Current Efforts to Make Bike Share More Equitable: A Survey of System Owners and Operators

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ABSTRACT

The number of public bike share systems has been increasing rapidly across the United States over the past five to ten years. To date most academic research around bike share in the U.S. has focused on the logistics of planning and operationalizing successful systems. Investigations of system users and impacts on the local community are less common, and studies focused on efforts to engage underserved communities in bike share are rarer still. This paper utilizes a survey of representatives from 55 U.S. bike share systems to better understand and document current approaches toward serving low income and minority populations. The survey asked about equity policies and metrics, the degree to which equity considerations affected a variety of system practices, what the existing barriers to utilizing bike share are for target populations, and what challenges the bike share system entity faces in addressing those barriers.

Results indicate that one in five systems have written policies around equity, though larger systems (over 500 bikes) were twice as likely to have such policies. However, many more systems incorporated equity into various aspects of their systems. Bike share systems incorporated equity into station siting, fee structure and payment systems, and promotion and marketing at much higher rates (68%, 72%, and 57% respectively), and into system operations and data collection and analysis to a lesser extent (42% each). Even so, the largest barriers facing systems are still cost, access, and outreach to users as well as overall funding and staff levels at the organization level.

BACKGROUND

In 2015, there were over 800 bike share programs across the world, with approximately 1 million bicycles, a substantial increase from the handful that existed in the late 1990s (*1*). Because of this growth, research interest in public bike share systems has increased rapidly, with the number of documented studies more than tripling from 31 during 2007-2010 to over 100 during 2011-2015 (*2*). However, a search of the Transport Research International Documentation (TRID) database revealed relatively few studies focused on bike share and equity or low-income populations (*2*). The majority of research to date has concentrated either on the logistics of designing and operating systems or else on broad transportation systems impacts. Investigations of system users and approaches to increase ridership among underserved communities have only just begun.

Despite the appeal and success of bike share in the U.S., there is growing evidence that certain groups are participating less and enjoying fewer benefits from these new transportation options. Research has shown that bike share users tend to have higher incomes (e.g. *1*; *3*; *4*), be more educated (e.g. *1*; *5*; *6*), and be more white (*5; 6*). For example, surveys of Washington D.C.'s Capital Bike Share users found that members had higher education levels and were more likely to identify as Caucasian than the city population as a whole, including extremely low participation levels among African American residents, whether looking at members or occasional users (*6*).

Bike share has the potential to benefit disadvantaged communities if service could better match their needs. In London, a study found that residents in poorer areas would use bike share if stations were sited locally and prices were affordable relative to other modes (*7*). Bike share can serve as an important link to transit and to work: a survey of annual members in Boston found that trips to/from work were the most common trip purpose (*8*). Bike share systems have also been identified by underserved groups in Philadelphia as a potentially lower-cost, more reliable substitute for transit (*9*). Bicycle ownership costs and lack of secure bike storage at home (problems that bike share systems can solve) were both identified as important barriers to cycling among specific low-income and minority populations in Portland, Oregon (*10*).

Station siting is an important factor in participation and access to bike share. Smith et al. found only four of the larger bike share systems have over 40 percent of stations located in communities categorized as having high economic hardship (*11*). Ursaki & Aultman-Hall found that there is an inequitable distribution of bike share access in seven cities, with significant differences in access based on race, education and income variables among the population groups (*12*). Research outside the U.S. has also found lower bike share station density in less affluent neighborhoods (*13*). Further, models of bike

share use in three U.S. systems revealed lower expected use when stations were located in neighborhoods with lower incomes and higher shares of non-white residents (*14*).

Station siting is not the only factor affecting use by lower-income and diverse populations. One early study found that siting stations in low-income communities in Minneapolis yielded limited ridership, likely due to a lack of ongoing community engagement (*15*). Credit card requirements and equipment liability absent credit holds are another barrier to use by low-income and minority populations (*16*). A recent set of case studies discussing several American cities' attempts to connect low income individuals to bike share found some successes via subsidized memberships to overcome cost barriers. However, difficulties persisted due to station siting and low use of stations in diverse communities (*17*).

The operating model for a bike share system may also influence equity outcomes. Throughout the U.S. there are a variety of operation models: non-profit; privately owned and operated; publicly owned and operated; public owned/contractor operated; and vendor operated (*8*). For example, Divvy is a bicycle sharing system located in the City of Chicago operated by the privately held company Motivate for the Chicago Department of Transportation. Meanwhile, Denver B-cycle is owned and operated by Denver Bike Sharing, a 501(c)3 non-profit. The reliance on private funding for capital and operating costs may influence station siting and other operating decisions, with varying implications for equity outcomes. For instance, the profit motive in private funding may foreclose the possibility of locating stations in what may be low-use areas but would help reach targeted equity populations.

Efforts are underway to address these issues. In a survey of North American bike share operators, 35% (n=20) of respondents located stations based on equity reasons, 35% subsidized membership, and 25% assisted low-income members with payment options (*18*). Another study found that 43% (n=23) of surveyed bike share programs factored equity considerations into bike share station siting decisions (*8*). The Better Bike Share Partnership (BBSP), a multi-organizational collaboration funded by The JPB Foundation, aims to build equitable and replicable bike share systems. At the time of writing, BBSP had funded 15 bike share operators, cities and local nonprofits to help U.S. cities develop and implement strategies to increase bike share use in their own underserved communities.

This paper presents findings from a survey of bike share system owners and operators aimed at understanding how they are approaching service to underserved, low-income and minority communities. The research provides a snapshot of the extent of current efforts to address equity and reveals opportunities and challenges for improvement. Additional research is necessary to fully understand the impact of these efforts.

METHODOLOGY

Using the Pedestrian and Bicycling Information Center's list of bike share programs (*19*), web searches, and help from the National Association of City Transportation Officials (NACTO), we identified 75 U.S. bike share systems that were either operational or in pre-launch. Our focus was on public bike share systems intended to serve a wide range of residents, although we did include a handful of larger university systems. We excluded systems with fewer than 40 bikes.

For each of the 75 systems, we sought to identify a key contact who could speak to overarching initiatives involving the system and any efforts to provide service to potentially underserved populations. In some cases, the identified contact was a representative of the public agency that either owns, operates, or oversees the bike share system, or some combination of the three. In other cases, the contact was a representative of a private vendor charged with managing the system. In the introductory email to each contact, we explained that we had identified them as a representative of the bike share system, and wanted the respondent to be someone who could speak about "decisions about system operations, policies and programs." We asked the recipient to inform us if someone else within the bike share system would be better suited to answer the survey. The initial request was emailed in March 2016. Up to three additional reminders were sent to each of the cities that had not yet completed the survey.

Respondents were provided with several example definitions of equity from organizations working in the bicycle realm. These included:

- League of American Bicyclists: "the guarantee of fair treatment, access, opportunity, and advancement for all, while at the same time striving to identify and eliminate barriers that have prevented the full participation of some group";
- Advocacy Advance: "recognizing and reacting to the under-representation of youth, women, and people of color in advocacy efforts and local transportation decisions."
- We noted that some would also add low-income and older adults and further recognize the ramifications of past inequity along with ongoing inequity.

Instructions also informed respondents that they were not limited to these definitions.

The survey started with basic information about the bike share system including the role of the respondent's organization in the system, type of organization, operational status of the system, and the number of bikes in the system. We then asked if the bike share system had an equity statement or policy (and if so, to provide the text), and if they had established specific metrics to measure equity in their system (and if so, what those metrics are). The next section asked what role, if any, equity considerations played in several key bike share system operational areas, including: station siting; fee structure and payment systems; system operations, including employment; promotion, outreach and marketing; and data collection, including assessment of user (and potential user) demographics. For each role we also asked them to explain how equity was incorporated.

Where we asked respondents to identify how much equity influenced that part of their system, we used ANOVA to test group differences. A majority of the analysis focused around the open-ended responses that allowed system respondents to explain how equity was considered in each section. We used an inductive coding scheme to identify key words or themes. Over 200 codes were identified throughout the analysis of the open-ended questions, many of which were combined in some way in explaining the findings.

As with any survey, there are limitations with respect to sampling and response rates. Although we attempted to identify all current or planned bike share systems, we were not able to identify appropriate contacts for some systems. In other cases, we learned of systems after completing the survey. It is difficult to assess the potential response bias for this survey without a complete and accurate inventory of systems. We did find very little difference between the systems responding and not responding in terms of Census measures of city size, non-white population, and poverty rates. Another limitation of the survey is having a single person respond. While we made attempts to identify the most knowledgeable person to respond, as noted in some of our findings, a single person is not always aware of all aspects of the system.

FINDINGS

In our analysis we first looked at the closed-ended questions on whether the respondent said they had equity policies or metrics and how they rated the role of equity in each of the different areas of their bike share operations. We then analyzed the responses we received in the open-ended questions where we asked the respondent to describe their equity policies, metrics, and the role of equity in areas of their bike share operations. Considering not every respondent answered the open-ended questions and those that did may not have given us the most detailed answers they could have, we focused the analysis more on what was present rather than what was absent. Terms such as low-income, diversity, underserved, disadvantaged communities were the respondents' terms and often were not well defined. In exploring equity implications, it is important to recognize the differences between strategies that target low-income users and those that target specific racial/ethnic groups as the two groups are not the same nor mutually exclusive.

Descriptives

Fifty-five of the 75 systems (73%) completed the survey, while another five (7%) provided a partial response. One system refused. Our analysis only included those that completed the survey. TABLE 1 shows how respondents classified their organizations. Respondents to the survey were

generally evenly split among owner (33%), operator (24%), and owner and operator (29%). Most respondents represented either a government agency or non-profit organization. Four of the systems self-identified as universities, which we excluded from analysis outside of what is presented in TABLE 1 as the equity dimensions on college campuses seemed likely to differ from city systems. Most of the systems that responded were already operational (82%). Just over half of the systems we considered medium sized (100-500 bikes), while around a quarter were small systems (<100 bikes) and a quarter were large systems (>500 bikes). In terms of geographic spread, around a third of responding organizations were from the West U.S. Census region, just over half were split between the South and Midwest regions, and only 13% were located in the East region.

TABLE 1 Responding Organization and Bike Share System Characteristics

	Percent of Responding Organizations
Responding Organization role in Bike Share system	
Owner	33%
Operator	24%
Owner and Operator	29%
Partner - Not owner or operator	14%
n	*55*
Responding Organization Type	
Government	44%
Non-profit organization	40%
Private Operator	11%
University	6%
n	*55*
Launch Status	
Operational	82%
Pre-launch	18%
n	*55*
Number of Bikes in System	
Up to 100 bikes (small)	26%
101 to 500 bikes (medium)	51%
501 or more bikes (large)	24%
n	*55*
U.S. Census Region	
Northeast	13%
South	24%
Midwest	29%
West	35%
n	*55*

Equity Policies and Statements

Only 24% of respondents reported that their systems had some form of equity statement (TABLE 2). Large bike share systems were most likely to have an equity statement with nearly half of such systems saying so. Systems that have equity statements had a median percentage of non-white populations in their cities 21 percentage points higher than those without equity statements. “Other” respondents almost unanimously stated their equity policies were in development.

TABLE 2 Presence of Equity Policy and Metrics, by System Size

Equity Policies	Up to 100	101 to 500	501 or more	All
Have Equity statement or policy	18%	14%	46%	23%
Do Not	73%	69%	39%	62%
Other	9%	17%	15%	15%
Total	11	29	13	53
Equity Metrics	**Up to 100**	**101 to 500**	**501 or more**	**All**
Have Equity metrics	9%	17%	46%	23%
Do Not	82%	69%	46%	66%
Other	9%	14%	8%	11%
Total	11	29	13	53

Whether systems were already operational and looking at expanding, planning their system, or any stage in between, there was a wide variance in how they approach equity. Many system respondents said they were in the process of drafting an equity statement or policy. Three systems provided extensive statements or policies which became even more so as they answered more specific items in the survey. Extensive policies typically outlined who they were targeting with their equity goals, how, and to what end. Their statements were much more specific rather than using general language.

Several systems had brief statements employing general language such as "providing accessible and affordable bicycles for all," some variation thereof, or pointed to Title VI requirements (Federal law requiring transportation agencies receiving federal money to abide by non-discrimination laws). However, a reliance on Title VI may be inadequate in addressing equity concerns (*20*). General language where phrases "for all" are used do not address the different ways in which population groups benefit from bike share and the strategies necessary to bridge those differences and ensure everyone does benefit. In most cases where the statements had "for all" or references to "all backgrounds," "all cultures," or "all social statuses," statements also lacked specificity about any particular groups.

System size appeared to have some influence on how extensive their equity statement was. Two of the three extensive statements or policies were from large systems. This made sense considering cities with large systems had an average percentage non-white population that was nearly ten percentage points higher than mid-size system and 14 percentage points higher than small system cities. Additionally, the two large systems that provided extensive statements were in cities with the highest proportion of non-white population among large government run systems in our sample. Smaller systems were the least likely to have provided us with an equity statement or policy with only 1 system providing one. And as was the case with all systems, not having an equity policy did not necessarily mean they did not incorporate equity in some way in their system.

The most common theme across the provided equity statements was a reference to access and affordability. Access can be a complicated word as it can mean many different things, and no system directly connected relevant policies with how it impacted access. Access can refer to density of stations, coverage, ability accommodations, and payment systems, and we had to infer their meanings of access in later sections such as in station siting and fee structures. Where affordability was mentioned in their equity statement or policy, systems typically also referred to low-income populations, but none mentioned minority populations. As respondents provided more detail with later questions, it was clear that many, but not a majority of bike share systems do have goals or strategies to target populations based on their race/ethnicity even if that was not apparent in their initial statements.

Metrics and Data Collection

As might be expected, the share of systems that had a defined metric relating to equity and bike share (22%) was similar to those that had an equity statement or policy (TABLE 2). As with an equity statement, specificity helps to ensure that goals are achieved. However, few of the systems surveyed offered clear metrics to rate success in achieving equity statement goals. When systems did have clear metrics, they typically referred to collecting demographic data or specified race, income, gender, age, educational attainment, and location. Most systems alluded to general demographic information or just race, income, and location, and typically did not tie these back to their equity goals. Only two systems specified gender as something they wanted to measure. Four of the systems had goals to ensure a certain percentage of stations were near target populations, typically low-income populations. The system with the most specific set of metrics focused specifically on their equity program and tracking how many trips their equity program participants were taking and monitoring the amount of overage charges they accrued. One of the two systems looking to measure gender of riders had specific targets for the share of subsidized memberships held by women and the share of women among all bike share members.

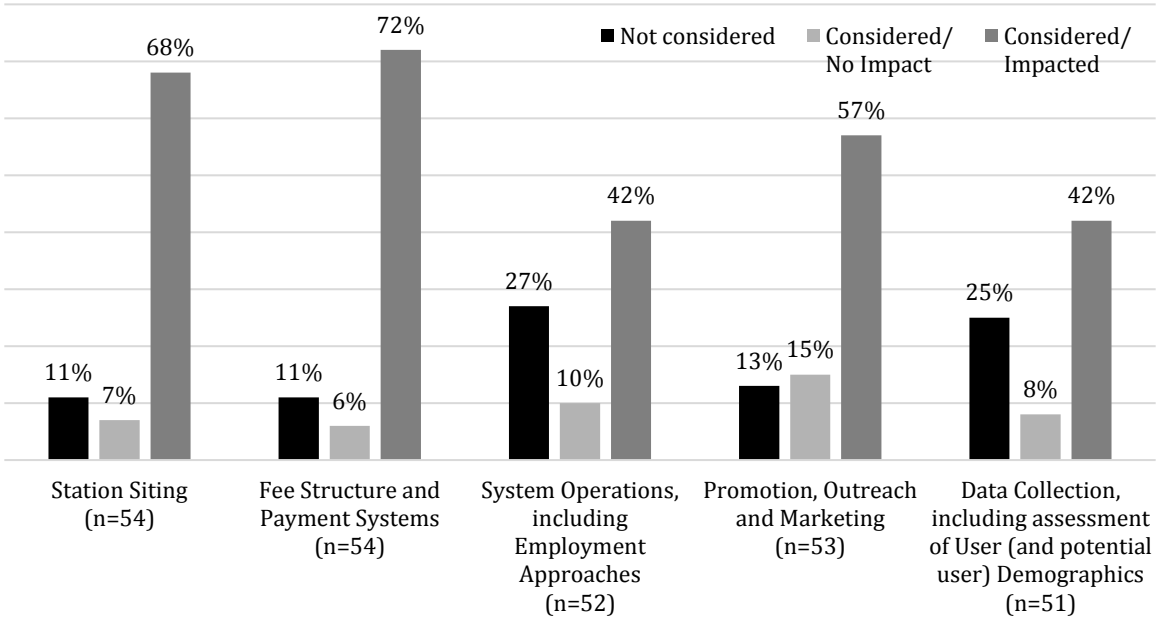
Among 21 responding organizations that included details about equity metrics, nearly all wanted to collect data to understand who their users were, generally through user surveys of some type. However, the timing of the surveys, how often they were done, who was targeted for surveys, and how they were conducted varied substantially. For example, it was unclear which riders were targeted for surveys for most systems, but four systems specified it was only surveying members, one of which said they also do surveys for walk-up users. Several of the respondents said their data collection efforts are still in development, being redone, or dependent upon securing funding. Five of the systems specified they were using the data they collected to measure progress toward equity goals.

Equity Considerations

Equity considerations appear to play the largest role in station siting and fee structure and payment systems, followed by promotion, outreach and marketing (FIGURE 1). Few systems said that equity considerations had no role in their bike share system. Only 11% did not consider equity in station siting or fee and payment systems. About a quarter of systems said that equity was not considered in their system's operations (27%) or data collection (25%). A similarly small number of systems responded they did not know or the particular aspect was not applicable to their system. This was likely an effect of having the survey answered by only one person in the organization. The stated effect of equity on these aspects of bike share did vary by system size. In all five areas, large systems were significantly more likely to have considered equity than the smaller systems (one-way ANOVA, α=0.05). We did not see significant differences between the smallest and mid-size systems.

The share of systems indicating that equity was a consideration in these five aspects of their systems is generally much higher than the share that have an adopted equity statement (23%). This implies that an equity statement is not necessary for equity to influence actions. However, those reporting having an equity statement also had higher mean responses to specific equity consideration and impact in all surveyed areas. The differences in fee structure, promotion, and data collection decisions were significant (one-way ANOVA, α=0.05). This indicates that having a defined equity statement, while not necessary, can help systems give greater consideration to equity when making bike share system decisions.

The sections below describe some of the examples of how systems incorporated equity into these aspects of their systems, based on answers to the open-ended questions on the survey.



Note: Percentages do not total 100% due to "Don't Know/NA" responses. Possible survey responses were: Not considered; considered, no impact; considered, minor role; considered, considerable role; considerations primary driver. We combined minor role, considerable role, and primary driver into the Considered/impacted category here.

FIGURE 1 How is equity considered in these areas?

Station siting

FIGURE 1 provides selected examples by level of equity consideration and whether that consideration impacted the structure of that piece of their system. Accessibility was a prominent feature in station siting. One way systems addressed access was to promote transit connectivity and place stations at public housing complexes. Others featured connections to jobs, retail centers, and recreation as important areas to locate stations for their targeted equity populations. Some system respondents referred to a goal of large coverage areas and having walkable distances between stations. Three of the 14 large systems stated they included quotas on siting stations in low-income and minority neighborhoods.

TABLE 3 provides quotes that system respondents used when replying to the role of equity in their station siting. This table serves as an example of how systems saw the role of equity and the range of actions that occur with how important equity was to the process. As can be seen there was no real relationship between the actions systems said they took on equity in station siting and the role equity played in the process. As such we did not include such tables for the other areas of the system.

TABLE 3 Examples of equity consideration in station siting

Category	n	Specific Examples
Considered but did not change outcome	4	"Stations were placed in low-income areas that fit within the overall connectivity of the system." "Our smaller bike share system and the design of our downtown doesn't afford us too many options to reach the equity population. That said we ensured we addressed new multi-family equity housing. The density and location of the complex meant it would have been serviced regardless of the equity consideration."
Minor Role	19	"We looked at addressing equity in siting by co-locating stations at transit hubs to serve low income residents as last mile connections and siting stations at partnering affordable housing communities." "We took a look at age. We placed one of our stations with a trike at the community center that has a senior focus to ensure that seniors could utilize the bikes." "Only if the funding source required equity considerations" "[W]e placed a few stations in 'underserved areas'" "Evaluated based on MPO […] definition which looks at ethnicity, income, car ownership, language spoken, seniors as % of population, children as % of population, etc."
Considerable Role	17	"[System expansion has] committed a significant percentage of stations to [specific] neighborhoods, bus stops, and commercial areas frequented by [the] Latino community." "Over 80% of the […] stations we will add this year will be in low-income neighborhoods." "City made sure that the vendor placed at least 20% of their system in regionally defined [equity areas]" "[W]e intentionally sited stations near low income housing" "We identified areas made up of specific demographics that are typically underserved by bike share programs. Once those areas were identified, we located nearby bus and transit stops along with parks and community centers. Bike stations were then permit[e]d and installed in those areas."
Primary Driver	1	"We've sited stations for reason of equity in areas where we don't see adequate demand and otherwise would not have placed them there"

Note: Minor role, considerable role, and primary driver reference the considered/impacted category in FIGURE 1. Considered but did not change outcome references the considered/not impacted category.

Fee Structure and Payment Systems

As with station siting, many more systems (40) said they incorporated equity in how they set up their fee structure and payment systems than had provided equity statements or policies (13). Fee structure strategies for equity primarily fell within three categories: cost, discounts, and payment systems. Incorporating any of the three could be seen as increasing access to the system by removing barriers to use.

For cost, some systems started off with pricing that they deemed attractive for a broad range of users. Others reevaluated their pricing and lowered their pass costs across the board. Bank holds acting as deposits for bikes were an equity barrier some systems found in their pricing and either eliminated them while still hedging liability or reduced the cost. To address some cost concerns, seven systems opted to offer more variation in their membership options, such as adding monthly and weekly options, or free

membership with a pay-per-ride structure. Some changed their annual memberships to be paid monthly to help those who found a large up-front payment too much of a barrier. One system prioritized simplifying the fee structure and making it easier to understand. Additionally, one system used the contract bid process to encourage applicant operators to provide "innovative fee structures."

Discounted or free memberships were noted by 14 responding organizations. Free memberships usually consisted of either a $0 registration or membership with per-ride charges (in some cases tied to the cost of a transit fare) being the only cost users would have to pay. One of the four systems that reported free membership had a zero cost program for their target equity population; the program was funded by a grant. Systems administering discounted passes often qualified a person if they were receiving some other sort of public assistance or met certain income thresholds. Thus, they were often tied to low-income populations, but not necessarily targeted toward any racial or ethnic groups. The range of the discounted memberships can vary considerably; for example, one system reported they offered $5 annual memberships and another offered $5 monthly passes. At least two of the systems reported they administered their subsidized passes through community organizations.

Serving unbanked populations was a barrier that 13 systems specifically reported they were planning to or had tried to address. Most of those respondents were working to offer cash payment options. Typically this was being done through commercial establishments such as grocery or convenience stores. One system reported they were offering cash payments through their library system. Some systems addressed cash payment needs by allowing their system to accept pre-paid credit/debit cards and gift cards. One respondent stated their unbanked-user strategy is looking to incorporate homeless populations.

System Operations

In systems where equity was incorporated into operations, paying a living wage and hiring locally were policies used by six responding systems. Five systems partnered with local workforce development organizations or public housing to find potential hires. At least one system specifically hired people of the demographic they were targeting for their equity program as advocacy staff to help with outreach.

For overall operations, many stated that the way their operations were organized made it difficult to implement equity considerations in their operations. This happened with systems where cities contracted with an operator, there was a multi-jurisdictional arrangement, or where particular municipal rules limited flexibility. However, two systems used the bidding process to either choose an operator that identified equity considerations in hiring the system was looking for, or were able to sway the selected operator to incorporate equity considerations.

Promotion, Outreach, and Marketing

As with many of the other equity considerations made by the respondent systems, promotional activities done for equity purposes were quite varied. However, there were some common elements among systems. Eleven respondents had promotional materials translated into at least Spanish. Nine systems specifically targeted low-income communities. Five specifically targeted people of color by either incorporating people of color in advertising materials and/or conducting outreach to specific neighborhoods. Eight stated their promotional activities were either inclusive or representative of the community. Three systems stated they had or are trying to form partnerships organizations ranging from public housing authorities to neighborhood organizations active in the communities they are trying to target in order to get help with outreach. Another three systems stated they are utilizing community events to promote the system in targeted communities.

Equity Barriers

Perceived barriers to targeted equity users

Our survey included two questions (both open-ended) on barriers as seen from the operator perspective: one relating to users and one relating to their organization. Forty-four systems shared what they perceived to be the key barriers to targeted equity users. Generally, these barriers fell into the categories

of pricing and payment systems, access, perceptions, and awareness and understanding of how the system works.

Twenty-two systems stated a key barrier was related to the price or payment system of their bike share. Of these 22 systems, 15 stated that cost to use the system was a key barrier and 15 also stated those without credit/debit cards would face large barriers to use the system. Most of those systems have made some effort to address those barriers through cash payments, pre-paid card acceptance, and discounted passes. Five systems recognized the difficulty they will have in attracting targeted equity populations to bike share with either cash payment options or subsidized passes and that they really need both to be successful. Relatedly, many also recognized the issues of access to smart phones and the internet for low-income and minority populations.

Various aspects of access to stations was cited as a key barrier to underserved users by 19 systems. Bike infrastructure was cited as a barrier by six systems while lack of transit connections was cited by one system. For instance, one system said, "No one advocates or values bike infrastructure in poorer areas of town, so they don't get investment." Nearly all systems that listed access as a problem stated their system had not expanded to areas where targeted equity users could use the system or their station network was not dense enough in low-income and minority neighborhoods for it to be useful. Similarly, several systems stated low population density in such neighborhoods and their location in the city made it difficult to include those neighborhoods in the system.

Eleven systems saw perceptions of bike share as a significant barrier. Most of the perceived barriers revolved around bicycling in general. For example, systems noted that their target demographics for their equity programs see bicycling as something that is "not for them," and more for the "epic outdoor folks" or "people in spandex." Three systems saw perceptions of safety while riding a bike as a significant barrier. Some systems also believe their target equity populations are unlikely to join because of the stigma associated with bicycling, particularly around the status symbol of owning a car versus riding a bike. Perceptions of bike share contributing to gentrification was cited as a barrier by one system.

How much potential users know about and are aware of bike share and how to use it were reasons 14 systems cited as barriers for bike share uptake by their target equity populations. Three systems felt their target demographics were unaware of the system. Another three recognized that the lack of multi-lingual instructions at stations is a large barrier to some target populations. However, most in this category (10 of 14) cited confusing language in their instructions and fee structures as well as ineffective or poor communication and educational outreach limiting the uptake of bike share by their target equity populations.

Barriers for the organization

A large majority of our responding bike share systems (24/37 responses) saw their operational funding and staff levels as the biggest barrier to succeeding in their equity strategies. Several systems stated they had such small staff levels, it was impossible for them to focus on equity strategies. But even the large systems had difficulty finding staff time.

Second to funding and staff levels was the ability to convince necessary stakeholders such as city governments and decision makers, funding partners, operators, and the general population that pursuing equity strategies was a worthwhile effort. One system indicated that the operator could be a barrier; given its objective of running a business, opening low-use stations in neighborhoods targeted for equity programming could be a tough sell. However, this points to what is perhaps more of a funding barrier, as many systems rely on private operators, with minimal or no public funding.

Other barriers were mentioned by only a handful (under five) of the systems. These included difficulties developing effective education and marketing materials and outreach programs, organizational partnerships (including finding the right groups that have the best connection to the target populations), the inability to accept cash, the threat of lost bikes without having a credit card on file, and organizational (provider) limitations.

Future Plans

Those who provided us with statements on their future plans were likely either just becoming operational, starting their equity programming, or actively looking to expand. As such, many of the statements for future plans follow the path of those who are currently operating full-scale equity programs such as discounted passes, cash payment, hiring community advocates, expanding stations into low-income and minority neighborhoods, and making their promotional materials more representative of the populations they are targeting. Some stated they hope to have an equity program in the future and are seeking the funding necessary to do so. One is exploring opportunities to make bike share more accessible to users of all abilities, a feature only once mentioned as currently existing.

We noted that pre-launch systems on average reported higher levels of equity consideration and impact in all aspects of planning and operations. This is consistent with the notion that equity is becoming a more integral part of bike share systems in the US as time goes on. Alternatively, it is also consistent with equity aspirations that may not be attainable due to resource and other barriers that arise after launch.

Strengths and Limitations

Our survey received a high response rate (73%), and many respondents provided a good amount of information in the open-ended questions. However, lack of detail in some responses does not necessarily reflect a lack of equity consideration. Conducting interviews with system owners/operators would allow the ability to ask clarifying questions to better understand how systems are defining and addressing equity, and how they reached these decisions. Having more than a single respondent from each system would also be useful at gathering that additional data. Finally, it is worth reiterating that a survey of operators may not always accurately reflect the perceptions and opinions of the targeted equity populations.

CONCLUSIONS

The number of bike share systems in the U.S. has grown rapidly. As with any new service or technology, there have been growing pains. Several systems have been criticized for the lack of ethnic and/or income diversity among users, and overall, systems appear to be responding to these concerns. We found that 24% of surveyed systems have adopted an equity statement or policy, and 7% are in the process of developing one. Moreover, for a majority of surveyed systems, equity had influenced several aspects of their planning and operations. In particular, 68% of the systems stated that equity influenced their station siting decisions. This figure is notably higher than surveys conducted a few years ago of 35% (*18*) and 43% (*8*). A similar share (72%) indicated that equity influenced fare structure and/or payment systems. Pricing, payment systems, and access to stations were also cited by the respondents as the largest barriers to having more diverse populations use bike share. Over half (57%) of the systems considered equity in their promotion, outreach, and marketing. This could help address the third most cited barrier to having more diverse people use bike share – individual perceptions of bike share. Respondents felt that many non-whites and lower income groups have negative perceptions of bicycling or bike sharing, or at least perceptions that bicycling or bike share was "not for them."

While many more systems indicated that equity influenced their decisions than had official equity statements or policies, we did find that systems with such policies were more likely to have taken actions related to equity. Therefore, there is likely value in having systems adopt explicit equity policy statements. For example, such statements may help maintain equity as a priority over time, particularly as leadership changes. We did, however, note that many of the equity statements, and particularly the metrics used to measure equity, lacked specifics. As systems mature, having specific metrics to gauge progress is important if equity is an actual goal. Similarly, the language used in equity statements can be key for focusing on outcomes. The use of language such as "for all" has implicit equity considerations, but it lacks the specificity that helps develop the metrics and programming necessary to ensure the system is actually "for all." For instance, being Black does not automatically mean you cannot afford to use the

bikes, but it does relate to issues of historic and continuing racial segregation and what and where transportation investments are made and whom the investments benefit. At the same time, being low-income is a status shared by all racial/ethnic groups, but when it is geographically constrained it is also often a minority neighborhood. Thus it is critical to define the "who" in equity and the strategies necessary to achieve equity in the system with each group.

We found that large systems were more likely to have equity statements and to have considered equity in the major aspects of their system. There may be several (likely related) explanations for this. The survey respondents indicated that funding/staffing was their biggest barrier to addressing equity. Larger systems may have more financial and staff capacity to address equity concerns while also having more bikes likely makes it easier to locate stations in more diverse neighborhoods. It is worth noting here that the financing model for the system can play a major role in station siting. Systems that rely more on user and ad revenues for operations may be reluctant to site stations in neighborhoods with high shares of lower income households where they believe ridership will be low.

While this survey revealed the current level of activity bike share systems are taking to address equity, as well as many specific examples of actions, it did not assess the effectiveness or outcomes of these efforts. Given limited resources, providers need information on those efforts—particularly fare structures, payment systems, and marketing/outreach—that are most effective at improving the diversity of system users. In addition, if such efforts are successful, it would also be useful to assess what effects access and increased use have on lower-income users. For example, a large body of literature links transportation access to positive economic outcomes, such as job placement and retention. Does bike share use have similar outcomes? Bicycling has also been linked to higher levels of physical activity and other health indicators. Does bike share improve these outcomes for lower-income and non-white populations? Bike share operators could play a key role in facilitating research that answers these questions.

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