



# Regulating the Ride: Lessons on the Evolution of Dockless Bikeshare Policy in American Cities

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FINAL REPORT

# REGULATING THE RIDE: LESSONS ON THE EVOLUTION OF DOCKLESS BIKESHARE POLICY IN AMERICAN CITIES

## FINAL PROJECT REPORT

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Sponsorship:  
CTEDD

Institute for Urban Studies

For:

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In cooperation with US Department of Transportation-Research and  
Innovative Technology Administration (RITA)

## Acknowledgments

This work was supported by a grant from the Center for Transportation Equity, Decisions, and Dollars (CTEDD) funded by U.S. Department of Transportation Research and Innovative Technology Administration (OST-R) and housed at The University of Texas at Arlington.

The authors are grateful to the many individuals who agreed to be interviewed as a part of this project. Their insights into the policy process for bikeshare programs were invaluable.

The authors also wish to thank Samantha Bradley, Jinat Jahan, Catherine Osborn, and Ladan Mozaffarian for their invaluable work as research assistants.

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## Technical Report Documentation Page

<b>1. Report No.</b>	<b>2. Government Accession No.</b>	<b>3. Recipient's Catalog No.</b>	
<b>4. Title and Subtitle</b> Regulating the Ride: Lessons on the Evolution of Dockless Bikeshare Policy in American Cities		<b>5. Report Date</b> 3/15/2019	
		<b>6. Performing Organization Code</b>	
<b>7. Author(s)</b> Dr. James Wood; Dr. Shima Hamidi		<b>8. Performing Organization Report No.</b>	
<b>9. Performing Organization Name and Address</b> Center for Transportation, Equity, Decisions and Dollars (CTEDD) USDOT University Transportation Center The University of Texas at Arlington 601 W.Nedderman Dr. Suite 103 Arlington TX 76019-0108 United States		<b>10. Work Unit No. (TRAIS)</b>	
		<b>11. Contract or Grant No.</b>	
<b>12. Sponsoring Organization Name and Address</b> United States of America Department of Transportation Research and Innovative Technology Administration		<b>13. Type of Report and Period Covered</b>	
		<b>14. Sponsoring Agency Code</b>	
<b>15. Supplementary Notes</b> Report uploaded at <a href="http://www.ctedd.uta.edu">www.ctedd.uta.edu</a>			
<b>16. Abstract</b> Throughout the U.S. and elsewhere, a growing number of dock-less bikeshare programs are being launched and managed to varying outcomes. Typically operated by private-sector investors, these programs represent a low-cost and visible means of improving personal mobility for residents and visitors. Still, many cities have allowed the operation of bikeshare programs without a written ordinance or enforceable set of regulatory guidelines to govern the safe and equitable usage of bikeshare within their borders. Limited information has thus far been gathered on how cities regulate bikeshare programs, or the degree to which city officials are willing or equipped to address the issue. This report adapts an existing policy rubric to a national sample of large American cities to document dock-less bikeshare regulations, score them against one another, and place them onto a spectrum of regulation. Using interviews and analyses of local media, this report also explores the experiences and insights gleaned from city bikeshare coordinators and cycling advocates in seven large American cities who have in recent years grappled with how to fairly and effectively regulate dock-less bikeshare programs in the name of safety and the general welfare. Analysis indicates a great many of the largest American cities lack an ordinance governing bikeshare programs, despite nearly all of them having active dock-less bikeshare programs on their streets. Findings indicate the process of regulating dock-less bikeshare programs varies considerably across American cities, with many coordinators and city officials innovating policies that suit their local and most immediate needs, due to a general lack of national best-practices for dock-less bikeshare regulation. Findings also illustrate the growing symbiosis between bikeshare programs and city infrastructure investments. Results also document the vagueness of regulatory language in those cities possessing a written ordinance, with limited verbiage devoted to issues of safety or equity among riders. These findings illustrate a failure on the part of local governments to anticipate or properly manage the growth of dock-less bikeshare providers on their streets. At the same time, the study also highlights a need for more robust and thoughtful bikeshare regulations that are better equipped to advance community goals of safety, equity, and the fair use of the public right-of-way.			
<b>17. Key Words</b> Bikeshare, Transportation Policy, Local Government, Bike/Ped Infrastructure		<b>18. Distribution Statement</b> No restrictions.	
<b>19. Security Classification (of this report)</b> Unclassified.	<b>20. Security Classification (of this page)</b> Unclassified.	<b>21. No. of Pages</b> 51	<b>22. Price</b> N/A

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## Abstract

Throughout the U.S. and elsewhere, a growing number of dock-less bikeshare programs are being launched and managed to varying outcomes. Typically operated by private-sector investors, these programs represent a low-cost and visible means of improving personal mobility for residents and visitors. Still, many cities have allowed the operation of bikeshare programs without a written ordinance or enforceable set of regulatory guidelines to govern the safe and equitable usage of bikeshare within their borders. Limited information has thus far been gathered on how cities regulate bikeshare programs, or the degree to which city officials are willing or equipped to address the issue. This report adapts an existing policy rubric to a national sample of large American cities to document dock-less bikeshare regulations, score them against one another, and place them onto a spectrum of regulation. Using interviews and analyses of local media, this report also explores the experiences and insights gleaned from city bikeshare coordinators and cycling advocates in seven large American cities who have in recent years grappled with how to fairly and effectively regulate dock-less bikeshare programs in the name of safety and the general welfare. Analysis indicates a great many of the largest American cities lack an ordinance governing bikeshare programs, despite nearly all of them having active dock-less bikeshare programs on their streets. Findings indicate the process of regulating dock-less bikeshare programs varies considerably across American cities, with many coordinators and city officials innovating policies that suit their local and most immediate needs, due to a general lack of national best-practices for dock-less bikeshare regulation. Findings also illustrate the growing symbiosis between bikeshare programs and city infrastructure investments. Results also document the vagueness of regulatory language in those cities possessing a written ordinance, with limited verbiage devoted to issues of safety or equity among riders. These findings illustrate a failure on the part of local governments to anticipate or properly manage the growth of dock-less bikeshare providers on their streets. At the same time, the study also highlights a need for more robust and thoughtful bikeshare regulations that are better equipped to advance community goals of safety, equity, and the fair use of the public right-of-way.



## Chapter I: Introduction

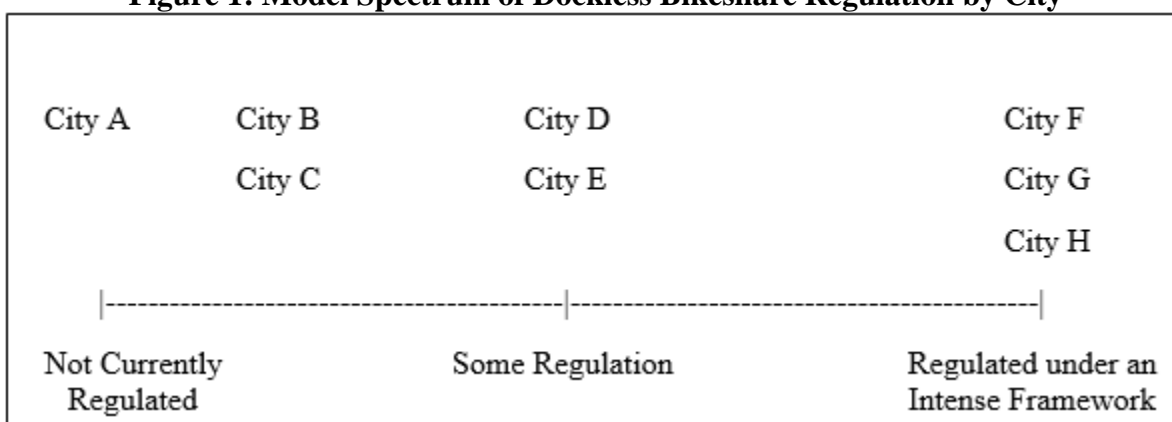
The concept of personal mobility in American cities is currently undergoing radical change, with new entrants such as ridesharing platforms and bikeshare challenging the longstanding dominance of both private autos and publicly-owned transit systems. The bikeshare phenomenon has grown particularly colorful recently, as options have expanded in number and diversity to encompass both traditional docked bikeshare programs and flexible, dockless bikeshare programs. As city officials and community activists seek to expand the transportation menu for residents and visitors, flexible new options such as dock-less bikeshare are emerging as low-cost alternatives to the more traditional public investments in mass transit and improved roadways. At the same time, a wave of private investment from high-tech firms and international consortiums has further reduced the startup and operating costs of dock-less bikeshare programs, which operate without costly docking stations or local administrative staff. Still, despite the early promise of dock-less bikeshare as a solution to America's personal mobility crisis, recent controversies over the management of these vehicles – including extensive media coverage of dock-less bikes being abandoned on sidewalks, in auto parking spaces, and even thrown into waterways and onto rail tracks – have swayed policymakers and elected officials in several American cities to revisit the issue of regulating these dock-less bicycles after their launch on city streets. This notion of regulating after the fact arguably represents a failure on the part of local officials to anticipate the potential risks associated with bikeshare programs, and the authors of this report set out to explore the degree to which officials in various large American cities opt to regulate or not regulate bikeshare programs operating in their public rights-of-way.

Bikeshare has quickly become a captivating topic for scholars of transportation and urban policy. And while the recent boom in bikeshare-oriented research has established several key lessons for practitioners facing these management questions, gaps remain in the literature, and several are addressed by this study. For example, studies have explored bikeshare usage factors among urban residents (Buehler, 2012; Ursaki, J., & Aultman-Hall, 2016), and others have explored equity concerns among lower-income urbanites who might benefit most directly from bikeshare services (Broach et al, 2012; Dill et al., 2014). However, studies investigating the regulatory environment for bikeshare – how public officials view bikeshare, and how they act to regulate it as a form of urban transportation – are comparatively lacking. In addition, studies documenting the full spectrum of bikeshare regulation in American cities are also uncommon and geared toward specific cities and practitioners rather than scholars (Burchfield, 2018). A more comprehensive and objective approach is arguably needed in order to better inform this growing literature. Taken together, these knowledge gaps indicate a clear need for a new approach to documenting and classifying bikeshare regulation frameworks in American cities. The study addresses this knowledge gap through the use of stakeholder interviews, content analysis of regulations and media coverage, and an expanded evaluation rubric borrowed from a more limited study on the topic of bikeshare regulation.

In seeking to understand the regulatory landscape for dock-less bikeshare, scholars must examine city bikeshare policies at a national scale. Given the locally-oriented nature of city

policies and ordinances, truly informative data can only be derived through national-level sampling. Next, a comparative analysis of how different sets of regulations relate to one another must be undertaken. Instead of merely documenting whether a city has policies in place, scholars must take steps to document the relative strength and detail of various dock-less bikeshare policies, and then classify them nationally along a spectrum ranging from “no regulation” to “highly regulated.” This would allow scholars and policymakers to view the true state of bikeshare regulation in American cities, and would represent an original contribution to the base of knowledge about bikeshare as a viable but regulated means of urban transportation. A basic illustration of the proposed Spectrum of Dockless Bikeshare Regulation is provided as Figure 1. More detailed illustrations will follow in subsequent sections.

**Figure 1: Model Spectrum of Dockless Bikeshare Regulation by City**



This project addresses three broad and existing gaps in the knowledge of bikeshare policy in American cities. The first gap, which occurred to the authors during the exploratory phase of the project, is a general lack of knowledge about what regulations and policies currently exist in American cities to govern dockless bikeshare. Also, little has been published about the depth or detail of city bikeshare regulations. In addition, little is known about how these individual city policies compare to one another in terms of common values or frameworks. To address this first gap, the authors thus created a database of bikeshare regulations in American cities. This database included the text of a city’s bikeshare ordinance or relevant written regulations (where present), as well as the specific concepts covered or mentioned within the written text (such as safety, equity, liability, etc.). This gap was addressed in Phase One of the project, and will be explained in greater detail in that chapter.

The second critical knowledge gap addressed by this study concerns the background and history of dockless bikeshare regulations in cities. While a database of regulatory frameworks can document the current state of affairs, it does not in itself probe the political and cultural factors that compelled a city government enact (or not enact, as the case may be) fresh regulations to govern dockless bikeshare programs. The authors view motivation as a critical component of the regulatory process, as it arguably sets the local tone for why and whether a government body may choose to place regulations onto an amenity such as dockless bikeshare. In response to this second knowledge gap, the authors conducted a set of stakeholder interviews with city planners and

cycling advocates in a sample of the cities from the aforementioned database. These interviews, and the related analysis, constitute Phase Two of the project.

Closely related to the second knowledge gap – and an issue that is vital for transportation policymakers to better grasp – is the gap of knowledge surrounding how a city’s bikeshare regulations (or a lack of them) can relate to that city’s broader community goals for bicycle-related infrastructure. The authors came upon this gap while identifying cases and stakeholders for Phase Two, when it became apparent that many of the city officials and cycling advocates who were suitable for interviews were also deeply engaged in setting and/or enacting broader goals for permanent bicycle-pedestrian infrastructure on city streets. Given the intuitive link between policy formation and subsequent public expenditures, the authors felt this area was ripe for richer investigation. This third gap is also addressed via the stakeholder interviews in Phase Two.

This report is thus organized into overarching themes and concepts, as well as two sequential phases of research with independent research methods, results, and implications for practice. Chapter II describes the conceptual framework of the study, as well as the history and critical challenges of bikeshare in an American context. That chapter also illustrates more explicitly the gaps in knowledge and policy surrounding bikeshare regulation – particularly of dockless bikeshare – while setting the stage for the two-phase study itself. Chapter III encompasses the methodology, research questions, and results of Phase One of the project, centered on a database of city bikeshare ordinances/regulations and a comparative/evaluative rubric of the same. Chapter IV covers the methodology, research questions, and results of Phase Two of the project, which is based on the set of stakeholder interviews with individuals from Phase One’s database of cities with dockless bikeshare ordinances and regulations. Chapters V and VI serve to bookend both phases, and feature an analysis of both phases’ results as well as the broader implications for practice and scholarship. Chapter VI also briefly outlines the suggested next steps for both policymakers and scholars, in order to ensure the crises and gaps outlined throughout the report are given an avenue for resolution.

## Chapter II: Background and Conceptual Framework

In seeking to understand the nature of bikeshare, and of bikeshare regulation, in American cities, the authors traced the history of city bikeshare programs and the rules that govern them. A summary of this exploration makes up the bulk of this chapter, providing essential background and context for the subsequent investigation into the specifics of city bikeshare regulations. While conducting the background investigation, the authors found that for several reasons, norms and regulatory best practices associated with bikeshare programs are rather limited compared to other modes of urban transportation. Still, despite the relative newness of bikeshare programs in cities, and the ever-shifting center of responsibility for managing bikeshare fleets, this exploration establishes that regulatory structures do indeed exist in various forms that can be compared to one another and illustrated on a spectrum. The diversity of regulations among these various city-specific structures, combined with the overall lack of national standards for bikeshare regulation, indicates the lessons from individual cities' experiences can indeed fuel the creation of basic national standards and best practices for bikeshare regulation (particularly of dockless bikeshare).

The existence of structured bike-sharing systems can be traced back roughly five decades in Western cities, with distinct “generations” of program maturity and attention to detail (Shaheen, Guzman, and Zhang 2010). However, the subject received only limited scholarly attention until the 2010's, due in large part to delays in bikeshare launch outside of Western Europe (Parkes et al. 2013). Seminal writings on bikeshare programs have arguably been focused primarily on the user's perspective of these offerings, such as rider experiences and preferences, trip types, user safety, health benefits, and so forth (Fishman, Washington, and Haworth 2013; Fuller et al. 2011; Fischer et al. 2009). These studies generally illustrate how bike share programs do (or in some cases, do not advance specific goals of personal mobility, health promotion, and access to alternative forms of transportation (Wang et al. 2016; Buehler, R., & Hamre 2014. Shaheen et al 2010)) delineated the “public interest benefits” of bikeshare programs often pursued or publicly touted by local governments. They include concepts such as reduced vehicle emissions, flexible individual mobility, health benefits, cost savings in transportation, and “last-mile” connectivity to existing forms of transit. Studies examining the actual impacts of these pursued goals exist in a limited and focused amount (Fishman, Elliot, Simon Washington 2012; Murphy 2010). As the scholarly literature of bikeshare programs continues to evolve, questions of day-to-day management as well as long-term effects of programs will surely grow in prominence.

### History of Bikeshare Programs

Formal bikeshare programs date back over 50 years, with the first iteration of bikeshare launching on July 28, 1965, in Amsterdam. This project, named “Provo” after the Dutch activist movement that created it, featured white bicycles painted with the group's name, and offered free bicycles for *Amsterdammers* on a per-ride basis. It was borne not out of a civic desire to grow cycling in the city, but of radical environmental activism. It shuttered after only a few weeks due to theft, vandalism, and confiscation by city authorities (Van der Zee, 2016). The Provo group improved the program over the years, adding locking mechanisms to the bicycles, but usage was limited among city residents. It was, however, popular with celebrities including John Lennon and Yoko Ono, as illustrated in Figure 2. A second generation of bikeshare, crafted by the same minds behind the first experiment, launched in Denmark in 1995. This typology of bikeshare was the first formalized bikeshare program to incorporate a management structure. It featured fixed stations,

coin payment, sturdier bikes, and a nonprofit organization to manage the program and maintain the bicycles. While the program still experienced theft, it had greater usage and a level of civic buy-in than the Provo bikeshare program (Van der Zee, 2016). In 1996, the United Kingdom's Portsmouth University introduced the third generation of bikeshare, which featured electronically-locking racks and bike locks, telecommunication between racks, smartcards and signal fobs for users, mobile phone access, and on-board computers. The Portsmouth program was the first to utilize electronics and user-linked profiles, rather than simply allowing riders to rent bicycles by depositing coins, and was intended to combat the lingering theft issues that plagued the "anonymous" coin-based systems (DeMaio, 2009). Other bikeshare platforms in Western Europe began to adopt these high-tech methods over the next several years, but the concept remained largely a European phenomenon in this time.

**Figure 2: John Lennon and Yoko Ono Demonstrating a Provo Shared Bike, 1969**



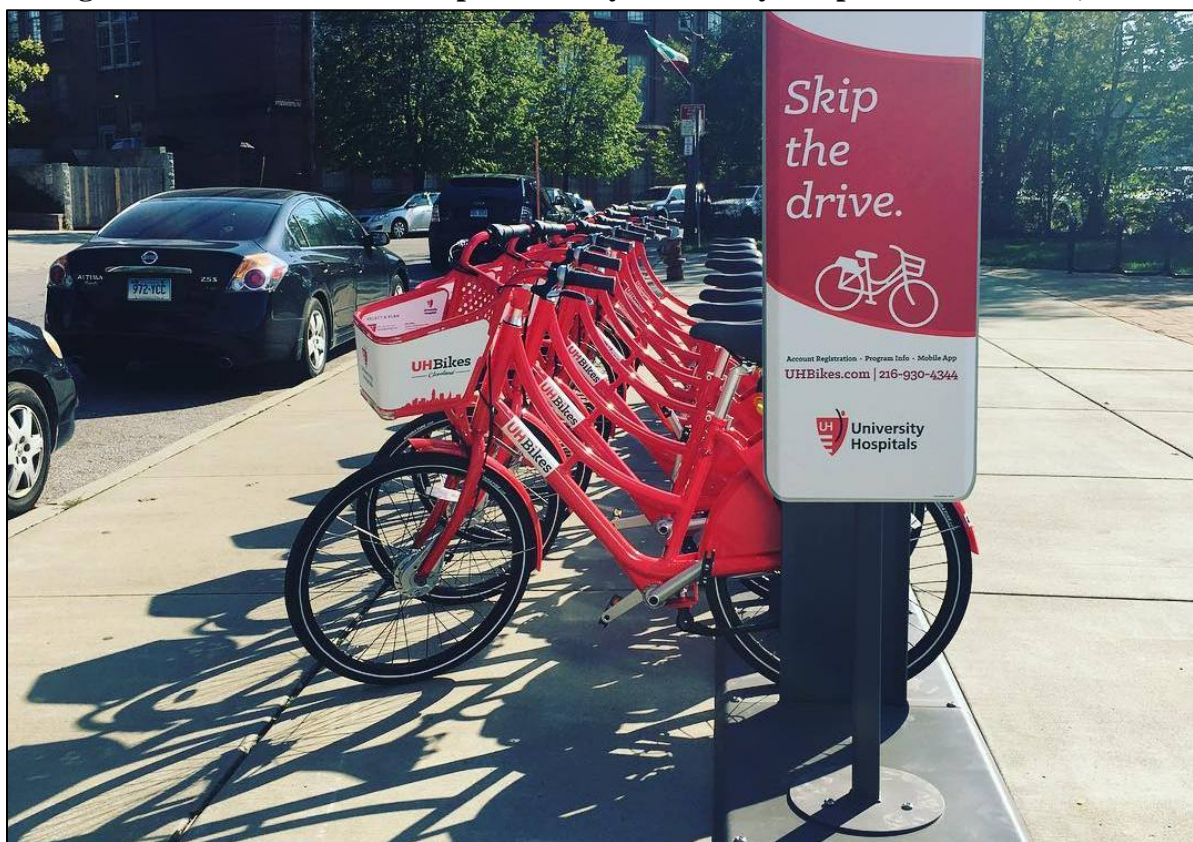
*Photo by Ben van Meerendonk, 1969.*

In 2008, Washington D.C. launched SmartBikes, reputed to be the first formal bikeshare program in the U.S. By the end of 2009, there were over 120 bikeshare programs worldwide, most in Europe and most still adhering to the lock-to-station model. In 2010, Bikeshare programs were launched in Minneapolis and Denver, with New York's Citibike following in 2013. Citibike was the first bikeshare to be fully funded by corporate sponsorships, while prior programs involved some degree of government investment and/or nonprofit management (CityLab, 2018). In 2015,

prior to the dockless bikeshare boom, there were over a million bikeshare bicycles worldwide, with 75% of those bicycles located in China’s rapidly growing cities (CityLab, 2018). By 2018, 45 of the 60 largest cities in the U.S. had a traditional or docked bikeshare program in operation. The rapid rise of these programs captivated journalists and policymakers, and raised fresh questions about the regulatory environment necessary to manage these programs safely.

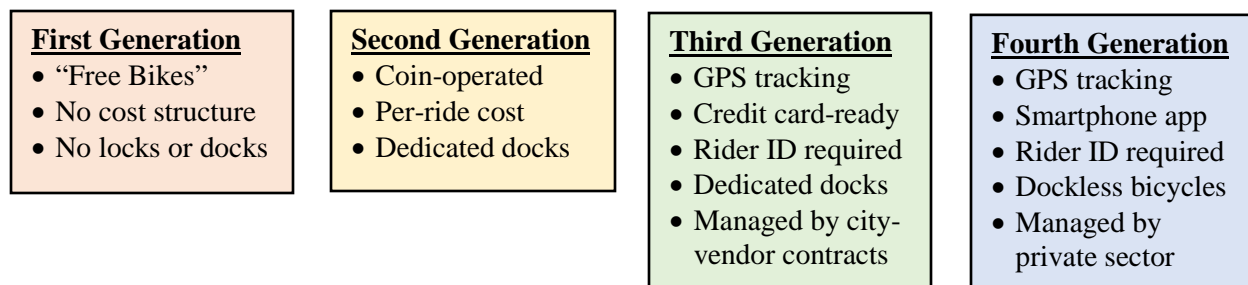
Docked bikeshare programs of this era tended not to require significant formal regulation due to the closed nature of the administrative relationships. In most cases, the city would enter into a contract with a designated vendor (usually a non-profit) to manage the bikeshare program and another vendor to maintain the bicycles (City of Ashland, 2018). The contract outlined costs, liabilities, program timelines, and other terms as appropriate. A city’s capital cost per bicycle generally ranged from \$3,000-\$3,600. This cost included the fabrication of bicycles and stations, software packages, member access cards, purchase or rental of maintenance/distribution vehicles, and installation of stations. To help offset these costs, city contracts might involve a corporate sponsor (such as Nike in Portland, OR, and University Hospital in Cleveland, OH). These private-sector sponsorships often included the stipulation that bicycles be painted or otherwise festooned with the name and color scheme of the sponsor. Figure 3 illustrates the bikeshare program sponsored by University Hospital (“UH Bikes”) in Cleveland, Ohio.

**Figure 3: A Bikeshare Dock Sponsored by University Hospital in Cleveland, Ohio**



*Source: Fitt Cleveland, 2017.*

Docked bikeshare programs of this nature constitute the “third generation” of bikeshare, and allow city governments and local boosters a significant degree of direct control over the required infrastructure. For example, because these bicycles must be secured to a dock after each use, managers can ensure the program’s bicycles are organized in a tidy and accessible manner that minimizes street clutter. Also, by placing dock stations at designated places throughout an urban core (such as near transit stops and major tourist attractions), managers can provide an intuitive start/end point for residents and tourists seeking to use the bikeshare program for a trip. Third-generation bikeshare programs incorporate the technological advances of the 2000s (such as credit card readers and GPS tracking) into a structured service framework based around a single-vendor, fixed-dock model of operation. This model required relatively few formal regulations written into city codes of ordinances, as most stipulations were included in the contracts arranged between city governments and vendors. Figure 4 illustrates the evolution of bikeshare programs across four generations of increasing complexity.

**Figure 4: Four Generations of Bikeshare Programs**

### Dockless Bikeshare Programs

In contrast to the more structured bikeshare programs of the docked variety, dockless programs offer significantly more variation and complexity in management. These fourth-generation bikeshare programs are a much more recent phenomenon in Western cities, with the first ones arriving to the U.S. in the first half of 2017. Dockless bikeshare differs from traditional/docked bikeshare in that it does not require a user to pick up and drop off the bike at a fixed station. Since there is no initial infrastructure required, dockless providers often have much lower capital costs and can launch programs with minimal delay. This can be a considerable plus for cities looking to provide low-cost transportation alternatives, and for investors looking for simple returns. The user benefits of dockless bikeshare can include low costs, flexibility of pick-up and drop-off locations, and easy access to bicycles. Although they physically resemble First Generation bikeshare vehicles (with no fixed docks), their reliance on smartphone apps and GPS tracking provide a more high-tech and cost-assured plan of operation. Another significant difference for dockless bikeshare is the dominance of private-sector operators. Whereas docked bikeshare traditionally had explicit city support and funding, dockless programs are almost universally a private-sector innovation with almost no financial ties to local government. In 2017, five companies launched dockless bikeshare programs in American cities: Ofo, Lime, Spin, Jump, and Mobike. In that year, the number of bikeshare bicycles on American streets more than doubled, and experts attribute most of that rapid growth to dockless bicycles (NACTO, 2017). As of December of 2018, 29 of the 60 most-populous U.S. cities had at least one dockless bikeshare program in operation, with 19 of those cities also having a traditional docked bikeshare program operating as well. In keeping with the concept of private-sector dominance of dockless bikeshare, many of these operators launched their programs without first coordinating with city governments or waiting for officials to draft an ordinance governing dockless bikeshare programs on city streets. Many of these cities were thus left in the unenviable position of having unregulated dockless bicycles operating on their streets. Without proper oversight, liability frameworks, or regulatory guidance, dockless bicycles in many of these cities were abandoned by their users on private property, unevenly dispersed throughout the city, or left to pile up on sidewalks, leaving unsafe and unattractive clutter in the public right-of-way. Figures 5-7 illustrate some of these negative externalities in cities with active dockless bikeshare programs.



**Figure 5: Improperly Parked Dockless Bicycles in Dallas, 2017**



*Source: Peter Simek, D Magazine, 2017.*

**Figure 6: Dockless Bicycles Blocking a Sidewalk in San Diego, 2018**



*Source: Coleen Cusack, Voice of San Diego, 2018.*

**Figure 7: Dockless Bicycle Discarded into White Rock Lake, Dallas, 2017**



*Source: Franklin Hernandez, 2017.*

The challenge facing city regulators with regard to dockless bikeshare is thus how to establish rules and policy guidance for an amenity that is already operating on city streets without any such regulation. The shift in responsibility is arguably part of why cities have been slow to regulate these programs. With traditional/docked bikeshare, cities had a direct role in managing the programs and setting terms, so there was little need for formal regulations. With dockless bikeshare, on the other hand, the bicycles are owned and operated entirely by private-sector forces, leaving the city with no direct responsibility to manage the bicycles or their externalities. In this context, city governments are left only with their police power as a means of influencing management practices among dockless operators. Still, as media coverage continues to document the excesses and hindrances caused by unregulated dockless bikeshare programs, city officials are finding more and more reason to overcome the hurdle of shifted responsibility and compel operators to reform their practices through formal regulations and city ordinances, and it is in this process that this study finds its unit of analysis.

### **Finding Norms and Best Practices among Bikeshare Operators and Regulators**

As policymakers seek to understand and ultimately regulate dockless bikeshare programs, they no doubt look to their peers in other cities – as well as to the technical and scholarly literature – for guidance on how best to accomplish their goals. Indeed, reliance on existing regulatory and social norms is an essential component of lasting policy action (Peck and Theodore, 2010). However, given the relative youth of bikeshare programs in their present form – the oldest programs are scarcely ten years old as of the writing of this report – enduring norms are in short supply. In addition, the highly location-specific nature of docked bikeshare programs means that each city’s lessons may not be easily transferrable to other cities, thus limiting the ability of

policymakers and scholars to establish enduring best practices that can provide foundational knowledge across the nation. In order to generate useful information at that scale, therefore, the authors of this study must therefore thread the needle between locally-oriented information and nationally-relevant best practices that allow policymakers to implement solid operational knowledge onto their existing foundations of local and experiential knowledge with dockless bikeshare in their cities.

Dockless bikeshare programs, when funded by tech-focused private interests, represent what the literature calls “market disruptor technologies” (Jenk, 2015; Schneider, 2017). These disruptors, ranging from bikeshare platforms to Uber, Lyft, and Airbnb, present themselves as a tech-driven and innovative approach to an existing urban feature, such as Uber/Lyft for transportation or Airbnb for hotel stays. According to Schneider (2017), disruptors are both a healthy element of modern commerce as well as a critical threat to existing public infrastructure and policy norms. Whereas Uber and Lyft represent potent competitors to public transit, dockless bikeshare programs pose a somewhat different challenge: They exist in a legal gray area in many cities, being neither authorized nor prohibited. They also, according to Schneider and others, exist in a layer of cultural acceptance and consumer largesse that sometimes allows them to operate under different circumstances (and different or no regulations) than their more established peers. Disruptors are also often national or global in scale, being based in other states or countries and having little permanent connection to each individual market they serve. Regulation of a market disruptor is thus quite complex an undertaking, and cities seeking to impose order on the new entrants must weave through consumer popularity, international commerce, information asymmetries, and a private-sector attitude of ambivalence about the need to play by the rules.

### **Three Types of Rule-Making: Ordinances, Contracts, and Permit Regulations**

As part of the exploratory phase at the beginning of this project, the authors found that formalized rules governing city-operator relations generally fall into one of three categories: Ordinances, contracts, and permit regulations. In various American cities, the rules governing bikeshare (where they exist) can be found in one or more of the three.

Ordinances are defined for this project as written and duly-enacted laws governing conduct within a municipality. As formal laws, they apply equally to all entities within the boundaries of the municipality. For example, all bikeshare operators, no matter their origin or tenure in the city, would be bound by the ordinance equally. This allows a city government to establish one set of rules for all, and to make those rules public and enforceable by local law enforcement. An individual who violates a city ordinance may be subject to prosecution in a court of law.

Contracts, on the other hand, are defined in this project as legally-enforceable agreements entered into by both a city government and one or more private- or nonprofit-sector entities. In contrast to an ordinance, a contract is generally restricted only to those specific parties who agree to enter into one. In the case of bikeshare, any rules of conduct stipulated in the contract would only be enforceable against the provider(s) who signed it. An individual or entity who violates the terms of a contract may be subject to legal action on a civil basis, though direct involvement by law enforcement or prosecuting attorneys is less likely than with an ordinance violation.

Finally, permit regulations are considered by the authors to exist in a regulatory realm somewhere between ordinances and contracts. Under the traditional permit process, a government classifies an activity (for example, renting bicycles to paying customers) as requiring a permit to operate within city limits. Administrators then craft a framework defining expected activities associated with the permit (for example, listing the rules of conduct a bikeshare operator would be expected to obey at all times), as well as a mechanism to enforce the framework and/or revoke the permit for noncompliance. In contrast to ordinances, which are approved by a governing body and enacted into municipal law, permit regulations may be written and amended by city staff. Because permit regulations are tied directly only to the issuance and use of a permit, a violator of these regulations is most likely to have their permit revoked on a temporary or permanent basis.

The choice of a city government to regulate bikeshare within its borders under one or more of the above frameworks forms a part of this research project, and will be explored in Stages One and Two. While the legal and philosophical differences among these three approaches are no doubt fodder for a rich discussion, the authors do not intend for this research project to determine conclusively which of the three formats is most suitable as a national exemplar. Indeed, the authors entered into this project with an open mind regarding the virtues and details of a city's decision to regulate (or not regulate) bikeshare programs.

### **Regulatory Structures are Variable, but Can be Compared and Contrasted**

The diversity of regulatory structures with regard to bikeshare programs in American cities is noteworthy in its own right, and while it may present challenges to a scholarly team seeking to classify them against one another, the authors find that it is possible to compare and contrast the ways in which city governments use the various tools at their disposal to understand and regulate bikeshare programs, while also in many cases folding this task into broader efforts to expand bicycle-scaled infrastructure. The authors contend that these various methods can indeed be placed onto a spectrum of regulation, and that the lessons of each city's experiences in that effort can contribute in a real way to the formation of nationally-relevant best practices for how best to manage bikeshare programs on the streets of America's major cities.

## Chapter III: A Spectrum of Bikeshare Regulations

Stage One of the project focused on building a database of city bikeshare regulations and ordinances, organizing them onto a spectrum of regulation ranging from “no regulation” to “very robustly regulated,” and evaluating them using a policy performance tool adapted for this purpose. This tool, originally developed by Bordenkircher and O’Neil (2018), evaluates the rigor of a city’s bikeshare ordinance on a range of factors including equity, bicycle parking requirements, multi-language communication, and clear definitions of legal liability. The original tool was applied to a small and pre-selected group of cities. For this project, the authors applied the tool to a national sample of over 50 cities, and included cases where an ordinance either did not exist or was merely under development at the time of investigation. The authors intended Stage One to establish a workable national dataset from which noteworthy cases could be drawn for deeper analysis, while also allowing the team to populate and then analyze the full spectrum of dockless bikeshare regulations across the nation’s largest cities.

### Methodology and Case Selection

This stage sought to answer a sequence of three interrelated research questions: First, how are bikeshare programs regulated in America’s largest cities? Second, what specific issues are covered by these regulations (for example, safety, equity, and bicycle parking restrictions)? And third, how do city bikeshare regulations compare across the nation?

To address the first research question, the authors set out to classify the regulatory frameworks in place to manage bikeshare programs in cities. These frameworks generally took the form of municipal ordinances or permit regulations enforced by city staff. The authors chose to focus on the “core city” of the nation’s 60 largest Metropolitan Statistical Areas by population. In five of the 60 cities, no bikeshare programs were in operation, thus reducing the dataset to 55 core cities. The authors documented which types of bikeshare (docked, dock-less, or both) were present in each city, as well as the contact information for each individual bikeshare operator/provider. At the same time, the authors compiled text from the bikeshare ordinances presently in force in the 55 cities, alongside details on each ordinance’s adoption date, companion regulations, and relevant media coverage. Those cities lacking a bikeshare ordinance were kept in the dataset, but with a notation indicating no written ordinance was in effect as of December, 2018. Creating this national dataset constituted the first phase of data collection, and gave the research team a comprehensive body of information from which analysis and evaluation could be drawn.

The second phase of the project addressed the second research question, and centered on the creation of a rubric designed to evaluate the various bikeshare ordinances on a host of predetermined factors, several of which were adapted from the Bordenkircher and O’Neil tool. In keeping with that framework as an inspiration, the authors organized a range of factors potentially present in a city bikeshare ordinance. These factors were divided into four categories: Operations and Maintenance; Ethical Standards and Data Laws; Fleet Size, Rebalancing, and Parking; and Safety. Subcategories for each were also delineated in the rubric, which is included as Table 1. While their tool provides the foundation for this study’s scoring rubric, this project greatly expands on the sample size utilized in Bordenkircher and O’Neil’s original work, while also organizing the city scores onto a spectrum of regulation.



**Table 1: Bikeshare Regulation Categories and Scoring Factors**

<b>Regulation Category</b>	<b>Subcategory</b>	<b>Explanation</b>
<b>OPERATIONS &amp; MAINTENANCE</b>	City Has Right of Removal/Termination	The city should be able to remove a bike or end a program if companies continuously do not comply to mitigate possible blocking of sidewalks, illegal parking, disposing in lakes, etc.
	Dock-less Vendors Incur All Liability & Fees	Cities will accrue costs to manage and enforce rules set in the ordinance; however, dock-less bikes should not cost the city anything. The dock-less vendors should take on all financial burdens with upfront fees and liability.
	Accessible Contract Info on Bikes & City Website	Users and nonusers need to be able to call the vendor to report an issue. The vendor should have a phone number physically on the bikes and/or on their website/application.
	Detailed Bike Maintenance Requirement	To ensure bikes are in usable condition, companies must be required to maintain the bikes at least every 45 days.
<b>ETHICAL STANDARDS &amp; DATA LAWS</b>	Equity Required for Underserved Neighborhoods	Strategies like, discounted rate for low-income areas, dock-less companies encouraged to operate in non-core areas through incentives, or in general pushing dock-less to serve areas that are not already served with traditional bike share if applicable.
	Dock-less Service Must be Multilingual	Depending on the city's demographics or tourism sectors, dock-less companies should be multilingual, offering various language options via their website or application.
	Must Provide Non-Smart Phone Option	Operators should provide some alternative to using a smartphone to access the bikes. This could be utilizing SMS, or the ability to purchase pre-paid cards at local gas stations or pharmacies to use.
	ADA Adherence	Even if all people with disabilities can't be served with dock-less bikes, they do have a right to all public services, which includes public sidewalks. Operators need to help educate users on parking adequate and establish procedures for quick bike removal when bikes are parked in public way.
	ADA Mobility Options	Encourage vendors through incentives to have a percentage of their fleet contain cargo or adaptive bikes for a broad range of users. Adaptive bikes could include trikes, side-by-side tandems, hand-cycles and heavy-duty bikes.
	Data Sharing	Anonymized bikeshare data, when shared with engineers and city planners, has the potential to improve bike infrastructure, cycling safety, bike share planning, and potentially solving last mile questions.
<b>FLEET SIZE, REBALANCING &amp; PARKING</b>	Allowed Initial Fleet of 500 Bikes or Less	Cities should incorporate some form of phasing into their ordinances to ensure there isn't an overstock or understock of bikes cluttering the city.
	Fleet Phasing Strategy	A fleet phasing strategy is one solution to having to remove bikes when too few are being used in a given area.
	Designated Hours for Rebalancing & Maintenance of Public Right-of-Way	If vendors want to be integrated in the public transportation sector, they should consider having bikes available 365 days a year and that their bikes can withstand harsh weather to be used in an emergency.

	Bikes Must Be Parked Upright	While this might be assumed, ordinances should explicitly state that bikes must be parked upright and should be required to stand up knocked over bikes throughout the day that could be not just be unappealing visually, but dangerous for sidewalk users as well.
	Suggestions for "Corral" Installation or a "Hub Centric Model"	Cities should at a minimum suggest, or possibly mandate depending on the structure of the city, that vendors have users park in designated "corrals" or centralized dock-less bike hub models. If a city is going to have multiple companies, they could identify and mark the areas and use the fees received from the companies to pay for it.
	Set Geofence Boundaries	Cities could require vendors to have a set "geofence" service area. This would allow the city to see parking trends and add or remove corrals based on the data.
<b>SAFETY</b>	Dock-less Vendors Required to Educate Users	Vendors should have visible language telling riders about local laws and regulations and should require users to agree to follow the rules before the bike unlocks.
	Insurance Coverage & Reimbursement Cap	Additionally, Cities should require a minimum insurance as well as performance bond or reimbursement cap to be used if the city has to remove any bikes or utilize any capital for the company.
	Helmet Law	Cities would have to get very creative in coming up with a reasonable plan that make helmets available to bikeshare users that were hygienic and attached to the bikes.
	Gamification Requirement to Give Riders Incentive for Good Behavior	Incentivize or rewards for good riders that follow safety rules, pick-up knocked over bikes or poorly parked bikes, etc. (Bordenkircher & O'Neil, 2018). Rewards could be ride credit or company merchandise.

*Rubric categories originally created by Bordenkircher & O'Neil (2018).*

The third and final phase of this project applied the aforementioned rubric to the bikeshare ordinances of the cities in the dataset. This step allowed the authors to generate a score for each city's bikeshare ordinance in terms of the degree to which each ordinance sought to regulate the various aspects of bikeshare management. Each of the twenty subcategories outlined in Table 1 made up a part of the city's total regulation score. If a subcategory was not mentioned in a city's ordinance, then the city's score for that factor was zero. If a subcategory was mentioned briefly, it received a score of one. Finally, if a subcategory was described in detail within the ordinance, then it received a score of two. Therefore, each city's "bikeshare regulation score" ranged from a minimum of zero to a maximum of forty. Once each city's ordinance was scored, it was placed on a spectrum of regulation, much like the example illustrated in Chapter I. This step addressed the third and final research question, and allowed the authors to comprehend the national landscape of bikeshare regulation in 2018.

## Results

Organizing the various city regulations and ordinances yielded several noteworthy results, even before the analysis began. In addition, plugging the ordinance data into the rubric generated some findings that are presented below as simple statements supported by the evidence.

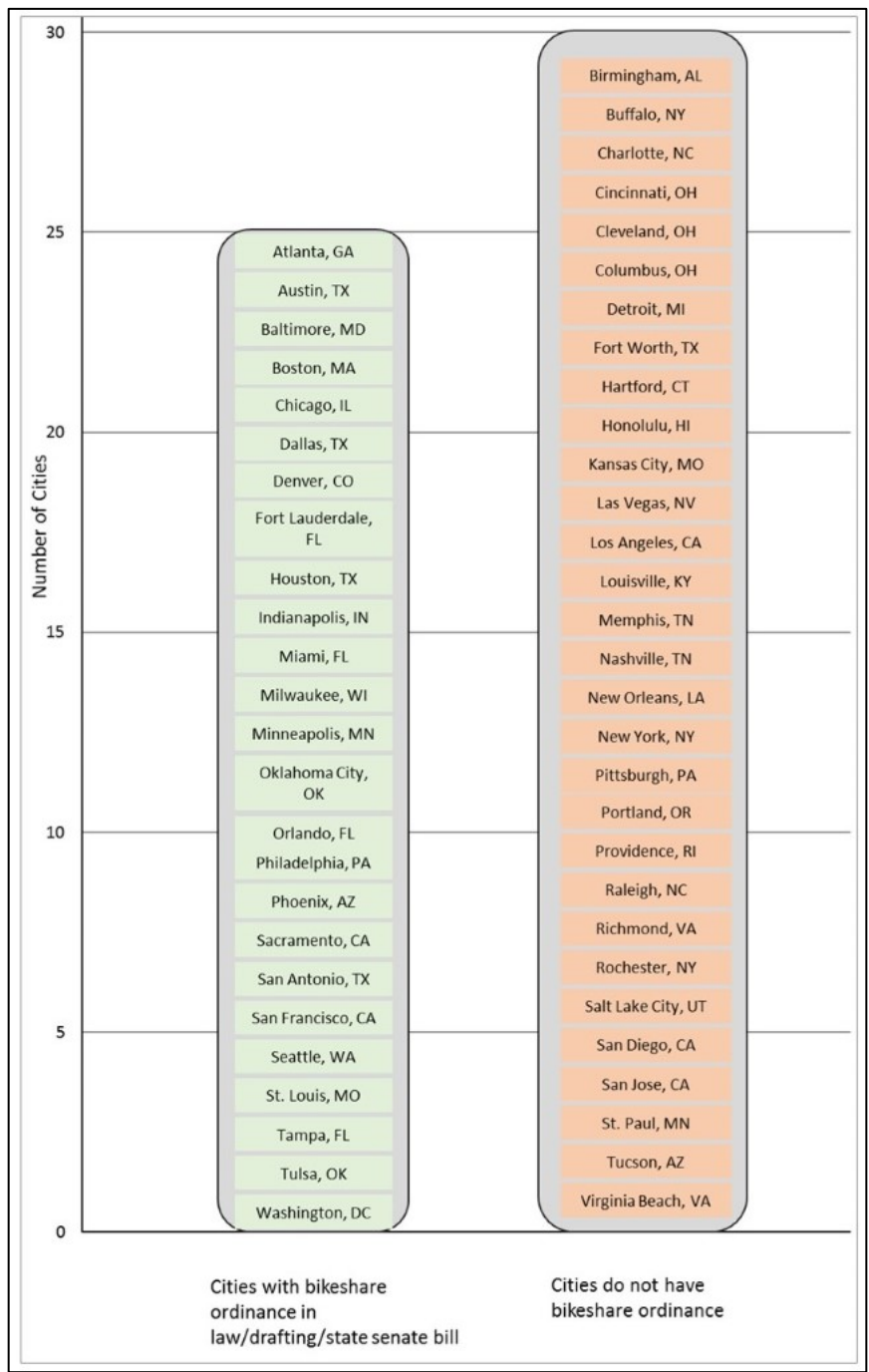
### **Many cities have no bikeshare ordinance, despite having active bikeshare programs.**

Figure 8 illustrates the status of bikeshare ordinances in the core cities. In the 55 core cities with active bikeshare programs examined in 2018, a total of 30 (colored orange on Figure 8) had no



ordinance related to bikeshare programs in effect or under consideration. The remaining 25 cities (colored green on Figure 8) either had an ordinance on their books (12 cities), were in the process of researching and/or crafting a bikeshare ordinance (10 cities), or were working in conjunction with state-level bikeshare legislation to manage those programs (3 cities). Figure 3 illustrates this distribution. The fact that so many large American cities allow bikeshare providers to operate without any formal or legally-binding ordinance in place begs the question of how planners and public officials intend to manage the externalities and impacts of bikeshare programs in their cities. It also leaves open significant questions regarding rider safety, liability insurance coverage, and enforcement of traffic and right-of-way laws. Preliminary research into individual cities' relations with bikeshare providers indicates that in some cases (particularly cases where a city hosts only a single, traditional/docked bikeshare operator), the city agrees to a contract directly with the single bikeshare operator. In these circumstances, the terms of the contract may include specific guidelines on how the bikeshare program is permitted to operate, as well as forms of oversight/sanction should the provider fail to abide by the terms. A direct contract represents an alternative to formal regulation, and while the authors did not conduct an exhaustive review of individual contracts in the cities that use them, the fact remains that more than half of America's largest cities with active bikeshare programs have no binding ordinance in place to govern the operation, oversight, or mechanisms of regulatory sanction for bikeshare providers. This raises significant questions of legal authority as well as regulatory outlook on the part of city officials, particularly in the event that a bikeshare vehicle causes injury or some other threat to the health, safety, or general welfare of the population.

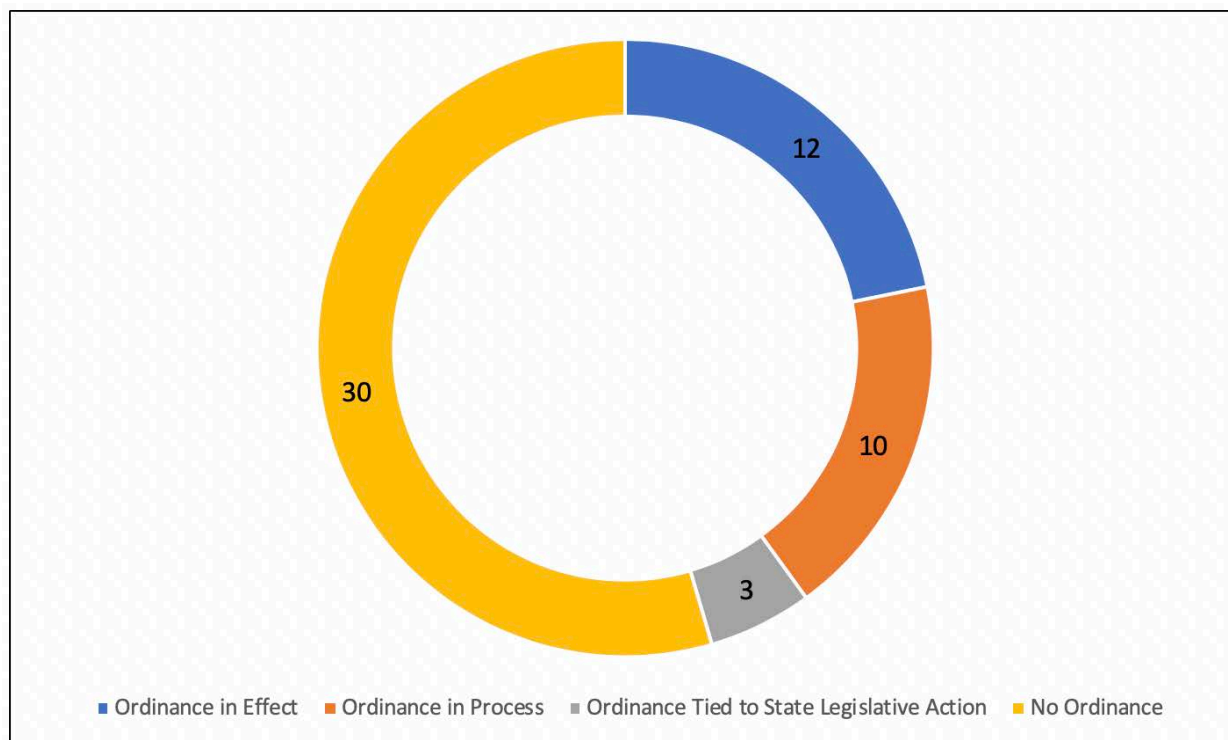
**Figure 8: Distribution of Cities by Status of Bikeshare Ordinance, 2018**



*Information current as of December 1, 2018.*

Figure 9 breaks down the 55 cities by the status of their bikeshare ordinance (where available) into more specific categories delineating the regulatory progress of their efforts.

**Figure 9: Status of Bikeshare Ordinances in Selected Cities, 2018**



*Information current as of December 1, 2018.*

**Bikeshare ordinance details vary considerably across cities that have them.** Among the subset of 25 core cities that have a bikeshare ordinance either in effect or under development, the details and format of the ordinance vary considerably from place to place. Absent a national standard of best-practices (apart from NACTO guidance on the topic) or federal guiding principles for bikeshare regulation in cities, individual local governments are ostensibly left to craft ordinances on an individual basis. The specific differences across city bikeshare ordinances will be explored in greater depth later in this section, but analysis indicates several general points of divergence. For example, some ordinances (such as Fort Lauderdale and Seattle) devote significant detail to guidelines about rider safety and helmet usage, while others make no mention at all of helmets. The authors are aware, however, that many states do not require adult bicyclists to wear a helmet, which may be a factor in the dearth of ordinances mentioning them. Also, some cities explicitly require multilingual signage and app compatibility, while others do not. For example, Seattle requires its bikeshare vendors to offer services in eight languages by 2019 (City of Seattle, 2018). The authors describe these wide variations in ordinance terms not to evaluate them as right or wrong, but to illustrate one central challenge of municipal bikeshare regulation – namely the lack of consistent and readily-applied standards at a national scale. Cities can and do craft ordinances that suit their local needs, and this need not change with the broader adoption of best practices in bikeshare regulation. Still, for the time being, the landscape consists of a great many unique ordinances, no two being substantially alike.



**Table 2: Bikeshare Regulation Scores for Cities with an Active or Pending Bikeshare Ordinance**

Core City	City Has Rights of Removal/Termination	Dockless Vendors Incur All Liability & Fees	Accessible Contract Info on Bikes & City Website	Detailed Bike Maintenance Requirement	Equity Required for Underserved Areas	Multilingual Bikeshare Services	Must Provide Non-Smart Phone Option	ADA Adherence	ADA Mobility Options	Data Sharing	Allowed Initial Fleet of 500 Bikes or More	Fleet Phasing Strategy	Designated Hours for Rebalancing & Maintenance of Right-of-Way	Bikes Must Be Parked Upright	Suggestions for "Corral" Installation or Bikeshare Hubs	Set Geofence Boundaries	Dockless Vendors Educate Users	Insurance Required to Reimburse Users	Helmet Coverage & Self Reimbursement Cap	Helmet Law	Gamification Requirement to Give Riders Incentive for Good Behavior	Total Score
Atlanta, GA	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	4
Austin, TX	2	2	2	2	2	0	0	1	1	2	2	1	1	2	0	1	1	2	0	1	0	25
Baltimore, MD	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Boston, MA	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Chicago, IL	0	2	0	2	1	0	1	0	0	2	1	2	1	2	2	0	2	2	0	0	0	20
Dallas, TX	0	1	2	1	0	0	0	0	0	1	0	2	0	2	1	2	2	2	2	0	0	18
Denver, CO	1	1	0	1	1	0	1	0	0	1	1	1	1	2	1	1	0	0	0	0	0	13
Fort Lauderdale, FL	2	2	2	1	1	0	1	2	0	2	2	2	2	2	2	2	2	2	2	0	0	31
Houston, TX	2	1	1	1	2	0	0	0	0	1	2	1	2	2	0	1	2	2	1	0	0	21
Indianapolis, IN	1	1	0	2	0	0	1	0	0	1	0	0	1	2	0	2	1	1	2	0	0	15
Miami, FL	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	6
Milwaukee, WI	2	2	0	0	1	0	0	1	0	1	2	1	2	0	0	0	0	0	0	0	0	12
Minneapolis, MN	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	0	0	7
Oklahoma City, OK	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	4
Orlando, FL	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	6
Philadelphia, PA	1	1	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	1	0	0	0	7
Phoenix, AZ	1	1	0	0	0	0	0	1	0	1	1	0	1	2	1	0	1	1	0	0	0	11
Sacramento, CA	2	2	1	1	0	0	0	0	0	1	0	0	2	2	2	0	1	2	0	0	0	16
San Antonio, TX	1	1	1	0	0	0	0	0	0	1	0	0	0	2	0	0	1	2	0	0	0	9
San Francisco, CA	2	2	1	2	2	2	2	1	1	2	1	1	2	2	1	0	1	2	0	0	0	27
Seattle, WA	1	2	2	1	2	2	1	1	1	2	2	2	1	2	2	1	1	2	2	0	0	30
St. Louis, MO	2	2	2	1	2	2	2	0	0	2	2	2	2	1	1	2	2	1	1	1	0	31
Tampa, FL	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	4
Tulsa, OK	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	4
Washington, DC	1	1	0	1	1	0	1	0	0	1	1	2	1	2	2	0	2	0	0	0	0	16

*Rubric derived from Bordenkircher and O'Neil, 2018. Information current as of December 1, 2018.*

As Table 2 illustrates, the 25 cities with an active or pending bikeshare ordinance produced a range of scores. Out of a possible 40 points, three cities scored 30 or higher: Fort Lauderdale, St. Louis, and Seattle. These three possessed active bikeshare ordinances that not only touched on virtually subcategory in the rubric, but also gave clear details on many of the factors included in the text of the ordinance and accompanying permit regulations. At the other end of the spectrum, a number of cities scored in the single digits, possessing an active or pending ordinance that was brief and/or vague. The authors saw no geographic pattern to the scores. Still, a number of patterns emerged based on the 20 subcategories of the rubric, and the general takeaways for each are listed in subsequent paragraphs.

**In Operations and Maintenance, liability regulations are the most prevalent subcategory.** Upon scoring the ordinances of the cities that had a written ordinance (or an in-progress ordinance available for public review), the authors found specific subcategories to be far more common and detailed in scope than others. The first of the four scoring categories featured in Table 1, “Operations and Maintenance,” required the research team to evaluate four specific attributes or subject areas that an ordinance might have in that realm. Of these, the most common subject area covered in this category related to vendors incurring liability and fees related to bikeshare vehicles. Approximately half of the written ordinances analyzed laid out specific responsibilities for the operator in the event of injury, collision, property damage, or legal action. In this category, the next most common subject area was terminology governing a city’s right to remove or impound bicycles or to revoke an active operator permit for cause. Specific language here covered the circumstances under which city agencies reserve the right to alter or end a permit arrangement if the operator fails to abide by specific terms – for example, failing to remove bicycles that users illegally park or discard into waterways or green space. Other subject areas within this category, such as a detailed program of bicycle maintenance or a requirement to post city-operator contracts online, were less common. The dominance of liability verbiage and assertions of municipal police power to terminate permits for cause reflects a legalistic mindset among city planners, who may face pressure to protect city government from lawsuits stemming from rider injury, collisions, or improperly-managed bicycles in a dock-less program.

**Written ethical standards are generally lacking or vague among ordinances, but language on the sharing of data is common and specific.** The second category of the scoring rubric – “Ethical Standards and Data Laws” – required the authors to score city bikeshare ordinances on six factors related to ethics and equal access among customers, as well as an element requiring data-sharing between bikeshare providers and the cities enabling them through ordinances and permits. For five of the six factors, scores across the sample were remarkably low – only a handful of written ordinances contained any reference to issues of equity or ethics. On matters of ADA-accessibility, multilingual communications, and dedicated service plans for lower-income or underserved neighborhoods, the ordinances were almost all silent. The most frequently observed factor in this subset centered on data-sharing agreements. Six ordinances laid out explicit requirements that bikeshare providers share operational data with city governments. The lack of explicit regulations ensuring equitable access and usage by a diverse audience of riders was unexpected by the authors, especially considering the potential for citizen legal action on civil rights or ADA-compliance grounds, as well as the growing prominence of equity as a core concept of planning and city management (Krumholz, 2011; Fainstein, 2010; Manaugh et al, 2015). The authors therefore isolated equity issues in bikeshare regulation as a central area for deeper study

in the growing bikeshare literature, as will be discussed in greater detail in the Conclusion section of this work.

**Fleet management guidelines vary, but rules for bike parking and rebalancing are common.** The third category of the scoring rubric, “Fleet Size, Rebalancing, and Parking,” consisted of six criteria closely related to regulating how bikeshare operators manage the size, location, and physical readiness of dock-less bicycles in between uses. All six criteria are notably unique to dock-less bikeshare programs, as traditional bikeshare vehicles are locked into dedicated racks between users. But as dock-less bicycles can be parked virtually anywhere within a city or service area, they arguably require a more detailed system of management to ensure the bicycles are kept in a safe and accessible condition for the next rider and the community. Of the six criteria, the requirement that dock-less bicycles be parked upright in between uses was the most common. Generally stated, this rule requires dock-less bikeshare providers to instruct (or compel) riders to park the bicycle upright at the end of their journey. Doing so ostensibly benefits both the bikeshare provider (because it may prevent damage to the bicycle) and the community (because an upright bicycle is likely to be less of an obstacle to pedestrians than one lying on its side). The next most common criteria was the instruction that providers must agree to rebalance and maintain the dock-less bicycles at a set interval. Rebalancing generally refers to the task of redistributing individual dock-less bicycles across a geographic area, generally in the evenings or overnight, in order to ensure riders have consistent access to a bicycle no matter their location in the service area. This task is particularly important for dock-less systems, because unlike traditional systems with their racks that can only hold so many parked bicycles, dock-less bicycles can accumulate in great numbers at popular destinations throughout the day or week. It therefore becomes a central task of dock-less providers to rebalance their inventory according to either internal or city-directed guidelines. The other criteria in this category, also designed to manage a bicycle fleet’s size and distribution throughout the service area, were less common among the cities.

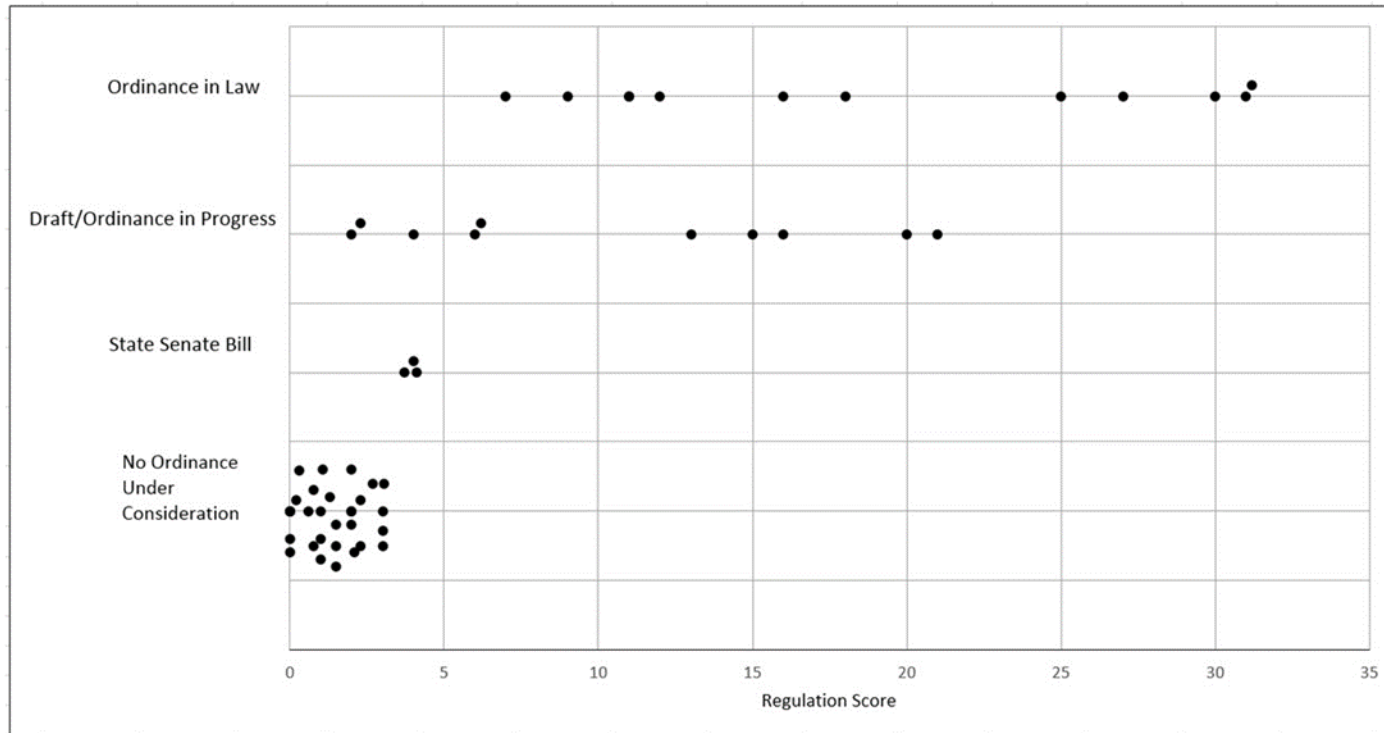
**Safety regulations for bikeshare are generally vague, but insurance issues dominate.** The fourth category on the scoring rubric encompassed criteria related to rider safety and specific ways providers might be compelled to promote it among riders. As with the first category, the most common safety-related concept in city bikeshare ordinances centered on insurance liability, and the requirement that bikeshare providers be insured in the event of a rider injury and/or legal action. This commonality reinforces the aforementioned observation that ordinances of this nature are more likely to include verbiage that indemnifies the city against lawsuits than they are to include verbiage on any other factor – including the safety and wellbeing of riders. The second most common regulation in the category of safety was the requirement that dock-less providers educate users on the risks and safety requirements of bicycles before they ride. The specifics of this requirement vary from place to place, as do the ways in which a provider might act to educate their customers. Since the dock-less bikeshare concept is centered on smartphone apps, one common means of providing rider safety guidance is for the operator to attach instructional text within the app that riders may read before gaining access to a dock-less bicycle. Text from the ordinances including this requirement generally leave the specifics of safety education up to each bikeshare provider. Under the category of safety, the issue of requiring helmet usage on bikeshare systems was a very uncommon factor among bikeshare ordinances. This issue has received colorful attention in the media as well as the bikeshare literature, with an active debate over whether – and in technical terms, how – bikeshare providers should require helmet usage among their adult riders (Fischer et al, 2009; Graves et al, 2014). The question of how bikeshare providers,

particularly dock-less providers, can ensure helmet access and usage among their rider base is not a part of this project's analysis, but it represents arguably the most critical safety-related question overshadowing the adoption and management of bikeshare programs in North American cities. One final element of the Safety category, gamification methods to reward safe bicycle riding, was virtually unheard of among the cities studied. While such positive reinforcement may indeed prove beneficial to all parties, and there may be many ways to incentivize riders to act accordingly, this remains an area of little concrete interest among the core cities studied.

**City bikeshare ordinances and scores fall across the spectrum of regulation.** The scoring process itself, as mentioned previously, evaluated each city's written or pending (where available for public view) bikeshare ordinance on 20 factors identified in Table 1. If an ordinance did not mention the factor, it was given a score of zero for that factor. If an ordinance mentioned the factor, but in a vague or limited sense, it was given a score of one. Finally, if an ordinance mentioned the factor in clear, detailed, and explicit terms, it was given a score of two. Thus, an ordinance featuring detailed verbiage on all 20 factors would receive the maximum score of 40. The minimum score of zero, on the other hand, is assigned to cities with no bikeshare ordinance. The city ordinances examined in this project scored on a range between the two extremes, with a few points of significant clustering. Figure 10 illustrates the scores of the full set of 55 case cities. The most significant cluster appears at the bottom-left of the graph, encompassing the 30 case cities with no active bikeshare ordinance. In contrast to this, ordinances under consideration rated a broader distribution of scores. Finally, cities with an ordinance in full effect rated the most diverse range of scores, with the five most comprehensive (and highest-scoring) bikeshare ordinances being in this cohort. This graphic helps to illustrate two levels of diversity among bikeshare regulations in American cities. First, it shows the stark regulatory divide between cities that have no ordinance at all and cities that have an ordinance of some degree or other in effect. Second, and perhaps more critically, it illustrates the diversity in detail/score among those city ordinances in effect. Far from being a dichotomous variable, the issue of city bikeshare regulation is indeed a colorful blend of varied approaches with no intuitive pattern.



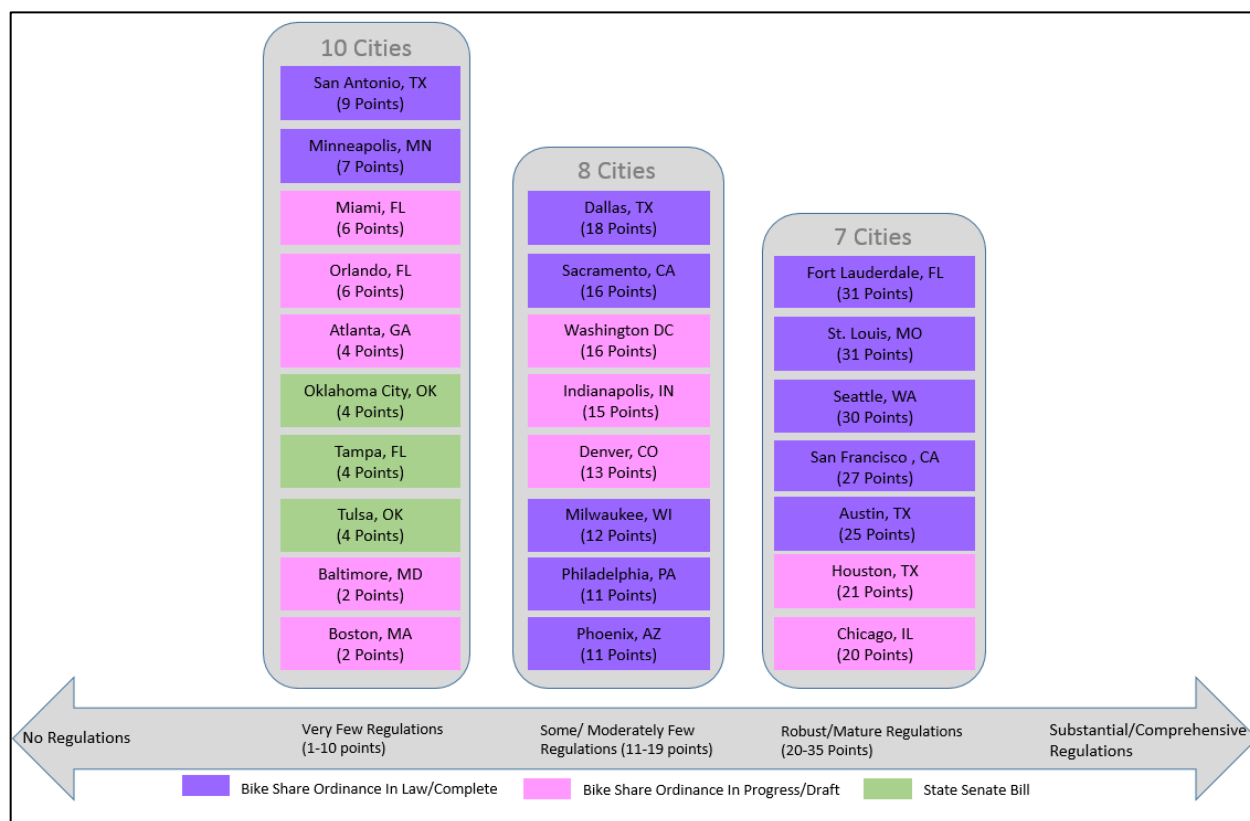
**Figure 10: State of Bikeshare Ordinances and Regulation Scores of Observed Cities, 2018**



*Data derived from city ordinances and state legislative repositories, 2018.*

**The spectrum of regulation shows wide geographic and policy variation.** Once the authors filtered the full set of 55 cities to exclude those 30 without an ordinance in place or under consideration, the remaining 25 could be examined in their respective three clusters. Since no city ordinance scored a perfect 40, and 30 scored zero, the two extremes of the regulation spectrum illustrated in Figure 5 are left blank. The remaining 25 cities, organized into three general clusters based on the details/score of their ordinances, thus represent the state of bikeshare regulation as of late 2018. In addition to being categorized by the details/score of their respective ordinances, the cities in Figure 5 are also color-coded based on the status of their ordinances as of late 2018. By this metric, the authors find that cities working with a state senate to craft statewide bikeshare regulations (green on the spectrum) were in 2018 crafting generally vague ordinances. In addition, those cities with an ordinance in effect (purple on the spectrum) were somewhat more likely than not to have an ordinance with a robust or moderate degree of specific verbiage on the 20 predetermined factors. Finally, those cities crafting an ordinance in late 2018 had scores across the spectrum, with a slight bias toward lower-scoring, less-specific ordinances. In terms of geographic distribution, no discernable pattern of either city location or size can be determined from this analysis. San Francisco's bikeshare ordinance was robustly-defined and high-scoring on the rubric, but Los Angeles (which did not have a bikeshare ordinance in 2018) earned a score of zero. Also, Fort Lauderdale earned the highest score of the cities (tied with St. Louis) despite being located in a state that was concurrently drafting a statewide bikeshare regulation much weaker in detail and scale. This lack of geographic or size pattern adds further credence to the finding that bikeshare ordinances and regulations in 2018 were largely an improvised, locally-driven activity.

**Figure 11: Regulation Spectrum for Cities with an Active or Pending Bikeshare Ordinance**



Stage One of this project allowed the researchers to capture the national ecosystem of dockless bikeshare regulations as of late 2018. The results documented here will be analyzed and placed into a more applicable context in Chapter V, but the information gleaned from this portion of the project directly informed the case selection process and methodology for Stage Two, the stakeholder interviews with planning officials and cycling advocates in noteworthy case cities.

## Chapter IV: Stakeholder Interviews in Noteworthy Cities

After organizing the set of core cities and their bikeshare regulations onto the spectrum in Chapter III, the authors next sought to learn about the regulatory process in a more focused group of cities with some sort of regulation in effect. This stage of the project sought to answer three research questions. First, how are city bikeshare coordinators (and to a lesser extent, community cycling activists) formulating long-range policies and regulatory practices for dock-less bikeshare programs in American cities? Second, how does the relationship between regulators and dock-less bikeshare providers differ from that of regulators and traditional (docked) bikeshare programs? And finally, what are the implications of bikeshare regulation (both docked and dock-less) and usage on the long-term infrastructure planning processes in American cities?

### Methodology and Case Selection

To address these research questions, the authors generated a database of the 60 largest metropolitan statistical areas (MSA's) in the United States by population. The authors then filtered each MSA down to its core city (for example, Denver, Colorado, as the core city of the Denver-Aurora-Lakewood MSA). Next, the authors filtered out the cities that had no active bikeshare program, leaving a database of 55 core cities. The authors then reviewed the core cities' codes of ordinances and related media coverage to ascertain which cities had a bikeshare-related ordinance in effect, under consideration, or under development in some form. Of the 55 cities, 30 had no ordinance in effect or under consideration as of October of 2018. The remaining 25 cities thus became the final dataset from which interview cases could be selected.

Utilizing city websites, public meeting records, and social media activity, the authors assembled contact information for bikeshare program coordinators (of various official titles) in the 25 cities. The authors also assembled a list of contacts among each city's cycling advocacy organizations, again using web searches and media coverage as a guide. The authors then contacted individuals by email and invited them to participate in phone interviews about bikeshare regulation in their respective cities. The interviews focused on the policy formation process as explained by local government officials and advocates, as well as each community's experiences with dock-less bikeshare programs, cycling culture, and efforts to integrate dock-less bikeshare programs into longer-term planning documents. The authors conducted the interviews by telephone, transcribed the responses, and analyzed them using a two-step model of summative (keyword matching) content analysis and axial coding.

### Results

A total of eleven interviews were conducted with a mix of city bikeshare coordinators, regional transportation planners, and cycling advocates. These individuals represented a total of 7 U.S. cities: St. Louis, MO; Philadelphia, PA; San Francisco, CA; Dallas, TX; Minneapolis, MN; Portland, OR; and Tempe, AZ. In the case of Tempe, which is not the core city of the Phoenix-Mesa-Scottsdale MSA, the city was added in place of Phoenix at the suggestion of regional bikeshare advocates due to its perception as having a more advanced network of bicycle infrastructure and cycling culture than Phoenix. The city of Tempe also had an active bikeshare ordinance at the time of the interviews, allowing the authors to seamlessly investigate that city's bikeshare regulations in place of Phoenix's regulations. Individuals in four cities requested

anonymity as a condition of participating, and this was ultimately granted to all interview participants. A base question set from the interviews is included in this report as Appendix A.

**Cities’ regulatory actions vary, but are often either inclusive and methodical or reactive to sudden negative externalities.** The seven cities each had their own way of regulating dock-less bikeshare, and their own experiences in dealing with dock-less providers and cycling advocates. In discussing the ways in which the regulations were crafted, the interview conversations focused again and again on the timeline of events that ultimately lead a city government to regulate an activity. In some cases, such as Minneapolis and St. Louis, regulators were able to work proactively with dock-less providers to create a mutually-acceptable set of permit regulations prior to the launch of dock-less programs in those cities. They drafted a “basic” ordinance governing bikeshare, but allowed planning staff to create a rigorous set of permit regulations that each bikeshare provider must follow in order to retain a permit to operate in the City of St. Louis. Coordinators described this model as straightforward and easy for staff to quickly amend as needed – the permit regulations can be amended virtually overnight within one office, whereas an ordinance can take months to amend. In the city of Dallas, by contrast, dock-less bikeshare programs were simply launched without any prior input or approval from city officials. In the case of these latter cities, regulations must then be crafted as a reaction to existing dock-less programs. The City of Dallas endured a contentious period of media scrutiny and public comment relating to the colorful consequences of dock-less bikeshare programs operating without any durable regulations. For example, local journalists photographed dock-less bicycles being discarded into rivers and blocking sidewalks (Bevilacqua, 2018), while local elected officials fielded calls from outraged constituents to regulate these programs as a matter of public safety (Wilonsky, 2018) before eventually passing an ordinance in June of 2018 (Chappell, 2018). Interview subjects were generally pleased to see bikeshare programs regulated in their cities, but most expressed a preference for the proactive approach, alongside a general distaste for the idea of reactive regulation after the externalities had begun harming the public interest.

**Coordinators rely heavily on local cycling advocates to help guide policy and organize public input.** A key part of the policy formation process, according to the interview subjects in these seven cities, is gathering and integrating feedback from the local cycling community. Subjects from local governments spoke favorably about their relations with area cycling advocates and groups, and subjects from those groups shared similar sentiments of their counterparts in government positions. In most of the cities with a bikeshare ordinance in effect or under consideration in late 2018, the legislative process included some element of public comment and/or contribution to the proposed regulation. In vocally “bike-friendly” communities like Portland, Tempe, and San Francisco, cycling advocacy groups play a central role in advising elected officials on regulations and infrastructure decisions. They also act as a coordinator of public input, both in organizing group appearances at public meetings and in rapidly disseminating information to their membership. Most of these cities also have advisory working groups in place to take the lead on issues relating to bicycle-pedestrian planning and bikeshare regulation. Both camps viewed this relationship as constructive, particularly those city planners and program coordinators who oversee bicycle-pedestrian planning but who have only limited formal knowledge in the realm of cycling in American cities. More than one interview subject from the public sector lamented the lack of formal training on the subject in their academic coursework on urban planning or public policy, and they expressed appreciation for what they have learned from cycling advocates.

**Coordinators view dockless bikeshare as more flexible and cost-effective than docked bikeshare, but also much more complex for local governments to manage.** Individuals from local government expressed a range of opinions about dock-less bikeshare, simultaneously praising the concept for its flexibility, ease of access, and generally lower cost to launch and operate. Subjects also noted how dock-less platforms are administered directly by private companies, whereas docked programs are often administered by a joint public-private effort requiring more day-to-day time investment to oversee. At the same time, several of these same interview subjects had caveats or even warnings about dock-less bikeshare as a means of personal mobility in cities. They critiqued dock-less platforms for being harder to organize and rebalance across a large service area, for being uneven or lax with safety education efforts, and for often being owned by distant (even international) companies with no ties to the communities they serve. Unlike docked bikes, which must be secured to a fixed station between uses, dock-less bicycles can be parked virtually anywhere, making them a constant management challenge for their owners as well as city regulators. In addition, while stakeholders can carefully plan where a docked bikeshare station will be placed (for example, in a tourist-heavy area or an area with many lower-income residents), they generally lack this ability with dock-less platforms. Finally, several coordinators spoke of a comfortable working relationship with the managers of docked bikeshare platforms, but expressed reservations about working with a dock-less provider. For example, in Minneapolis, the city worked closely with a local nonprofit to launch docked bikeshare, but reservations remain about opening the network to new entrants who may not follow the same nonprofit model. In Dallas, city officials struggled even to communicate with their dock-less providers, the most high-profile of which was based in China.

**Coordinators argue the missing link in growing cycling ridership is proper infrastructure, rather than rider education programs or rich regulatory frameworks.** Each interview posed the question of which category local governments and cycling advocates should press as more vital to growing bikeshare usage and bicycle ridership generally: Infrastructure investments or rider education. All eleven stakeholders felt that infrastructure was the more important investment for growing ridership. In St. Louis, the subjects talked about the number of cyclists who ride on city sidewalks – in violation of the law – because there are often no marked bike lanes or safe pathways for one to cycle on a busy roadway. One city official there mentioned the local police departments have a policy of not citing cyclists who ride on the sidewalks, because “the police know people have to either ride on the sidewalks or risk a possible fatality accident.” In Dallas, one cycling advocate described organizing learn-to-ride sessions for families in the region, but having to hold them inside city parks because there were no suitable bike lanes on the surrounding roadways that could be used for rider education. Furthermore, while the topic of the interviews was centered on bikeshare regulations, several people spoke about what they viewed as the far more critical challenge facing cities: The lack of safe and durable bicycle infrastructure. Without a long-term investment in that, they argued, no amount of regulation or easily-accessible bikeshare platforms will lead to a lasting mode shift.

**Coordinators and advocates view bikeshare as instrumental in boosting public support for bicycle infrastructure in cities.** In connection with the previous finding on the importance of infrastructure for long-term planning, interview subjects also discussed the value of bikeshare platforms in advancing the general feasibility of cycling in American cities. As

individuals in Philadelphia, Minneapolis, Dallas, and Tempe all said separately, bikeshare programs allow people to become cyclists for almost no financial investment. In the case of St. Louis, they are also viewed as a vital tool in advancing mobility for lower-income residents. Interview subjects spoke of how this increased visibility and utility of bikeshare programs – and of cycling in general – will play a central role in growing the debate on bicycle infrastructure in cities. As more people ride and see cyclists on the roadways every day, one coordinator argued, the easier it will be for them to support multimodal transportation plans that devote lasting resources to cycling infrastructure.

**Electric scooters, or e-scooters, are of growing concern among planners and activists.**

One final topic worthy of discussion is one that emerged without prompting from several interview conversations: The widespread belief that electric scooters (e-scooters) will overtake soon dock-less bikeshare platforms in many cities and render these efforts at regulation moot. Individuals mentioned the rapid growth of e-scooters in their cities, many of which were being offered by the same private-sector companies that had only recently offered dock-less bikeshare platforms. Subjects from several cities discussed their perception that dock-less bicycles were already being phased out and replaced with e-scooters, which represent an entirely new set of challenges for regulators and planners. While e-scooters were not a part of this research project, their growth as a tool of urban mobility is beyond denying as of this publication, and both the authors and the broader literature view e-scooters as the next stage in ensuring safe mobility in American cities.

## V. Discussion and Implications for Practice

These results from Stage One (Chapter III) indicate a colorful diversity of ordinance formatting and strength among America's largest cities. By scoring the cities' bikeshare regulatory environments, and then organizing those scores onto a spectrum of regulation, the authors were able to illustrate the range of ways in which individual cities are managing the growth of docked and dock-less bikeshare programs within their borders. In addition, by exploring the institutional factors at work in selected cities, the authors gained some understanding of the mindset of bikeshare planners and advocates. Still, an overarching theme arose from the analysis, which will arguably color future efforts at regulating bikeshare and similar models of personal mobility: Formal regulation of these innovative mobility programs often fails to keep pace with the day-to-day operating realities in American cities. In other words, while this study did not incorporate an element of time-progression, it is evident from the analysis that many cities are acting to regulate bikeshare programs only after such programs are already active on their streets. The authors were intrigued by the evidence that the governments of so many major American cities are willing to allow bikeshare programs to operate without first organizing or enacting any legally-binding guidelines to manage their safe usage on city streets. The reasons for this apparent willingness were not investigated in this study, but the authors contend it must be explored in future studies, as it illustrates an area in which city officials and planners have failed as proactive guardians of health, safety, and general welfare.

The results from Stage Two (Chapter IV) indicate the environment for bikeshare regulation in American cities depends to a significant degree on local factors and informal expertise. This matches with the authors' introductory assumption that the absence of nationally-viable best practices would lead individual cities to craft their own policies. The authors found that these policy-formation processes often seem caught between reactive (to sudden crises and negative externalities) and proactive (for advancing longstanding mobility goals) pressures. Coordinators are invested in transportation planning and policy, and work to advance those issues, but the nature of bike-ped management evidently leads to many unanticipated challenges that require more immediate attention. The authors see this as a key pressure point in bikeshare coordination, because if staff are too occupied with the crisis of the day, they may fall behind in their long-range planning goals. The authors are aware that this pressure often exists among urban planning professionals in general, but it remains an area of concern among bikeshare regulators.

The concept of safety was poorly represented among the ordinances and regulations scored in this project. While the rubric adapted from Bordenkircher and O'Neil included a whole section dedicated to scoring the safety-related verbiage of bikeshare regulations, the language itself was generally silent on the topic. Current regulations are thus vague, or nonexistent, on most issues of bikeshare rider safety, thus leaving riders open to information asymmetries and possible injury while using bikeshare. In addition, issues of equity were also generally missing from the ordinances and regulations examined. It is not clear from city ordinances how these communities seek to enforce – or even to define – goals of equity and fair access to bikeshare among residents. The regulation scores shown in Chapter III show a visible focus on issues of insurance liability and legal indemnification, but few cities appear willing to utilize bikeshare programs as a tool for advancing economic opportunity, social equity, or safe cycling habits among residents. The authors recommend deeper study into the linkages between equity and access to bikeshare as a



low-cost means of transportation, and the ways in which city governments can nurture this relationship through the regulatory process.

Given the number of cities allowing bikeshare programs to operate without any form of explicit bikeshare regulation, it remains unclear the degree to which bikeshare operators can be influenced by the language or regulatory strength of a bikeshare ordinance. Still, given the growing interest in fostering a wider variety of travel modes in cities, and in encouraging bicycle-pedestrian activity in general, these results remain relevant to those seeking to gain a clearer understanding of how bikeshare programs are (or in many cases, are not) regulated in American cities. As more city governments explore the role of bikeshare in meeting those mobility goals, the spectrum of regulation outlined in this paper will continue to grow and diversify.

The project was able to explore to some degree the ways in which a city's relationship with dock-less bikeshare operators might differ from that of a docked bikeshare operator. Among public employees interviewed, the consensus was that cities generally had a more constructive and rich relationship with docked providers than with dock-less, due in large part to so many cities launching their docked bikeshare programs through a methodical and mutual process. This stands in contrast to the dock-less programs, many of which are owned by overseas companies and several of which were infamously launched in cities without any prior notification to local governments. The authors were not surprised by the notion that policymakers prefer to work with entities that operate methodically and openly. For practitioners, this finding may broadly suggest that cities should work to enshrine these preferences into written policies, which would effectively give preference to locally-oriented providers and push overseas companies to establish legitimate local ties in order to remain competitive.

Interview subjects were vocal on the subject of bicycle infrastructure being their chief concern, rather than a rigorous regulatory or permitting process for bikeshare itself. Their reasoning – that even a well-managed bikeshare system will not be used by many people if the city seems unsafe for cyclists – resonated with the authors, and also conformed to the literature on the subject (Schoner and Levinson, 2014; Parker et al, 2013). Several interview subjects argued plainly that bikeshare helps to make cycling more visible citywide, which they hope will ultimately boost the debate on bicycle infrastructure in cities. For practitioners, the lesson here is to encourage the growth of bikeshare programs in a safe and visible way that can feed into the public debate on building the related physical infrastructure. Individual communities are working to integrate both regulatory frameworks and infrastructure planning into a single mobility vision, and practitioners elsewhere must find ways to do the same.

One final topic worthy of discussion is one that emerged without prompting from several interview conversations: The widespread belief that electric scooters (e-scooters) will overtake soon dock-less bikeshare platforms in many cities and render these efforts at regulation moot. Individuals mentioned the rapid growth of e-scooters in their cities, many of which were being offered by the same private-sector companies that had only recently offered dock-less bikeshare platforms. Subjects from several cities discussed their perception that dock-less bicycles were already being phased out and replaced with e-scooters, which represent an entirely new set of challenges for regulators and planners. While e-scooters were not a part of this research project, their growth as a tool of urban mobility is beyond denying as of this publication, and both the

authors and the broader literature view e-scooters as the next stage in ensuring safe mobility in American cities.

The authors find the regulatory model set forth by St. Louis planners – a simple but enforceable ordinance, paired with a detailed but flexible set of permit regulations developed to suit local needs – to have significant utility for cities still grappling with how best to manage bikeshare programs on their own terms. Included in this paper as Appendix A is a model bikeshare ordinance, which borrows attributes from all seven cities studied in this project. The authors encourage city officials to craft an ordinance that is locally-tailored, enforceable, and enduring, so that permits for bikeshare can be issued legally and fairly, and bikeshare programs can be monitored for safety, equity, and other concerns within the public right-of-way. At the same time, the authors recommend a detailed set of permit regulations to guide bikeshare programs in a way that suits local needs and interests. These permit regulations should be crafted with the input of cycling advocates, local businesses, and city staff, in order to ensure they reflect the needs and wishes of the community. Staff overseeing the permit process must be empowered to make reasonable changes to the permit regulations as needs change, and should also be encouraged to coordinate their efforts with bikeshare providers, cycling activists, and long-range planners. This blended process would offer cities a solid regulatory framework that still bends to meet local needs and a changing marketplace as some areas incorporate e-scooters and other technologies.

## VI. Next Steps for Scholarship and Practice

The findings presented in this study represent a glimpse into the state of bikeshare regulations in America's largest cities in 2018. While the investigation encompassed over fifty of the nation's largest cities, work remains to be done in understanding the nature of city regulations that govern personal mobility. This is especially pressing considering the pace of change in these cities – the present iteration of docked/dock-less bikeshare is a relatively recent phenomenon, and regulatory frameworks and best-practices remain under development.

The literature on bikeshare in America – its usage, its potential for mobility improvements, and its management as an enduring part of the transportation landscape – is quickly growing but still largely in its infancy. A great deal of additional study is needed in order to fully explore the nuances of bikeshare in American cities, and this project represents only one modest effort toward that goal. Over the course of this project, the authors observed a few key areas ripe for further study by qualified scholars. First, while this study established that there is indeed a spectrum of regulation for bikeshare programs, it remains unknown whether and how cities communicate with one another in the formation of their various bikeshare regulations and permitting guidelines. For example, when a city is developing its bikeshare ordinance, to what degree do city employees look to peer cities for policy guidance or strategy? Understanding the ways in which cities influence one another's policy developments would greatly inform this strand of the literature going forward. In addition, it would add a time-series element that was ultimately lacking from this project. Scholars should examine whether city bikeshare policies evolve over time due to the influence of their peers and the lessons learned elsewhere. Finally, as identified in the findings of this paper, little has been published in the bikeshare literature about the nature of exclusivity contracts between cities and bikeshare operators. The authors were ultimately left to speculate that one reason why so many cities in the dataset had bikeshare programs but no written regulations governing them was because many of those cities may have had exclusivity agreements/contracts with a single operator. In this case, rather than write a formal ordinance governing conduct for many providers, a city agrees to a contract specific to one or two bikeshare providers, using the contract terms as an ersatz regulatory framework. These contract-based relationships, to the degree that they exist and represent an alternative (or disruption) to the traditional ordinance model, must be explored in future scholarship in order to capture the full picture of bikeshare regulation.

The authors also encourage scholars and practitioners to continue to develop industry-wide best practices that can be shared across providers and across cities. Given the extreme variation observed in city bikeshare ordinances, the authors contend that best practices and widely available guidebooks on bikeshare regulation would be beneficial in establishing a more consistent set of regulations and norms across the nation's major cities. While there exist a few guidebooks on the subject that offer general advice on bikeshare management, the authors still see the need for unifying best practices which can be developed and shared as this regulatory environment continues to mature.

While practitioners should be encouraged to work toward such best practices, the authors remain committed to recommending locally-oriented ordinances and regulatory frameworks. Policymakers and city staff must be empowered to protect public safety and propose/execute any suitable means of doing so within the confines of local and state law. These solutions must be

tailored to meet local needs, as well as the wishes and goals of residents, public officials, and private-sector bikeshare operators.

Discussions of bikeshare as a component of long-range mobility and transportation planning in major cities dominated several of the stakeholder interviews, and it is clear to the authors that bikeshare (and cycling in general) must be more formally and explicitly integrated into local and regional mobility plans. While cycling may not presently have a substantial mode-share in most American cities, it remains a high-profile goal among many city leaders. In order to advance this goal, at least in part, policymakers must fold discussions of how best to plan for bikeshare into a broader and more comprehensive vision of mobility planning for the next generation of urban infrastructure. Interview subjects in several cities commented on how bikeshare programs lower the barrier of entry for all who ride them, from tourists and low-income families to influential civic leaders and elected officials. To them, bikeshare represents a chance for all members of the public to experience bicycling in the city for themselves, and over time may influence their thinking on investing in bike-ped infrastructure. For this reason, if bikeshare is to be allowed to remain and be regulated, city officials must leverage the opportunity to expand plans and investments to improve bicycle pathways, signage, and racks over the long term.

Finally, on the topic of market disruptors in cities, the authors strongly urge policymakers and elected officials to liberalize their regulatory frameworks in order to keep up with these new entrants and their externalities, both positive and negative. The authors' brief exploration of these disruptors in Western cities comes to the same conclusion of those scholars quoted throughout the literature: Disruptors have now become a permanent fixture in city life. If these entities – both at present and into the future – will continue to disrupt established market paradigms and offer new technologies and new options to city-dwellers, then city officials and regulators cannot keep struggling to catch up with them. A key component of many cities' delay in regulating dockless bikeshare was officials' apparent surprise that the programs were even being launched, along with a hesitation to implement regulations on something so foreign to them. This hesitation represents a failure of regulators to perform a core civic function, and the authors strongly urge these officials to better understand the concept and intentions of these market disruptors, so they may be better equipped to handle the next wave of disruptive new entrants onto city streets.

## VII. Conclusion

This project demonstrates some of the key factors at work in American cities' efforts to regulate dock-less bikeshare programs. The most overarching lesson evident from the process is that the regulatory environment for dock-less bikeshare is highly variable and is informed to a considerable degree by nongovernmental activists pursuing the interests of cyclists and bikeshare users. Among a national sample of cities, no two bikeshare ordinances were found to be considerably alike, and many of the cities were only able (or willing) to draft rules and guidelines to govern dock-less bikeshare programs only after they had already appeared on city streets. The policy formation process is in this case guided not by national policy or best practices, but by the resources and input of individual coordinators and cycling advocates who eagerly serve on advisory boards intended to craft regulations for city adoption. While the interview subjects expressed a range of opinions and anecdotes regarding dock-less bikeshare programs in their cities, none expressed a blanket opposition to dock-less bikeshare as a means of personal mobility. Even so, concerns over safety, logistics, and coordination between private-sector managers and public-sector planners were aired to a significant degree by nearly every individual interviewed. In written ordinances and permit regulations, issues of legal liability dominated all other factors. Finally, and most significantly for planning practice, infrastructure investment was rated by stakeholders as being the most critical step in advancing bikeshare and bicycle usage as permanent additions to the mobility menu in American cities. They rated this factor as far more influential in advancing cycling and promoting safe ridership than any other factor or regulation. While they were willing to discuss their regulatory frameworks and processes, they also impressed upon the authors that the more vital concern for policymakers should not be the regulation of bikeshare platforms, but the building of suitable infrastructure that encourages residents to mode-shift to bicycles of any ownership format. The authors therefore encourage deeper study into bicycle infrastructure planning and construction in American cities.

The findings presented here, while useful to the literature and policymakers, do come with a few minor caveats and pathways for future study of this topic. First and most visibly, the sample size of core cities for this national-scale study was ultimately smaller than the authors had intended. In addition, the authors had initially hoped to include more elected officials in the interview process, but this did not occur due to a mix of circumstance and direct suggestion from interview subjects in several of the seven cities. A second caveat to this work – one that can be addressed quickly in a follow-up study – is the lack of input from the private-sector bikeshare operators themselves. The bikeshare literature in general would benefit from a better understanding of the forces behind private-sector bikeshare initiatives, and a future study must investigate that group's motivations, perceptions, and long-term aspirations in the mobility sphere. Finally, the authors recommend a follow-up study focused specifically on the differences between broad city ordinances (which apply to all permitted operators in a city) and closed contracts (which apply only to a city and a single partner/vendor/provider). The authors' foundational research on bikeshare regulation found many examples in North American cities where a city government declined to enact a formal ordinance on bikeshare, but instead arranged an exclusive contract with a single bikeshare provider. Further study must be undertaken to analyze these contracts, and to ascertain whether one regulatory format delivers more durable results than the other. As the ecosystem of personal mobility in cities enters another period of renewal, fresh study of the latest offerings and their externalities will only enrich our shared understanding of these modes.



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## Appendix A: Base Interview Question Set

1. Tell us about your current position and role in your community.
2. How long have you been active in the area of bikeshare policy/activism/management?
3. What do you think of your city's current bicycle/cyclist culture and community?
4. What do you think of your city's current bicycle-pedestrian infrastructure?
5. In your own words, what distinguishes traditional bikeshare from dock-less bikeshare?
6. Does one have a clear advantage over the other? Why?
7. How are bikeshare programs, and bicycling in general, regulated in your city?
8. Are those regulations necessary or sufficient? How are they impacting riders?
9. Do you think bicycling in your city is safe enough for casual riders?
10. What makes a city safe for bicyclists, and how has your community performed at that?
11. To your knowledge, how did bikeshare launch in your city? Whose idea was it?
12. What forces/actors were a part of those deliberations? Whose input was sought?
13. In what ways has the city government's attitude toward bicycling changed since bikeshare was first launched?
14. Why do you think these changes in attitude have occurred?
15. Can you think of anyone in city leadership who was vocally opposed to bikeshare or bike-ped infrastructure?
16. If so, has that person remained a skeptic?
17. How does the city government treat traditionally regulated businesses, like taxis, restaurants, hotels, etc.?
18. How does the city government treat "disruptors" like bikeshare, Uber, AirBNB, etc.?
19. Do you think there's a difference in how the two groups are treated? Why?
20. What vital lessons has your community learned from bikeshare that can be imparted to other cities considering a broader bikeshare program?
21. How might your community's experience with bikeshare (for better or worse) affect its acceptance of "disruptor" technologies in the future?
22. Do you have any additional comments, or questions to ask us at this point?

