SHARED MOBILITY REGULATIONS: BALANCING POLICY GOALS WITH OPERATING COSTS

APRIL 2026

URBANISM NEXT CENTER
UNIVERSITY OF OREGON
SHARED-USE MOBILITY CENTER

ACKNOWLEDGMENTS

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Lauren McCarthy and Colin Murphy at the Shared Use Mobility Center provided support and input in this project, particularly gathering data and providing feedback. We thank the professionals we interviewed, whose time and expertise informed report findings and discussion. This report was funded in part by the Center of Excellence on New Mobility and Automated Vehicles.

ACKNOWLEDGMENTS

THE SHARED-USE MOBILITY CENTER

The Shared-Use Mobility Center is a public-interest organization dedicated to achieving equitable, affordable, and environmentally sound mobility across the US through the efficient sharing of transportation assets. By connecting the public and private sectors, piloting programs, conducting new research, and providing policy and technical expertise to cities and regions, SUMC seeks to extend the benefits of shared mobility for all.

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Urbanism Next explores the multi-level impacts of emerging technologies. New and novel developments in mobility and e-commerce are affecting land use, urban design, building design, transportation, and real estate. The changes have significant potential implications for equity, health and safety, the economy, and the environment.

Through our research, convening, and outreach, Urbanism Next's multi-disciplinary team develops policy frameworks and strategies for decision-makers, researchers, and communities to harness emerging technologies in ways that achieve community goals. By understanding the potential long-term impacts of new technological developments, present-day decision making can be oriented in ways that support long-range goals.

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SUMMARY

Shared mobility services operate under varied, and sometimes labyrinthine, systems of regulation. These regulations are set by different levels of government, carry different compliance and enforcement costs, and may change substantially over a short time. Ideally, regulations help mobility services flourish while minimizing their most harmful potential externalities. Yet in the face of widely variable regulations, shared mobility operators also respond to regulations in different ways: they may avoid regulations entirely by operating elsewhere, may eat the costs of regulations in order to operate, or find that the regulations benefit their service. At its most extreme, a program may sink under the weight of regulations. Despite the important role shared mobility regulations may play in both service success and alignment with broad city goals, no comprehensive understanding exists of how shared mobility regulations are set, by whom, and what elements of service and operation are regulated across modes. This report details regulations, summarized in Table 1, across four shared modes: electric bike-share and scooter-share, transportation network companies (TNCs), micro-transit, and shared autonomous vehicles (AVs). In addition to categorizing regulations by mode, we review how shared mobility regulations are set, who sets them, and the qualitative costs and benefits regulations yield for different stakeholders.

Table 1. Regulation Overview

Requirement	Micromobility	Microtransit	Shared Autonomous Vehicle (AV)	Transportation Network Company (TNC)
Regulatory Framework	Pilot	Procurement Models	Pilot	Permanent
	Permit	Turnkey	Permanent	Local Preemption
	Contract	Separate Contracts	Local Preemption	
		Contract		
		In-House		
Fines, Fees, and Fares				
Fees	Per-Permit	Permit	Permit	Permit
	Application	Application	Application	Application
	Per-vehicle		Annual Assessment	Per-ride
	Per-trip			Annual License

Table 1. continued

Requirement	Micromobility	Microtransit	Shared Autonomous Vehicle (AV)	Transportation Network Company (TNC)
Fees	Parking			Percent per Ride
				Flat Rate per Ride
				Reduced Rate for Shared Rides
				Reduced Rate for Electric TNCs
Fares	Fare Restriction	Fare Restriction	Limits AV Fares to Cost of Non-AV Fares	
			Bans Dynamic Pricing on AV Fares	
Fines	Parking Violation			
Data Sharing	Reporting Requirements	Average/Max Wait Times	Passenger Receipt	Driver and Trip Records
	General Bike-share Feed Specification	Data Ownership - Agency Owns, Agency Access, Operator Owns	Record Retention	Driver Pay
	MDS		Crash Reporting Requirements	
Vehicle	Speed Limits	Accessibility Requirements	Trade Markings	Maintenance
	Vehicle Type Specification	Zero Emission Requirements	Speed Limits	Inspections
	Vehicle Feature Specification		Zero Emission Requirement	Trade Markings
	Vehicle Text Specification		Weather Limitations	
	Li-ion Batteries		Time of Day Restrictions	
	Sustainable Manufacturing		Speed Limitations	

Table 1. continued

Requirement	Micromobility	Microtransit	Shared Autonomous Vehicle (AV)	Transportation Network Company (TNC)
Vehicle	Vehicle Requirements			
	Maintenance Requirements			
	State of Good Repair & Inspection			
	Seasonal Restrictions			
	Time of Day Restrictions			
	Maintenance Timelines			
Spatial	Geo-fence/ Speed Restrictions	Drop-off and Pick-up Requirements	Solicitation	Solicitation
	Mandatory Drop Zone Discounts		Location Limitations	Location Limitations (e.g. airports)
	Parking Requirements		Remote Operator must be available at all times of operation	
	Distribution (Under Equity Plan)			
Equity	Equity Plan	Vehicle Accessibility	Passenger Safety Plan that includes Passengers with Disabilities	Service Requirements
	Payment Requirements	App Accessibility		Cannot Refuse Service Animal
	Adaptive Vehicles	Vehicle Testing		
	Disadvantaged/ Minority/ Women-owned Business Preferred	Payment Methods		

Table 1. continued

Requirement	Micromobility	Microtransit	Shared Autonomous Vehicle (AV)	Transportation Network Company (TNC)
Equity	Equity Discount Zone	Disadvantaged/ Minority/ Women-owned Business Preferred		
	Helmet Policies	Driver Eligibility Requirements	Passenger Safety Plans	Periodic Vehicle Inspections
Safety	Safety Plans In-App Safety Education		Hours of Operation Limits Weather Limitations	Limits on age of Vehicles
	Nighttime Operation Req		Law Enforcement Interaction Plan	
	Seasonal Limitations			
Public Outreach	Outreach Requirements			
	Multilingual Outreach			
	Public Reporting of Damaged Vehicles			
Hiring	Disadvantaged/ Minority/ Women-owned Business Preferred	Disadvantaged/ Minority/ Women-owned Business Preferred		Driver Background Check
	Contractor Experience	Contractor Experience		Training Requirements
	Hiring & Labor Plans	Background Check		Minimum Driver Age
		Training Requirements		
		Minimum Driver Age		
		Driving Restrictions		

Table 1. continued

Requirement	Micromobility	Microtransit	Shared Autonomous Vehicle (AV)	Transportation Network Company (TNC)
Performance Metrics		Average/Max Walk Distance, Completion Factor	Mobile app or online dispatch services pertaining to hearing and visual accessibility	Average/Max Walk Distance, Completion Factor
Technology	Mobile app or online dispatch services pertaining to hearing and visual accessibility	Mobile app or online dispatch services pertaining to hearing and visual accessibility		Mobile app or online dispatch services pertaining to hearing and visual accessibility
	General Bike-share Feed Specification Mobility Data Specification	Mobility Data Specification		
Liability	Performance Bond	Indemnification	Liability Insurance Requirements	Logged on but not engaged in ride
	Liability Insurance Requirements	Liability Insurance Requirements		Engaged in Ride
	Letter of Credit			Dependency Prohibition
	Indemnification			

SHARED MOBILITY REGULATIONS VARY WIDELY BY MODE

Shared mobility modes themselves represent a diverse array of technologies and mobility options; correspondingly, the regulations that govern them likewise vary. Some modes require land use permits to install charging or parking infrastructure on the public right of way, others may avoid those regulations by locating infrastructure on private property. Some modes require more– or different types–of labor to operate. Some need licensed drivers (and are therefore subject to more labor regulations), others may require people to rebalance vehicles, or maintenance staff to repair and replace damaged

vehicles.

The most common types of regulations across all modes are ones related to liability, data sharing and fees, although all vary by program and place. Fees in particular vary tremendously across cities and states. Even if a local government cannot regulate all aspects of shared mobility (typically because the state preempts aspects such as vehicle type, or fleet size), they typically can choose to impose fees on businesses. Liability requirements also vary widely from state to state, which categorize modes differently. For example, some states define e-scooters as a vehicle, while others have created a new, unique, regulatory category.

TIMING AND POLICY PREFERENCES SHAPE REGULATIONS

What explains different regulatory stringency across modes and places? First, timeline matters. First-mover jurisdictions–areas where services first pop up–may set more stringent requirements than later adopters, who have more time to learn from early regulatory efforts elsewhere. Second, policy goals also matter. Regulations may be more burdensome for operators of services that jurisdictions are wary of, such as electric scooter-share. By contrast, agencies may lighten requirements, and streamline the process to speed up a program launch, for transportation programs they are eager to adopt, such as publicly-contracted micro-transit services.

GOVERNMENT STRUCTURE AFFECTS SHARED MOBILITY REGULATIONS

Governance structure also helps explain the degree of uniformity, or variability, in shared mobility regulations. Regulations imposed at the state and federal level (prevalent for autonomous vehicles, TNCs, and micro-transit) create a more uniform regulatory landscape compared to modes regulated locally (including micro-mobility), which produces high levels of regulatory variability.

Operators generally prefer consistent regulations across markets, and thus may lobby for state preemption over local regulatory control, as was the case for TNCs. The federal government (carried out by the National Highway Traffic Safety Administration) is most active in setting vehicle requirements, and ensuring that public programs comply with accessibility requirements laid out in the Americans with Disabilities Act. Accessible vehicle requirements are, therefore, generally highly uniform across programs. Micro-mobility regulations, set by hundreds of unique jurisdictions across the country, are correspondingly

more variable than those for other modes. Micro-mobility regulations are typically set by cities and counties, and thus can vary drastically from one locality to the next. Regulations specific to micro-mobility include, notably, vehicle caps and various local fees. Even within micro-mobility, however, states may choose to intervene in certain realms of regulation, notably insurance requirements.

REGULATIONS REFLECT MODAL MATURITY

Regulatory differences can reflect how mature a particular mode is. The less a new transportation technology fits into existing regulatory structures, the more initial regulatory variation is often seen across jurisdictions. For example, micro-transit, though a relatively nascent industry, resembles existing services such as para-transit and TNCs in vehicle type and operating model, and thus regulations show fewer regional differences. In contrast, cities and counties may include a wish list of requirements for AVs and micro-mobility–neither of which fits neatly into established regulatory frameworks–that operators may or may not be able to comply with, in part because agencies may be unaware of what is and is not feasible. Regulations can shift over time as modes mature and regulators adapt to experiences; yet some early regulations, such as liability requirements, remain remarkably intransigent despite evolving understanding of shared mobility travel.

INTRODUCTION

Governments issue transportation regulations to manage various externalities, among them: air and noise pollution, collisions, congestion, and wear and tear to the roads. Some externalities are immediate (e.g., crash risk), while others develop over a longer time frame (e.g., climate change). Transportation regulations might target vehicle technology, individual driver/rider behavior, or the design and price of roadways and other transportation infrastructure. Regulations may be outcome-based and intended to spur innovation; for example, a state may establish an emissions cap and give firms the flexibility to reduce emissions in the most cost-effective manner. Other regulations may be mandates, such as specific vehicle requirements.

Shared mobility–including electric bike-share and scooter-share, transportation network companies (TNCs), micro-transit, and shared autonomous vehicles (AVs)–are some of the newer forms of transportation to be publicly regulated, and both operators and local public agencies must navigate a complex regulatory regime. Shared mobility regulations are set by different levels of government, carry different compliance and enforcement costs, and may change substantially over a short time. Ideally, regulations help mobility services flourish while minimizing their most harmful potential externalities. In the face of widely variable regulations, shared mobility operators also respond to regulations in different ways: they may choose to avoid regulations entirely by operating elsewhere, may simply eat the costs of regulations in order to operate, or find that the regulations benefit their service. At its most extreme, a program may sink under the weight of these regulations.

Despite the important role shared mobility regulations may play in both service success and alignment with broad city goals, no comprehensive understanding exists of how shared mobility regulations are set, by whom, and what elements of service and operation are regulated across modes. This report details regulations, summarized in Table 1, across four shared modes: electric bike-share and scooter-share, transportation network companies (TNCs), micro-transit, and shared autonomous vehicles (AVs). In addition to categorizing regulations by mode, we review how shared mobility regulations are set, who sets them, and the qualitative costs and benefits regulations yield for different stakeholders.


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LITERATURE REVIEW

REGULATION: PURPOSE, COSTS, AND BENEFITS

Shared mobility regulations serve a number of functions: address public safety (e.g., vehicle conditions, driver background checks); ensure fair and stable prices; promote workers' rights; mitigate negative externalities related to congestion and pollution; avoid oversupply that could depress per vehicle utilization that undermine service viability; and protecting access for all groups regardless of race, gender, or disability (Vignon et al. 2023, Walker, 2017). While the goals of regulations are lofty, evidence from the US suggests both a utility and disutility of regulations. Walker (2017) argues, for example, that regulations should promote public safety and worker rights, but that fare or entry regulations may undermine service viability. Price and supply limits could also constrain service area and demand, leading to higher wait times and fares if restrictions are set for industry rather than passenger welfare (Vignon et al., 2023). Others argue that safety-oriented measures like helmet laws are perceived to promote safety, but have limited effects on outcomes, thus simply add to the overall regulatory burdens without yielding corresponding public benefits (Pimentel et al., 2020).

Economist Ronald Coase explicitly framed regulatory costs as a form of transaction cost (Coase, 1937). Firms decide how to structure their businesses and whether to enter certain markets based, in part, on the regulatory environment. Disruptive business models are often those that minimize, or evade entirely, regulatory costs that entrenched business models contend with. For example, by eschewing taxi regulations, TNC companies avoided paying for costly medallions to operate. A key policy question for public agencies facing disruptive business models is whether these models create externalities that existing regulations do not adequately address.

Regulatory hurdles may be exacerbated in the face of stakeholder opposition, such as public transit agencies opposing micro-transit services; similarly, previous experiences with the rise and fall of shared micro-transit companies suggest that a range of regulatory-related factors—including insurance too expensive for the business model and lacking company capacity to address regulatory complexities related to deadlines and regulations—can ultimately sink services (Walker, 2017).

HOW ARE REGULATIONS SET?

Regulations may be imposed by the federal government, states, or local authorities. The power to set regulations depends, in part, on preemption. Preemption is a legal doctrine where a higher level of government limits a lower level of government's power to regulate a specific issue (Legal Information Institute). The U.S. Constitution does not mention local governments and leaves all powers not delegated to the federal government to the states. This allows states to override or restrict local laws and ordinances. Traditionally, local governments have been limited by "Dillon's Rule," a judicial doctrine that emphasizes the subordinate nature of local governments to the state, and only permits local issue regulations when the state allows it (Phillips, 2017). However, regulatory restrictions have lessened over time, and now almost every state has some level of "home rule" authority, where states delegate power to local governments to enact laws and ordinances without state approval (Richardson, Gough, and Puentes, 2003). Most states incorporate a combination of Dillon's Rule and home rule, depending on the specific topic being regulated or the specific city. For example, some cities in California are classified as "charter" cities and others are classified as "general-law" cities (Jenkins, 1997). California's charter cities follow the home rule, giving them broader authority to regulate municipal affairs, while the general-law cities follow the general laws of the state. However, as the state always retains the ability to preempt local regulation of specific issues, whether a specific issue is preempted varies across jurisdictions.

While preemption is sometimes viewed negatively as limiting local control, businesses often prefer state preemption to avoid additional regulatory compliance costs. When operators have to comply with laws and regulations in multiple jurisdictions and at multiple levels of government, the complexity of compliance increases (Trebbi, 2023). With the increased complexity also comes increased costs, including implementation costs (OECD, 2014). Entities incur implementation costs when they must familiarize themselves with new regulations. Many mobility operators, for example, operate in multiple states and numerous cities within those states; as local operations increase, so do the costs of familiarizing and complying with varied local regulations.

TYPES OF SHARED MOBILITY REGULATIONS

Studies on shared transportation often focus on land use and safety implications of a new mode, and the ways regulations can address them (e.g., with parking requirements and insurance minimums). Scholars have examined some components of shared mobility regulations in detail, including fares, fines, and fees for micro-mobility (Lowe et al., 2021, MacArthur et al., 2022), how governments spend shared mobility revenues (Brown, 2022; MacArthur et al., 2024), equity requirements for shared micro-mobility (Brown and Howell, 2024; Brown and Howell, 2025), and parking requirements for car-share and micro-mobility programs (Shaheen and Cohen, 2010; Brown, 2021). Autonomous vehicles are a growing but nascent industry, and scholarship on AV regulations have largely predicted future regulations rather than studied existing regulations (e.g., Geistfeld, 2017; Winter et al., 2021), and examined consumer attitudes towards them (e.g., Claybrook and Kildaire, 2018). In general, however, scholarship on shared mobility regulations remains limited; particularly lacking is a comprehensive comparative study of regulations for different types of shared mobility.

Regulations for shared mobility can generally fall into two categories: user behavior regulations (e.g., specified parking/loading areas, mandatory helmets, speed limits), and operator regulations. While some research focuses on how user-side regulations affect rider behavior (see for example Lo et al., 2020), this paper and review focuses on how regulations—including those regulating user behavior—can affect operator costs and behaviors. Operator regulations vary widely by place and mode, but the most commonly imposed include: permits and operational fees, maximum fleet sizes, minimum service provision, equity requirements, and rebalancing or service geography requirements.

REGULATION AND DISRUPTIVE BUSINESS MODELS: HOW REGULATIONS EVOLVE

In the face of a new transportation technology, public agencies might try to promote it; may try to limit its harmful externalities; may turn a blind eye; or may ban a technology outright (Catlin, 2022). In the case of shared mobility services, approaches have ranged from banning services outright to minimalist regulation. Generally, public agencies from the local to the federal level have been slow to regulate "disruptive" transportation technologies. Government bureaucracy, critics argue, is inefficient and unable to keep up with the private sector's fast-changing technology (Sarewitz, 2011).

Law and innovation scholars have proposed a range of alternative ways to govern new technology that does not fit neatly into existing regulatory frameworks (Biber et al., 2017).

Rather than "hard" rules and regulations that may not bend easily to new technology, scholars encourage agencies to adopt "soft" law governance (Hagemann et al., 2018). For example, agencies can choose flexible and dynamic regulations that are outcome-based, or that encourage experimentation in limited areas or for short periods of time (Kaal, 2016).

Biber et al. (2022) establish a framework for understanding the different types of "disruptions" that innovative business models may create and how policymakers may adapt (or not) using regulations. Policymakers may find that existing regulations 1) apply to the new technology; 2) must be adapted to fit new technologies; or 3) must be entirely rewritten to address the new technology. Biber et al. (2022) then provide a process to decide how a public agency can react to the new business form in a way that is neutral in regards to how a business is organized, and instead focuses on how regulations may interact with key policy goals.

Catlin (2022) applied the Biber et al. (2022) framework to analyze the trajectory of e-scooter-share services in five cities in Los Angeles County. E-scooter companies deployed their services rapidly and at a scale that cities did not anticipate. Cities responded to e-scooters out of two primary concerns: 1) they posed right-of-way and accessibility concerns for pedestrians and users; and 2) some operators launched without official permission from public authorities (Catlin, 2022). All but one city Catlin (2022) studied adopted new regulations to respond to e-scooters, either establishing a pilot program or creating a direct agreement with e-scooter companies. The exception case study city, the City of

Beverly Hills, banned e-scooters outright. The largest city, the City of Los Angeles, coordinated scooter program oversight across multiple city departments, which required every regulatory component of the new scooter program to be able to scale. Yet even within a large, coordinated city structure like Los Angeles, the program's operating success depended on capable leadership and a clear vision for how to manage shared mobility. Catlin (2022) highlighted the role that individuals can play in setting local policy, and the effectiveness of communication across cities to collaboratively regulate innovative transportation technology that scales quickly.

Shared mobility services like e-scooters often evolve from a "disruptive" mode to a permanent and officially-sanctioned program through an intermediary pilot program. A pilot program can help local governments test out new regulations on a short time scale and with limited physical investment. Pilot programs offer public officials protection from potential public outrage; if a new service angers constituents, a city can simply end the pilot. Pilots also, ideally, provide public officials and the private operators important learning opportunities; they can test and refine the service (the vehicles and customer interface), the operational area, and the pricing structure.

Scaling poses a challenge for pilot programs generally, and for shared mobility pilot programs in particular. Pilots help operators lower their start-up costs (e.g., limited service area) and often subsidize services to increase exposure (e.g., offering free rides to new members). Yet pilot programs are often small and programs may fizzle out after a subsidized demonstration phase (Van Winden and Den Buuse, 2017). To scale up, programs benefit from economies of scale (e.g., the marginal cost of charging infrastructure lowers the more vehicles there are to use them), as well as from network economies (e.g., shared bikes and scooters become more useful and valuable the bigger the network is). Programs that successfully scale from pilot to permanent program must also implement changes that respond to successes and missteps during the pilot; such knowledge transfer can prove challenging if the pilot and permanent program are led by different organizations (e.g., city versus department of transportation).

Two more regulatory challenges can inhibit scaling: pilot programs may operate in a "protected niche" where public agencies have simplified or reduced existing regulations to enable a pilot program to deploy more quickly or cheaply (Van Winden and Den Buuse, 2017). When the pilot program matures into a permanent program and those protections go away, it may be more challenging for a service to scale, either due to costly regulations or a more competitive procurement process. Second, policies, subsidies and regulations may be volatile, particularly when it comes to emerging transportation modes. Instability

and uncertainty may cause operators to abandon a program or move to a more certain regulatory context.

The legal context, too, can create regulatory challenges for shared mobility. Shared electric scooters and bikes, AVs, and other shared mobility services, do not always fit neatly into existing regulatory categories. Legal ambiguity can create logistical challenges for cities that want to regulate the new mode. For example, in places where the state and municipal vehicle codes did not differentiate between shared and privately-owned vehicles, law enforcement lacked the authority to fine, tow, or boot private cars parked in car-share spaces (Cohen and Shaheen, 2018). Public agencies often need time to adapt requirements to new forms of transportation, which can leave firms and users in a regulatory gray space. In the case of shared micro-mobility, even when governments adopt regulations, they may be ambiguous or inconsistent (Pimentel et al., 2020). When states do not clearly define e-bikes or e-scooters–or include them with a broader category of motorcycles and mopeds–shared micro-mobility can face similar licensing and registrations that apply to larger and much faster motor vehicles (Pimentel et al., 2020). In some cases, state laws conflict with regulations set by municipalities, such as when the City of West Hollywood, California outlawed e-scooters from operating on sidewalks, despite California state law that defined allowed sidewalk riding (Pimentel et al., 2020). In other cases, state and local law may define the vehicles, such as levels of e-bike, differently; in effect, one definition would allow a given e-bike on a bike path, but another definition would prohibit it.

COMPLYING WITH REGULATIONS

How much do shared mobility companies comply with regulations, particularly those that are especially challenging or expensive? When the cost and risk of complying with regulations outweighs the benefits, mobility firms may choose to risk ignoring the rules (Becker, 1968). For example, a shared e-scooter service might agree to distribute its vehicles in certain "equity zones," but may be lax about compliance if the demand in those areas is lower, the cost of rebalancing vehicles there is high, and the risk of getting caught and sanctioned by the city for noncompliance is low. Inspections are an important deterrent to regulatory noncompliance (Gray and Scholz, 1991). Fines can also deter a sanctioned company from falling out of compliance in the future, as well as motivate compliance among other companies who see the consequence of noncompliance (Shimshack and Ward, 2005). If cities lack resources to consistently inspect mobility programs, then the mobility companies may choose to risk getting fined for falling out of compliance.

How regulations are set can also impact compliance. If an industry participates in creating rules and regulations, then they will be more likely to view the regulations as fair and reasonable, and subsequently adhere to them (Ayres and Braithwaite, 1992). The size of the firm also matters; larger firms with more resources, such as legal departments, are more likely to comply with regulations than smaller, less-resourced ones (Ayres and Braithwaite, 1992). Firms that are particularly worried about their public image, like a shared AV service, will be particularly careful to follow regulations; if they don't, the company could lose the consumer trust that they worked hard to build up. By adopting and complying with regulations common in peer industries, a new transportation mode may also gain legitimacy (Meyer and Rowan, 1977). For example, in some states, TNCs adopted existing chauffeur regulations in part to gain public acceptance. Moreover, the regulations must be clear for firms to follow them; regulatory ambiguity gives firms room to interpret requirements in ways that are most advantageous to the firm. Similarly, users may break traffic laws if they are unfamiliar with them or the laws themselves are unclear. For example, when the traffic laws for e-scooter use are unclear or unfamiliar (e.g., where people may ride on sidewalks or roadways), riders may engage in unsafe or unpermitted behavior (Useche et al., 2022).

LIABILITY AND INDEMNIFICATION

Perhaps the most direct way that states protect the public against the various risks of shared mobility is through insurance requirements. With insurance requirements, states have some certainty that a transportation service can afford to make any potential victims whole again. Setting insurance requirements for a new transportation mode presents challenges. With little data on crash risk, more risk-averse states may require more insurance coverage than more permissive states. In some cases, high insurance rates may price a business model out of the market.

States may manage risks with a range of liability-related requirements. They may require operators to purchase, for example:

1. **General liability** insurance that covers damages or injuries when users crash their vehicles
2. **Cybersecurity insurance** for data breaches or other data security threats
3. **Workers' compensation** for when employees become sick or injured on the job
4. **Commercial auto insurance** to cover vehicle damages or theft
5. **Uninsured/underinsured motorist insurance** for when another driver who is uninsured or commits a hit and run causes damage in a crash.

Local governments may also require operators to indemnify the city, that is, not to hold the city liable, for any claims from users or people who were injured or suffered property damages in a crash. Mobility providers, too, might protect themselves from having to pay for damages by requiring riders to sign an agreement that severely limits the scenarios under which they can claim damages from the operator or technology company (Stoeltje et al., 2023). A pedestrian involved in a collision with a scooter, for example, could claim damages from the scooter rider. If the rider does not have the means to pay, and the city and scooter company are legally protected, then the pedestrian may have little recourse. Some states carve out exceptions, however, for incidents beyond "ordinary negligence," such as recklessness, illegal acts, or gross negligence (Stoeltje et al., 2023).

Insurance companies may determine rates based on a number of factors: risk history (past crashes and theft incidents, and previous claims) and exposure to risk (telematics, such as vehicle miles traveled, speed, braking patterns; neighborhood characteristics, such as dangerous intersections, and denser areas with higher crash rates). Mobility providers in turn may try to reduce their insurance rates by providing statistics showing low crash rates, or showing they have taken anti-theft measures to protect their fleets.

RESEARCH QUESTIONS AND METHODOLOGY

This study aims to better understand the regulatory environment for shared mobility including electric bike-share and scooter-share, transportation network companies (TNCs, also referred to as ride-hail), micro-transit, and shared autonomous vehicles (AVs). Our study broadly outlines the various externalities that regulations may address, and how easily or how costly each regulation may be to comply with. Specifically, our research questions include:

1. **What types of regulations govern shared mobility?**
2. **To what extent do regulations vary across jurisdictions, and what explains that variance?**
3. **What are the intended regulatory benefits for operators, public agencies, users, and the public broadly?**
4. **What are the regulatory costs incurred by operators, public agencies, users, or the general public?**
5. **How are shared mobility regulations set and, potentially, changed?**

To answer our questions, we used a mixed-methods approach, primarily analyzing statutes and request for proposals (RFPs) for mobility programs across the US, and supplementing our analysis of regulations by conducting eight interviews with public officials and private mobility operators. We examined over 80 Requests for Proposals, regulatory guidance documents, public utilities regulations, and municipal ordinances for micro-mobility, micro-transit, and TNCs. We also examined over 70 state statutes for micro-mobility, TNCs and AVs. The sources covered cities and states from across the U.S., including the states of California, Colorado, Arizona, Florida, Maryland, Missouri, Kansas, Oklahoma, Oregon, Wisconsin and Washington, and the cities both large (Los Angeles, Chicago), mid-sized (Kansas City) and small (Tallahassee). The RFP sources and guidance documents are from the years between 2017 and 2025, and the statutes cover the years between 2010 and 2025. Appendix A1 lists all the sources, divided into statutory sources and non-statutory sources.

Using these primary sources, we first created a regulatory typology for each of the four shared mobility modes across broad topic areas used to organize report findings:

- Regulatory frameworks
- Service and procurement models
- Operational models
- Fines, fees, and fares
- Data sharing models
- Data sharing requirements
- Vehicle requirements
- Vehicle maintenance and seasonal requirements
- Parking requirements
- Equity requirements
- Safety requirements
- Required public outreach
- Hiring requirements
- Performance metrics
- Technology Requirements
- Liability and Insurance Requirements

We supplement RFP and statute analysis with interviews with eight public officials and private mobility operator. Interviews were conducted via Zoom between February and May 2025. Interview transcripts were transcribed and coded into themes (see Appendix A3 for the list of general interview questions, which we tailored to each interviewee). We synthesized interviews and existing literature on regulation to determine the qualitative costs and benefits of each regulation. Unless otherwise noted as deriving from an interview, the bulk of our analysis stems from our document analysis.

In our analysis, we compared the regulations across modes and places, examining how common certain regulations are across modes (or conversely how specific they may be to certain modes or to certain jurisdictions) and whether certain modes are subject to more stringent or more lax regulations than others. We also provide a deeper analysis of liability requirements in particular, as they are one of the clearest examples of how states (and in some cases, municipalities) place value on modal risk management. We compared insurance requirements of two shared modes, TNCs and AVs, against their nearest established analogue: the private vehicle. We conclude the report with our broad takeaways from the study, and future direction for research.

LIMITATIONS

This report focuses on the types of regulations listed in RFPs and state statutes. What an operator or a rider is legally required to abide by, however, may not reflect compliance on the ground. Additionally, some of the costs that public agencies incur to support shared mobility programs– such as re-striping roads, establishing regulations, or creating parking or loading zones–are not counted here. We do not include every detailed type of regulation, nor does our research reflect the full population of shared mobility programs or regulations. Therefore we do not report on the share of programs governed by different types of regulations. Instead, we provide a shared mobility regulatory typology, which documents example regulations alongside the qualitative costs and benefits, to illustrate a big picture landscape of regulatory burden and benefit. The typology identifies which modes are subject to different regulations; modes that did not have evidence of a given regulation are marked as blank ("-") as, while there was no evidence for these modal regulations in the sampled RFPs, they may exist in other contexts. This research reflects the regulatory landscape in Spring 2025; in the fast-evolving shared mobility landscape, the regulations documented here represent a snapshot in time. We conclude our report with future directions for research.

FINDINGS

REGULATORY FRAMEWORKS

Table 2. Regulatory Frameworks

	Pilot	Permanent Program	Permit	Contract	Performance-Based Regulations	Local Preemption
Definition	A program established as a short term initiative, lasting for a predefined period. Typically intended as a trial before a permanent program can be initiated, but sometimes renewed repeatedly by a legislative body	A permanent program is a program that has no set end date. These programs may still require individual operators to renew/ renegotiate a permit or contract on a regular basis, but the overall program does not need to be renewed by a legislative body	Permission from a jurisdiction to operate a shared mobility service. Formal application process available to any qualified organization that includes a processing timeline, set fees, and policies for revocation. Typically specifies the number of vehicles available or other service details. Some systems specify a maximum number of operators, leading to a competitive procurement process. Typically renewed at a regular interval	A contract to operate a specified level of service within a city, sometimes in exchange for fees. Operators are typically determined through an RFP process or similar competitive procurement system, and are regulated through a city ordinance once selected. In contract-based systems, operators must follow regulations and any commitments made in during the RFP process, making the actual regulations that operators must follow more ambiguous	A regulatory framework where some regulations are not required or strongly recommended, but where compliance yields operator benefits such as reduced permit fees or increases in vehicle caps.	Prohibits local governments or other state entities from regulating certain conditions

Table 2. continued

	Pilot	Permanent Program	Permit	Contract	Performance-Based Regulations	Local Preemption
Relevant Modes						
Micromobility	Y	Y	Y	Y	Y	–
Microtransit	Y	–	–	–	–	–
AVs	–	Y	Y	–	–	Y
TNCs	–	Y	–	–	–	Y
Costs and Benefits						
Benefits	Learning, flexibility, political, exposure for potential users	Stability for riders, infrastructure investment	Defined expectations for operators and cities; reduced liability for cities	Defined expectations for operators and cities and users; reduced liability for cities	Encourages innovation, flexibility, reduces costs for operators, helps agencies determine feasible regulations, incentives operators to offer additional benefits to agency	Promotes uniformity potentially reducing compliance burdens for TNC operators
Costs	Administration costs, infrastructure costs, instability	May limit competition	Administrative costs to oversee; time/effort to apply for and select operators; costs to reapply and recompete for operators; constraints on operators	Costs to apply and legal costs to finalize, time/delays to finalize contract; uncertainty for operators	May create additional expectations for applicants that are costly to operators	Limits local government control and flexibility

Shared mobility programs fall under a number of distinct regulatory frameworks, which vary in stringency and duration (see Table 2). Shared mobility programs can be regulated by federal, state and local authorities. Higher levels of government can limit a lower level of government's regulatory authority. Many states, for example, have preempted local governments from regulating TNCs. Often, however, states delegate powers to local governments to enact laws and ordinances without state approval (Richardson, Gough, and Puentes, 2003). We find that the regulatory locus for shared mobility varies by mode; TNCs and AVs are largely (though not exclusively) governed by state law, while micro-mobility and micro-transit are typically governed by local ordinances and permits.

While the locus of regulation varies by mode, all shared mobility programs currently operate with some form of regulatory oversight. Though some modes (e.g., micro-mobility programs and TNCs) arrived absent any comprehensive rules, they have since been governed by local and state regulation. Shared mobility programs can be established as pilot or permanent programs, which vary in contract time length, oversight, and renewal process; a government might require operators to acquire a permit to operate, and/or they may require contracts that define the regulations that both operators and public agencies will be held to. The definition of a 'pilot' varies across contexts, and usually, but does not always, imply a fixed program length.

Contracts for shared mobility services can be structured in different ways based on how long a government wants a program to remain in place before renegotiating a contract, and how a government measures a program's compliance and general performance.

PILOT PROGRAMS

Pilot programs are designed to test a new service model. Pilots are typically the shortest duration and require legislative approval to be extended or crafted into a permanent program. A legislative body like a city council is less likely to intervene once a permanent program has been established, though operators may still renew and/or renegotiate contracts on a regular basis.

Pilot programs create uncertainty for operators, as a local authority may choose not to renew or extend a pilot program. Uncertainty may be particularly acute when members of the public strongly oppose the pilot program. One interviewed transportation department administrator explained that they initially circumvented the city council approval process for a new e-scooter program by authorizing the program under an "Emerging Business Permit." The permit allowed businesses that were not in the city's municipal code – in this case, shared bikes and e-scooter were not in the code – to receive a two-year permit without requiring approval from the council.

Shorter contracts for pilot programs help both operators and public agencies experiment with regulations before committing to longer-term contracts. A micro-mobility operator explained that:

"Newer cities are still testing the waters… just part of the process. They get in line with how they've seen other cities operate. There's typically a one year pilot, and then if they're comfortable, they'll go into, say, a two to five year licensing scheme that then gives them the opportunity, the flexibility, to be able to make changes along the way."

"If your city is truly new to micro-mobility and there's still some uncertainty, you can work out the kinks and then change…have a new regulatory regime in a subsequent longer term program."

While pilots can create the flexibility needed to try new modes and regulations, they may be a less attractive structure for both operators and regulators as time passes. Annual permit review processes create substantial administrative work for regulatory agencies, as well as for applicants. Therefore, some established operators may choose not to participate in pilot programs as they require substantial effort (submitting an application and setting up a program), typically short-term, and may require substantial investment without clear future payoff. One micro-mobility operator the uncertain regulatory environment in one Colorado city:

"Every year, the council has to appropriate the funds [for the program]. And that certainly has posed some challenges in terms of planning and hiring. It's also a seasonal system, and staffing is very difficult in these mountain towns. And so I think in those markets, we've had to just get comfortable with the unknown and operate in good faith that it will continue to renew. And so far it has, so we haven't been burned, and that's been a little bit easier to plan for."

The more a mode is tested through pilots, the less an operator may want to engage in pilots in new cities. The marginal benefits of each additional pilot program declines over time. A micro-mobility operator explained that:

"I feel like we're past the stage of pilots. We will still entertain them if it's a large enough agency, but it takes the same amount of effort to do an RFP for a 500 person program versus a 5,000 person program. So with limited resources on our end to go through this very onerous procurement process, we will obviously choose the agencies that are sure about what they want to do."

Operators may also be wary to enter into pilots that require substantial infrastructure investment, such as bike-share stations. As a former scooter-share operator explained:

"Cities wanted to see us with a warehouse in the district or in the zone and hiring employees instead of contractors, but then you didn't know whether you'd have that permit in nine months."

"I don't know if we're not interested in pilots, but it's a lot harder…We haven't really seen any, and just given the amount of infrastructure we need to put down and the team that we need to support that, it's a lot harder for us to engage insomething that's short term. So I wouldn't say we're against pilots or anything like that, but I think it's just harder for us to really try out smaller scale solutions, if we're not necessarily going to get a longer term commitment."

Operators also note that short-term pilots with limited initial investment may yield small outcomes like ridership, which can ultimately stymie efforts for greater and sustained modal investment and public commitment. As a docked micro-mobility operator stated:

"[With docked micro-mobility] you see the benefits of scale. And so if you're only doing a couple of stations, you're not going to really see tremendous ridership growth. But then if you have a network, you're going to see much more

significant ridership as more people are able to access the platform. And so that's another challenge with pilots with shared micro-mobility: it's hard to justify the larger scale investments when you're not really seeing the results on a smaller scale. And so you kind of need to actually put the investment in place for a much larger solution at scale in order to see the benefits."

Similarly, a former employee who worked on scooter-share RFPs explained that annual scooter contracts were often highly competitive and demanding:

"Cities wanted to see us with a warehouse in the district or in the zone and hiring employees instead of contractors, but then you didn't know whether you'd have that permit in nine months. That made it really hard to do so… You want to show off that you have the local knowledge and really tailor it to that city. And then having to do it every year was tough. We had to have a whole team of RFP writers, and that was a big burden."

Ultimately many programs transition from pilot to renewable permits or contracts. Such transitions are not always without growing pains. Pilot regulations can become more inflexible as city council approval may be required for regulatory changes, or separate licensing agencies may become more involved. Learnings from the pilot may not always transfer seamlessly to a permanent program as well, particularly if oversight shifts within the city. For example, the City of Phoenix administered its pilot program but shifted responsibility to the city's Street Transportation Department once it became permanent.

PERMITS, CONTRACTS, AND REQUESTS FOR PROPOSALS

Duration of Permit or Contract Periods

Following pilot periods, many cities adopt permanent programs that rely on renewable, often multi-year, permits or contracts. One micro-mobility operator argued that four and five year contracts represent a happy medium between short pilots and decade-long contracts typical of some shared mobility service like established bike-share systems.

Operators and public agencies both benefit from creating renewable permits, rather than issuing a new RFP after a permit expires. Administratively, renewing permits is far less costly for both operators and agencies than beginning a new RFP application process. Riders, too, benefit from a predictable transportation system. One city administrator explained:

"We really want shared micro-mobility to be a reliable form of transportation that people can use to get around the city, and that's the reason for the two year permit term. That's the reason why the permits are renewable, because if we had to go through an RFP process, and you've got all these residents who are accustomed to using Lime or accustomed to using Spin, and suddenly they're gone, then they have to start over."

More upfront investment in a mobility program can translate into faster and more certain success. Transportation services benefit from network externalities: the more people using a service, the more a service expands to accommodate demand, the more utility customers receive since they can use the service across a larger area. Longer contracts not only make bigger investments worthwhile for operators, but they add certainty and stability that benefit both riders and the administering public agency. A city's transportation department official emphasized that, in setting micro-mobility contract lengths:

"What it really came down to is, first and foremost, our residents are relying on this as a mode of transportation to get around the city, and we didn't want gaps in the service."

As a shared mobility technology and service model matures, the time lengths for contracts can lengthen. A micro-mobility operator said:

"I think because the industry has existed now for over a decade, it's fairly consistent. I don't think the procurement phases have changed significantly, if at

all, we're just seeing perhaps longer term contracts than we used to see in the past, which I think is beneficial."

Shaping Requests for Proposals

In both pilot and permanent programs, local authorities typically establish a formal procurement system, often with a request for proposal, whereby prospective operators submit applications to receive a permit (permission) to operate.

Local RFPs vary greatly across place and program. In some contexts, operators engage directly to help inform the final RFP. Regulators often issue an initial request for information (RFI), in which operators are explicitly asked to provide input into the permit or contract language, such as noting what they could feasibly offer in a program. An RFI helps a city learn how operators have structured programs in other cities, or whether they need a pilot to test a service. One transportation agency official described their process for creating RFPs:

"We're going to put out something that says 'we want to do this. Can everybody tell us what's the best way to do this? What do you think, private industry? Come back and tell us, and then, based upon those responses, we're going to draft an RFP with the scope of work.' Because if someone comes and says, here's the type of charging you can do that doesn't have to go under the ground, we'll find out if it's cost effective, and if it is, we're putting that in the RFP, and then we're going to come out and say, 'Alright, who can deliver this product at the best cost, but also deliver what we want?"

Operators may also try to discuss operating models with regulators prior to an RFP release. Once an RFP is issued, operators may have little ability to revise the requirements. Operators may, however, appeal RFP award decisions to an administrative law judge.

The more experience operators have with RFPs, and the more their service model matures, the more they may push back on certain regulations. For example, operators may tell the city that certain regulations are difficult to comply with and try to amend them. A micro-mobility operator explained:

"Some of the other requirements…have changed quite a bit now, but used to be much more front and center. We did comply with sidewalk technology, we did comply with trying to put [in] adaptive devices, but also we're trying to make

sure that they're considered in a broader perspective. So if we are going to cave on sidewalk detection, can we also push the city to improve infrastructure and make this not about putting all the ownership onto the organizations or the companies and have a little bit more like a public private partnership approach. When [the city isn't invested] that to us, is almost like a deal breaker. But it's hard to gauge exactly …without necessarily knowing how it's written and how the cities are actually looking at this contract as well."

Over time, RFPs can become more streamlined and standardized. Technology standards have also become more uniform and consistent across RFPs over time. That standardization may, in part, be due to more global experience with shared mobility programs. With more completed pilots, cities can look to other places for best practices and blueprint RFPs. Fewer competitors over time may also explain more uniform requirements. One micro-mobility operators described:

"[micro-mobility RFPs have] gotten a little bit more streamlined. But in the past, there were a lot more additional asks, when there was actually a lot more competition, and that was influencing a lot of changes in product design and changing how a lot of cities were trying to procure shared micro-mobility solutions."

Some operators also seek to align RFPs across neighboring jurisdictions. Such efforts can reduce operator costs and avoid conflicting rules for both operators and users. One micro-mobility operator described a joint RFP process where four jurisdictions collaborated in a single RFP process:

"Inner ring suburbs that still maintain that urban fabric are also adopting rules and regulations that typically mirror the rules and regulations of the larger control city within that metro area…five jurisdictions came together for a regional RFP… and so the winners of that RFP process were then permitted to operate within all of those jurisdictions…We would prefer a regulatory framework that works for the entire region where all of the contractual requirements are about the same, and that means the insurance requirements, indemnification, tech requirements, and integration with the mass transit system, fees, parking."

Operator Approaches to RFPs

In addition to contract durations, operators consider a number of factors before pursuing an RFP, including population density and area demographics (e.g., university students are more likely users). If an operator assesses favorable market conditions based on these local characteristics, they may try to help

shape the RFP process through RFIs or other avenues. Operators may engage with stakeholders or local advocates to support the service. Similarly, operators may supply information for city staff who are compiling a report before legislation is drafted, or share blueprint legislation language with a city councilor based on a peer city that the operators say implemented best practices. One micro-mobility operator described:

"There's usually a very excited local city council member who [traveled to], say, Washington, D.C. They saw [a similar service] and they want it in their community."

Operators also increasingly look for strong partnerships with public officials and agencies when applying for programs that require significant upfront costs. Examples of strong partnerships include cities that may directly fund operations, provide stations for vehicles to park, or otherwise streamline regulatory processes that could slow a program launch. A micro-mobility operator described wanting a strong commitment from cities:

"In a lot of dock-based micro-mobility systems, there's public funding that's part of the contract. So ideally, that would be what we're looking for: that a city is actually willing to do that. If it's a large enough city where the ridership volumes are high enough, then maybe there's a rationale not to need to have that public funding. But without [public investment], I think it's almost like a no go, because at this point we're not going to be able to recoup our investment if we're not getting any sort of public funding or public investment."

Another key consideration for operators considering whether to apply for an RFP is whether they have operated in that state previously. Because state regulations vary widely, the costs of introducing operations in a new state are uncertain and often high. Not only must an operator ensure that they have all the state or local licenses to operate, but they must be familiar with specific state law. For example, in New York, unlike in other states like California, a micro-transit program is regulated as a TNC. When a micro-transit operator wants to start offering services in New York, their legal team must secure the necessary licenses and permits from various boards and commissions, which may cost tens of thousands of dollars. In some cases, an operator may have built up relationships with a "champion" administrator for their program, only to see that administrators change jobs, creating renewed regulatory uncertainty with an appointee.

Operators may avoid RFPs that require significant changes from their standard

business offerings. Customization is costly, as one micro-mobility operator explained:

"We can't do significant customizations. We have to ensure that this will be a profitable solution for us. So as long as we can gain alignment from both sides. I think that definitely helps to streamline the procurement process."

Operators observed that cities often adjust regulations, but may strive to maintain cost and time investment equilibrium. For example, a city may add a new RFP requirement, but simultaneously remove a previous one. In Chicago, for example, the city lifted their curfew restrictions on scooter operations, but added a sobriety test requirement for riders requesting the service between 12am and 5am.

Sometimes regulations could drastically change if public opinion over a mode, or a key public official's opinion, soured. The operator may spend more resources on community outreach, only for a sudden change in policy goal focus. As one micro-mobility operator described:

"We'd have to put a lot of community engagement on the ground, whether it was for positioning ourselves to win an RFP, or just managing around other complaints, if it's coming from the police or coming from other, more powerful constituencies that weren't technically in charge of the program. But [say] someone almost runs over a friend of the mayors, suddenly all the regulations have changed even if staff had a totally different recommendation [regarding] sustainability or whatever department was in charge."

Operators pay close attention to what their competitors offer, sometimes legally requesting access to other RFP applications once the application process is complete. One TNC operator explained:

"We're always mindful of what's happening competitively. We FOIA [Freedom of Information Act] each other's applications to understand what we're offering, what we're responding to, if we know we're falling behind in something…we're always being very mindful and tailoring our responses based on what we think our competitors are offering, but for the most part, like on the TNC side, we're commodities, right? So you're not going to really see that big of a difference between what both companies are offering."

Operators also noted how RFPs may be a place where companies might try to

cut out competitors by inserting very specific requirements:

"The RFP process is…a place where cities often want to talk to the private sector because we have a lot of the expertise [and] they need to design a program appropriately. But other competitors are playing that game too, and trying to shape the RFP. And that's good in a lot of ways, because we want to make sure it's written in a way that will be a successful program. [A regulation] might sound like a great idea, but the city doesn't know that only one scooter company has 10 inch wheels or only one micro-transit provider has this exact data feed that is worth including knowing that it cuts out many other options. So something that I think we always try to make sure cities are making the RFPs flexible enough that they can choose [between applicants], which seems like the right fit and not box themselves in."

Regulators' Considerations for RFPs

Cities vary in how many shared mobility operators they permit. When Chicago first started their micro-mobility pilot program, they began with ten operators. Detroit, by contrast, created a permit process in which they selected up to three micro-mobility operators, and allocated a fleet size based on their application scoring and operation history. An interviewed city administrator argued that more competition spurred innovation. The more operators competing for RFPs, the more choice a city could request in an RFP. Competition for micro-transit and AVs to date has, by contrast, been relatively limited.

Regulators might have a specific, and potentially lengthy, wish list of things they want operators to provide. Lengthy requirements might preclude some operators from respondent to an RFP, either because they do not have the capacity to comply (e.g., they don't have a certain type of vehicle) or because doing so would be too costly. One micro-mobility operator explained:

"The procurement process is…awful to navigate for everyone involved. [The RFPs are] just so technical, and there's so much room for error and I don't think it's the best way to procure..a scooter or micro-transit service, but it is what it is. I guess the most actionable thing would just be making sure that cities design [RFPs] to not be too specific so they box out potential vendors. It's probably better for [a city] to have a more open mind. 'If this is our budget, what can we do?' rather than this is exactly the type of service we want."

Agencies may even create duplicate RFPs when they are unsure of the exact type of mobility system they want. One micro-mobility operator explained that:

"As a response to the RFI, [we] try to convince a city that it actually would be worth investing in a dock-based solution rather than dock-less. Or if they want to consider both, then maybe it's a separate procurement process, but ideally, it's not necessarily one that they try to do together, since they won't necessarily get the solutions they might be looking for."

When a city or state welcomes a service, the RFP process can look very different from when a government is wary of the service. If a city actively sought out a micro-transit service to offer rides to seniors or people working at or attending a community college, for example, they might impose fewer regulations than they would on a scooter operator facing vocal public opposition. The scooter operator might entice the regulator by offering additional services, such as providing more accessible vehicle types or operating in low-income areas. They might also be required to pay additional fees to operate (see the Fines, Fees and Fares section below). A former employee at a shared e-scooter company described:

"It was always strange when they were clearly written by a procurement person that's used to procuring a fleet of vehicles or a bridge or something. And it totally flipped because we're trying to pay them money to let us operate in the city…It's very different from the scooter world, where it's a permit. And in many cases, the scooter companies were competing to pay money to get a permit to operate, and then there will be a ton of restrictions on how the operation goes. In this role at [a micro-transit company], we need to help the city find a budget, and then they pay us as this turnkey vendor to operate."

One city transportation official described quickly putting together a team of people from multiple departments in order to fast track and streamline every possible regulatory hurdle in order to establish a public-private car-share program. The program was a policy priority for the city, and so they reduced permits and planning requirements as much as possible to ensure a quick launch.

Moving from RFP to Permit or Contract

Drafting an RFP and selecting a winning bid is resource intensive for the public agencies administering the programs. One major city said that the pilot program team involved four or five program staff, additional city staff, and outside consultants to review the applicants, all of whom needed to meet several times to reach a decision.

Once permits are awarded, winning applicants then work with local authorities

to finalize a contract that specifies the regulations the operator must follow. In some cases, the draft contract must evolve substantially before finalized, particularly if a city approaches shared mobility using established procurement models. As one TNC operator described:

"When they go out to procurement, they issue operating or services type contracts, whereas a technology contract would be more appropriate and has terms that are more aligned with our business model and the way we define ourselves legally. And so we'll get to the end of the road with the procurement process, and then the contract will come up, and they'll be like, well, 75 percent of this doesn't really make sense, because we're a technology platform."

Limiting Local Regulation through State Preemption

Some shared mobility operators, such as AV and TNC companies, have tried to reduce local regulatory uncertainty and variation by seeking state and federal preemption over local authority. Local control over every permitting process is costly for operators, who must tailor their service model, offer public outreach, and sometimes lobby for new government approval processes to launch their service. Each time an operator enters a new local jurisdiction, they are unsure who exactly they will be working with, what that agency or administrator most cares about, how transparent regulators will be with the operators, or even what the exact costs to operate will be (such as fee structure). TNC companies were largely successful in efforts to preempt local regulations at the state level, creating uniform regulations across the state, many of which prevent localities from adjusting, adding, or tailoring requirements; AV companies tend to emulate the state preemption approach initially forged by TNCs.

SERVICE AND PROCUREMENT MODELS

Public agencies structure shared mobility services in different ways: turnkey models, separate contracts for different program components (e.g., backend systems versus operations), technology-only contracts, or public ownership and/or operation in-house (see Table 3). Public agencies design programs based on their procurement needs, ranging from "turnkey" models where a firm provides the infrastructure (e.g., vehicles), technology and backend operations (e.g., app), labor (e.g., drivers, communications), and marketing, to an in-house model where the public agency creates and operates the program. Mobility services that require less infrastructure, particularly infrastructure on public land, are more easily operated as a turnkey model. In contrast, micro-mobility services that require space to store vehicles, may require more permitting and planning to launch.

Service models are generally set at the local level, by transit authorities or other city or county public agencies. Public agencies may combine shared mobility service models to achieve goals. For example, many publicly-owned bike-share systems (e.g., Divvy (Chicago), Biketown (Portland, OR) contract operations to private companies, although some public bike-share systems also oversee operations (e.g., Metro Bike-share (Los Angeles). By contrast, most e-scooter programs are turnkey systems owned and operated by private companies. Similarly, the majority of micro-transit procurement models are turnkey. Neither TNCs nor AVs typically undergo a procurement process, outside of para-transit programs.

Both finance and agency capacity also help to explain selected procurement models. When a public agency has constrained staff resources, and limited expertise with a given mobility technology, they may outsource certain or all program elements. Relatedly, public agencies may only subsidize a mobility program when they have external funds to do so. For example, some state agencies set aside funds for active transportation or pilot programs to test a shared mode or expand micro-mobility. These funds, however, are often time-limited and can be restricted to certain uses, such as for charging infrastructure, or specific vehicle types, which in turn affects what agencies may procure. A city department of transportation official explained how short-term grant funding, and funds restricted for specific uses, create burdens for the agency:

"When it's a mosaic of grants, it becomes a weight on your shoulders…the limits of grants by geography, and we're seeing this just in all kinds of things. It becomes this whole administrative role in and of itself. So you have a project manager managing four or five different grants all just to have that one single program, because there isn't something in the general city budget for this,

there isn't that long term RFP type of element, that is a real weight."

Multiple public actors may also complicate the procurement process and structure. A public agency's procurement team, for example, may not communicate with the department charged with managing a program. Operators seeking to suggest changes to align an RFP more closely align with what an operator is able to provide, or the best practices they see in other cities, can therefore experience a protracted procurement process as operators, program teams, and procurement teams struggle to communicate a shared understanding of what a mobility program can and should look like. One shared mobility operator explained:

"There's a firewall between the program team at an agency and the procurement teams at an agency, And that creates a lot of gaps in understanding, and those gaps end up being ironed out by a bunch of lawyers in a room, which is not the best way to do these sorts of things. So that usually extends like the contracting time pretty significantly. RFPs are these complex, massive jump to the hoop type exercises. What we struggle with a lot is requirements that aren't necessarily well thought out. And this, again, has to do with, I think, the firewall between program teams and the procurement teams. Program teams have something in mind. Those don't get translated perfectly to the procurement teams. And so when we're asked to do RFPs, it doesn't necessarily fit with our business model, or necessarily fit with what we think is going to be best for those cities' transportation [systems] that we're working with. And so it becomes a lot of back and forth and getting everybody on the same page."

Procurement and regulations may also depend on how shared mobility is situated within the broader legal context. Shared mobility operators may view themselves as technology companies, first and foremost, rather than traditional transportation services that public agencies may be more accustomed to managing. The procurement process can therefore be mired in technical legal challenges when a public agency establishes a contract that doesn't translate well to a technology-focused business model. A TNC company that offers para-transit services explained:

"When they go out to procurement, they issue operating or services type contracts, whereas a technology contract would be more appropriate and has terms that are more aligned with our business model and the way we define ourselves legally. And so we'll get to the end of the road with the procurement process, and then the contract will come up, and they'll be like, well, 75% of this doesn't really make sense, because we're a technology platform."

Table 3. Procurement Models

	Turnkey	Separate Contracts	Technology-Only Contracts	In-House
Definition	Agency contracts out all operations to a single vendor, including an app, backend systems, and transit operations, including vehicles, marketing, and operators	Agency contracts out most or all operations, but issues separate contracts for different components. Typically results in one contract for technology (e.g., app and backend systems), and one contract for operations (e.g., staffing and vehicles). This allows for multiple contractors, including public agencies, to participate in operations.	Agency only contracts out technology systems, and runs the service using drivers and vehicles either directly from the agency or from the same contractor that operates fixed-route service.	Agency creates the majority of the customer-facing technology, in addition to running actual service themselves.
Relevant Modes				
Micromobility	Y	Y	Y	Y
Microtransit	Y	–	–	–
AVs	–	Y	Y	–
TNCs	–	Y	–	–
Costs and Benefits				
Benefits	Quickly deployed/ modified; single point of accountability; scalable	Mix of scalability and reliability	More operational control; lower upfront costs	Full flexibility; lower operational costs long-term
Costs	Systemic risk with vendors; higher operating costs; limited flexibility	Vendor complexity; coordination costs; mix of different margins	Higher staffing needs; potential limitation on vendors	Highest staffing and coordination costs; limited legacy knowledge

OPERATIONAL MODELS

Operational models refer to the ways in which riders use vehicles to get to their destination, and the ways vehicles travel through the network. Models differ both within and across modes, though only micro-transit operates across all categories (see Table 4). Digital routing systems are generally deployed to achieve planning or financial goals. Systems that provide more convenient point-to-point service (as opposed to service which drops users off nearby) are often constrained in the number of total trips they can provide by limited vehicle and driver supply.

Table 4. Operational Models

	Route Deviation	Many-to-Many	Many-to-One	Many-to-Few	Few-to-Few
Definition	Trips follow a fixed route, with riders able to request that service deviate to serve a specific location within a defined service area. Often called "flex" routes and operated directly by agencies	Riders can request a trip from any point (or one of a large number of points) within a defined area to another point within the same or a different area. Vehicles may make intervening stops to serve other riders but will transport riders directly to a point near their desired location.	Riders can request a trip from any point (or one of a large number of defined points) to one destination point and vice versa.	Riders can request a trip from any point (or one of a large number of defined points) to select destinations	Riders can request a trip to and from a relatively small number of defined points.
Relevant Modes					
Micromobility	Y	Y	Y	Y	–
Microtransit	Y	–	–	–	–
AVs	–	Y	–	–	Y
TNCs	–	Y	–	–	Y
Costs and Benefits					
Benefits	Lower operating costs	Highest operating cost; lowest capacity	Operational efficiencies	Operational efficiencies	Higher capacity; lower wait times; lower operating cost
Costs	Worse customer experience; potentially longer transit times and lower capacities	Rider flexibility; high quality of trip and return ridership	Service planning costs	Service planning costs	Lower ridership; less flexibility for riders

FINES, FEES AND FARES

Fines, fees and fares serve different purposes. Fines serve as a deterrent and punishment for violations such as illegal parking; fees are paid by operators and can cover specific services, infrastructure, or programs; and fares are paid by users and generally cover operating costs. The money each garners may cover an agency's costs to administer a shared mobility program, an operator's cost to provide the service, generate revenue that can be earmarked for specific uses (e.g., dedicated infrastructure, wheelchair accessible vehicles), or go into a general fund. In this section, we focus primarily on fees, a central element of shared mobility regulation. Governments can also set fares, primarily by limiting trip fares in certain locations or for select traveler groups (e.g., people earning lower incomes).

Table 5. Fines, Fees and Fares

	Per-Permit Fees	Application Fees	Per-Vehicle Fees	Per-Trip Fees	Parking Fines	Occupancy-Based Fees	Location- and Time-Based Fees	Fares	Fare-Based Fees	Special Fund Fees	Special Fund Fees
Definition	Fees to obtain a permit paid either when a permit is obtained or renewed or on a set interval. Fee usually does not vary by the number of vehicles or trips	Fees required when applying for a permit or contract, that are not refunded if a permit or contract is not granted	Fees charged per operated vehicle per time period	Fees charged for each completed trip	Fines charged if a vehicle is parked in prohibited areas	Fees vary based on whether the ride is shared or solo.	Fee that vary based on time of day or location of ride	Cost for riders to use the service. Regulators may require fare rates be posted online or on an app, or that customers can preview the total estimated fare amount.	Fees charged as a percentage of a trip's fare.	Fees charged per trip (flat or percent-based) earmarked for special use, such as expanding a wheelchair-accessible fleet.	Fees incurred by users if they damage or lose a vehicle. Fees cover cleaning, maintenance, or replacement.
Relevant Modes											
Micromobility	Y	Y	Y	Y	Y	–	–	Y	–	–	Y
Microtransit	–	–	–	–	–	–	–	–	–	–	–
AVs	Y	Y	–	–	–	–	–	Y	–	–	Y
TNCs	Y	Y	–	Y	–	Y	Y	Y	Y	Y	Y

Table 5. continued

	Per-Permit Fees	Application Fees	Per-Vehicle Fees	Per-Trip Fees	Parking Fines	Occupancy-Based Fees	Location- and Time-Based Fees	Fares	Fare-Based Fees	Special Fund Fees	Special Fund Fees
Costs and Benefits											
Benefits	Cost for operators regardless of project scope; Revenue for agency	Helps agencies recoup administrative costs; may restrict applicant competition	Linked to number of operational vehicles; generates revenue for agency; discourages excess vehicles in fleet	Linked to number of operational vehicles; generates revenue for agency	Encourages operators to remove misparked vehicles; discourages riders from parking in prohibited areas; cities recoup foregone parking meter revenue	Increased revenue for governments	Increased revenue for governments	Enhanced transparency for riders	Increased revenue for government	Helps agencies raise funds for specific causes, such as disability access.	Helps operators cover costs of extra maintenance; deters users from damaging/ dirtying the vehicle.
Costs	Inflexible; Costly for operators and cost may be passed to riders	Adds cost for operators they may not recoup	Adds to cost of providing service; cost may be passed on to riders	Adds to cost of providing service; cost may be passed on to riders	Adds to cost of providing service; cost may be passed on to riders	Adds to cost of providing service; cost may be passed on to riders	Adds to cost of providing service; cost may be passed on to riders	Adds to cost of providing service; cost may be passed on to riders	Adds to cost of providing service; cost may be passed on to riders	Adds to cost of providing service; cost may be passed on to riders	Adds to cost of providing service; cost may be passed on to riders

Fees vary by place and mode

Fees range by city, both by type and amount, and particularly for micro-mobility programs (see Table 5). Regulations determined at the state or local level vary across contexts and modes. Fees can be added on top of local, county, or state sales taxes, depending on the mode and location. State and local governments tax shared modes differently, in part because they may classify modes differently, and in part because mobility companies may be more or less successful in preempting jurisdictions from adding local fees and taxes. Ride-hail fees, for example, are commonly preempted at the state level, limiting cities' ability to either mandate or use fees for either fiscal purpose or as policy mechanisms (Lowe et al., 2021). A micro-mobility operator explained:

"In most states, ride hail trips are exempt from sales tax, and Uber and Lyft lawyers were very good at preempting cities from applying any sort of fees either."

Fees vary both within and across modes. Ride-hail fees are levied varyingly by trip, as a share of the total fare, time of day, and if a ride is pooled or solo; rates range widely by city and state (Brown, 2022). Micro-mobility trips, by contrast, average about $0.70 per mile or $0.89 per trips, equivalent to 23 times higher per mile than personal cars and 5 times higher per mile compared to ride-hail trips (MacArthur et al., 2024). Modes that are more likely to receive public funding, such as micro-transit services that transit agencies procure, may be subject to fewer fees than privately owned and operated programs. Fees are particularly wide-ranging when local governments are not preempted by state or federal authorities from imposing fees.

Operators incur costs each time they enter a new jurisdiction and must comply with different tax and fee requirements. A TNC operator stated:

"I think the big challenge for us is the interoperability of regulatory conditions in different markets, and the fact that we have to operate entirely different business structures in different markets. The most noticeable difference for customers is cost and tax and fee imposition in different markets."

MacArthur, Fang and Thigpen (2024) note that the lack of uniform fee structure across for micro-mobility suggests a lack of consensus over the purpose of fees. As one micro-mobility operator described of the changing fee landscape:

"Six, seven years in, [cities are] not landing on a common fee structure."

Public transportation administrators we spoke with seemed less concerned about high fees for operators than they were about what those fees paid for and ensuring fees recouped administrative costs. One operator described:

"What are the cities thinking about when they're setting their program fees? It was very revealing and made sense: they're thinking about the mundane question of, how do we try to recoup the costs? City budgets are strapped."

Fees can influence operator and traveler decisions

Fee structures influence operator decision-making: fees levied per vehicle at the start of a contract may discourage operators from providing larger fleets. By contrast, operators pay fees levied per trip in proportion to operating scale. Effectively, fixed vehicle fees represent both a risk and sunk cost for operators while per-trip fees scale based on program success. For example, if ridership suddenly dropped, an operator who paid a per-vehicle fee may face a net loss, while under a per-trip fee structure, operators would pay simply pay fewer fees. Unsurprisingly, operators prefer the fee structure that presents fewer sunk costs and financial risks: per-trip fees. Operators also liked that per-trip fees linked city revenue benefits to higher ridership. Some operators we spoke with said they no longer sought to operate in cities that required per-vehicle fees. A micro-mobility operator described:

"Most cities [previously] adopted a fee structure of $1 per day per vehicle. Most cities are moving away from that now, which Chicago led the way, or at least capped some of it. Chicago had $1 per day per scooter paid up to two years in advance. And so before you launch in Chicago, say you had 1,000 scooters, you had to cut the city a check for $736,000 so you're paying for two years of operations…for that tranche of scooters. By the one year mark, if you're looking [to add] another 1,000 scooters, then you had to cut the city a $365,000 check for the remaining balance of that license term, and so it's a massive amount of money for a seasonal market, and asking for three quarters of a million dollars before you've made a penny in the city is detrimental to business, no matter how you cut it. It's also not smart business practice to come up off of that much capital before you've actually made a penny. And most businesses are not required to do that. That's what sets shared micro-mobility apart from other business areas, especially within transportation."

Fees that vary by location and time of day are another way that governments can nudge where and when people use a service. In places where demand is relatively inelastic, such as at airports with few alternative modes, fees may have little impact on people's use. When riders have more flexibility for when and where they travel, fees may encourage travel behavior changes. For example,

if operators do not charge users a fee in certain zones, such as lower-income neighborhoods, then people on the borders of the zone may choose to start their trip where that fee does not apply (see Equity Requirements section for more detail).

Riders, however, are only willing to pay so much before shifting modes, or forgoing a trip. High fees that discourage use or limit use–and therefore profitability–may spur operators to exit a market. A micro-mobility operator described the basic calculus for whether to enter or remain in a market:

"If [fees] are too high and aren't justified by what we anticipate the ridership would be, and we don't anticipate we'd be able to run a profitable market or break even."

While some of the costs of fees and taxes get passed down to riders, operators may be constrained, however, by contracts that limit how much they can charge users. Operators may try to build high ceilings into contractual pricing, but that can only work to a point, as one operator described:

"On the bike share side, we can't pass the costs along to the rider. In many cases, [it's] because our pricing is determined by the contracts. We have specific inflationary numbers that we can grow, but for the most part, our pricing is set with the city that we're working with. So if we do have ballooning costs, it is really hard for us to manage that…I think on the rideshare side, a lot of those costs can be passed through, but from the bike-share side, it's a lot harder."

Operators and transit administrators alike wanted fees to fund transportation infrastructure and services. One city's transportation department official felt that shared mobility license fees were wrongly siphoned directly to the general fund, rather than funding transportation improvements. When fees from micro-mobility programs help fund protected bike infrastructure, for example, the fees can potentially generate a positive feedback loop with ridership. Program scale can also limit how much cities can realistically charge operators. A micro-mobility operator described:

"If you're getting a ton of ridership and a bunch of money, then maybe you can have higher fees that go back into the city to support installing bike lanes and corrals, and things that make the program run better. But if it's a smaller program that's not producing a bunch of revenue, then you're not going to have a scooter company there for very long unless you make it really cheap for them to operate, and that means lower requirements in other areas."

DATA SHARING MODELS AND REQUIREMENTS

Public agencies may require operators to disclose data related to program use, including safety (e.g., crashes, vehicle maintenance, customer-reported issues, etc.) and telematics (e.g., trip speed, trip origin/destination). Data sharing requirements vary based on the type of data operators must share, how public the data must be, and how data are stored. An agency may have complete ownership over all data produced, limited access to certain data points, or minimal to no access to shared mobility data (see Table 6 for an overview of data sharing models). Unless the program is publicly-owned, agencies typically do not own the data, but do require access. Data sharing has become more common over time. While data requirements can pose coordination costs between agencies and operators, data are critical to informing how public agencies incorporate shared mobility services into the existing transportation system.

Table 6. Data Sharing Models

	Agency Owns	Agency Access	Operator Owns
Definition	Public agency owns and has complete access to all data produced by the operator, even after the contract expires	Public agency has access to pre-defined data generated by the system, but does not own it. Data access may be limited to Key Performance Indicators for financial and federal reporting requirements and/or could include broader access to a Mobility Data Specification (MDS) data for real-time reporting.	Operator retains full access to data. More common in older systems
Relevant Modes			
Micromobility	–	Y	Y
Microtransit	Y	Y	Y
AVs	–	Y	–
TNCs	–	Y	–
Costs and Benefits			
Benefits	Quickly deployed/modified; single point of accountability; scalable	More operational control; lower upfront costs	Full flexibility; lower operational costs long-term
Costs	Systemic risk with vendors; higher operating costs; limited flexibility	Higher staffing needs; potential limitation on vendors	Highest staffing and coordination costs; limited legacy knowledge

Data sharing serves multiple goals: it can provide insight into deployment or travel patterns, anticipate congestion, and assist in long-term planning efforts such as locating loading zones or installing dedicated bike lanes. Private companies are, however, often reluctant to provide detailed information about ride patterns to public agencies and the broader public. As a result, many regulators and private operators enter into data sharing agreements. Depending on the mode and arrangement, data is typically provided at either an aggregated level or a more granular, but anonymized level. Data shared with regulatory agencies like city or county planning organizations or state bodies is typically edited and redacted prior to distribution to the public. The locus of data distribution also varies by mode: AV and TNC companies are typically only required to submit data to the state, which may then remit the data to local partners; micro-mobility and micro-transit operators, by contrast, are required to submit data to the local regulating agency (e.g., city, transit agency, department of transportation). Micro-mobility data regulations tend to be more stringent compared to other modes - many, for example, are required to provide real-time access to location data for vehicles.

Program data include a range of data points (see Table 7), with examples such as:

- Telematics: trip destinations and origins, distances, routes, idling time
- User data: user ID, fares paid, user survey data
- Charging data for electric vehicles: frequency of charges, maintenance problems at chargers
- Crash and incident data
- Employment data: number of full-time equivalent positions
- Accessibility data: number of wheelchair accessible trips
- Vehicle data: maintenance records, vehicle types

These data are valuable to public agencies, private operator competitors, and researchers more generally. More detailed telematics data may be required when transit agencies want to integrate a shared mobility service into an existing transportation system. For example, transit agencies may procure a micro-transit service to fold into their “family” of services, and require the operator to provide real-time vehicle location data. Program data can also help agencies make the case for continuing, expanding, or stopping a service. One city transportation administrator described using shared scooter program data to make the case for requiring services in designated “equity zones.” The administrator used scooter trip data to push back against operator claims that insufficient demand existed in “equity zone” areas, and used data to show that a significant portion (42 percent) of rides took place in the zones.

Among the data sharing challenges that public agencies face to access and incorporate private operator data are: privacy concerns, a lack of data uniformity, and public agency capacity to build up necessary digital infrastructure. Over time, as agencies gain more experience procuring and licensing shared mobility providers, they have also become more experienced establishing data requirements. A TNC operator described the battle between operators and public agencies over how much data operators were required to share, a battle the operator says TNCs lost:

"Data sharing, for example, was a huge [issue] when TNC-based transit partnerships first launched. Data was a wild west. Nobody really knew what they wanted. Data privacy issues that we were trying to push back on. As a company, our competitors were less interested in data privacy, and so we originally tried to stake that out as a competitive advantage where we care about data privacy, we don't want to just share anything with you, maybe to our detriment, but we lost that battle."

Table 7. Data Sharing Requirements

	General Bike-share Feed Specification (GBFS)	Mobility Data Specification (MDS)	Driver and Trip Records	Driver Pay	Passenger Receipt	Record Retention	Crash Reporting Requirements
Definition	Requires agencies to report public-facing data using GBFS.	Requires agencies to report data containing Personally Identifying Information to the jurisdiction using MDS.	Specifies the detail of trip records that must be retained and for how long. E.g., trip origin/ destination, wait times, timestamp, AV (yes/no), fare.	Requires disclosure of pay information to the driver and/or customer.	Content and format of electronic receipts issued to passengers. Variables may include trip origin, destination, total duration and distance of the ride, and itemized fares or charges.	Specifies how long records must be stored (e.g., records of trips, complaints and resolutions, collisions, etc.)	Detailed reports on crashes submitted within specified time frames. Reports may include data on the number of incidents or amounts paid for bodily injury, fatalities, and property damage.
Relevant Modes							
Micromobility	Y	Y	–	–	Y	–	Y
Microtransit	Y	Y	–	–	–	–	Y
AVs	–	Y	Y	–	Y	Y	Y
TNCs	–	Y	Y	Y	Y	Y	Y

Table 7. continued

	General Bike-share Feed Specification (GBFS)	Mobility Data Specification (MDS)	Driver and Trip Records	Driver Pay	Passenger Receipt	Record Retention	Crash Reporting Requirements
Costs and Benefits							
Benefits	Ability to integrate with external systems and platforms	Ability to integrate with external systems and platforms	Enhanced transparency	Enhanced transparency for drivers and riders	Added financial costs to operators; Potential increased costs to riders	Enhanced transparency for regulators and auditors	Enhanced transparency for riders
Costs	Limited as adoption now widespread	Limited as adoption now widespread	Increased compliance burdens for operators; Added financial cost to operators; Potential increased cost for riders	Increased complexity to software systems; Increased compliance burdens for operators; Added financial cost to operators; Potential increased cost for riders	Added financial costs to operators; Potential increased costs to riders	Added financial costs to operators; Potential increased costs to riders	Added financial costs to operators; Potential increased costs to riders.

Data ownership remains a negotiating point between operators and agencies. Operators want to own data, out of concerns over both trade secrets and customer privacy, and negotiations often relate to how much data sharing is needed to retain customer privacy while supporting regulator analysis or evaluation needs.

Agencies also contend with the logistical challenge of developing a digital infrastructure to house and analyze the data. Cities and states often lack a uniform standard to store and share data. Agencies may need to develop–or contract out–a dashboard to monitor trends or enforce contract violations. A less visible cost to administering programs is digital management. Agencies need server space, as well as database workers to manage data and ensure that operators consistently provide required data. To streamline and reduce costs, some agencies try to "templatize" as much as they can - including standardized data formats and data sharing platforms - such that even small jurisdictions can easily examine data trends. Open market applications for data management have helped public agencies store, analyze, and share program data in a more cost effective way than creating custom in-house data management systems, which are very labor intensive. One city transportation official said that data sharing was more complicated for certain modes (robot deliveries, dock-less micro-mobility), and slower for modes that needed to build up a digital infrastructure, such as for-hire taxis:

"There's an invisibility with technology in digital stuff that people don't acknowledge. We were just asked: 'Can we bring this in house, instead of having an outside contractor manage this?' and we're like, 'yeah, give me a database architect, give me a database manager, give me a UX designer, give me a data analyst,' right?"

VEHICLE REQUIREMENTS

Agencies may specify the types of vehicles and their features that operators can deploy based on safety, accessibility, or sustainability goals. States tend to set sustainability requirements for vehicles (e.g., electric vehicle requirements for AVs), and the federal government sets accessibility requirements (e.g., para-transit specifics for micro-transit). Vehicle requirements are especially variable across jurisdictions for micro-mobility, where localities may require certain features to enhance accessibility (e.g., seats) or address local traffic laws (e.g., speed limits, vehicle texts about traffic laws) (see Table 8).

Table 8. Vehicle Requirements

	Speed Limits	Vehicle Type Specifications	Vehicle Feature Specifications	Vehicle Text Specifications	LI-Ion Battery Regulations	Manufacturing Sustainability Regulations	Electric / Zero Vehicle Requirements	Vehicle Age	Trade Markings	Vehicle Testing
Definition	Limits to vehicle speeds, for entire fleet or trips meeting select conditions (e.g., user's first ride, in certain area or time of day)	Specific vehicles that must/should be used (e.g., only use one type of vehicle; percentage of seated vehicles in the fleet)	Specifications vary highly by place and may include bells, wheels and tires of a specified size, steering wheels.	Vehicles must include specified text on them such as regulator/ operator phone numbers, info about helmets and sidewalk riding, etc. May require multiple languages and/ or Braille	Lithium-Ion batteries are purchased and maintained with safety standards in mind	Vehicles are manufactured in a sustainable manner, or that operators create a plan to do so	Operators provide a set proportion of their fleet as electric vehicles. Often specifies that proportion will increase over time	Maximum vehicle age	Distinctive signage identifying a TNC or AV must be approved by city and on display in all operating vehicles	Requires in-service testing and inspection of all vehicles and systems.
Relevant Modes										
Micromobility	Y	Y	Y	Y	Y	Y	–	–	–	Y
Microtransit	–	–	–	–	–	–	Y	–	–	Y
AVs	Y	Y	Y	Y	–	–	Y	Y	Y	Y
TNCs	–	Y	–	–	–	–	Y	Y	Y	Y

Table 8. continued

	Speed Limits	Vehicle Type Specifications	Vehicle Feature Specifications	Vehicle Text Specifications	LI-Ion Battery Regulations	Manufacturing Sustainability Regulations	Electric / Zero Vehicle Requirements	Vehicle Age	Trade Markings	Vehicle Testing
Costs and Benefits										
Benefits	Prevents crashes (and property damage and injury) for users; reduces liability for operators; politically easier for public officials; reduces risks to pedestrians	Helps public agency meet accessibility targets for people who can only ride sitting; can increase political acceptability	Helps public agency meet accessibility targets; adapt fleets to local road and weather; ensures minimum quality for vehicles to keep users safe	Addresses emergency assistance for users; may improve safety; provides traffic law education to users; reduces liability for public agency and operator	Addresses public safety threat	Environmental sustainability	Environmental sustainability	Enhances rider safety or experience	Clear identification of TNC vehicles	Improves passenger perception; reduces long-term liability risk
Costs	Depending on speed limit and sidewalk availability, may cause riders to feel less safe traveling at lower speeds than nearby vehicles	May reduce options for users; may require operators to provide vehicles that are not used; may add costs to require specialized vehicles	Add costs for operators; may not be necessary for road conditions; vehicle specifications may not meet user preferences (e.g., seats) or use (e.g., helmet)	May not address root safety issues; may add costs for operator to manufacture vehicles if vehicles in different jurisdictions requires different language	Adds costs for operator.	May add vehicle manufacturing costs for operator	Limits number of eligible vehicles; higher upfront costs; potentially reduced capacity with charging needs	Limits number of eligible vehicles	Increase costs related to approval and providing appropriate markings to drivers	Increases start-up cost; potentially adds to launch complexity and delay

VEHICLE, MAINTENANCE, AND SEASONAL REQUIREMENTS

Agencies issue maintenance requirements to safeguard against faulty or unsafe vehicles, and to ensure a reliable service with timely repairs (see Table 9). Either state or local agencies may impose these requirements, depending on which level of government regulation. Micro-mobility operators face additional requirements related to the vehicles used to rebalance and service micro-mobility vehicles, such as the type of vehicle and where it can park. Additionally, micro-mobility and shared AVs may be subject to seasonal restrictions, such as preventing operations during colder and wetter seasons to minimize crash risks.

Vehicle requirements may address public safety concerns, disability access, sustainability goals, and service reliability issues (see Table 9).

Safety is a common motivating factor for regulators requiring certain vehicle specifications. Agencies may require vehicle features to reduce risk or ensure riders abide by traffic laws. For example, cities and states may require speed limiters on e-scooters that prevent them from traveling faster than state law permits. Agencies may also require operators to educate riders about the rules of the road, such as by labeling vehicles with certain traffic laws or requiring riders to take a brief quiz before their first trip.

In jurisdictions with environmental sustainability goals, operators may be required, or recommended to adopt, zero emission vehicles, or to ensure that vehicles are relatively new and less pollutive. “Clean” vehicle requirements benefit the broader public by reducing tailpipe emissions. But zero emission requirements may also add significant operational and infrastructure costs for operators. Electric vehicles cost more to produce than internal combustion engines, and require longer to fuel. Operators across modes must therefore establish charging infrastructure (and potentially additional land use permits), and adjust operating schedules or models to support frequent vehicle charging. If the public agencies do not assist with providing charging infrastructure, operators may reduce fleet sizes and/or pass costs onto consumers.

Certain vehicle specifications and maintenance standards may address accessibility and consumer protection goals. Some regulations require operators to routinely service and test their vehicles to prevent consumers from handling unsafe, unreliable or unclean vehicles. Regulations may also require operators to provide vehicles for disabled riders, including wheelchair accessible vehicles for TNCs or AVs, and seated scooters for shared micro-mobility

services. Vehicle feature requirements may compel operators to provide a certain vehicle type regardless of consumer demand. Early in micro-mobility history, cities often set fleet-wide requirements for accessible vehicles. Operators reflected that early requirements felt arbitrary, such as requiring ten percent of a scooter fleet to have seats, whether or not disabled users felt comfortable with seated scooters, or whether that percentage reflected the number of potential disabled users.

Other required vehicle features may be artifacts from earlier technology that no longer apply to newer vehicle types. The National Highway Traffic Safety Administration, for example, caps the number of AVs without driver controls (e.g. steering wheels, pedals, mirrors) that manufacturers can sell to 2,500 (Walz, 2025). As a result, most AVs continue to have steering wheels and pedals although riders are forbidden from touching them.

Table 9. Vehicle Maintenance and Seasonal Requirements

	Vehicle (Maintenance) Requirements			Seasonal Availability
	State of Good Repair & Inspection	Maintenance Vehicle Requirements	Maintenance Timeliness Requirements	Operating Season/Weather Requirements
Definition	Vehicles must be kept in state of good repair. May specify particular components of the vehicle to be inspected at a given frequency; others more vague. Often requires inoperable vehicles be removed from right-of-way	Requires operators to maintain vehicles and software, both for vehicles that passengers use and for vehicles used to maintain and rebalance micro-mobility vehicles.	Requires operators to make repairs or remove inoperable vehicles within a defined time period following request	Require operators to only operate vehicles during a defined season, such as the summer, or during "fair weather."
Relevant Modes				
Micromobility	Y	Y	Y	Y
Microtransit	–	Y	–	–
AVs	Y	–	–	Y
TNCs	Y	Y	–	–
Costs and Benefits				
Benefits	Quickly deployed/ modified; single point of accountability; scalable	Mix of scalability and reliability	More operational control; lower upfront costs	Full flexibility; lower operational costs long-term
Costs	Systemic risk with vendors; higher operating costs; limited flexibility	Vendor complexity; coordination costs; mix of different margins	Higher staffing needs; potential limitation on vendors	Highest staffing and coordination costs; limited legacy knowledge

SPATIAL REQUIREMENTS

Spatial requirements for shared mobility enforce where pick-ups, drop-offs, and riding can occur (see Table 10). Typically, spatial regulations impose, or recommend, restrictions on where people can use and store shared vehicles, with the aim to reduce competition with other modes, expand access to the service, maintain a public right of way and reduce crash risks.

Like other regulations, spatial regulations vary by modes and jurisdictions, with the most stringent regulations falling on micro-mobility. Restrictions on TNC and AV use or passenger loading typically aims to reduce competition with other modes, expand access to the service, maintain a public right of way, and reduce crash risks.

In the case of shared vehicles such as TNCs and AVs, spatial requirements may limit where customers can be picked up to avoid competition with the taxi industry. In such cases, the spatial requirements reflect a certain degree of agency capture by established modes, like taxis. The shared mobility service may lose potential customers by limiting where they can operate. Other spatial requirements may reflect equity goals, such as providing discounts (or lower fees) for rides that start in lower-income neighborhoods. Discount zones can create additional operational complexity as either micro-mobility operators rebalance vehicles, or TNCs or AVs deadhead between less and more desirable locations.

Both AVs and shared micro-mobility services are often confined to select operating zones, typically geofenced to prohibit people from using vehicles outside of approved areas. Spatial requirements may limit or impede ridership, however, if too restrictive. For example, if a service area precludes people from traveling to popular destinations, people may opt for a different mode entirely. More fine-grained spatial requirements–such as prohibited sidewalk riding for micro-mobility–likewise create complexity in practice. A micro-mobility operator described the limits of well-intentioned technology requirements, which can both add liability risks for operators and deter customers:

"A number of different tech requirements are well intentioned but end up being harmful to the program. Another example being sidewalk riding…Not only do we have to detect if a rider was on a sidewalk or not, which is not only incredibly challenging to get right – a lot of false positives and a lot of false negatives – but also extremely expensive to implement if you're going to do it right."

The same operator noted that blanket spatial regulations–such as prohibited sidewalk riding–pose challenges in a nuanced and complex world:

"If you were riding next to a 35 mile an hour four lane road with no bike lane, and you chose to get on the sidewalk, you know, I wouldn't probably want to ride again."

Some operators also expressed frustration that cities sometimes used spatial requirements to address highly localized issues rather than broad policy goals. For example, regulators may impose stringent operating limitations in response to a scooter crash, but not invest in creating calmer streets to shift people out of private vehicles.

Some spatial requirements could change drastically depending on which public administrator had authority to make decisions, and what the policy priority of the moment was. One former micro-mobility operator described how cities would quickly change rules over where and when scooters could be used without much explanation or data-driven reasoning:

"Often the people we worked with day to day wanted them to the programs to succeed, but we were stuck between the limits of our own our operations and technology on one side, and then some pretty reactive demands from the police, or there would be one accident that wasn't even caused by a scooter but that just the knee jerk reaction was 'alright now there's no scooters downtown after five o'clock' or something crazy – rules that would come in without looking at the data or considering the pros and cons. And suddenly there would just be a drastic change. And it would be months and months before that could be rolled back or adjusted at all. So I think it was not always clear who was making the decisions, and they'd have all these cities have all these plans about, you know, climate and all that. But when push came to shove, it was just more about perception and reacting to [an] incident."

Table 10. Spatial Requirements

	Geofence	Solicitation
Definition	Digitally identified area that enforces vehicle behaviors, such as slowing (lower speed limit) or stopping vehicles (no ride zone), or prohibiting vehicles from parking outside of designated areas.	Specifies areas where operators cannot solicit passengers
Relevant Modes		
Micromobility	Y	–
Microtransit	Y	Y
AVs	Y	Y
TNCs	Y	Y
Costs and Benefits		
Benefits	Quickly deployed/modified; single point of accountability; scalable	Full flexibility; lower operational costs long-term
Costs	Systemic risk with vendors; higher operating costs; limited flexibility	Highest staffing and coordination costs; limited legacy knowledge

Micro-mobility Parking Requirements

While TNC and AV service areas or loading zones may be restricted in pilot or select cases, micro-mobility parking regulations are by far the most complex among shared mobility modes.

Micro-mobility regulators most commonly aim to ensure accessible rights-of-way, balance vehicle supply and demand, and reduce perceived sidewalk clutter. Most regulations specify one of four parking schema: 1) vehicles must be locked to a fixed object, 2) vehicles must park in certain mandatory parking zones, 3) vehicle may park anywhere (free-floating parking) so long as they do not block the public right-of-way, or 4) a hybrid approach combining two or more of the other structures (see Table 11). Parking regulations are then layered on top of overarching parking structures. Micro-mobility parking requirements often include banning parking within a specified distance of transit stops, on private property, or blocking sidewalks.

While some parking requirements are common–like not blocking sidewalks–others present a contradictory and inconsistent regulatory landscape. Most cities (95 percent) allow e-scooters to park in street furniture/curb zones, but far more ambiguity exists across other locations; 70 percent of cities allow scooters to park against buildings, 62 percent on vegetation or landscaping, and 60

percent against signs (Brown, 2021). Local nuances require costly customized implementation, customer outreach and education, and enforcement strategies within each market aligned with local regulation. Yet it remains unclear if specific regulations are associated with desired outcomes: research suggests that many micro-mobility regulations, including parking and fleet size, do not bear clear connections to parking outcomes such as impeded sidewalk access (Brown et al., 2020).

Regulators may also link parking requirements to financial incentives or penalties. Regulators can offer fiscal incentives for operators to deploy vehicles in prioritized areas. Operators are typically required to display parking information in app. Regulations typically specify fines for operators when users illegally park vehicles. Contracts typically specify fines for operators when users illegally park vehicles.

Some parking requirements are technically simple to comply with, but easily ignored without enforcement. Lock-to requirements, for example, do not guarantee that shared scooters and bikes park where intended or do not block the sidewalk. Vehicles may be "free-locked" (locked to themselves) and still block the sidewalk. Cities may also lack sufficient infrastructure (e.g., bike racks) to lock vehicles to, making it physically impossible for riders to comply with regulations, or spur users to lock to unpermitted objects (e.g., fences). While lock-to requirements aim to–but do not guarantee–preserve clear public rights-of-way, they also substantially increase vehicle manufacturing and maintenance costs, as locks frequently break or may be vandalized.

Other spatial requirements are technically challenging for operators to comply with, despite sounding seemingly straightforward, such as geofencing to prevent riders from using scooters on sidewalks. As one former micro-mobility operator argued that cities may enact spatial requirements to solve problems that are outside an operator's power to solve:

"There's an inclination to hope that the transportation tech company can solve these challenges, when at the end of the day, they're very much just like bread and butter city, urban and transportation planning issues, right? We need more bike lanes. We need slower vehicle speeds. We need more [micro-mobility] parking. [Operators] can't solve those. All of those from a tech perspective [are] something that needs city partnership as well. And in [one city], for example, sidewalk riding requirements ended up – to put it bluntly – kind of tanked the program."

Table 11. Micro-mobility Parking Schema

	Mandatory Drop Zone Discounts	Lock-To	Mandatory Parking Zones	Free-Floating	Hybrid
Definition	Requirements that operators implement specified discounts for riders who return vehicles to specified drop zones	Requires users to secure their vehicles to a fixed object (e.g., pole, bike rack). May be combined with other parking structures	Requires users to park their vehicles in a specific area	Riders may park vehicle anywhere, so long as it doesn't block public right-of-way.	Combination of free-floating and mandatory parking zones
Relevant Modes					
Micromobility	Y	Y	Y	Y	Y
Microtransit	–	–	–	–	–
AVs	–	–	–	–	–
TNCs	–	–	–	–	–
Costs and Benefits					
Benefits	Reduce rebalancing costs for operators; incentivize parking in desired locations; attract riders to certain areas	Reduces sidewalk obstructions; may reduce vehicle theft	Reduces right-of-way obstructions and vehicle clutter in unwanted areas	Provides users flexibility with where to end and start a ride	Combines flexibility of free-floating with required parking locations typically at popular destinations
Costs	Require operators to provide rider discounts	High operators costs; frequent vandalism; may confuse riders and discourage use; adds public enforcement costs	May limit where riders can end rides and inconvenience users; administrative costs of enforcement; operator costs rise with parking fines	May add enforcement or rebalancing costs; can create vehicle clutter or concentrate vehicles in certain areas	Varied scheme across space may create confusion for riders

EQUITY REQUIREMENTS

An equity plan describes how operators will address equity in service. Plans can include vehicle distribution, pricing, payment methods, and in-person outreach. Jurisdictions may require equity plans, suggest them, or provide a fee discount to operators that provide one.

Cities may impose equity requirements intended to expand physical, digital, and financial access to shared mobility services, particularly among people who earn lower-incomes, do not have bank accounts or smartphones, have disabilities or may be excluded from services in other ways (see Table 12). Requirements relate to vehicle distribution, vehicle design, fares and payment, and app accessibility. Most of these requirements apply to all shared mobility modes, although most frequently on micro-mobility services. Others like equity zones, where operators must distribute a proportion of their fleet to target neighborhoods, are imposed only for select shared mobility services (micro-mobility).

Table 12. Equity Requirements

	Distribution Requirements	Payment & Technology Requirements	Fare Requirements	Adaptive Vehicle Requirements	App Accessibility
Definition	Requires a certain number or share of vehicles deployed to predefined equity zones or target neighborhoods.	Services must be accessible without a credit card and/or smartphone	Discounted rates typically available to those earning low incomes. May set a number of free minutes per day, percentage discount, or lower flat trip fare	Requires adaptive vehicles (e.g., wheelchair accessible, 3-wheel trikes, etc.) to be available. May/ may not require all vehicles be accessible. Often measures performance comparing accessible to non-accessible vehicles	Customer-facing apps must meet certain accessibility guidelines, often based on the Web Content Accessibility Guidelines (WCAG)
Relevant Modes					
Micromobility	Y	Y	Y	Y	Y
Microtransit	–	Y	Y	Y	Y
AVs	–	–	–	Y	–
TNCs	–	–	–	Y	Y

Table 12. continued

	Distribution Requirements	Payment & Technology Requirements	Fare Requirements	Adaptive Vehicle Requirements	App Accessibility
Costs and Benefits					
Benefits	Expanding mobility services into priority or under-served areas	Expands access to people who are unbanked or without smartphones; increases potential user base	Reduces price barriers and encourages use by riders earning low incomes.	Expands mobility options for certain disabled riders; may reduce liability for public agency	Increases digital access; can be scaled across programs
Costs	May reflect mismatched supply and demand; added labor, rebalancing, and vehicle costs for operators; adds enforcement cost for regulator; may not increase use if other barriers (e.g., infrastructure) not addressed	Added operator cost to create alternative payment method	Reduces trip revenue for operators; adds administrative costs for operators to verify enrollment and operate program	May not meet varied rider needs; higher operating costs due to driver training & selection; adds costs for operator to provide accessible vehicles; potentially higher wait times/ lower system capacity	Increases start-up cost; potentially adds to launch complexity and delay

Public agencies typically define equity zones or target neighborhoods as those under-served by transportation, home to a disproportionate share of residents with few resources, or that face higher transportation externalities (e.g., areas with higher air pollution, higher rates of poverty, poorly served by existing public transportation, or other socioeconomic factors). Some cities require operators to deploy a certain portion of their fleets in these zones, and/or to provide discounted fares for trips that begin or end in those areas. Not every city identifies equity zones. A public regulator explained their reasoning behind requiring micro-mobility devices be deployed to equity areas, noting that private operators do not prioritize service in these areas:

"In my mind, I say, All right, well, I give you kind of free reign in these areas that are really profitable, and your advertising dollar goes a lot, a lot farther. But as part of that free reign and exclusivity in that area, I need you to have a certain percentage in [a disadvantaged area], where your advertising dollar may be less, but I have a lot of people, and there'll be utilization in the area, and I want to grow [shared mobility] in that region."

About two-thirds of micro-mobility programs in the US impose at least one requirement aimed to increase equitable access and outcomes, with about half (46 percent) mandating more than one requirement (Brown and Howell, 2024). Equity requirements range from process-related requirements (e.g., targeted outreach) to access objectives (e.g., text-to-unlock, cash based fares), and

enforce compliance related to equity (e.g., permit revocation), although only discount ride programs and geographic equity zones seem linked to outcomes in practice (Brown and Howell, 2025).

While operators agree that equity requirements benefit riders and align with operator missions, they also pose logistical and financial challenges. Fleet distribution in equity zones, for example, requires operators to expend resources rebalancing vehicles, sometimes in areas with less demand or where additional barriers must be addressed before people will utilize shared mobility. For example, riders may not feel safe using shared micro-mobility services without protected bike lanes, even if vehicles are available. Some micro-mobility operators said that equity zones do not always align with areas of high demand:

"It is an additional regulatory burden that does not have a direct benefit to the customers, especially if our demand-based systems tell us that people want to be on this side of the street, and we're constantly moving scooters from that side of the street, then you're actually disadvantaging the people we were supposed to be creating a service for, and instead, we're just following the stated rules, as opposed to using technology in a more dynamic way to be able to help people within the Equity Zone, so we lose that flexibility."

Operators identified zone-based discounts as a particularly costly requirement. Operators explained that, in these areas, discounts require prices well below what demand would justify. One micro-mobility operator said:

"There's a number of other equity requirements that cities often have: cash payment, text to unlock. And then maybe most notably would be equity zones, discount zones in particular, [are] a very costly requirement. At least from where I sit, when a city with good intentions implements and requires a discounted fair zone, it's unclear who ends up benefiting. Is it really the people who live there, or is it just anyone who happens to pass through? What's the ROI [return on investment] on what ends up being a business investment? Because again, I'm not aware of any city that subsidizes those trips. So is that really a wise, well thought out policy?"

Rather than offer discounts trips themselves, regulators may require operators to provide discounted fares for certain eligible riders, such as riders whose incomes fall below a certain threshold. Discount ride programs may identify fare structures or amounts, such as a flat fare, a percentage-based discount, a dollar-based discount, or they may provide riders a set number of free minutes or rides per day. Both discount zones and rider-based fare discounts can be

costly for operators, who lose revenue. Some operators expressed a desire for more public subsidy to support equity requirements. One operator stated:

"Putting restrictions on pricing or having specific equity mandates, which I think are really beneficial, but not having funding behind them…if they're putting out a contract and there are specific obligations that we need to meet. Ideally, in order to be comprehensive, we should be able to deliver that through a public subsidy of some sort."

A transportation agency official, however, viewed their role as responsible for ensuring equal access to mobility services:

"Our role is to make sure that everybody has access, not just, you know, this particular customer base…These [tech] companies don't see value in a lot of the communities we as a city, do, and so we often have to force you to do something that you wouldn't otherwise do on your own if you're just using your own money."

One city used data on dock-less micro-mobility locations to enforce equity zones. If the operator did not deploy the required portion of a fleet to an equity zone, the operator would be fined. Others comply with equity requirements even without fines to support a stronger application for a future RFP process.

Shared mobility providers are often required to provide different vehicle types to meet the needs for people with physical disabilities. AV and TNC operators are often required to provide wheelchair accessible vehicles. Currently, AV services offer wheelchair accessible rides, but without the use of autonomous vehicle technology. A driver manually operates the vehicle, and assists riders with entering and exiting the vehicle, as well as securing the wheelchair. Shared micro-mobility operators, by contrast, may be required to offer adaptive vehicles (often via partnerships with local bike shops) or deploy seated scooters.

SAFETY REQUIREMENTS

Regulations are one way that public agencies try to enhance public safety, address public concerns about a new mode, and lessen their own liability in the case of crashes (more on liability in the Liability section).

Cities may require operators to provide safety plans and a range of additional requirements that address risks for riders and the public (Table 13). Safety plans vary based on whether the vehicle is operated by professional drivers (e.g., TNCs and micro-transit), by noncommercial private drivers (e.g., car-share), unlicensed riders not required to verify they have a driver's licenses but who navigate the vehicle (e.g., scooter riders), or automated entirely (riders in AVs). If a user is not required to verify a driver's license, the operator may be required to place more traffic safety instructions in the app or on the vehicle itself.

Safety concerns may motivate a range of related program regulations such as operating times and locations. For example, some regulators limit operating hours to the daytime to ensure better lighting and reduce the risk of inebriated riders.

Safety requirements may address different gaps: an information gap (users don't know traffic laws), a technology gap (the existing technology may be dangerous without additional precautions, such as helmets), and an enforcement gap (without oversight, users may violate traffic laws, like riding on sidewalks). To address an information gap, agencies may require operators to provide safety information to users before using the service, or they may require operators to highlight certain traffic laws (e.g., "no riding on sidewalks") onto the vehicle itself. To address a technology gap, agencies may ask operators to provide extra safety features for users, such as helmets or car seats for children. They can also reduce distracted driving by limiting phone use while operating the vehicle.

Without enforcement, however, safety requirements may have little effect on desired outcomes. Some requirements are much easier to enforce than others. Easiest for public agencies to enforce are requirements that can be tracked with telematics data, which are often shared with regulators to monitor vehicle locations, operating times, and speeds. Requirements that are difficult for users to avoid–such as reading a traffic safety notice before starting a ride or showing proof of license–are also easy and low-cost to enforce. Other safety requirements pose greater challenges to enforcement, particularly ones that regulators don't have sufficient oversight to quickly, automatically, or uniformly identify (e.g., running a stop sign), and ones that riders can easily flout (e.g., wearing a helmet). One transportation agency official observed that police

insufficiently enforced violations like scooter riding on sidewalks or riding without a helmet. An operator similarly noted that some safety measures, like providing free helmets, had little impact on user behavior:

"Cities had another expectation that we'd have local people showing up to events or going to the farmers market or tabling and they always wanted us to do safety events. And we would go give out helmets. And it felt often that was just checking a box…At a certain level that is great. And it is important to give out helmets and teach people about safety. But the people who showed up to those events were not the people who someone would say they saw riding unsafely the next night. So it kind of felt like a lot of effort for optics."

A particularly contentious safety requirement was a sobriety test for micro-mobility riders. After a micro-mobility operator successfully lifted curfew restrictions on their service in one major city, the public agency instead required the operator to install a sobriety test for any rider between the hours of 12am-5am. The operator described how the test opened the operator to additional liability:

"[The] sobriety test [was] implemented within a country that does not have tort reform, and in a city that often shoulders all exposure to the private entity. The city is now requiring operators to implement technology that increases our risk of litigation and the issue there is that we can't tell somebody if they're drunk or not. That's not what we're doing. But if someone is injured after taking that test and passing [and[unlocking the device, they then have an ability to find an ambulance chaser and say [the micro-mobility company] told me that I was sober, and now you have to spend the money to defend that, even though it's a requirement by the city."

Table 13. Safety Regulations

	Safety Plans	Helmet Policies	In-App Safety Education	Nighttime operation requirements	Distracted Driver Avoidance
Definition	Operators must create a plan to ensure that riders comply with traffic regulations and ride safely (e.g., encourage helmets, outreach, and in-app messaging).	Operators must provide free or subsidized helmets, require selfies before a ride, and include in-app messages. This supplements local regulations around helmet use for shared and private vehicles	Operators must provide safety education through apps, which may be required for users to ride. May require users to pass a quiz on safety topics, or to read required information	Operators must enact additional safety requirements when operating at night such as requiring users to complete a reaction time exercise to determine whether they are intoxicated.	Requires that operators take measures to reduce distracted driving, typically by banning texting while working or using an operator-provided phone
Relevant Modes					
Micromobility	Y	Y	Y	Y	–
Microtransit	–	–	–	–	Y
AVs	Y	–	–	–	–
TNCs	Y	–	–	–	Y
Costs and Benefits					
Benefits	Expanding mobility services into priority or under-served areas	Expands access to people who are unbanked or without smartphones; increases potential user base	Reduces price barriers and encourages use by riders earning low incomes.	Expands mobility options for certain disabled riders; may reduce liability for public agency	Increases digital access; can be scaled across programs
Costs	May reflect mismatched supply and demand; added labor, rebalancing, and vehicle costs for operators; adds enforcement cost for regulator; may not increase use if other barriers (e.g., infrastructure) not addressed	Added operator cost to create alternative payment method	Reduces trip revenue for operators; adds administrative costs for operators to verify enrollment and operate program	May not meet varied rider needs; higher operating costs due to driver training & selection; adds costs for operator to provide accessible vehicles; potentially higher wait times/ lower system capacity	Increases start-up cost; potentially adds to launch complexity and delay

REQUIRED PUBLIC OUTREACH

All businesses try to advertise to the public to broaden their customer base; most are not required to. Shared mobility outreach requirements are generally intended to expand people's awareness of a shared mobility program who may not otherwise learn about the service, know how to use it, or face a language barrier (see Table 14). Outreach requirements may include organizing in-person events in specific neighborhoods to share information. Operators may be required or volunteer to provide outreach materials, app options and customer service in languages other than English. Micro-mobility services are most likely to be required to provide community outreach, while other shared mobility services, such as AVs and TNCs, are more likely to voluntarily do so.

Public agencies may require, or operators may voluntarily comply with, measures to engage a broader public. Public outreach can benefit members of the public who otherwise might not have known about, or known how to use, a shared mobility service. Operators may organize outreach events in areas with lower ridership, or places with a higher demand for the service (such as lower rates of private vehicle access), or face barriers to the service. They may ensure their app, customer service, and outreach materials are translated into other languages or are accessible to visually-impaired people. In turn, operators benefit from higher ridership.

Public outreach may be particularly beneficial to operators who face greater public opposition, or run services that people are least familiar with. Shared e-scooters, for example, fit both those characteristics: they excite public anger over right-of-way and pedestrian crash risk, and users may not be familiar with micro-mobility traffic laws or even how to ride them (e.g., can they be used on sidewalks? Must riders wear helmets?). A micro-mobility company may therefore use engagement events to garner more trust from a skeptical public, provide safety tips and gear (e.g., helmets) for riders, and offer vehicles to test for first-time users. Engagement offers companies a way to informally gain "social license" to operate; that is, they win over a public who may worry about the safety or value of a service. One TNC operator said of a successful AV company:

"[The AV company is] a very good example of that. They are trying really hard to not only partner with government agencies on cool regulatory responsibilities, but also social license to operate and doing the right thing and getting out there and meeting the community and helping people understand what's going on."

Public outreach requirements, such as hosting in-person community events, may require operators to expend resources in advertising where they might otherwise not. For example, they can ensure outreach to areas that may yield fewer profits but greater mobility benefits (e.g., neighborhoods with lower median household incomes). The marginal benefit of every public outreach effort may decline the longer a service has been in operation. Some requirements may also be costly and yield limited benefits; a multilingual customer service hotline, for example, can prove extremely costly, but few if any people may utilize it. Other measures may provide operators a way to teach users how to travel safely with their service, or help them gain public trust and support.

Table 14. Public Outreach Requirements

	Outreach Requirements		Language Requirements		Customer Service	Advertising
	Outreach Plans	In-Person Event Requirements	Multilingual Requirements	Non-Voice Support	Contact Requirements	Advertising Related Regulations
Definition	Operators must create a plan to perform outreach to engage communities, generally focused towards engaging those less likely to use services. Plans may include activities such as community events, partnering with community organizations, and targeted marketing.	Operators must run in-person events on a periodic basis (e.g., monthly, quarterly). Some jurisdictions have exacting event requirements (e.g., at identified communities, including specific components, or reporting event attendance)	Requirements that operators provide their service in multiple languages. Many but not all programs identified the languages services must be accessible in.	Requires call centers provide alternatives to voice communications (e.g., relay services or telecommunications devices for the deaf (TDD))	The public must be able to report broken or damaged vehicles or other service issues through a specified method such as a phone number or online system.	Requirements that operators do not place advertisements except for their own service, or that they limit their advertisements in some other manner
Relevant Modes						
Micromobility	Y	Y	Y	–	Y	Y
Microtransit	Y	–	Y	Y	Y	Y
AVs	–	–	–	–	Y	–
TNCs	Y	–	–	Y	Y	Y

Table 14. continued

	Outreach Requirements		Language Requirements		Customer Service	Advertising
	Outreach Plans	In-Person Event Requirements	Multilingual Requirements	Non-Voice Support	Contact Requirements	Advertising Related Regulations
Costs and Benefits						
Benefits	Spreads service awareness; may expand mobility for low-information population, or population with latent travel demand	Expands awareness of service; may expand mobility for people with limited information or latent travel demand	Expands awareness of service; may expand mobility for non native English speakers; improves customer experience	May increase ridership; improves equity outcomes	Provides operator data on local service conditions; speeds process of removing damaged vehicles for residents	Reduce advertising in public space (potential aesthetic benefit); may comply with existing advertising contracts held by a city
Costs	Labor cost for operator to conduct community outreach and create community outreach material	Labor cost for operator to conduct community outreach and create outreach materials	Labor cost for operator to translate material; advertising costs for operators	Increases staffing costs; may increase operating costs	Cost for operator to establish reporting service; cost for operator to respond to service requests/ complaints	Reduces revenue for operators

HIRING REQUIREMENTS

Public agencies may require operators to comply with certain labor stipulations, which include eligibility requirements for workers, preferences for hiring people from select demographic groups, and incentives to hire locally (see Table 15). Modes that require drivers, such as TNCs and micro-transit, require additional standards such as background checks, training, and minimum ages. States and the federal government set commercial driver requirements, whereas state, local and federal agencies may establish eligibility for minority-owned hiring preferences. Local governments may set preferences for local or union hiring.

Hiring requirements can address a number of public policy aims, including safety, economic productivity, and equity aims. Requirements depend on the types of jobs a program might create. When a program requires drivers, such as TNCs and micro-transit, operators face more stringent driver-specific requirements: including background checks to filter for poor driving records or criminal history, minimum age requirements, and additional trainings. In programs that require electric vehicle charging infrastructure, states may require that electricians installing and maintaining chargers have specific certifications.

Public agencies may prefer, reward, or require that operators hire a certain portion of their staff locally, hire union workers, or hire employees rather than contractors. Such hiring preferences may encourage operators to provide more benefits and higher wages to employees, as well as concentrate the employment benefits of a program among local residents. However, higher wage and benefit requirements may raise costs for operators, potentially reducing the number of employees they hire, or discouraging the operator from pursuing an RFP. As one e-scooter operator described:

"Cities wanted to see us with a warehouse in the district or in the zone and hiring employees instead of contractors, but then you didn't know whether you'd have that permit in nine months. That made it really hard."

Hiring requirements can limit the pool of eligible staff, and lead to staffing shortages or higher labor costs, particularly if workers must have additional certification/licensing, or if the local labor supply is already scarce. If the contracts are short-term, hiring requirements may not be worth an operator's time and investment.

When reviewing RFP applications, public agencies may also consider demographic characteristics of operator employees. Agencies may prioritize

operators owned by someone from a minority status, or a woman, or otherwise disadvantaged person. Agencies may have such preferences to further their equity/diversity goals, but it is unclear whether such preferences impact operation quality. Agencies may also prefer operators with more experience, as their past experience may indicate future success in carrying out a mobility program. Such preferences may, however, disadvantage newer operators with potentially more novel technologies or business models.

In some cases the very requirements intended to help smaller, community-based firms can price them out of the application process. One micro-transit operator described an RFP from a public agency: if the operator attained a disadvantaged firm status – a status for minority-owned or small organization size – they would enjoy an advantage in the RFP selection process. However, the process to gain official recognition as a disadvantaged business proved too burdensome, and they were not able to participate:

"Disadvantaged business requirements are hours and hours and hours of work. And I don't know how a smaller firm would even consider applying to that."

Table 15. Hiring Requirements

	Hiring & Labor Plans	M/W/DBE Regulations	Background Check	Training Requirements	Minimum Age	Driver Restrictions	Contractor Experience	Union Neutrality Requirements
Definition	Plan for hiring operating personnel. May prioritize W2 staff over independent contractors, that companies follow "hire local" policies, and for that companies track workforce diversity	Preference for operators that qualify as a Minority-Owned, Woman-Owned, Disadvantaged, etc. Business Enterprise with the regulating jurisdiction	Specifies whether a background check is required for drivers, including the type and frequency of background check required	Mandates additional driver training, such as for human trafficking awareness.	Sets the minimum required age for drivers, typically 18 or 19 years old.	Restricts on who can be a driver. Restrictions include criminal histories, vehicle moving violations, etc.	Requires or prioritizes prospective operators with experience operating a shared mobility service	Requires that operating companies are neutral in the case of a union petition from the union representing agency-employed bus operators
Relevant Modes								
Micromobility	Y	Y	–	–	Y	–	Y	–
Microtransit	Y	Y	Y	Y	Y	Y	Y	Y
AVs	–	–	–	–	–	–	–	–
TNCs	–	–	Y	Y	Y	Y	–	–

Table 15. continued

	Hiring & Labor Plans	M/W/DBE Regulations	Background Check	Training Requirements	Minimum Age	Driver Restrictions	Contractor Experience	Union Neutrality Requirements
Costs and Benefits								
Benefits	May improve employment in service area; may create more job stability for people operating the service	Greater representation of diverse backgrounds among operators.	Enhances rider safety	Enhances rider safety	Enhances rider safety	Enhances rider safety	Potentially reduces long-term costs; reduces tail risk	Better integration or acceptability to transit operator union
Costs	Adds labor costs for operator; local labor market may not meet operator labor needs	Adds complexity to hiring process; identity preference for certain operator may not reflect quality of service	Increased compliance burdens and financial cost for operators; Potential increased cost for riders	Increased compliance burdens and financial costs for operators; Potential increased cost for riders	Limits number of eligible drivers	Limits number of eligible drivers; Increased compliance burdens and financial costs for operators; Potential increased cost for riders	Raises search and coordination costs	Higher operational costs

MICRO-TRANSIT AND TNC SERVICE PERFORMANCE METRICS

Performance metrics refer to specific operating characteristics or metrics operators are required to meet. While some relate to operational service area, maintenance, and fleet deployment, as previously discussed, others are specific to driver-operated services (see Table 16). Performance metrics are most typically found in regulations for TNC and micro-transit operators, and they are typically set by local authorities. RFPs may specify that operators complete a certain percentage of scheduled trips, that average user wait times for rides do not exceed a certain threshold, or set a maximum distance that users must walk to access a vehicle. If an operator fails to meet the performance metrics, their contract may be terminated. However, we found no examples of contracts voided for failing to meet performance metrics, either because the metrics are not sufficiently enforced or because operators are able to meet the requirements. Operators could theoretically ensure that wait times never exceed a certain point by refusing to place customers in line for a ride once wait times hit the maximum.

Public agencies may issue performance metrics to ensure that disabled riders do not suffer prolonged wait times. In some cases, operators may advocate for performance metrics like maximum wait times rather than fleet size requirements for accessible vehicles which may not accurately reflect demand. For example, in New York City, three TNC operators successfully removed a requirement that a quarter of all trips be made by wheelchair-accessible vehicles. In its place, a new rule instead required operators to ensure that eighty percent of all wheelchair-accessible vehicle requests arrive in less than ten minutes, and 90 percent arrive in less than 15 minutes (Grossman, 2018).

Table 16. Performance Metrics

	Average/Max Wait Time	Average/Max Walk Distance	Completion Factor
General Definition	Maximum and average wait times, often a key performance indicator (KPI)	Maximum average and worst-case distance is provided in the contract or RFP as a KPI	Minimum completion factor (percent of scheduled trips that are completed) is provided in the contract or RFP as a KPI
Relevant Modes			
Micromobility	–	–	–
Microtransit	Y	Y	Y
AVs	–	–	–
TNCs	Y	Y	–
Costs and Benefits			
Benefits	Potential vendor accountability	Improved vendor accountability; incentive for better service	Improved vendor accountability
Costs	Goodhart's law - vendors can cancel rides rather than exceed threshold	Goodhart's law; reduced capacity and increased wait times	Obfuscation by vendor of metrics; improper measurement

TECHNOLOGY REQUIREMENTS

Technology requirements refer to digital features that users interact with (e.g., apps) and those only visible to operators and public agencies (e.g., software and trip routing). State and local governments may require operators to provide a certain degree of transparency for users in terms of displaying trip logs, as well as how users can book a trip. Public agencies may require operators to use certain software to ensure agencies can access trip data, and specify the type of information that drivers, dispatchers and supervisors can see (e.g., remove distractions for drivers).

Technology requirements may help public agencies address a number of issues: consumer protection, accessibility, and internal planning and operations. Agencies may set standards for trip planning software in order to plan their other transportation services around the service, to change a service route as needed, or to monitor a service for complying with spatial requirements (e.g., discount zones). Agencies may also require operators to comply with certain routing requirements, such as minimum numbers of pick-up points for vehicles. Operators may be required to comply with certain user-facing app requirements, such as showing riders their routes or different ways riders can book a trip, in order to provide customers with transparency and expand access to the service.

Public agencies may specify that operators use certain software in order to ensure that public agencies such as transportation planners and emergency services are able to easily access their data. Operators incur additional costs when adopting different softwares across contracts. A para-transit/TNC operator, however, said that technology requirements have become more consistent and standardized in RFPs over time. More uniform technology requirements help both agencies and operators reduce costs to sharing and storing data. They do, however, run the risk that agencies become dependent on certain software and delay updating them when private companies have shifted to more efficient or effective technology standards.

Table 17. Technology Requirements

	App Specifications	Stop / Routing Requirements	Dispatch/Staff Requirements	Operator Software Requirements
General Definition	Specifies particular features that the user-facing app must have. Can include the methods by which riders book a route, the languages available in the app, the ability to see trip logs, as well as other features	Requirements or recommendations for the routing of trips and designated pick-up points. Includes the density and minimum number of pick up points	Requirements for software used by dispatchers and other program staff, such as compatibility with agency-owned devices, allowing for operators to manually adjust trips, and to receive alerts regarding service issues or anomalies	Requirements for software to be used by operators. More likely to be present in software-only or separate contract systems. Can include requirements that operators get precise directions for service, receive instructions from supervisors and dispatchers, and that the system does not cause a distraction when operators are driving the vehicle
Relevant Modes				
Micromobility	Y	–	–	–
Microtransit	Y	Y	Y	Y
AVs	–	–	–	–
TNCs	Y	–	–	Y
Cost and Benefits				
Benefits	Improves customer experience	Increased capacity; better integration with existing transit infrastructure	Better integration with existing transit infrastructure	Better integration with existing transit infrastructure
Costs	Potentially increases upfront and operating costs	Planning costs; limitations on ridership	Upfront and technical costs	Upfront and technical costs

LIABILITY AND INSURANCE REQUIREMENTS

Insurance requirements quantify the risk that public agencies think a mode poses. We refer to liability as an umbrella term for a number of different regulations, including bonds and letters of credit, insurance, and indemnification (see Table 18).

States typically set liability requirements to manage various safety issues, particularly crash risks. The specific insurance types depend on the state and the service model. For services with professional drivers, such as TNCs, states may require that both operators and drivers carry insurance, which may vary based on whether a driver is transporting a passenger or waiting to accept a trip request. To manage crash risks, operators often must carry liability insurance, and may be asked to indemnify the regulator or jurisdiction against any damages. Other types of insurance operators may carry include cyber security and worker's compensation coverage. Operators may also be required to carry a performance bond or letter of credit in the event they violate their permit or contract.

Insurance requirements may specify that an operator shows proof they have purchased coverage for a variety of scenarios (an employee gets injured, a rider crashes, private operator data is breached, different phases of a TNC trip) or that they are self-insured for the required coverage. Performance bonds and letters of credit are essentially monetary amounts that operators must show they can pay if they violate their contract. Indemnification protects a jurisdiction from being liable if someone using the mobility service injures themselves or others or damages property. Depending on the mode, the operator may require their contractors to carry additional insurance beyond operator insurance (e.g., TNCs require that drivers also carry personal automobile insurance). See section A2 in the Appendix for tables detailing state insurance requirements by mode.

Micro-mobility and shared AVs operate on two ends of the liability spectrum: the former is operated by an unlicensed and untested user, and the latter is operated by a highly tested, though nascent, algorithm and technology. Micro-transit and TNCs fall somewhere in between, as both are operated by human drivers prone to human error, but drivers must pass various certifications.

Table 18. Liability Requirements

	Performance Bond	Liability Insurance Requirements	Letter of Credit Requirements	Indemnification Requirements	Logged on but not engaged in prearranged ride	Engaged in prearranged ride	Dependency prohibition
Definition	Bond made by an operator to the regulator guaranteeing that they will follow contract terms. The bond may be for a particular amount (which varies substantially), or an amount that adjusts alongside services offered. Often required for a system to operate	Covers hazards within the scope of the insuring agreement up to a specified amount from an insurer. Required during contract. Specific forms of insurance may be required, such as cyber-liability or workers' compensation coverage.	Operators must provide jurisdictions with a "letter of credit" from a bank, which can be drawn upon if they fail to comply with requirements in their permit or contract	Operators must indemnify the permitting jurisdiction against any possible damages occurring as a result of their services, including the operator and its customer's use of public right of way	Insurance requirements that apply when an operator is logged onto the system but has not accepted a ride. Usually specifies amounts of insurance required for death, bodily injury, and property damage.	Insurance requirements that apply from the start/end of a prearranged ride. Usually specifies amounts of insurance required for death and bodily injury, and property damage.	Provisions sometimes included in state law that prohibit operators from requiring drivers to use personal insurance before using the operator- provided insurance.
Relevant Modes							
Micromobility	Y	Y	Y	Y	–	–	–
Microtransit	–	Y	Y	Y	–	–	–
AVs	–	Y	–	–	–	–	–
TNCs	–	–	–	–	Y	Y	Y

Table 18. continued

	Performance Bond	Liability Insurance Requirements	Letter of Credit Requirements	Indemnification Requirements	Logged on but not engaged in prearranged ride	Engaged in prearranged ride	Dependency prohibition
Costs and Benefits							
Benefits	Provides agency financial certainty for any damages if the operators breaks contract	Provides agency financial certainty for any damages if operators breaks contract	Provides agency financial certainty for any damages if operators breaks contract	Reduces costs for regulators in case service users damage property or get/cause injury; creates legal and operational clarity	Added potential financial payments for crash victims	Added potential financial payments for crash victims	Protects drivers from personal liability
Costs	Adds operator costs	Adds operator costs	Adds operator costs	Adds operator costs which they may or may not be at fault for; potentially fewer vehicles in service	Added financial cost to operators; Potential increased cost for riders	Added financial cost to operators; Potential increased cost for riders	Added financial cost to operators; Potential increased cost for riders

Insurance requirements constitute a significant expense for shared mobility operators. As one micro-mobility provider put it:

"Insurance and indemnity: no one really talks about this, but it's hugely influential, not only in terms of the premiums we have to pay for insurance, but also the legal exposure that we take on."

Similarly, another private operator described the role that local governments can play in raising liability costs for operators:

"Sometimes the city would require us to indemnify them.. Insurance requirements can be pretty excessive.. And that cost does directly circle back to the city."

Each time an operator starts a service in a new jurisdiction, they must expend legal resources to ensure they are complying with that specific area's liability requirements. Some jurisdictions carry much more onerous requirements for particular modes. For example, one TNC operator described having to carry uninsured/underinsured motorist insurance, a kind of insurance that applies when a TNC driver is involved in a crash caused by someone who was not themselves insured:

"Different markets require wildly different sets of insurance requirements. Uninsured Motorist Insurance, for example, where [a TNC company] is required to hold insurance for other people who don't hold insurance is incredibly costly and driving up prices dramatically."

Insurance requirements can vary significantly across jurisdictions and across service models (see Appendix A2). On average, TNCs must carry the highest insurance. However, while the highest insurance requirements for TNCs in a particular state is $1.5 million, the highest insurance requirement for a single jurisdiction across all modes is Seattle's shared micro-mobility program, which requires $10 million in general liability insurance. Additionally, two states (California and Tennessee) require AVs to carry $5 million in liability insurance. We found no significant differences in insurance minima between states with operating shared AV services and states without them.

Several reasons may explain higher insurance requirements for certain modes: agencies may be risk averse, and without having sufficient safety data, may require high amounts of insurance coverage. Agencies may also use liability

requirements to effectively price out service models they are wary of. In the case of shared e-scooters, for example, the State of California added statutory requirements for operators to carry insurance that would cover injuries in e-scooter crashes caused through no fault of the company, including by the rider's own negligence (AB 371). A micro-mobility operator described the particularly high costs of obtaining insurance coverage in California:

"I know we were battling California insurance regulation in the past, and generally speaking, e-bike insurance costs are significantly higher than pedal bike insurance costs. And for the most part, it doesn't really make sense. It's almost like the insurance industry was trying to find a way to bite into the growth of shared micro-mobility. And it's crazy that sometimes our costs are higher than auto rates."

How states and local governments set liability requirements like insurance minima can be somewhat of a black box. TNC, micro-transit and micro-mobility operators we spoke with were frustrated that insurance requirements did not clearly align with actual risks of a service. In one instance, a micro-transit operator held a deductible worth five times as much as the required deductible for a state-funded shared mobility grant program. The grant administrators told the operator they needed to lower their deductible to meet state requirements. A lower deductible neither helped the city nor the grant funder, but repeated back-and-forth conversations between grant administrators and the operator's lawyers did increase the operator's costs. When the micro-transit operator asked the state to accept their higher deductible, they were frustrated by bureaucratic processes:

"We've had to get our brokers to talk directly with people on the grant side who often don't even know why things are written the way they are. It's just whatever state rule that's the side that can't budge. And it just creates a lot of needless back and forth that nobody in the calls is responsible for, but just dealing with."

Whether out of political aversion, or due to higher risk profile, localities can require additional liability requirements for shared mobility programs they deem risky, over and above what the state might require. In some cases, the agencies that set liability requirements may add requirements that go beyond a state minimum, either because they are not familiar with state statute, they miscategorized the service model, or they felt the liability requirements should be higher. A para-transit TNC operator described successfully pushing back on insurance requirements that public agencies had added over and beyond state requirements:

"[Para-transit] insurance requirements is also one that we usually push back on... in a third of the contracts, the agencies have not done the research and don't recognize that there are already existing kind of insurance requirements or the TNC industry have its own insurance policies, and so that's a lot to push back [on], but most of the time they'll issue insurance requirements that are aligned with state statute...it's like a million [dollar] coverage, and that's pretty standard, I think, across all states, unless state statute requires something higher than it may be different."

In other cases, agencies require standardized insurance that may not be logical for a certain service model. One micro-mobility operator described having to push back against city requirements that didn't apply to their service model but were included in standard contract language for the city:

"..insurances we had never heard of before that were not applicable to us… [such as] protecting against [the] risk of being hit by a train while working on our product, which is not near the train tracks. So we had to really be strong and firm and force the town to make exceptions, which took time."

Elevated insurance rates include high required minima, and may also reflect a limited insurance market for newer transportation technologies. A city transportation administrator said, when discussing insurance requirements:

"It's tough to balance that out, because what you see in these markets are limited insurance carriers, and that means your prices are sky high for the insurance but then you have, like, a city that's like, 'No, we need sky high insurance'."

For particularly disruptive business models with the least precedent, such as shared AVs, operators may assume that the longer the service operates, and the more safety data the operator collects, the lower insurance premiums will become over time, as one operator described:

"In the grand scheme of things, given the amount of money that's being poured into autonomous technology and the cost structure that exists. I think from an insurance perspective, the industry, to a large degree, kind of accepted the fact that it's expensive at the start, and it's going to get better over time."

However, we found limited evidence that either insurance minima nor insurance premia (what an insurance company charges) fall over time. Once insurance

requirements are set, those policies are sticky. Among all fifty states, we found just two that changed their AV insurance requirements over time (Arkansas increased their insurance minima to $750,000 and Nevada reduced their rates to $1 million). Similarly, we found only three instances where states changed insurance requirements for TNCs when a driver is engaged in a ride (Nevada and North Carolina reduced their requirement to $1 million, and Arizona increased to $1 million).

Insurance companies tended to only increase premiums for shared mobility operators over time. In part, high insurance premiums reflect a limited and changing marketplace for shared mobility insurers. Small operators in particular may be priced out of business by insurance costs alone. Operators with large fleets can better afford high insurance costs, and thus may benefit when smaller competitors exit the market. A micro-mobility operator described the volatile insurance marketplace and rising premiums, and their impact on small operators:

"It's rapidly changing and evolving. I think at a macro level, the risk tolerance is always changing for insurance brokerages. The players involved are always changing. We have a broker who's been a really strong partner and who we trust, but still, I know our premiums were 10 times last year what they were the year prior…We've heard it across the board. We've seen smaller players really struggle, sometimes go out of business, due to the insurance costs… We started doing a lot more, what we call IHOP, internally operated in-house markets, and that changed the business description in the eyes of our broker. So that was difficult for us. [In] California, we see much higher requirements. I think $5 million per occurrence requirements versus the rest of the country, it's typical to see just $1 or 2 million, but we have so many California projects that we carry that, and then the rest are easy to meet."

Some liability costs are not specific insurance requirements themselves, but other program requirements that expose an operator to higher risk. For example, indemnification requirements essentially enable cities to legally protect themselves as much as possible from any potential damages and resulting lawsuits in the case of a crash. From the perspective of a public agency, shared mobility services represent new reasons for people to sue the city and drain its budget. As one transportation agency administrator explained:

"This is a risk that you take by operating in the city. Like you offer this product, and if somebody hits a pothole, one could argue, yes, we should have filled that pothole, but ultimately, they wouldn't have hit that pothole if they weren't on your scooter."

From the perspective of private operators, however, indemnification requirements can unevenly shift responsibility away from public agencies:

"Most cities want to hold themselves harmless… If there is a lawsuit from, say, a rider that injures themselves on a rental device on the public street, and maybe they hit a pothole, most casual observers would say the pothole was the city's responsibility, therefore, the city should be responsible for any of the associated damages or costs that come from that type of litigation. Conversely, a casual observer would say, if the brakes on a device did not work in an instant that led to a rider being injured, a casual observer would say that is the company's responsibility. And so, within that casual observance, there's not usually disagreement [about what] the company should be responsible for."

The more that operators are exposed to legal risk, the higher their legal fees can climb. For example, if a city requires a scooter operator to add a sobriety test to limit riding under the influence, then the operator may risk a lawsuit if their technology fails to prevent someone who is not sober from accessing the service. One micro-mobility operator described:

"The city is now requiring operators to implement technology that increases our risk of litigation with zero protections for the city and the issue there is that we can't tell somebody if they're drunk or not…But if someone is injured after taking that test and passing unlocking the device, they then have an ability to find an ambulance chaser and say '[the operator] told me that I was sober', and now you have to spend the money to defend that."

One operator described how legal costs can swamp operating costs, despite high ridership levels and minimal crash incidents:

"You can keep fees as low as possible, but once you see your legal bill at the end of the year, you can then realize that on the compliance side, you are net negative. And you could have had this [high] ridership year. You could have had the best performance ever. You could have had a lower incident rate than the year prior. In a less successful year, everything could go right. And then you look at the legal bill, and you say, this completely consumed any type of operational profit that we thought that we had throughout the year. And so it's destabilizing. Cities continue to make requirements that then create more exposure to the operator, and they're not willing to negotiate on that side. And again, California is probably the best example."

One policy avenue to reduce the liability costs for shared mobility operators

is to enact tort reform, essentially limiting people's ability to sue the company under certain circumstances, or reducing how much compensation they may receive in a lawsuit. However, as one operator stated, jurisdictions with the most successful ridership levels are often those where the political appetite for tort reform is smallest:

"Most of our most successful markets are in states with political climates and political leadership that are typically opposed to tort reform."

Operators may also try to limit their exposure by requiring potential riders to abdicate their right to sue the company in certain circumstances.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

The sheer breadth of shared mobility regulations–not even all covered in this report–makes clear how wide-ranging regulations are in type, intent, and stringency. In part, the volume of regulations mirrors the multiple policy goals that public agencies try to address with regulation (Pinski et al., 2025). Agencies want to protect public safety, reduce air pollution, boost local employment, and a number of other goals we outline. Yet operators may not be able to influence each outcome, and some policy goals are more costly to address than others. Interviewed operators were willing to pursue these public policy goals, but stressed that they wanted a stronger public partnership to ensure requirements were reasonable in cost, maximized longer-term city and operator benefits, and were evidence-based rather than arbitrary.

A number of factors explain broad variation in regulations across modes and jurisdictions. One key factor is public agency demand: if an agency, or particular official, wants a mobility program to operate, they may ask for fewer or more lenient requirements, and may even speed up the permitting process. If agencies try to accomplish too many goals outside of expanding mobility, however, they may add costs for operators and users that ultimately reduce the transportation benefits of a service (Pinski et al., 2025). For example, public agencies may require union or local hiring, or specify vehicle features, which can affect costs and ridership outcomes.

A second key factor that determines regulatory variation is the locus of government. The higher the level of regulation (e.g., state rather than city), the more uniform regulations are across space and programs. More localized regulatory control, by contrast, yields more varied requirements across place. Unsurprisingly, shared mobility operators often seek state regulations and state preemption to avoid tailored services that meet local requirements but prove costly without scale.

A third factor in the shared mobility regulatory landscape is service model maturity. Often, the more a model matures, the more that cities and states can mimic the already-tested regulations they see elsewhere. Jurisdictions can

adapt a statute or contract and adjust it as needed to fit their local context. Nonetheless, many jurisdictions may still ask for "boutique" services, with unique requirements that operators may need to expend legal, administrative, and technical resources to comply with. Some jurisdictions may have particularly costly additional requirements for operators to qualify for a permit, such as a particular form of insurance.

Finally, the less a new technology fits the existing regulatory framework, the more differences we may see in how agencies choose to regulate the new mode. A "disruptive" transportation technology is one that may not clearly fit into existing regulatory categories. For example, TNC companies initially exploited their ambiguous status as a technology platform to avoid taxi regulations. In California, TNCs successfully avoided local bans by winning state preemption. When e-scooters launched, cities tried to avoid a similar fate. E-scooters were initially in a state of regulatory limbo; they did not neatly fit into existing municipal codes. Local governments, who were the first to respond to e-scooter services, reacted in various ways. Most cities created new statutes, others banned e-scooters entirely (Catlin, 2022), and others (e.g., Santa Monica, California) categorized e-scooters temporarily under vendor laws, which helped localities maintain regulatory authority over the mode while they formalized statutory definitions for shared micro-mobility.

Regulations may change over time. Early on, public agencies often experiment with regulations for a shared mobility service via pilot programs. Pilot programs provide operators with formal permission to operate, and offer local governments the opportunity to see which requirements work and which don't, and whether the service model can meet their public goals. However, even pilot regulations can quickly become sticky. We found that state statutes such as insurance requirements rarely change once passed, and that when local governments changed regulations for a shared mobility program, they often removed certain requirements only to add new ones.

Multiple avenues for future research exist to build on these study findings. Transportation's regulatory framework is generally understudied, in part because regulations, particularly local ones, are so wide-ranging and change over time. Future studies could more comprehensively catalogue Requests for Proposals, as well as service contracts, to measure exactly how much requirements change across jurisdictions, by service model, and over time. Additionally, future studies could estimate a dollar amount that each regulation costs operators and public agencies to comply with, although these values may be both business-sensitive and challenging to estimate even for operators with full data; this is because many service elements are entwined, so isolating the cost of one service element from others may prove challenging or impossible.

Our study is limited to the costs and benefits of regulations that public agencies set. Future research could better understand the costs to public agencies to ensuring that a new transportation technologies can operate safely, be it the process to set regulations and to monitor compliance, or the cost to improve public infrastructure for riders to use the service (e.g., restriping streets for AVs to operate). Our study also does not measure the extent to which operators comply with regulations, which may be an important topic for future work. Another emerging area for research in shared mobility is goods delivery; future work could explore regulatory environments for modes such as delivery robots. Finally, research is needed to better understand how regulations relate to land use for shared mobility, and the ways the operators may try to circumvent onerous requirements such as electric charging infrastructure permits and parking requirements and restrictions.

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APPENDICES

APPENDIX A1. STUDY SOURCES

A1.1 Requests for Proposals, Government Guides, and ArcGIS StoryMaps

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APPENDIX A2. INSURANCE REQUIREMENTS BY MODE

Table A2.1 Car-share Insurance Requirement Examples

Bill Name	State	Year Passed	Liability Limit (Relative to conventional)	Rental Car Limits (property)	Non-Commercial Passenger Limits	Who is primary?
AB 1871	California	2010	3x	30/60/15K	30/60/15K	Provider
SB 90	Colorado	2019	1x	25/50/15K	25/50/15K	Provider
HB 1362	Indiana	2019	3x	25/50/25K	25/50/25K	Provider
LD 1615	Maine	2019	3x	50/100/25K	50/100/25K	Provider
SB 743	Maryland	2018	1x	30/60/15K	30/60/15K	Provider
HB 166	Ohio	2019	1x	25/50/25K	25/50/25K	Vehicle owner
HB 3149	Oregon	2011	3x	25/50/20K	25/50/20K	Provider
HB 2384	Washington	2012	3x	25/50/10K	25/50/10K	Provider
S05941	New York	2025	25x	25/50/10K	25/50/10K	Provider
HB445	Texas	2021	1x	30/60/25K	30/60/25K	Provider
S2236	Massachusetts	2022	1x	20/40/5K	20/40/5K	Provider
HB 2903	Illinois	2011	4x	25/50/15K	25/50/15K	Provider
S224	Missouri	2025	1x	25/50/25K	25/50/25K	Provider
SB386	Wisconsin	2023	1x	25/50/10K	25/50/10K	Provider
HB 2559	Arizona	2015	1x	25/50/15K	25/50/15K	Provider

Table A2.2 E-scootershare Insurance Requirement Examples

Bill Name	State	Year Passed	Private Ownership Insurance?	Commercial General Liability Limits (individual event)	Commercial General Liability Limits (aggregate)	Pedestrian injury/death (individual event)	Damage to device (individual event)
AB 371	California	2022	No	$1M	$5M	$10K	$1K
4-1-8 Ordinance 8423	Boulder, CO	2020	No	$1M	$2M		
G-7113	Phoenix	2022	No	$2M	$1M	$1M	
O-2785	Santa Monica, CA	2024	No	$5M all-in	n/a		
O-180606	Milwaukee, WI	2024	No	$7M all-in	n/a	$100K	
R-21-0304	Denver, CO	2021	No	$1M	$2M	$100K	
TRN-15.01	Portland, OR			$1M	$2M+$2M cyber		
O-2018-021	Albuquerque, NM	2024	No	$2M	$2M	$1M	
Free-Floating Shared Micro-mobility Program Permit Requirements – Version 4.5. (June 2024)	Seattle, WA	2024	No	$10M	$10M		
24 DCMR 3310	Washington, DC	2025	No	$1M	$2M	$1M	

Table A2.3 E-bikeshare Insurance Requirement Examples

Bill Name	State	Year Passed	Private Ownership Insurance?	Commercial General Liability Limits (individual event)	Commercial General Liability Limits (aggregate)	Pedestrian injury/death (individual event)	Pedestrian injury/death (aggregate) injury/death (individual event)
	California		No	$1M	$5M		
4-1-8	Boulder, CO	2020	No	$1M	$2M		

Table A2.4 State Insurance Requirements for Shared Autonomous Vehicles

State	Code Section	Year passed	Insurance requirements	Liability Limit (Relative to conventional)	Non-commercial passenger limits
Alabama	Code of Ala. § 32-9C-4	2024	$1,000,000 per accident for death, bodily injury, and property damage to a third party.	10x	25/50/25K
Arizona	A.R.S. § 28-9702	2021	25/50/15K	1x	25/50/15K
Arkansas	A.C.A. § 27-51-2002	2021	$750,000	7.5x	25/50/25K
California	Cal Veh Code § 38750 & Cal. Code Regs. tit. 13, § 227.08	2012	$5,000,000	47x	30/60/15K
Colorado	C.R.S. 42-4-242	2017	25/50/15K	1x	25/50/15K
Florida	Fla. Stat. § 627.749	2019	$1,000,000 for death, bodily injury, and property damage	50x	10/0/10K
Georgia	O.C.G.A. § 40-8-11	2017	100/300/50K	4.5x	25/50/25K
Iowa	Iowa Code § 321.516	2017	20/40/15K	1x	20/40/15K
Kansas	K.S.A. § 8-2903	2022	25/50/25K	1x	25/50/25K
Kentucky	KRS § 186.766	2024	$1,000,000	11x	25/50/10K
Michigan	MCLS § 257.665	2013	20/40/10K	1x	20/40/10K
Mississippi	Miss. Code Ann. § 63-35-11	2023	25/50/25K	1x	25/50/25K
Nebraska	R.R.S. Neb. § 60-3304	2018	25/50/25K	1x	25/50/25K
Nevada	Nev. Rev. Stat. Ann. § 482A.060	2013	$1,000,000	10.5x	25/50/20K

North Carolina	N.C. Gen. Stat. § 20-401	2017	30/60/25K	1x	30/60/25K
North Dakota	N.D. Cent. Code, § 39-01-01.2	2019	25/50/25K	1x	25/50/25K
Oklahoma	47 Okl. St. § 1704	2022	$1,000,000	10x	25/50/25K
Pennsylvania	75 Pa.C.S. § 8508	2022	$1,000,000	20x	15/30/5K
South Dakota	S.D. Codified Laws § 32-41-4	2024	25/50/25K	1x	25/50/25K
Tennessee	Tenn. Code Ann. § 55-54-102	2017	$5,000,000	50x	25/50/25K
Texas	Tex. Transp. Code § 545.454	2017	30/60/25K	1x	30/60/25K
Utah	Utah Code Ann. § 41-26-107	2019	30/65/25K	1x	30/65/25K

Table A2.5 State Insurance Requirements for Transportation Network Companies

State	Code Section	Year Passed	Insurance requirements: Logged on but not engaged in prearranged ride	Insurance requirements: Engaged in prearranged ride	Uninsured Motorist insurance required in amount different than non-commercial passenger limits	Liability Limit (Relative to conventional when logged on)	Liability Limit (Relative to conventional when engaged)	Non-commercial passenger limits
Alabama	Code of Ala. § 32-7C-2	2016	50/100/25K	At least $1,000,000 for death, bodily injury, and property damage	N/A	1.75x	10x	25/50/25K
Alaska	Alaska Stat. § 28.23.050	2017	50/100/25K	At least $1,000,000 for death, bodily injury, and property damage	N/A	1x	5.7x	50/100/25K
Arizona	A.R.S. § 28-4038	2015	25/50/20K	$1,000,000	$25k per person; $75 k per incident	1x	11x	25/50/15K

Arkansas	A.C.A. § 23-13-709	2015	50/100/25K	At least $1,000,000 for death, bodily injury, and property damage		1.75x	10x	25/50/25K
California	Cal Pub Util Code § 5433	2014	50/100/30K	$1,000,000	$1,000,000	1.75x	9.5x	30/60/15K
Colorado	C.R.S. 40-10.1-604	2014	50/100/30K	$1,000,000	$250 k per person; $400 k per occurrence	2x	11x	25/50/15K
Connecticut	Conn. Gen. Stat. § 13b-120	2018	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Delaware	2 Del. C. § 1908	2015	50/100/25K	$1,000,000	$100,000 when non engaged in prearranged ride; $1,000,000 when engaged in prearranged ride	2x	11.7x	25/50/10K
Florida	Fla. Stat. § 627.748	2017	50/100/25K	$1,000,000	N/A	8.75x	50x	10/0/10K
Georgia	O.C.G.A. § 33-1-24	2015	100/50/50K	$1,000,000	300/100/25k	2x	10x	25/50/25K
Hawaii	HRS § 431:10C-703	2016	50/100/25K	$1,000,000	N/A	2.5x	14.3x	20/40/10K
Idaho	Idaho Code § 41-2519	2015	50/100/25K	$1,000,000	N/A	1.9x	11.1x	25/50/15K
Illinois	625 ILCS 57/10	2015	50/100/25K	$1,000,000	N/A	1.8x	10.5x	25/50/20K
Indiana	Burns Ind. Code Ann. § 8-2.1-19.1-8	2015	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Iowa	Iowa Code § 321N.4	2016	50/100/25K	$1,000,000	N/A	2.3x	13.3x	20/40/15K
Kansas	K.S.A. § 8-2708	2015	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Kentucky	KRS § 281.655	2015	50/100/25K	$1,000,000	N/A	2.1x	4.1x	25/50/10K
Louisiana	La. R.S. § 45:201.6	2015	50/100/25K	$1,000,000	N/A	2.5x	14.3x	15/30/25K
Maine	24-A M.R.S. § 7303	2015	50/100/25K	$1,000,000	N/A	1x	5.7x	50/100/25K
Maryland	Md. Public Utilities Code Ann. § 10-405	2015	50/100/25K	N/A	N/A	1.7x	N/A	30/60/15K

Massachusetts	ALM GL ch. 175, § 228	2016	50/100/30K	$1,000,000	N/A	2.8x	15.4x	20/40/5K
Michigan	MCLS § 257.2123	2016	50/100/25K	$1,000,000	N/A	2.5x	14.3x	20/40/10K
Minnesota	Miss. Code Ann. § 77-8-15	2015	50/100/30K	$1,500,000	N/A	1.6x	13.6x	40/60/10K
Mississippi	Miss. Code Ann. § 77-8-15	2016	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Missouri	§ 379.1702 R.S.Mo.	2016	50/100/25K	$1,000,000	N/A	2.1x	11.8x	25/50/10K
Montana	69-12-343, MCA	2015	50/100/25K	$1,000,000	N/A	1.8x	10.5x	25/50/20K
Nebraska	R.R.S. Neb. § 75-333 -334	2015	25/50/25K	$1,000,000	N/A	1x	10x	25/50/25K
Nevada	Nev. Rev. Stat. Ann. § 690B.470	2015	50/100/25K	$1,000,000	N/A	1.8x	10.5x	25/50/20K
New Hampshire	RSA 359-U:8	2023	50/100/25K	$300K	N/A	1.75x	3x	25/50/25K
New Jersey	N.J. Stat. § 39:5H-10	2017	50/100/25K	$1,500,000	$1,500,000	1.75x	15x	15/30/5K
New Mexico	N.M. Stat. Ann. § 65-7-8	2016	50/100/25K	$1,000,000	N/A	2.1x	11.8x	25/50/10K
New York	NY CLS Veh & Tr § 1693	2017	75/150/ 25K	$1,250,000	$1,250,000	2.9x	14.7x	25/50/10K
North Carolina	N.C. Gen. Stat. § 20-280.4	2015	50/100/25K	$1,000,000	N/A	1.5x	8.7x	30/60/25K
North Dakota	N.D. Cent. Code, § 26.1-40.1-03-.04	2015	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Ohio	ORC Ann. 3942.02	2015	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Oregon	HB 3023	2019	50/100/25K	$1,000,000	N/A	1.8x	10.5x	25/50/20K
Pennsylvania	66 Pa.C.S. § 2603.1	2016	50/100/25K	$500,000	N/A	3.5x	10x	15/30/5K
Rhode Island	R.I. Gen. Laws § 39-14.2-14	2016	50/100/25K	$1,500,000	N/A	1.75x	15x	25/50/25K
South Carolina	S.C. Code Ann. § 58-23-1630	2015	50/100/50K	$1,000,000	N/A	2x	10x	25/50/25K

South Dakota	S.D. Codified Laws § 32-40-8 - 9	2016	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Tennessee	Tenn. Code Ann. § 55-12-141	2015	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Texas	Tex. Ins. Code § 1954.052-053	2015	50/100/25K	$1,000,000	N/A	1.5x	8.7x	30/60/25K
Utah	Utah Code Ann. § 13-51-108	2015	50/100/30K	$1,000,000	N/A	1.5x	8.3x	30/65/25K
Vermont	23 V.S.A. § 750	2018	50/100/25K	$1,000,000	N/A	2.1x	11.8x	25/50/10K
Virginia	Va. Code Ann. § 46.2-2099.52	2015	50/100/25K	$1,000,000	N/A	1x	10x	50/100/25K
Washington	Rev. Code Wash. (ARCW) § 46.72B.180	2015	50/100/30K	$1,000,000	$1,000,000	2.1x	11.8x	25/50/10K
West Virginia	W. Va. Code § 17-29-8	2016	50/100/25K	$1,000,000	N/A	1.75x	10x	25/50/25K
Wisconsin	Wis. Stat. § 440.48	2015	50/100/25K	$1,000,000	N/A	2.1x	11.8x	25/50/10K
Wyoming	Wyo. Stat. § 31-20-107	2017	50/100/25K	$1,000,000	N/A	1.8x	10.5x	25/50/20K

APPENDIX A3. INTERVIEW QUESTIONS

Operators

1. Can you talk about the process to be licensed or permitted in a jurisdiction? What are the types of permits, service contracts, or operating agreements you typically encounter?
2. Does the structure of the overarching regulatory framework (e.g., permit vs service contract) seem to make a difference in either how you approach or experience the process? Can you talk about the time commitment typically required to apply to become licensed/permitted in a jurisdiction? Does your approach/perspective change based on the duration of a permitting period (e.g., one-year pilot vs longer-term contract)?
3. What types of fees do jurisdictions require for shared mobility programs (bike-share, scooter-share, micro-transit, car-share, and public electric charging infrastructure)? How do you view different fee structures (e.g., per trip, per day, etc.) from an operational and overall cost perspective?
4. In addition to the permitting and fees, what other regulatory hurdles do you encounter during either permitting or operations?
5. Which regulations or requirements are particularly time-consuming or otherwise challenging to comply with for shared mobility providers and program administrators, particularly in disadvantaged communities?
6. How do regulations vary across jurisdictions? Are they more, less, or similarly extensive in disadvantaged communities?
7. Is there a kind of “goldilocks” sweet spot for regulations? Is there such a thing as too few regulations to operate somewhere comfortably? At what point are regulations so expensive that you shift elsewhere?
8. Could you offer an example of a situation where you chose not to provide service in an area due to regulations, fees, time or monetary costs?
9. How much time typically elapses between when you submit an application and begin service? What are the typical milestones and what types of delays do you tend to encounter?
10. How might you suggest changing approval processes for shared mobility programs?
11. Do you feel public agencies are sufficiently transparent and communicative with you? Examples of when they are or aren’t?
12. Shared mobility programs sometimes face public oppositions - often for scooter or bike-share programs. When you plan a new program, to what extent - if any - do you expend capital in advertising or other forms of public engagement to get local support for your program

13. Where do you think lobbying is most effective? At the state or local level? And what kinds of issues do you expend the most energy lobbying for reform around? Alternatively, are there cases you've fought in court to address obstacles to program implementation?

Public Agencies

1. Can you talk about the process to be licensed or permitted in your jurisdiction?
    a. How did you select this type of permits/service contracts/operating agreements and has this affected how you approach or experience the process?
    b. Can you talk about the staff time commitment typically required to stand up the application process, review and vet operators, etc.?
    c. How frequently (e.g., every 1 year, 5 years) do you issue permits or equivalent?
    d. What informed your decision around permitted time period?
2. What other public or private stakeholders are engaged in helping to craft regulations?
3. Do you impose any types of fees on operators?
    a. Can you describe them if so?
    b. What was the motivation for these?
    c. What do they fund?
4. How much time typically elapses between when you receive applications and a service begins?
    a. What are the typical milestones?
    b. What types of delays do you tend to encounter?

Insurance Broker

- How much would you say insurance requirements and actual premiums vary across US states? Internationally? What might you attribute that to - time of legislation, political climate, risk profile?
- Do local governments typically add to insurance requirements on top of state minimums?
- What are the specific insurance challenges/costs within shared modes?
- Do you consider insurance requirements to be in line with risk profile?
- What quality is the data we have on risk profile, particularly in micromobility and bike-share?
- Does tort law affect insurance rates?

- What is the typical indemnification requirement (if any) for micro-mobility?
- What creative ways have providers tried to minimize risks and lower costs?
- What changes have you seen over time with regard to insurance requirements?
- Do modes that have professional drivers tend to have higher or lower insurance requirements?
- What are key trends you're seeing related to new mobility technologies and insurance?
- Do you have any insight into the process of how minimum insurance requirements for new technologies are set by law?

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