through the state but are limited under law. New market entrants will not be able to enter the market at all and Pennsylvania residents interested in them will have to go out of state to do so. Pennsylvanians deserve to be able to buy the electric vehicle they want and how they want in their home state and we look forward to having further discussions with the legislature on this important issue.

Thank you again for giving me the opportunity to speak with you today. I hope those of you who were able to make it to yesterday's event had a chance to look at the cars we brought and speak with our advisors about the exciting cutting-edge technology. I look forward to answering any questions you may have.

Thank you --

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Tesla