DOCKETED	
Docket Number:	19-AB-2127
Project Title:	Implementation of AB 2127 Electric Vehicle Charging Infrastructure Assessments
TN #:	247510
Document Title:	Cruise David Rubin Comments - Cruise LLC Comments - Response to CEC HEVI-LOAD and WIRED Workshop
Description:	N/A
Filer:	System
Organization:	Cruise / David Rubin
Submitter Role:	Public
Submission Date:	11/17/2022 4:50:40 PM
Docketed Date:	11/17/2022

Comment Received From: Cruise / David Rubin
Submitted On: 11/17/2022
Docket Number: 19-AB-2127

Cruise LLC Comments - Response to CEC HEVI-LOAD and WIRED Workshop

Additional submitted attachment is included below.

cruise

November 18, 2022

California Energy Commission
Comments in Workshop on Medium- and Heavy-duty and Ride-hailing Electric Vehicle Infrastructure Analysis
Docket No. 19-AB-2127

Cruise LLC ("Cruise") thanks the California Energy Commission ("CEC") for the opportunity to comment on its recent workshop, held on November 9, 2022, to inform and solicit feedback on electric vehicle (EV) infrastructure modeling needs in support of the Medium- and Heavy-duty Electric Vehicle Infrastructure Load ("HEVI-LOAD") and Widespread Infrastructure for Ride-Hailing EV Deployment ("WIRED") models to support the second iteration of California's Assembly Bill (AB) 2127 assessment.

As California evaluates pathways to achieve its decarbonization goals, the CEC's AB-2127 report and underlying tools that examine high priority electrification cases like HEVI-LOAD and WIRED will be critical in filling critical infrastructure gaps to meet electrification targets.

Cruise Comments on WIRED Model Forecasting

Cruise is a shared, fully-electric, self-driving car company based in San Francisco, California, with a mission to provide safer, cleaner, and more inclusive transportation. Following the EVI-Pro modeling workshop held in March, Cruise commends the CEC for hosting this secondary workshop to specifically look at medium and heavy duty (MDV) fleet needs, as well as ridesharing infrastructure needs.

As a wholly-owned light duty EV fleet, Cruise believes strongly in the importance of incorporating business models and infrastructure use cases like ours into the state's forecasting for electrification needs. We submit the following recommendations and comments - focused largely on WIRED - as areas to further refine and strengthen modeling in the CEC's second AB 2127 assessment. As outlined in the workshop, there is a growing policy need for electrification of California's vehicle stock under the Clean Miles Standard, alongside the infrastructure to support those vehicles. This includes both traditional ridehailing transportation network companies (TNCs) like Uber and Lyft, as well as new entrants such as autonomous vehicle (AV) fleets like Cruise, that largely operate with behind-the-fence infrastructure and are classified as transportation charter party carriers (TCPs) by the California Public Utilities Commission.

WIRED results from the 2021 AB 2127 modeling report found demonstrable need for ridehail EV charging infrastructure. In order to support electrification of TNCs in San Diego, San

cruise

Francisco and the broader Bay Area, and Los Angeles, over 2,000 TNC-dedicated DC fast chargers (DCFCs) would be needed across these three metros (with the assumption of 40% home charging) by 2030. That's roughly 50% of the total DCFCs estimated to support all light-duty EV interregional travel across the state by 2030 - but confined to just three cities.[1] And of course, research that underpinned the WIRED model found that while ridesharing EVs represent only ~0.5% of total EVs on the road in California, they represent 35% of total energy demand from DC fast chargers.[2] That analysis also found that these electric ridesharing vehicles visit DC fast charging (DCFC) stations 2.5 times a day, compared to private EVs which visit DCFCs on average once every 2 weeks.

However, Cruise contends that the originally estimated 2030 demand for charging infrastructure may be overly conservative. The final AB2127 report notes that TNC charging demand was revised compared to the AB 2127 staff report due to the inclusion of home charging, which estimated that EV TNC drivers will charge at home ~40% of the time. Cruise believes this may be an overestimation in both the near and long term, due to two emerging market and land use forces - the general lack of multi-unit dwelling (MUD) charging to support drivers, and the emergence of AV fleets and their own unique charging needs:

Potential TNC Electrification Barriers for MUD Resident Drivers: Regarding the former, the lack of MUD charging availability could increase DCFC needs, particularly in the near-term. In a survey of 732 Uber EV drivers nationally, a UC Davis report found an even higher percentage of at-home charging than cited in the final AB 2127 report - 58% compared to 40%.[3] However, Cruise is concerned that rather than *exemplify* the trend of at-home charging being available for TNC drivers, this data may confirm that EV adoption for ridehailing is easier for single-family homeowners, and highlight the lack of available charging for those who rent or live in MUDs - critical driver populations to ensure Clean Miles Standard compliance that may face additional hurdles to electrify. The UC Davis study cited above found that of the surveyed EV TNC drivers, 32% lived in MUDs and 42% were renters.

Even this may be an underestimation for California - another survey from UCLA that specifically surveyed LA-based Lyft and Uber drivers (using ICE and ZEV platforms alike) reported that a majority lived in MUDs and a majority were home renters.[4] These residences are often more

---

[1] California Energy Commission. "Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment - Analyzing Charging needs to Support ZEVs in 2030". *Table 9 and Figure 17.* July 2021. https://efiling.energy.ca.gov/getdocument.aspx?tn=238853.

[2] Dr. Alan Jenn. "Emissions Benefits of Electric Vehicles in Uber and Lyft Services". *National Center for Sustainable Transportation.* August 2019. https://escholarship.org/content/qt15s1h1kn/qt15s1h1kn.pdf?t=pw4rht.

[3] Dr. Angela Sanguinetti, and Dr. Ken Kurani. "Characteristics and Experiences of Ride-Hailing Drivers with Plug-in Electric Vehicles". *UC Davis Institute of Transportation Studies.* March 2020. https://escholarship.org/uc/item/1203t5fj.

[4] Deepak Rajagopal, and Allison Yang. "Electric vehicles in ridehailing applications: Insights from a Fall 2019 survey of Lyft and Uber drivers in Los Angeles". *UCLA Institute of the Environment and*

difficult and costly to install L2 charging compared to owned, single family properties, and may see extended lags for L2 installations compared to single family units. The UC Davis report also found that 27% of TNC EV drivers either leased or rented their vehicles, leading to less incentive to invest in at-home charging infrastructure.

While local policy solutions have been advanced to address this need, such as San Francisco's Commercial Garage EV Charging Ordinance (No. 244-19) that required lots with over 100 parking spaces to install L2s in at least 10% of spaces by January 2023, there are lingering questions related to enforcement, and of course applicability to residential dwellings.

Emerging AV Use Case Could Skew Charging Needs to Shared-Private: Regarding the latter, the emergence of AV ridesharing fleets will also impact both the potential use of home charging in serving these trips, and will also lead to an increasing role of shared private charging in ridehailing applications - both for individual fleets and possibly in shared fleet/TNC capacities. As Cruise has commented in past filings, the charging needs of AV ridesharing more closely reflect those of traditional fleets, where public charging use is less feasible (due to the need for charging porters) and less attractive (due to a desire not to overcrowd public infrastructure) in the near-term. Rather than public charging, Cruise (and other wholly-owned ridehail fleets) plan to serve market demand through largely owned and operated infrastructure. Furthermore, these AVs could see more charging sessions than a traditional TNC driver, given longer duty cycles and vehicle downtime. Cruise, for example, estimates that our own fleet's DCFC and L2 needs in 2024 could total 500 and roughly 2,000 respectively in San Francisco alone - upwards of 50MW in peak power and roughly 300MWh per day. This infrastructure would total half of the 2030 TNC DCFC demand estimated for San Francisco in WIRED, 6 years ahead of projection.

While some of these charging sites may be exclusively "behind the fence", others - such as the site funded by the CEC's CARTS grant in San Francisco - including both behind the fence and shared DCFCs intended for public and TNC use. The charging behavior and use case of light duty ridehail fleet electrification - high utilization and vehicle throughput - can help reduce electricity costs, and even improve the unit economics for adjacent or attache public charging sites, making these sites more attractive, convenient, and potentially even affordable for TNC EV drivers that may not have access to home charging. These shared benefits could help catalyze shared use "charging hubs" in urban cores that could reduce, or at the very least complement, TNC drivers' use of at-home charging.

Furthermore, the Clean Miles Standard rulemaking has not yet been finalized by the California Public Utilities Commission, and it is possible that there could be funding developed through

---

Sustainability. April 13, 2020. https://www.digitalenergyenvironment.org/site/assets/files/1058/rajagopal_ucla_sharing_paper_final.pdf.

fees, incentives, or other programs that would clear a financial pathway for such TNC-dedicated charging hubs, also potentially reducing the rate of at-home charging.

Recommendations

Based on these observations, Cruise would like to recommend to the CEC and UC Davis that this next iteration of WIRED should ensure that a range of ridesharing electrification use cases are captured, in order to ensure that state infrastructure planning and forecasting accurately reflects the potential evolutions in this segment. Cruise submits the following recommendations for incorporation into the next round of WIRED modeling:

1. **Incorporate shared private charging use into WIRED model:** Based on the feedback above, Cruise recommends that this next iteration of WIRED include the role of shared private charging and owned- and operated- fleets. In the coming years, autonomous ridehailing could quickly replace trips served by TNC drivers, with different impacts on charging infrastructure needs that may skew away from at-home charging and towards shared private or hybrid public/private sites. Ensuring that these potential scenarios are captured will help support a more comprehensive understanding of evolutions of the ridehailing market and its associated infrastructure needs through 2030.

2. **Maintain different ranges for at-home charging use:** As stated above, the Clean Miles Standard will require significant electrification of TNC vehicles by 2030. However, many drivers - including the majority that live in MUDs and rent - face intrinsic barriers to home charging and electrification that may skew charging behavior towards more public charging, or towards shared private and public/private sites. Cruise recommends that this next iteration of WIRED modeling retain the previous scaled assumptions for home charging rates for TNC drivers, while also incorporating emerging use cases like AV fleets that may instead need to rely on different charging options.

3. **Incorporate HEVI-LOAD's capacity and load profile into WIRED, engage with utilities:** Lastly, Cruise recommends that this next iteration of WIRED also incorporate HEVI-LOAD's capacity and load profile modeling, so that the CEC can launch a dialogue with utilities and other power providers regarding timely interconnection and power availability. The CEC's workshop highlighted some of the advanced methods in which HEVI-LOAD models circuit capacity and load profiles. MDV vehicles will represent a significant added load on the existing grid. However, as noted above, ridesharing charging could also present significant load demand - perhaps in ways more acute than MDVs. DCFC ridesharing infrastructure and associated charging behavior tends to skew towards downtown urban cores where ride demand is highest.

   Even without the potential needs of AV fleets, the ~1,200 DCFCs estimated for San Francisco by 2030 in the last iteration of WIRED could represent between 60MW and

cruise

120MW of peak power for ridehail DCFCs alone, potentially totaling hundreds of MWh per day.[5] And this power draw would not be distributed as it may be with MDV fleets, but instead occur in areas with constrained transmission and distribution assets, often with limited remnant power. Ensuring that ridehail infrastructure forecasting is mapped to utility upgrades and investments, forecasting, and interconnection timelines in these areas will be critical to ensure that infrastructure to support ridehail electrification - and, more generally, EV adoption - can be achieved.

Cruise also recommends that, to the extent possible, the CEC work with California utilities to map the findings of both HEVI-LOAD and WIRED against capacity maps to help prioritize distribution-level grid upgrades to support electrification.

Conclusion

Based on this evidence, Cruise recommends that CEC staff and UC Davis incorporate the important nuances of light duty rideshare and TNC fleet charging infrastructure needs outlined above in the next iteration of WIRED as part of the AB-2127 assessment. As noted by staff during the workshop, WIRED is a critical component of the state's modeling efforts, particularly given the growing needs under the Clean Miles Standard.

Cruise would finally like to thank the Commission for its attention to this issue. In our comments to the CEC on the EVI-Pro modeling in March, Cruise recommended that the CEC reexamine WIRED and ensure that its analysis was also updated to reflect evolutions in the rideshare charging space. We welcome the opportunity that the CEC has presented in hosting this workshop, and would like to thank the Commission and staff for their continued support and engagement on this topic - critical to achieving a cleaner and more inclusive transportation future for California.

Sincerely,

David Rubin
Head of Policy Research
Government Affairs
david.rubin@getcruise.com
Cruise, LLC

[5] Assuming boundaries of 50kW and 100kW chargers.