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Where are Private "Smart City" Transportation Technologies Concentrated in California?

Amy Huang, Alison E. Post, Ishana Ratan, Mary C. Hill, Bingyu Zhao
University of California, Berkeley

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In recent years, "smart city" information and communication technologies have proliferated. For local government agencies, procuring and introducing these technologies offers the possibility to manage infrastructure assets more effectively, plan for preventive maintenance, and disseminate schedules and information about transit and other services. Many of these technologies are deployed by private firms in the context of local regulations and government-sponsored incentives. In the transportation sector, examples of "smart city" technology services provided by private firms include: electric vehicle (EV) chargers, micro-mobility (e.g., scooter and bike rentals), and transportation network company (TNC) services, such as Uber and Lyft.

To understand variation in how private sector smart city transportation technologies are deployed across California, researchers at UC Berkeley webscraped and cross verified data on EV chargers, Uber services, and micro-mobility. EV charger data was obtained from the Department of Energy, and Uber and micro-mobility access data came from vendor websites.

Key Research Findings

Almost all large cities in the Bay Area and the Los Angeles region[1] possess a higher level of EV chargers per capita than the state median.[2] Within the Bay Area and Los Angeles region, 85% of the largest cities (45 cities) have a higher level of EV charger access than the state median of 5.7 chargers per 10,000 individuals. Among large cities outside the Bay Area and Los Angeles, 52.6% (20 cities) possess an above-median number of chargers per capita. Only 45.1% (108 cities) of small cities in the Bay Area and Los Angeles, and 44.7% (68 cities) of small cities in other parts of California have above-median access (see Figure 1).

EV chargers are more prevalent in wealthier cities. Out of the 129 cities with the most concentrated wealth (where over half of the total household income comes from households in the top 20% statewide), 92 cities (71.3%) have higher EV charger per capita than the state median, whereas of the remaining 353 jurisdictions, only 42.2% (149 cities) have more EV chargers than the median.

Uber operates in all cities in the Bay Area and Los Angeles region, but is less likely to offer services in cities elsewhere in the state. While Uber offers services in all large and small cities in the Bay Area and Los Angeles region, it only operates in 44.7% (17 cities) of the largest cities and 31.6% (48 cities) of smaller cities outside these two regions (see Figure 1). Cities without Uber are smaller and more rural than those with access.

Uber service is more prevalent in high-income jurisdictions. Uber operates in 79.8% (92 cities) of the top 129 cities with the highest wealth concentrations but in only 71.9% (149 cities) of the remaining 353 cities. While Uber services are more prevalent in high-income jurisdictions, public transportation agencies do sometimes partner with ridehail vendors to serve lower-income areas as a complement to public transportation (Shaheen and Chan 2016).

Micro-mobility access across California is relatively low but highest in the largest cities in the Bay Area and Los Angeles region, as well as in the largest cities outside these regions. Micro-mobility vendors operate in 13.2% (7 cities) of the 53

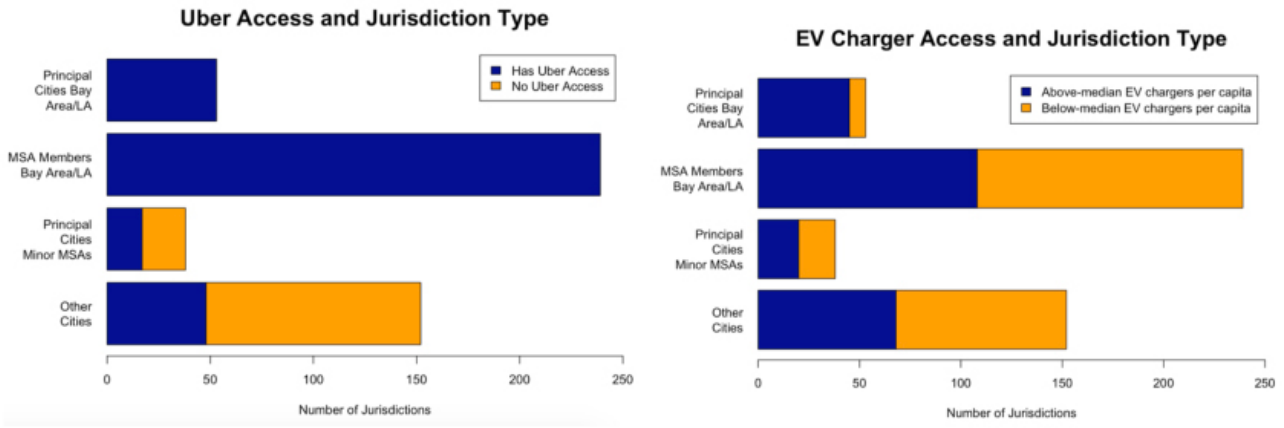

Figure 1: EV Charging and Uber Access by Jurisdiction Type

Note: The Bay Area/LA includes member cities of SCAG and ABAG (see footnote 1). Principal cities are defined as the largest urban area in a metropolitan statistical area (MSA) and surrounding jurisdictions that meet population and employment thresholds. Member cities represent the smaller cities in a MSA.

largest cities in the Bay Area and Los Angeles and 10.5 % (4 cities) of the largest cities outside these regions. In comparison, only two smaller cities in the Bay Area and Los Angeles possess micro-mobility. In sum, micro-mobility is more strongly concentrated in the largest urban jurisdictions than EV charging and Uber, and has diffused less to small cities within the Bay Area and Los Angeles.

Age is a stronger predictor of micro-mobility access than household income. Micro-mobility operations are primarily associated with a high percentage of the population in the 24-35-year-old demographic. Higher median household income is not positively correlated with micro-mobility access in California. While micro-mobility services are still at an early stage of diffusion, other research suggests access in low-income areas is growing, particularly as a complement to public transportation (Shaheen et al 2020). Micro-mobility access is also positively associated with higher public transportation ridership in the working-age population.

More Information

This policy brief is drawn from the report, "Benchmarking Smart City Technology Adoption in California: An Innovative Web Platform for Exploring New Data and Tracking Adoption" prepared by Amy Huang, Alison E. Post, Ishana Ratan, Mary C. Hill, Bingyu Zhao with the University of California, Berkeley. The report can be found at www.ucits.org/research-project/2021-24. For more information, contact Alison Post at aepost@berkeley.edu.

[1]The Bay Area is defined as the counties within the Association of Bay Area Governments (ABAG): Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, Sonoma, and the city and county of San Francisco. The Los Angeles region is defined as the counties of the Southern California Association of Governments (SCAG): Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura.

[2]This dataset includes all public and private EV chargers (Level 1, Level 2, and Tesla superchargers) in California and excludes personal/residential chargers.

References:

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Shaheen, Susan and Nelson Chan 2016. "Mobility and the Sharing Economy: Potential to Overcome First- and Last-Mile Public Transit Connections." https://doi.org/10.7922/G2862DN3.

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