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Electrifying Ridehailing: Drivers' Charging Practices and Electric Vehicle Characteristics Predict the Intensity of Electric Vehicle Use

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Issue

Electrifying ridehailing services provided by transportation network companies (TNCs) can reduce climate-altering emissions and air pollution and provide cost savings on fuel and maintenance to TNC drivers. Policy levers have emerged to nudge the industry in this direction. California's Senate Bill 1014 establishes a "clean miles standard" requiring an increasing percentage of ride-hailing services be provided by zero-emissions vehicles such as plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs)—together referred to as plug-in vehicles (PEVs). This can be achieved by increasing the number of TNC drivers using BEVs and PHEVs, and by increasing the electric miles PHEV drivers travel.

In spring 2019, researchers at UC Davis surveyed 732 TNC drivers in the US who already use a PEV, to better understand

their experiences, charging practices, and use of their PEV. This is the third in a series of briefs highlighting the results of the survey. It explores the factors that predict the hours per week that TNC-PEV drivers drive on TNCs, using this metric as a proxy for electric vehicle miles traveled (eVMT). The researchers were unable to directly measure eVMT because of a lack of data on the proportion of miles PHEVs are driven in electric, gas, or mixed-fuel modes.

Key Research Findings

The more times TNC-PEV drivers are willing to charge per ridehail "shift," the more hours they drive for TNCs (Figure 1). TNC-PEV drivers also tend to drive more hours if they drive on more than one TNC, and if they were a TNC driver before getting a PEV rather than the reverse.

Characteristics		Attributes		
All PEV Drivers	Willing to charge during "shift"	None	Once	Twice or more
	Providing service on multiple TNCs	Single TNC		Multiple TNC's
	TNC driver prior to getting PEV	PEV driver first		TNC driver first
BEV Drivers	Primary charging location	Home		Public
	Primary charging level	Level 1	Level 2	DC Fast
	Vehicle electric range	Short-range	Mid-range	Long-range
PHEV Drivers	Charges vehicle	Yes		No
		Fewer ridehailing hours produced		
		More ridehailing hours produced		

Figure 1. Factors that contribute to more hours driven for TNCs

TNC-BEV drivers who rely more on public charging (whether Level 2 or DC Fast) drive more hours for TNCs than those who primarily charge at home (whether Level 1 or 2). Among drivers relying on DC Fast charging, those who rent long-range BEVs to drive for TNCs drive the most hours per week of all. Finally, BEVs with longer electric range are likely to be driven more hours for TNCs.

TNC-PHEV drivers who never charge their vehicle drive more hours for TNCs than those who do. None of the miles that these PHEV drivers travel are electric. Unlike with BEVs, longer electric driving range in PHEVs does not predict more hours driving on TNCs.

Policy Implications

Drivers who have ample access to and are interested in public charging should be encouraged to acquire a BEV, since all their ridehailing travel will be electric and they are less likely to be limited by electric range, particularly if they are willing to charge during a ridehail “shift” and have access to DC Fast charging. Longer-range BEVs should be emphasized, since they will accommodate more driving hours, particularly for drivers unwilling to charge during a “shift.” Automakers will need to produce longer-range BEVs and more longer-range BEV models to give TNC-PEV drivers viable options.

PHEVs might seem to be a good fit for drivers who have limited access to charging. However, since PHEV drivers are not constrained by electric range, it is important that they have at least some access to convenient and affordable charging so they may charge frequently. This would allow them to maximize the proportion of their driving that is electric. For example, TNC-PHEV drivers who can charge at home can at least leverage their PHEV’s electric range on a daily basis. Electric miles traveled among TNC-PHEV

drivers could be further increased if automakers were to discontinue production of PHEVs with short electric ranges.

Drivers without easy access to home or public charging should not be encouraged to acquire any type of PEV unless such a promotion includes programs to provide charging opportunities. Without such charging opportunities, TNC drivers acquiring PHEVs will be likely not to charge the vehicles.

Programs to support TNC electrification should include charging infrastructure improvements and driver education. Strategies to increase the proportion of TNC miles traveled by BEV drivers include maximizing new public charging infrastructure and information on existing charging opportunities, including apps that provide charger mapping, real-time information on charger availability, and options to reserve a spot.

More Information

This policy brief and the others in this series are drawn from “Characteristics and Experiences of Ride-Hailing Drivers with Electric Vehicles,” and the forthcoming paper “Driving and Charging Electric Vehicles on Ride-hailing in the United States,” both authored by Angela Sanguinetti and Ken Kurani of the University of California, Davis. The papers and additional policy briefs can be found here: <https://www.ucits.org/research-project/2021-35/>.

For more information about the findings presented in this brief, contact Ken Kurani at knkurani@ucdavis.edu.

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