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# Tesla Supercharger

A **Tesla Supercharger** is a 480-volt direct current fast-charging technology built by American vehicle manufacturer Tesla, Inc. for their all-electric cars. The Supercharger network was introduced in 2012. As of November 8, 2020, Tesla operates over 20,000 Superchargers<sup>[1]</sup> in over 2,016 stations worldwide<sup>[2]</sup> (an average of 10 chargers per station). There are 1042 stations in North America, 559 in Europe, and 415 in the Asia/Pacific region.<sup>[3]</sup> Supercharger stalls have a connector to supply electrical power at 72 kW, 150 kW or 250 kW.<sup>[4]</sup>

Tesla Model S was the first car to be able to use the network, followed by the Tesla Model X, Tesla Model 3, and Tesla Model Y. Some Tesla cars have free supercharging for life, some have 100-400 kWh per year, some have a single 100-400 kWh credit, and some have a monetary credit.<sup>[5]</sup> If the car does not have any credit, the user pays with a credit card on file for the electricity used (but in some localities that is not allowed, so Tesla charges for the time spent charging).<sup>[6]</sup> An idle fee may be charged (depending on the percent occupancy of the Supercharger station<sup>[7]</sup>) for continuing to be plugged into the Supercharger after charging has been completed.<sup>[8]</sup>

Tesla has taken steps to focus use of the Superchargers on making longer journeys. In late 2017, Tesla disallowed commercial, ridesharing company, taxi, and government usage of the public Supercharger network.<sup>[9]</sup>

Independent of the Superchargers, Tesla also has Tesla destination chargers. As of September 2019, Tesla has distributed 23,963 destination chargers to locations (such as hotels, restaurants, and shopping centers<sup>[10]</sup>) worldwide.<sup>[11][12]</sup> These chargers are slower (typically 22 kW) than Superchargers, and are intended to charge cars over several hours.<sup>[13]</sup> These chargers are typically free to Tesla drivers who are customers of the business at the location.<sup>[13]</sup>



Supercharger stall with cable and parking space



Tesla Supercharger network rapid charging station in Tejon Ranch, California. The rooftop of the carport has a solar collector manufactured by SolarCity feeding energy into the grid.

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Europe/Worldwide Tesla Supercharger with dual cables: Type 2 for Model S/X and CCS Combo 2 for Model 3

## Supercharger technology

The original V1 and V2 Tesla supercharging stations charge with up to 150 kW of power distributed between two cars with a maximum of 150<sup>[21][22]</sup> kW per car, depending on the version.<sup>[23][14][24]</sup> They take about 20 minutes to charge to 50%, 40 minutes to charge to 80%, and 75 minutes to 100% on the original 85 kWh Model S. The charging stations provide high-power direct-current (DC) charging power directly to the battery, bypassing the internal charging power supply.<sup>[2]</sup>

In September 2017, Tesla announced the availability of urban Superchargers. The urban Superchargers are more compact than the standard Supercharger stalls, and will be primarily deployed in urban areas such as mall parking lots and garages. Compared to the standard Superchargers, urban Superchargers have a maximum power delivery of 72 kW. Instead of 150 kW distributed between two vehicles at a Supercharger A/B stall pair, each Urban Supercharger stall provides dedicated 72 kW capacity.<sup>[25]</sup>

A few of the Tesla supercharging stations use solar panels to offset energy use and provide shade.<sup>[26]</sup> Tesla plans to install additional solar power generation at Superchargers.

As of March 2020, the network is exclusive to Model S, Model X, Model 3, and Model Y cars. Supercharging hardware is standard on all Model X, Model 3, and Model Y cars, and is standard on Model S cars equipped with a battery of 70 kWh or greater, and optional (with a one-time payment of US\$2,000) on Model S vehicles equipped with a 60 kWh battery. The original Roadster is not equipped to charge from the Superchargers, but Tesla states that all future Tesla cars will include the ability.<sup>[27][28][29]</sup>

Tesla makes V3 superchargers at Giga New York.<sup>[30]</sup> Tesla first opened V3 stations in 2019, and they can provide up to 15 miles per minute (depending on circumstances).<sup>[31]</sup> A 1 MW charge box supplies 4 stalls at 250 kW each.<sup>[32]</sup>

In the European market, Tesla has been using the standardized IEC 62196 Type 2 connector for Model S and Model X cars and Superchargers.<sup>[33]</sup> Tesla announced<sup>[34]</sup> in November 2018 that it was updating all Superchargers in the EU to add CCS/Combo2 connectors, as an additional connector to the existing DC Type 2 connector. In the same announcement it was stated that this CCS/Combo2 connector will be the connector used for the Model 3 due the following year. This brings complete compatibility with the legislated charging standard for EU public charging. Existing Model S and X cars will be given the option of an adapter for CCS/Combo2 that allows those cars to use the EU standard public infrastructure as well. There will remain an incompatibility with imported US Tesla cars (that all use a Tesla proprietary connector). As of 2017, Tesla is the only automobile manufacturer which offers direct current (DC) charging based on the IEC 62196-2 specification. Other manufacturers use the IEC 62196-3 Combined Charging System (CCS) charging standard.<sup>[35]</sup>

Tesla has indicated on multiple occasions that they were interested in having discussions with other auto manufacturers about sharing the Supercharger network, however no agreements have been completed or made public to date.<sup>[36][37]</sup>

In late 2019, on a busy Thanksgiving weekend in San Luis Obispo, California, Tesla deployed a mobile Supercharger set-up on a flatbed trailer, offering additional charging capacity powered by a Tesla Megapack energy storage system.<sup>[38][39]</sup>

### Controversy

In 2016, the Advertising Standards Authority ruled that it was accurate to state that Tesla Superchargers are the highest-power chargers available in the UK, turning down a complaint by Ecotricity. Although the Superchargers are technically capable of 150 kW,<sup>[21]</sup> Tesla cars restricted the power to 120 kW, but boosted that to up to 150 kW for the Model 3 Long Range and the 100 kWh versions of Models S and X in 2019.<sup>[21]</sup> The Chinese GB/T standard has a theoretical maximum of 180 kW, but as of 2018, no car had a 500–600 V battery required for the 180 kW charging speed.<sup>[23][14]</sup>



Tesla Supercharger outlets in Europe/Worldwide (left) and North America only (right).



Tesla Supercharger stall with parking space and cable-outlets

## Supercharging network

Tesla Supercharger stations allow Tesla vehicles to be fast-charged at the network within roughly an hour, and are often located near restaurants with restrooms.

The average number of Tesla cars per Supercharger stall was 34 in 2016.<sup>[40][41]</sup> Cost estimates per station range from US\$100,000 in 2013<sup>[42]</sup> to US\$270,000 in 2015, depending on the number of stalls and other circumstances.<sup>[43]</sup> Tesla estimates that station equipment lasts 12 years.<sup>[44]</sup>

Most car charging occurs at home or work, a situation that Tesla has compared to cell phone charging.<sup>[45]</sup> As of 2014, less than 10% of charging came from Superchargers.<sup>[46]</sup> In the month of July 2019, Tesla delivered 72 GWh through Superchargers.<sup>[47]</sup>

Most Supercharger stations are owned by Tesla, but some are owned by fleet operators to charge their Tesla cars, such as taxis. These charger stalls are limited to 60 kW.<sup>[48]</sup> In December 2017, Tesla changed its terms of service so that any vehicles being used as taxis or for commercial, ride-share, or government purposes were effectively banned from using Superchargers. This ban only applies to vehicles bought after December 15, 2017. Other charging options would be provided for these vehicles.<sup>[49][50]</sup>

### Fees for using Superchargers

Unlimited supercharging for life is free for all Model S and Model X cars that were ordered before January 15, 2017,<sup>[51]</sup> or between August 2, 2019<sup>[52]</sup> and May 26, 2020,<sup>[53]</sup> or for vehicles that were purchased using a referral code during certain periods.<sup>[54]</sup>

Model S and Model X cars that were ordered between January 15, 2017 and November 2, 2018, received 400 kWh (about 1,000 miles or 1,600 km) of free Supercharging credits per year.<sup>[55]</sup> Once those credits are used, supercharging will have a fee, but that fee is lower than filling up a gas-powered car.<sup>[56]</sup>

Between May 2017 and September 18, 2018, Tesla allowed existing Tesla owners to give free unlimited supercharging for life to up to five friends if the friend purchased a new Tesla and used their referral code. Tesla also offered all existing Tesla owners who purchased a new Model S, Model X or Performance Model 3 for themselves with free unlimited supercharging for life on those cars.<sup>[57][58]</sup>

From time to time, Tesla has offered 1,000 or 2,000 miles of free supercharging as an incentive to purchase a new Tesla car.<sup>[59][60]</sup>

Other than the above caveats, Tesla Model S and Model X cars purchased between November 2, 2018 and August 2, 2019, and all Model 3 and Model Y cars purchased at any time do not receive any supercharging credits.<sup>[61]</sup>

### Fees for remaining connected after being fully charged

Since December 16, 2016, any car that remains connected to a Supercharger after being fully charged may be fined. In the United States, there is no fine if the Supercharger station is less than half full, a fine of \$0.50 per minute if the station is at least 50% full, and a fine of \$1.00 per minute when the station is 100% full (these fees may vary by country).<sup>[62]</sup> This fee is waived if the car is removed in five minutes. Any incurred fees must be paid by the time of the next service visit.<sup>[63]</sup>

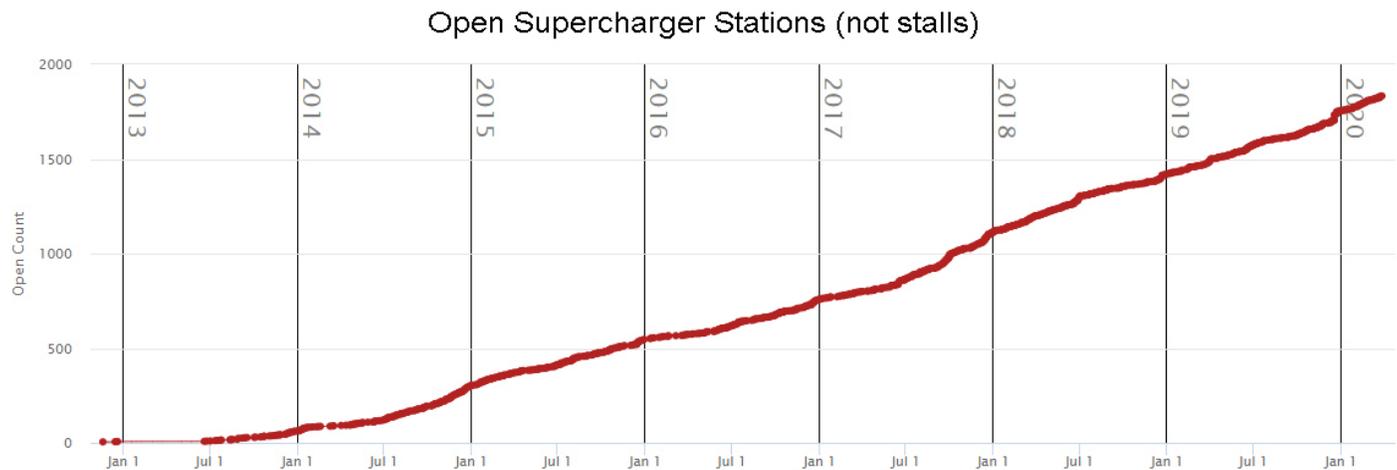
### Change over time



When both pairs of Tesla Supercharger station stalls (A and B) occupied, they share the available power of up to 150 kW. However, the depicted Superchargers are the older generation, only capable of delivering 105 kW per car.<sup>[14]</sup> Each Supercharger cabinet<sup>[15]</sup> with twelve charger modules<sup>[16][17][18][19]</sup> feeds two charging stalls (max 150 kW per car), so if two cars are charging at the same time their charging rate may be reduced.<sup>[20]</sup>



Tesla logo at Supercharger station



Source: <https://supercharge.info/charts> as of March 29, 2020

Chart of Supercharger stations (not stalls) over time

In October 2014, there were 119 standard Tesla Supercharger stations operating in the United States, 76 in Europe, and 26 in Asia.<sup>[2]</sup> On 31 March 2016, Tesla CEO [Elon Musk](#) announced that the number of Supercharger stations would be doubled (from 613 stations with 3,628 chargers) by 2017.<sup>[64]</sup>

The number of Supercharger stations worldwide grew to 280 by the end of 2014; 584 by the end of 2015; and 1,045 by the end of 2017.<sup>[49]</sup> By December 2014, two stations were solar powered.<sup>[65][26]</sup> A solar-assisted Supercharger was opened in [Belgium](#) in 2017.<sup>[66]</sup> As of April 2017, Tesla had plans to expand the network to 15,000 stalls.<sup>[67]</sup> As of March 2020, Tesla operates 16,103 Superchargers in 1,826 stations worldwide;<sup>[2]</sup> these include 908 stations in the U.S., 98 in Canada, 16 in Mexico, 520 in Europe, and 398 in the Asia/Pacific region.<sup>[3]</sup>

## North America

2012 saw eight initial Supercharger stations<sup>[68][69]</sup> around the United States, located at strategic points on the [Boston-to-Washington](#) and [Los Angeles-to-San Francisco](#) highway corridors. By mid-July 2013, 15 stations were open across the United States, with the number expected to nearly double by the end of the summer.<sup>[70]</sup> The stations were developed and mass constructed in cooperation with [Black & Veatch](#).<sup>[71]</sup> Supercharging stations were available in Canada along the [Highway 401](#) corridor between [Toronto](#) and [Montreal](#) by 2014.<sup>[72]</sup>

The initial network was built in high-traffic corridors across North America, followed by networks in Europe and Asia in the second half of 2013. The first Supercharger corridor in the US opened with free access in October 2012. This corridor included six stations placed along routes connecting San Francisco, [Lake Tahoe](#), Los Angeles, and [Las Vegas](#).<sup>[27][28]</sup> A second corridor was opened in December 2012 along the [Northeast megalopolis](#), connecting Washington, DC, [Baltimore](#), [Philadelphia](#), New York City and Boston. This corridor includes three stations in highway rest areas, one in [Delaware](#) and two adjacent ones in [Connecticut](#).<sup>[29]</sup> At some stations, the electricity is paid by local business to attract customers.<sup>[73]</sup>

The electricity used by the Supercharger (277V L-N of a 480Y/277V 3-phase configuration) in the West Coast corridor comes partly from a [solar carport](#) system provided by [SolarCity](#). Eventually, all Supercharger stations are to be supplied by solar power.

According to Musk, "...we expect all of the United States to be covered by the end of next year [2013]". He also said that early Tesla owners' use of the network would be free forever.<sup>[74]</sup>

As of December 2019, [North Dakota](#), [Alaska](#), and [Hawaii](#) are the remaining states without Superchargers. Supercharging



Tesla Model S charging at the Supercharger network station in Newark, Delaware.



Illuminated charge port on a Model S

stations are planned to be opened in 2020 in all three states.<sup>[75]</sup> Most of the southern Trans-Canada Highway was covered at the end of 2019.<sup>[76]</sup>

## Europe

In early 2015, the first European Supercharger was upgraded with a 'solar canopy' (a carport with solar cells on the roof) in Køge, Denmark.<sup>[77]</sup> According to the person responsible for Tesla's Superchargers in the Nordic countries, Christian Marcus, the 12-stall Supercharger in Køge has 300 m<sup>2</sup> (3,230 sq ft) solar cells with a projected annual production of about 40 MWh and is equipped with its own battery bank for temporary storage of excess production. Unlike other European Supercharger stations, Tesla has bought the land on which the Køge Supercharger stands.<sup>[78]</sup> On April 26, 2016, Kostomłoty became the first charger to open in Poland.<sup>[79]</sup> Tesla opened a grid-connected 2-stall Supercharger at Nürburgring in 2019.<sup>[80][81]</sup> There are a few privately operated Supercharger stations such as the one opened on April 27, 2016, in Zarechye, Russia, with 3 stalls.<sup>[82]</sup>

The European Supercharger network is planned to allow a Model S to drive from the North Cape in Norway to Istanbul or Lisbon.<sup>[78]</sup> As of July 2019, the Supercharger closest to Istanbul is the one in Vrgorac (Croatia), and the one nearest to Lisbon is Alcacer do Sal.<sup>[83]</sup> The map of current and planned sites<sup>[84]</sup> includes every European Union country except Malta and Cyprus, and represents all of the countries in the world in the top 10 of electric vehicle adoption rates.<sup>[83]</sup>

## Asia-Pacific

As of June 2015, Hong Kong had the highest density of Tesla Superchargers in the world, with eight stations with a total of 54 Supercharger stalls, allowing most Model S owners to have a Supercharger within 20 minutes' drive.<sup>[85]</sup> Other Superchargers can also be found in People's Republic of China, Australia,<sup>[86]</sup> Japan, Macau, New Zealand, South Korea, and Taiwan.<sup>[2]</sup> Tesla contracts Infigen Energy to supply electricity for its Australian Superchargers.<sup>[87]</sup>

In 2016, Tesla also announced plans to deploy a nationwide network of Superchargers in India.<sup>[88][89]</sup> No deployments as of 2020.

## Large Supercharger stations

Largest operational Supercharger stations by number of V3 Supercharger stalls; 250kW dedicated

Stalls	Country	Location	Amenities	Opened	Notes
24	US	<u>Flamingo &amp; Caesars Palace Las Vegas</u> ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/lasvegaslinqsupercharger">https://www.tesla.com/en_GB/findus/location/supercharger/lasvegaslinqsupercharger</a> ) <u>monorail station</u>	solar canopy	~2019-07 <sup>[90]</sup>	13 Destination Chargers also available
20	Norway	<u>E18 Bamble</u>	Circle K	2020 - 07	Located at Circle K E18 Bamble, 12 other CCS chargers also available
10	Norway	<u>Liertoppen</u> ( <a href="https://www.tesla.com/findus/location/supercharger/liertoppensupercharger">https://www.tesla.com/findus/location/supercharger/liertoppensupercharger</a> )		~2020-03 <sup>[91]</sup>	
8	UK	<u>Station</u> ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/parkroyaluksupercharger">https://www.tesla.com/en_GB/findus/location/supercharger/parkroyaluksupercharger</a> ) in <u>Park Royal</u> , London		~2019-12 <sup>[92]</sup>	8 V2 chargers also available
8	Canada	<u>Regina</u> ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/reginasupercharger">https://www.tesla.com/en_GB/findus/location/supercharger/reginasupercharger</a> )		~2019-12	



Tesla Model 3 using Mobile Charger 2.0



Type 2 compatible inlet implementing a three-phase AC charging and DC Supercharging on European Tesla Model S and Model X; a notch/teardrop-shaped keying planned for unprotected Mode 1 domestic charging was reused in 2019 for Supercharging

Largest operational Supercharger stations by number of V2 Supercharger stalls; 120-150kW shared

Stalls	Country	Location	Amenities	Opened	Notes
50	China	Shanghai - Lilacs ( <a href="http://www.teslamotors.com/findus/location/supercharger/ShanghaiLilacscentersupercharger">http://www.teslamotors.com/findus/location/supercharger/ShanghaiLilacscentersupercharger</a> )		2017-10-23	
50	China	Beijing - Hairun ( <a href="https://www.tesla.com/findus/location/supercharger/beijinghairunmansionsupercharger">https://www.tesla.com/findus/location/supercharger/beijinghairunmansionsupercharger</a> )		2018-01-04	
50	China	Beijing - Baolong ( <a href="https://www.tesla.cn/findus/location/supercharger/cnsc8139">https://www.tesla.cn/findus/location/supercharger/cnsc8139</a> )		2017-09-18	[93]
44	Norway	Eidsvoll Verk / Nebbenes ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/eldsvollverknorwaysupercharger?redirect=no">https://www.tesla.com/en_GB/findus/location/supercharger/eldsvollverknorwaysupercharger?redirect=no</a> )		2016-08-31	One of first European S/Cs with CCS Combo 2 plugs
42	Norway	Rygge ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/ryggesupercharger?redirect=no">https://www.tesla.com/en_GB/findus/location/supercharger/ryggesupercharger?redirect=no</a> )			
40	United States	Kettleman City, CA ( <a href="https://www.tesla.com/findus#/bounds/70,-50,5,-170,d?search=supercharger&amp;name=North%20America&amp;place=kettlemancitysupercharger">https://www.tesla.com/findus#/bounds/70,-50,5,-170,d?search=supercharger&amp;name=North%20America&amp;place=kettlemancitysupercharger</a> )	24-hour Tesla Customer Lounge	2017-11-14 <sup>[94]</sup>	Solar canopy
40	United States	Baker, CA ( <a href="https://www.tesla.com/findus#/bounds/70,-50,5,-170,d?search=supercharger&amp;name=North%20America&amp;place=bakercasupercharger">https://www.tesla.com/findus#/bounds/70,-50,5,-170,d?search=supercharger&amp;name=North%20America&amp;place=bakercasupercharger</a> )		2017-11-15	Solar canopy
32	Netherlands	Badhoevedorp ( <a href="https://www.tesla.com/nl_NL/findus/location/supercharger/badhoevedorpsupercharger">https://www.tesla.com/nl_NL/findus/location/supercharger/badhoevedorpsupercharger</a> )	Free Wifi	2018-11-21	
28	Netherlands	Breukelen ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/breukelensupercharger">https://www.tesla.com/en_GB/findus/location/supercharger/breukelensupercharger</a> )	Free Wifi	2018-05-15	
26	Denmark	Køge ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/kogesupercharger">https://www.tesla.com/en_GB/findus/location/supercharger/kogesupercharger</a> )		2015-02-04 <sup>[77]</sup>	Solar canopy
24	Netherlands	Eindhoven ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/eindhovensupercharger">https://www.tesla.com/en_GB/findus/location/supercharger/eindhovensupercharger</a> )		2015-11-20	
24	Norway	Lillesand ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/lillesandsupercharger?redirect=no">https://www.tesla.com/en_GB/findus/location/supercharger/lillesandsupercharger?redirect=no</a> )			
24	Switzerland	Dietikon ( <a href="https://www.tesla.com/en_GB/findus/location/supercharger/dietikonsupercharger">https://www.tesla.com/en_GB/findus/location/supercharger/dietikonsupercharger</a> )	24-hour Tesla Customer Lounge	2019-05-09 <sup>[95]</sup>	
20	France	Mâcon ( <a href="https://www.tesla.com/fr_FR/findus/location/supercharger/maconfrsupercharger">https://www.tesla.com/fr_FR/findus/location/supercharger/maconfrsupercharger</a> )	Free WiFi	2018-06-20 <sup>[96]</sup>	
20	Sweden	Mellbystrand ( <a href="https://www.tesla.com/sv_SE/findus/location/supercharger/mellbystrandsupercharger">https://www.tesla.com/sv_SE/findus/location/supercharger/mellbystrandsupercharger</a> )	Free WiFi	2019-06-30	

Largest operational Urban Supercharger stations by number of Supercharger stalls; 72kW dedicated

Stalls	Country	Location	Amenities	Opened	Notes
40	United States	Daly City, CA ( <a href="https://www.tesla.com/findus/location/supercharger/dalycitysupercharger">https://www.tesla.com/findus/location/supercharger/dalycitysupercharger</a> )		2018-10-05	
36	United States	San Jose, CA ( <a href="https://www.tesla.com/findus/location/supercharger/santalarosjsupercharger">https://www.tesla.com/findus/location/supercharger/santalarosjsupercharger</a> )	2nd Valet Supercharger ( <a href="https://www.tesla.com/findus/location/supercharger/santalarosvaletsupercharger">https://www.tesla.com/findus/location/supercharger/santalarosvaletsupercharger</a> )	2019	25 Destination Chargers also available
35	United States	Aventura, FL ( <a href="https://www.tesla.com/findus/location/supercharger/aventurafisupercharger">https://www.tesla.com/findus/location/supercharger/aventurafisupercharger</a> )		2018-05-17	
24	United States	Westminster, CA ( <a href="https://www.tesla.com/findus/location/supercharger/westminstersupercharger">https://www.tesla.com/findus/location/supercharger/westminstersupercharger</a> )		2018-12-22	

## Battery-swap proposal

A "**Tesla station**" was a planned second version of the Supercharger<sup>[97]</sup> that, as of 2013, would provide Tesla owners with extremely-fast battery pack swaps as well as fast-recharge for Tesla Model S and Model X vehicles.<sup>[98][99]</sup> However, the company's plans changed and battery swapping is no longer a significant part of Tesla's charging infrastructure plans.

By December 2014, 18 months after the announcement, no battery swapping stations had yet opened to the public.<sup>[65]</sup> That

same month, the company announced a revision to their much-delayed<sup>[65][100]</sup> plans. A single battery-swap station would be opened in California as a pilot project, where only invited Model S owners could do battery swaps by appointment, to assess technical and economic aspects of the service. Demand for the priced service—which was expected to take three minutes (instead of the 90-second time demonstrated in 2013)—would be used to determine whether the company would fully commercialize battery swapping stations more generally.<sup>[101]</sup> The original plan in the June 2013 company announcement explicitly indicated that the company would eventually upgrade all existing Tesla Supercharger stations to become Tesla stations, which would offer the battery-pack swap for the Model S in addition to the fast recharge capability that each facility initially opened with.<sup>[99]</sup>

By June 2015, the company had indicated that battery swapping capabilities was no longer a significant part of Tesla's plans for on-road energy replacement for their vehicles.<sup>[102]</sup>

## History

In June 2013, Tesla announced the goal to deploy a battery swapping station in each of its existing supercharging stations, to be renamed *Tesla stations*.<sup>[97]</sup> At an event at Tesla's design studio in Los Angeles, CEO Elon Musk demonstrated a battery swap operation with the Tesla Model S, which took just over 90 seconds each for the two cars participating in the demo. The swapping operation took less than half the time needed to refill a gasoline-powered car used for comparison purposes during the event.<sup>[103][104]</sup>

The Tesla Model S was designed from the beginning to support fast battery swapping,<sup>[97][105][106]</sup> with Tesla publicly discussing the capability as early as March 2009.<sup>[107]</sup>

By December 2014, no battery-swapping stations had been opened to the public.<sup>[65]</sup> On 19 December, Tesla announced revised plans. They would now build only a single battery-swapping station, and institute a "Battery Swap Pilot Program" at that selected station in Harris Ranch, California in order to "assess demand." Only invited Model S owners would be able to participate in the pilot battery swaps. The company stated they would "evaluate relative demand from customers ... to assess whether it merits the engineering resources and investment necessary" for the upgrade of additional first-generation Supercharger stations.<sup>[101]</sup>

In June 2015, Tesla announced that of 200 invitations sent out to try the pilot pack swap station, only approximately five tried it. Tesla then invited all California Model S owners to try it out, but expected a low usage rate.<sup>[102]</sup> A survey showed that most users were not interested.<sup>[108]</sup>

## Deployment

The first Tesla Station with battery-swapping capability was planned to be piloted in California late in 2013,<sup>[109]</sup> but this was subsequently delayed. Elon Musk said at an event in February 2014 that a few battery swap stations will open in the next few months along the route between Los Angeles and San Francisco, and that the initial stations will be studied before deciding to build any more.<sup>[110]</sup> In mid-2013 each swapping station was projected to cost US\$500,000 and have approximately 50 batteries available without requiring reservations.<sup>[103]</sup>

Elon Musk said the battery swapping service would be offered for the price of about 15 US gallons (57 l; 12 imp gal) of gasoline at the current local rate, around US\$60 to US\$80 at June 2013 prices. Owners may pick up their own battery pack fully charged on the return trip for no extra payment. Tesla will also offer the option to keep the pack received on the swap and pay the price difference if the battery received is newer; or to receive the original pack back from Tesla for a transport fee. The billing will be handled via customer credit card on file with Tesla. Pricing had not been determined as of June 2013.<sup>[103]</sup>

## Regulatory issues

The California Air Resources Board staff considered modifying the Zero Emission Vehicle (ZEV) regulation to exclude battery swapping as a "fast refueling" technology; this change would deny Tesla some of the ZEV credits that the manufacturer might otherwise receive when the battery-swapping station is placed in service in California.<sup>[104]</sup> After



Tesla Supercharger stations are also available at highway rest areas. These are placed at a rest area at the Bundesautobahn 9 in Germany at the Münchberg / Nord Autohof exit.

criticism from several motoring manufacturers, this proposal was withdrawn.<sup>[111]</sup>

## Tesla Megacharger

Tesla announced a higher-capacity "Megacharger" along with the unveiling of a prototype for its Tesla Semi, a semi-trailer truck, in November 2017. Trucks would use the Tesla Megacharger Network to charge. The solar-assisted Megacharger Network stations would charge the semi trucks with 400 miles (645 km) of charge in 30 minutes, out of the total capacity of 500 miles (805 km) in the battery pack.<sup>[112][113][114][115]</sup> To accomplish this, it will likely have an output level of over one megawatt.<sup>[113]</sup>

## See also

- [Electrify America](#)

## References

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## External links

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-  Media related to Tesla charging stations at Wikimedia Commons
- Official website (<http://www.tesla.com/supercharger>)
- Video of battery swap (<https://vimeo.com/68832891>)
- Charts of Supercharger stations over time (<https://supercharge.info/charts>)

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