International Transport Forum

Optimising New Mobility Services
Discussion Paper

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Background: Dockless bike share from Shanghai to Seattle

Over the past decade, emerging technologies and innovative business models have turned the transportation sector on its head. New mobility options are constantly coming online; presenting more choices to travelers as city transportation departments evaluate how best to integrate these modes into existing networks. One of these new mobility offerings, dockless bike share, has increased the visibility and ubiquity of urban cycling in cities around the world.

The concept of bike share without stations is not new. Operators like nextbike, Social Bicycles, and OV Fiets have been offering hub-centric, stationless bike share options for years. However, dockless bike share in its current form - GPS-enabled bikes that allow users to lock and unlock them anywhere using smartphones - has been operating in China since 2014, and was largely unregulated during its infancy. Market imperfections quickly emerged as cities were inundated with millions of dockless bikes and the challenges that came with them, including piles of discarded bikes blocking rights of way and vandalism. A response from the government was all but inevitable and, in April 2017, Chinese cities were given express permission to begin exploring options for regulating the supply of bikes and better managing public space and parking (Perkowski, 2017). Soon after, dockless bike share began to emerge in the United States and other western markets. In July 2017, Seattle, Washington released the first ever comprehensive permit structure as part of a pilot to manage dockless bike share operations before companies dropped bikes on city streets. Since then, more and more cities have launched pilot programs to test regulatory approaches on the ground prior to more formal implementation.

As cities began to proactively consider regulating dockless bike share, it became clear that a delicate balance must be maintained. Operators consistently call for flexibility to innovate, compete, and improve their service delivery, technology, and business models. Meanwhile, parameters that limit oversupply of bikes, ensure bike safety and protect users are critical to the public interest. Private dockless companies claim to provide bike share profitably (that is, without subsidy), which creates the potential for bike share to become a rapidly scalable transportation option in cities around the world. Cities are in a position to leverage this opportunity, working with the private sector to offer bike share options that increase access to transit and key destinations, while ensuring that sidewalks and other public spaces retain their value for all potential users. This paper aims to identify lessons and best practices from the rollout of dockless bike share to inform how cities manage all types of technology-enabled, new mobility services, toward the goal of encouraging their use as part of a more sustainable transportation network.

Why regulate?

Market failures

As dockless bike share gained popularity in China, many companies moved into the market in an attempt to establish a user base. This eventually led to an oversupply of bikes – even though demand continued to grow – and the emergence of "bicycle graveyards" where tens of thousands of dockless bikes were left abandoned (Taylor, 2018). Parked dockless bikes oversaturated city sidewalks, blocked pedestrian paths and spilled out into streets.

In early 2017, successful Chinese bike share firms set their sights on new markets outside of China. Employing the "ask for forgiveness, not permission" mantra, companies like the now defunct Bluegogo launched fleets of bikes on the streets of San Francisco and New York. Without a system in place to properly respond, these cities issued cease and desist notices (Hobson, 2017). Still, a precedent of rogue launching of dockless bike share had been set, with private companies dictating how, where and when dockless bikes would be available. A lack of policies or regulations in place meant that cities had to create new regulatory approaches or continue to allow dockless bike share to operate unregulated.

Despite seeing first-hand the challenges an unregulated environment can yield, many cities allowed dockless bike share companies to operate unregulated. Taking a wait-and-see approach or allowing a "free market" environment in order to attract operators has, in many cases, resulted in poorly-delivered service, parking complaints, vandalism, and other negative outcomes. Especially in cities without an existing bike share system, these outcomes degrade the overall image and potential dockless bike share can offer. In Dallas, Texas, unregulated dockless bike share companies flooded the unprepared city with bikes, the total number of which reached 20 000 in late 2018. Without proper infrastructure or policies in place, the system soon devolved, generating a myriad of complaints about mis-parked, vandalized and abandoned bikes (Macon, 2018). Significant risks to active transportation writ large, to future investments in cycling, and to accessing transit and other destinations could result from such a poorly-managed dockless bike share system.

Regulation enables system-building

Privately operated, technology-enabled services like dockless bike share can have a positive impact on urban mobility. Operator data shows that dockless bike share extends the reach of transit networks by providing first- and last-mile connections to rail and bus riders, and can help shift travelers away from cars especially during peak travel times when cycling can be faster than driving (LimeBike, 2017; Wiley, 2018). A nimble approach to regulating new mobility services that maximises these benefits, while keeping the public interest front and centre, is critical. Regulation also enables cities to build a bike share system that is integrated with other modes and structurally sustainable in the long term.

Multi-stakeholder relationship-building

Well-regulated dockless bike share establishes an expectation that private operators both collaborate with the city and provide a high quality service for users. It cultivates a transparent working relationship between the city and operators, more effectively securing bike share as part of the transportation system. Developing these relationships enables cities to communicate their goals for bike share to operators, as well as their expectations for service delivery. Several cities have established this relationship early on, requiring operators to respond to requests for expressions of interest (RFEI) so that cities can understand how operators plan to provide services and meet goals related to equity, affordability, public space management, user privacy protections, etc.

Operational standards

Clear, outcome-oriented regulation creates a fair, stable and predictable operating environment for businesses. This is intended to establish a minimum level of service from all operators that improves reliability at the system level and does not allow for a "race to the bottom" scenario in which operators provide mediocre service without market consequences. Specific operational objectives and strategies to minimise operational shortfalls are discussed in the following section.

Integration with other shared modes

Multimodal integration between bike share and transit or bike share and ride share is ripe for development as a first- and last-mile solution. Third party trip planning applications such as Transit and Citymapper are lowering barriers to finding the closest dockless bike, regardless of operator, by using operator-provided application programming interfaces (APIs) to display bikes (and, when available, rideshare, bus, rail and other transit options) on a common map. Some of these companies are working toward in-app payment integration, further reducing barriers to multimodal travel. More trips that include sustainable transportation for at least one leg mean more city-wide benefits like greenhouse gas and other emissions reductions, affordability, and more demand for street space dedicated to walking and cycling.

Integration of dockless bike share and ride share companies like Lyft, Uber, and Ola into one mobile application poses an interesting opportunity for shared mobility and, potentially, mobility as a service (MaaS). Several ride share companies have recently acquired or partnered with bike share companies to offer bikes in their apps, most notably Uber, which now allows users to find and rent pedal assist electric bikes through its app in San Francisco, Washington, D.C., and New York. Indian rideshare giant, Ola, launched its own dockless bike share pilot in India in late 2017 (Sharma, 2017). Reducing barriers to shared mobility modes makes these modes easier for users to choose and link together, offering more robust alternatives to using a private vehicle. Early data from Uber in San Francisco shows a 10% decrease in Uber car trips during peak travel periods, however engagement with the platform increased by 15% following a user's first Uber bike trip (Wiley, 2018). This indicates that users are substituting car trips with bike trips in that market.

Policy framework for maximising benefits of dockless bike share

In the past, cities and private companies entered into cost and revenue sharing contracts to provide public transportation services like bike share. Now, in the new mobility era, private companies are more commonly owning and operating these services – largely on their terms. Private investment in transportation could allow for public funding to be freed up for other uses, like infrastructure or more frequent transit service. Still, private operation of dockless bike share requires the use of city-owned streets, sidewalks and other public space. Cities have used that leverage not only to check rogue operators, but to establish wholly new regulatory mechanisms to better manage private mobility operations. Dublin, Mexico City, San Francisco, Singapore and others established permit systems, requests for proposal (RFPs), and memoranda of understanding (MOU) that allowed those cities to set service quality standards and align operators with their larger transportation and mobility goals.

The following policy framework encourages cities to think more holistically about how dockless bike share might contribute and connect to the broader transportation network, thereby integrating this mode into the mobility landscape in a more long-term, sustainable way. Concurrent real time and periodic evaluation processes allow cities to address immediate operations issues like managing public space and protecting users within the context of system-level performance goals. Figure 1illustrates this iterative process.

Figure 1. Methodology for regulating dockless bike share
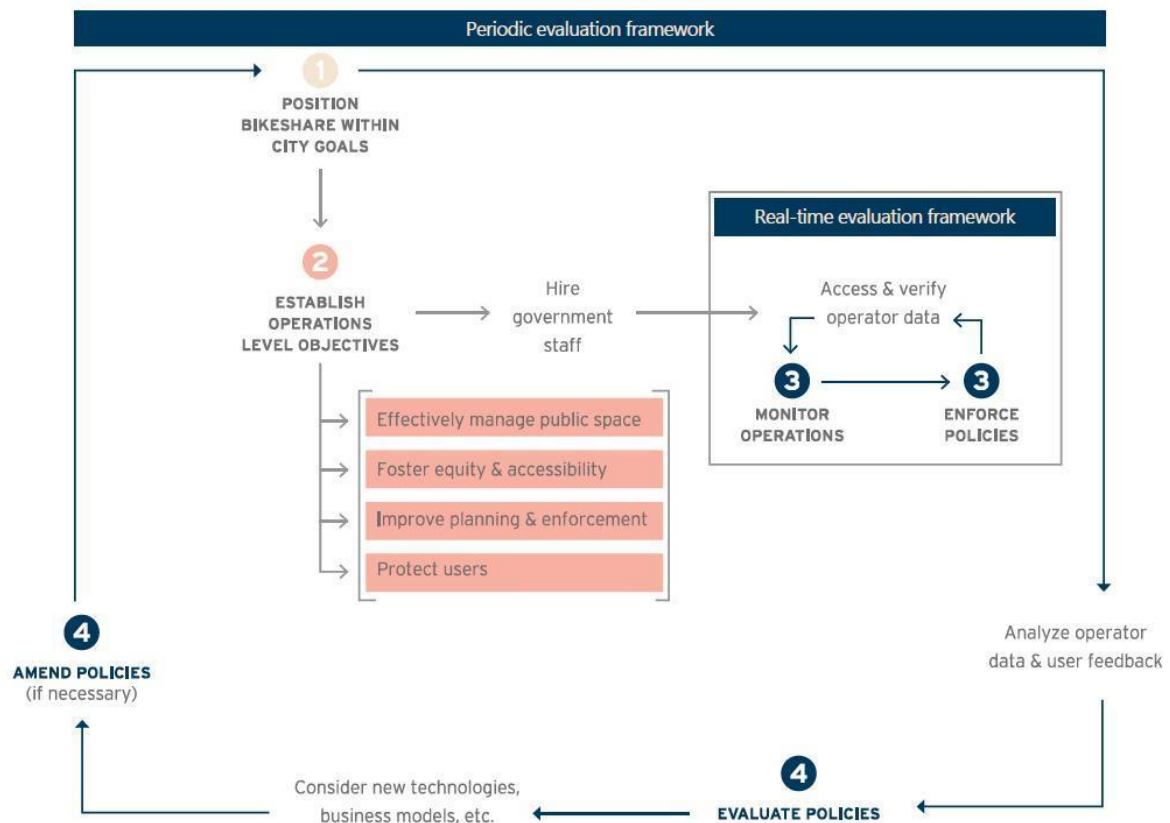
Source: Institute for Transportation and Development Policy (2018).

Outcome-oriented system planning

Bike share can be a key component toward achieving access, economic development, sustainability, health, and other efforts cities are already undertaking. Identifying how dockless bike share can connect to existing goals will help cities decide which policies to prioritise, and how best to track progress and measure success. For example, bike share can contribute to economic development goals to attract tourists and businesses – offering an affordable and sustainable transportation mode for visitors to explore the city, and a quality of life benefit for residents. Buehler and Hamre (2013) found that 23% of Capital Bike share riders in Washington, DC spent more money at local businesses because they used bike share, and that 16% of riders to the central business district would not have made that trip if bike share were not available.

Addressing operational shortfalls

In addition to contributing to city-wide goals, regulatory requirements that address specific challenges related to dockless bike share will help to maximise benefits. Some of the current challenges include: oversupply of bikes, lack of coordination between governments and operators, uncertainty around

service delivery, etc.. In this section, these challenges are grouped into four operations-level objectives: manage public space; foster equity and accessibility; improve planning and enforcement; and protect users. Table 1 includes examples of regulatory requirements and the operations objectives and broader city goals that they can help achieve.

Table 1. Outcome-oriented policy options

Requirement	Operations objective(s) met	City-wide goal(s) contributed to
Data reporting standards	Manage public space Foster equity and accessibility Improve planning and enforcement Protect users	Improve transportation infrastructure, planning, cycling network connectivity. Track progress toward city goals.
User education	Manage public space Foster equity and accessibility Protect users	Increase physical activity. Reduce traffic injuries and fatalities. Provide affordable, reliable multimodal trip options.
Equipment standards	Foster equity and accessibility Protect users	Attract businesses/high-skilled workers. Attract tourists. Reduce traffic injuries and fatalities.
Fleet cap	Manage public space	Provide public right-of-way that is safe for all users.
Bike distribution requirement	Foster equity and accessibility	Provide affordable, reliable multimodal trip options. Improve access to jobs/destinations. Increase physical activity.
Transit integration	Foster equity and accessibility	Provide affordable, reliable multimodal trip options. Improve access to jobs/destinations. Reduce GHG emissions, other pollutants. Attract businesses/high-skilled workers.
Flexible payment options	Foster equity and accessibility	Provide affordable, reliable multimodal trip options. Improve access to jobs/destinations.
Clear safety information	Protect users	Reduce traffic injuries and fatalities. Provide public right-of-way that is safe for all users.

Conditions and goals undoubtedly differ from city to city, and uncertainty exists in some cases around local authority being able to regulate dockless bike share. Given this, different policies (or a combination of policies) may be necessary to address each objective, and cities should construct regulatory frameworks that meet their specific needs. In addition, it is important to consider that goals and objectives may conflict with each other. For example, requiring rigorous equipment standards as a means of protecting users may lead to more expensive bikes and user fees, making it more challenging to meet the city-wide goal of providing affordable travel options. The following sections explore regulatory requirement options that could help to address dockless bike share challenges, and to maximise system wide benefits.

Objective 1: Manage public space

Dockless bike share operates under the assumption that public space will be available for bike parking between uses. In some areas of the city, public space may be less contested due to wide sidewalks, low pedestrian flows, etc. However in areas with narrow sidewalks, high pedestrian traffic, street trees or other planters, outdoor restaurant seating, and any number of other uses of public space, parked bike share bikes compete for space. Regardless, public space is a social and economic good, which cities are responsible for maintaining.

There are many examples of public space management issues that have arisen due to a lack of proactive regulation. "Bike piles" on Chinese city sidewalks in Beijing, Shanghai, Guangzhou and elsewhere have caused major concerns. Early dockless bike share adopters in the United States like Washington, D.C., Seattle and Dallas saw parking issues on a smaller, yet still noteworthy, scale. Strong concerns were raised by mobility-challenged residents and American Disabilities Act (ADA) advocates about bikes blocking curb ramps and narrow sidewalks, preventing wheelchairs from passing (Cohen, 2017). As evidenced by Chinese bike piles, the public space management challenge tends to grow with the size of dockless bike share fleets. Larger fleets, on the one hand, help to achieve scale and improve reliability, but they can also increase the rate and occurrence of mis-parked bikes.

Local authorities will also need to consider trade-offs - designating space for dockless bikes will likely mean less space for pedestrians (if parked on the sidewalk) or cars (if street parking is converted to bike parking areas). However, capacity and/or resource constraints may limit what a city is capable of both requiring and enforcing.

Policies which cities have at their disposal to yield more clearly-defined parking habits and orderly public spaces include:

Fleet cap: The total number of bikes each operator is allowed to have on the street is limited to a specific number. The cap could be dynamic, changing over time - for example, increasing by a percentage each month for the first three months of operation, as is the case in Seattle – or when an operator meets certain milestones, or remains static, like in Milan, which restricts each operator to a maximum of 3 000 bikes.

Time-Bound response to parking complaints: Operators are required to respond to mis-parked bike complaints within a certain time frame, typically two hours. The city then has the authority to fine the operator, or remove the bike from the street at the expense of the operator.

User education: Operators are required to include information on proper and inappropriate parking locations on their website and in their mobile app which users must read through and agree to follow in order to complete the registration process.

Lock-to requirement: Cities limit dockless bike share operation to companies that can provide bikes that lock to existing infrastructure (bike rack, sign post, etc.) in order to end a ride. There is no definitive evidence that lock-to technology reduces instances of tipped-over bikes, or bikes blocking right-of-ways and other public spaces. Still, cities interested in implementing a lock-to requirement should work with operators to invest in additional bike parking given the significant increase in demand for racks this requirement yields.

The following requirements may require more political will, staff time and resources to implement relative to the requirements suggested above.

Designated parking areas: Physical parking areas are sited and painted by the city for use by all dockless bikes. Parking areas may be particularly beneficial in more congested areas where competition for sidewalk space is high. City staff will need to work with operators to ensure that a) the GPS technology on their bikes is accurate enough to recognise bikes parked within the designated areas as complying, and b) parking areas are clearly defined (and users are incentivised to use them) across all real-time service maps.

Demand-based designated parking areas: Designated parking areas can be priced based on demand. For example, parking areas in the central business district could carry a premium parking fee during weekday

mornings. Cities would need to work closely with operators to ensure pricing changes are being implemented in alignment with congestion management goals.

Objective 2: Foster equity and accessibility

Station-based bike share systems have been widely criticised for their inequitable rollout in terms of station locations and marketing strategies. Due to the high costs of stations, traditional bike share systems have typically concentrated stations in central business districts and other high-density, high-destination areas to generate ridership and, thus, revenue to fund expansion into lower-density areas (Shaheen et al., 2014). While this strategy is intended to minimise risks and ensure long-term financial stability of the system, it simultaneously excludes residents who live in lower-density areas further from the city centre (often low income communities) from using bike share. Focusing on building ridership from the wealthier city centre sends the message that bike share is designed for wealthier, downtown residents and, conversely, that bike share is not intended for low income residents. Indeed, many station-based systems' ridership demographics reflect this sentiment.

One of the strengths of dockless bike share is its potential to bring fleets of shared bikes to all corners of a city at once, given substantially lower upfront capital costs compared to station-based systems. Access to transit, jobs, and other destinations could drastically improve - especially in historically disconnected communities - if dockless bikes are consistently available across all neighborhoods. This will only happen if cities are mindful of the barriers that bike share can present to low-income communities, and demand operators meet one or more of the following accessibility requirements to minimize those barriers. Additionally, cities should develop a comprehensive community outreach strategy for communicating the benefits of bike share and encouraging cycling as a cost-effective, sustainable transportation option.

Accessibility requirements to minimise use barriers for low-income communities include:

Bike distribution requirement: An operator can only have a certain number of bikes (cap) or must have a minimum percentage of their fleet (minimum) in each zone (could be neighborhoods, wards, etc.) at any given time. This could help to ensure more equitable spatial distribution of bikes across the city, and that bikes can be more reliably found in less dense or less destination-heavy zones.

Flexible and reduced payment options: Accessibility to dockless bike share can be limited by needing a smartphone to locate and unlock a bike, and a credit card linked to a user's account. Cities could require operators to provide at least one alternative payment option for users to top up their account (cash at local stores, using a pre-paid card, etc.). To ensure bike share is affordable, San Francisco requires dockless operators to provide a reduced fare plan to low-income customers that waives the initial deposit and offers unlimited trips under 30 minutes.

Transit integration: Citywide accessibility rests heavily on the reach of the transit network, and bike share has the opportunity to extend that reach if it is well-integrated, affordable, and efficient for users. Reduced fare bike share trips that connect to transit (similar to reduced fare transfers from bus to metro), as well as the ability to access bike share and transit using a common radio-frequency identification (RFID) card, could significantly expand first- and last-mile connections. Cities could require dockless operators to provide bikes that can be unlocked using an RFID card (preferably the city transit card), or work with operators to develop a payment platform that allows for reduced-fare transfers between bike share and transit.

Objective 3: Improve planning and enforcement

Dockless bikes with on-board GPS provide more robust trip data than was previously possible with non-smart bikes. This data is particularly valuable to cities for its potential to inform a variety of planning decisions related to citing and improving cycling infrastructure, as well as to shed light on how and where users are riding dockless bikes (perhaps compared to other modes). Understanding these trends may help cities to better prioritise – and expand the impact of – limited funding available for active transportation improvements that support the bike share system and cycling more broadly. Real-time, verifiable data from dockless bike share operators is also critical for monitoring and enforcement of compliance with city policies.

Cities should set a precedent for data sharing from operators early on in the permitting process, requiring both real-time and historical data as a condition of operation. Permit language in cities like Washington, D.C., St. Louis, and Chicago requires that operators provide specific data points and, in most cases, establish a standard format for submitting that data. A comparison of requirements from these cities is included in Table 2.

Table 2. Comparing data reporting requirements

City	Maintenance report required/ period	Theft and vandalism report/ period	Crash report required/ period	Progress on community engagement report/ period	User survey required	Bike location and availability via API/ using GBFS	Anonymised trip data/ standard format identified
Washington, DC	Y/monthly	N	Y/monthly	N	Y	Y/Y	Y/N
St. Louis, MO	Y/monthly	Y/monthly	Y/monthly	Y/monthly	Y	Y/Y	Y/Y
Chicago, IL	Y/not specified	N	N	N	N	Y/Y	Y/N

Source: Individual city permit documents (n.d.).

Without clear data reporting requirements, cities risk not having access to critical insights on mobility patterns unfolding on their streets *and* limiting the effectiveness of their monitoring and enforcement efforts.

The following policies enable cities to leverage these insights and improve their dockless bike share system performance over time.

Data reporting standards: Operators are required to provide access to real-time data on the location of every operational bike via an API that uses the General Bike share Feed Specification (GBFS) format.[1] Anonymised trip data, maintenance activity data, and crash data should also be shared at periodic intervals set by the city through a standardised format detailed in the permit or MOU.

User survey requirement: Operators are required to distribute an annual survey (preferably drafted by the city to standardise data collection across operators) to users that collects data on the demographics of dockless bike share riders and how and why they use dockless bikes. This data may help analyse progress toward city goals such as expanding access, and where and to what groups the city should target efforts to encourage bike share use.

Objective 4: Protect Users

Generally, bike share is considered a relatively safe transportation mode - safer, even, than riding a personal bike. This is largely attributed to both the heavy, limited-performance design of most bike share bikes, as well as observed cautious riding behavior common to less comfortable or experienced riders (Martin et al., 2016). Due to a lack of crash data, however, little is known about the overall safety of dockless bike share. Newer dockless bike share bike models, are much lighter and, arguably, lower quality than traditional bike share models, which could increase the likelihood of malfunctions and crashes. Fishman and Schepers (2018) propose that because dockless bikes can be found in more areas of the city than docked bikes, there could be an increase in bike share riders in areas without bike lanes, which may increase the prevalence of crashes.

Cities have a responsibility to protect residents and visitors riding dockless bikes on city streets and trails. Educating users and requiring that operators meet industry standards for equipment and maintenance can contribute substantially to safety at the system level. Protecting users also entails requirements that safeguard user privacy and transactions within dockless bike share apps. For example, Denver's dockless mobility pilot permit includes a requirement that operators' electronic payment systems comply with Payment Card Industry Data Security Standards (PCI DSS), a global standard that protects credit cardholder data and helps to reduce fraud.

The following requirements seek to address both pieces - physical and financial - of the user protection picture:

Clear safety information: Operators are required to include safety information for riders on their website and in-app, which is triggered upon registration. Such information includes educating riders to wear a helmet, inspect the bike for damage before riding, submit a maintenance report, yield to pedestrians while riding, and park in acceptable locations, etc. Requirements for especially pertinent information, like a customer service phone number for the operator, on each bike could yield additional benefits.

Equipment and liability standards: Bikes are required to meet ISO Standards for safety, which include front and rear lights. Prior to being permitted to operate, companies are required to present proof that a process in place for users to notify them of safety or maintenance issues involving their bikes. As standard practice, proof of liability insurance is also required prior to operating.

User deposit refund protections: Operators are required to refund deposits and/or account balances to users according to an established timeline if they cease operations in the city. While many operators seem to be moving away from requiring user deposits, at least in certain markets, several still require a deposit upon registering. Cities may consider establishing a government or escrow account to house (and protect) these user deposits.

Real-time monitoring and enforcement

Effective monitoring and enforcement of dockless bike share operations requires data to be submitted by private operators and validated by dedicated government staff, and a strategy that imposes penalties for non-compliance.

Data sharing

In order to make sure permit or other regulatory requirements are successfully minimising operations-level challenges, cities need real-time data from operators that is easy to validate. Verified operator data

is critical for an accurate analysis of system performance and for carrying out effective enforcement. This will underscore the impact policies are having towards each operational objective. More broadly, using operator data to track progress toward city goals can also help evaluate the success of dockless bike share policies, and whether and how policies should be adjusted - for example, re-evaluating fleet caps - if technology, business model, or other changes arise. Consistent, reliable data submitted by operators in a standardised format allows the city to be flexible and responsive to how these changes affect the bike share operating environment, and to rework policies in order to stay on track to meet city goals.

Staffing

A minimum suggested staffing requirement for any jurisdiction is one full-time staff member dedicated exclusively to monitoring dockless bike share. However, cities should plan for the staff they will actually need to effectively run the program, which will likely be more than one staff member. Bike share staff should be able to understand and critically evaluate data submitted by operators to ensure compliance with city policies, which would likely include geographic information system (GIS) skills, an understanding of APIs, and field-verifying operator data. Because this data will help to inform compliance checks, the position(s) should be housed within or have a direct link to the department tasked with issuing fines to enforce dockless bike share policies. It is not recommended, however, for these staff to be directly or solely responsible for issuing fines so as to avoid potential for bribery from operators, or other corrupt practices. Optimally, additional staff would be responsible for community outreach and education to encourage the uptake of bike share citywide and help establish norms of behaviour.

Compensation for dockless bike share monitoring staff can be funded through permit and/or administrative fees paid by the private companies to operate on public rights-of-way. Dallas, Denver, and Seattle's permits include application review fees paid by operators to cover staff time (National Association of City Transportation Officials, 2018). Given the potential for conflict of interest, funding to cover staff time for monitoring should not come from non-compliance fines imposed on companies.

Developing an enforcement strategy

An enforcement strategy implemented from the outset will help to establish norms that maximise policy compliance, and minimise the need for future enforcement. A successful strategy will require both elements described above: reliable, real-time data from operators, and staff capable of interpreting that data to assess non-compliance penalties when appropriate. It is recommended that cities enforce policies using fines or other penalties. Enforcement strategies should also be designed in a way that encourages compliance, and reduces the need for enforcement over time as operators understand that adapting their operations to meet requirements is cheaper and easier than paying penalties, having their fleet size reduced, etc. The number of staff and other officers required to conduct enforcement may, then, reduce over time.

Revenue generated from fines should be directed to bicycle and pedestrian infrastructure projects (and not city bike share staff compensation), under a separate jurisdiction from the city's bike share program staff, to avoid any appearance of conflict of interest.

Long-term policy evaluation and adjustment

System performance should be periodically evaluated by the city, or a third-party managed by the city, to ensure that dockless bike share policies are effectively meeting established goals. Appropriate data that

corresponds to progress toward each goal should be collected for this purpose. For example, to measure equity of the system, an annual, comprehensive survey distributed by each operator to their users could help the city understand the demographics and needs of system users. These data could then be combined with modal split, accessibility, and other existing indicators to reveal a more complete travel picture.

Through this evaluation, policies such as fleet caps, service area boundaries, equipment standards, etc. can be adjusted as needed. Periodic evaluation may also shed light on the need for secondary or follow-up policies to bolster the effects of existing policies, such as adding designated parking areas if operators are falling short on public space management requirements. It is important, however, to make this process as clear as possible to operators, which may be sensitive to significant changes in policy. This process should also include a review of technological, business model, and/or other significant innovations that have emerged, and how these might impact existing policies.

Funding to support this periodic, larger-scale data analysis and evaluation could come from permit and/or administrative fees assessed from the dockless operators as part of their initial application to operate.

Lessons for regulating new mobility modes

Shared, point-to-point transport options can improve accessibility and connectivity in crowded cities, and the private sector is playing an increasingly major role in these solutions (National Association of City Transportation Officials, 2018). City policies will ultimately dictate how and to what extent emerging modes like dockless bike share will contribute to less polluted, congested spaces. As additional new mobility modes emerge, and existing ones iterate and evolve, cross-cutting lessons for maximising benefits, reducing logistical challenges, and minimising negative impacts on the public should be documented. Early lessons for regulating new mobility modes, informed by cities' experiences managing dockless bike share, are explored in this section.

Design and pilot regulations informed by city goals

As discussed in detail above, identifying how new mobility modes will serve as tools to meet existing citywide goals is a critical first step to developing outcome-oriented regulations. This exercise encourages cities to evaluate how new mobility can impact multimodal integration, equitable access, emissions reductions, etc. and what processes will need to be in place to maximise those impacts. At this stage, it is also critical to define metrics to track progress toward mobility and access goals. These metrics, combined with ridership data from operators, will inform how well the system is being used.

Many cities have designed pilot programs to test regulations for dockless bike share before they are more formally adopted and enforced. Pilots typically run for up to one year, giving the city and operators time to experience and understand how the service is working on the ground. During this time, cities can communicate goals with operators, ensuring that the latter are positioned to align their operations toward those goals identified by the city. Pilots also provide an opportunity to establish standards for data sharing, and set a precedent that data sharing is compulsory. Findings from the pilot often inform revisions to the original requirements before final permit requirements are adopted.

The ever-changing nature of new mobility operations, both from technological and business model perspectives, requires more nimble processes from cities to regulate and respond. Past models for public-private partnerships – like those created for public bike share systems – often included long contracts that did not allow for or incentivise much innovation by the operator or the city. For example, in 2017, a 15-year contract was awarded to Smovengo, a consortium of French and Spanish mobility companies, to take over operations of Paris' hugely successful Velib' system. However, delays and glitches in system equipment to allow for pedal assist e-bikes plagued Velib' throughout 2018. The system suffered from dramatic drops in memberships and significant ridership declines, and while Smovengo was forced to pay high penalties for the delays, it remains the system's operator (Chrisafis, 2018). Recognising that the evolution of new mobility services is incredibly fast-paced and dependent on the most cutting-edge technology, policy models that allow for changes to regulations and/or operators in the short-term are clearly needed. Annual or biannual permits awarded to companies that show genuine ability to meet cities' standards and needs for providing new mobility services may better align with the rapid pace of development of those services. Requiring operators to apply annually for a permit provides cities the opportunity to evaluate each operator's performance from year to year, and deny permits to operators that have underperformed.

Understand costs

Despite cities not having to contribute funding for capital costs related to dockless bike share or other privately-funded new mobility services, *managing* these services will carry costs associated with staff time to design, implement, and evaluate a pilot program, as well as infrastructure investments to support growing ridership.

Staff time

As mentioned in the previous section, city staff will need to be designated or hired to develop permit requirements and/or a pilot program to test those requirements prior to implementation on the ground.

Associated tasks may include but are not limited to:

- Drafting a request for expression of interest (RFEI) form to be completed by operators.

- Reviewing submitted RFEIs.

- Gathering input from city active transportation staff and experts, operator RFEIs, and community members about pilot program goals and high priority requirements.

- Drafting permit requirements for approval through municipal channels.

- Reviewing operator permit applications and short-listing operators for approval.

- Siting and installing physical infrastructure such as designated parking areas or bike racks.

- Monitoring real-time operator data feeds for compliance with permit requirements.

- Coordinating with city maintenance staff to address parking and right-of-way issues.

- Partnering with operators, local transport groups, and other community groups to encourage ridership and education about the program.

- Conducting an evaluation of the pilot, and establishing protocols for periodic evaluations of the system using historical data and user surveys.

The breadth of tasks included in this list indicates the level of capacity city staff will likely need to commit to managing a new mobility system in order to sustain that system in the long term. Without this prioritisation of staff time to management, the system could suffer from a number of unwanted outcomes that ultimately degrade the quality of service for users. While small and mid-sized cities may not have the capacity to commit staff for all of the tasks listed above, short term consultants could be hired to provide support during the pilot phase or for particularly high-skilled tasks like data collection, verification and analysis. Or, cities could build these costs into operator fees required to receive a permit. Seattle has built program administration costs, including 1.5 full-time staff positions, into its dockless bike share permit, which will be covered by a USD 250 000 annual vendor fee (Seattle Department of Transportation, 2018b).

Infrastructure

Cities should consider the need to install additional infrastructure in line with the launch of a dockless bike share or other new mobility program, and the costs associated. In the case of dockless bike share, more bikes available for use calls for more bike racks, particularly in cities that have adopted a "lock-to" requirement as part of their public space management strategy. Throughout the course of a pilot program, cities can use data showing where bikes are consistently parked to inform siting additional bike racks. If cities have identified designated dockless bike parking areas as part of their public space management strategy, there will be financial costs to implementing those (city staff time, materials, signage, etc.) and potential political costs as well. Some cities are converting on-street parking spaces to dockless bike share parking areas in neighborhoods where sidewalk space is limited, which could incur backlash from drivers (National Association of City Transportation Officials, 2018).

For dockless bike share and scootershare systems, targeted investments in city bike lane network expansion should also be considered. Studies show that bike share riders are particularly sensitive to riding in mixed traffic, and improving bike lane quality and connectivity can significantly expand where people are willing to ride (National Association of City Transportation Officials, 2016). Cycling infrastructure benefits all riders – not just bike share riders – and has been linked to increased daily bike share trips (Xu & Chow, 2018). Investing in cycling infrastructure could be a strategy to improve bike share system performance over time.

Evaluate system performance

Following the completion of any new mobility pilot, system performance should be evaluated based on metrics established at the launch of the pilot. The evaluation will not only shed light on what was successful about the pilot, but will identify areas that could be improved before the program is formally implemented. Key performance indicators such as climate, health, safety and access with related metrics under each indictor will help cities understand whether the new mobility service is contributing to progress toward broader city goals. After the completion of its dockless bike share pilot in July 2018, the City of Seattle released an evaluation report that included a measurement of system success based on metrics such as total trips, percent of incorrectly parked bikes, usage by and outreach to underserved communities, and public funding contributed, among others. The evaluation identifies equity, parking enforcement, and disability compliance as areas needing improvement, and provides recommendations to better address these areas in the formal permit (Seattle Department of Transportation, 2018a).

Analysing success using a set of indicators can also provide empirical evidence from which to evaluate funding designated to support the system, expanding service areas, or other system-level decision making.

Develop new mobility ecosystems

Privately-funded, technology-enabled mobility services are contributing to a paradigm shift that cities need to recognise and respond to – one in which people are demanding alternatives to single-occupancy vehicle trips. As new modes continue to emerge, cities have the opportunity to be proactive, with systems and institutional capacities in place to address market failures in real time, and adapt to maximise benefits.

Some cities are already taking steps toward more holistic mobility ecosystems. San Diego is working to establish a Mobility Board, which would combine its existing bicycle and parking advisory boards, with the goal of bringing together city staff working on walking, biking, transit, and new mobility to make more informed, system-level transportation decisions (San Diego City Government, 2018). The Board would be responsible for decision making related to dockless bike share, dockless e-scooters, and future emerging modes. This type of ecosystem approach to mobility planning can help to reduce logistical challenges that arise from addressing each mode individually, and can help to identify connections that reduce inefficiencies and encourage action.

Note

1   The General Bikeshare Feed Specification (GBFS) was designed to provide real-time system status data through a standardized API. The feed is updated periodically and edits can be suggested by the GitHub community. More information can be accessed at https://github.com/NABSA/gbfs/blob/master/gbfs.md.

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International Transport Forum

Optimising New Mobility Services

This paper presents a policy framework intended to maximize the benefits of dockless bike share through outcome-oriented system planning that includes monitoring and enforcement of regulations. Operational shortfalls of dockless bike share are categorised and several policy options for each category proposed. Finally, the paper identifies lessons and best practices from the rollout of dockless bike share systems around the world.

All resources from the Roundtable on App-Based Mobility Services are available at:
www.itf-oecd.org/regulating-app-based-mobility-servies-roundtable

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