


CITY AND COUNTY OF SAN FRANCISCO  
BOARD OF SUPERVISORS

**BUDGET AND LEGISLATIVE ANALYST**

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*Policy Analysis Report*

To: Supervisor Preston  
From: Budget and Legislative Analyst's Office   
Re: Public Bike Share in San Francisco: Issues and Options for Consideration  
Date: February 17, 2022

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**Summary of Requested Action**

Your office requested an analysis of options for a potential municipal bike share program, including a program fully owned and operated by the City of San Francisco, a program owned and operated by a nonprofit organization, and a program publicly owned and privately operated. For further information, contact Severin Campbell at the Budget and Legislative Analyst's Office.

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**Executive Summary**

- Bay Area Bike Share is a regional system administered by the Metropolitan Transportation Commission (MTC) through agreements with a private system operator and participating cities. The agreements between MTC, the private system operator, and participating cities were originally enacted in 2015 and extend to July 2027. Lyft purchased the system in 2018 and assumed bike share system operations under the agreement with MTC.
- The Bike Share program in San Francisco includes both regular ("classic") bikes and hybrid electric-assist bikes ("e-bikes"). The number of bikes in daily operation in San Francisco Bike Share increased from an average of approximately 1,100 classic bikes in 2018 to an average of approximately 3,600 classic and e-bikes in 2021. Beginning in 2019 Lyft began to increase the number of stations and bikes.
- Bike Share ridership increased from less than 40,000 riders per month in July 2017 to nearly 150,000 riders per month in October 2018. Lyft began to deploy e-bikes beginning in December 2019, offering e-bikes at the same rate as classic bikes, resulting in a spike in bike ridership of more than 300,000 riders per month prior to March 2020. The onset of the pandemic and setting of higher rates for e-bikes caused a drop-off in bike ridership beginning in March 2020. In recent months, rides on both classic and e-bikes have been trending upwards, and while e-bike rides exceed classic bike rides, in July 2021 slightly more than one-quarter of all bike rides were classic bikes, indicating that use of classic bikes, while lower than e-bikes, is a durable component of the program.
- As Bike Share ridership has recovered from the pandemic, San Francisco ridership has shifted from members to casual riders and from classic bikes to e-bikes. Rides by casual

users and members were approximately the same number in April 2020, but over the last year, rides by casual users have consistently exceeded those of members.

- According to the 2015 Program Agreement between MTC and the private system operator, Bay Area Bike Share is intended to provide an alternative mode of public transportation in the Bay Area and to encourage bicycle use as a healthy, environmentally friendly, and congestion reducing transportation option. Bay Area Bike Share is a privately owned system, operated through agreements between MTC and the system operator, Lyft, and participating cities. An alternative model is BIXI Montreal, for which the assets are owned by the city of Montreal (Quebec, Canada) and the program is operated by a nonprofit organization set up by the municipal government for the express purpose of operating the BIXI system. BIXI Montreal is the only citywide publicly owned and managed bike share system in North America.
- Whether a bike share program should be publicly or privately owned and operated depends on the extent to which public and private for-profit goals conflict. Private ownership and operation of the bike share program by a Transportation Network Company (TNC) such as Lyft could conflict with the program's goals to create alternative modes of public transit. The core business of Lyft and other TNCs is the provision of auto-based private transportation services that generate a profit. Although Lyft does not publicly report revenues and costs for operating bike share programs, based on our estimates of program costs and revenues, private bike share programs are unlikely to generate a profit. Further, TNCs such as Lyft may reduce rather than enhance use of public transportation and result in increased car-generated air pollution and congestion.
- If the City were to implement a publicly owned bike share system, the City would incur costs for purchasing system assets and ongoing operations. We estimate that a public buy out of system assets consisting of 4,500 bikes (one-half of which are e-bikes and one-half of which are classic bikes) and 8,755 station docks would cost approximately \$33.2 million in one-time costs. Estimated annual operating costs range from \$13.3 million if the City were to set up a non-profit entity to operate the system (in the same manner as Montreal) to \$18.2 million if the City were to assign operations to a City agency.
- Annual operating revenues would cover a portion of the estimated operating costs. BIXI Montreal's operating costs are covered by 50% user charges, 25% advertising and sponsorship agreements, and 25% public sector subsidy. Based on the BIXI Montreal model, the annual operating subsidy cost to the City would range from \$3.4 million for a nonprofit-operated program to \$4.7 million for a City-operated program, assuming 50% cost recovery from memberships and user charges and 25% advertising and sponsor revenues. The annual City operating subsidy could be higher if advertising and sponsor revenues were not available, or member fees and user charges did not offset 50% of costs.

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## Policy Options

The Board of Supervisors could consider three policy options:

- Option A: The City could own and operate a bike share program, including publicly funding acquisition of the system and subsidizing annual operating costs. The system operator could be either SFMTA, or a designated non-profit entity set up by the City for the express purpose of operating bike share (this is the model used in Montreal). This would require the City purchasing the physical assets and directly providing the service or setting up a nonprofit entity to provide the service.
- Option B: The City would own all physical assets (bikes, stations, kiosks), and contract with a private operator (either a private for-profit company such as Lyft or a nonprofit company). The contract with the private operator could require the operator to grant the City exclusive rights to user data to ensure privacy, prevent proprietary data capture and commercial usage for purposes not directly related to bike share, and return of such data to the City at the termination of the operating agreement. The City would contract all operations to a private company and would reimburse the company on a flat rate basis or through revenue sharing agreement tethered to performance benchmarks and tiered earnings thresholds. This is the type of agreement that is in effect in Boston, Toronto, and Washington DC.
- Option C: The City could contract with a private for-profit entity such as Lyft through the City's contracting process, including setting performance standards and equity benchmarks on the system operator. This is the current agreement between MTC, Lyft, and participating cities, including San Francisco.

In considering the options for the future of bike share in San Francisco, the Board of Supervisors would need to evaluate the public benefit of the program, including the extent to which the program could reduce pollution and congestion and enhance public transportation. The Board of Supervisors could also consider: (a) whether the goal in increasing bicycling is to reduce driving; (b) the extent to which more protected bike lanes would be needed; and (c) policies to increase bicycling among populations that are not currently frequent users.

If the City were to implement a public bike share program prior to the termination of the existing agreement between MTC and Lyft in July 2027, the City would need to work with the cities participating in the bike share program and with MTC and Lyft on early termination of the agreement. Other considerations would be the cost of purchasing Lyft's bike share infrastructure, and whether other cities would want to participate in the public bike share program. As an example, the city of Montreal purchased the assets of the bike share program operator when the operator declared bankruptcy and liquidated their assets. On acquiring the assets, the city of Montreal set up the nonprofit, BIXI Montreal, which operates the Montreal bike share program and provides call services to other cities, including Toronto and Detroit.

<i>Project Staff: Severin Campbell, Karl Beitel</i>
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## Bike Share in San Francisco 2013-2021

Bike Share launched in 2013 as a Bay Area wide program consisting of 700 bikes and 70 stations, of which 35 stations and approximately 350 bikes were located in San Francisco. The Bay Area Air Quality Management District was the system's original administrator for three years, after which administration of the system was transferred to the Metropolitan Transportation Commission (MTC) in 2016. The system's original operator, Alta Bicycle Share, was acquired in 2015 by a team of investors<sup>1</sup> and was relaunched as Motivate, which proposed to MTC to transfer the system to full private ownership.<sup>2</sup> MTC agreed, and Motivate became the sole system owner-proprietor, assuming all financial responsibility<sup>3</sup> and the benefits and risks associated with ownership and operation of Bay Area Bike Share. Lyft re-named the system Bay Wheels after acquiring Motivate in November 2018.

Bay Wheels is a regional system; participating cities include San Francisco, Oakland, Berkeley, Emeryville, and San Jose. Most utilization of the bike share program is in San Francisco, making up approximately 87% of regional bike share use in 2021.

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## Bay Area Bike Share Agreements

The Bay Wheels system is made up of two agreements; the Program Agreement (between the system operator and MTC) which lays out the framework for the operator to deliver, own and operate the system; and the Coordination Agreement (between the system operator, MTC, and participating cities) which lays out terms for installation of the system.

### Joint Coordination Agreement between Lyft, MTC, and Participating Cities

The current Bay Area Bike Share Coordination Agreement between the system operator, MTC, the participating cities - San Francisco, Oakland, Berkeley, Emeryville, and San Jose – came into effect on December 31, 2015; the Coordination Agreement term is in effect through the term of the Program Agreement (see below)<sup>4</sup>. The Agreement grants the system operator (currently Lyft) rights to operate as the sole and exclusive vendor of Bay Area Bike Share within the signatory cities.

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<sup>1</sup> Investors included Equinox, Related Companies, and other private investors. The acquisition by these investors followed reports of Alta Bicycle Share's financial and management problems.

<sup>2</sup> In 2017, Ford Mobility became the title sponsor and branded the system as Ford GoBike. In November 2018, Motivate was acquired by Lyft and Lyft re-named the system Bay Wheels. In 2021, Lyft merged Motivate into its subsidiary Lyft Bikes and Scooters.

<sup>3</sup> The Joint Coordination Agreement between Lyft, MTC, and the participating cities, allows cities to pay for services in addition to the agreed-upon services provided by Lyft.

<sup>4</sup> The original term of the Program Agreement was from December 31, 2015 through July 31, 2027, subject to the system provider meeting performance goals. The Agreement allowed MTC to reduce the term by five years in December 2020, if the system operator did not meet the performance goals. This provision was changed in the 2016 modification to the Program Agreement, which provided for a term reduction by MTC of three years rather than five if the Bay Area Bike Share program did not meet performance goals. The Coordination Agreement and Program Agreement will end in July 2027.

### *Steering Committee*

Bay Area Bike Share is overseen by a joint Steering Committee composed of representatives from MTC and the municipal signatories. Steering Committee decisions are reached, whenever possible, through consensus. Selection of the system operator was a determination made by the MTC, in consultation with participating cities. MTC serves as the lead entity that negotiates the multi-jurisdiction agreement that sets out operational specification and performance standards that must be met by the system operator. The Steering Committee has sole authority to determine when the system operator is in default on the terms of the agreement, adjust and modify Key Performance Indicators, and approve the system's corporate sponsor. Decisions made by the Steering Committee on such matters are binding on the participating cities.

### *Role of Participating Cities in the Coordination Agreement*

The Coordination Agreement grants each participating city the right to use its own funds and/or negotiate agreements with the system operator to expand the scale of Bike Share beyond the minimum standards set out in the agreement. Modification of the terms of the Coordination Agreement must either be done pursuant to written instructions of the Executive Director of the MTC, or by mutual agreement between the governing body of the participating municipality and the system operator.

### **Bike Share Program Agreement between Lyft and MTC**

In addition to the Coordination Agreement, MTC entered into a Bike Share Program Agreement in 2015 with Motivate that set targets for the number of bikes that were expected to be in operation. San Francisco was slated to have 4,500 bikes by May 2017 but due to limitations in implementing the bike share program, including the system operator's financial and management problems and the inability of SFMTA to conduct community outreach and secure approval for the installation of the required number of stations, this initial timeline was not met.

### *Member and Casual Rider Fees*

The Program Agreement imposes a baseline for membership pricing, initially set at \$149 in 2015. The operator has the ability to make annual adjustments equal to the Consumer Price Index (CPI) plus 2% thereafter. The Program Agreement requires the system operator to offer less expensive subscriptions to members of households with incomes at or below 200% of the Federal Poverty Level (FPL). The reduced membership amount started at \$5 per year for the first year of the Program Agreement, increasing to \$60 per year in the second year with annual CPI adjustments plus 2%.

The first 30 minutes of usage by members must be offered free-of-charge. If this initial ride period is exceeded, the operator may impose a time-based user fee charge. The total user charge assessed to Bike Share members may not exceed \$100 for any 24-hour period.

The Program Agreement with MTC does not impose any restrictions on non-member pricing and user fees. All non-member pricing - unlocking fees and time-based usage charges – are set at the discretion of the operator.

### *Revenue Sharing in the Program Agreement*

The Program Agreement provides for revenue sharing between the operator and MTC. Under the agreement, the operator pays to MTC 5% of revenues exceeding an annual threshold; for ridership revenues, the threshold is set at \$18,000,000, and for sponsorship revenues, the threshold is set at \$7,000,000. The Coordination Agreement provides for MTC to allocate 80% of the revenue sharing to the participating cities. As of October 2021, the revenue threshold has never been exceeded, and the agreement is unlikely to result in any revenue in the foreseeable future.

### *Termination of the Agreement*

The Program Agreement contains provisions regarding what constitutes breach of contract by the operator and outlines the various actions MTC may take in the event of contractual breach, which include purchase of system equipment or outright termination. The Agreement states that failure to adhere to the timelines pertaining to station and bike fleet deployment - including as modified under the terms of the October 2016 amendment - is grounds to consider the operator to be in default under the terms of the (modified) Agreement. According to SFMTA, the current system operator Lyft has not breached any timeline deadlines.

### **Agreement between SFMTA and Lyft/Motivate for Hybrid Electric-Assist Bikes**

In addition to the agreements between the current system operator Lyft and MTC, SFMTA entered into an agreement with Lyft for the implementation of hybrid electric-assist bicycles from January 2020 through December 2024. The agreement provides for Lyft to deploy 4,000 hybrid electric-assist bicycles in San Francisco in addition to the 4,500 classic bicycles to be deployed by Lyft under the original 2015 Program Agreement, with an operating flexibility provision that sets a minimum number of bikes in operation over a period of time equal to 70% of 4,000.

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## **San Francisco Bike Share System Capacity and Ridership Trends**

### **Number of Bikes and Stations**

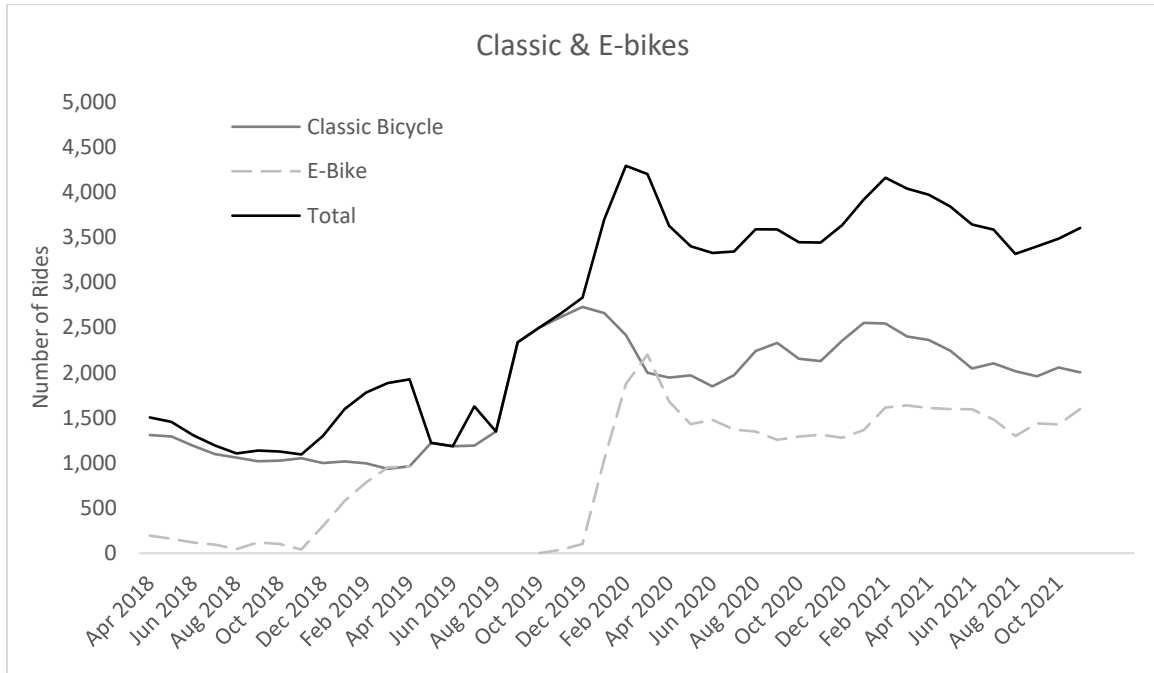
The number of bikes in operation in San Francisco Bike Share increased from an average of approximately 1,100 classic bikes and 130 e-bikes in 2018 to an average of approximately 3,600 classic and e-bikes in 2021.<sup>5</sup> Between April 2018 and May 2019, the number of bikes in active operation on any given day fluctuated between approximately 1,100 to 1,800 bikes. After Lyft acquired Motivate the number of stations and bikes increased. Exhibit 1 below shows the number of bicycles in use by type (classic bikes and e-bikes). As shown in Exhibit 1, Lyft began to deploy e-bikes beginning in December 2019. By March 2020, the daily average of e-bikes in active operation was 2,200. As reported on November 30, 2021, San Francisco Bike Share has 255

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<sup>5</sup> Actual number of bike available for use on any given day may be slightly higher or lower, depending on number of bikes undergoing replacement and repair.

operating stations, and a bike fleet of 3,600 bikes, of which 2,000 are classic bikes, and 1,600 are e-bikes.

**Exhibit 1. Classic and E-Bikes in Active Operation by Day  
April 2018 – October 2021<sup>a</sup>**



Source: BLA Based on SFMTA Data

<sup>a</sup> E-bikes had also previously been installed in San Francisco by Jump, which at that time was owned by Uber.

**Bike Ridership Trends**

Prior to the beginning of the pandemic in March 2020, bicycle use in San Francisco trended upward, as shown in Exhibit 2 below. The increase between 2017 and 2018 ranged from less than 40,000 riders per month in July 2017 to nearly 150,000 riders per month in October 2018. Bike Share ridership varied between November 2018 and November 2019 but averaged approximately 150,000 riders per month.

As shown in Exhibit 1 above, Lyft began to deploy e-bikes beginning in December 2019 and by mid-January 2020, the total number of e-bikes in active service had increased to slightly over 1,300, correlating with a rapid growth in ridership of e-bikes in the period just prior to the onset of Covid pandemic. <sup>6</sup> Lyft increased the number of available e-bikes in February 2020 while allowing members to rent these bikes at the same fee charged for use of a classic bike. The

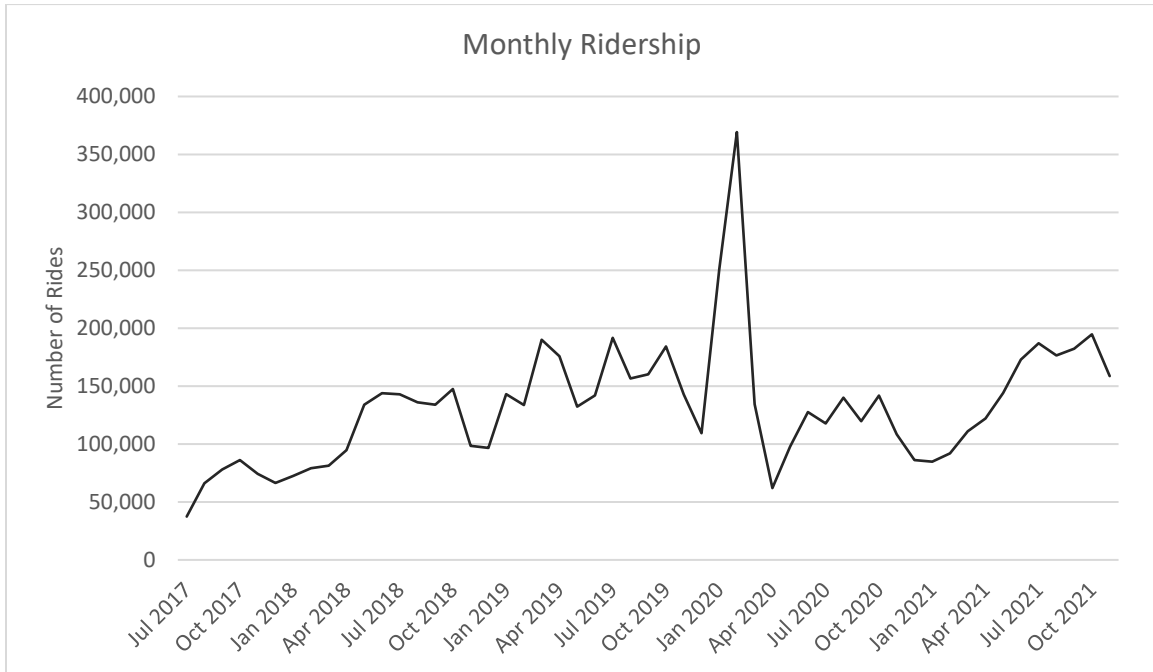
<sup>6</sup> E-bikes had also previously been installed in San Francisco in October 2018 by Jump, which at that time was owned by Uber. Jump closed all operations in San Francisco in May 2020.



increased availability of e-bikes at the standard fee resulted in a large growth of e-bike ridership in February 2020.

In March 2020, Lyft instituted a differentiated pricing scheme, charging an additional per-minute fee for e-bikes for both members and casual users. This coincided with the onset of the Covid 19 pandemic. The combination of the two factors lead to a drop in e-bike usage. This has subsequently been reversed, with the resurgence of ridership over the last year driven in large part by e-bikes.

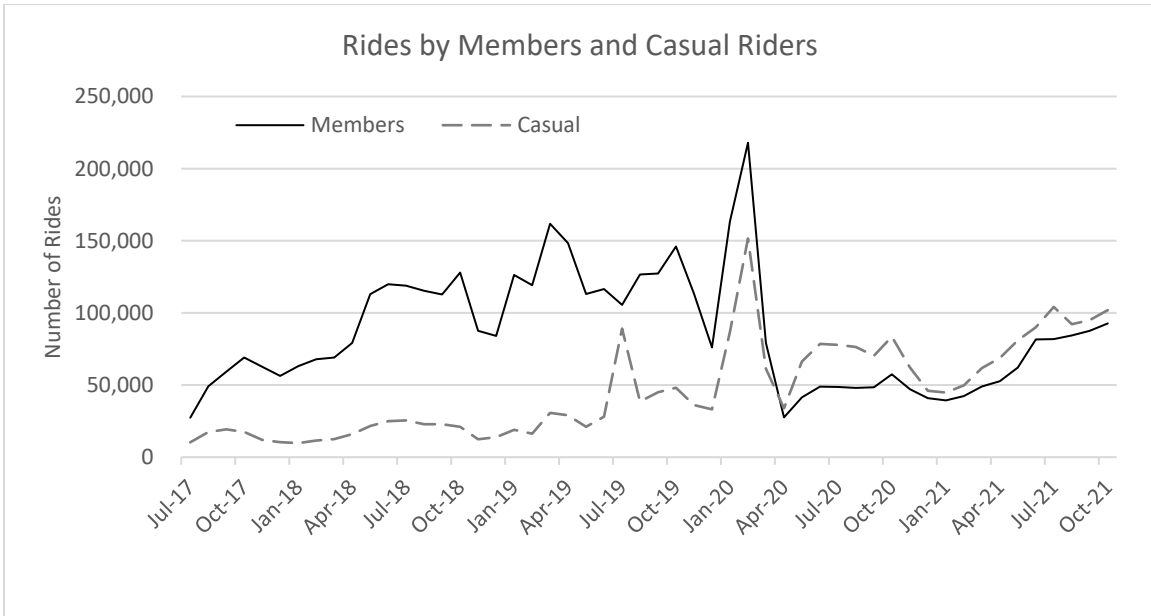
### Exhibit 2. Changes in Monthly Ridership July 2017 – October 2021



Source: BLA Based on SFMTA Data

As San Francisco Bike Share ridership has recovered from the pandemic, ridership has shifted from members to casual riders and from classic bikes to e-bikes. Casual users and members accounted for approximately the same number of rides April 2020. However, over the last year, rides by casual users have consistently exceeded those of members. This shift in rides from members to casual riders may have implications for the future of Bike Share in San Francisco.

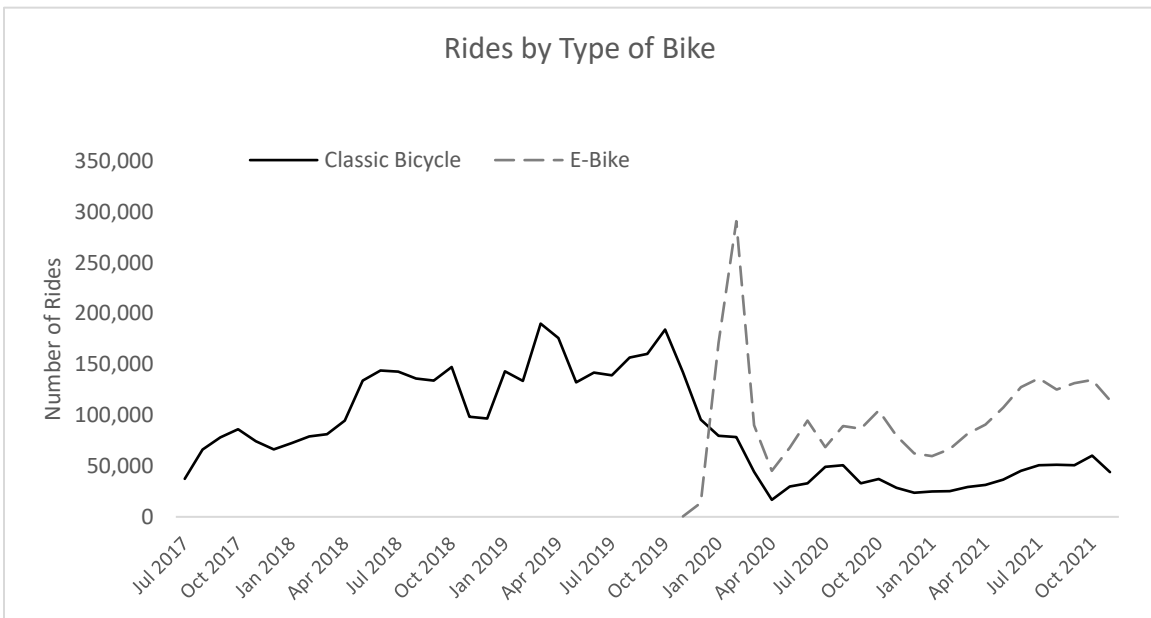
**Exhibit 3. Change in Portion of Rides by Members and Casual Riders  
July 2017 – October 2021**



Source: BLA Based on SFMTA Data

After the introduction of e-bikes, users have preferred e-bikes to classic bikes, as shown in Exhibit 4 below. Rides on both types of bikes have been trending upwards, and while e-bike rides exceed classic bike rides, in October 2021 slightly more than one-quarter of all bike rides were classic bikes, indicating that use of classic bikes is a durable component of the program.

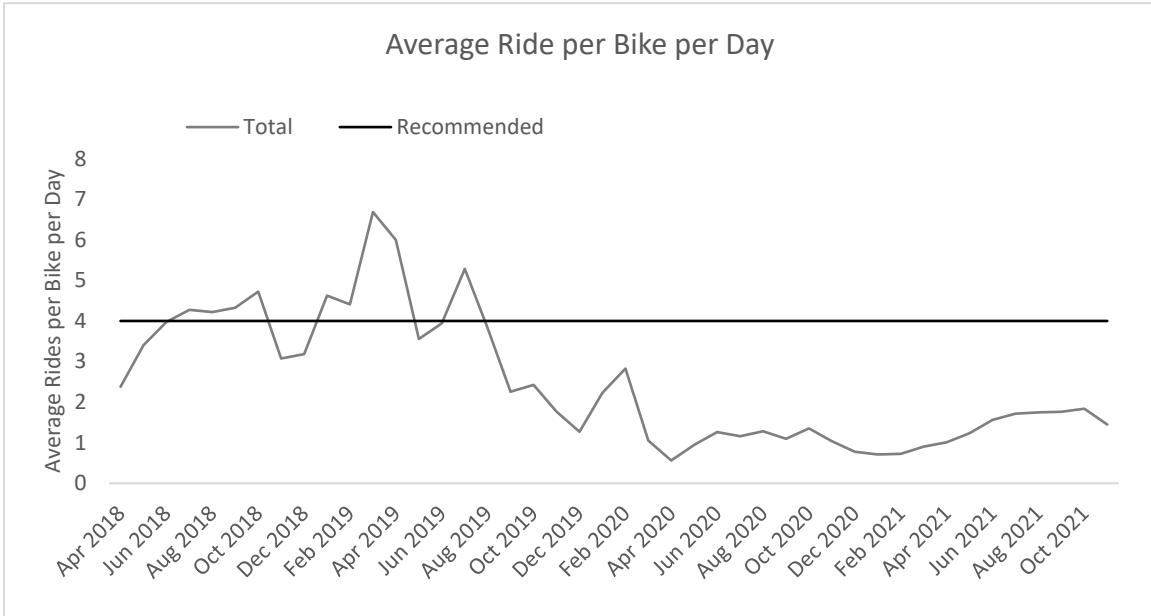
**Exhibit 4. Increase in Use of e-Bikes Compared to Classic Bikes  
July 2017 – October 2021**



Source: BLA Based on SFMTA Data

After acquisition of Motivate by Lyft, Lyft increased the number of bikes in San Francisco. Increase in system capacity coincided with a decline in rides per bike per day. The initial decline was due largely to the increase in the total bike stock. Between September 2019 and February 2020 average daily utilization was 2.13 rides per bike per day before declining following the onset of the Covid 19 pandemic to 2 or fewer rides per bike per day. Exhibit 5 below shows total rides per day and Exhibit 6 below compares total rides to the number of bikes.

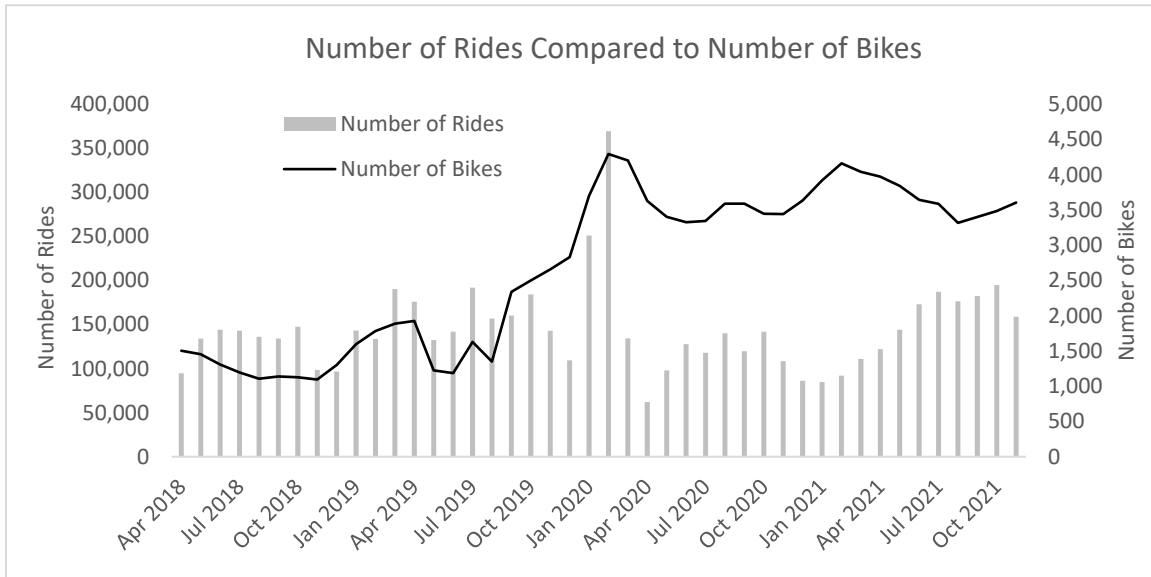
**Exhibit 5. Average Number of Rides per Bike per Day (classic & e-bikes)  
April 2018 – October 2021**



Source: BLA Based on SFMTA Data

Note: Rides per bike per day include both e-bikes and classic bikes. E-bike data is for Lyft only; e-bikes and e-bike rides prior to Lyft acquisition are not included. Also, e-bike data for July 2019 are entered as zero due to an anomaly in reported data

**Exhibit 6. Number of Bikes in Operation and Number of Rides per Month  
April 2018 – October 2021**



Source: BLA Based on SFMTA Data

**Diversity of Bike Share Ridership in San Francisco**

According to Lyft’s most recent Multimodal Report covering 2020, the demographic characteristics of San Francisco Bike Share ridership shows male riders account for two-thirds of riders. This reflects the gender breakdown of bike ridership overall. Nearly one-third (32%) of users identify as Latinx or Hispanic, which is greater than the current percentage of the Latinos in San Francisco’s total population. The percentage of white and Black riders approximately matches their respective share the total population, whereas the percentage of Asian riders is less than the percent of Asians for the population as a whole. The average age is 34, which is younger than the total population, and median household income is \$73,000, which, while high by U.S. standards, is below the San Francisco median of \$114,696 in 2019. Demographic data reported by Lyft for 2020 likely reflects the effect of a shifting composition of users, as commuters and members compose a smaller share of total ridership.

**Exhibit 7. Bike Share Ridership by Characteristics**

Gender		Race/ Ethnicity				Average age	Median household income
Women	Male	White	Latinx	Black	Asian		
34%	64%	46%	32%	4%	18%	34	\$73,000

Source: Lyft Multimodal report

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## Public or Private Ownership of Bike Share Programs

According to the Program Agreement, Bay Area Bike Share is intended to provide an alternative mode of public transportation in the Bay Area and to encourage bicycle use as a healthy, environmentally friendly, and congestion reducing transportation option. Bay Area Bike Share is a privately owned system, operated through agreements between MTC and the system operator, Lyft, and participating cities. Lyft also operates the bike share programs in Boston, New York, Chicago, Washington DC, and other U.S. cities. An alternative model is BIXI Montreal, for which the assets are owned by the city of Montreal (Quebec, Canada) and the program is operated by a nonprofit organization set up by the municipal government for the express purpose of operating the BIXI system. The BIXI system is further described in Appendix II to this report.

Whether a bike share program should be publicly or privately owned and operated depends on the extent to which public and private for-profit goals conflict.

### Estimate of Bike Share Program Costs

Our estimates of bike share program costs are shown below. Because Bay Area Bike Share is operated by Lyft, program revenues and costs are not publicly reported, and we were not able to obtain revenue and cost information from Lyft. The extent to which charges to riders and other program revenues cover the costs of the program are not known.

#### *Cost of Bikes, Station Equipment, and Installation*

We estimated three different cost scenarios for replacement of bikes and stations. The first estimate is for stations with both classic bikes and e-bikes and is based on costs provided in the 2015 Agreement between MTC and Motivate for a system consisting of approximately 5,250 classic bikes and e-bikes and 10,000 total docks. The mid-point estimate to install 370 stations, each with 14 bikes (one-half classic bikes and one-half e-bikes) and 27 docks, is \$36.6 million, shown in Exhibit 8 below.

**Exhibit 8. Estimated Station Costs for 5,250 Classic Bikes and e-Bikes and 10,000 Docks**

Size of Station				Station Cost		Total Cost		
No. of Docks	No. of Bikes	Cost per Bike	Bike Total per Station	Total Cost per Station	Total Stations	Total Station Cost	Total Bike Cost	Total System Cost
15	8	\$1,388	\$11,100	\$51,883	667	\$34,588,400	\$7,399,943	\$41,988,343
19	10	\$1,388	\$13,875	\$61,053	526	\$32,133,316	\$7,302,668	\$39,435,984
23	12	\$1,388	\$16,650	\$70,224	435	\$30,532,174	\$7,239,130	\$37,771,304
27	14	\$1,388	\$19,425	\$79,394	370	\$29,405,037	\$7,194,408	\$36,599,445
31	16	\$1,388	\$22,200	\$88,564	323	\$28,569,129	\$7,161,315	\$35,730,444
35	18	\$1,388	\$24,975	\$97,734	286	\$27,923,971	\$7,135,707	\$35,059,678
39	20	\$1,388	\$27,750	\$106,905	256	\$27,411,436	\$7,115,358	\$34,526,794

Source: BLA Estimates

<sup>a</sup> The number of bikes and docks per station are included in the 2015 Program Agreement.

<sup>b,c</sup> The estimated cost reported by Lyft to SFMTA for a classic bike is \$873 and an e-bike is \$1,903. The estimates in Exhibit 8 assume the bike fleet is composed of classic bikes and e-bikes with the cost per station based on the cost from the 2015 Program Agreement, adjusted for inflation using the Producer Price Index (PPI). The median sized stations are highlighted in each table – we believe this provides a reasonable starting point for deriving estimates of the total cost of a future Bike Share system

The second estimate is for stations with e-bikes only and is based on costs provided in the 2015 Agreement between MTC and Motivate/Lyft for a system consisting of approximately 5,250 e-bikes and 10,000 total docks. The mid-point estimate to install 370 stations, each with 14 e-bike and 27 docks, is \$39.3 million, shown in Exhibit 9 below.

**Exhibit 9. Estimated Station Costs for 5,250 e-Bikes and 10,000 Docks**

Size of Station				Station Cost		Total Cost		
No. of Docks	No. of Bikes	Cost per Bike	Bike Total per Station	Total Cost per Station	Total Stations	Total Station Cost	Total Bike Cost	Total System Cost
15	8	\$1,900	\$15,200	\$51,883	667	\$34,588,400	\$10,138,400	\$44,726,800
19	10	\$1,900	\$19,000	\$61,053	526	\$32,133,316	\$9,994,000	\$42,127,316
23	12	\$1,900	\$22,800	\$70,224	435	\$30,532,174	\$9,918,000	\$40,450,174
27	14	\$1,900	\$26,600	\$79,394	370	\$29,405,037	\$9,842,000	\$39,247,037
31	16	\$1,900	\$30,400	\$88,564	323	\$28,569,129	\$9,819,200	\$38,388,329
35	18	\$1,900	\$34,200	\$97,734	286	\$27,923,971	\$9,781,200	\$37,705,171
39	20	\$1,900	\$38,000	\$106,905	256	\$27,411,436	\$9,728,000	\$37,139,436

Source: BLA Estimates

<sup>a</sup> The number of bikes and docks per station are included in the 2015 Program Agreement.

<sup>b,c</sup> The estimated cost reported by Lyft to SFMTA for an e-bike is \$1,903. The estimates in Exhibit 9 assume the bike fleet is composed of all e-bikes. The cost per station is from the 2015 Program Agreement, adjusted for inflation using the Producer Price Index (PPI). The cost of station installation is likely to be higher than the station costs reported in the 2015 Agreement between MTC and Lyft. However, given the lack of more information, we have not made any adjustments in station replacement costs. Note that the current system in San Francisco consists of classic and e-bikes, so that our estimate in Exhibit 9 is likely to be error on the side of overreporting current system replacement costs.

The third estimate is for the replacement cost of the current system in San Francisco assuming 4,500 bikes, consisting of a mix of classic bikes and e-bikes, and 325 stations. If we assume an average station size of 27, this results in 8,775 station docks. The total price of the hybrid bike fleet is \$7,398,000, and the total station cost is \$25,803,050. This yields a total cost of \$33,201,050, which we consider a reasonable baseline estimate of the cost of a public buyout.

The break-even cost of equipment could be lower than estimated in Exhibits 8 and 9, if as Lyft has indicated, Bay Wheels in San Francisco was operating at a very narrow or even negative net profit margin even at pre-COVID 19 utilization levels. Exhibits 8 and 9 do not include labor set-up costs or costs that may be incurred due to logistical issues that arise during the transfer of the system to public ownership, or costs to the City in terms of additional overhead and administrative labor.

**Operating Costs**

Because Lyft will not share actual operating cost data, we have constructed a range of estimates of operating costs based on per ride cost data reported by SFMTA based on their understanding of Lyft costs per ride for San Francisco Bay Wheels (operated by Lyft), and actual cost data that was provided to us by BIXI Montreal.

Estimated Operating Costs Based on Program Agreement and Costs Reported by SFMTA

Estimated annual operating costs range from approximately \$12.6 million to \$18.9 million, depending on the number of classic bike and e-bike rides, shown in Exhibit 10 below. These estimates are based on information provided by SFMTA, assuming that the cost per ride of an e-bike is \$6.00, and a classic bike is \$3.00.<sup>7</sup> The actual cost could be lower due to economies of scale.

**Exhibit 10. Estimated Annual Bike Share Program Operating Costs**

	<b>Number of Rides per Month</b>	<b>Estimated Cost per Ride</b>	<b>Total Operating Costs per Month</b>	<b>Estimated Total Operating Costs per Year</b>
Annual operating estimate based on rides in July 2021				
Classic bike	76,744	\$3.00	\$230,232	\$2,762,784
e-Bike	136,213	\$6.00	817,278	9,807,336
<b>Total</b>	<b>212,957</b>		<b>\$1,047,510</b>	<b>\$12,570,120</b>
Annual operating estimate based on 50% increase in rides in July 2021				
Classic bike	115,116	\$3.00	\$345,348	\$4,144,176
e-bike	204,320	\$6.00	1,225,920	14,711,040
<b>Total</b>	<b>319,436</b>		<b>\$1,571,268</b>	<b>\$18,855,216</b>

Source: BLA based on estimated per ride cost reported by SFMTA for San Francisco Bay Wheel operated by Lyft

Note that cost per dock is for classic bike only. E-bike costs would be higher. Adjusted using Bureau of Labor Statistics CPI for 2015 to 2021.

Exhibit 11 is an estimate of the cost of operating a 5,250 bike, 10,000 dock system based on an inflation-adjusted estimate provided in Appendix B of the Program Agreement between Lyft and MTC. The annual cost is \$17,580,000, which is slightly below our adjusted cost estimate based on current cost per ride as stated by Lyft and conveyed to us by SFMTA.

**Exhibit 11. Estimated Annual Operating Costs Based on Program Agreement**

<b>Cost per Dock (monthly)</b>	<b>Number of Docks</b>	<b>Monthly Cost</b>	<b>Annual Cost</b>
\$146.50	10,000	\$1,465,000	\$17,580,000

Source: BLA based on Program Agreement Appendix B

Estimated Annual Staff Costs Based on BIXI Montreal

To provide a baseline for constructing annual payroll costs of a publicly owned and operated bike share system, we have used data provided to us by BIXI Montreal shown in Exhibit 12. To

<sup>7</sup> The estimated cost per ride for a classic bike of \$3 and an e-bike of \$6 is based on information provided verbally SFMTA by Lyft.



construct the estimates shown in Exhibit 12, we took the ratio of employees to bikes for Montreal and then applied this ratio to the number of bikes set out in the Agreement between MTC and Lyft, which is 4,500. We then multiplied this ratio by 1.5 to account for the effects of year-round operation in San Francisco.<sup>8</sup> We further assumed that of the total workforce, 60% would be employed full-time, 40% would be part-time employed on average at 25 hours per week. On this basis, San Francisco would need to hire 139 employees to fully staff and operate bike share. If all jobs were civil service positions with total annual compensation (salary and benefits) set at \$135,000 per FTE, total estimated payroll expense is \$12,033,012. If San Francisco was to set up a non-profit to operate Bike Share – which is the arrangement in Montreal – assuming the same workforce structure, and setting total annual compensation at \$80,000 per FTE, total estimated payroll expense is \$7,130,674.

By setting the cost for a FTE in the public sector and non-profit sector at \$135,000 and \$80,000, respectively we have constructed these estimates to error on the high side (e.g. to bias our estimate to overestimate costs). Given the nature of the work, some of which is semi-skilled labor, actual salary costs per FTE are likely to be lower. Also, we have not assumed the existence of any economies of scale. Total annual salary expense may thus be less than those shown in Exhibit 12.

**Exhibit 12. Estimated Annual Civil Service/ Nonprofit Staff Costs for Bike Share**

	San		Civil Service		Nonprofit Organization	
	Montreal <sup>a</sup>	Francisco <sup>a,b</sup>	Cost per FTE	Total	Cost per FTE	Total
Stations	610	325				
Bikes	7,270	4,500				
Employees	150	139	\$135,000	\$12,033,012	\$80,000	\$7,130,674

Source: BLA based on BIXI Montreal Staff Ratios

<sup>a</sup> Montreal numbers are for 2019 and San Francisco numbers are for 2021.

<sup>b</sup> As noted in the text, this assumes the same ratio of employees per bike as Montreal, which is then adjusted by (a) assuming 60% full-time and 40% part-time employees, and (b) increasing this employee estimate by a factor of 1.5 due to the effects of seasonal weather.

Estimated Annual Equipment and Administrative Costs

Estimates of annual operating expenses include the annual cost to maintain the system in a state of good repair. The average service life is the number of years on average a given bike or station can be maintained in more or less continuous use through ongoing maintenance and repair. We use the replacement schedule from a report prepared for Philadelphia to derive our estimates

<sup>8</sup> BIXI Montreal is inoperable for approximately four months out of the year due to cold winter.

of the annual depreciation cost shown in Exhibit 13 below.<sup>9</sup> Our estimates assume that e-bikes compose one-half of the total bike fleet which have a higher replacement cost.

### Exhibit 13. Average Life of Service and Depreciation of Bikes and Stations

Replacement schedule	Years in Operation				Average Service Life
Bicycles					
Years in operation	7	8	9		8.2
Replacement likelihood	15%	50%	35%		
Stations					
Years in operation	9	10	11	12	10.6
Replacement likelihood	15%	25%	45%	15%	
<b>Annual depreciation allowance</b>					
Bikes (5,250)	\$845,122				
Stations (500/27 dock)	\$3,797,406				
<b>Total</b>	<b>\$4,642,528</b>				

Source: 2018 Indego Business Plan, City of Philadelphia

In addition to annual depreciation, we estimate annual administrative costs of \$1,500,000 to cover additional expenses such as software, insurance, cost of office rental, and various miscellaneous expenses.

#### Estimated Operating Cost Range for Publicly Owned Bike Share Program

The estimated annual operating costs for a publicly owned bike share program range from \$13,272,202 for a program operated by a nonprofit organization to \$18,175,540 for a program operated by the City, shown in Exhibit 14 below.

### Exhibit 14. Estimated Annual Operating Costs for Public Bike Share in San Francisco

	Civil Service	Nonprofit Organization
Staff Costs	\$12,033,012	\$7,130,674
Depreciation Allowance	4,642,528	4,642,528
Other Administrative Costs	1,500,000	1,500,000
<b>Total</b>	<b>\$18,175,540</b>	<b>\$13,273,202</b>

Source: BLA Estimate

### Operating Revenues

Annual operating revenues would cover a portion of the estimated operating costs. BIXI Montreal's operating costs are covered by 50% user charges, 25% advertising and sponsorship

<sup>9</sup> Indego report (2018) also gives the replacement cost of a classic (non-electric) bike as \$1,200. Estimates of replacement schedule are from Indego report 2018

agreements, and 25% public sector subsidy. Based on the BIXI Montreal model, the annual operating subsidy cost to the City would range from \$3.4 million for a nonprofit-operated program to \$4.7 million for a City-operated program, assuming 50% cost recovery from memberships and user charges and 25% from advertising and sponsor revenues. The annual City operating subsidy could be higher if advertising and sponsor revenues were not available, or member fees and user charges did not offset 50% of costs.

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## Options for Public Ownership and Operation of Bike Share

If the goal of the bike share program is to provide an alternative mode of public transportation in the Bay Area and to encourage bicycle use as a healthy, environmentally friendly, and congestion reducing transportation option, as stated in the Program Agreement between MTC and Lyft, then private ownership and operation by a Transportation Network Company (TNC) such as Lyft could conflict with the program's goal. The core business of Lyft and other TNCs is the provision of auto-based private transportation services that generate a profit. Although Lyft does not publicly report revenues and costs for operating bike share programs, based on our estimates of program costs and revenues, bike share programs are unlikely to generate a profit. Further, TNCs such as Lyft may reduce rather than enhance use of public transportation and result in increased car-generated air pollution and congestion.

The Board of Supervisors could consider the costs and benefits of public ownership and operation of the bike share program. Consideration would need to include how the bike share program fits into the public transit system, the role of bike share in meeting public goals such as reduction of congestion and pollution, and the extent to which public subsidies to bike share are warranted.

### Options for San Francisco

Based on interviews conducted by the BLA with staff in Montreal, Toronto, Boston, Washington DC, Philadelphia, and San Francisco, six out of seven interviewees expressed disappointment with current operating agreements, all of which involve contracting out operations to a private entity and were favorably inclined towards transforming bike share into a municipally owned and operated public utility. One interviewee opposed the idea of public *operation*, and instead favored a model based on public *ownership* coupled with a private operating agreement.

The Board of Supervisors could consider three policy options:

- Option A: The City could own and operate a bike share program, including publicly funding acquisition of the system and subsidizing annual operating costs. The system operator could be either SFMTA, or a designated non-profit entity set up by the City for the express purpose of operating bike share (this is the model used in Montreal). This would require the City purchasing the physical assets and directly providing the service or setting up a nonprofit entity to provide the service.
- Option B: The City would own all physical assets (bikes, stations, kiosks), and contract with a private operator (either a private for-profit company such as Lyft or a

nonprofit company). The contract with the private operator could require the operator to grant the City exclusive rights to user data to ensure privacy, prevent proprietary data capture and commercial usage for purposes not directly related to bike share, and return of such data to the City at the termination of the operating agreement. The City would contract all operations to a private company and would reimburse the company on a flat rate basis or through revenue sharing agreement tethered to performance benchmarks and tiered earnings thresholds. This is the type of agreement that is in effect in Boston, Toronto, and Washington DC.

- Option C: The City could contract with a private for-profit entity such as Lyft through the City's contracting process, including setting performance standards and equity benchmarks on the system operator. This is the agreement San Francisco currently has with Lyft, and as a signatory jurisdiction to the MTC regional bike share agreement.

In considering the options for the future of the San Francisco Bike Share program, the Board of Supervisors would need to evaluate the public benefit of the program, including the extent to which the program does or could reduce pollution and congestion and enhance public transportation. The Board of Supervisors could also consider other questions, including: (a) whether the goal in increasing bicycling is to reduce driving; (b) the extent to which more protected bike lanes would be needed; and (c) policies to increase bicycling among populations that are not currently frequent users.

If the City were to implement a public bike share program prior to the termination of the existing agreement between MTC and Lyft in July 2027, the City would need to work with the cities participating in the bike share program and with MTC and Lyft on early termination of the agreement. Other considerations would be the cost of purchasing Lyft's bike share infrastructure, and whether other cities would want to participate in the public bike share program. As an example, the city of Montreal purchased the assets of the bike share program operator when the operator declared bankruptcy and liquidated their assets. On acquiring the assets, the city of Montreal set up the nonprofit, BIXI Montreal, which operates the Montreal bike share program and provides call services to other cities, including Toronto and Detroit.

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## Appendix I: Bike Share in San Francisco and Other Cities

Two system-level characteristics have the largest impacts on bike share ridership: (1) number of bikes per 1,000 service area residents, and (2) station density per square kilometer ( $\text{km}^2$ ). The Institute for Transportation and Development Policy (ITDP) and National Association of City Transportation Officials (NACTO) recommend cities place 10-30 bikes per 1,000 residents throughout the entire service area. The actual number of bikes should be sufficient to accommodate fluctuations in demand, yet should not be such that the number of daily rides per bike (on average) falls below 4, as low levels of bike utilization increase the cost per trip.<sup>10</sup> Recommended station density is one station every 250 to 300 meters within the service area, or 10-16 stations per square kilometer.<sup>11</sup> In addition, the industry standard recommends 2 -2.5 docks per bike to insure that pick-up/drop-off points always have a sufficient number of open and available docks. While it is possible to operate at a higher ratio of bikes to docks, this will require more intensive rebalancing, increasing operational costs.

In conformance to the existing literature, we use rides per 1,000 residents and rides per bike per day as our two key system-level performance indicators. We tested different models to account for differences in ridership and utilization data available in the ITDP 2018 Annual Report. As expected, the two primary system-level characteristics that account for variations in ridership are bikes per 1,000 residents and stations per  $\text{km}^2$ . We used the results of the models that provided the best predictor of ridership and utilization to predict ridership and utilization in San Francisco, and then compared this to actual data to see how San Francisco is performing relative to predicted values.

### **Bikes per 1,000 Residents and Station Density per Kilometer**

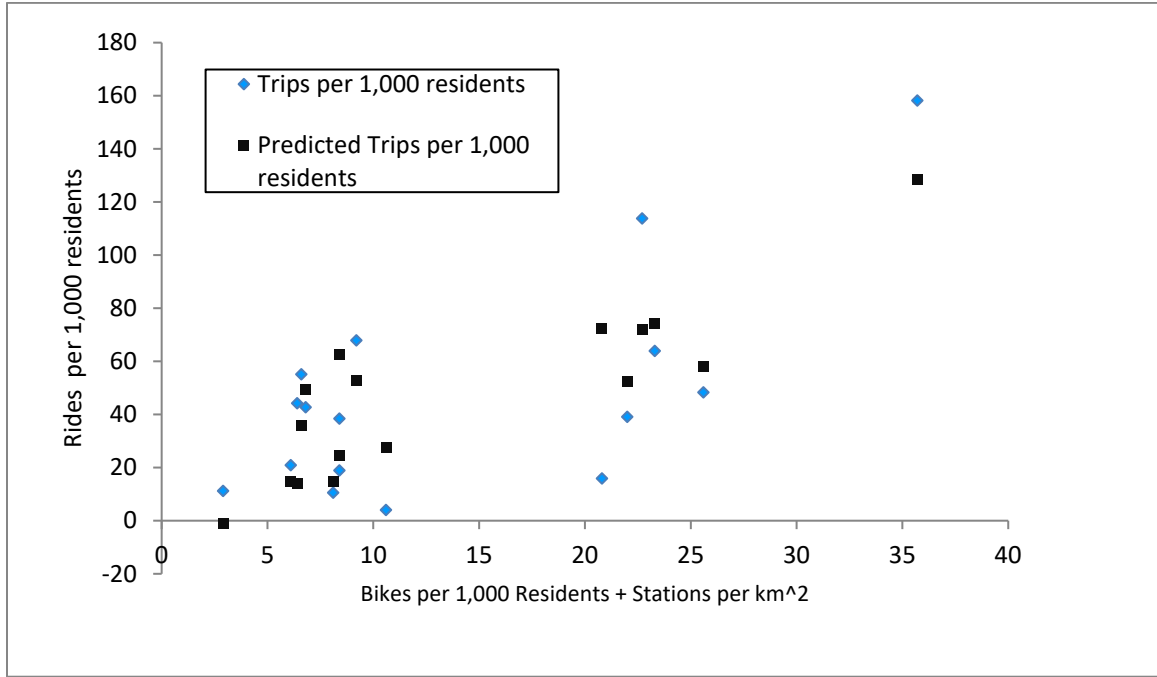
Exhibit 15 below shows the results of a model using bikes per 1,000 and station density per  $\text{km}^2$  to account for variations in ridership. Both variables have independent effects, indicating they are in fact measuring distinct characteristics that effect ridership levels in our comparison cities. For each increase in one bike per 1,000 residents we expect to see an increase in ridership per 1,000 residents of 2.109 rides per day; and for each increase of one station per  $\text{km}^2$  we expect to see an increase in ridership of 4.346 per day per 1,000 residents. These two variables account for 63% of the observed differences in our comparison cities.

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<sup>10</sup> Analysis conducted by ITDP found that increasing the number of bikes per 1,000 service area residents tends to be weakly correlated with a decline in utilization. Our results confirm these findings, although models yield lower levels of explained variance (co-efficient of determination, or  $R^2$ ), and independent variables are not significant at the 0.05 level.

<sup>11</sup> Planners have found that potential riders' willingness to use bike share declines if the station is more than a 5 minutes' walk from the departure or arrival point.

**Exhibit 15. Actual Rides (Trips) per 1,000 Residents due to Increase in Number of Bikes and Stations Compared to Prediction**

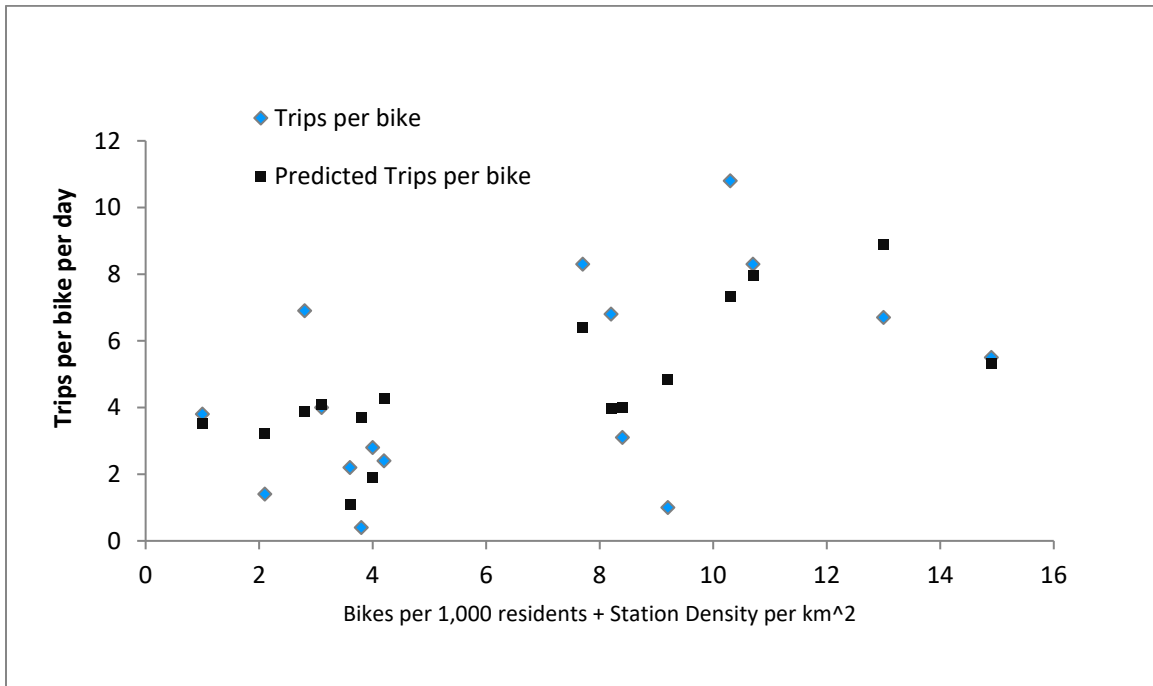


	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	-11.478	14.125	-0.812	0.431
Bikes/1,000	2.109	0.790	2.668	0.019
Station/per km <sup>2</sup>	4.346	1.802	1.802	0.031
R Square	0.63			
Observations	16			

Source: BLA regression based on data from Institute for Transportation and Development Policy (ITDP) 2019 Bike Share Planning Guide

We conducted a similar set of statistical tests to determine the best predictor of variance in utilization, or the number of rides per day per bike, in our comparison cities. As seen in Exhibit 16 below, for each an increase of one station per km<sup>2</sup> we expect the number of rides per bike per day to increase by 0.525; and for each increase one bike per 1,000 residents, we expect to see a decrease in rides per bike per day of -0.167. The amount of the variance in bike utilization accounted for by the model is 48%.

**Exhibit 16. Increase in Bike Utilization (Number of Rides per Bike per Day) due to Increase in Station Density per km<sup>2</sup> Compared to Prediction**



	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	3.473	1.263	2.749	0.017
Station Density per km <sup>2</sup>	0.525	0.161	3.257	0.006
Bikes per 1,000 Residents	-0.167	0.071	-2.362	0.034

R Square	0.476
Observations	16

Source: BLA regression based on ITDP data

Tests of the relationship between the number of bikes per 1,000 residents and utilization found that increasing the bike-to resident ratio did not result in higher utilization per bike. Ease of availability as indicated by station density per km<sup>2</sup> is the single most important factor that increases utilization.<sup>12,13</sup>

<sup>12</sup> We also ran a regression of utilization on a model with both population per km<sup>2</sup> and stations per km<sup>2</sup>. The model showed a small gain in explanatory power, but the population density variable was no longer statistically significant.

<sup>13</sup> In an effort ensure some consistency with the ITDP data, we used the average number of rides per day for the peak month observed in San Francisco, using ridership data from the Bureau of Transportation Statistics, Department of Transportation Service. The service area is the buffer provided by SFMTA.

## San Francisco Performance Relative to Comparison Cities

We compared predicted/ actual ridership and predicted/ actual utilization performed for both 2019 (pre-Covid) and 2021 (post-Covid and following more widespread introduction of dockless e-bikes into the system). For 2021, we generated two predictions. The first uses the population and km<sup>2</sup> of the City area served by the bike share system, while the second uses the population and km<sup>2</sup> of all of San Francisco.<sup>14</sup> We used the results of the regression models to predict ridership and bike utilization in San Francisco based on the number of bikes per 1,000 residents and station density per km<sup>2</sup>. We then compared predicted to actual values to see whether San Francisco is more or less compared to expected levels of ridership and utilization.<sup>15</sup>

### *Pre-Covid 2019 Predicted and Actual*

Exhibit 17a shows the predicted and actual number of rides per 1,000 residents and the daily riders per bike in 2019 for the area of the city served by the bike share system. This data is prior to the COVID-19 pandemic and introduction of e-bikes by Lyft in December 2019. As shown in Exhibit 17a, the actual number of rides per 1,000 residents and daily rides per bike was slightly below the predicted number.<sup>16</sup>

### **Exhibit 17a. Predicted and Actual Rides per 1,000 Residents and Daily Rides per Bike in Area of City Served by Bike Share System in 2019**

	Rides per 1,000 residents		Daily Rides per Bike	
	Predicted	Actual	Predicted	Actual
<b>Model 1 (ridership)</b>	16.25**	14.89*		
<b>Model 2 (utilization)</b>			5.17**	3.80*

Source: BLA using data reported by SFMTA for 2019

\* Actuals based on July 2019

\*\* Based on co-efficient estimates from regression models using 2019 ITDP data

Note: This table represents data prior to the COVID-19 pandemic and prior to introduction of e-bikes by Lyft in December 2019. The data is for riders and daily rides within the City area served by the bike share system, equal to approximately 47 square kilometers and 456,405 residents.

<sup>14</sup> The km<sup>2</sup> of the service area buffer is 47.3 and the estimated population is 456,405. For all of San Francisco, the service area is 110 km<sup>2</sup> (the entire area of San Francisco minus Treasure Island, Golden Gate Park, and McLaren Park) and population is 875,114.

<sup>15</sup> In an effort ensure some consistency with the ITDP data, we used the average number of rides per day for the peak month observed in San Francisco, using ridership data from the Bureau of Transportation Statistics, Department of Transportation Service. The service area is the buffer provided by SFMTA.

<sup>16</sup> The ITDP data set that we used for our statistical analyses reports rides per 1,000 residents using data for the peak month in the comparison cities. For consistency we have adopted this approach. The month with the peak in average rides per day in San Francisco occurred in March of 2019.



*Post-Covid Predicted and Actual*

Exhibits 17b and 17c show predicted and actual number of rides per 1,000 residents and daily rides per bike in San Francisco in 2021. Exhibit 17b shows this information for the area of the City served by the bike share system, and Exhibit 17c shows this information for the City as a whole. As shown in Exhibit 17b, actual number of rides per resident and daily rides per bike with the bike share system service area were well below the predicted number.<sup>17</sup> However, as shown in Exhibit 17c, the actual number of rides per resident citywide were slightly higher than predicted, although the actual number of daily rides per bike were still well below the predicted number.

**Exhibit 17b. Predicted and Actual Rides per 1,000 Residents and Daily Rides per Bike in San Francisco in Area of City Served by Bike Share System in 2021**

	Rides per 1,000 Residents		Daily Rides per Bike	
	Predicted	Actual	Predicted	Actual
<b>Model 1 (ridership)</b>	28.04**	13.76*		
<b>Model 2 (utilization)</b>			5.03**	1.80*

Source: BLA using data reported by SFMTA for 2021

\* Actuals based on October 2021

\*\* Based on co-efficient estimates from regression models using 2019 ITDP data

Note: This table represents data during the COVID-19 pandemic and after introduction of e-bikes by Lyft in December 2019. The data is for riders and daily rides within the City area served by the bike share system, equal to approximately 47 square kilometers and 456,405 residents.

**Exhibit 17c. Predicted and Actual Rides per 1,000 Residents and Daily Rides per Bike in San Francisco in City as a Whole in 2021**

	Rides per 1,000 residents		Daily Rides per Bike	
	Predicted	Actual	Predicted	Actual
<b>Model 1 (ridership)</b>	7.01**	7.18*		
<b>Model 2 (utilization)</b>			4.03**	1.80*

Source: BLA using data reported by SFMTA for 2021

\* Actuals based on October 2021

\*\* Based on co-efficient estimates from regression models using 2019 ITDP data

Note: This table represents data during the COVID-19 pandemic and after introduction of e-bikes by Lyft in December 2019. The data is for riders and daily rides within the City as a whole, equal to approximately 110 square kilometers and 875,114 residents.

The onset of the pandemic in March 2020 and introduction of e-bikes in December 2019, including introduction of e-bikes that do not need to be docked at a station, impacts the

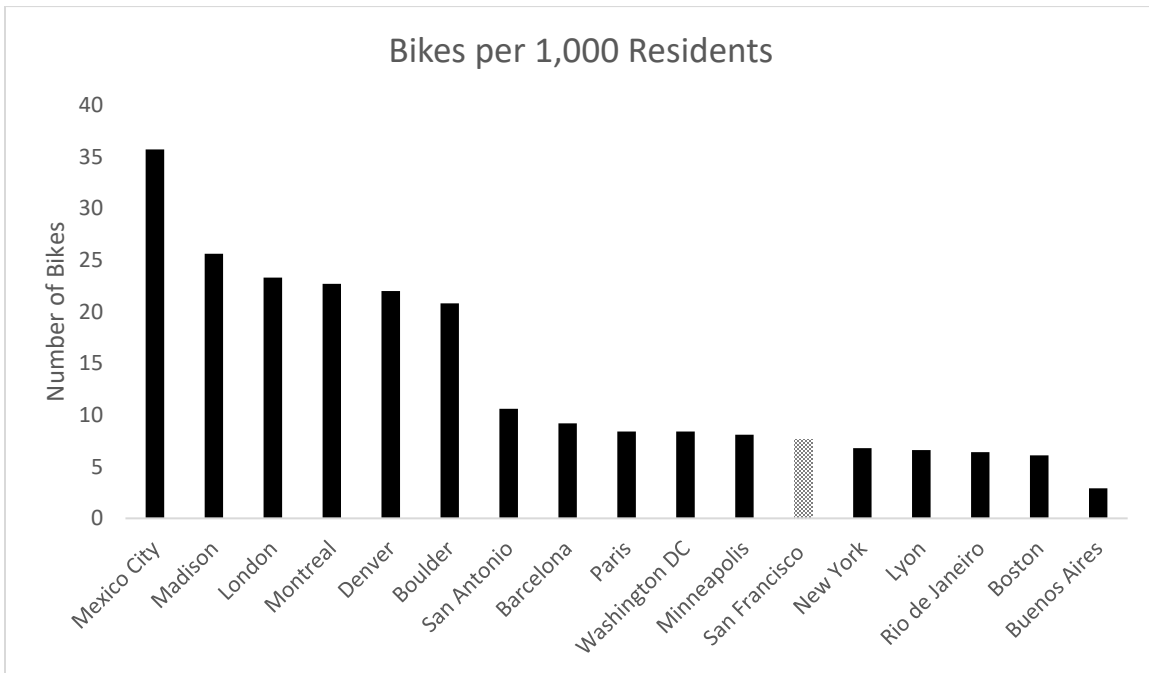
<sup>17</sup> Actual utilization does not change between models given that the number of rides and number of bikes remains the same.

comparison of predicted and actual rides per 1,000 and daily rides per bike. The exhibits above show that actual bike share utilization with the area of the City served by the bike share system in 2021 is below the predicted utilization.

*Prevalence of Bikes and Stations Among Comparison Cities*

Exhibits 18 and 19 show how San Francisco compares to. Exhibit 18 charts the ratio of bikes to service area residents, while Exhibit 19 displays the number of stations per km<sup>2</sup>. San Francisco ranks twelfth in terms of bikes per 1,000 residents, and ninth in terms of station density per km<sup>2</sup>.<sup>18</sup>

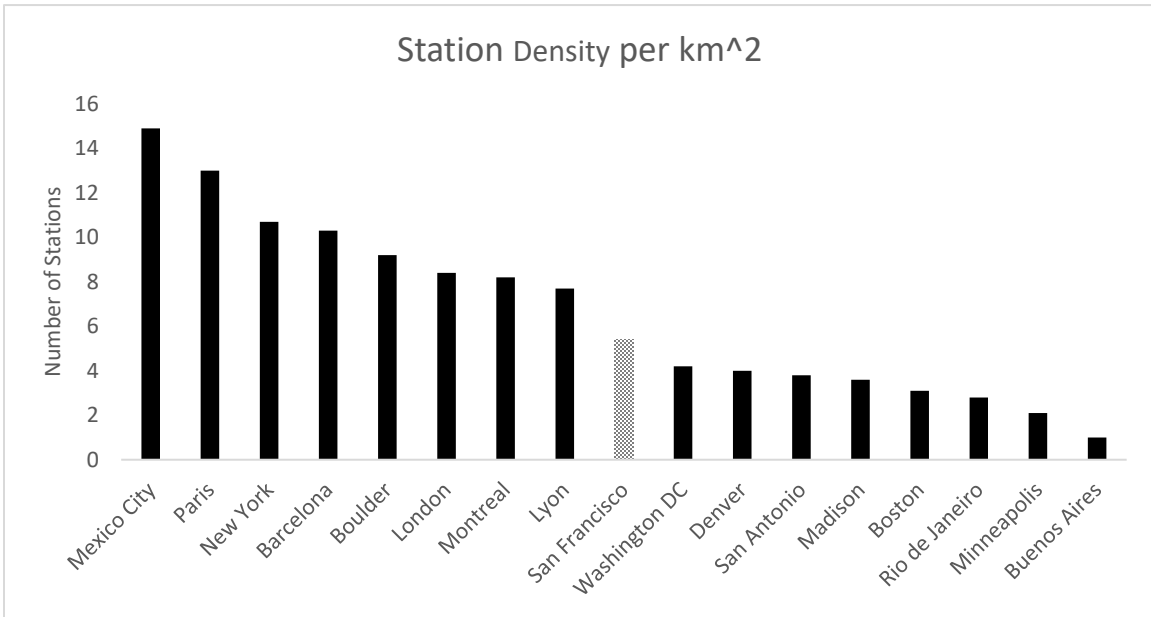
**Exhibit 18. Bikes per 1,000 Service Area Residents by City**



Source: ITDP and SFMTA

<sup>18</sup> The data cities in the comparison sample and San Francisco are not strictly comparable: data on bikes per resident and stations per km<sup>2</sup> is taken from the ITDP 2019 publication, while the data for San Francisco is based on system characteristics as of August 2021.

**Exhibit 19. Stations per km<sup>2</sup> by City**

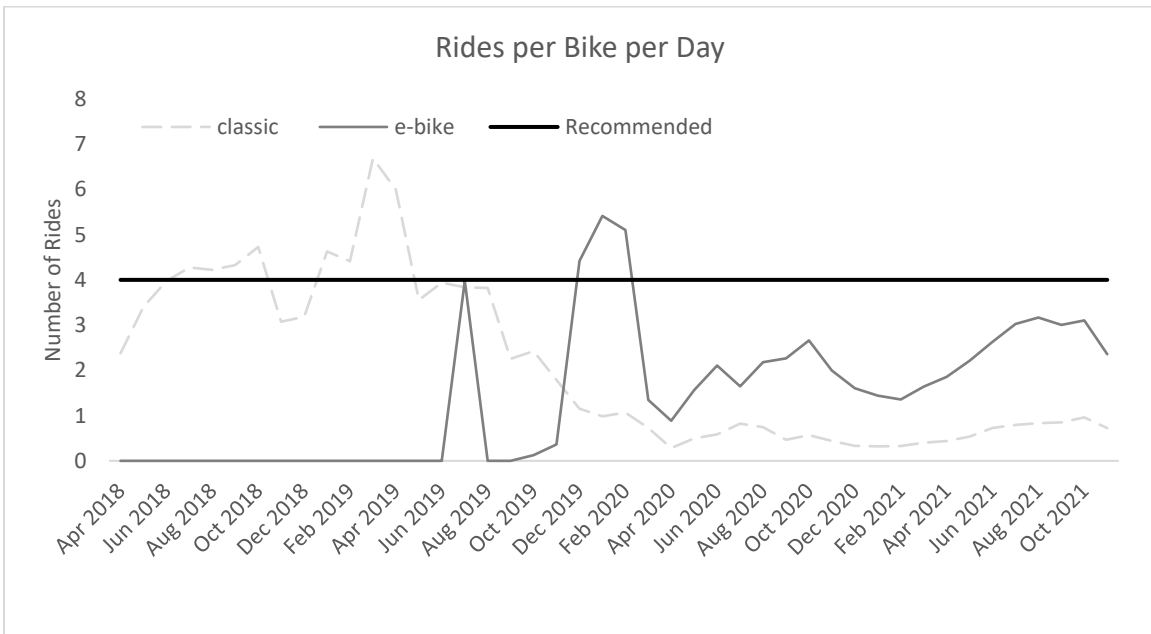


Source: ITDP and SFMTA

**Utilization (Rides per Bike per Day) in San Francisco**

The prevailing consensus is that the number of bikes and stations should be sufficient to allow for ease of access yet should be calibrated to insure at least 4 rides (or more) per bike per day. As seen in Exhibit 20, utilization underwent a major increase between October 2018 and March 2019, with approximately 10 daily rides per bike reached in the peak day of March 2019.

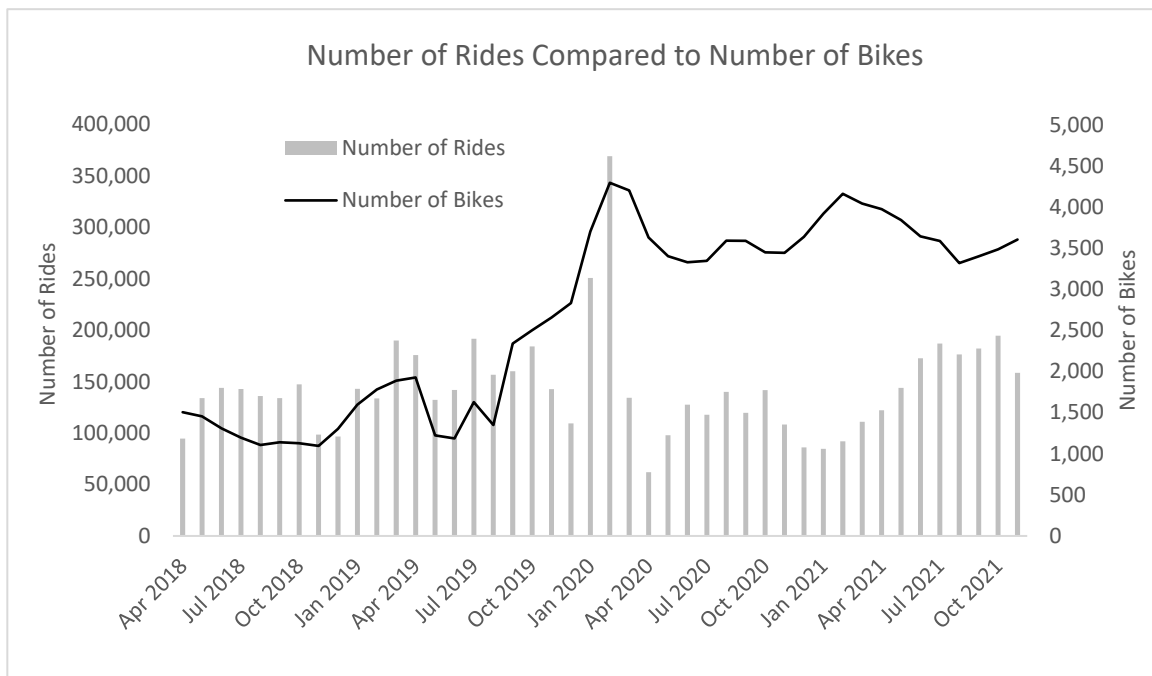
**Exhibit 20. San Francisco Rides per Day per Bike (Classic Bike and e-Bike)  
 April 2018 – October 2021**



Source: SFMTA Dashboard

Following Lyft’s acquisition of Motivate, Lyft began to increase the number of bikes and docking stations to meet service levels. As a result of this increase, utilization underwent a *pre-Covid* decline, falling to below 2 rides per bike per day in December 2019. The upturn in bike utilization observed in January and February 2020 was largely due to the introduction of e-bikes that could be rented at no additional service charge. Lyft terminated this policy in March 2020. The combination of the increase in bikes in operation and the Covid-induced reduction in ridership, as seen in Exhibit 20, would decrease average utilization to less than 2 rides per bike. A partial recovery in utilization has been achieved in 2021 through a combination of recovery of ridership and bike stock reduction (Exhibit 21). Despite the partial recovery, at 1.5-2 rides per bike per day, system utilization continues to be below recommended levels.

**Exhibit 21. Number of Bikes in Operation and Number of Rides per Month  
April 2018 – October 2021**



Source: SFMTA

**Ridership Trends in Selected U.S Comparison Cities**

Exhibit 23 below shows fluctuations in bike share ridership from January 2019 through July 2021 for a select group of comparison cities. Covid had a disparate impact across our comparison cities. In New York, ridership quickly rebounded and has exceeded pre-pandemic levels. In Chicago, there is a decline in peak month rides in 2020 relative to 2019, but in 2021 ridership has exceeded the pre-pandemic peak. Ridership in Philadelphia was stable in the first year of the pandemic and shows some evidence of decline in 2021 relative to levels observed in 2019.

Boston, San Francisco, and Washington DC stand out as the cities most impacted by the pandemic. The percentage decline that occurred between 2019 (pre-pandemic) and 2020 (pandemic year) is shown in Exhibit 22 below. Exact comparisons are difficult, due to the

differences in patterns of seasonal weather variation. What is clear is that Washington DC, Boston, and San Francisco all experienced a significant Covid-induced ridership decline and stand as a group in sharp contrast to Chicago, New York, and Philadelphia, where post-Covid ridership has increased.

**Exhibit 22. Percent Decline in Ridership – Washington, DC, Boston, and San Francisco – 2019-20**

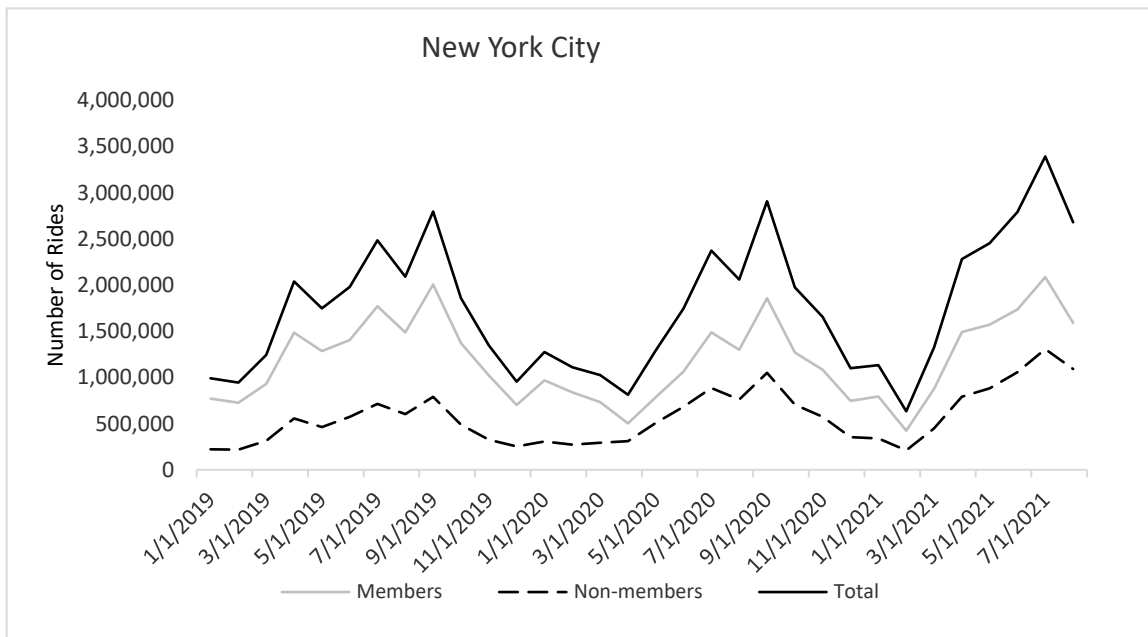
Washington DC	Boston	San Francisco
-42.91%	-19.37%	-18.76%

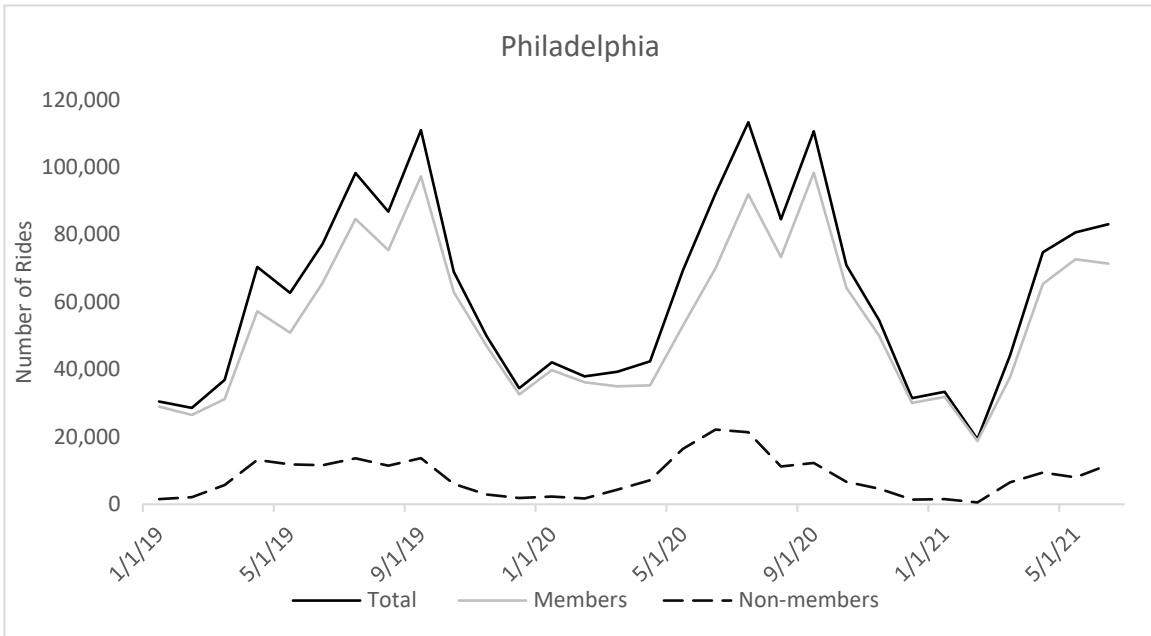
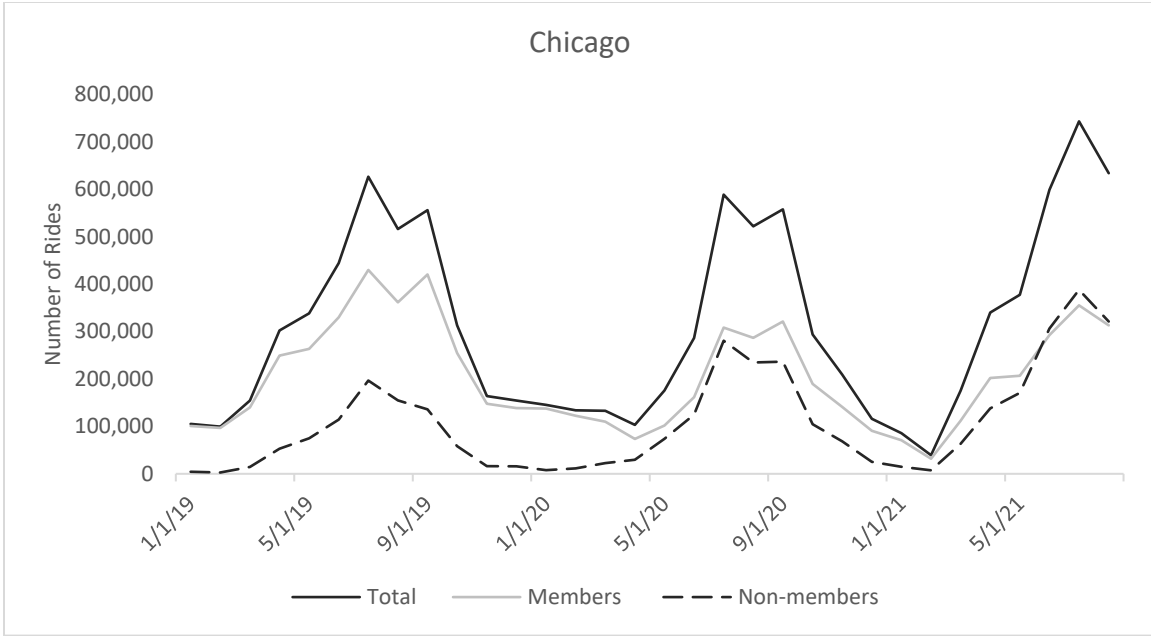
Source: Federal Department of Transportation, Division of Transportation Statistics

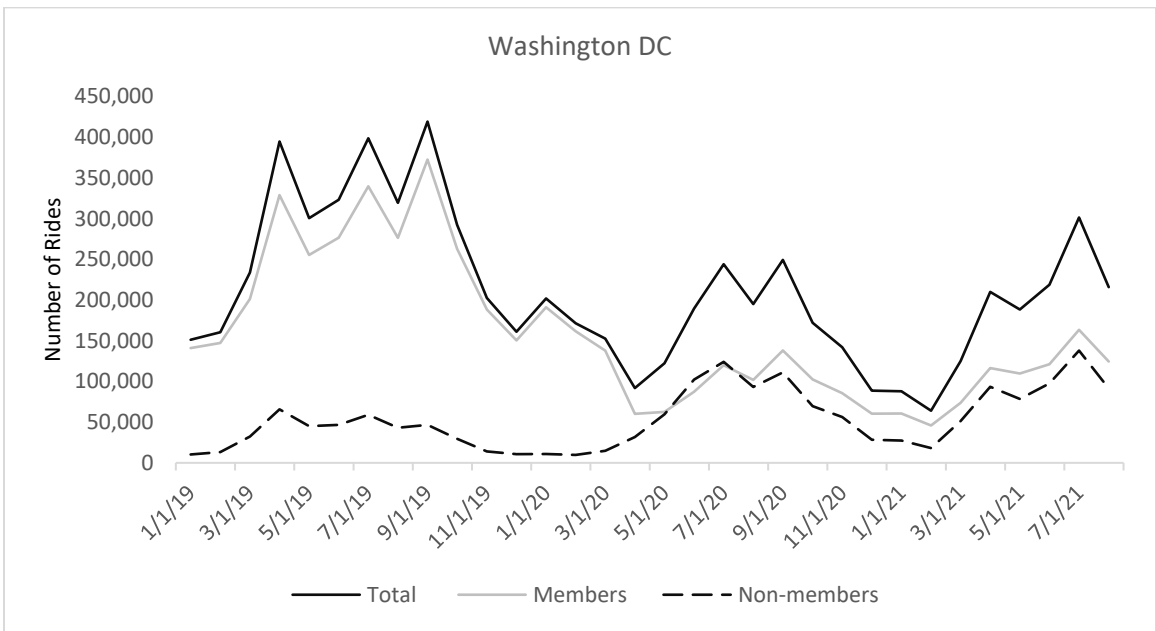
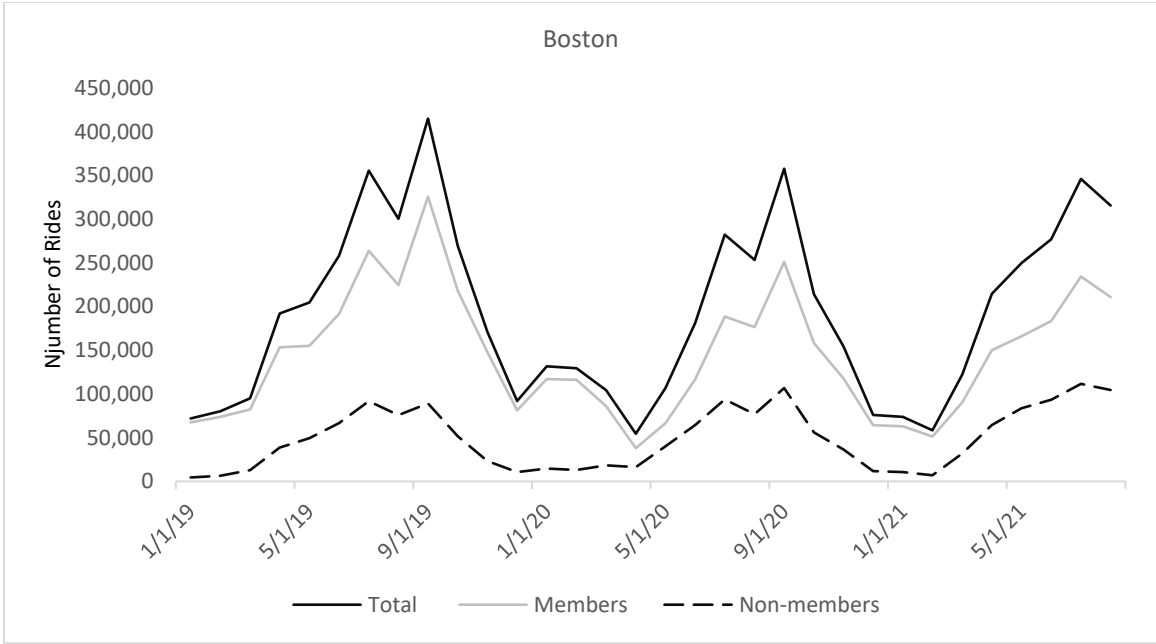
Note: Washington, DC, and Boston percentages represent the average decrease in ridership between May 2019 and October 2020. San Francisco percentage represents the average decrease in ridership between March 2019 and October 2020.

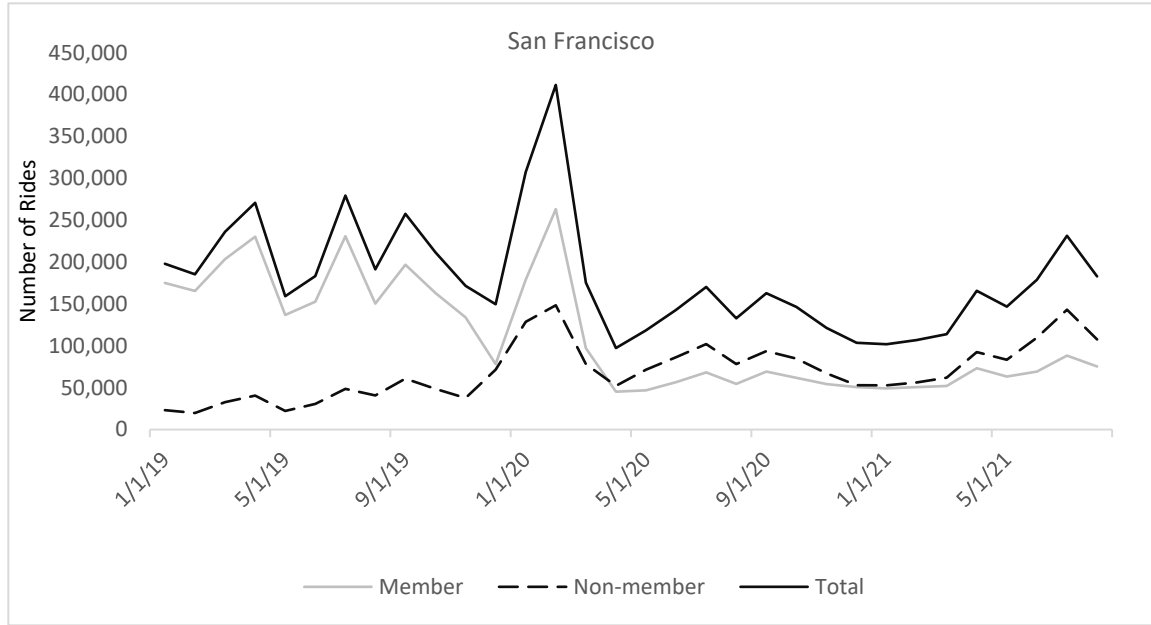
The percentage of rides taken by non-members increased in all cities except Philadelphia. In Chicago, rides by non-members are now roughly equal to rides by members. The largest increase in the percentage of nonmember users occurs in Washington DC and San Francisco. In DC, beginning in May 2020 the number of rides by members and non-members is nearly equal, while in San Francisco rides by non-members now exceed rides by members. In all cities, the ratio of rides on weekends to rides on weekdays has increased, indicating that bike share is being used more for recreational purposes and light shopping.

**Exhibit 23. Member and Nonmember Riders in Select Cities January 2019 – July 2021**



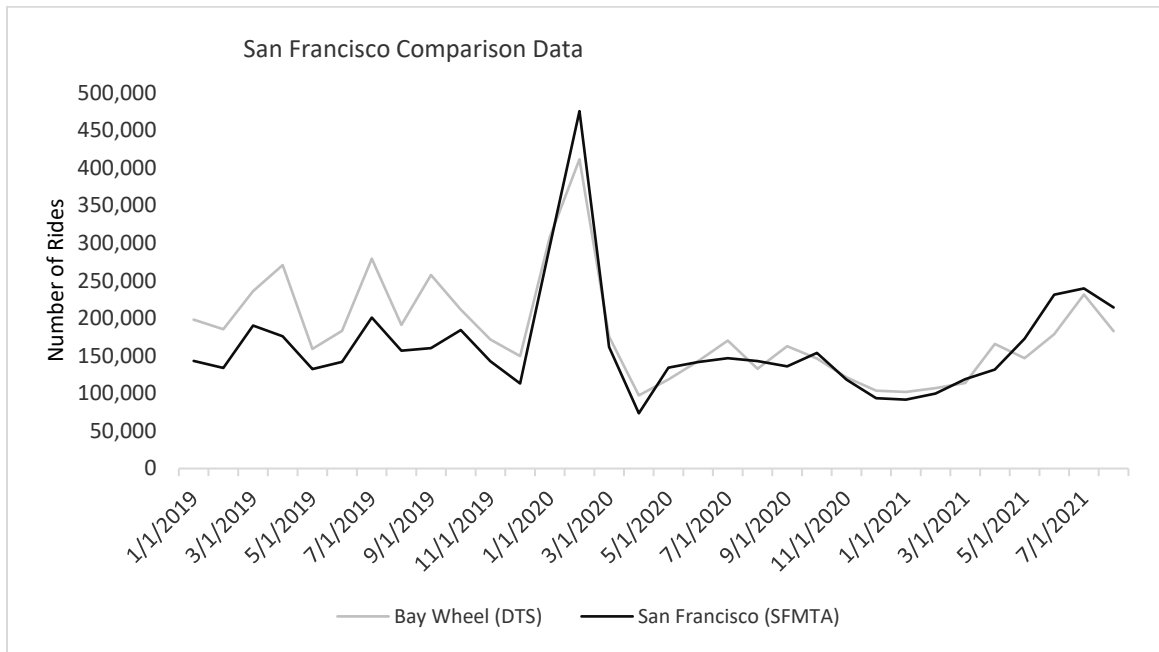






Source: Exhibit 23 data for San Francisco and comparison cities from federal Department of Transportation Division of Transportation Statistics

**Exhibit 23A. Comparison SFMTA and Federal Department of Transportation (DTS) Data**



\* See footnote below for explanation<sup>19</sup>

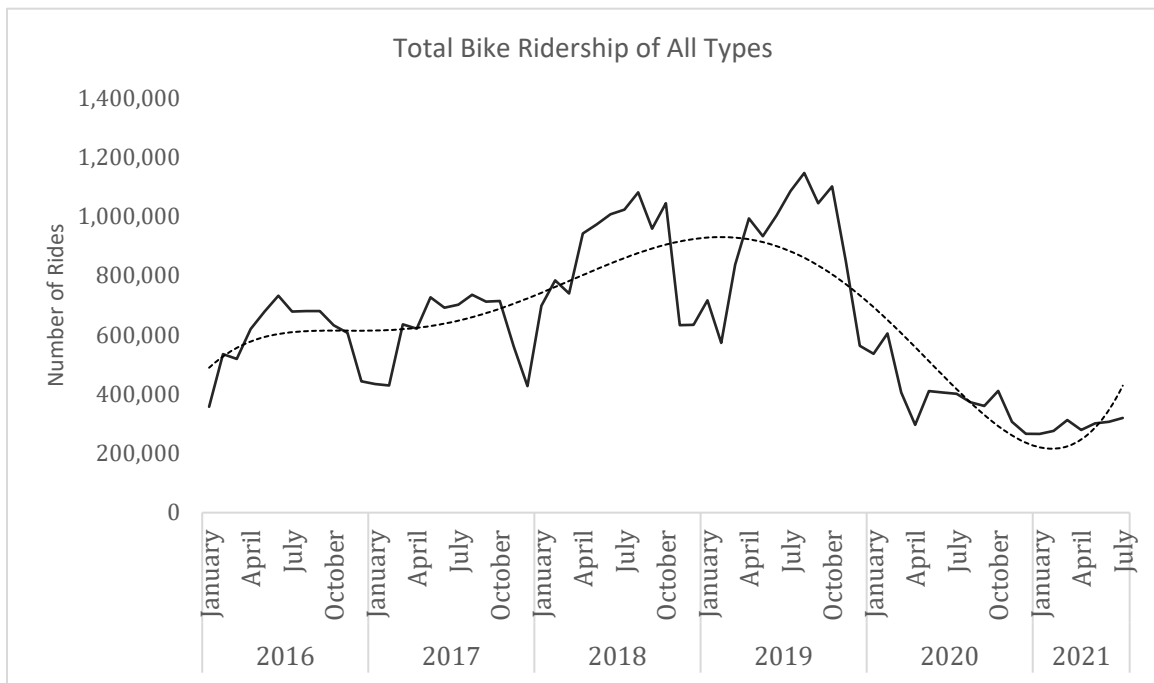
<sup>19</sup> The Exhibit shows the number of rides reported by Department of Transportation Service (Division of Transportation Statistics) and SFMTA to control for possible differences in the two data series that could affect the validity of the comparison. DTS reports ridership for all of Bay Wheels, not just San Francisco. As



### Bike Ridership Patterns in New York and San Francisco

San Francisco and New York City are the only two cities in our sample that collect data on overall bike ridership, not just ridership for bike share. For San Francisco, Exhibit 24 shows an upward trend in total bicycle ridership in the four years preceding the pandemic with a particularly pronounced increase occurring between peak months in 2017 and 2018. As seen in Exhibit 24, bike ridership in New York was fairly constant prior to January 2019, after which bike trips increased overall. Bike ridership in San Francisco by contrast shows a major decline from pre-Covid levels with evidence of recovery beginning in December 2020. Ridership recovery in San Francisco for bike share is proportionately greater than for bike ridership overall.

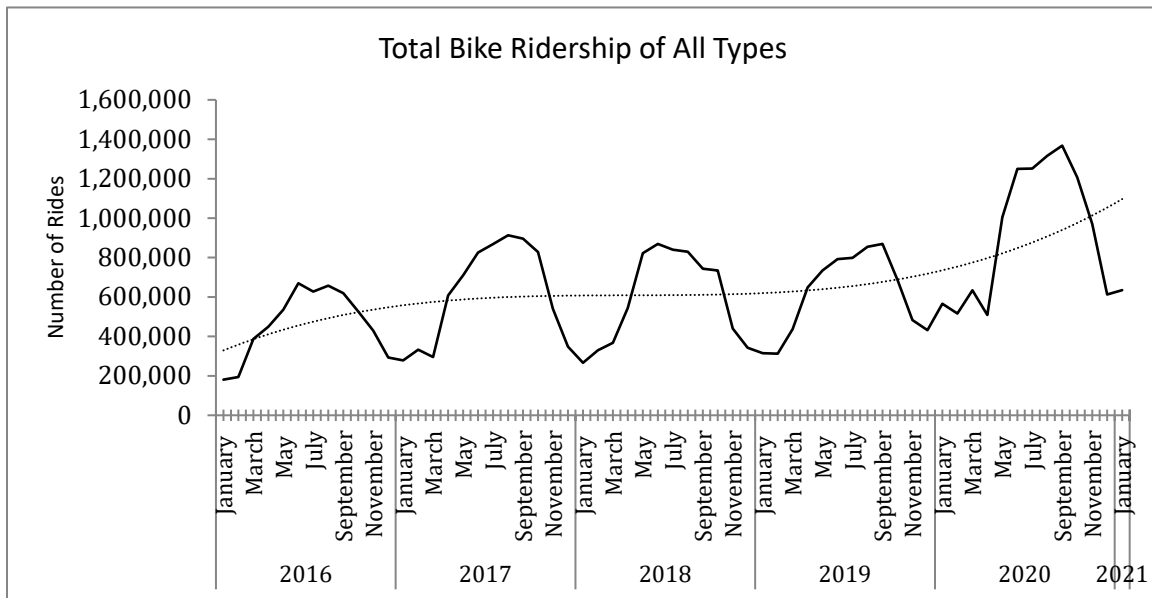
**Exhibit 24. Total Bike Ridership of All Types in San Francisco 2016-2021**



Source: SFMTA

seen in the pre-Covid period, DTS numbers, as expected, exceed those for San Francisco. After March 2020, the two series are nearly identical, which is due to the reduction in bike share usage in the rest of the Bay Area. This validates the use of DTS data for between city comparisons. All data, other than the SFMTA series in this figure, is from DTS Division of Transportation Statistics

### Exhibit 25. Total Bike Ridership of All Types in New York City 2016-2021



Source: [www.citibikenyc.com](http://www.citibikenyc.com)

#### The Impact of COVID 19 and Bike Ridership Patterns in San Francisco

We examined the number of characteristics that could explain variations in the impact of Covid across our comparison cities. We hypothesized the following factors could explain variations in ridership trends and the impact of Covid 19:

- (a) The percentage of the day-time workforce consisting of non-resident commuters. We hypothesized that cities with a higher ratio of commuters relative to employed residents would suffer a higher loss of bike share ridership due to the Covid-induced collapse in the daily commute.
- (b) The percentage of households that own automobiles, We expected that the greater the rate of auto ownership the larger would be the negative impact of Covid on bike share, as residents would have the option of shifting from public transit to private autos.
- (c) The percentage of residents that commute by public transit. We hypothesized that cities with higher percentages of employed residents that commute by public transit (within city of residence) would see a less severe drop off in bike share ridership as some residents would shift to cycling to avoid potential Covid exposure on enclosed trains and buses.
- (d) The percentage of residents who bike as their primary means of commuting. We expected that the greater the percentages of residents that biked to work, the greater the relative loss of ridership following onset of the pandemic due to the collapse of the weekday commute.
- (e) The ratio of peak period weekend bike share ridership to peak ridership during the workday commute. We use this ratio as a proxy of the degree to which bike share has been integrated into the mode choices of urban residents. We hypothesized that cities in which this ratio is higher

would experience a smaller Covid related decline in ridership, as the decline of commuting would be partially offset by recreational use.

(f) The “Uber-Lyft effect”. TNC and bike share may compete in the same ‘niche’ of short-to-medium term intra-city trips. Therefore, the greater the number of Uber and Lyft rides per resident, the greater the negative *long-term* impact of the pandemic on bike share ridership, due to the greater prevalence and acceptance of TNC usage as an alternative to both public transit and travel by bike.<sup>20</sup>

The expected effects of our observation variables, and the actual effects we can discern from our selected comparison cities is summarized in Exhibit 26. The data summary for our comparison cities is shown in Exhibit 27.

**Exhibit 26. Hypothesis’s Regarding Factors that Explain Observed Patterns of Inter-City Variation due to Covid 19**

	Workforce Consisting of Non-Resident Commuters	Households Owning Private Automobiles	Residents Commuting by Public Transit	Residents that Bike to Work	Ratio of Weekend to Weekday Ridership	TNC rides/resident <sup>a</sup>
City relative rank on predictor variable	High (Low)	High (Low)	High (Low)	High (Low)	High (Low)	High (Low)
Expected effect of Pandemic on Bike share ridership	Negative (Positive)	Negative (Positive)	Positive (Negative)	Negative (Positive)	Positive (Negative)	Negative (Positive)
Expectation confirmed? (Y/N/?*)	YES, (NY*)	NO, (NY*)	NO, (NY*)	YES	?*	YES (**)

NY\* indicates New York as exception

?\* indicates ambiguous or indeterminate results

\*\* Data is incomplete as Philadelphia and Chicago are missing

<sup>a</sup> Data reported for 2017

<sup>20</sup> To be more specific, we expected this effect to operate most strongly during the re-opening process and with the increase in vaccination rates, as this would mitigate fears of riding in enclosed autos.

**Exhibit 27. Factors Impacting Bike Share Ridership in San Francisco and Comparable Cities**

	Covid Impact 1 = less impacted 6 = most impacted	Percent				Ratio of Weekend to Weekday Ridership	TNC rides/resident <sup>a</sup>
		Day Time Workforce Consisting of Non-Resident Commuters	Households Owning Private Automobiles	Residents Commuting by Public Transit	Residents Biking to Work		
Chicago	1	34.9	72.5	28.4	1.73	0.21	n/a
New York	2	67.7	45.6	57.5	1.21	0.22	42
Philadelphia	3	33.9	70.5	25.5	2.1	0.19	n/a
San Francisco	4	48.3	70.5	36.3	3.97	0.13	86
Boston	5	60.5	66.2	32	2.17	0.18	54
Washington DC	6	65.6	62.9	34.2	4.37	0.22	66

Source: For specific sources, see exhibits in the discussion below

<sup>a</sup> Data reported for 2017

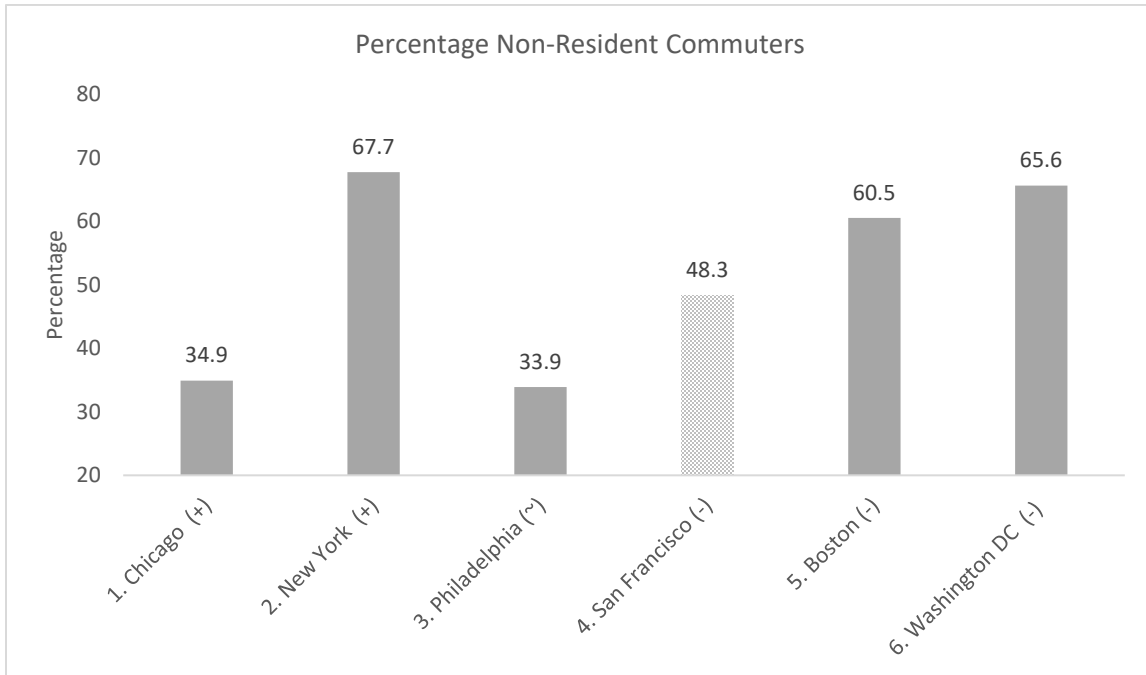
Discussion

(Note that in all exhibits in this section, the cities are ranked in terms of the relative impact of Covid, with 1 indicated the least impacted, and 6 the most impacts. Chicago, the least impacted, is according always on the left of the bottom axis, and Washington DC, the most impacted, is always on the far right)

(a) Percentage of the day-time workforce consisting of non-resident commuter

As seen in Exhibit 28, the share of commuters as a percentage of the total workforce is generally correlated with the degree to which bike share was negatively impacted by the pandemic. Cities that saw the sharpest declines (DC, Boston, and San Francisco) are those that tend to have a larger share of the pre-Covid workers composed of non-resident commuters. New York (Manhattan) stands out as the exceptional case, as the very high percentage of commuters from the boroughs did not show up as a decline in bike share ridership. We believe this is due to the unique and singular role performed by the public transit system in New York City.

**Exhibit 28. Day Time Workforce Consisting of Non-Resident Commuters (%)**

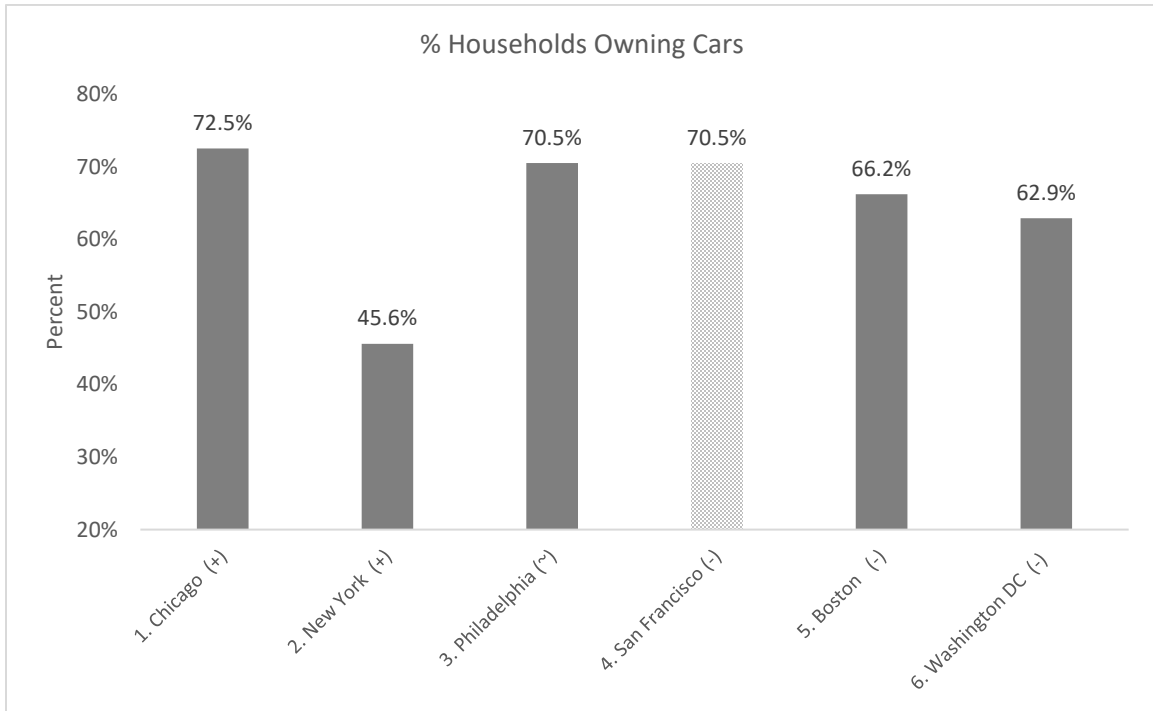


Source: ACS, 2019, Tables

**(b) Rates of private automobile ownership**

Exhibit 29 does not show any evidence of a consistent link between car ownership and bike share ridership in our comparison cities. While New York has low car ownership and higher recovery of bike share ridership following the onset of the pandemic, Chicago, and Philadelphia, on the one hand, and DC, Boston, and San Francisco show divergent patterns. Chicago and Philadelphia have high percentages of households that own cars, as does San Francisco, yet Chicago bike share has increased in 2021 relative to 2019, while San Francisco ridership has remained below prior pre-covid levels.

**Exhibit 29. Percent of Households that Own a Car**



Source: Governing.org

(c) Percentage of residents that commute by public transit.

Data on bike ridership in New York shows a shift from transit to bikes during the pandemic but data on bike ridership in San Francisco shows minimal or non-existent shift from transit to bikes., whereas in San Francisco the effect may be more minimal or non-existent. <sup>21</sup> We only saw the transit-to-bike substitution in New York City, which has the highest public transit use of the comparison cities, suggesting that the transit-to-bike substitution effect exists when public transit use exceeds some threshold of which New York is the sole representative. <sup>22</sup>

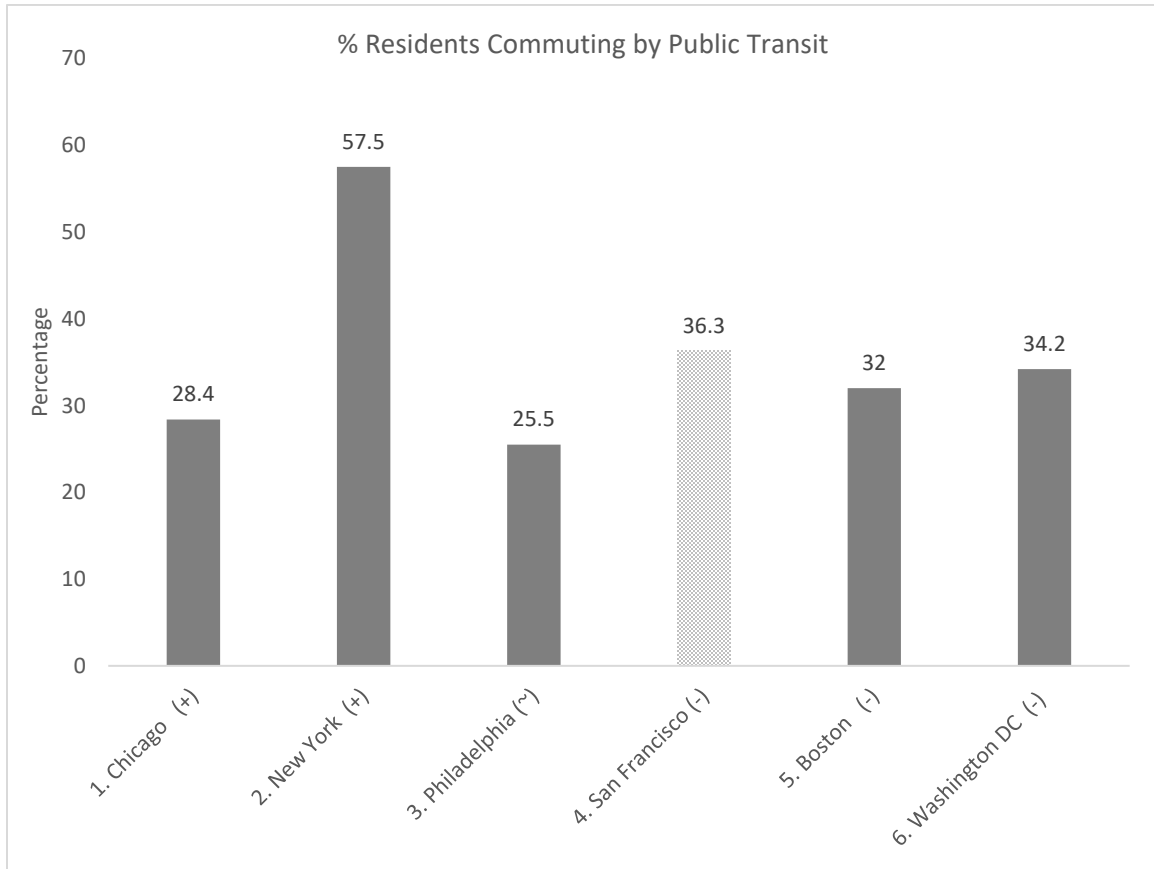
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<sup>21</sup> The data of public transit ridership available from the ACS reports mode share in relation to the daily commute. We are surmising that cities with a high percentage of commuters using public transit also have a higher prevalence of use of public transit for non-work-related purposes

<sup>22</sup> The postulated relationship is supported by various accounts of substitute of bikes for public transit that has occurred in New York. See for instance

[www.nytimes.com/2020/03/14/nyregion/coronavirus-nyc-bike-commute.html](http://www.nytimes.com/2020/03/14/nyregion/coronavirus-nyc-bike-commute.html)

### Exhibit 30. Percentage of Residents Commuting by Public Transit

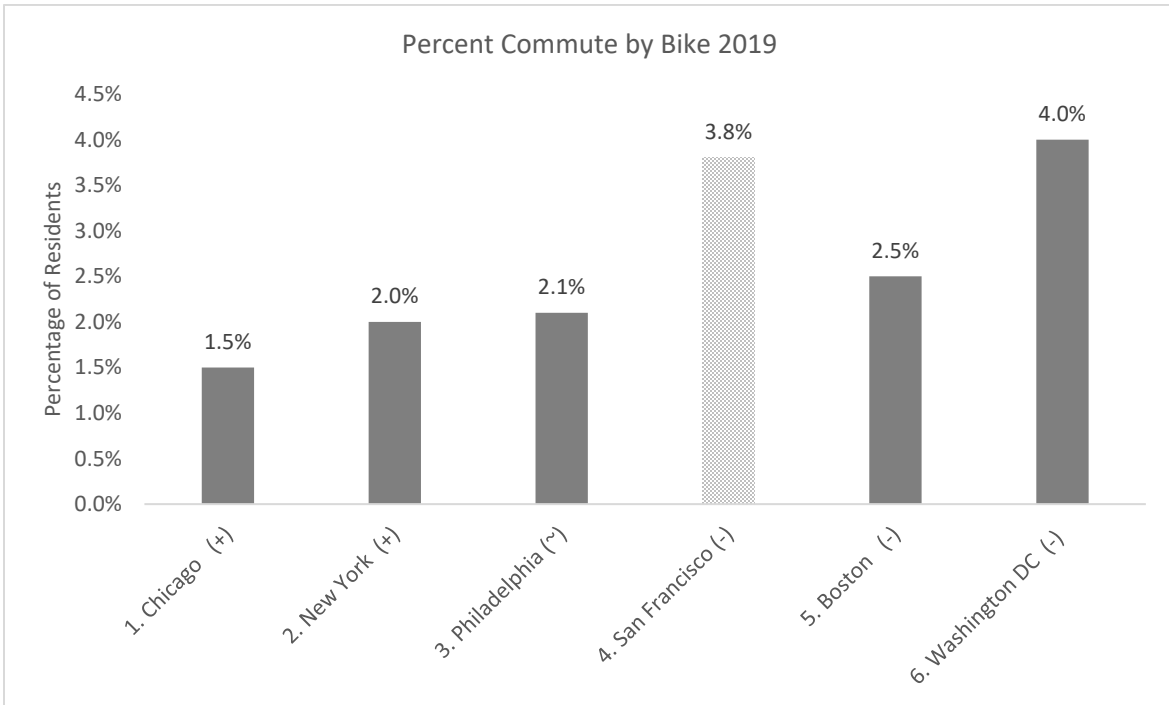


Source: ACS

#### (d) Percentage of residents that commute by bike

As seen in Exhibit 31, the higher percentage of residents that commute to work by bike, the greater the degree of bike share ridership decline due to the pandemic. Of all factors we examined, the impact of the percentage of bike commuters had the most significant and consistent relation to Covid-induced changes in usage of bike share. The consistency of the association indicates that pre-Covid bike share usage in San Francisco was strongly tied to the daily commute. It further suggests that the recovery of ridership seen in 2021 may be due to greater adoption of bike share for non-commuting purposes.

**Exhibit 31. Percent of Residents that Commute by Bike 2019**



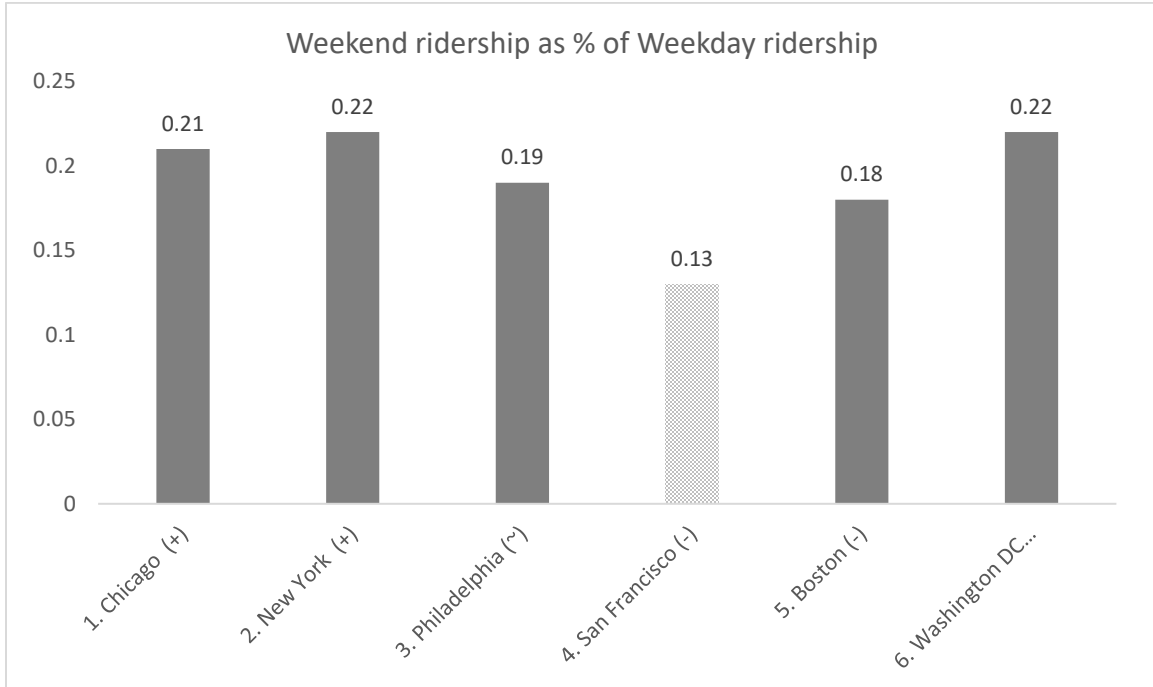
Source: ACS

(e) Weekend to weekday ridership ratio

Among our comparison cities, the three cities that experienced smaller reductions and more rapid recovery in ridership had a higher ratio of weekend to weekday ridership, as seen in Exhibit 32. However, Washington DC contradicts this pattern, as the city had a high percentage of weekend to weekday usage but experienced the largest Covid-related ridership decline. San Francisco has the lowest ratio of bike weekend bike rides relative to rides during the peak commute hours and experienced a large decline in ridership. Boston does not appear to conform to our hypothesized relation.



**Exhibit 32. Ratio of Weekend Bike Share Ridership to Weekday Total Ridership for Comparison Cities (2019)**

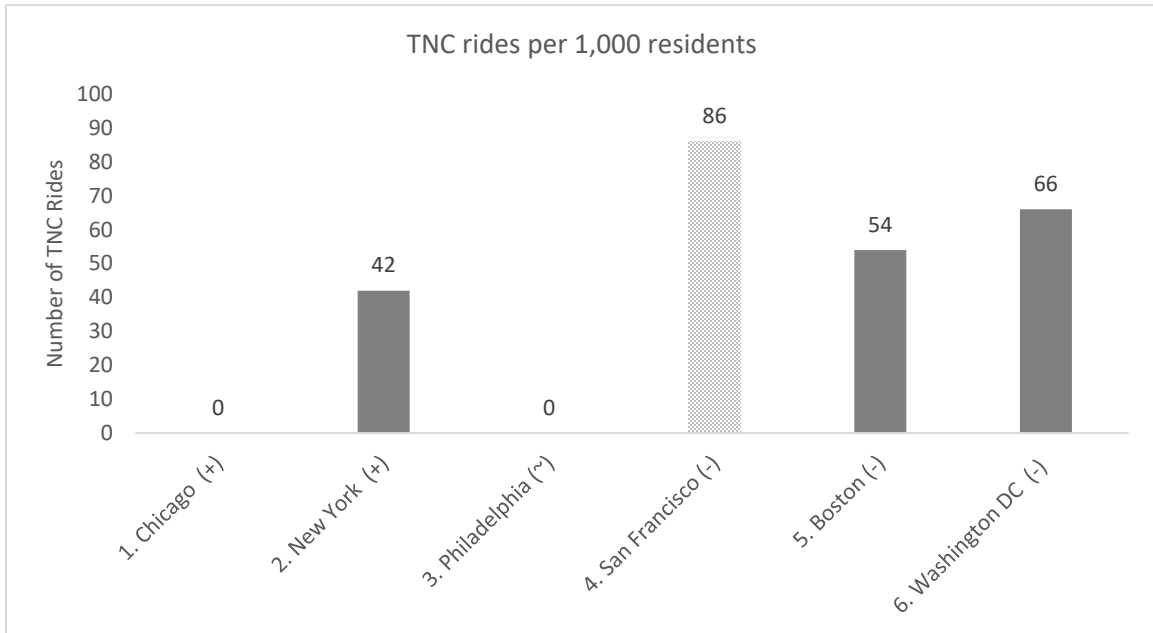


Source: BLA analysis of data from Bureau of Transportation Statistics

**(f) The Uber-Lyft Effect**

The use of TNCs may impact bike share ridership. As seen in Exhibit 33, San Francisco and Washington DC had the highest use of TNC per resident in 2017 (86 rides on average per resident per year in San Francisco and 66 riders per resident per year in Washington DC). Ridership in these cities suffered significant Covid-related losses. Given that use of Lyft and Uber increased in 2018 and 2019, the actual number of riders per resident pre-pandemic was likely even higher. To the extent bike share and TNCs are ‘substitute goods’ in relation to short to medium trips within the municipality, a greater overall prevalence of TNC usage could have negative longer-term impacts on bike share.

### Exhibit 33. TNC rides per 1,000 residents



Source: Federal Department of Transportation Division of Transportation Services

## Conclusion

Although bike share ridership in San Francisco has increased since the beginning of the pandemic in March 2020, the bike share system continues to have an excess of bicycles compared to the number of riders. This will increase the overhead component of operating costs, as overhead is distributed across an underutilized bicycle stock. Increasing bike share ridership will need to reflect ridership trends since the beginning of the pandemic, including the impact of the comparative shift in ridership from members to casual riders, a shift that has also been observed in other cities. The increase in casual riders could reflect an increase in bike share use for shopping, recreation, and other purposes, rather than for commuting to work as was the likely use prior to the pandemic.

Bike share use in both New York City and San Francisco corresponds with an overall increase in bicycling, suggesting that increasing bike share program utilization will require greater adoption of bicycling more generally as a preferred mode of within-City transportation. If the City were to convert the bike share program into a publicly owned and operated program, based on our comparative analysis of other cities, the bike share program should be coupled with other planning and programs to promote bicycling, public transit, and walking.

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## Appendix II: Case Studies – Montreal and Boston

### Case Study on Option A: BIXI Montreal - a Public Ownership and Operating Model

BIXI Montreal is the only citywide publicly owned and managed bike share system in North America. Montreal bike share was launched in May 2009 as North America's first large-scale bike share program. Public Bike Share Company (PBSC) was launched in 2009 and initially funded by the City of Montreal. PBSC, which was not a public entity, operated as an independent corporation and business decisions did not require city approval.

In 2012 PBSC developed its own information technology (IT) systems and software following a dispute with the original software designer 8D Technologies. PBSC had been awarded seven contracts to develop software for bike share in multiple cities – including New York and Chicago but did not have sufficient time to develop the software to include all the required functions; when these systems were installed, the software and IT were discovered to have operational problems, resulting in a delay in payment by municipalities and cash flow problems for PBSC.

By 2014 PBSC was saddled with approximately \$50 million in debt, and a decision was made to split the company in two. PBSC was broken up and its assets liquidated. The international division was sold off, and the City of Montreal took possession of all bike share physical assets and equipment. Rather than seeking to contract operations to a private vendor – such as Motivate (now Lyft) - Montreal established and provided funding to BIXI Montreal, a non-profit organization that was explicitly created for the sole purpose of operating Montreal bike share.

#### *BIXI Montreal*

BIXI Montreal is responsible for all aspects of operations and maintenance, including contracting with advertisers and corporate sponsors. BIXI contracts with Lyft for operational IT and software. The city of Montreal pays BIXI a fixed annual sum tethered to the volume of equipment. According to the BIXI Executive Director, an annual city of Montreal payment constitutes around 25% of BIXI total revenue. As additional 25% is received through advertising revenue and various partnership and sponsorship agreements with Montreal businesses.<sup>23</sup> The balance of approximately 50% is covered by annual membership and fees charged to casual users. Our understanding is that the city of Montreal guarantees the solvency of BIXI Montreal and will provide assistance in the event of an unexpected shortfall in membership and fee revenue.

#### Staffing

BIXI has approximately 150 employees. Of this total, approximately half are full-time, and half are part-time. According to the BIXI Executive Director, the number of required employees is based on ridership (usage), number of bikes, and understanding of the member base in how the system works, lowering demands on the call center.

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<sup>23</sup> Montreal BIXI currently has eleven partnership agreements, many of them with local businesses.

Staffing by job classification is approximately as follows:

~ 50 mechanics

~ 25 call center staff (call center also serves for Toronto, Detroit, and Chattanooga, in addition to Montreal)

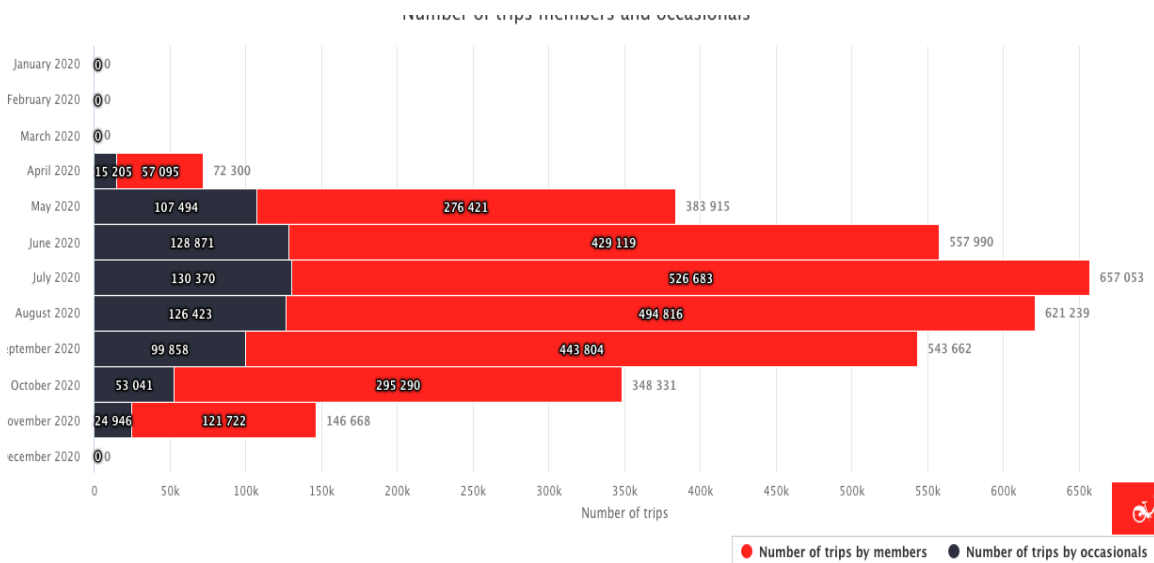
~ 15 administrative (3 finance, 2 human resources, 4 planners, 4 marketing and government relations, 1 in-house IT, 1 executive director)

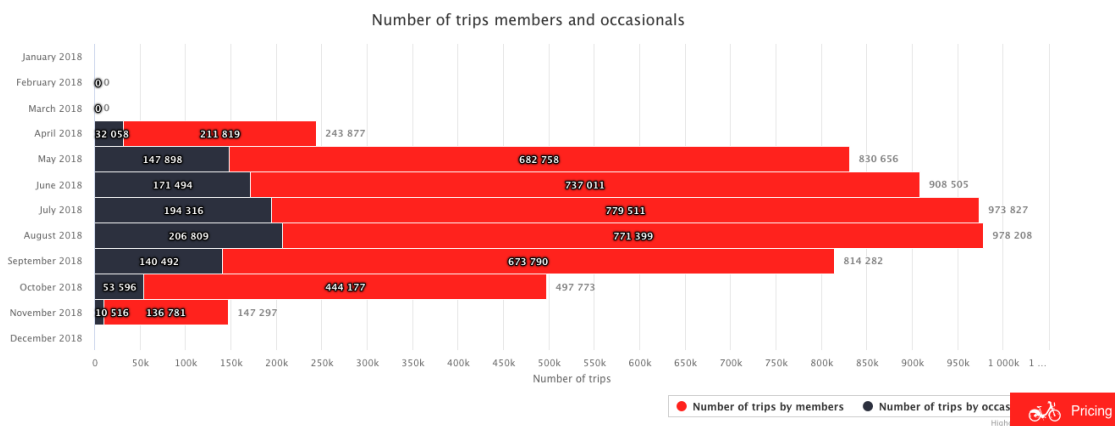
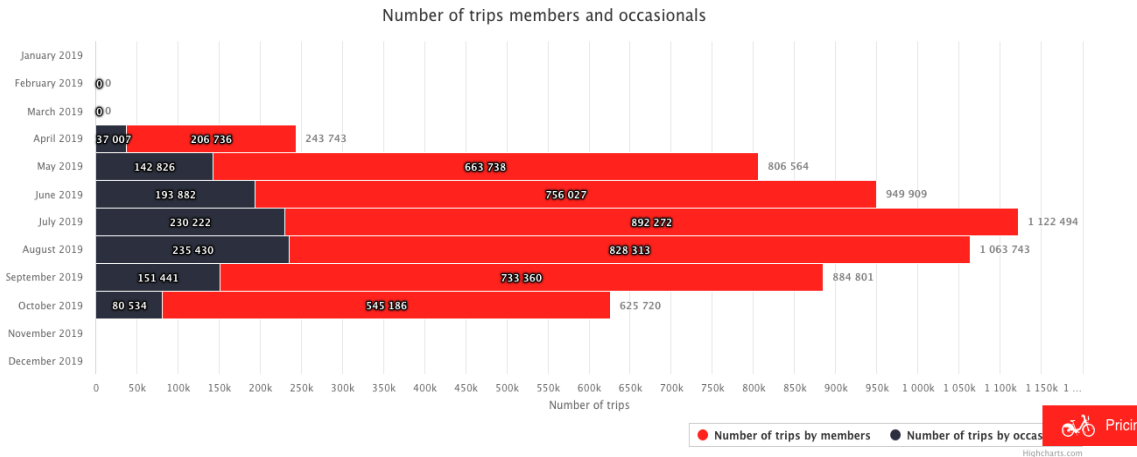
~ 60 field operations (rebalancing bikes, etc.)

BIXI Montreal oversaw an increase in ridership in the year prior to the pandemic. As seen in the Exhibit 34 below, peak month ridership rose from 978,208 in 2018 to 1,122,494 in 2019, before declining to 657,053 in 2020 due to the effect of the Covid pandemic.

The BIXI Executive Director indicated to us that he believes BIXI will fully recover as the pandemic recedes, and that bike share has been integrated into the city’s urban culture. The Executive Director is a strong proponent of public ownership. He stated the only disadvantage of public takeover of bike share is the initial cost of infrastructure – i.e., the initial acquisition cost – and need for ongoing subsidy to maintain low user charges and membership prices. The Executive Director stated that that IT and software development and maintenance is not the most complex, costly, or critical issue that should determine whether San Francisco opts to convert bike share into a public utility. The major costs for ongoing operations are total dedicated working hours for field operations and rebalancing of bikes to ensure the required hour-by-hour spatial re-distribution of bikes.

**Exhibit 34. Ridership BIXI Montreal, 2018-2020**





If members of the Board of Supervisors and SFMTA staff should decide to explore public bike share, BIXI Montreal’s Executive Director stated his organization would be open to consulting with San Francisco over how to best proceed in establishing a publicly owned and operated bike share program.

**Case Study on Option B: Boston – Combining Public Ownership and Private Operation**

The city of Boston is an example of a North American city that has a mixed model of public ownership of all equipment and hardware with operations contracted to Lyft. Regional bike share was launched in the Boston area 10 years ago. Bike share was established as a multi-jurisdictional system under the auspices of the Metropolitan Area Planning Council. The formation of a regional structure reflected the Boston metropolitan’s physical geography, the close proximity and relatively small size of the political sub-divisions of municipalities other than Boston, and existing commuting patterns and retail and recreational travel destinations, all of which augured in favor of establishing an integrated, regional system.

A decision was made early on that the cities would be the system’s equipment owners and would contract operations from a private corporation. The Metropolitan Area Planning Council (MACP) was assigned the task of identifying a private operator and in 2011 entered into a contract with

Alta Bicycle Share to operate the Hubway system. In January of 2015, Alta Bicycle Share was purchased by Motivate, who served as the new system operator. Motivate was subsequently acquired by Lyft, who is the system's current operator. The municipalities have retained ownership of all equipment and infrastructure.

According to discussions with Boston bike share staff, using MACP as regional coordinator provides participating municipalities with several advantages over entering into separate operating agreements. Participants in the operating agreement have formed a purchasing consortium to seek lower prices on equipment. Also, vesting certain legal powers and procurement responsibilities within MACP opens up access to federal transportation funding.

In late 2014 and early 2015, Motivate approached Boston about privatization of the bike share system. The City decided to seek other offers, and a Request for Information (RFI) was advertised. Internal deliberations within the city of Boston led to a decision not to privatize the system, as retaining a direct public stake in the system was deemed to be in the public interest as it increases the ability of public actors to hold Lyft accountable to broader policy goals such as reducing automotive usage, cutting CO2 emissions, and insuring integration into city/regional transportation systems. Staff involved in the deliberations determined that preserving municipal authority over the system would enhance the ability to achieve these goals.

The city of Boston also had concerns over complexities related to the re-zoning permit approval process. Boston and the surrounding cities have "right of way" powers, allowing the local transportation authority to designate streets for bicycle usage. Because private entities do not have the same authority, designative streets for bicycle use would be more cumbersome if the system was under private ownership. The city of Boston also wanted to ensure community input and concluded that the City should retain authority and control over all aspects of consultation with local residents and merchants over station citing and redesignation of street usage.

#### *Contract and Business Model*

The Boston regional agreement specifies various revenue allocations and apportionments. Each municipality that is a signatory to the regional agreement between MACP and Motivate (Lyft) owns its own equipment and has its own operating agreement with Lyft.

The city of Boston's agreement grants Lyft exclusive rights to serve as the City bike share operator. Boston Agreement with Lyft is a performance-based business model, which differs from the flat fee model in the agreement between MTC and Lyft for the Bay Area bike share program. The performance-based model is based on the revenue sharing agreement between Lyft and the selected corporate sponsor.

Under the terms of the agreement with the city of Boston, Lyft/Motivate has sole responsibility for recruiting the system's corporate sponsor, which at the present time is Blue Cross/Blue Shield. The contract between Lyft and Blue Cross/Blue Shield obligates the latter to pay a total \$18 million over a contract term of six years. The operating agreement between the city and Boston and Lyft includes a front-loaded revenue sharing agreement between the City and the Lyft as system operator. In year one Blue Cross/Blue Shield paid Lyft \$12 million, \$6 million of

which was transferred to the City. The contract is structured so that Blue Cross/Blue Shield pays the balance of \$6 million in equal installments over the remaining five years.

The operating agreement between the city of Boston and Lyft also differs from the agreement between MTC and Lyft for Bay Area Bike Share in that the city of Boston retains control over pricing. The cost of ride per minute and annual membership fees are set by the City, not Lyft.<sup>24</sup> If Lyft meets certain performance goals – such as increases in ridership –Lyft may increase user rates up to the City-mandated maximum rate. Also, the city of Boston owns all ridership and user data. Lyft may not use this data for commercial purposes and is prohibited from integrating the city of Boston bike share data into Lyft’s other platform applications.

### *Public Operation*

According to Boston bike share staff, the city of Boston is interested in the option of transforming bike share into a fully publicly owned and operated system. This will likely require the City to set up a new dedicated bike share transit entity, as the current public transit system is operated by the regional transportation authority. However, the current agreement between the city of Boston and Lyft for operation of the bike share system involves no ongoing cost to the City. Transforming the Boston bike share system into a public transit utility could require some level of public subsidy.

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<sup>24</sup> Annual member fees, initially set at \$89, are currently capped at \$125.

## Appendix III: Other City Bike Share System Characteristics

	System Owner (system equipment)	Operator	Corporate Sponsor	Year Founded
San Francisco (Bay Wheels)	Private (Lyft)	Private (Lyft)	Mastercard	2013
New York (CitiBike)	Private (Lyft)	Private Lyft	Citibank	2013
Philadelphia (Indego)	Public	Private (BTS)*	Independent	2015
Washington DC (Capital Bikeshare)	Public (DC)	Private (Lyft)	None	2008
Chicago (Divvy)	Public (DoT)**	Private (Lyft)	None	2013
Boston (Blue Bike)	Public ***	Private (Lyft)	Blue Cross	2011
Montreal (BIXI)	Public	Public (BIXI)	None	2009

Source: BLA Survey

\* Bicycle Transit Systems

\*\* Chicago Department of Transportation

\*\*\* Four City Regional Consortium

	Privately Owned & Operated		Publicly Owned & Privately Operated		Publicly Owned & Operated
	San Francisco (Bay Wheels)	New York (CitiBike)	Washington DC (Capital Bikeshare)	Boston (Blue Bike)	Montreal (BIXI)
System Owner (system equipment)	Lyft	Lyft	City of Washington DC	Four City Regional Consortium	City of Montreal
Operator	Lyft	Lyft	Lyft	Lyft	BIXI Montreal
Corporate Sponsor	MasterCard	Citibank	none	Blue Cross	None
Year founded	2013	2013	2008	2011	2009
<b>System density (2019)</b>					
Bikes per 1,000 residents	7.6	6.8	8.4	6.1	22.7
Bikes per km <sup>2</sup>	5.4	10.7	4.2	3.1	8.2
<b>System usage (2019)</b>					
Daily rides per 1,000 residents	13.5	42.7	18.9	20.9	113.8
Daily rides per bike	3.8	8.3	2.4	4.0	6.8
Annual membership	\$159	\$179	\$95	\$109	\$99*
Free of charge (classic bikes)	45 min	45 min	45 min	45 min	45 min
Charge per additional minute	\$0.20/min	\$0.12/min	\$0.05	\$0.08/min	\$0.05/min
E-bike additional per minute charge**	\$0.20/min	n/a	\$0.10/min	n/a	\$0.10

Source: BLA Survey

\* BIXI covers period from April 15 through October 15

\*\* This additional rate is assessed from the start of the ride