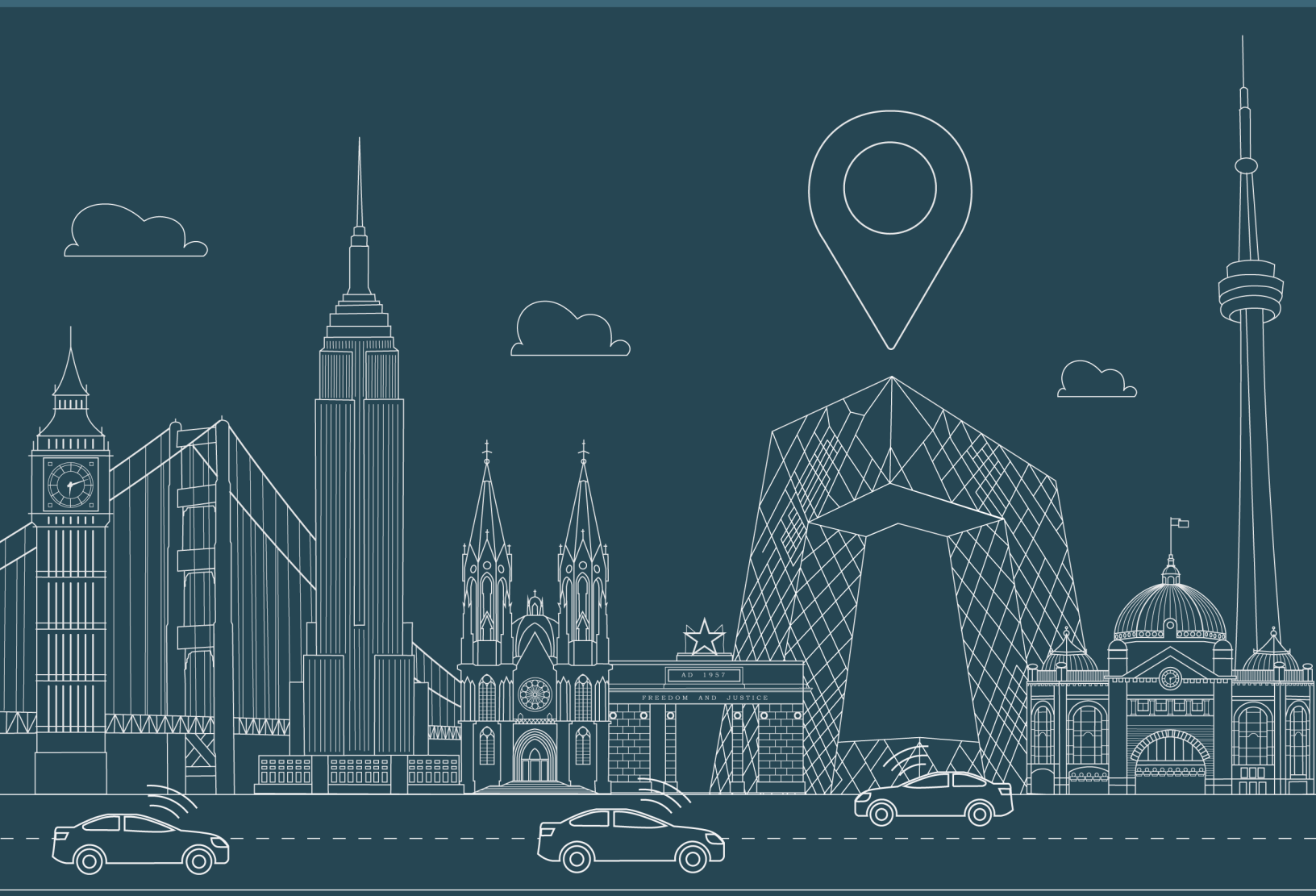
E-Hail Regulation in Global Cities

November 2019



Meera Joshi
Nicholas Cowan
Olivia Limone
Kelsey McGuinness
Rohan Rao

NYU WAGNER rudin center for transportation

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The Rudin Center for Transportation Policy and Management at NYU's Wagner school explores challenges in transportation and infrastructure. The Center draws upon faculty and graduate students to conduct research on cities and mobility, information technology in transportation, and access to mass transit. For more information, please visit https://wagner.nyu.edu/rudincenter

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EXECUTIVE SUMMARY

In recent years—and with increasing speed—global cities are exercising their authority to regulate e-hail services such as Uber, Ola, Lyft, and Didi. This report, by the NYU Rudin Center for Transportation, describes the current and future regulatory strategies of 13 international cities for e-hail services. To craft stronger regulation in the future, cities can learn from each other's regulatory approaches to leverage the power of shared information. To compete in the future, e-hail services can adapt their business models to meet increasing government regulation.

Regulation targets the same urban challenges the services were expected, but have yet, to solve. E-hail service in cities was predicted to reduce car dependency, yet their success has often added to vehicle congestion in city centers. As a result, the introduction of e-hail services has served as a catalyst for cities to implement new policies and fees aimed at congestion mitigation. Working for an e-hail service was promoted as offering an easy, flexible way to quickly supplement income. Yet today, millions of e-hail drivers are pressing for government regulation to protect driver pay and to improve working conditions.

Although cultures, currencies, languages, and road systems differ among nations, growing e-hail services pose similar challenges for their dense cities. Cities must continue to focus their regulatory attention on key areas in order to ensure that the explosive growth of e-hail services does not inhibit the rapid and safe flow of vehicles in their jurisdiction. These include data access to set and maintain service standards; fees to generate local revenue for public transit, infrastructure, and accessibility; policies to limit the environmental effects of more cars on the road; and regulatory protection for millions of passengers and drivers.

Data

Global cities recognize the need to collect **trip data** in order to monitor and control the growth of the industry, as well as to improve safety, increase access, understand drivers' working conditions and to effectively track use of their public streets. Of the 13 cities studied, most require the submission of trip data; the remaining cities have publicly recognized the need and are actively pursuing the adoption of data requirements. For the e-hail companies that are reluctant to provide cities with essential data, their policies will be seriously tested worldwide.

Revenue

Cities provide and maintain the physical platform on which e-hail services exist—the roads. In pursuit of financing maintenance, most of the cities discussed in this report raise revenue through **trip or location-based fees** to support infrastructure, improve public transit, and fund a more accessible and greener fleet. As these programs grow, the adequacy of the monetary amounts collected will be measured. Upward adjustments are expected, and those few cities that have not yet taxed e-hail operations will face increasing pressure to do so.

Environment

As e-hail services grow in popularity, so do their carbon footprints and their contributions to congestion. Most of the cities profiled have set **strict future vehicle emissions requirements** and enacted **policies aimed at reducing the attractiveness of single-occupancy e-hail trips** in the cities' most congested areas. Maintaining the flow of traffic and protecting air quality are essential to a city's capacity

to attract people and jobs in the 21st century. Cities will address these quality-of-urban-life challenges through e-hail regulation aimed at reducing e-hail vehicles' contribution to traffic and emissions.

Driver Pay

As a clearer picture of e-hail drivers working conditions emerges, cities will need to address a growing and often struggling work force. Enacted **driver pay protections** are not currently widespread, but the pressure for action is mounting. The majority of the cities studied in this report recognize the cumulative effects on drivers of successive pay cuts and mounting expenses; many are in the initial stages of gathering information on pay and benefits with an eye towards formulating permanent legal protections.

The city profiles in this report outline present and projected regulatory action of 13 global cities and provide a look at the regulatory approaches available to cities. In addition, they suggest what operational changes e-hail services must pursue to continue to operate and grow in crucial markets.

INTRODUCTION

Value in a Global Regulatory Understanding

With common characteristics of quick, trackable, and cashless transportation at the touch of a button, e-hail platforms such as Uber, Lyft, Ola, and Didi allow passengers to enjoy uniformity in transportation wherever they go—from London, to Melbourne, to São Paulo. However, although apps may look similar across the globe, there are a wide variety of city-specific standards that govern the quality of service. Regulation has arisen out of a complex synthesis of new technology, passenger demands, driver protests, local politics, and an increasing number of vehicles on already crowded streets.

By 2015, most major international cities knew that e-hail services, a clear boon to passengers, had also created negative externalities. Cities went about addressing these in a vacuum because, frankly, there was an overwhelming amount of politically difficult and time-sensitive work to be done. City regulators didn't have the luxury of researching how others were approaching similar problems—the day-to-day regulatory crisis of managing an emergent and rapidly growing industry overshadowed all.

Unfortunately, an isolated approach to regulation deprives cities of the ability to learn from others. It also limits their abilities to appreciate the similarities of the effects these services have on larger infrastructure and communities. Most of all, it deprives cities of the negotiating power of shared information.

A complete understanding of the data requirements companies have complied with in New York City, Toronto, Chicago, and Melbourne provided Mexico City with a useful guide in formulating their recently enacted data regulations. An awareness that many major cities are receiving a complete list of active and suspended drivers empowers the City of Moscow to demand the same. The City of São Paulo has taken the lead in pricing the road for e-hail services and provides a model for all dense urban cities contemplating effective congestion combating tools.

Though many cities were unprepared for the influx of cars and traffic created by the emerging e-hail service markets between 2012 and 2014, they are now well aware and poised to tackle them. From obtaining and managing trip data, to balancing the public's desire for easy access and drivers' need to earn a living, to the increasingly unmanageable congestion, cities—through collaboration and a collective understanding—can enact smart regulation to improve mobility for all.

An isolated approach to regulation deprives cities of the ability to learn from the experience of others and prohibits true appreciation of the similarities of the effects these services have on larger infrastructure and communities.

OVERVIEW OF CITY REGULATIONS

City	Present	Projected
New York City	• Trip data required • Publicly available datasets • Accessible service mandated • Cap on driver working hours • Per-trip congestion fee to support public transit • Driver pay protection • Cap on new vehicle licenses • Higher fuel efficiency requirements in the congestion zone	• Comprehensive congestion pricing • Airport access fees
Toronto	• Trip data required • Per-trip fees to support accessibility • Mandatory minimum passenger fare	• Additional driver training • Requirements for low-emission e-hail vehicles
Chicago	• Trip data required • Publicly available datasets • Per-trip fees to support infrastructure and accessibility • Accessible service mandated	• Per-trip congestion fees • Driver pay protection
Los Angeles & San Francisco	• Trip data collected at state level • Per-trip fees to support accessibility • Airport access fees and trip data • Environmental regulations at state level	• Driver pay protection • Congestion mitigation regulation • Increased data sharing by state to cities
Mexico City	• Trip data required • Per-trip fees to support introduction of low-emission vehicles	• Data-based regulation of e-hail services to mitigate congestion • Legalization and regulation of pooled ride services
São Paulo	• Trip data required • Road use pricing to support infrastructure • Financial incentives for low-emission vehicles, accessible vehicles, and female drivers	• More stringent driver licensing requirements

City	Present	Projected
London	• Fee for entry into congestion zone • Fee for entry into Ultra Low Emissions Zone	• Push by drivers for access to their own data • Push by drivers for pay protection • All new e-hail vehicles must be zero-emission by 2023 • National driver licensing standards • Accessible service mandate • Cap on the number of working hours for drivers
Moscow	• E-hail services operate through taxi market • Trip data required	• Broader trip data requirements • Driver pay protection • Congestion mitigation regulation
Accra	• Basic vehicle and driver standards	• Congestion mitigation regulation
Beijing	• Trip data required • Authority to regulate passenger prices • Low-emissions standards for new e-hail vehicles	• Increasingly strict low-emissions standards for e-hail vehicles
Mumbai	• Passenger emergency alert systems • Requirements for new e-hail vehicles to be clean diesel fuel-based, CNG/hybrid fuel-based, or electric	• Forty percent of new e-hail vehicles electric by 2026 • Mandatory minimum passenger fare • Driver pay protection • Comprehensive congestion pricing
Melbourne	• Trip data required • Merged taxi and e-hail services • Financial support for accessible vehicles	• Emissions requirements for e-hail vehicles • Comprehensive congestion pricing • Driver pay protection

GLOSSARY OF TERMS, ABBREVIATIONS, AND ACRONYMS

API	Application Programming Interface
BACP	Chicago Department of Business Affairs and Consumer Protection
BRT	Bus Rapid Transit
CARB	California Air Resources Board
CBD	Central Business District
CNG	Compressed Natural Gas
COFECE	Federal Economic Competition Commission of Mexico
CPUC	California Public Utilities Commission
CPV	Commercial Passenger Vehicles
CPVV	Commercial Passenger Vehicles Victoria
DVLA	Ghana Driver and Vehicle Licensing Authority
GDPR	European Union General Data Protection Regulation
LADOT	Los Angeles Department of Transportation
LAX	Los Angeles International Airport
ML&S	Toronto Municipal Licensing and Standards
MPTP	Melbourne Multi Purpose Taxi Program
NEV	New Energy Vehicle
SEMOVI	La Secretaría de Movilidad de la Ciudad de México
SFCTA	San Francisco County Transportation Authority
SFMTA	San Francisco Municipal Transportation Authority
SFO	San Francisco International Airport
TfL	Transport for London
TLC	New York City Taxi and Limousine Commission
ULEZ	Ultra Low Emission Zone
WAV	Wheelchair Accessible Vehicle

For the purposes of this report, we use the term "e-hail services" to describe the provision of passenger vehicles that can be hailed electronically through a phone application. Many global cities have local terminologies for such services, included below for reference. We recognize that some of these terms directly correlate with e-hail services whereas others encompass e-hail as well as other services.

FHV	For-Hire Vehicles *(New York City)*
PTC	Private Transportation Companies *(Toronto)*
TNP	Transportation Network Providers *(Chicago)*
TNC	Transportation Network Companies *(Los Angeles & San Francisco)*
PHV	Private-Hire Vehicles *(London)*
Booked Services	*(Melbourne)*

CITIES


Moscow
12.41 Million
London
8.95 Million
Toronto
2.93 Million
Chicago
2.71 Million
San Francisco
0.88 Million
New York City
8.4 Million
Los Angeles
3.99 Million
Beijing
21.7 Million
Mexico City
8.92 Million
Mumbai
12.96 Million
Accra
2.48 Million
São Paulo
12.18 Million
Melbourne
4.94 Million

NEW YORK CITY
UNITED STATES

Population
8.4 Million *(2018 Estimate)*

Regulating Entity
Taxi & Limousine Commission (TLC)

Top E-Hail Companies (Year Entered the Market)
- Uber (2011)
- Lyft (2014)
- Via (2013)
- Juno/Gett (2016)

Market Volume
700,000 Daily Trips
60,000 Vehicles Per Day
87,000 Active Drivers

Introduction

New York City is notable for its early and extensive data requirements, as well as its licensing structure. Since entering the New York City market in 2011, Uber and all e-hail services that followed have been required to comply with existing for hire vehicle licensing requirements. Such rules are set and enforced by the city's 600-person Taxi and Limousine Commission (TLC). In 2018, NYC became the first major city to pass legislation protecting e-hail drivers' income and limiting the number of new e-hail vehicles entering the market.

Data

In 2014, TLC expanded its longstanding data requirements for the taxi industry and began collecting trip-level information from the e-hail services, including the date, time, and location of every pickup. This requirement expanded over the years and as of 2019, the TLC collects (1) the date, time, and location of both pickups and drop-offs; (2) trip route; (3) the driver's logged hours; (4) whether a vehicle is in the congestion zone (midtown Manhattan); (5) the duration between when a passenger requests a car and when the car arrives; (6) how much the driver is

paid; (7) how much the passenger pays; (8) whether the ride is a shared or pooled ride; (9) whether the vehicle is wheelchair accessible; and (10) the duration between requesting accessible-vehicle service to actually getting it. Notably, the City does not collect any passenger information. Collected data is key to the TLC's ability to formulate flexible regulations that provide public safeguards in several key areas, including safety, congestion, and driver wages.

> **In 2018 NYC became the first major city to pass legislation protecting e-hail drivers' income and to limit the number of new e-hail vehicles entering the market.**

The TLC has strict data security guidelines to ensure privacy, and data access initially is limited to city employees charged with conducting analysis. NYC does publicly share data. When data is made available, driver and vehicle identifiers are redacted, and locations are aggregated spatially at the neighborhood level.

Service Standards

Unlike other cities in the United States, New York City requires e-hail service drivers be licensed by the TLC and fingerprinted, pass a criminal background check, have a clean driving record, and pass an annual drug test. In many other cities, confirming the legitimacy of drivers is the responsibility of the e-hail service. Additionally, drivers are required to take a 24-hour training course covering safety, accessibility, the City's Vision Zero efforts to reduce traffic fatalities, local geography, and customer service rules. All vehicles must be registered with the TLC, have TLC license plates, carry commercial insurance, and pass inspection three times every year.

The TLC monitors drivers' hours, even when they are driving for multiple apps, and prohibits driving past the point of fatigue (a maximum of 10 hours with a passenger in a 24-hour period, and a weekly limit of 60 hours). Data on wheelchair accessible vehicles (both fleet size and response time) allows TLC to monitor customer service levels and impose penalties on those e-hail companies not providing sufficient coverage within customer service benchmarks.

Environment

New York City has struggled to impose meaningful emission standards on its e-hail and taxi fleets. Early attempts to require hybrid and electric taxis resulted in two court rulings,[1] both of which held that federal law preempted local jurisdiction—thereby prohibiting the TLC from requiring more stringent emissions standards than those set by the federal Clean Air Act. To date, California is the only state permitted by the United States Environmental Protection Agency to issue standards surpassing the federal Clean Air Act. Thus, although the City incentivizes use of hybrid and electric cars (for example, by allowing fleet operators to charge a higher leasing fee for hybrid vehicles), it cannot mandate them. The higher purchase price and operation costs associated with greener vehicles often makes them unattractive for drivers. Additionally, without infrastructure to facilitate fast charging of electric vehicles—the time equivalent of filling up a tank of gas—adoption of this mode is slow even with incentives.

The rapid growth of e-hail services has required

changes to existing regulations to account for these services' increased presence on New York City streets, especially in the most congested areas. In 2013, there were about 15,000 cars working with e-hail services (and a similar number of drivers). This number has grown to almost 60,000 active vehicles per day and over 87,000 unique drivers. Daily trip volume for e-hail, which in 2013 hovered around 20,000, hit over 700,000 in 2019.[2]

In 2018, the New York City Council imposed a one-year cap on the number of e-hail vehicles that can enter the market.[3] The law was unsuccessfully challenged by Uber, and the case was dismissed in October 2019.[4] From 2013 to 2018, about 2,000 new vehicles entered the market every month. During the year pause, the TLC and the New York City Department of Transportation studied e-hail services' effects on the city's most congested area, Midtown Manhattan. The study revealed that in New York City, approximately 30% of traffic is made up of FHVs (the majority of which are e-hail service vehicles) and that 41% of the time, these vehicles are driving without passengers (known as cruising time).[5] As a result of the study, in mid-2019, TLC extended the cap (allowing only licenses for accessible or electric vehicles to be issued) and will review the market every six months to determine whether to lift it in whole or in part. Uber and Lyft have challenged the new TLC rules, and the case is currently pending.

In addition to the vehicle cap, data collected on cruising time is also used to impose penalties on companies with underutilized cars in the city's most congested areas, with the strictest cruising limits for the Midtown congestion zone. Companies with drivers servicing the congestion zone without a passenger more than 31% of any hour will be subject to a

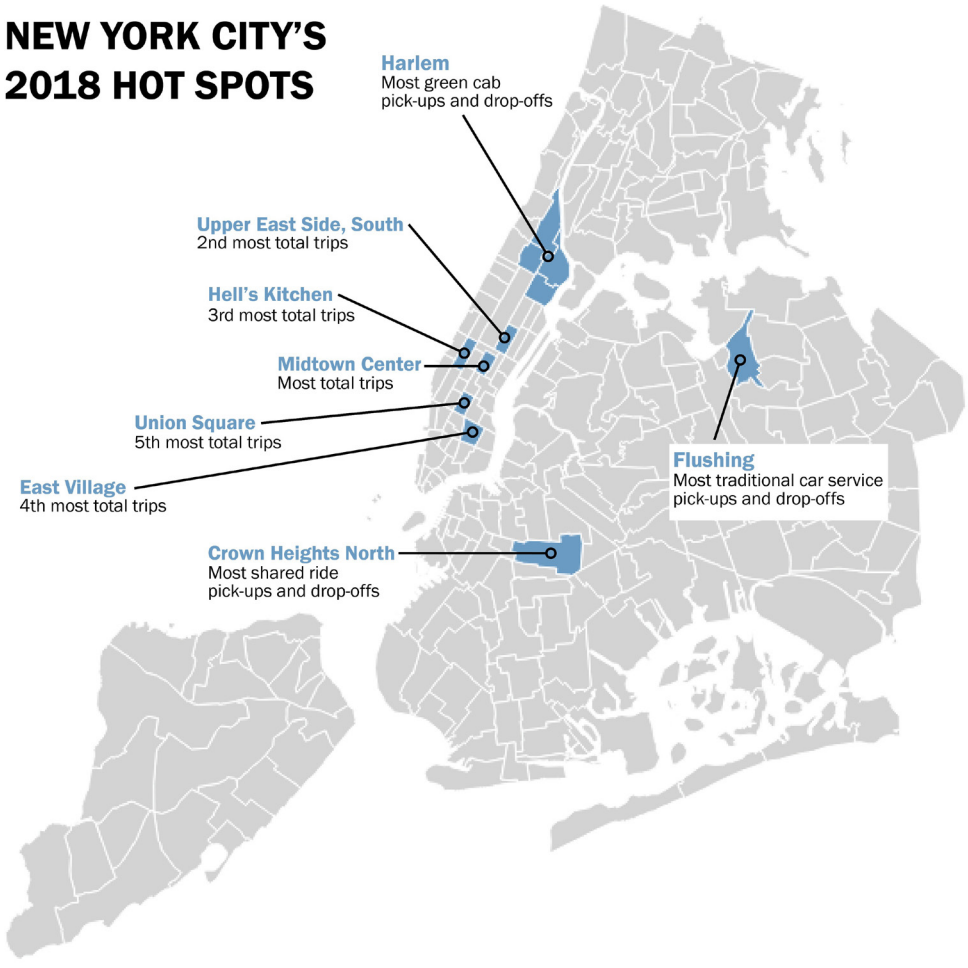

Figure 1. New York City 2018 taxi and e-hail hot spots. Reprinted from "2018: A Year (of Trips) in Review," by S. Schmidt, 2018, *Medium*. Copyright by Taxi & Limousine Commission.

penalty fee.[6] The TLC expects this change to reduce this specific congestion type by over 20%, alleviating both traffic pressure and harmful air pollution from vehicle emissions. Additionally, e-hail trips that occur within or pass through the city's congestion zone—below 96th Street in Manhattan—are subject to a $2.75 per-trip fee, reduced to $0.75 for shared trips. In March 2019, New York State authorized a comprehensive congestion pricing plan that affects all vehicles, making New York City the first city in the United States to enact such a policy. The plan is expected to go into effect in 2021.

Economics

In addition to fees levied on trips below 96th Street, the majority of NYC e-hail trips are also subject to an 8.875% state sales tax and a 2.5% surcharge for a state workers' compensation fund that provides driver workers' compensation for qualifying on-the-job injuries. Moreover, in an effort to improve airport infrastructure, New York City will be imposing pick-up fees on e-hail services originating and ending at its three major regional airports by October 2020—$2.50 for individual rides and $1.25 for shared rides.[7]

New York City is the first global city to pass legislation protecting driver's pay. A study on e-hail driver pay revealed that of the over 80,000 e-hail drivers working in New York City, 96% were making less than the equivalent of the City's $15 minimum wage.[8] This study formed the backbone of the City's 2018 regulation, which guarantees that drivers are paid a minimum fare per minute (to ensure drivers' take-home pay is close to minimum wage) and per mile (to ensure drivers can cover weekly vehicle expenses). In addition, information about how often drivers are cruising without a passenger has led to requirements increasing the amount e-hail service companies must pay to drivers per minute and per mile if they can't keep them supplied with passengers. The TLC estimates these regulations have added millions of dollars every month to New York City e-hail service drivers' aggregate income.[9]

TORONTO
CANADA

Population
2.93 Million *(2017 Estimate)*

Regulating Entity
City of Toronto Municipal Licensing and Standards

Top E-Hail Companies (Year Entered the Market)
- Uber (2012)
- Lyft (2017)

Market Volume
176,000 Daily Trips
90,435 E-Hail Drivers *(As of May 2019)*
13,317 Taxi/Limo Drivers; 5,739 Vehicles

Introduction

Uber entered the Toronto market in 2012 with its UberBlack service, operating under existing regulatory framework for pre-arranged car service. In 2014, Uber began offering its on-call economy class service, UberX, with drivers using their personal cars as opposed to ones licensed by the City to provide car service. Citing UberX's unlicensed status, the City sought an injunction to stop the unlicensed operation. The case was dismissed in 2015, putting pressure on the legislature to enact governing licensure regulations on the growing services.[10] In May 2016, by approval of new rules in the Toronto Municipal Code, UberX was officially legalized.[11] The initial legislation set rules for data requirements, driver and consumer protective measures (including base fares), and preliminary accessibility requirements. Recent amendments, passed in June 2019, have expanded upon accessibility and safety measures.[12]

Data

Today, e-hail service companies operating in Toronto are required to be licensed through the City's Municipal Licensing and Standards (ML&S). As part of the licensure, Toronto requires e-hail companies to maintain and provide the City the following

trip-level data: (1) type of service provided (for example, UberX, UberPool, Lux, etc.); (2) date, time, and location of passenger pickup and drop-off; (3) total fares paid; and (4) information regarding trip cancellations. Companies are also required to submit driver and vehicle information, including (1) driver and vehicle identifiers; (2) the total time a driver is logged into a platform and available to accept requests; (3) the wait time between when a request is accepted and when the passenger is picked up; and (4) ridership including the total number of shared rides. This information is hosted and analyzed by Toronto's Big Data Innovation Team, and it is used as the foundation for policy concerning safety, accessibility, and infrastructure planning.

Service Standards

To be licensed, a potential driver must pass a background check, have a minimum of one year of driving experience, and have a clean driving history. Vehicles must pass annual inspections and be no older than seven years. The responsibility for enforcing these standards falls on the e-hail companies, which must submit on behalf of their drivers and vehicle owners all required information. E-hail service companies are subject to audit to ensure they are taking adequate measures to comply with the regulations.

In addition, Toronto has taken measures to ensure adequate accessible service. E-hail companies working with more than 500 drivers are required to track and disclose the volume of wheelchair accessible service their drivers are providing. E-hail companies working with over 500 vehicles must provide accessible service within the same average wait time as non-accessible service and at equivalent price.[13]

Following the original 2016 legislation, studies confirmed public sentiment that the regulations did not go far enough, particularly with regards to safety, accessibility, and congestion abatement.[14] Thus, in 2019, amendments to the regulations established an Accessibility Fund Program. This fund will be distributed to drivers of accessible vehicles in order to subsidize the additional costs of providing this service. It will be supported by a series of fees (to go into effect January 1, 2020), which includes an annual fee charged to non-accessible taxis, and two per-trip fees charged to e-hail services—$0.40 combined—which are applied into the fund and towards administrative support costs.

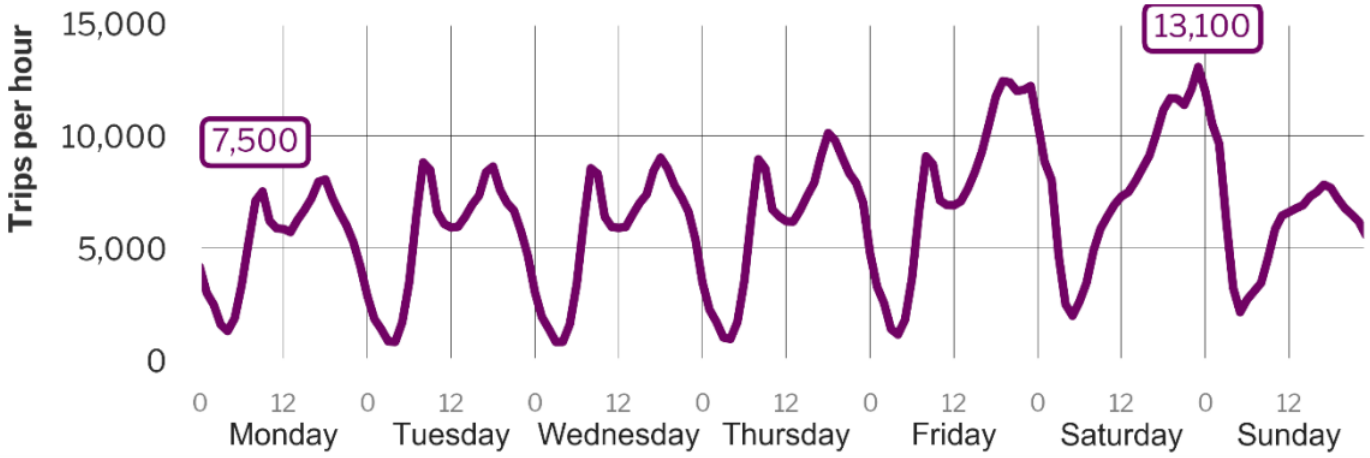

Figure 2. E-hail trips by time of day and day of the week, September 2018. Reprinted from "The Transportation Impacts of Vehicle-for-Hire in the City of Toronto," 2019, *Big Data Innovation Team*, p. 9.

To promote public and personal safety, the 2019 amendments raised the minimum driving experience of drivers from one to three years, and established a new mandatory training program to be completed by all new drivers and eventually all existing drivers eligible for license renewal. Preliminary topics include safe passenger transportation, driving in an urban setting, providing service to accessible users, anti-racism and cultural diversity sensitivity, and legal requirements related to providing e-hail services.

Environment

In 2014, the City of Toronto passed legislation that required all its traditional taxis meet "green standards": all new taxi vehicles must be alternative fuel, hybrid, or low-emission vehicles, with the exception of new wheelchair-accessible vehicles.[15] In the time since, public pressure has pushed the City to make similar requirements of e-hail service vehicles, which are not subject to the same legislation as taxicabs. Instead, the 2019 amendment repealed the initial 2014 mandate for new taxis. Nevertheless, the City endorses the goal that by 2050, 100% of vehicles-for-hire vehicles (both taxis and e-hail services) will utilize low-carbon energy sources.

Toronto is currently using data collected from e-hail services to monitor the effects of the industry on traffic congestion. In June 2019, in partnership with the University of Toronto Transportation Research Institute, the Big Data Innovation Team found that e-hail trips had grown by 180% in the city since September 2016 and account for 5-8% of total traffic—with minimal effect on downtown traffic travel times.[16] Most concerning for the city of Toronto is the finding that approximately half of the surveyed customers would have taken public transit in the absence of e-hail services. This has implications on the city's carbon footprint, as more individuals opt for cars instead of lower-emission mass transit options.

Economics

Toronto has implemented some price controls as part of its e-hail service regulations. To both protect the traditional taxi industry of the city as well as to ensure that e-hail service drivers make adequate income, Toronto's 2016 legislation set a mandatory minimum fare for e-hail services. E-hail services can charge no less than $3.25 per trip (the approximate equivalent of the base taxi fare), preventing them from completely undercutting the existing taxicab industry. Simultaneously, the City permitted traditional taxis using booking apps to charge below or above the metered rate, enabling them to compete with e-hail service providers on price flexibility.

Toronto's 2016 legislation set a mandatory minimum fare for e-hail services. E-hail services can charge no less than $3.25 per trip, the approximate equivalent of the base taxi fare.

CHICAGO
UNITED STATES

Population
2.71 Million *(2018 Estimate)*

Regulating Entity
Chicago Department of Business Affairs and Consumer Protection (BACP)

Top E-Hail Companies (Year Entered the Market)
- Uber (2011)
- Lyft (2013)
- Via (2015)

Market Volume
8.8 Million Monthly Trips *(2018 Estimate)*
100,000 E-Hail Vehicles

Introduction

In 2011, UberBlack entered the Chicago market and worked under the city's existing car service regulations. In 2013, UberX and Lyft began providing e-hail service, with drivers using their personal vehicles and operating outside of any licensing framework. By 2014, the City established a regulatory and licensing framework that set the ground rules for these companies and all other e-hail companies to follow. The oversight responsibility is held by the City of Chicago's Department of Business Affairs and Consumer Protection (BACP). To operate in Chicago, all e-hail service companies must first obtain a license issued by BACP, which includes an annual $10,000 licensing fee plus a $0.02 administrative fee per trip.[17]

Data

Chicago is notable for its early recognition of the necessity of data for informed policymaking and enforcement. Building on data requirements already in place for traditional taxi service, since 2014, Chicago has required e-hail companies to submit trip-level data on (1) date, time, and location (to the census block level) for all pickups and drop-offs; (2) length of trip; (3) passenger fare, including tip; and (4) whether the trip was a shared ride. For vehicle and driver

data, Chicago requires (1) vehicle make and model; (2) last vehicle inspection date; (3) crash reports; and (4) driving history of authorized drivers.[18]

Chicago also stands out as one of the few major cities to open trip data to the public. In 2019, via its open data portal, the City published three datasets on e-hail services: (1) trips; (2) drivers; and (3) vehicles.[19] The publicly accessible data is aggregated to protect user privacy; start and end locations are published by census tract and Chicago Community Area level rather than exact geographic coordinates, and trip locations made outside city limits are excluded. Additionally, trip times are rounded to the nearest 15 minutes, fares to the nearest $2.50, and tips to the nearest $1.00. These parameters mirror those already in place for the city's publicly available taxicab data from 2013 to present.[20]

Chicago also stands out as one of the few major cities to open trip data to the public. In 2019, via its open data portal, the City published three datasets on e-hail services: (1) trips; (2) drivers; and (3) vehicles.

Service Standards

All e-hail drivers must obtain a BACP license, undergo a background check (performed by the e-hail companies and submitted to the BACP), and complete an annual safety training to support a citywide initiative to eliminate deaths and serious injuries from crashes. Vehicles must be registered with the City and pass annual inspections.

To support safe driving, e-hail service drivers have a mandated 12-hour time cap across a 24-hour period over which they can operate. The e-hail service companies are responsible for implementing measures that prohibit drivers from going over this threshold. Independently, some e-hail companies report that they do this by alerting drivers when they are approaching their time cap and automatically logging them off the platform once the limit is exceeded.[21]

Additionally, Chicago is working to increase mobility options for the disabled via e-hail services. While the City has historically hosted wheelchair accessible vehicle (WAV) service through traditional taxicab service providers, there is public pressure for e-hail services to provide more accessible vehicles. In 2017, Chicago mandated that e-hail service companies create official accessibility plans.[22] Since then, there has been an increase in available e-hail-based WAVs. In 2017 e-hail services provided a total of 9,638 trips and by 2018 the annual total increased to 29,035. E-hail companies also provide monthly reports to Chicago on aggregated wait times for their WAV trips, which provide important equity insights.

To further incentivize expansion of this service, drivers of e-hail WAVs are paid an additional $15 to the full fare for every trip transporting a passenger who uses a wheelchair. This is made possible through a $0.10 fee per trip (paid by the e-hail company) completed by every nonaccessible vehicle, which contributes to the "Accessibility Fund."[23] Chicago took further action to improve accessibility by mandating that app interfaces are accessible to the blind, visually impaired, deaf, and hard of hearing, and that accessible vehicles are easily available to request in every app's platform.

Environment

Chicago has examined the connection between e-hail services and increased congestion, and has indicated that legislative action is imminent. Accord-

ing to the City's Mobility Task Force, the popularity of e-hail services in Chicago has contributed to increased congestion in the city's central business district (CBD).[24]

The CBD already hosts a robust public transit network, but the rise of short, inefficient car trips is seemingly becoming a factor in decreasing public transit ridership. However, e-hail companies are providing critical service to areas previously underserved by transit and have lessened people's need to own personal vehicles. Visits to residential neighborhoods outside of Chicago's CBD constitute 20% of e-hail service trips—as opposed to 2% of taxi trips—indicating that many use the e-hail services to travel to areas ill-served by the city's central transportation options.

Currently Chicago's regulation does not enforce emission standards for e-hail companies. The City does collect data on the fuel source of its traditional taxi fleet, of which 80% are hybrid vehicles.

Economics

Chicago has been able to leverage the data provided by e-hail services to increase city revenue through both an annual debt audit of drivers and taxes levied on e-hail service companies. E-hail service drivers that owe any outstanding traffic tickets have 90 days to pay or be barred for driving for the three app platforms in Chicago. City-imposed fees on every e-hail trip currently total $0.72. In addition to the administrative ($0.02) and accessibility fund ($0.10) per-trip fees, each trip booked via an e-hail service is charged a $0.60 ground transportation fee which goes to fund local infrastructure. Chicago is considering an additional congestion fee on e-hail trips in the City's busy downtown district on weekdays between 6:00 a.m. and 10:00 p.m.[25]

Typical of other major cities, drivers have publicly expressed concern over low pay. According to studies conducted by driver advocacy groups, many e-hail service drivers in Chicago make less after expenses than the state minimum wage.[26] Driver protest demonstrations are not uncommon, with advocates calling for a suspension of new license issuance (similar to the cap instituted in New York City) and for driver pay protection legislation.

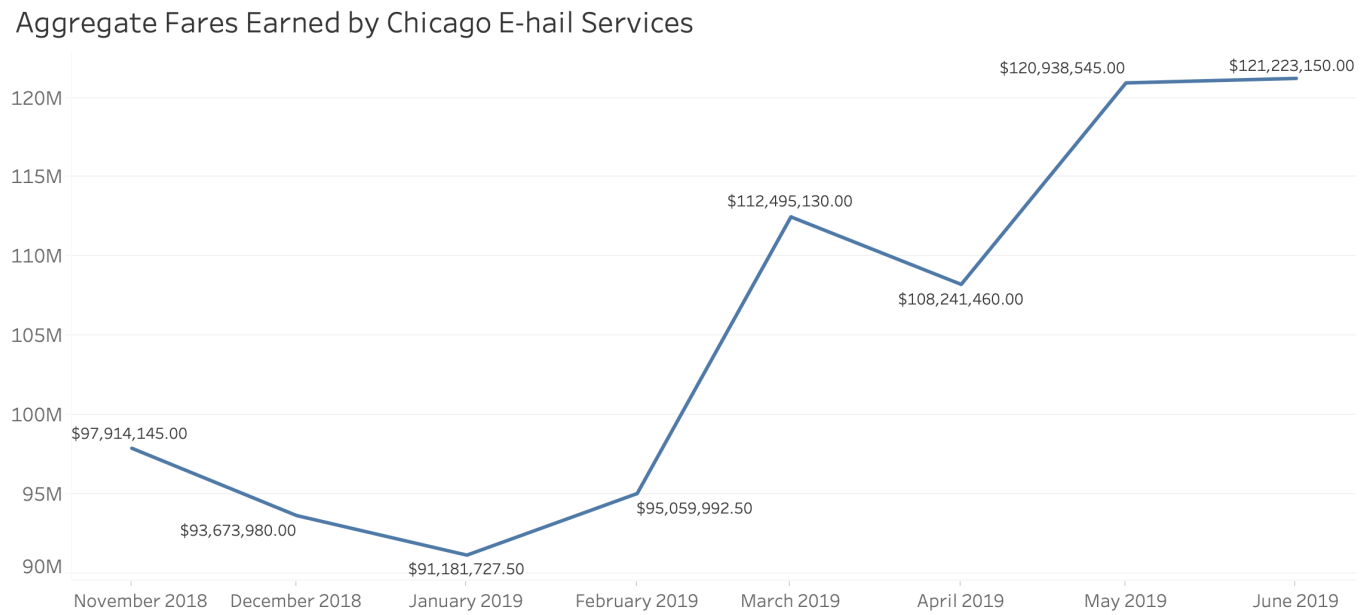

Figure 3. Aggregate Fares Earned by Chicago E-hail Services: November 2018 - June 2019. Adapted from "Transportation Network Providers - Trips - Dashboard," 2019, Chicago Data Portal.

LOS ANGELES & SAN FRANCISCO
UNITED STATES

Population
3.99 Million *(LA 2018 Estimate)*
0.88 Million *(SF 2018 Estimate)*

Regulating Entity
California Public Utilities Commission

Top E-Hail Companies (Year Entered the Market)
- Uber (2010 SF; 2012 LA)
- Lyft (2012 SF; 2013 LA)

Market Volume
30,000 Drivers in LA
45,000 Drivers in SF
170,000 Daily Trips in SF

Introduction

Uber debuted in California—and ergo the world—in 2010 with its UberBlack service. By 2013, the state had created regulations for the emerging industry. In California, e-hail services are regulated on the state level by the California Public Utilities Commission (CPUC), which oversees all pre-arranged modes of transportation such as limousines and other for-hire carriers that cannot accept "street hails." Street-hailing services, which include traditional taxis, are controlled on a local level by agencies such as Los Angeles' Department of Transportation (LADOT) or San Francisco's Metropolitan Transportation Authority (SFMTA). However, taxis in both cities can accept pre-arranged requests for transportation. Thus, in California, regulation of these intertwined industries is effectively split between state and local governments.

Data

E-hail service companies are required to submit a limited set of trip-level data directly to the CPUC. This data includes (1) accessible service volumes; (2) service volume by zip code; (3) problems reported about drivers; (4) hours logged by drivers; (5) miles logged by drivers; and (6) the identities of those drivers that completed a driver training course. In 2016, Uber

was fined $7.6 million by the CPUC for its failure to submit data as required under the agency's rules.[27] The CPUC keeps this information confidential, and does not share it with local authorities in Los Angeles and San Francisco despite their requests for access.

Both San Francisco and Los Angeles have engaged in ongoing challenges to the CPUC's lack of transparency with data necessary for local policymaking. In the wake of several sexual assault allegations from female passengers, Los Angeles City Council is exploring how it can legally collect more data about driver backgrounds.[28] LADOT has also pressured the CPUC to share trip data with the public or governmental agencies for more effective traffic management. In May 2019, a California appeals court affirmed the San Francisco District Attorney's ability to subpoena data from e-hail services relating to accessible service, public safety, and drivers' wages (to ensure compliance with the city's minimum pay laws).[29] In September 2019, the California Supreme Court upheld the appeals court's ruling.[30] The CPUC is currently engaged in further rulemaking, including proposals to streamline the process of collecting data from e-hail services. As part of this process, the CPUC is considering sharing trip data with local government.

Despite this, airports in both cities present data collection opportunities. Both Los Angeles International Airport (LAX) and San Francisco International Airport (SFO) collect data concerning e-hail service trips, as well as set service fees. Both airports require the e-hail companies to incorporate a geofence on their platform so the airport is notified in real time when a driver enters or exits the airport property. Additionally, e-hail services must provide passenger pickup and drop-off data (date, time, and location).[31] SFO charges e-hail services a per-trip fee ranging from $3.00 to $5.00, generating tens of millions in revenue.[32] LAX requires a $4.00 per-trip fee on all e-hail service rides. In 2018, LAX generated $44.3 million in revenue from this fee, up from $33.7 million in 2017.[33] In response to congestion concerns, in October 2019, LAX banned e-hail vehicles from curbside pick-up within its terminals.[34]

Service Standards

The 2013 regulations set by the CPUC set standards for public and passenger safety and service. E-hail services companies must complete third-party criminal background checks for all their drivers, and drivers must be 21 years or older and have at least one year of driving experience. Vehicles must undergo a thorough inspection before service and again every year or after 50,000 miles (whichever happens first). Drivers are mandated to provide proof of commercial insurance in the event of a collision. This insurance can be purchased by the drivers themselves, the e-hail service companies, or a combination of the two. E-hail companies are responsible for monitoring this compliance.

California Vehicle Code §21702, enacted in the mid-eighties, prohibits a driver of "any vehicle designed or used for transporting persons for compensation" from driving for more than 10 consecutive hours or 10 hours within a 15-hour period. After either period, the driver must rest for at least eight hours. Though the law applies to e-hail drivers, the extent to which the CPUC can or does enforce these provisions, due to the limited data it currently receives, is unclear.

To address accessibility concerns, California has taken similar steps as Toronto and Chicago by creating an accessibility fund. Beginning July 1, 2019, California requires all e-hail services to pay a per-trip

fee into the "Access for All" fund. Under the CPUC rules, $0.10 for every trip must be deposited into the fund, which will be used to defray the costs of providing accessible service.[35]

Environment

On a city level, San Francisco and Los Angeles are undertaking congestion studies to better understand what can be done to increase overall traffic speeds in their most congested areas. LA Metro's two-year study is ongoing, examining the feasibility of a per-trip fee on e-hail trips. Other recent studies, such as the Southern California Association of Governments (SCAG) report, similarly suggest the consideration of road use fees, whether that be hourly or per trip.[36]

Of particular concern is the simultaneous rise in e-hail ridership and decline in public transit, as noted in other major cities. Public transit ridership in LA is the lowest it has been in a decade. This is despite recent investments in new lines and a public-private partnership with Via in 2017 where the company, funded through a grant from the Federal Transit Administration, worked with the LA Metro to provide first and last mile transportation to and from select stations and payable through a rider's Metro fare TAP cards.[37]

In San Francisco, the County Transportation Authority (SFCTA) is responsible for developing congestion management strategies for the area. Without access to the CPUC data, the agency must use alternative avenues for data collection at taxpayer expense. A 2018 SFCTA report, the product of one such collaboration, showed that traffic resulting from e-hail services comprised an estimated 25% of total vehicular congestion and caused the greatest congestion increases in the densest part of the city.[38] Similar to Los Angeles, San Francisco is undertaking a feasibility study on congestion pricing policy that would include fees on e-hail service trips.[39] Ahead of these studies, a ballot measure proposed for a November 2019 vote would impose a 3.25% tax on single-passenger e-hail rides (1.25% for shared rides) to fund transportation infrastructure projects. The added tax is expected to be passed on to passengers and raise over $30 million.[40]

On a national level, California is the only jurisdiction in the United States that can set emissions standards that are more stringent than the federal Clean Air Act. In 2018, the state took its first steps towards setting emissions standards for cars used by e-hail services such as Uber and Lyft through the Clean Miles Standard and Incentive Program.[41] The Clean Miles Standard makes California the first state to directly regulate e-hail service companies' carbon footprint by making emissions standards a precondition of operation. The California Air Resources Board (CARB) and the CPUC will set greenhouse emissions-per-passenger-mile reduction targets for e-hail companies, and the companies will be required to create plans on how they will meet these goals by 2023. The program also encourages the use of zero-emission vehicles, carpooling, and intermodal passenger transit.

The Clean Miles Standard makes California the first state to directly regulate e-hail service companies' carbon footprint by making emissions standards a precondition of operation.

Economics

In addition to the state-imposed $0.10 per-trip accessibility charge, all e-hail services companies pay

a one-time $1,000 registration fee to operate in the state and a $100 annual renewal fee. Moreover, 0.33% of each company's gross revenue is paid into the CPUC's Transportation Reimbursement Account (PUCTRA), earmarked to cover the regulatory and administrative expenses.[32]

A 2018 California Supreme Court case—*Dynamex Operations West, Inc. v. Superior Court of Los Angeles*—established a three-part test, aka the "ABC" test, for legally distinguishing independent contractors from employees.[42] In September 2019, California State codified the *Dynamex* decision in state law with the passage of AB5.[43] Though the law lists several work classifications that are exempt, e-hail drivers are not explicitly excluded. Under this framework, e-hail drivers would likely qualify as employees, entitling them to minimum wages and benefits such as workers compensation, at considerable cost to the companies. Following passage of a state law, Los Angeles is researching imposing a $30 hourly minimum wage for e-hail drivers.[44]

MEXICO CITY
MEXICO

Population
8.92 Million *(2016 Estimate)*

Regulating Entity
La Secretaría de Movilidad de la Ciudad de México (SEMOVI)

Top E-Hail Companies (Year Entered the Market)
- Uber (2013)
- Cabify (2013)
- Didi (2018)

Market Volume
175,000 Daily Trips
83,000 Uber Drivers
139,500 legal and 40,000 illegal taxis

Introduction

In 2013, Yaxi, Easy Taxi, and Cabify began operating in Mexico City outside of any regulatory framework. Uber entered shortly thereafter, quickly dominating the market. In 2015, the Federal Economic Competition Commission of Mexico (COFECE) recommended recognizing e-hail companies as a new form of transportation and setting a basic regulatory framework that would protect consumers and not inhibit competition.[45] A month later, La Secretaría de Movilidad de la Ciudad de México (SEMOVI) officially allowed e-hail companies to operate in the city under codified regulations, making Mexico City the first Latin American city to establish ground rules for e-hail service operation.[46]

Data

Though Mexico City has the authority to collect trip data from e-hail companies, this authority was not initially asserted in the 2015 legislation. By 2019, the need for data became apparent and in October, Mexico City promulgated detailed data requirements under which e-hail services must provide information about individual trips, vehicle oc-

cupancy, passenger kilometers, driver pay, and activity in the congestion zone. The City also requires data on the volume of female drivers, trips where surge pricing was charged, driver hours, and details on traffic collisions. Mexico City plans to use this information for policymaking pertaining to, among other areas: access to services, reducing emissions, the effect of e-hail services on public transportation and reducing e-hail service related congestion. The 2019 legislation also requires all e-hail drivers and vehicles to be registered with Mexico City, an accountability measure absent from the initial 2015 legislation.[47]

By 2019, the need for data became apparent and in October, Mexico City promulgated detailed data requirements, under which e-hail services must provide information about individual trips, vehicle occupancy, passenger kilometers, driver pay, and activity in the congestion zone.

Service Standards

With respect to vehicle standards, SEMOVI requires that e-hail vehicles cost at least MXN 200,000 (approximately USD 10,000) in an effort to raise overall fleet quality. Vehicles must also have four doors, air conditioning, and seatbelts; be no more than 10 years old; and undergo yearly inspections. In addition, drivers must have commercial insurance, pay a one-time registration fee of MXN 1,902 (USD 100), and also pay a yearly technical and personal documentation inspection fee of MXN 1,635 (USD 85). E-hail companies are required to pay an MXN 5,491 (USD 280) registration fee per car and perform background checks on the drivers they use.

Cash has been banned in Mexico City since 2015; however, successful challenges to cash bans in other jurisdictions has led to a wholesale disregard for the rule. E-hail services now freely offer and receive cash payments for their services. Shared services (for example, UberPool) are currently prohibited in Mexico City, pending regulation specific to this service.

Environment

The 2015 regulations established a per-trip tax on e-hail services of 1.5%. These funds are earmarked for the "Fund for Taxi, Mobility and the Pedestrian," part of which goes towards a taxi substitution program. This program gives subsidies for traditional taxi drivers who want to buy new hybrid or low-emission vehicles—MXN 96,182 (USD 5,000) for hybrids and MXN 48,091 (USD 2,500) for low-emission vehicles. Mexico City is currently introducing the possibility of incorporating electric vehicles into this program.

For three decades, Mexico City has addressed congestion and air pollution through *Hoy No Circula*, a road space rationing program restricting the days drivers can use older and higher emission vehicles, based on the last digit of their license plate. *Hoy No Circula* generally applies to cars that are over nine years old.[48] Since many e-hail services impose age limits on vehicles used on their platform, for the most part, their cars are exempt from *Hoy No Circula* restrictions. Thus, e-hail services are popular on days that drivers cannot use their own older vehicles, often leading to surge pricing.[49]

Economics

Mexico City has raised the equivalent of approximately USD 15 million through its 1.5% per-trip fee on all e-hail trips. Initially, this money went into a private-federal fund, which prevented local government from having access to it. Now it is used to support the city's goal of a more sustainable taxi fleet.

Traditional taxi drivers have experienced a decline in income and have held numerous impactful street protests, bringing traffic to a halt at major intersections and roadways. It is Mexico City's goal that the taxi substitution program, as well as the creation of a taxi app, will reduce the social conflict between traditional taxi and e-hail service drivers by improving taxi standards and efficiency.[50]

SÃO PAULO
BRAZIL

Population
12.18 Million *(2019 Estimate)*

Regulating Entity
São Paulo Mobility and Transport

Top E-Hail Companies (Year Entered the Market)
- Uber (2014)
- 99 (2012, acquired by Didi in 2018)
- Cabify (2016)

Market Volume
More than 50,000 registered vehicles

Introduction

São Paulo's timeline is typical: in 2012, e-hail companies entered the market and quickly became popular with visitors and residents who were dissatisfied with existing ride-hailing options. However, economic and service-based concerns are considered federal matters in Brazil—leaving local government with limited direct regulatory power over e-hail services, which may be framed within the limits of economic development (as a key component of the sharing or gig economy). Therefore, to confront concerns of worsening congestion, city officials needed to craft a policy that indirectly regulated the services by creatively managing road use in the city, which is under local control. Thus, in May 2016, São Paulo Mobility and Transport officials instituted a road use charge policy that levies e-hail services for every kilometer dispatched vehicles travel on the city's roads with a passenger.

Data

In order to determine the exact distance driven by each company, the City established data collection infrastructure, requiring e-hail companies to develop an application programming interface (API) accessible to city officials. The API is broken into three datasets containing data on a one-day lag. The first dataset includes driver data (social security number, age, and gender), the second includes vehicle data (model year, type, and accessibility), and the third includes trip data (GPS

coordinates of starting and ending points, length of trip in kilometers, time of trip, and a map of the ride). Protecting privacy is prioritized, so the three datasets keep driver identification, social security numbers, and registration separate from trip and vehicle information.

Most e-hail companies comply with São Paulo's data requirements, but some—most notably Uber—refuse to comply in full, hindering the city's ability to adequately monitor and adjust congestion pricing. Additionally, political turnover has shifted city interests. As a result, the city's organizational capacity to oversee the regulation is limited, hindering important traffic analysis. Nevertheless, the innovative framework of the policy provides access to extensive and granular data, allowing the City to monitor real usage of the roads and plan for further mobility improvements.

Service Standards

To ensure safety for all passengers, e-hail companies must comply with a series of background checks for drivers and vehicle inspections regulated by the City. Additionally, since 2017, Mobility and Transport officials have managed a registry of all drivers, ensuring they are properly vetted and possess the appropriate licensing, and that their vehicles are less than eight years old. The rules issued by the São Paulo Mayor's Office include a requirement for drivers to do a 16-hour online course with similar content to that required from taxi drivers, as well as demands such as dress code and identification on cars.[51] In addition, all companies are required to have at least 15% of their drivers be women.

Environment

São Paulo's road use charge policy utilizes a mechanism of purchased credits to charge e-hail companies for their passenger vehicle kilometers traveled. E-hail services thus "pay" to use São Paulo's streets. This pricing scheme is dynamic, charging higher prices during peak hours with only one passenger and less for rides in underserved areas, rides with more than one passenger, electric and hybrid vehicles, accessible vehicles, and female drivers.

This pricing scheme is dynamic, charging higher prices during peak hours with only one passenger and less for rides in underserved areas, rides with more than one passenger, electric and hybrid vehicles, accessible vehicles, and female drivers.

Economics

Road use discounts vary, with the intended effect of incentivizing certain types of rides. For pooled rides, the greater the number of customers sharing a ride, the greater the discount (upwards of 80% off for a four-person pool). Up to 50% discounts are provided for women drivers, spawning the formation of companies that exclusively employ female drivers who pick up female customers, such as Lady Driver and FemiTaxi. The charge was initially a progressive tax larger companies were taxed at a higher rate. However, Uber sued, and due to pending litigation, the progressive aspect of the tax is not in force today.

The congestion policy has been a financial success, annually generating revenues of approximately BRL 94 million (approximately USD 23 million), which fund transport and mobility initiatives.[52]

LONDON
UNITED KINGDOM

Population

8.95 Million *(2019 Estimate)*

Regulating Entity

Transport for London (TfL)

Top E-Hail Companies (Year Entered the Market)

- Uber (2012)
- Ola (2019)
- Bolt (2019)

Market Volume

115,000 Drivers *(2018 Estimate)*

Introduction

E-hail companies operating in London must meet all the requirements of London's existing national and local private hire regulations. As in other global cities, e-hail services, once introduced, grew rapidly; today, the local regulator, Transport for London (TfL), receives over 1,000 applications for new licenses every week. Many regulations are controlled by the national government based on the 1998 Private-Hire Vehicles London Act, although the City does have power and discretion to set licensing standards.

Data

London currently collects very little data on the movement of e-hail services, posing a significant obstacle to London's ability to address challenges the rapid rise of e-hail services has created. TfL can request a list of vehicle numbers and driver licenses that carried out bookings or were available to do so the previous week, allowing them to see only general traffic volume and how many drivers work for multiple companies. Efforts to cap the number of e-hail vehicles in the city are supported by many local electeds and the City's mayor, yet there is widespread agreement that such a change would require national authorization.

In March 2019, four drivers sued Uber under the European Union's General Data Protection Reg-

ulation (GDPR) for access to their individual data, claiming that the rules uphold their rights to personal data held by any company.[53] The courts confirmed this access, and disclosure is now required for drivers that request it.

Service Standards

TfL conducts continuous criminal background and driving history checks on e-hail drivers and ensures that they can legally work in the United Kingdom. All drivers are required to submit medical clearances every three years. E-hail vehicle inspections are conducted upon licensing, and all vehicles must have commercial insurance coverage. Traditional taxi drivers must complete a rigorous assessment of their knowledge of London's road network and landmarks, known as "The Knowledge," while e-hail drivers only have to complete much simpler geographical test assessing their map-reading skills.[54] The City is considering expanding e-hail driver licensing requirements, including additional modules within the geographical test and a separate advanced driving test.

In 2016, over 16,000 passengers voiced safety concerns about the rapid growth of passenger vehicles and drivers in the city. In response, TfL amended existing regulations to include requirements that (1) drivers pass an English proficiency test; (2) passengers get guaranteed upfront price estimates; (3) a photo and details of the driver are provided to the passenger in advance; and (4) drivers increase their insurance limits.

London also instituted an Ultra Low Emission Zone (ULEZ) in the same area as the congestion charge which is in effect 24/7 and applies to e-hail services.

In September 2017, TfL denied Uber's operating license, citing concerns over inadequate safety precautions and lack of compliance with existing regulations. Uber appealed and was able to continue operations during the pending litigation. In June 2018, Uber was granted a 15-month probationary license accompanied by a list of conditions, including providing additional security processes, increasing transparency about criminal complaints received, and monitoring driver fitness.[55] The probationary license expired on September 25, 2019, and on September 24th, 2019 the TfL granted Uber a two-month extension, with a more final licensing decision expected at the end of November 2019. The company can continue operations during the probationary period.

Environment

A congestion charging scheme has been in place in central London since 2003; anyone driving in the charging zone between 7:00 a.m. and 6:00 p.m. on weekdays must pay a daily charge of £11.50. Initially, e-hail vehicles were exempt from the charge, but in April 2019, London expanded application of the daily charge to include e-hail vehicles. With the number of e-hail drivers doubling in less than a decade, from about 60,000 in 2010 to around 115,000 in 2018[56], TfL recognized that it could not properly address issues of congestion in the central city without including this growing market.

Currently, an e-hail vehicle must have a Euro 6 engine and have a minimum 20-mile zero-emission range in order to qualify for an exemption from the congestion charge. By December 2025, this standard will increase to only exempt pure electric vehicles.[57] The system uti-

lizes the city's camera network with automatic number-plate recognition (ANPR) modules to track vehicles entering and exiting the congestion charge zone. TfL has observed approximately a 19% decrease in the number of e-hail vehicles in this zone.

London also instituted an Ultra Low Emission Zone (ULEZ) in the same area as the congestion charge, which is in effect 24/7 and applies to e-hail services but does not apply to taxis (a distinction that e-hail drivers are challenging in litigation).

In the ULEZ, vehicles must comply with strict standards, such as low-emission engines (Euro 4 petrol-hybrid engine or a Euro 6 petrol or diesel engine), generally corresponding to 2016 and later model cars. Noncompliant vehicles have to pay an additional £12.50 charge per day to enter into the zone.[58] The practical effect of the congestion and emission charges is that e-hail drivers with older cars will pay a total of £24 (approximately USD 29.50) as a daily entry fee in London's congestion zone and ULEZ. ULEZ requirements will be extended to cover all of London over the next few years. All wheelchair accessible vehicles are exempt from ULEZ fees until October 2025.

Since January 1, 2018, traditional taxis seeking first time licensing must be zero-emission capable (vehicles must emit no more than 50 g/km of CO2), which ultimately encourages the use of electric vehicles.[57] A city-funded delicensing scheme makes £42

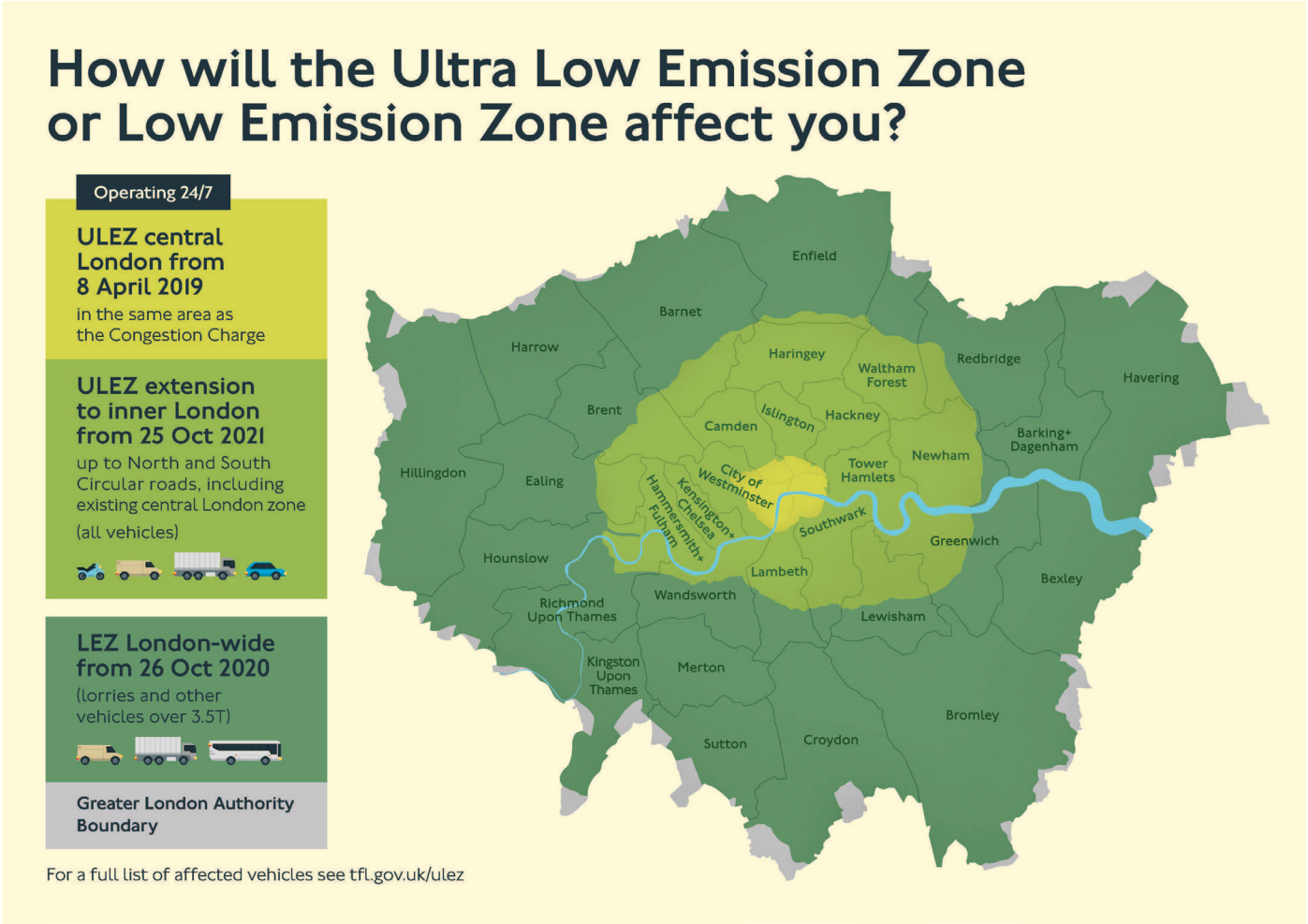

Figure 4. London Ultra Low Emission Zone Map. Reprinted from "Green Scheme: What is the ULEZ congestion charge, where is the London's Ultra Low Emission Zone and could I get fined?," by T. Tahir, 2019, *The Sun*. Copyright by Transport for London.

million available to support taxi drivers who want to delicense their older petrol vehicles. Moreover, TfL recently tightened the age limit on taxis from 15 years to 12 years. E-hail vehicles can not be older than 10 years. By 2023, all newly licensed e-hail vehicles will also need to be zero-emissions capable.

Economics

London is limited in its ability to regulate e-hail fare and drivers' pay protection, which would likely require national legislation. Nevertheless, a "Task and Finish Group on Taxi and Private Hire Vehicle Licensing" was convened in 2017 in order to analyze current regulation and identify priority concerns to address through national legislation. Most notably, the Group's recommendations included: national minimum standards for all driver licensing, increasing access to wheelchair accessible services, and setting a cap on the number of hours that drivers can work over a given time.[59]

Pending litigation is challenging the status of drivers as independent contractors. E-hail drivers are seeking official classification as "workers," which would place them at a level of work protection between independent contractors and employees. If classified as "workers," drivers would get a guaranteed minimum wage and holiday pay, but not necessarily all the benefits of employees. The drivers have won in the lower court. Uber has appealed, seeking to bring the case to the U.K. Supreme Court.[60]

MOSCOW
RUSSIA

Population
12.41 Million *(2019 Estimate)*

Regulating Entity
Moscow Department of Transport and Road Infrastructure Development

Top E-Hail Companies (Year Entered the Market)
- Yandex.Taxi (2011; purchased Uber in 2018)
- CityMobil (2007)
- Gett (2012)

Market Volume
90,000 Drivers
523,529 Daily Trips

Introduction

Unlike many global cities where e-hail companies enter as an alternative to traditional taxi companies, when e-hail companies entered Moscow in 2007, they were required to work through the existing taxi companies. Today, the city's for-hire service is dominated by hybrid e-hail/taxi companies, including Yandex.Taxi (56.6% market share—co-owned by Russian search engine Yandex and Uber), CityMobil (24.5%), and Gett (9.4%). As a result, the overall taxi market is growing: 80% of all taxi rides are now hailed through app services.[61] Currently, e-hail services are not regulated at the federal level, but a newly proposed law would grant such power in the future.

Data

One marked accomplishment of Moscow's e-hail service regulation is their data requirements. By a 2017 city decree, e-hail services are required to provide trip data, including (1) the location of available and unavailable vehicles; (2) trip routes; (3) passenger fares; and (4) vehicle license and registration number. The City's future data collection plans include collecting detailed information about drivers.

The collected data is not released on an open portal, but information such as the average trip price—RUB 450 (USD 7)—and market volume is shared to news outlets every three months. The full data is used by the City to analyze popular taxi routes and traffic intensity, mediate parking, and to design public transportation systems based on trip concentration. This data will also be used as the basis for future congestion management plans and fees.

Service Standards

E-hail service growth has coincided with notable quality enhancements—the average wait time for a taxi was reduced from 35 minutes to 5 minutes between 2011 and 2019[62]—and safety improvements as illegal taxis have been displaced from the market. However, only taxi and e-hail companies are licensed (not individual drivers), so it is the companies' responsibilities to collect driver information and ensure safe conditions. At a minimum, all drivers must be medically cleared and have a total driving experience of at least three years, and the City has signaled their intention to add more driver training in future regulation. Since 2013, all licensed vehicles must be painted yellow and have a checkered belt in order to differentiate them from illegal vehicles.

In 2018, Yandex.Taxi implemented a vehicle speed monitoring system; dispatched vehicles are tracked via GPS and their speeds are compared to road speed limits to determine if a driver is speeding.

In 2018, Yandex.Taxi implemented a vehicle speed monitoring system: dispatched vehicles are tracked via GPS and their speeds are compared to road speed limits to determine if a driver is speeding. If a driver regularly exceeds the speed limit by 20 kph, they receive a warning. After several warnings, they will be restricted from working with the platform.[63]

Environment

Moscow currently has no requirements regarding vehicle brand, model, age, or emission standards. Moreover, no congestion policy applies to e-hail services, although the City has noticed that bus lanes are congested with e-hail vehicles. The City's short-term goal is to impose fees for trips in high traffic areas and to control vehicle volumes.

Economics

To encourage small businesses, the City subsidizes individuals starting taxi service operations. The program has contributed approximately RUB 7 million (approximately USD 11 million) over the past six years to the taxi/e-hail industry.

Drivers' pay is a recognized challenge. In August 2018, the Deputy Mayor for Transportation commissioned the Moscow Department of Transport to conduct a study into driver satisfaction and working conditions.[64] Of over 5,000 drivers surveyed, 87% reported pay as inadequate to meet living expenses. To make ends meet, drivers in Moscow work long hours—only 14% reported working eight hours or less a day, while 11% reported over 16-hour days—and the vast majority are earning less than the countrywide minimum wage. Long working hours pose serious safety risks, as exhaustion is linked to rising crash rates. Yandex.Taxi has indicated a willingness to voluntarily limit driver working hours in recognition of the prevalence of driver fatigue.[65]

ACCRA
GHANA

Population
2.48 Million *(2019 Estimate)*

Regulating Entity
Accra Transport Department of the Metropolitan Assemblies

Top E-Hail Companies (Year Entered the Market)
- Uber (2016)
- Bolt (2017)
- Yango (2019)

Market Volume
300 Uber Drivers

Introduction

Seven years after Uber made its worldwide debut, in mid-2016, the e-hail company began to operate in Accra, making it one of the first cities in Africa to gain the service.[66] A year and a half after Uber's launch, Taxify (now operating as Bolt) entered the Ghanaian market.[67] Many e-hail companies, both local and international, have since entered the market, but Uber and Bolt remain the most prominent.

Data

Currently, no data is collected by the city of Accra on e-hail services. Such information could provide important insight to Ghanaian policymakers on how to improve traffic congestion and passenger safety.

Service Standards

During Uber's first week of service in Accra, the Ghanaian Ministry of Transport and Uber signed a Statement of Understanding (SOU), officially welcoming Uber to the country, permitting the use of e-hail services nationwide, and setting the stage for Uber to partner with the Transport Ministry in establishing a regulatory framework.[68] However, no e-hail service specific regulation was enacted until 2019, when the federal Driver and Vehicle Licensing Authority (DVLA) passed regulations on e-hail ser-

vices. Under these regulations, vehicles must be no older than 20 years, display a company identifying marker, and have a DVLA-issued roadworthiness sticker indicating that the vehicle has successfully undergone biannual vehicle inspection.[69] Drivers must be at least 25 years of age and have commercial insurance.[70] Uber, for example, insures its drivers and rides up to GHC 50,000 (USD 9,140) per occupant of the vehicle.[71] In addition to these federal standards, e-hail companies must obtain an operating permit from the City of Accra Department of Transport.

An absence of convenient transit options made e-hail services immediately popular in Accra. Prior to e-hail services, residents and visitors of Accra relied on an inconsistent taxi system, where point-to-point pickup and drop-off was not guaranteed and many drivers operate without licenses. Additionally, e-hail service companies often charge much less than the traditional services and many riders perceive e-hail services as a safer option since information about drivers and their vehicles is known prior to the trip. Unlike e-hail services in many other countries, there is an option for riders to pay in cash, as Uber and other e-hail services have adapted to Accra's cash-based society.

Unlike e-hail services in many other countries, there is an option for riders to pay in cash, as Uber and other e-hail services have adapted to Accra's cash-based society.

Environment

Since their arrival three years ago, e-hail services are believed to have considerably contributed to Accra's heavy gridlock and air pollution.[72] To combat these effects, elected officials have advocated investing in improved public transit services, such as bus rapid transit (BRT) as a means of alleviating congestion in the city core. Although attempts at a BRT system have failed previously in Accra, the idea has not yet been abandoned.[73]

Economics

As in other cities, e-hail drivers in Accra regularly protest over low wages and long working hours. In September 2018, Uber drivers held a protest over unfair charges, specifically the 25% commission that Uber takes and the company's unwillingness to address conflicts between drivers and patrons.[74] Driver dissatisfaction with Uber is believed to have boosted the popularity of Bolt and other smaller apps, which take lower commissions.[75] In September 2019, Uber decreased fares by as much as 10%, claiming that the reduction would improve driver earnings by increasing each driver's trip volume.[76]

BEIJING
CHINA

Population
21.7 Million *(2018 Estimate)*

Regulating Entity
Beijing Municipal Commission of Transportation

Top E-Hail Companies (Year Entered the Market)
- DiDi (2012)
- Yidao (2010)
- Shouqi (2015)

Market Volume
200,000 Daily Trips
1.5 Million Drivers

Introduction

E-hail companies began operating in Beijing in 2010. By 2016, DiDi Chuxing Technology Co. ("DiDi") acquired Uber China, thereby dominating the market. That same year, after allowing e-hail companies to operate in a legal gray area for years, China passed national regulations that set ground rules for e-hail service operations in the country, making it the first major economy to legalize e-hail services on a country-wide level. The legislation, called the Temporary Rule on Regulation of Operation and Service of App-based Ride Hailing Vehicles, or the "Temporary Rule,"[77] also set forth guidance for taxi reform—with the goal of balanced coexistence between traditional taxis and e-hail services. Today, regulation for e-hail services is set at both the national and local levels and focuses primarily on driver and vehicle standards, as well as on efforts to curb illegal activity.

Data

China's national regulations requires e-hail services to collect and store trip data on their own servers for up to two years. Such data must include date, time, and location of pickups and drop-offs. The 2016 national law empowers local governments to collect data from e-hail service companies. However,

few cities have been able to, since many local governments do not have the proper technological infrastructure. Beijing is one Chinese city that has leveraged the national regulations, explicitly requiring regular submissions of comprehensive data, including pickup/drop-off location and ride fares as well as driver information.

Service Standards

Under the 2016 national law, to work in Beijing, e-hail drivers must be licensed by the City, have a minimum of three years of driving experience, a minimal number of traffic violations in their driving history, and no criminal record. They must also be residents of Beijing (holding a household registration, or *hukou*) and their vehicles must be registered to a Beijing address. Vehicles must be less than eight years old and have less than 600,000 kilometers (372,000 miles).

Attacks on passengers have led to calls for stricter safety regulations. Between 2016 and 2018, several female passengers were murdered or sexually assaulted by drivers on DiDi's shared ride service. After pressure from local and national government, DiDi suspended its pooled-ride service and began suspending unregistered drivers and vehicles from its app.[78] In total, over 12,000 unregistered drivers and 13,000 vehicles were suspended from their platform.[79]

Environment

Since 2016, all vehicles in China currently must comply with low-emissions standards.[80] An increasingly stringent national emission standard will go into effect in 2020. The City of Beijing has taken an even more aggressive approach by preemptively initiating standards prior to the nationwide regulation. The City implemented the 2016 nationwide low-emissions standards by 2013.

In 2018, the country launched a New Energy Vehicle (NEV) mandate, aimed at converting 10% of the passenger car market to electric by 2019 and 12% by 2020.[81] To help reach this quota, a number of cities, such as Shenzhen and Guangzhou, have ceased issuing new licenses to non-electric e-hail service vehicles.[82] Beijing has not yet instituted such regulation, although the pricing structure for licensing a traditional gasoline car is much higher than for its electric counterpart. DiDi, which dominates the e-hail service market in China, has their own initiative to convert its fleet to electric, partnering with electric vehicle manufacturers and working to develop charging infrastructure within the cities where it operates.[83]

In 2018, DiDi began utilizing its internal data to manage traffic congestion.[84] Partnering with local traffic authorities, DiDi utilizes e-hail service data and artificial intelligence to manage over 1,300 traffic lights in cities across mainland China, including Beijing. The goal of this project is to optimize traffic by responding to real-time conditions. AI analysis adjusts traffic signal timing and responses based on the movement of drivers on its platform. This is an innovative development from traditional traffic monitoring, which generally requires human surveillance of traffic flows.

Partnering with local traffic authorities, DiDi utilizes e-hail service data and artificial intelligence to manage over 1,300 traffic lights in cities across mainland China, including Beijing.

Economics

The 2016 national law provides that e-hail service companies must not have unfair or illegal pricing behavior that disrupts the market order or damages state interests or other operators' legal rights (such as by setting prices below market rates in an effort to push out competitors or dominate the market).[85] In addition, the legislation makes clear that although e-hail companies are allowed to adjust their ride prices in response to the market, city authorities reserve the right to provide a government guidance fare when necessary.[86] However, as the prices of e-hail services have equalized with traditional services, no local Chinese governments have yet taken such regulatory action.

MUMBAI
INDIA

Population
12.96 Million *(2019 Estimate)*

Regulating Entity
Government of Maharashtra

Top E-Hail Companies (Year Entered the Market)
- Ola (2010)
- Uber (2014)

Market Volume
550,000 Ola drivers
350,000 Uber drivers
(2016 Country-Wide Estimates)

Introduction

Mumbai's hailable taxis and rickshaws were the dominant form of private transport for the greater part of the 20th century. With landline infrastructure expensive and unstable, cell phones were quickly adopted, creating a large instant market when e-hail services began in 2010. Although these services were a boon to consumers, they created some regulatory challenges for supervisory bodies. Traditional taxi companies complained about the lack of regulatory oversight, and several high-profile attacks on female passengers put safety in the spotlight.

Data

While millions of e-hail trips occur every month, no trip level data is currently required by the local government, leaving the City at a significant disadvantage in controlling overwhelming congestion challenges.

In 2016, the Maharashtra State government instituted a four-member Khatua Committee to undertake a comprehensive review of the existing policy framework for e-hail services. Of the many recommendations published in their 2017 report, they proposed that e-hail services share trip level data with the Motor Vehicles Department, including: (1) date, start, and end time of trip; (2) pickup and drop-off locations; (3) trip distance; (4) surge pricing, if applicable; (5) carpooling status; (6) driver work hours; and (7) passenger requests for assistance. The committee

recommended that e-hail companies share this data with the regulatory authorities on a quarterly basis.[87]

Service Standards

In 2017, the revised Maharashtra City Taxi Rules were passed to govern e-hail services in the Mumbai Metropolitan Region. E-hail companies must be licensed by the City and are required to pay a one-time fee of INR 100,000 (approximately USD 1,400). Every vehicle must have air conditioning and be equipped with GPS. Drivers must be residents of the city/state, pass a criminal background check going back seven years, have two years of driving experience, and undergo annual training.

Following a high-profile rape of a female passenger in Delhi, the national government began requiring taxis and e-hail services be equipped with a panic (SOS) button. Mumbai put companies on notice that their licenses to operate were in jeopardy without more stringent security policies.[88] Both Uber and Ola have introduced in-app panic buttons that connect passengers either to a call center or directly with police. In addition, Ola has set aside INR 144 crores (USD 20 million) for safety initiatives in India and intends to provide additional enhanced security features such as double layer GPS security tracking.[89] Uber actively recruits retired police personnel as drivers, and is exploring incorporating enhanced biometrics, voice recognition, and polygraph testing in driver screening and background checks.[90]

Environment

India's National Bharat Stage (BS) VI emission standards are scheduled to go into effect in 2020.[91] These standards reduce the allowable pollutant emission rates for passenger vehicles manufactured after April 1, 2020, and essentially aligns India's vehicle regulations with those of the European Union. In an effort to improve the air quality in India's national capital of Delhi, the Supreme Court mandated in 2015 that taxis and e-hail vehicles switch to CNG (compressed natural gas).[92] While diesel vehicles will be allowed to operate until their licenses expire, only CNG vehicles will be able to receive new registration. Although it may one day be adopted nationally, the ban has not yet been extended to other cities such as Mumbai.[93] However, India plans to nationally mandate e-hail services that have 40% of their fleet electric by 2026.[94]

Economics

In Mumbai, Ola and Uber drivers continuously protest against denied protections set forth under labor laws. Specifically, drivers want minimum pay protection in the form of an assurance from the e-hail companies that they will provide a minimum daily income and increase the base passenger fare.[95] Drivers periodically go on strike by going offline in unison, often forcing the companies to incentivize them to return to work. The longest and most disruptive occurred in late 2018, lasting over three days and with 80% of drivers offline.[96]

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The 2017 Khatua Committee recommended fare regulations, including implementing a floor and ceiling on prices that e-hail companies can charge consumers in an attempt to protect consumer interests and preserve competition between e-hail companies and traditional taxi services.[97] Though implementation was mandated by a 2019 court decision, no changes have been made to date.

MELBOURNE
AUSTRALIA

Population

4.94 Million *(2018 Estimate)*

Regulating Entity

Commercial Passenger Vehicles Victoria (CPVV)

Top E-Hail Companies (Year Entered the Market)

- Uber (2013)
- Bolt (2013)
- Ola (2018)

Market Volume

52,000 E-Hail Vehicles and 9,800 Taxis
92,000 Registered Drivers

Introduction

Uber began providing service in Melbourne in violation of existing laws. However, with huge public demand, cheaper prices, better availability, and—at least in the early days—potential for good money for drivers, the services' popularity forced a change in law. In May 2016, an Uber driver successfully appealed a $900 fine for illegal operation, forcing legislators to craft a framework for operation.[98]

In July 2018, Commercial Passenger Vehicles Victoria (CPVV) created a single regulating system to govern both taxis and e-hail services.[99] Under the new legislation, there are vehicles that only offer "booked" (e-hail) services and vehicles that offer both booked and unbooked (traditional taxi) services, which together are known as commercial passenger vehicles (CPVs).

The CPV market has grown exponentially from about 6,000 passenger vehicles before e-hail services to over 60,000 vehicles today, of which e-hail services represent 81% of the market. Commercial passenger vehicles now represent 8% of the total transit network.

Data

Melbourne, similar to New York City, has an established history of collecting significant amounts of data from the traditional taxi industry, including (1)

driver and vehicle identifiers; (2) date, time, and locations of pickups and drop-offs; (3) whether or not the ride was provided using an accessible vehicle; and, more recently, (4) the full fare charged for the trip.

Current legislation requires the exact same information be collected and submitted by the e-hail companies to the city upon request. In addition, e-hail companies are asked to collect and submit upon request (1) the date and time the service was requested and (2) any complaints received. E-hail services initially expressed some reluctance to provide the type and volume of data required by CPVV, citing concerns regarding data security—including secure transfer methodologies and data storage infrastructure—which have now been addressed. CPVV works with e-hail companies to ensure the required data is provided and has granted time extensions for individual companies transitioning to the required data specifications and formats.

The data collected by CPVV provides the City with comprehensive information on the use of e-hail services, their interactions with public transportation, factors contributing to congestion, CBD parking, and the mode selection within the CBD and broader metropolitan area. Although no data is released on an open portal, a state of the industry report is released annually by CPVV that is informed by collected data.

Service Standards

Upon licensing, all drivers are subject to criminal background checks, medical checks, and driving history checks. All vehicles are subject to inspection and signage requirements.

Currently, all city ordained wheelchair accessible vehicles (WAVs) are traditional taxis. Nevertheless, accessibility is a major initiative and the focus of CPVV's 2019 state of the industry report.[100] The City is working to expand its Multi-Purpose Taxi Program (MPTP) to e-hail services, offering subsidized fares for disabled passengers who cannot access public transit. A 50% discount—up to a maximum of AUD 60 (approximately USD 41) per trip—is offered to anyone with a severe or permanent disability that require the use of a wheelchair or experience financial hardship.[101] Moreover, the City incentivizes the purchase and use of wheelchair accessible vehicles by (1) paying CPV drivers and owners a bonus of AUD 20.80 (approximately USD 14) when transporting an eligible passenger (at least two thirds must go to the driver, and the remaining payment is retained by the vehicle owner), and (2) subsidizing the purchase or upgrade of WAVs for up to AUD 44,000 (approximately USD 30,000) through a Wheelchair Accessible Subsidy Scheme.[102]

Commercial Passenger Vehicles Victoria is experimenting with public-private partnerships, including an app that integrates e-hail services and public transit to establish better last mile connections.

Commercial Passenger Vehicles Victoria is experimenting with public-private partnerships, including an app that integrates e-hail services and public transit to establish better last mile connections. The goal is to improve the safety of passengers by providing them with easily accessible e-hail service connections between their public transit stop and their final destination, which are often considerably far apart.

Environment

Current e-hail regulation has no provisions for emissions or congestion control. Nevertheless, the City recognizes the need to address such issues moving forward, as seen in their Draft Transport Strategy 2030, which advocates for improvements in the management of curbside space for e-hail vehicles, a transition to zero-emissions transport by 2050, and a citywide congestion pricing scheme.

Economics

A particularly unique aspect of Melbourne's regulation is its abolishment of the perpetual taxi license (analogous to the medallion in the U.S.) when CPVV was created. It was replaced by a single registration system with a small fee of AUD 50 (approximately USD 34) for all commercial passenger vehicles. Previously, Melbourne had a tightly controlled taxi market with capped licenses that were sold on the private market for between AUD 250,000 and AUD 400,000 (USD 168,000–270,000). In August 2016, the local government set aside over AUD 450 million (USD 300 million) for an industry adjustment package that would assist taxi owners facing immediate financial hardship, funded by a levy of AUD 1.00 (USD 0.68) on all CPV trips, including those by e-hail services. Owners received a reimbursement of up to AUD 100,000 (USD 67,000) for the first license and AUD 50,000 (USD 34,000) for each of up to three additional licenses.

E-hail drivers in Melbourne have been vocal about low pay and poor working conditions. The Essential Services Commission (ESC) sets maximum taxi fares for hailed services, while the fares of e-hail are not regulated. It is unclear the extent to which CPVV is empowered to require change. However, Engage Victoria—a tool used by the Victorian Government to facilitate engagement with the community—has set up an inquiry into the on-demand workforce in an attempt to better understand e-hail drivers' pay, work conditions, and protections.[103]

CONCLUSION

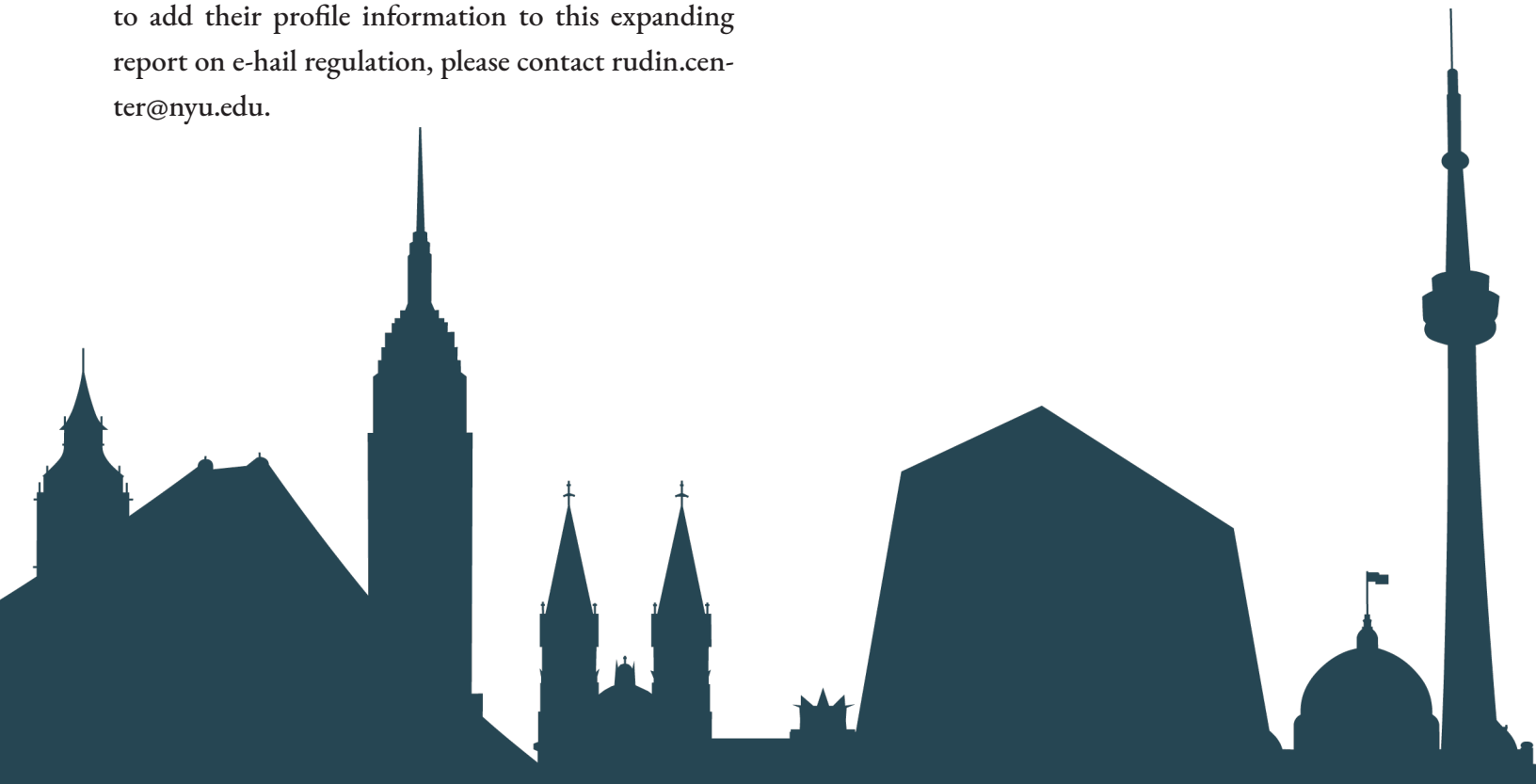
The public policies described in this report provide a benchmark for urban regulation of e-hail vehicles worldwide. Beyond cars, new forms of electronically dispatched transportation are embraced by consumers in global cities every day. Regulations regarding the allocation of road space, standards for safety and access, provider accountability through data requirements, and the integration of services with public transit will also be vital to the governance of e-scooters, e-bikes, e-helicopters, autonomous vehicles, and everything in between. As demonstrated in these profiles, the policies global cities employ to address the challenges of e-hail services will guide cities' responses and adaptations necessary for urban integration of electronically dispatched transportation services, in all their various forms, now and into the future.

This report serves as the foundation for future collaboration among city planners to achieve strong systems of accountability. For municipalities wishing to add their profile information to this expanding report on e-hail regulation, please contact rudin.center@nyu.edu.

ACKNOWLEDGMENTS

Meera Joshi is a Visiting Scholar at NYU Wagner's Rudin Center for Transportation and former Chair of New York City's Taxi and Limousine Commission. Nicholas Cowan, Olivia Limone, Kelsey McGuinness, and Rohan Rao are graduate research assistants at NYU Wagner's Rudin Center for Transportation.

We are grateful to the individuals who conveyed their insights and expertise to the authors. We also want to thank Rachel G. Wise for her editorial advice and guidance. Mitchell L. Moss and Sarah M. Kaufman provided additional assistance and support.



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