

New York City Taxi & Limousine Commission

Battery Electric Vehicle Taxi Pilot

Evaluation Report, November 2022

www.nyc.gov/electrictaxis

Overview

In May 2021, the New York City Taxi and Limousine Commission (TLC) passed a resolution to establish the Battery Electric Vehicle (BEV) Taxi Pilot (the BEV Pilot). In response to an evolving car market and the need to combat climate change, TLC allowed select BEV¹ models to be put in service as taxis. These models met most taxi vehicle specifications, but due to the unique technology of BEV engines, the participating vehicles were required to have a 0-60 mph acceleration rate slower than 4.4 seconds. This acceleration metric permitted the BEVs engine specifications to be measured in the more appropriate form rather than converting the kilowatt output of the BEV into the traditional horsepower measurement. The BEV Pilot allow medallion owners to apply for the program using a list of vehicles, that meet the pilot requirements, and additional models that meet the requirements are added upon review by the Safety and Emission Division.

This report evaluates the BEV Pilot based on interviews with fleet operators, drivers, crash and summons data, and trip analysis. Based on the findings of this report, TLC proposes amending TLC rules to permit electric vehicles that meet existing TLC vehicle requirements for medallions, and the acceleration rate specified under the pilot, to be used as medallion taxis.

Background

TLC recognizes the dramatic shift the automobile market will make over the next decade, changes in consumer choices, and the urgency to lower the carbon emissions produced in the taxi industry in accordance with federal, state, and city goals. With over 100,000 licensed vehicles, including 13,587 taxis, the TLC has the responsibility to ensure our licensees can help meet these goals.

TLC licenses 13,587 medallion taxis. Prior to the start of the pilot program, the TLC permitted the hack up of the Tesla Model 3. Furthermore, several owners have opted for highly fuel-efficient hybrid, wheelchair accessible taxis. The TLC is currently in discussions with vehicle manufacturers regarding the research and development of all-electric wheelchair accessible vehicles.

Additionally, the TLC has made significant efforts to adopt lower emissions in the taxi sector through a prior pilot project. Between 2013-2015, TLC embarked on a two-year pilot to evaluate the effectiveness and viability of electric taxis, following then Mayor Bloomberg's plan to have one-third of the licensed taxi fleet electrify by 2020. The resulting TLC report highlighted that the necessary EV technology and charging infrastructure was not yet ready for widespread adoption by the taxi industry. The short battery range of the Nissan LEAF, nearly non-existent fast charging network, and limited number of participants were severe limitations to this pilot.

¹ A battery electric vehicle (BEV) is a fully electric vehicles that do not utilize a traditional internal combustion engine (ICE) or a conventional transmission. These vehicles rely solely on large rechargeable batteries to power an electric motor and produce no emissions.

Participants

Two medallion agents participated in the BEV Taxi Pilot. As of August 2022, there were 17 vehicles between the two agents. Below is an overview of the participants, the vehicle models, and relevant vehicle specifications.

Vehicle	Battery Range	MSRP	Participating Vehicles
		\$39,090 -	
Kia Niro EV EX FWD	239 miles	\$41,245	15
Ford Mach-E	312 miles	\$53,550	1
Tesla Model Y	330 miles	\$58,990	1

Vehicle purchases have proven difficult due to supply chain issues and soaring demand.² Semiconductor microchips are in short supply and are an essential component of all vehicles, but even more so for EVs.³ As a result, vehicle prices are high, and waitlists are long.⁴

Evaluation Metrics and Results

The pilot evaluated vehicles based on their safety record during the time it operated as a taxi for the pilot. Additionally, drivers and industry partners were interviewed to discuss other operational issues including charging and battery range, maintenance, passenger comfort, and ease of adaption. For a more detailed analysis, this evaluation looked closely at three long-term participants for metrics pertaining to operations and passenger trips. Safety data examined all participants.

Specifically for safety:

<i>Crash data for participating vehicles</i>	<i>TLC summons and violation data for participating vehicles</i>	<i>Interviews with drivers regarding training on the vehicle and adaptation to the new driving experience.</i>
There were no reported crashes on participating pilot vehicles while they were participating in the pilot program through August 2022.	There were no summons or violations for participating pilot vehicles through August 2022.	<ul style="list-style-type: none"> ▪ In interviews with drivers, there were no reported safety concerns regarding the acceleration or motor power of the vehicle. ▪ Drivers reported an easy transition to using the vehicles even with some differences in how quickly the vehicle

² <https://www.cnn.com/2022/05/24/electric-vehicles-are-in-short-supply-heres-what-you-can-find-as-gas-prices-soar-.html>

³ <https://mitsloan.mit.edu/ideas-made-to-matter/how-auto-companies-are-adapting-to-global-chip-shortage>

⁴ <https://www.nytimes.com/2022/03/23/us/electric-car-buying-guide.html>

		<p>gains speed compared to an ICE vehicle.</p> <ul style="list-style-type: none"> ▪ Drivers reported that the sensitive touch of the gas and brake pedals are an easy adjustment and can make driving feel safer and reactions quicker. ▪ Drivers were all trained by companies on the safety features of the vehicle and how to best use the braking and acceleration. Drivers reported being driven and then driving with an experienced staff member from the garage.
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In addition to evaluating how the acceleration or motor strength may impact the safety outcomes of the participant vehicles, the Pilot Evaluation also examined several other areas of taxi operations. Review of these additional areas also included interviews with several drivers that operate the already taxi-eligible, Tesla Model 3.

- *Charging*
 - Participating drivers reported using publicly available DC fast charging.⁵ New York City currently has 169 publicly available DC Fast Charging plugs.⁶ Drivers that were interviewed cited using the large Revel charging hub, as well as DCFC located at the Brooklyn Museum⁷ and JFK airport.
 - Drivers preferred fast chargers with no or minimal parking fees and readily available chargers. Drivers commonly charged at the end of their shift, prior to returning the taxi to the garage. All driver participants in the pilot leased their taxis.
- *Any major adaptations for operating an electric taxi*
 - Drivers reported that the HVAC system can have a dramatic impact on the battery range of the vehicle. Drivers must prepare themselves for additional time to charge in times of extreme weather.

⁵ Direct Current Fast Charging (DCFC or DC Fast Charging) is the highest level of charging and can completely charge an EV battery in 30-60 minutes, depending on the electrical output and battery technology.

⁶ https://afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC

⁷ Brooklyn museum is a Tesla-only charging site.

- One driver reported maximizing the regenerative braking feature on the vehicle, which allowed him to drive on a longer charge.
- *Passenger feedback*
 - In interviews, drivers report that passengers are largely positive about electric vehicles.
- *Trip and Fare Data*
 - BEV Taxis performed at the same level of service as ICE⁸ vehicles. The pilot tracked indicators such as trip counts, mileage, farebox, and trip length and saw that the pilot vehicles operated similarly to that of an ICE taxi. The TLC will continue to monitor these indicators as additional electric taxis take to the road.

Proposed Rules Changes

TLC anticipates promulgating a change to TLC Rule 67-05.1(f), which would address the power specifications that are unique to electric vehicles by adopting the acceleration standard that was set forth under the pilot.

Policy and Programming Recommendations

In addition to proposed rule changes the TLC will explore additional policy recommendations to improve the electric vehicle driving experience and support a robust charging market in New York City. The TLC will work closely with city and state partners to ensure licensed drivers have access to adequate charging so that future electric adoption is a smooth and seamless transition.

- TLC will soon release a detailed electrification plan in that outlines the agency's policy recommendations to ensure an all-electric future.
- TLC will continue to engage with drivers, medallion owners, and taxi-related businesses regarding electrification barriers, improving charging, and opportunities to connect with EV businesses and innovators. =
- TLC will continue to collaborate with DOT and DCAS initiatives to expand charging opportunities for drivers around the city, with a specific focus for TLC-licensed drivers. This could include providing specific charging stations for TLC drivers or other opportunities for TLC-licensed drivers.

⁸ Internal Combustion Engine (ICE), vehicles that are gas-powered