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# ACCELERATING RIDE-HAILING ELECTRIFICATION: CHALLENGES, BENEFITS, AND OPTIONS FOR STATE ACTION

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## INTRODUCTION

In the United States, usage of ride-hailing services has grown at a steep rate over the last decade, and this trend is expected to continue. These on-demand services expand mobility, especially for people with limited access to private vehicles and transit services. However, studies show that non-pooled ride-hailing trips produce significantly more greenhouse gas (GHG) emissions on average than trips in private vehicles. A rapid transition in ride-hailing fleets from internal combustion engine (ICE) vehicles to electric vehicles (EVs), and in particular to battery electric vehicles (BEVs), would reduce emissions of GHGs and other air pollutants, increase consumer exposure to EVs, deliver maintenance and fuel cost savings to drivers, and improve the business case for fast charging infrastructure by increasing utilization.

In recognition of the significant benefits that would result from electrifying ride-hailing services, the Northeast States for Coordinated Air Use Management (NESCAUM) worked with the Multi-State ZEV Task Force[1] to develop this white paper. The paper identifies the benefits and challenges associated with transitioning vehicles driving on transportation network company (TNC) platforms to EVs and recommends specific actions that the Task Force states can take to support and accelerate the transition. Implementation of the recommended state actions – which include both new state policies and programmatic investments – would help advance implementation of one of five top priorities in the *Multi State Zero Emission Vehicle Action Plan* for 2018 to 2021[2]: electrifying public and private light-duty fleets.

| **DEFINITIONS FOR KEY TERMS** | |
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| *TRANSPORTATION NETWORK COMPANY (TNC)* | AN ORGANIZATION THAT PROVIDES ON-DEMAND TRANSPORTATION SERVICES USING A TECHNOLOGY-BASED PLATFORM TO CONNECT PASSENGERS WITH DRIVERS USING A PRIVATE VEHICLE. |
| *RIDE-HAILING SERVICES* | SERVICES THAT ALLOW USERS TO REQUEST A RIDE ON-DEMAND THROUGH A MOBILE APPLICATION AND SPECIFY THEIR DESIRED PICK-UP AND DROP-OFF LOCATIONS. |
| *RIDE-POOLING SERVICES* | FARES AND RIDES ARE SPLIT AMONG MULTIPLE PASSENGERS WITH SIMILAR ORIGIN-DESTINATION PAIRINGS. |
| *DEADHEADING* | MILES THAT ARE ASSOCIATED WITH TRAVEL PERIODS WITHOUT A PASSENGER IN THE CAR. |

## RIDE-HAILING MARKET GROWTH AND PROGRESS ON ELECTRIFICATION

Since the founding of Lyft and Uber – the two dominant TNCs by market share – usage of ride-hailing services has climbed dramatically. For instance, TNCs transported 1.9 billion passengers in the United

[1] The Multi-State ZEV Task Force consists of 10 member states—California, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont—that signed a Memorandum of Understanding committing to coordinated action to support accelerated EV adoption.
[2] ZEV Task Force. *Multi-State ZEV Action Plan: 2018-2021*. 2018. Available at: https://www.nescaum.org/topics/zeroemission-vehicles/multi-state-zev-action-plan-2018-2021-accelerating-the-adoption-of-zero-emission-vehicles.

States in 2016 and 2.61 billion passengers in 2017, an increase of 37 percent in just one year. In 2019, more than 36 percent of American adults used ride-hailing services, up from just 15 percent in 2015. Early research suggests that the widespread availability of ride-hailing services in urban areas has decreased public transit ridership for light-rail by 3 percent and bus services by 6 percent. Projections by experts before the onset of the COVID-19 pandemic forecasted a continuing upward trend in utilization of TNC platforms.[3]

Progress toward electrifying TNC vehicles has been minimal to date. Lyft and Uber both report that less than 1 percent of drivers on their platforms are driving EVs. During 2020, Lyft[4] and Uber[5] each announced new commitments to transition their platforms to 100 percent EVs by 2030.

## BENEFITS OF TNC ELECTRIFICATION

The benefits described below create a strong rationale for state action to help TNCs and TNC drivers make the transition to EVs as quickly as possible.

### REDUCING TRANSPORTATION-SECTOR POLLUTION

On average, vehicles driven on TNC platforms are newer and more fuel efficient than privately owned vehicles,[6] but their frequent duty cycles result in higher average vehicle miles traveled (VMT). A 2019 study on VMT within six metropolitan regions found that ride-hailing vehicles accounted for 2 to 13 percent of VMT in the core county of each region.[7] In addition, frequent deadheading[8] in these vehicles results in lower average passenger occupancy and higher average per-trip emissions of pollutants.

TNC vehicles are responsible for a small but rapidly rising percentage of transportation-sector GHG emissions as a result of the growing popularity of ride-hailing combined with the carbon-intensity of the trips. The average non-pooled ride-hailing trip using an ICE vehicle emits 47 percent more GHGs than a private vehicle trip of the same length and produces nearly 70 percent more GHG emissions than the average trip it displaces (biking, walking, public transit, private vehicle, and taxi).[9] Transitioning ICE vehicles driving on TNC platforms to EVs would deliver significant GHG emission reduction benefits because full-time TNC drivers average 180-190 miles per day, and part-time drivers average 30-40 miles per day.[10] As such, the emissions benefits of electrifying a full-time ride-hailing vehicle are substantially greater – as much as three times in California for example – than electrifying a private vehicle.[11,12] Electrification is also important for reducing ride-hailing's contribution to aggregate criteria air pollution that causes respiratory diseases and other adverse health impacts. TNCs provide most of their services

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[3] California Air Resources Board. *SB 1014 Clean Miles Standard, 2018 Base-year Emissions Inventory Report*. December 2019. Available at https://ww2.arb.ca.gov/sites/default/files/2019-12/SB%201014%20-%20Base%20year%20Emissions%20Inventory_December_2019.pdf.
[4] Lyft. *Leading the Transition to Zero Emissions: Our Commitment to 100% Electric Vehicles by 2030*. June 17, 2020. Available at https://www.lyft.com/blog/posts/leading-the-transition-to-zero-emissions.
[5] Khosrowshahi, D. Driving a Green Recovery. Uber Newsroom. September 8, 2020. Available at https://www.uber.com/newsroom/driving-a-green-recovery/.
[6] Based on estimates by the California Air Resources Board using data supplied by TNCs, vehicle fleets in California averaged 31.1 miles per gallon (mpg) compared to 26.0 mpg for privately-owned vehicles.
[7] Fehr & Peers. *Estimated TNC Share of VMT in Six Metropolitan Regions*. August 6, 2019. Available at https://www.fehrandpeers.com/what-are-tncs-share-of-vmt/.
[8] The California Air Resources Board examined over 1.4 billion ride-hailing trip records for calendar year 2018 and found that deadheading was responsible for 38.5 percent of ride-hailing's total VMT in California.
[9] Union of Concerned Scientists. *Ride-Hailing's Climate Risks.* February 25, 2020. Available at https://www.ucsusa.org/resources/ride-hailing-climate-risks.
[10] Jenn, A. Emissions benefits of electric vehicles in Uber and Lyft ride-hailing services. *National Energy (2020).* https://doi.org/10.1038/s41560-020-0632-7.
[11] Ibid.
[12] The emissions benefits of electrifying ride-hailing vehicles will vary based on the carbon intensity of electric generation sources.

in densely populated metropolitan areas that already experience disproportionate air pollution from vehicular traffic and congestion.[13] While TNC electrification will not reduce traffic congestion or VMT unless ride-hailing services displace on-road private vehicles, replacing ICE vehicles with BEVs that emit no tailpipe emissions will reduce total criteria air pollution emissions, especially in densely populated metropolitan areas where ride-hailing is common and where congestion may already be contributing to a higher air pollution burden.

## IMPROVING MOBILITY SOLUTIONS IN LOW-INCOME COMMUNITIES AND DRIVER EARNINGS

TNCs increasingly provide critical mobility solutions for low-income communities[14] and populations with limited access to private vehicles or public transit, both in densely populated urban centers and rural areas. They provide "first- and last-mile" services, for example, to bring riders to locations where they can access public transportation. In 2019, 40 percent of U.S.-based Lyft rides started or ended in low-income areas,[15] and 48 percent of riders used the platform to connect to public transit.[16] These mobility services are important, but when provided by ICE vehicles they contribute to existing air pollution burdens that low-income communities may face from heavy commercial traffic. The electrification of ride-hailing vehicles could improve access to clean mobility solutions and complement public transit use without exacerbating air pollution and negative public health outcomes.

In addition, the use of EVs by TNC drivers could increase their earnings as a result of the vehicles' lower refueling, maintenance, and operational costs. Compared to ICE vehicles, BEVs require fewer inspections and their efficient electric powertrain causes less wear and tear on mechanical parts.[17] As a result of high annual VMT, frequent duty cycles, and low operational and maintenance costs, TNC EV drivers will realize greater cost-per-mile savings in a BEV than an ICE vehicle and shorten vehicle payback periods when federal and state purchase incentives are factored into total cost of ownership calculations.[18]

## INCREASING AND BROADENING CONSUMER EXPOSURE TO EVS

Nationally, TNCs provide ride-hailing services to well over one million passengers per day, which creates an invaluable opportunity for expanding consumer awareness of and experience in EVs. Every TNC trip taken in an EV becomes a "ride-and-drive" for introducing consumers to the vehicles. Lyft and Uber both offer anecdotal evidence that their drivers enjoy interacting with passengers about the technology, and positive perceptions of driving EVs are often conveyed from drivers to passengers. This finding is consistent with consumer surveys that routinely find EV drivers are highly satisfied with their vehicles and often become de facto technology ambassadors by touting their vehicles' environmental attributes, fuel and maintenance savings, and powerful and quiet acceleration.[19] As more EVs are deployed in ride-hailing services, the opportunity to raise general consumer awareness of the benefits of driving electric will grow.

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[13] American Lung Association. Disparities in the Impact of Air Pollution. Available at https://www.lung.org/clean-air/outdoors/who-is-at-risk/disparities.
[14] No universal definition or qualifier for identifying "low-income communities" exists across the United States. The parameters for identifying low-income communities vary by geography and cost of living.
[15] Lyft. *Economic Impact Report, 2020.* Available at https://www.lyftimpact.com/impact/riders/expanded.
[16] Lyft. *Economic Impact Report, 2020.* Available at https://www.lyftimpact.com/impact/transportation/expanded.
[17] UBS. UBS Evidence Lab Electric Car Teardown – Disruption Ahead? May 18, 2017.
[18] Pavlenko, N., Slowik, P., Lutsey, N. *When does electrifying shared mobility make economic sense?* The International Council on Clean Transportation. January 8, 2019. Available at https://theicct.org/publications/shared-mobility-economic-sense.
[19] Dzikiy, P. 'Three in four U.S. drivers believe 'EVs are the future of driving,' survey says. Electrek. February 27, 2019. Available at https://electrek.co/2019/02/27/survey-drivers-evsfuture/#:~:text=The%20survey%20found%2085%20percent,back%20to%20a%20gas%20vehicle.%E2%80%9D.

## DELIVERING GRID BENEFITS AND GROWING DIRECT CURRENT FAST CHARGING UTILIZATION

BEVs used in ride-hailing fleets are highly dependent on direct current fast charging (DCFC) infrastructure to meet their refueling needs and minimize time spent charging. Observed DCFC usage behavior demonstrates that electric ride-hailing fleets can deliver grid benefits. These vehicles frequently charge at times when there is high renewable energy generation and can help flatten electric load shape.[20] Moreover, peak demand for ride-hailing services occurs during evening commute hours, which generally coincides with peak electricity demand. TNC drivers will be motivated to avoid charging during this period, resulting in minimal impacts to the grid.

Further, TNC electrification can strengthen the business case for DCFC station development. For DCFC station developers, low charging utilization rates often result in costly demand charges that exceed the revenue generated. A 30 percent utilization rate for DCFC stations is indicative of a mature EV market, and supports increased investments in DCFC infrastructure.[21] A 2019 University of California-Davis study on DCFC usage behavior for 105,000 unique EVs in California found that EVs operating in ride-hailing fleets were responsible for 35 percent of total energy demand at non-Tesla DCFC stations, despite making up less than 0.5 percent of the total EVs in-state.[22] TNC electrification can improve DCFC station economics and accelerate overall EV adoption by stabilizing pricing and distributing demand charges through increased DCFC use. This, in turn, can support continued expansion of DCFC stations accessible to both TNCs and the public.

## CHALLENGES FOR ELECTRIFYING TNCS

As a greater number of long-range BEVs come to market in the next several years, the feasibility of electrified ride-hailing will increase, and TNC drivers will have more vehicle choices. Still, there are a number of challenges for electrifying TNCs that must be addressed, including: higher upfront EV purchase costs; limited driver education and awareness of the benefits of driving electric; and lack of access to reliable, cost-effective, and conveniently located charging infrastructure. The COVID-19 pandemic has severely disrupted ride-hailing services in 2020 and introduced market uncertainty that may present additional challenges over the next several years.

TNCs employ independent contractors (i.e., drivers) to provide ride-hailing services using either their own private vehicles or rental vehicles from commercial fleet providers. While EVs are projected to reach cost parity with ICE vehicles in 5 to 10 years,[23] higher upfront purchase costs are currently a major obstacle to adoption by individual TNC drivers and rental fleet providers. A growing number of TNC drivers rely on ride-hailing as their primary source of income,[24] and a 2019 driver survey found that drivers' average wages were $12.66 per hour after accounting for vehicle expenses such as fuel, maintenance, and insurance.[25] Without attractive leasing options or financial incentives to help close or offset the higher purchase price, TNC drivers are unlikely to switch to EVs. Furthermore, like the average

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[20] Jenn, A. Emissions benefits of electric vehicles in Uber and Lyft ride-hailing services. *National Energy (2020).* https://doi.org/10.1038/s41560-020-0632-7.
[21] Fitzgerald, G., Nelder, C. *DCFC Rate Design Study*. Rocky Mountain Institute. 2019. http://www.rmi.org/insight/DCFC-rate-designstudy.
[22] Jenn, A. Emissions benefits of electric vehicles in Uber and Lyft ride-hailing services. *National Energy (2020).* https://doi.org/10.1038/s41560-020-0632-7.
[23] Bloomberg New Energy Finance. *Electric Vehicle Outlook 2020.* Available at https://about.bnef.com/electric-vehicle-outlook/.
[24] UCLA Institute for Research on Labor and Employment. *More Than a Gig, A Survey of Ride-Hailing Drivers in Los Angeles.* May 2018. Available at https://www.labor.ucla.edu/wp-content/uploads/2018/06/Final-Report.-UCLA-More-than-a-Gig.pdf.
[25] Campbell, H. Lyft & Uber Driver Survey 2019: Uber Driver Satisfaction Takes a Big Hit. October 1, 2020. Available at https://therideshareguy.com/uber-driver-survey/.

U.S. consumer, TNC drivers typically have low awareness of EV technologies, capabilities, and benefits, and may not understand the potential for operational cost savings from driving electric.[26]

The lack of access to affordable and convenient charging presents another obstacle to TNC electrification, but the extent of this challenge varies greatly depending on geography and population density. Many TNC drivers live in multi-family dwellings and do not have access to Level 1 or Level 2 overnight charging at or nearby their homes. Time spent charging during the day at public DCFC stations reduces potential wage earnings. Additional impacts to wages occur when DCFC stations are not conveniently located in relation to typical routes or affordable to use in comparison to the costs of fueling with gasoline. To help address this hurdle, TNCs have negotiated with electric vehicle supply equipment (EVSE) providers to develop discounted DCFC rates for TNC drivers who utilize their infrastructure as part of electrification pilots. For example, Lyft partners with EVgo in select cities to enable EV drivers on their platform to refuel at EVgo DCFC stations at subsidized rates. EVSE providers recognize the potential revenue stream for providing DCFC infrastructure solutions to TNC drivers, and some are exploring opportunities to build dedicated DCFC infrastructure exclusively for ride-hailing fleets.

## OPTIONS FOR STATE ACTIONS TO DRIVE AND SUPPORT TNC ELECTRIFICATION

Accelerating TNC electrification will require action by many stakeholders, including TNCs, electric utilities, automakers, EVSE providers, nonprofit organizations, government at all levels, and others. This section highlights actions that state governments can employ. As discussed in detail below, these actions are wide-ranging and include initiating data reporting requirements, developing vehicle emissions regulations, providing purchase incentives to TNC drivers and rental fleet partners, and supporting investment in charging infrastructure strategically located for TNC driver use. The recommendations below are not listed in any particular order because states will need to implement a combination of appropriate and feasible strategies, taking into account the unique challenges and opportunities for electrifying ride-hailing fleets operating within their jurisdictions.

### IDENTIFY ELECTRIFICATION OF RIDE-HAILING AS A PRIORITY AND COLLECT TNC DATA

State governments should consider including TNC electrification as a priority strategy in state transportation electrification plans. By highlighting the environmental, public health, and consumer education benefits of TNC electrification, states can encourage collaboration among TNCs, fleet and rental car companies, EVSE providers, electric utilities, and other partners to accelerate EV procurement for ride-hailing services and deployment of DCFC infrastructure needed to meet fueling needs.

States should also consider collecting specific types of TNC data to inform consideration of electrification policies and charging infrastructure investments, such as data on vehicle fleet composition, geographic service areas, and charging behaviors. Some states have established data reporting requirements for TNCs. In Massachusetts, for example, the Department of Public Utilities requires companies to share trip data that it uses to create interactive, annual reports on ride-sharing services.[27] The California Air Resources Board (CARB) undertook a resource-intensive process to collect data for 1.4 billion ride-hailing trips from 14 TNCs operating in California. Analysis of the data was used to draft CARB's *SB 1014*

[26] Puget Sound Clean Air Agency. *Electrifying Ride-Hailing in Seattle*. September 2019. Available at https://www.atlasevhub.com/wp-content/uploads/2019/09/Electrifying-Ride-hailing-in-Seattle-WWCC-Report.pdf.
[27] Massachusetts Department of Public Utilities. *Rideshare in Massachusetts, 2019 Data Report*. Available at https://tnc.sites.digital.mass.gov/.

*Clean Miles Standard, 2018 Base-year Emissions Inventory Report* and inform the development of regulations for reducing GHG emissions from TNC operations.[28]

## PROVIDE POINT-OF-SALE VEHICLE PURCHASE INCENTIVES FOR TNC ELECTRIFICATION

There are two pathways that TNCs can take to electrify their fleets: (1) encourage TNC drivers to purchase private EVs for use on their platforms, and (2) integrate EVs into rental programs through which drivers rent vehicles, usually on a weekly basis, with insurance and charging costs bundled into a single rate. Lyft's Express Drive program, a partnership with rental fleet companies to make conventional, hybrid, and plug-in electric vehicles available to drivers is an example of the second approach. TNCs have indicated that integrating EVs through rental programs is a near term strategy for advancing electrification on their platforms, but EV purchases by TNC drivers will be critical to achieving their 2030 electrification targets.

Federal and state incentives remain critical to facilitating a more rapid transition to EVs through both pathways. Almost all ZEV states have existing purchase incentive programs that could be utilized or revised to support the procurement of EVs for ride-hailing. This is a cost-efficient use of limited incentive funding because the high annual VMT and frequent duty cycles of these vehicles will result in substantial GHG emissions reductions when compared to electrification of private vehicles for personal use. Targeted approaches for facilitating TNC electrification through state purchase incentives include:

a. ***Expanding purchase incentive eligibility for fleets.*** Most state EV purchase incentive programs either do not allow commercial fleet eligibility, or offer it on a limited basis (e.g., typically capped at 20 or fewer vehicles annually). Revising state incentive programs to expand eligibility for fleet vehicles would provide immediate financial support to ride-hailing fleet partners to increase EV rental offerings for drivers and set affordable rental rates. For instance, Colorado legislation making TNCs eligible for the state's EV tax credit[29] enabled Lyft and its fleet partner to procure 200 BEVs for Lyft's Denver Express Drive program and offer the vehicles to drivers at competitive rental rates (see Appendix C). States could sunset EV fleet incentives to align with decreasing EV purchase prices and require rebated vehicles to remain in ride-hailing service for a set number of years. Concerns about retaining sufficient funding for private vehicle incentives could be addressed by increasing incentive program funding, providing smaller incentives for fleets, or creating a limited fleet incentive carve-out.[30]

b. ***Providing targeted incentives for low-income residents.*** Various studies indicate that a significant proportion of TNC drivers earn low and moderate incomes.[31] An income-based EV purchase incentive could nearly, or completely, offset the incremental upfront EV purchase cost for TNC drivers when combined with federal tax credits and other state or utility purchase incentives.

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[28] California Air Resources Board. *SB 1014 Clean Miles Standard, 2018 Base-year Emissions Inventory Report*. December 2019. Available at https://ww2.arb.ca.gov/sites/default/files/2019-12/SB%201014%20-%20Base%20year%20Emissions%20Inventory_December_2019.pdf.
[29] Colorado General Assembly. HB 19-1158. Available at https://leg.colorado.gov/bills/hb19-1159.
[30] For an example of a fleet incentive program with dedicated funding, see the Bay Area Air Quality Management District's High Mileage Fleet Program.
[31] Mishel, L., *Uber and the labor market.* Economic Policy Institute. May 15, 2018. Available at https://www.epi.org/publication/uber-and-the-labor-market-uber-drivers-compensation-wages-and-the-scale-of-uber-and-the-gig-economy/; Cook et al., *The Gender Earnings Gap in the Gig Economy: Evidence from over a Million Rideshare Drivers*. Stanford University Graduate School of Business. May 24, 2020. Available at https://web.stanford.edu/~diamondr/UberPayGap.pdf; and Campbell, H. Lyft & Uber Driver Survey 2019: Uber Driver Satisfaction Takes a Big Hit. October 1, 2020. Available at https://therideshareguy.com/uber-driver-survey/.

Among the ZEV Task Force states, California, Oregon, and Vermont currently offer EV purchase incentives for low- and moderate-income individuals.

*c.* ***Adding purchase incentive eligibility for used vehicles.*** Another way to support TNC drivers' purchase of EVs is to make used vehicles eligible for state incentives. Used EVs may be an affordable option for many drivers, especially as a greater variety of longer range EVs come off lease and enter the secondary market. A number of ZEV Task Force states currently provide incentives for purchasing used EVs. States could use income eligibility and MSRP caps to ensure incentives for used EVs are directed to those most in need.

***d***. ***Implementing annual mileage-based incentives.*** As mentioned above in *Benefits of TNC Electrification*, ride-hailing vehicles' high annual VMT and frequent duty cycles provide a valuable opportunity to realize substantially greater emissions reductions through electrification when compared to EVs purchased for private use. States could develop targeted incentives for vehicle applications with high annual VMT, specifically including TNC drivers, to ensure that these emissions benefits are realized. These incentives could be targeted to lower-income drivers using private vehicles or rental fleet vehicles.

## ESTABLISH TNC GHG EMISSIONS REGULATIONS

While nearly all states have implemented regulations related to TNC permitting and/or trip surcharges, environmental regulations lag behind. States could consider establishing GHG emission reduction targets for ride-hailing operations, along with increasing electrification targets. Promulgating regulations could help to ensure that TNCs invest in electrifying the vehicles on their platforms. Capital could be mobilized by TNCs through a small surcharge on all ride-hailing trips. Uber levied such a surcharge on trips in London in response to congestion pricing (see Appendix C).

California's Clean Miles Standard, which is under development, will include requirements for ride-hailing fleets to reduce their GHG emissions by 2022, and every two years thereafter, under an approved GHG emission reduction plan.[32] More specifically, the regulations will establish a compliance metric of annual grams-$CO_2$-per-passenger mile ($gCO_2$/mi) modeled after the *2018 Base-year Emissions Inventory Report,* and electric VMT (eVMT) targets through 2030 (see Appendix C). These increasingly stringent GHG emission and eVMT targets send a strong regulatory signal that will drive TNC investments in electrification and promotion of pooled ride-hailing services. Other states may want to consider this approach.

## INVEST IN PUBLIC DCFC INFRASTRUCTURE AND IMPROVE CHARGING ECONOMICS

Further development of publicly accessible DCFC charging networks will be critical to enabling electrification among drivers without access to at-home charging. To minimize lost opportunity costs from charging during their shifts, TNC drivers need access with minimal wait times to DCFC stations conveniently located within their service areas. Public utility commissions should encourage utilities to submit investment proposals that include DCFC stations in areas where ride-hailing usage is high and where there are amenities that drivers can use while they charge. Strategically located DCFC charging hubs in neighborhoods without off-street parking and near travel corridors can serve multiple purposes. Several utilities, including the Exelon Joint Utilities in Maryland and Dominion Energy in Virginia, have

[32] California Air Resources Board. Clean Miles Standard. Available at https://ww2.arb.ca.gov/our-work/programs/clean-miles-standard.

submitted proposals to their public utility commissions that include DCFC stations designed to serve TNC drivers.

Public utility commissions also could establish beneficial electricity pricing structures that enable drivers to realize fuel cost savings when switching from an ICE vehicle to a BEV. Lowering the cost of charging could incentivize more drivers to purchase EVs and spur fleet partners to increase EV rental offerings, in turn supporting greater DCFC station utilization and improving the business case for station development. Beneficial pricing structures include reduced or waived demand charges that could be phased out as DCFC utilization increases. For example, Connecticut's Public Utilities Regulatory Authority approved for three years a full demand charge waiver for publicly accessible DCFC stations in Eversource Energy's service territory.[33] Public utility commissions could encourage the development of similar utility rate proposals with discounted DCFC charging rates or demand charge relief mechanisms.

## EXPAND ACCESS TO CONVENIENT AT-HOME AND ON-STREET CHARGING

A significant share of TNC drivers reside in multi-family dwellings with limited access to convenient at-home Level 1 and Level 2 charging that can be accessed overnight when electric rates are typically cheapest. There are, however, a number of barriers to installing charging stations at multi-family dwellings, including upfront equipment and installation costs, insurance liability, and access and ownership. States can help to address these barriers with EV-ready building codes, "right to charge" laws, EVSE incentives, and by encouraging utility investments. Adopting building codes that establish EV-ready parking requirements for new construction and major building renovations, with a particular emphasis on multi-family dwellings, can drastically reduce installation costs. Enacting "right to charge" laws provide EV drivers living in multi-family dwellings with conditional rights to install charging stations to meet their fueling needs. In addition, state EVSE incentive programs for multi-family dwellings and utility investments in make-ready and charging stations at multi-family dwellings help reduce the costs associated with purchasing and installing EVSE. Increasing access to at-home charging will provide added convenience and greater economic benefits by enabling TNC EV drivers to charge overnight when electric rates are typically cheapest.

Expanding publicly accessible Level 2 charging infrastructure near multi-family dwellings can also support TNC electrification. Through public utility commissions, states can support investments in Level 2 curbside charging stations to expand charging solutions in densely populated residential areas without off-street parking or with limited access to charging. Retrofitting streetlights with charging ports as they are converted to LED lighting can increase the availability of charging while minimizing distribution side infrastructure costs by tapping into existing excess electrical capacity. Charging station developers in Los Angeles[34] and New York City[35] have utilized this approach to expand curbside charging.

## INCENTIVIZE ELECTRIFICATION THROUGH REDUCED FEES AND TAXES

The annual and per trip fees and taxes that TNCs and their drivers remit represent a significant share of total operating costs. Appendix B summarizes current fee structures in the ZEV Task Force states.

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[33] Decision, PURA Docket No. 17-10-46RE01, Application of the Connecticut Light and Power Company d/b/a Eversource Energy to Amend its Rate Schedules—EV Rate Rider. March 6, 2019. Available at http://www.dpuc.state.ct.us/DOCKCURR.NSF/60903cc7b9de44728525746b006e8ffb/78a25b4e83776981852583b50057c9d1/$FILE/171046RE01-030619.pdf.
[34] Bureau of Street Lighting, Los Angeles Department of Public Works. EV Charging Stations. Available at http://bsl.lacity.org/smartcity-ev-charging.html.
[35] SmartCitiesWorld. *Turning light poles into electric chargers.* August 15, 2018. Available at https://www.smartcitiesworld.net/news/news/turning-light-poles-into-electric-chargers-3237.

Existing TNC fees and taxes produce revenue used for a variety of purposes, including state road improvements, transit investments, and state policing. In a few cases, they help to finance municipal funds allocated for investments meeting specified criteria. For this reason, integrating incentives for electrification into existing fees may require a revenue neutral approach, and the importance of achieving revenue neutrality will be heightened as states contend with fiscal contraction caused by the COVID-19 pandemic.[36] Specific opportunities for states to adjust or redirect fee structures to support electrified ride-hailing are described below.

a. ***Reduce or Eliminate State Surcharges on Electric Ride-hailing Trips.*** Among the ZEV Task Force states, Connecticut, Massachusetts, New Jersey, and New York assess per trip fees for ride-hailing services, either as a flat surcharge or as a percentage of the trip fare. These fees could be reduced or waived for trips provided in EVs and for pooled trips. In cities where riders can proactively select an EV for their trip, lower fares could drive additional demand for electrified ride-hailing and provide greater economic benefit to TNC EV drivers.[37] Furthermore, some states currently use exemptions and discounts to incentivize beneficial mobility services such as first- and last-mile TNC trips that connect riders to public transit.

b. ***Lower or Create Exemptions from State Rental Car Taxes for Ride-hailing EVs.*** When TNCs and their rental fleet partners procure vehicles and rent them to drivers, those rental vehicles are subject to state excise taxes. Most ZEV Task Force states structure rental car excise taxes as a flat charge per day or trip, or a percentage surcharge on the value of the rental. A comparative state-by-state analysis completed by the Tax Foundation illustrates that the effective tax rate varies from 2 percent to 12 percent of the full value of car rentals.[38] EVs in TNC or rental partner fleets could receive exemptions or discounts on these excise taxes, which would lower the total operating costs for TNC drivers who provide ride-hailing services in EV rentals.

c. ***Consider Electrification Incentives in Municipal Congestion Pricing Programs.*** Depending on existing state laws, state legislatures may be asked to approve municipal congestion pricing programs and state officials may play a role in developing them. In March 2019, for example, New York State approved congestion pricing for taxi, for-hire, and ride-sharing trips in Manhattan as part of its fiscal year 2020 budget.[39] It is not known yet whether this landmark program will include a reduced fee or exemption for EVs. The NYC Taxi and Limousine Commission currently charges a fee for TNC trips within the inner core of the City that does include such an exemption. If more states consider congestion pricing legislation, provisions that ensure consideration of electrification incentives as part of program design could be incorporated.

d. ***Encourage Airports to Embed Incentives for Electrification into Fee Structures.*** Nearly all commercial airports in the United States are owned and operated by state, regional, or local government authorities. Airport authorities typically charge TNCs fees for dropping off and picking

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[36] For an analysis to demonstrate how reduced fees for EVs could be coupled with fee increases for ICE vehicles to achieve revenue neutrality, see International Council on Clean Transportation. *How Can Taxes and Fees on Ride-Hailing Fleets Steer Them to Electrify?* September 23, 2019. Available at https://theicct.org/publications/taxes-and-fees-electrify-ridehailing.

[37] Uber. *Climate Assessment and Performance Report, 2017-2019*. September 9, 2020. Available at https://d1nyezh1ys8wfo.cloudfront.net/static/PDFs/CAsPR2020_CompleteReportFinal.pdf?uclick_id=979d5c4d-5f18-44a5-9a42-2d56ee1b4abb&utm_campaign=gcrm_uscan_rider_uber_green_launch-email_et&utm_medium=email&utm_source=ET.

[38] Watson, G. *Reforming Rental Car Excise Taxes*. The Tax Foundation. March 26, 2019. Available at https://taxfoundation.org/reforming-rental-car-excise-taxes/.

[39] Plitt, A. *NYC posed for first congestion pricing system in the country*. Curbed NY. April 1, 2019. Available at https://ny.curbed.com/2019/4/1/18290323/nyc-traffic-congestion-pricing-state-budget.

up passengers at airport terminals. These fees could include incentives for electrification. For example, after piloting a program that established emissions performance standards for ride-hailing vehicles operating at Seattle-Tacoma International Airport,[40] staff at the Port of Seattle report that the program is being restructured to incentivize TNCs to electrify trips to and from the airport (see Appendix C).[41] Large state-owned airports could be mandated to adopt similar approaches to reduce GHG emissions associated with their operations. These airports could also be required to expand investment in DCFC stations co-located with amenities to serve drivers' charging needs. Airports owned by regional authorities or large municipalities could be encouraged to do the same, perhaps in tandem with additional state funding for DCFC infrastructure.

### SUPPORT LOW-COST FINANCING FOR PURCHASING OR LEASING TNC EVS

State-funded green banks have confirmed an increasing interest in providing financing to support transportation electrification. For example, the New York Green Bank recently developed a new financing framework that includes strategies to advance EV fleet procurement. States could facilitate dialogue between green banks and TNCs to explore lending approaches that could help fill gaps in capital for accelerating the procurement of EVs. Although green banks may not be organized for small scale lending to individuals, lending could target acquisition of EVs by rental fleet providers. Green banks could also be encouraged to enter discussions with EVSE providers about financing installation of dedicated DCFC infrastructure to serve ride-hailing fleets. States could also consider establishing loan loss reserves to minimize lender risk for providing low-interest loans and financing to lower-income TNC drivers for EV purchases and leases. California's Clean Vehicle Assistance Program uses a loan loss reserve model to help low-income state residents purchase new and used EVs.[42]

### CONDUCT OUTREACH TO TNC DRIVERS

Driving EVs on ride-hailing platforms can be beneficial for individual drivers because EVs have lower maintenance needs and costs and often cost less to fuel than ICE vehicles, especially when drivers can charge overnight. States should encourage TNCs to incorporate information about the benefits of driving electric into driver training programs. States could also conduct targeted outreach to drivers about these benefits and the availability of federal and state purchase incentives. The State of Oregon is experimenting with strategies specially designed to reach TNC drivers in Portland through a partnership with Forth Mobility.[43] Similarly, regional Clean Cities Coalitions in Denver and Seattle are experimenting with targeted outreach for TNC drivers as part of shared mobility pilot projects funded by the U.S. Department of Energy. Some of the strategies being developed include creating informative podcasts and social media campaigns. These early efforts at outreach can provide valuable lessons for states to consider.

## CONCLUSION

On-demand ride-hailing has experienced rapid growth in recent years, especially in metropolitan areas. While the share of total transportation sector GHG emissions from ride-hailing vehicles may be small at

[40] Port of Seattle. Pilot Program Announced to Bring Transportation Network Companies to Sea-Tac Airport. March 22, 2016. Available at https://www.portseattle.org/news/pilot-program-announced-bring-transportation-network-companies-sea-tac-airport.
[41] Details about the restructured program are expected to be available in early 2021.
[42] California Air Resources Board. Financing Assistance for Low-Income Consumers. Available at https://ww3.arb.ca.gov/msprog/lct/vehiclefinancing.htm.
[43] Forth Mobility. Rideshare Drivers. Available at https://forthmobility.org/why-electric/rideshare-drivers.

present, ride-hailing vehicles emit more GHGs per mile traveled than private vehicles, and their annual VMT is higher as well. Transitioning ride-hailing fleets to EVs will deliver climate benefits, reduce emissions of criteria pollutants in densely populated areas, and broaden access and exposure to the technology among demographically diverse drivers and passengers, supporting faster adoption. States should consider a range of policy and programmatic actions to accelerate electrification of ride-hailing fleets and select those that best address unique challenges and opportunities within their jurisdictions. Recent announcements by TNCs and their EVSE partners indicate a willingness to collaborate with state governments to support a rapid transition. Actions by partners, including the TNCs, local governments, utilities, nonprofit organizations, and others will also be needed to support a complete transition.

# APPENDIX A
# ACKNOWLEDGMENTS

This white paper was prepared by the Northeast States for Coordinated Air Use Management (NESCAUM), on behalf of the Multi-State Zero Emission Vehicle (ZEV) Task Force. The ZEV Task Force is comprised of state agency representatives from the following jurisdictions: California, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont. Members of the Task Force provided valuable input on the draft white paper.

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# APPENDIX B

## TNC REGULATORY FEES IN ZEV TASK FORCE STATES

| State | Regulatory Agency | TNC Fees | Ride Surcharges | TNCs Operating within State |
|---|---|---|---|---|
| CA | Public Utilities Commission | $1,000 initial permit application; $100 annual renewal fee<br><br>0.33% gross California revenues, paid into CPUC Transportation Reimbursement Account, plus a $10 administrative fee | | Silver Ride, Lyft, Wingz, Executive Ride, Ride Plus, Altruistic, Via, Uber, InDriver, Ziro Ride, Ridvy, U-HOP, HopSkipDrive, Zum Services, Dolightful, ActiveScaler, Ainos, MVN 2, Kiddie Commute, Nomad Transit, WineHound, Pawar Transportation |
| CT | Dept. of Transportation | $5,000 annual registration fee | $0.25 per trip | Lyft, Uber, Carmel |
| MA | Dept. of Public Utilities, TNC Division | TNCs pay a surcharge based on intrastate operating revenues from the prior year | $0.20 per trip | Lyft, Uber, Arro, Carmel, Curb, Super Shuttle, Via |
| MD | Public Services Commission | | Except in counties and municipal corporations that imposed a fee prior to January 2015, other counties and municipalities can impose a surcharge of $0.25 per trip | Lyft, Uber, Super Shuttle |
| ME | Secretary of State | $10,000 annual permit fee | | Lyft, Uber, Carmel |
| NJ | Motor Vehicle Commission | $25,000 annual permit fee | $0.50 per non-shared ride; $0.25 per pooled ride | Lyft, Uber, Arro, Blacklane, Carmel, Via |
| NY | Dept. of Motor Vehicles | $100,000 initial application fee; | 4% assessment on the gross trip fare of | Lyft, Uber, Via, Arro, Blacklane, Carmel, Curb, |

| | | | | |
|---|---|---|---|---|
| | | $60,000 annual renewal fee | every TNC trip that originates anywhere in New York State outside New York City and that terminates anywhere in New York State<br><br>2.5% “Black Car Fund” surcharge on all TNC trips statewide<br><br>Congestion Pricing within “NYC congestion zone” - $2.75 for each for-hire transportation trip in a vehicle that is not a medallion taxicab or a pool vehicle | Jayride, Kid Car, Super Shuttle, Talixo |
| OR | - | - | - | Lyft, Uber, Wingz, Carmel, Curb |
| RI | Division of Public Utilities and Carriers | $5,000 annual TNC permit fee if fewer than 50 active TNC drivers; $10,000 if at least 50 but fewer than 200 active TNC drivers; $30,000 if at least 200 active TNC drivers | 7% sales and use tax applied to TNC operations | Lyft, Uber, Carmel |
| VT | Commissioner of Motor Vehicles | | $0.25 per trip in Burlington | Lyft, Uber, Carmel |

# APPENDIX C
# INNOVATIVE POLICY AND PROGRAM EXAMPLES

The following examples are referenced in the report to illustrate how states, cities, and electric utilities are accelerating the electrification of ride-hailing services. The descriptions below provide additional details about these examples.

## EXAMPLE REGULATORY APPROACHES

**Program/Policy Name:** Clean Miles Standard

**Location:** California

**Lead Entities:** California Air Resources Board (CARB) and California Public Utilities Commission (CPUC)

**Description:** Under SB 1014 (2018), the Clean Miles Standard and Incentive Program, CARB and CPUC are developing regulations for TNCs to reduce their GHG emissions. More specifically, CARB is developing a baseline for GHG emissions from ride-hailing vehicles on a grams-$CO_2$-per-passenger-mile-traveled ($gCO_2$/PMT) basis using 2018 as the base year. By 2021, CARB and CPUC will set annual GHG reduction targets, beginning in 2023, and by 2022, and every two years thereafter, each TNC will be required to develop a GHG emission reduction plan. These regulatory requirements are consistent with California's statewide GHG emissions reduction policy and will increase electrified VMT (eVMT) by ride-hailing vehicles.

**Results/Impacts:** In December 2019, CARB released its *SB 1014 Clean Miles Standard, 2018 Base-year Emissions Inventory Report*, which calculates emissions from California's ride-hailing fleet. CARB has hosted a series of public workshops to detail its plans for developing the regulations, share updates on its base year GHG emissions calculations and eVMT targets for ride-hailing vehicles, and receive public feedback on the regulatory development process.

**Policy/Program Name:** Private Hire Vehicle Licensing Requirements

**Type of Policy:** Emissions standard

**Location:** London, United Kingdom

**Lead Entity:** Transport for London

**Description:** The City of London adopted new regulations to accelerate the electrification of taxis and private hire vehicles (ride-hailing vehicles). Beginning January 1, 2020, private hire vehicles less than 18 months old must be zero emission capable (ZEC)[44] and meet the Euro 6 emissions standard when licensed for the first time; and vehicles older than 18 months must meet the Euro 6 emissions standard when licensed for the first time. By January 1, 2023, all private hire vehicles must be ZEC when they are first licensed and meet the Euro 6 emissions standard.

[44] To meet Transport for London (ZEC) requirements a vehicle must: emit no more than 50 g/km $CO_2$ and be capable of being operated with zero emissions for a minimum range of 10 miles; or emit no more than 75 g/$CO_2$ exhaust emissions and be capable of being operated with zero emissions for a minimum range of 20 miles.

**Results/Impacts:** In 2019, in response to these regulations, Uber began charging its users a £0.15 (US$0.19) "clean air fee" per mile for every TNC trip booked through the Uber app in London. Uber will use all collected clean air fees to provide financial incentives for its drivers to transition EVs. The company expects to raise over £200 million (US$261 million) from clean air fees in three to four years. Uber aims for all vehicles operating on its platform to be electric by 2025. Uber raised more than £80 million (US$105 million) in the first year of its Clean Air Plan. Over 900,000 ride-hailing trips have been taken in EVs, and more than 500 TNC drivers in London use ZEC vehicles.[45]

## EXAMPLE PARTNERSHIP TO DEPLOY EV RIDE-HAILING RENTAL FLEETS

**Policy/Program Name:** EV Shared Mobility Project, Denver

**Location:** City and County of Denver, Colorado

**Lead Entities:** Depts. of Public Works and Public Health and Environment, EVgo, Lyft, and Denver Metro Clean Cities Coalition (DMCCC)

**Description:** Denver is one of four U.S. cities (along with New York, Portland, and Seattle) receiving U.S. Department of Energy grant funding to identify effective pathways to accelerate the electrification of shared mobility services. The city is collaborating with the electric utility Xcel Energy and charging infrastructure provider EVgo to strategically place seven DCFC stations in multi-use, high traffic areas to support TNC electrification in Denver. DMCCC is partnering with Lyft on education and outreach efforts designed to gauge EV awareness among TNC driver populations, identify and address barriers to EV adoption, and communicate the economic benefits of electrified ride-hailing services to TNC drivers.

**Results/Impacts:** Through its Express Drive rental program, Lyft has deployed 200 Kia Niro BEVs with an all-electric range of 239 miles in the Denver region. Xcel Energy and EVgo finalized site selection and host contracts for two DCFC stations. DMCCC has canceled all in-person education and outreach events due to COVID-19 and shifted its approach to utilize digital media platforms such as webinars and podcasts for communicating the benefits of electrified ride-hailing with TNC drivers and TNC riders. The EV Shared Mobility website offers case studies with more detail on this project and projects in the other three cities.

## EXAMPLE PROGRAM TO ELECTRIFY TRIPS TO AND FROM AIRPORTS

**Name:** Environmental Key Performance Indicator

**Location:** Seattle-Tacoma International Airport, Washington State

**Lead Entity:** Port of Seattle

**Description:** In 2016, the Port of Seattle implemented a pilot program that established emissions performance standards for ride-hailing vehicles that provide passenger pick-ups and drop-offs at Seattle-Tacoma International Airport (SEA-TAC). The Port of Seattle uses an environmental key performance indicator (E-KPI) metric, based on a ride-hailing fleet's weighted average per-mile-gallon performance, deadheading statistics, and passenger pooling, to demonstrate compliance. The program requires TNCs to report monthly information, including make, model, and vehicle year, for all vehicles operating at the

[45] Green Car Congress. Nissan and Uber partner in London: 2,000 LEAFs. January 27, 2020. Available at https://evadoption.com/ev-models/. https://www.greencarcongress.com/2020/01/20200127-nissan.html.

airport. If the Port of Seattle finds any TNC out of compliance with the program, the company is subject to penalties. The program also contains a "Re-Match" component designed to reduce the number of trips taken to and from the airport without passengers. Under Re-Match, a ride-hailing vehicle is allowed to receive an immediate trip request from a new rider at the airport if the vehicle meets fuel efficiency standards of 45 miles per gallon or greater.

**Results/Impacts:** To date, all TNCs operating at SEA-TAC are compliant, and the Port of Seattle seeks to implement a restructured E-KPI under a new contract with the TNCs that will establish more stringent emissions performance standards to incentivize TNC electrification. Details about the restructured program are expected to be available in early 2021.