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NATIONAL OVERVIEW OF TNC ELECTRIFICATION

Making the Business Case for Smart, Shared, and Sustainable Mobility Services

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This overview highlights the growing transportation network company (TNC) market in the United States in the context of an expanding electric vehicle (EV) market. The largest TNC companies –Uber and Lyft—have established electrification targets, creating a significant opportunity to accelerate transportation electrification generally with the expansion of EV offerings and charging infrastructure along with supportive public policy development.

NATIONAL EV MARKET GROWTH ACCELERATED IN 2018

The national EV market has experienced significant growth over the past three years and most recently saw an 81 percent year over year increase in EV sales in 2018. This growth has been dominated by Tesla, which accounted for more than half of the national EV sales in 2018. Tesla continues to own the lion’s share of the market today, but major manufacturers like Ford and GM are making significant commitments to develop dozens of new EV models over the next several years [1]. Overall, the number of available EV models sold in the United States has increased from 31 in 2016 to 45 in 2019 [2]. While the national EV market growth continues in 2019, the pace has slowed since last year. The market grew only 11 percent and 27 percent year over year in the first and second quarters of 2019; a noticeable drop from 2018 levels. Despite this recent deceleration, declining battery costs and investment commitments from automakers should help boost sales figures in the near term [3].

FIGURE 1: NATIONAL EV SALES FROM 2016 THROUGH JUNE 2019



This chart shows the growth in the national EV market. EV sales grew significantly in 2018 while growth has proceeded at a more moderate pace in 2019.

Source: [2]

What Are TNCs?

Transportation Network Companies (TNCs) are shared mobility providers that use websites and apps to connect riders with drivers. This is commonly referred to as a ride-hail service. TNC activity has expanded throughout the United States and leading companies like Uber and Lyft operate in many cities.

THE U.S. PUBLIC CHARGING NETWORK GREW 40% IN 2018

As the national EV market grows, the public charging network must also grow to support it. According to the Atlas EV Hub, cumulative charging ports in the United States increased by 40 percent between the first quarters of 2018 and 2019. This is up from a 26 percent increase between 2017 and 2018. As of June 2019, there were 68,241 charging ports recorded throughout the country; 84 percent of these are Level 2 stations and 30 percent of all charging stations are located in California [4]. Private investment in the charging network is increasing with \$2.6 billion committed by Electrify America, ChargePoint, and EVgo [1]. On the public side, more than \$25 million in state funds from the Volkswagen Settlement have been awarded for charging infrastructure out of roughly \$300 million committed to this investment category [5].

FIGURE 2: NATIONAL CHARGING STATION DEPLOYMENT



This chart shows the growth in the national charging market. Cumulative port count has increased steadily since 2016 with Tesla’s proprietary DC fast charging stations accounting for a significant part of the national network.

Source: [4]

TNC RIDERSHIP ON THE RISE

Shared mobility services including taxis, car-sharing, and ride-hailing accounted for roughly five percent of global distance traveled in 2018 and Bloomberg New Energy Finance estimates that this share will

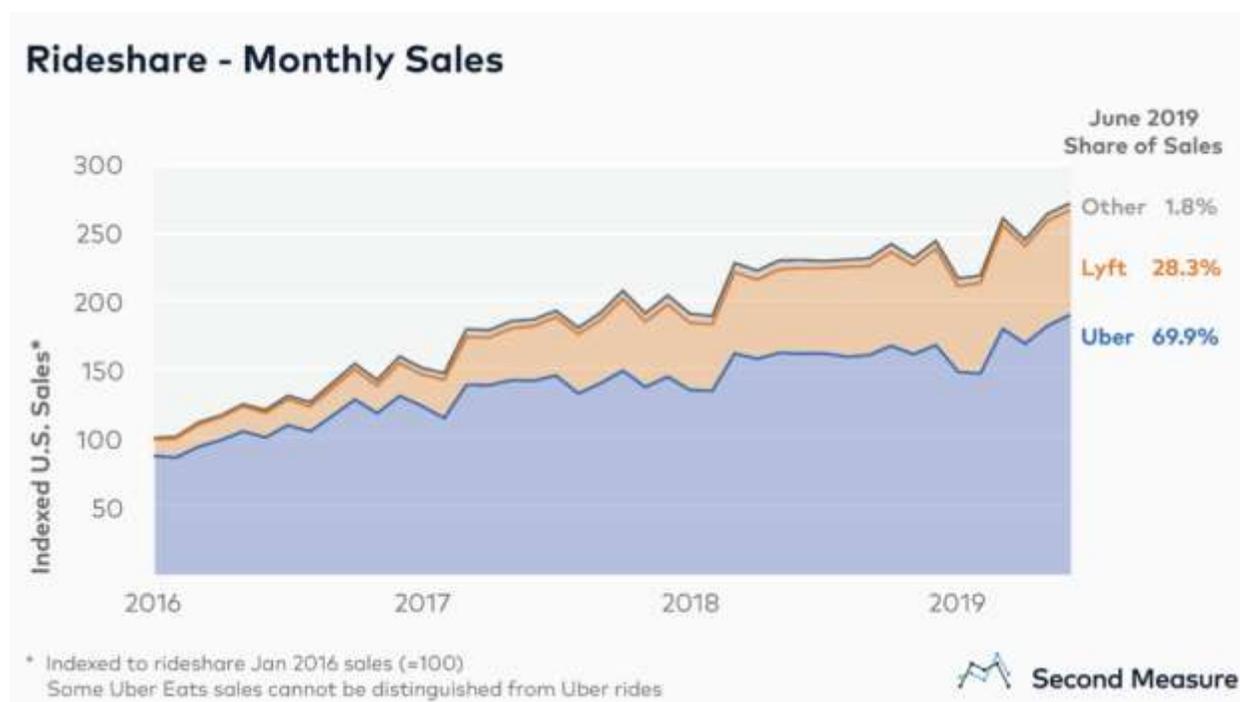
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increase to 19 percent by 2040 [6]. Uber and Lyft are the clear market leaders in the TNC space in the United States and have led to a two-fold increase in for-hire vehicles in the United States since 2012. Both companies recently went public and the market continues to grow throughout the country. These services have added an estimated 5.7 billion miles of driving annually, accounting for miles traveled by TNCs and reductions in personal vehicle travel, across several large metro areas in the country. TNC ridership was also projected to surpass transit bus trips in 2018 [7].

LEADING U.S. CITIES FOR UBER AND LYFT

San Francisco, Seattle, Washington D.C., Philadelphia, New York, Boston, Miami, Chicago, and Los Angeles account for more than 70 percent of the rides on the Uber and Lyft platforms. In these nine metro areas, TNC companies have contributed to an estimated 180 percent increase in city driving [7]. San Francisco has the highest rides per capita, at roughly 86 rides per person in 2017. New York City leads in terms of total ride volume [7]. In 2018, TNCs completed more than 180 million rides in the Big Apple [8].

FIGURE 3: U.S. TNC MARKET SHARE OVER TIME



This chart shows the evolution of TNC company market share in the ride-hail market. Uber continues to lead with Lyft gaining ground over the last several years. Other companies account for a small proportion of the market.

Source: [9]

ELECTRIFICATION EFFORTS IN THE TNC MARKET

UBER

According to Second Measure, Uber accounts for roughly 69 percent of the U.S. ride-hail market and has a significant presence in all regional markets. Uber has experimented with a variety of programs to encourage electrification and has a goal of delivering five million electric rides by the end of 2019 [10]. Uber has also developed an EV Champions Initiative in partnership with organizations including Forth in Portland to raise driver awareness and provide resources to help drivers learn more about the benefits of EVs. These efforts are active in seven cities—Austin, Los Angeles, Montreal, Sacramento, San Diego, San Francisco, and Seattle—and have informed early awareness campaigns of the EV Shared Mobility project **Invalid source specified.**

LYFT

With a stronger hold in the west, Lyft is the second largest ride-hail company in the United States. The company has seen significant growth over the last four years, accounting for 29 percent of the national market and doubling the revenue growth of Uber in 2017 and 2018 [9]. Lyft a goal to deliver one billion electric rides by 2025 [10]. The company has also added EV offerings to their Express Drive car rental service in both Seattle and Atlanta [11].

OTHER TNC COMPANIES

Companies including Via, Juno, and Gett account for the remaining two percent of the ride-hail market in the United States. Via operates in Chicago, Washington, DC, and New York. Juno and Via both deliver roughly one million rides a month in New York [12]. These companies have not announced significant electrification targets as of July 2019.

MAVEN GIG FOR TNC DRIVERS

Owned by General Motors, Maven is a car rental service that offers EV rentals for both TNC and non-TNC drivers through the Maven Gig program. They partner with EVgo to offer bundled fast charging services to their drivers in several markets. Maven facilitated 21 million electric miles driven by their customers through August 2018 [13] and roughly one third of the 75 million miles driven on their platform has come from TNC, car share, and delivery drivers [14]. Maven has faced challenges recently, forcing them to pull out of eight markets nationally in order to focus on cities where demand for their service is strongest [15]. These same challenges have resulted in their exit from the EV Shared Mobility project in early 2019.

TNC ELECTRIFICATION: CHALLENGES AND OPPORTUNITIES

Increasing the adoption of EVs in the TNC market presents significant greenhouse gas emissions saving potential [16]. Ride-hail electrification currently lags behind broader electrification in the passenger vehicle sector and strong commitments to electrification from TNC companies have been scarce. The International Council on Clean Transportation (ICCT) estimated that roughly 0.2 percent of all ride share vehicles from leading companies were electric through 2017 [10]. Comparatively, EVs account for roughly

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0.6 percent of all passenger vehicle sales in the United States between 2010 and 2017 [2]. Efforts to bring these figures into closer alignment have been progressing, but significant issues must be addressed.

BARRIERS TO TNC ELECTRIFICATION

According to a report from the ICCT, limited charging access, high upfront costs, and a lack of consumer awareness create an environment where the market alone is not enough to encourage rapid electrification of TNC vehicles. Without public policies and vehicle rebates, ride-hail EVs of all ranges have a higher total cost of ownership (TCO) than conventional ride-hail vehicles [17].

INSUFFICIENT CHARGING INFRASTRUCTURE

Public access to fast charging infrastructure is critical for the electrification of this sector [13]. To date, there are only 10,925 public DC fast chargers spread throughout the country [4] and, according to ICCT estimates, that figure may need to double to meet EV demand in large metro areas alone by 2025 [10]. EVgo and the ICCT estimate that in 2017, 88 out of the 100 largest metro areas in the United States had less than half of the charging stations needed to meet expected EV adoption growth by 2025. Public and workplace charging stations installed through 2017 were sufficient for only up to 25 percent of projected demand, requiring 20 percent annual growth through 2025 to meet expectations [18]. TNC drivers are more dependent on public charging than other types of drivers. Public fast charging in particular can reduce the opportunity cost for drivers waiting to recharge their vehicles and maximize their time giving rides. Charging hubs such as the recent ones opened by Maven and EVgo in Los Angeles directly target TNC drivers with their program and are a promising solution [19].

TABLE 1: PUBLIC CHARGING STATION DEPLOYMENT IN LEADING CITIES FOR TNC RIDERSHIP

City	DC Fast Charging	Level 2 Charging
Los Angeles	610	6,656
San Francisco	465	3,185
New York	323	1,756
Chicago	182	981
Washington DC	179	1,446
Seattle	164	1,345
Miami	137	1,018
Boston	111	1,261
Portland	100	775
Philadelphia	94	380
Denver	74	711

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This table presents data on the deployment of both public DC fast charging and Level 2 charging stations in U.S. cities with the highest TNC activity. Cities are ranked in order of the highest deployment of DC fast charging stations. Denver and Portland are included as they are also partners on the EV Shared Mobility project.

Source: [20]

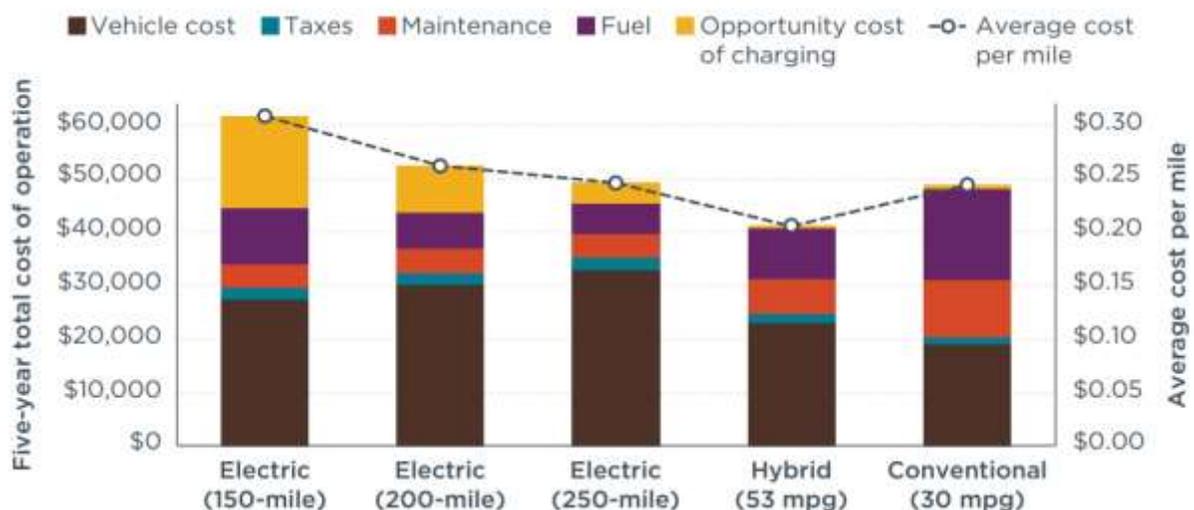
LACK OF PUBLIC AWARENESS AND DATA AVAILABILITY

A 2017 study from the University of California Davis Institute of Transportation Studies found that despite significant policy and technology advancements in California, consumer awareness of increasing EV availability and range did not shift significantly between 2014 and 2017 [21]. Across the country, 40 million Americans indicated they would consider purchasing an EV for their next vehicle when responding to a AAA survey released in May 2019. However, the survey also indicated large gaps in consumer awareness of the technological advancements and diversity of options in the EV market [22]. This lack of awareness extends to TNC drivers who could benefit from the cost savings potential that EVs offer. Through the EV Shared Mobility project, Forth is partnering with TNC companies operating in Portland, Oregon to raise EV awareness among TNC drivers and communicate the increased profit potential that EVs can offer [23].

Beyond public awareness, data sharing on the state and local level related to TNC electrification remains a challenge that many cities are seeking to address. Denver and New York are working as a part of the EV Shared Mobility project to improve access to data and assess the impact of outreach efforts on TNC driver EV adoption patterns.

HIGH UPFRONT COSTS COMPARED TO GASOLINE VEHICLES

FIGURE 4: TCO FOR RIDE-HAIL VEHICLES BY FUEL TYPE



This figure presents data on the TCO of different ride-hail vehicles by fuel type excluding existing state and federal vehicle incentives. Without public subsidies, EVs have a higher TCO than conventional ride-hail vehicles.

Source: [17]

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Despite technology improvements and supportive public policies, the relatively high cost of owning an EV remains a significant barrier to widespread adoption. According to the ICCT, upfront costs of EVs are between \$7,000 and \$10,000 more expensive than the average conventional vehicle depending on the range of the EV. With up to \$7,500 in federal tax credits and more at the state level in certain cases, existing public programs significantly improve the business case for owning an EV as a TNC driver. Additionally, the higher annual mileage for TNC drivers allows this group to recover costs faster than others, making them prime targets for EVs [17]. On the manufacturer side, Tesla and General Motors recently reached the cap of the federal tax EV credit and the upfront cost barrier is steeper for these market leaders in the near term compared to other automakers [24]. Although battery costs, a primary factor in total EV manufacturing cost, are expected to decline from \$176 per kilowatt-hour in 2018 to \$87 per kilowatt-hour by 2025 [25], federal and state vehicle incentives will remain a crucial bridge that allow more consumers to purchase EVs while the private sector works to drive down costs from vehicle and battery production.

OPPORTUNITIES AND SUPPORTIVE POLICIES

Policymakers at the city and state level are actively seeking to accelerate shared mobility electrification to achieve their environmental goals and electrification targets. Statewide policies such as fleet regulations requiring the integration of EVs, financial incentives, and charging infrastructure investments all aim to generate growth in the market. California has emerged as an early mover on this front and in September 2018 became the first state to adopt government fleet regulations that require the establishment of emission reduction targets from TNC vehicles and encourage drivers to buy EVs [26].

Cities also hold significant influence over the regulation of TNC companies in their region and can restrict the amount of licenses granted to these companies. A license cap for for-hire vehicles has been implemented already in New York City as well as a minimum wage requirement for TNC drivers [27]. European cities are exploring policies that exempt EVs from these registration limits and restrict vehicle access to certain areas, allowing only EVs to travel in specific zones [28]. Cities like London have already implemented a policy that exempts EVs from daily congestion charges in high traffic zones [29]. Cities can also implement policies like building codes requiring charging infrastructure installation, streamlined permitting of public charging, and EV prioritization in access to public services and spaces like airports [17]. Los Angeles has implemented one such strategy by partnering with Maven and EVgo to develop charging hubs that exclusively serve TNC EV drivers [30].

Electric utilities also play a central role in encouraging electrification through charging infrastructure investment and rate promotions to lower the cost of charging. Utilities like Austin Energy are taking the lead by offering subscription-based public charging services as well as rebates for home charging stations while developing partnerships with companies like Maven and ChargePoint to accelerate public fast charging access and increase driver savings potential [30]. Portland General Electric and Seattle City Light are working with the Forth and City of Seattle Department of Transportation in Seattle and Portland, respectively, to deploy fast charging stations targeted at TNC drivers as a part of the EV Shared Mobility project [13].

TNC companies are uniquely positioned to overcome the various hurdles to EV adoption. In London, Uber has added a fee to all rides on their platform to fund their Clean Air program that provides rebates to drivers to offset the purchase of an EV [29]. Beyond directly subsidizing the cost of vehicles, the ability of TNC companies to connect directly to drivers is a powerful tool in any public awareness campaign on EV availability and the potential benefits of EV ownership. Uber and Lyft are beginning to address awareness

and vehicle access in their EV Champions Initiative and Express Drive programs, respectively, and even without internal awareness campaigns, these companies can amplify the outreach efforts like that of Forth in the EV Shared Mobility project. Outside of driver awareness, TNCs could also combat the issue of high upfront costs by achieving cost savings through the bulk purchase of EVs for use in their fleets [17].

THE ROAD AHEAD

Rapid growth in TNC ridership and the unique characteristics of ride-hail driver behavior present a significant opportunity for cities and states across the country to accelerate growth in the EV market. As ride-hail activity is expected to continue increasing, it is important that states and municipalities work with local utilities and TNC companies to prioritize electrification of these vehicles. These partnerships can lead to greenhouse gas emissions reductions from some of the highest mileage vehicles on the road, increased driver revenue, and expanded access to EVs and charging infrastructure for all drivers.

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