



**SCAG**<sup>TM</sup>

INNOVATING FOR A BETTER TOMORROW

# BIKE SHARE IN LOS ANGELES COUNTY

An analysis of LA Metro Bike Share  
and Santa Monica Breeze



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# ACKNOWLEDGMENTS

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Prepared for Southern California Association of Governments (SCAG)

On behalf of Los Angeles County Metropolitan Transportation Authority (Metro)

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City of West Hollywood

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CycleHop

And the many community members who gave their time and energy to participate in our outreach efforts and whose insights added to the value and relevance of this study and its recommendations.

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**Metro Bike**

# 01 PROJECT PURPOSE AND GOALS

The Southern California Association of Governments (SCAG), in partnership with Los Angeles Metro (Metro), commissioned a study to better understand the role of bike share within the Los Angeles regional transportation system. The results are intended to guide decision-making related to future system investments and new shared mobility programs in the region.

While the analysis was originally conceived to evaluate just two bike share programs of the metro area - the Downtown Los Angeles Pilot Program and Santa Monica Breeze<sup>1</sup> – the study team expanded this to include the full Metro Bike Share program (excluding a now inactive program in Pasadena) and to consider Breeze in the context of Bike Share Connect, which is an integrated bike share network including Santa Monica's Breeze Bike Share, WeHo Pedals, UCLA Bruin Bike Share, and Beverly Hills Bike Share systems.

The specific goals of the study are to:

1. Develop recommendations for optimizing existing bike share programs within Los Angeles County;
2. Identify lessons learned related to the planning and implementation of bike share in Los Angeles County; and
3. Develop considerations for regional interoperability.

Understanding the broader changing landscape of mobility is important for interpreting results of the study process and proposing relevant next steps for the system. This study comes at an historic time within the transportation sector due to changes in travel patterns<sup>2</sup> and the rise of shared and micromobility solutions.

The study centered on five core phases of analysis:

- **User Survey:** An online and intercept survey targeted existing bike share users, available for 2 months in spring of 2019, which garnered 351 valid responses (201 from Metro users and 150 from Santa Monica users) and provided a 95 percent confidence level and a margin of error of ±5.2 percent overall.
- **Focus Groups:** Four independent sessions with 26 total individuals, consisting of bike share users and non-users who were recruited through survey outreach and local community organizations.
- **Statistical Analysis:** System usage data (anonymized and aggregated), provided by the system owners and analyzed by the study team based on a range of factors related to system performance and target outcomes.
- **Agency and Operator Interviews:** Private interviews conducted with each system owner (Metro and City of Santa Monica) and each system operator (Bicycle Transit Systems and CycleHop) using a common set of interview questions.
- **Contextual Framework:** A scan of new mobility trends in Los Angeles and an interview with staff of the Cities of Los Angeles and West Hollywood

This report provides an executive summary of the findings and conclusions of this work and proposes actionable next steps for consideration by Metro and City of Santa Monica, in partnership with system operators. More detailed technical reports are provided as appendices.

<sup>1</sup> While the majority of data analysis isolates Santa Monica Breeze usage, revenue from April 2018 onward is for the entire Bike Share Connect Regional Network.

<sup>2</sup> Examples of such shifts include five straight years of declining Metro transit usage (discussed in [this report](#)).

## Quick Reference Glossary

**New Mobility** refers to transportation services enabled, defined, or refined by digital technology

**Shared Mobility**<sup>3</sup> is the shared use of a vehicle (motorcycle, scooter, bicycle, or other travel mode) to provide users with short-term access for one-way or round trips

**Shared Micro-mobility** encompasses all shared-use fleets of small, fully or partially human-powered vehicles; bikesharing and scooter sharing are types of shared micro-mobility

**Bikesharing** is the shared use of a fleet of bicycles (manual or e-bikes) which provides users with on-demand access to bicycles for one-way (point-to-point) or roundtrip travel.

**Scooter sharing** is the shared use of a fleet of scooters which allows individuals access to scooters for on-demand for one-way trips. To-date, in the U.S., scooter sharing programs offer electric (rather than manual) scooters, are private sector owned and managed by companies that operate in multiple markets, and are dockless (or free-floating).

**Carsharing** offers members access to vehicles by joining an organization that provides and maintains a fleet of cars and/or light trucks. Members who join a carsharing organization typically pay a fee each time they use a vehicle.

**Microtransit** is a privately or publicly operated, technology-enabled transit service that typically uses multi-passenger/pooled shuttles or vans.

**Ridesharing** (also known as carpooling and vanpooling) is defined as the formal or informal sharing of rides between drivers and passengers with similar origin-destination pairings. Vanpoolers share the cost of a van and operating expenses, and may share driving responsibility.

**Ridehailing** services (also known as ridesourcing and transportation network companies (TNC)) are prearranged and on-demand transportation services for compensation in which drivers and passengers connect via digital applications.



### Types of bikesharing systems include:

**Dock-based** – a bike can only be retrieved at and returned to a station with technology-enabled docks; user transactions can occur through web, smartphone application, or kiosks; may include manual bikes or e-bikes (e.g. B-Cycle)

**Dockless** – a bike can be retrieved at or returned anywhere within the service area, and the bike locks to itself (rather than an object) using a rear wheel lock enabled or disabled with a smart phone application; user transactions occur through a smartphone application (e.g. Lime-E)

**Hybrid** – a bike can be retrieved at and returned to a station which consists of a series of bike racks, or anywhere within the designated service area; bikes are typically referred to as “smart bikes” due to the on-board technology hardware; user transactions can occur through hardware on the bike, web, and/or smartphone application; may include manual bikes or e-bikes (e.g. Social Bicycles and JUMP)

<sup>3</sup> For more information on new terms in mobility, refer to the Society of Automotive Engineers J3163™, Taxonomy and Definitions for Terms Related to Shared Mobility and Enabling Technologies and the National Association of City Transportation Officials 2019 report Shared Micromobility in the U.S.: 2018.

# 02 A TALE OF TWO SYSTEMS

Bike share evolved in a unique fashion in Los Angeles County. Breeze Bike Share launched in November 2015 in Santa Monica with 500 bicycles and 80 stations, with partial capital funding from Metro and the Air Quality Management District. Breeze operates as a hybrid system; it has stations where a bike can be docked but uses a smart bike that allows the bike to be parked anywhere in the service area. This system expanded to Beverly Hills, West Hollywood, and UCLA in 2016 and 2017. Expansion was catalyzed by a “me-too” clause included in the original procurement. The systems operate under different names and with separate contracts, but with the same operator and equipment. In April 2018, the systems were unified under Bike Share Connect, and the system area was expanded to be contiguous. The City of Long Beach also utilizes the same smart bike equipment, and contracted with the same operator until August 2017.

Metro Bike Share was launched in July of 2016 with a fleet of 1,000 dock-based bicycles, funded and operated by the Los Angeles County Metropolitan Transportation Authority (Metro). Originally focused on downtown Los Angeles, the system expanded to the Port of Los Angeles, Venice, and Pasadena in 2017, with additional bikes placed at Metro Stations in Santa Monica. The Pasadena program closed in August 2018.

With the advent of scooter share and additional smart bike and dockless bike share systems, cities in the Los Angeles region have begun permitting micromobility programs. In September

2018, Santa Monica launched a 16-month Shared Mobility Pilot Program, which permitted four scooter share and one dockless e-bike vendors to operate 2,000 e-scooters and 500 e-bikes. In December 2018, LADOT issued a One Year ‘Dockless On-Demand Personal Mobility Conditional Use Permit’, which includes scooter share, e-bikes, manual bikes, and adaptive bikes. As of April 2019, three vendors currently offer 22,500 e-scooters, and an additional three vendors are pending with 4,000 scooters and 5,000 e-bikes, and another five vendors are being considered which would add another 2,100 scooters and 500 bicycles.<sup>4</sup>

This study comes at a time of uncertainty for the future of micro-mobility across the region:

1. Will the introduction of thousands of additional shared scooters and shared bikes from private companies have a lasting impact on public bike share system ridership? What, if any, impact will they have on the viability of public systems?
2. Will the overlap of Breeze and Metro Bike Share along with other vendors in Los Angeles County offer greater mobility at a lower cost to the public, or, simply cause confusion as the number of operators continues to expand?
3. Are new privately-funded and operated micro-mobility options economically viable and will they still exist several years from now?

<sup>4</sup> Note that several other companies continued to operate within an existing conditional-use permit and vehicle cap while working to comply with the one-year permit requirements.

Metro Bike Share and Breeze are distinctly different bike share systems, each playing a different role in the Los Angeles region. They share a common geography, with service area boundaries linking one to the other.

## Understanding Each System

	METRO BIKE SHARE	SANTA MONICA BREEZE BIKE SHARE
<b>Launch Date</b>	<b>July 2016</b>	<b>November 2015</b>
<b>Capital Funding</b>	50% Metro (various grants) 50% Partner Agencies	65% Metro (funding from Measure R) 22% AQMD 13% City of Santa Monica
<b>Operations Funding</b>	65% Partner Agencies 35% Metro (Includes Membership and Usage Revenues)	City of Santa Monica (Usage Charges; Sponsored by Hulu)
<b>Owner</b>	Metro	City of Santa Monica
<b>Operator</b>	Bicycle Transit System	CycleHop
<b>Bicycle manufacturer</b>	BCycle, LLC	Social Bicycles (now owned by Uber)
<b>Expansion dates</b>	Piloted E-bikes in November 2018 <sup>5</sup> ; Added Smartbikes to fleet in March 2019	Bike Share Connect launch in April 2018
<b>Number of bikes/stations</b>	1000+ bikes / 100+ stations (currently undergoing expansion)	Breeze: 500 bikes / 86 stations Bike Share Connect: 830 bikes / 135 stations
<b>Average Annual Trips</b>	242,593 (2017 and 2018 only, does not include Pasadena)	240,171 (2016 - 2018 only, trips in Santa Monica only)
<b>Service area</b>	Downtown LA, Central LA, the Westside, Port of LA, and Venice <sup>6</sup>	Santa Monica, Beverly Hills, West Hollywood, and UCLA <sup>7</sup>
<b>Program partners</b>	Metro, City of Los Angeles and Port of LA	Bike Share Connect Network: City of Santa Monica, City of Beverly Hills, City of West Hollywood, University of California – Los Angeles <sup>8</sup>
<b>Pricing</b>	Pay-Per Ride: \$1.75 per 30 minutes 24-Hour Access: \$5 per day 30-Day Pass: \$17 per month 365-Day Pass: \$150 per year Discounts available for Reduced Fares, Buy-in-Bulk, and Bike Share for Business participants.	Pay as You Go: \$0.12 per minute Monthly: \$25 per month Annual: \$99 per year Academic: \$7 per month Bike Share for All <sup>9</sup> : \$5 per month (verification required)
<b>Payment options</b>	TAP wallet, Station kiosk (credit or debit accepted)	Online, SoBi Mobile App, Station kiosk (credit or debit accepted)
<b>Other Shared Micro-Mobility Options in the Service Area</b>	Permitted scooter share and other shared micro-mobility since September 2018	Scooters introduced in September 2017 (interim vending permit); scooter and e-bike share pilot program since September 2018 (ends January 2020)

5 Metro Bike Share added E-bikes to the fleet in May 2019.

6 The City of Pasadena, not listed here, was part of the service area from July 2017 to August 2018, but not included within the study analysis.

7 This study analyzed only the Santa Monica portion of the Breeze Bike Share system.

8 The City of Long Beach, not listed here, launched in 2016 with the same bikes and software, which enables customers of Bike Share Connect to also use their system.

9 Bike Share for All provides discounted memberships to low-income individuals.



# 03 WHAT THE DATA TELLS US

## Key Findings

An analysis of usage data<sup>10</sup> from the LA Metro Bike Share and Santa Monica Breeze programs reveals that:

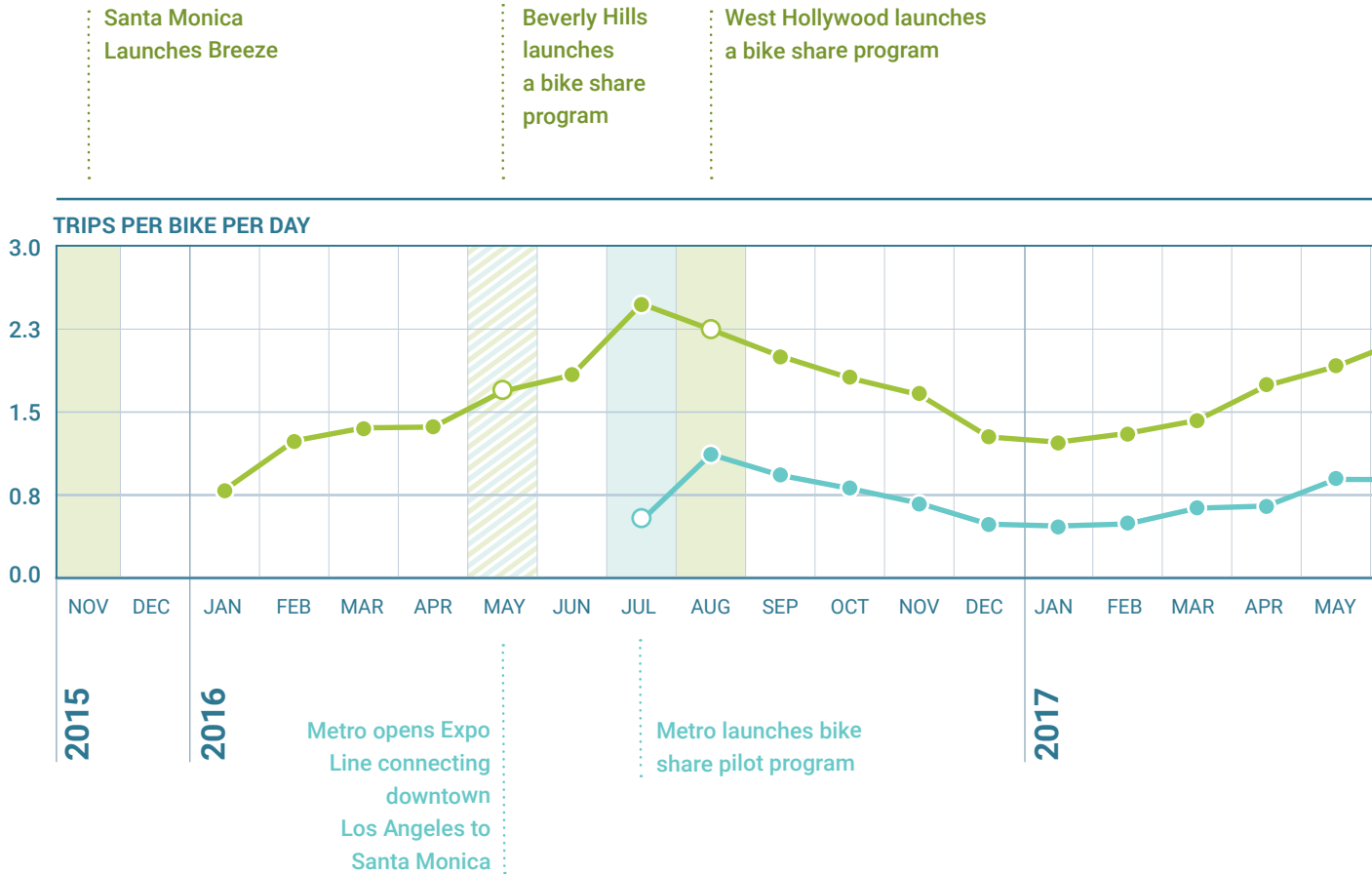
- **Breeze usage steadily increased for the first two and a half years of operation.** The system had consistent strong performance starting from launch both in total trips per month and trips per bike per day (t/b/d); usage has decreased since the introduction of scooter share.
- **Metro Bike Share usage has steadily increased since launch.** Usage data shows an overall increase in both total trips per month and also trips per bike per day (t/b/d). The impact of scooter share on Metro Bike Share is not yet available due to the later launch of scooter share in Los Angeles.
- **Both systems are used for both daily transportation and occasional use.** Both systems show consistent spikes at morning and afternoon commute times for Member users, but not for Casual users.
  - » This is true for all types of Breeze Member users - including Students and Bike Share for All.
  - » Metro also shows an additional spike in usage at lunch time for Member users (but not Casual).
- **Summer is a peak season at the beach.** Breeze shows a consistent yearly spike in usage during summer months.
  - » Breeze's Casual users (Pay-as-you-go) are major contributors to the spikes in 2016 and 2017 summer months.
  - » Metro's Casual users (Walk-up) and Member users track closely during summer months until 2018, when Casual users showed a higher spike.
- **Member user trips are shorter than Casual user trips for both systems.**
  - » Metro Casual user trips are more than triple the duration of Member user trips.
  - » Breeze Casual user trips are more than double the duration of Member user trips.
- **Members provide baseline revenues, and Casual users add ride-based revenues**

### TYPES OF BIKE SHARE SYSTEM USERS

**Casual Users** are generally spontaneous or opportunistic bike share users that do not become ongoing or long-term members. This includes the Breeze “Pay-as-you-go” option that has no time limit and no time-overflow usage fees and the Metro “Day Pass” that requires an upfront fee with time limit and assigns time-based usage charges beyond that.

**Members** are active passholders that have multiple pricing plans to choose from. For Metro Bike Share, a membership sign-up fee gives you access to unlimited 30-minute trips with overage charges for any usage beyond the 30 minutes per trip. For Breeze, it offers unlimited trips up to a total of 90 minutes of bike usage per day and applies per minute charges beyond for any usage beyond the 90 minute daily allocation.

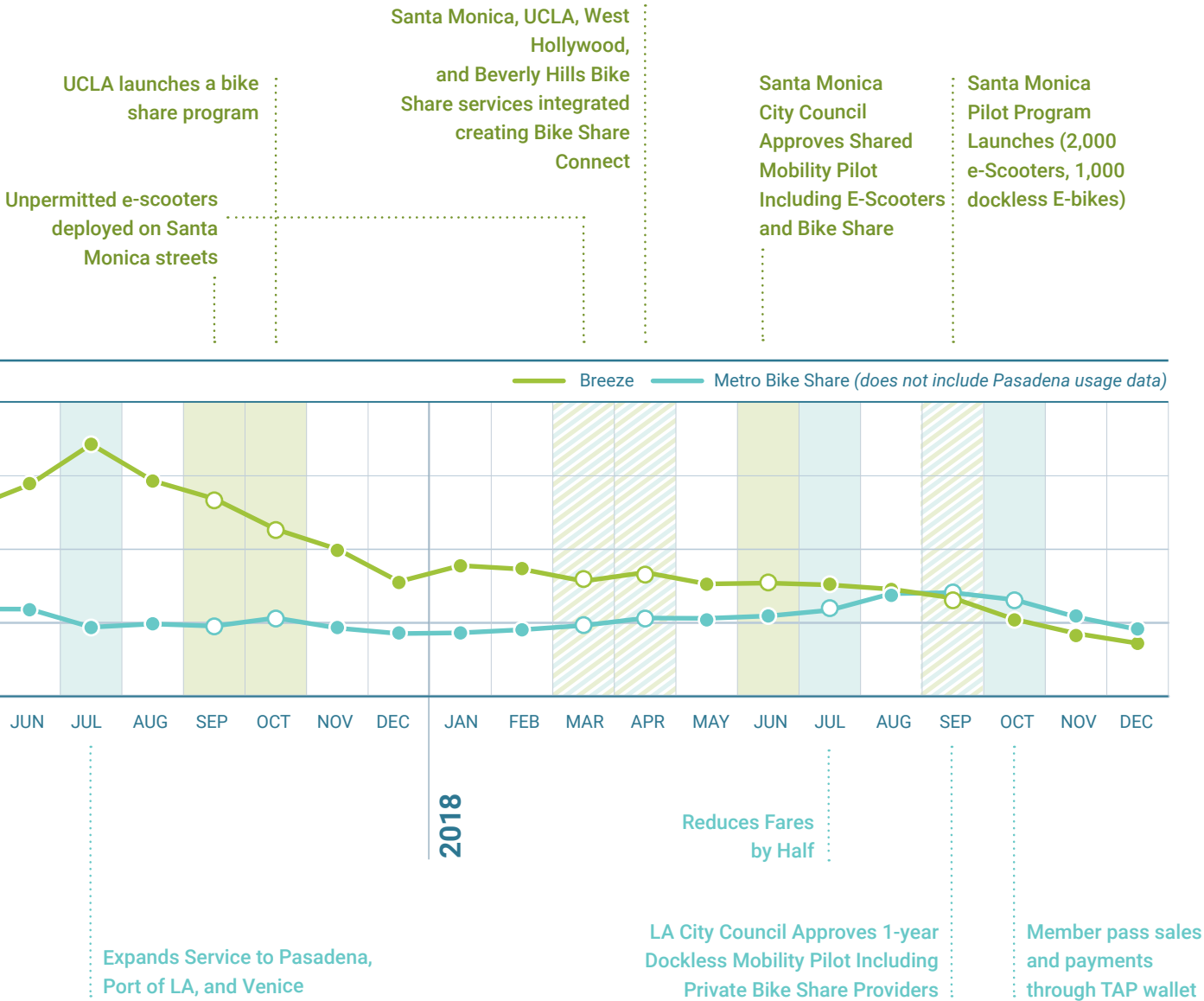
<sup>10</sup> Anonymized and aggregated data provided by Metro and City of Santa Monica; Because Breeze Trip data was not available for March and April of 2017, values were imputed to calculate annual statistics.



Both internal and external factors influence system usage and user trends. Trips per bike per day (t/b/d) is the most commonly used metric for bike share system performance. When t/b/d is considered in relation to major events and decision points over the course of the study period, the impact of program expansions, pricing changes, and scooter share programs is evident.

When considering the relationship to land use context, the study team found that the following factors are correlated with the number of trips taken from a station in the Metro system (the level of positive correlation is noted):

- Employment density (strong)
- Population density (moderate)
- Proximity to light rail or bus rapid transit (moderate)
- Other bike share stations within a half mile (strong)
- The number of docks at the station (moderate)



For the Breeze system, the following factors are correlated with the number of trips taken from a station (the strength of the correlation is noted in parenthesis):

- Employment density (moderate)
- Other bike share stations within a half mile (moderate)

The project team found no correlation between regular bus service and trips in either system.

## Who Is Using Bike Share?

While data related to the demographics of Breeze users was not available for this study because the system does not collect demographic data, an analysis of Metro Bike Share user demographic data and the make-up of survey participants (discussed further in section 05) indicate the bike share users are not representative of the region. For Metro Bike Share passholders, Black and Latino community members were underrepresented in the demographic data. Latino users represent 49 percent of Los Angeles residents, but comprised just 19 percent of Metro Bike passholders and Black residents make up 9 percent of Angelenos, but just 5 percent of pass holders. On average, 64 percent of pass holding members identified as male, while only 36 percent of pass holders identified as female. Approximately 55 percent of Metro Bike Share pass holders earn an annual income of \$95,000 or more, and approximately 15 percent earn less than the median income for Los Angeles (\$55,909). The results suggest that barriers to bike share entry for women, ethnic minorities, and middle to low income populations exist.

Users of the systems have a range of options when accessing a bike. Casual users are generally spontaneous or opportunistic

bike share users that do not become ongoing or long-term members, even if they might use the systems multiple times. Members of the systems are active passholders with multiple pricing and term options.

Breeze’s active member trends (members only, not casual users) reveal that annual passes generally sell best amongst their customer base. Subscriptions to memberships declined in December 2017. While student memberships saw the sharpest decline, the volume of student trips remained steady, suggesting the drop may have been due to an update member records. Subscriptions to other pass types experienced minor decreases at that time.

For Metro Bike Share, monthly passes and flex passes are the best-selling membership plans. Monthly pass sales experience spikes in sales during certain months, followed by a notable increase in membership lapses the subsequent month. This suggests many who choose to try monthly membership during these spikes only do so for a single month. Flex pass membership increases and decreases at a more gradual and stable rate than monthly passes due to the annual nature of renewal.



### CASUAL USERS

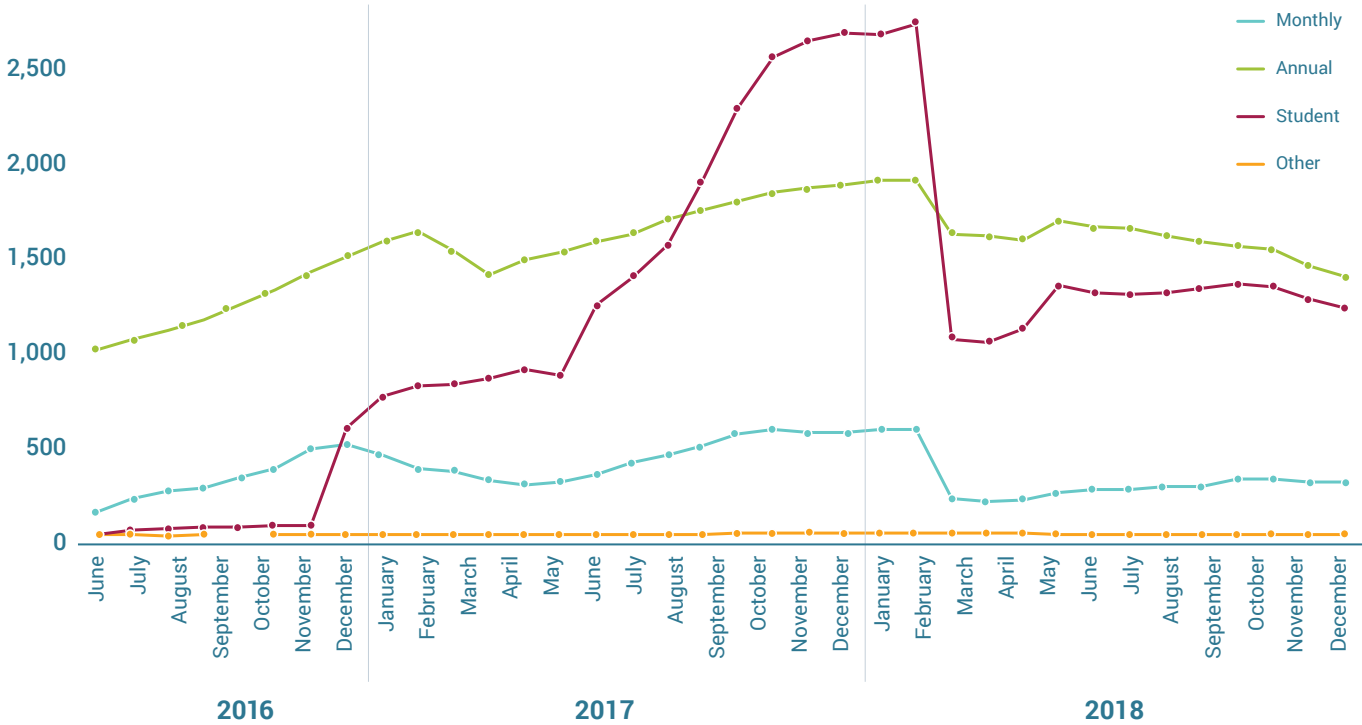
- **Breeze** offers a “Pay-as-you-go” option that charges by the minute for only the minutes used, has no time limit, and has no time-overflow usage fees
- **Metro** offers a “Day Pass” that requires an upfront fee for a set amount of time and assigns time-based usage charges beyond that. Metro introduced a “Pay Per Ride” pass in January 2019.



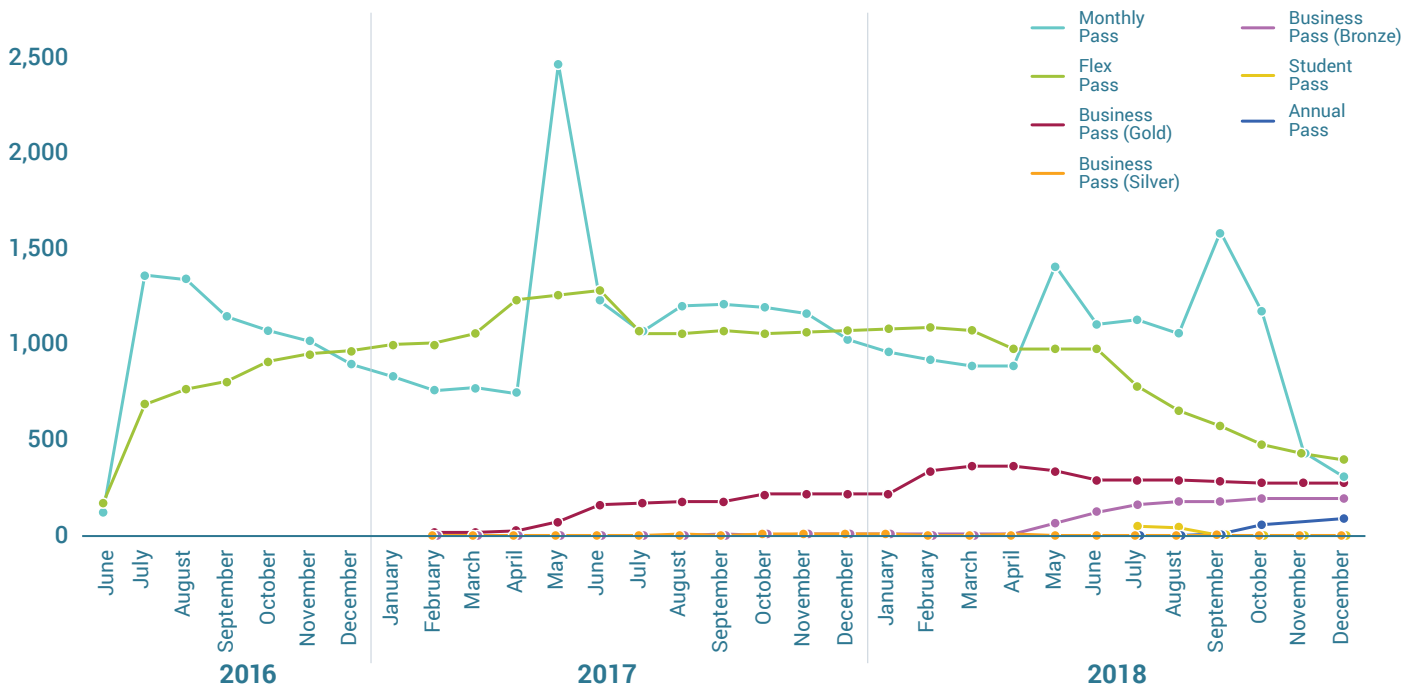
### MEMBERS

- **Breeze** offers 6 different member pricing plans, available at various points of the study period
- **Metro** offers 8 different member pricing plans, available at various times of the study period

BREEZE ACTIVE MEMBER TRENDS



METRO BIKE ACTIVE MEMBER TRENDS

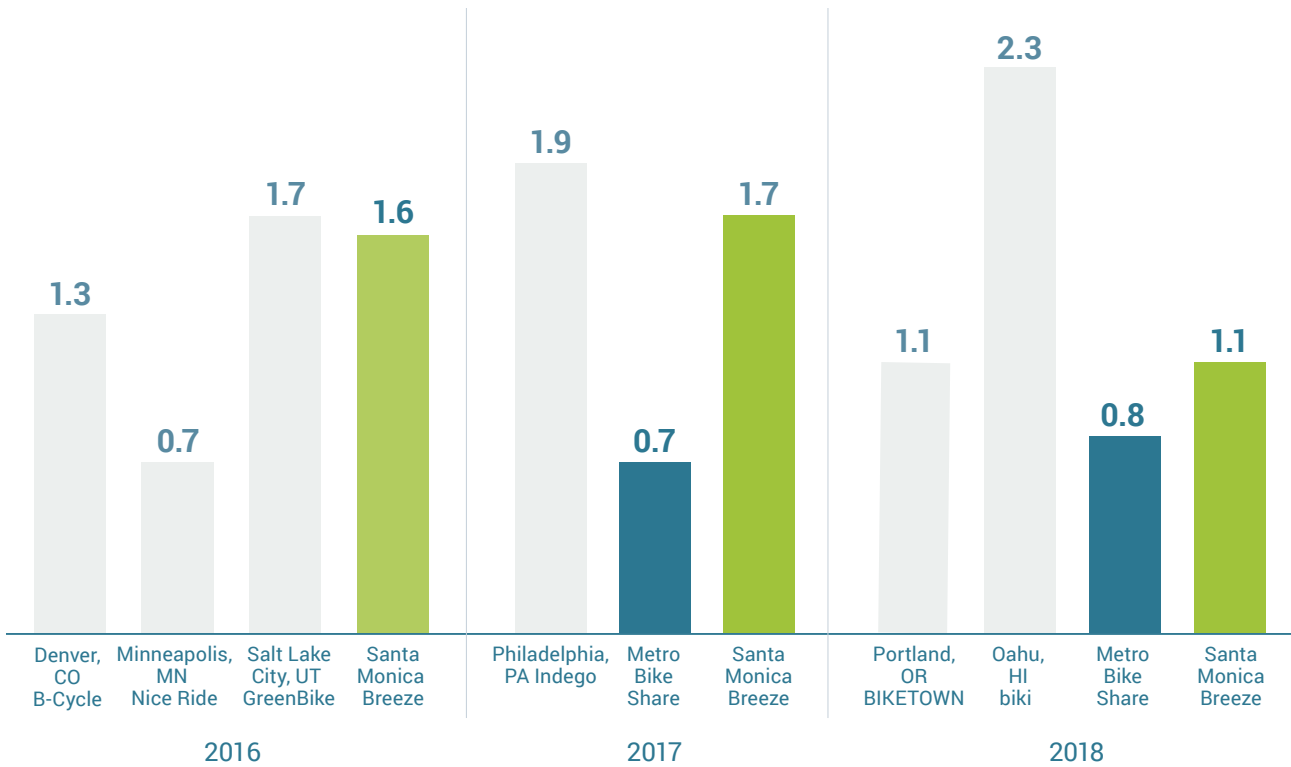


## How are the Systems Performing?

Bike share system performance is most commonly measured in trips per bike per day (t/b/d). This metric is helpful for understanding value gained in relation to system scale and operations costs. However, it is important to note that this metric does not account for other factors of system success that may be related to local transportation goals, such as transportation choice, mode shift, increased access to destinations, user experience, transportation equity, and sustainability.

There is no peer to Los Angeles, or to the unique context of Santa Monica, however the visualization below provides a point of reference for bike share context. When compared to systems in other U.S. cities, Metro Bike Share underperforms in usage averages, but continues to be on an upward trend. Trips per bike per day is a representation of higher performing areas like Venice combined with lower usage areas like Port of LA. Santa Monica Breeze has historically outpaced or tracked with other systems.

TRIPS PER BIKE PER DAY



**METRO**

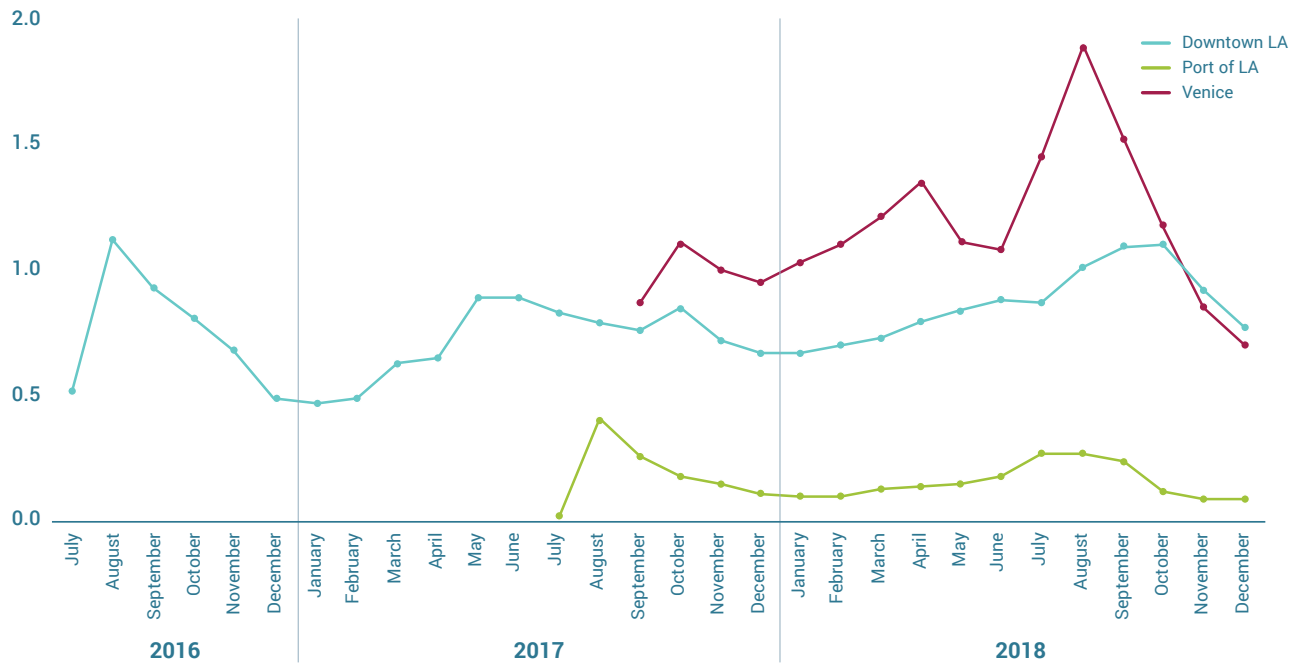
Trips per bike per day (t/b/d) have ranged from an average of 0.5 to 1.1 t/b/d over the analysis period. Taking seasonality into account, t/b/d have grown slowly but steadily. In 10 of 12 months, trips per bike per day were higher in 2018 than 2017.

Trips per bike per day vary by region within the Metro system, with the Port of LA seeing a much lower usage rate than the other regions in the system. Population, employment, and station density are much lower surrounding the Port of LA stations, compared to Venice and Downtown LA.

**BREEZE**

Trips per bike per day (t/b/d) have ranged from an average of 0.5 to 2.6 t/b/d over the analysis period. In both 2016 and 2017, t/b/d remained over 1.5 from May through November, with both years peaking in July with approximately 2.5 t/b/d. In 2018, t/b/d remained steady from January through April, before declining over the rest of the year. The major spikes in t/b/d in Summer 2016 and 2017 were primarily pay-as-you-go trips.

**METRO BIKE SHARE: TRIPS PER BIKE PER DAY BY REGION**



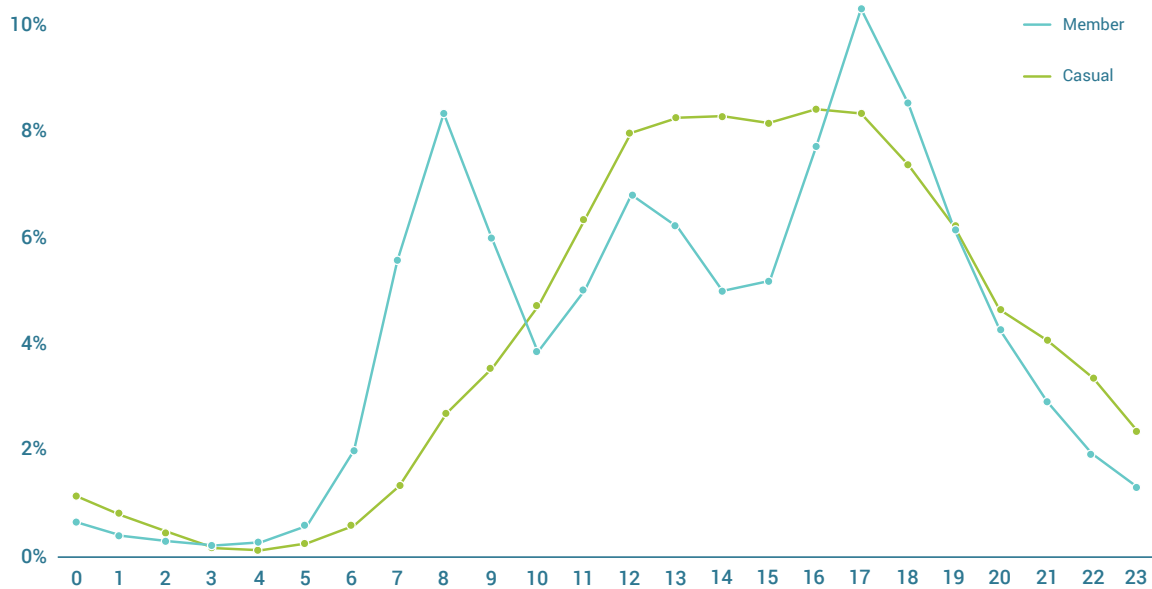
## When Are Bike Share Trips Occurring?

For both systems, usage varies throughout the day, and over 90 percent of trips occurred between 7 am and 9 pm. On weekdays, members and casual users exhibit different travel patterns.

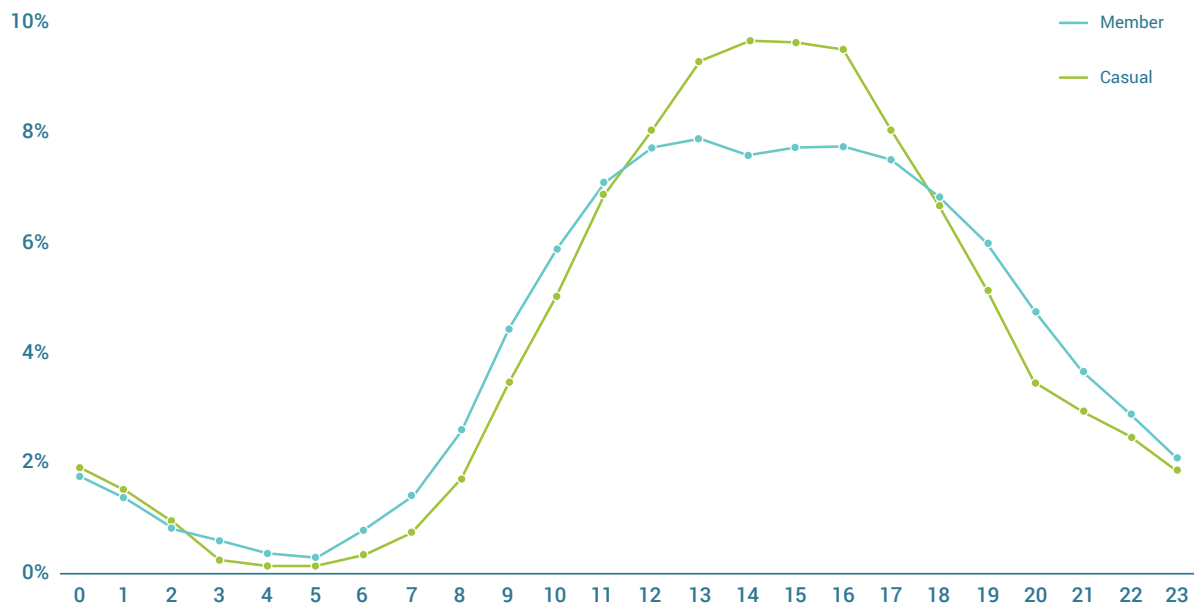
Members show commute activity (spikes in usage from 7-10 am and 4-7 pm), and sustained usage throughout the day. In the Metro system there was also increased activity around lunchtime. All four membership options offered by Breeze (annual, monthly, bike

share for all, and student) exhibited a similar commute pattern. Casual usage of both systems increased throughout the day with a sustained peak from noon-7pm. On the weekends, members and casual users exhibit similar behavior with the daytime peak occurring between 2-4pm; casual users made a higher proportion of those mid-day trips.

**METRO: WEEKDAY TRIPS BY TIME OF DAY**

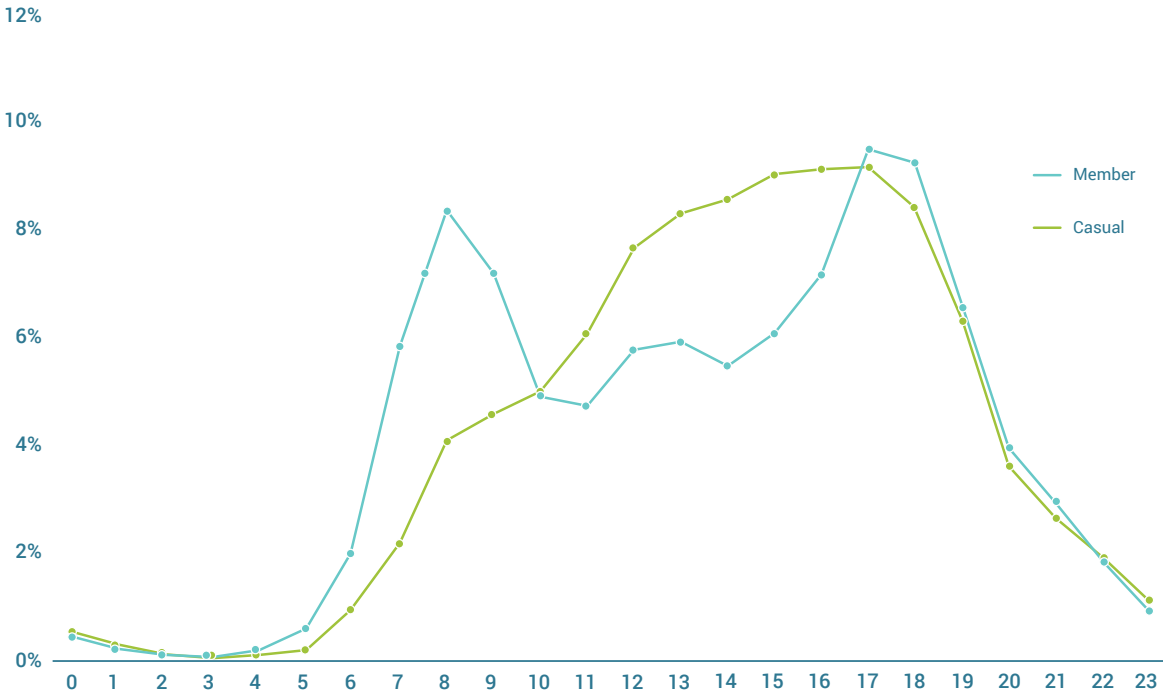


**METRO: WEEKEND TRIPS BY TIME OF DAY**

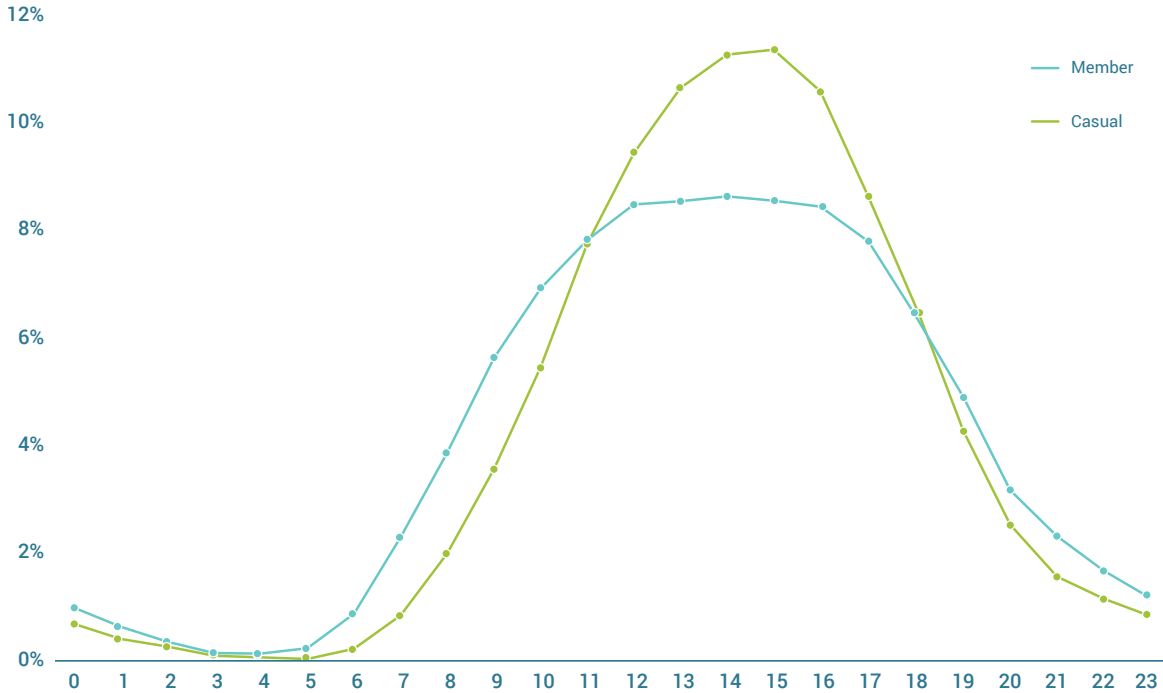




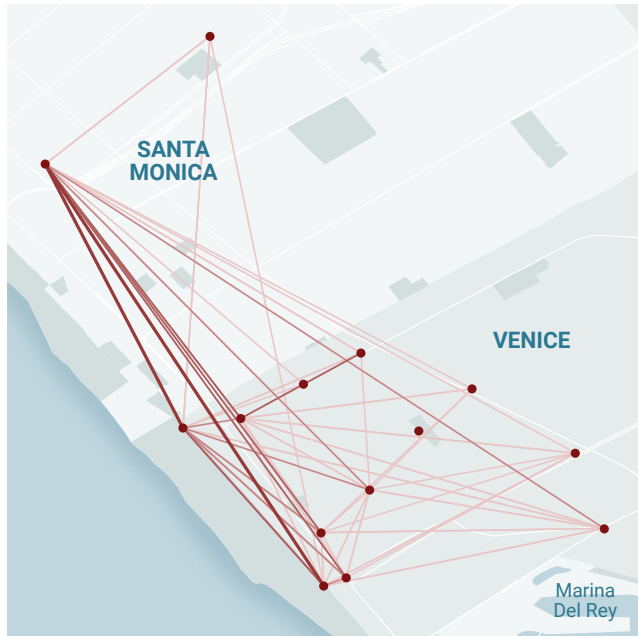
BREEZE: WEEKDAY TRIPS BY TIME OF DAY



BREEZE: WEEKEND TRIPS BY TIME OF DAY



## METRO BIKE SHARE



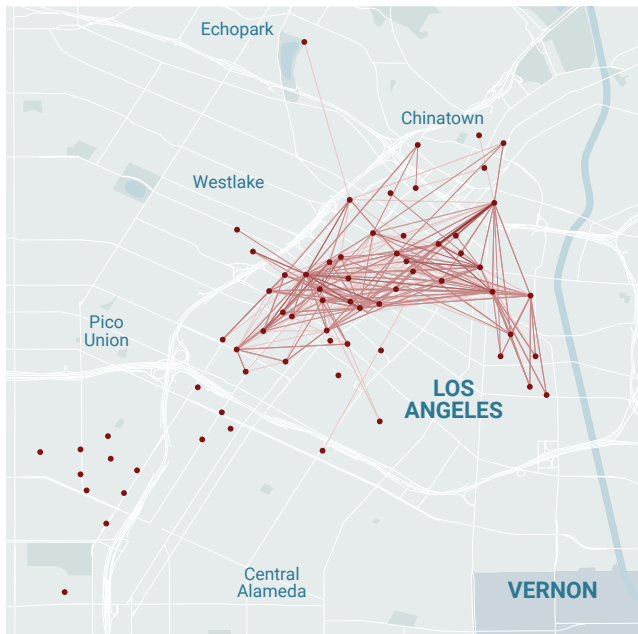
## Where Are Bike Share Trips Going?

The following maps of Downtown Los Angeles, Santa Monica, and Venice display the most popular trips between stations or hubs.<sup>11</sup> Thicker lines indicate a higher volume of trips (i.e. more popular) over the full study time period

### IN VENICE

Metro Bike Share usage data shows:

- **By far, the most popular trips** connect the Expo Line's Downtown Santa Monica station across city limits to docked stations in Los Angeles (8 of the 10 most popular trips start or end at Downtown Santa Monica Expo Line).
- **Of those, the top two trips that occur most frequently are** between the Downtown Santa Monica Expo Line Station and locations along Venice Beach.
- **Other popular trips are** 1) between stations along Rose Avenue and 2) between Venice Beach and more inland centers of activity



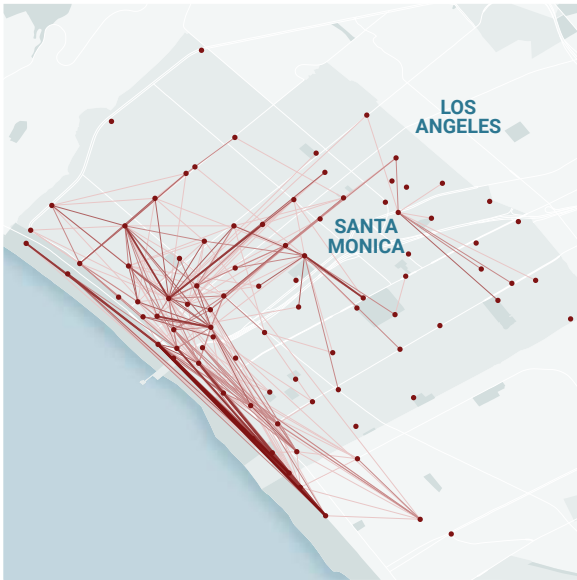
### IN DOWNTOWN LA

Metro Bike Share usage data shows:

- **The most popular trip** is between Union Station and 1st and Main St; this trip occurs twice as frequently as the next most popular trip
- **The next most popular trip** is between the stations at 7th and S Flower Streets and 7th and S Spring Streets; this trip is more than double the frequency of the next most popular trip
- **Many of the most popular trips** are circulating internally within the Financial District near Pershing Square
- **Other popular trip origin and destinations** are within the Arts District near E 4th and S Alameda Streets and connect to Downtown to the west (linking district to district rather than circulating internally)

<sup>11</sup> Breeze does not use stations and bikes are not required to be returned to designated hubs though it is encouraged. Thus, for the purposes of this analysis, trips were joined to the nearest hub, if they began within 1,000 feet of a hub.

**BREEZE**



**IN SANTA MONICA**

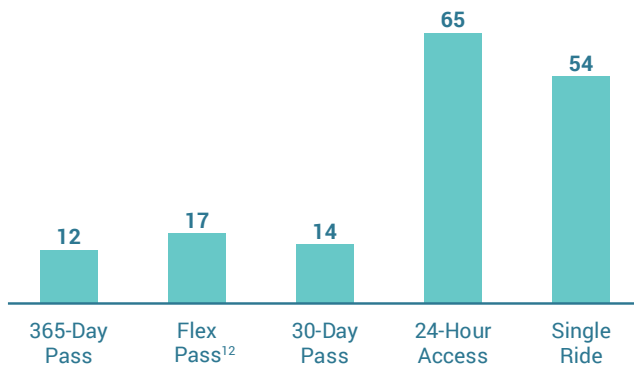
Breeze usage data shows:

- **The top five most popular trips** are between stations along the beachfront.
- **The most popular trips** are either between beachfront stations or between downtown stations, but not between downtown and the beach.
- **A hub of activity was found downtown centered on the intersection of Arizona Street and 4th Street.**
- **The most popular trip** is between Colorado Ave and 17th St, and Santa Monica College at 17th St.

**METRO**

The average casual user trip on Metro Bike Share is over three and a half times longer than the average duration of a member trip. Members average 14.5 minutes per trip, while casual trips average 56 minutes.

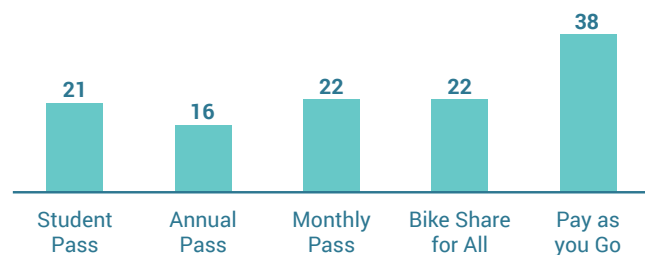
**METRO: AVERAGE TRIP DURATION (MINUTES)**



**BREEZE**

Breeze members average 19 minutes per trip while casual users average 39 minutes. Amongst the different members, annual members take the shortest trips with an average of just over 15 minutes per trip.

**BREEZE: AVERAGE TRIP DURATION (MINUTES)**



<sup>12</sup> A Flex Pass was available for a limited time within the study period. For an annual fee of \$40, all trips 30 minutes or less were \$1.75 and then a charge of \$1.75 per 30 minutes thereafter.

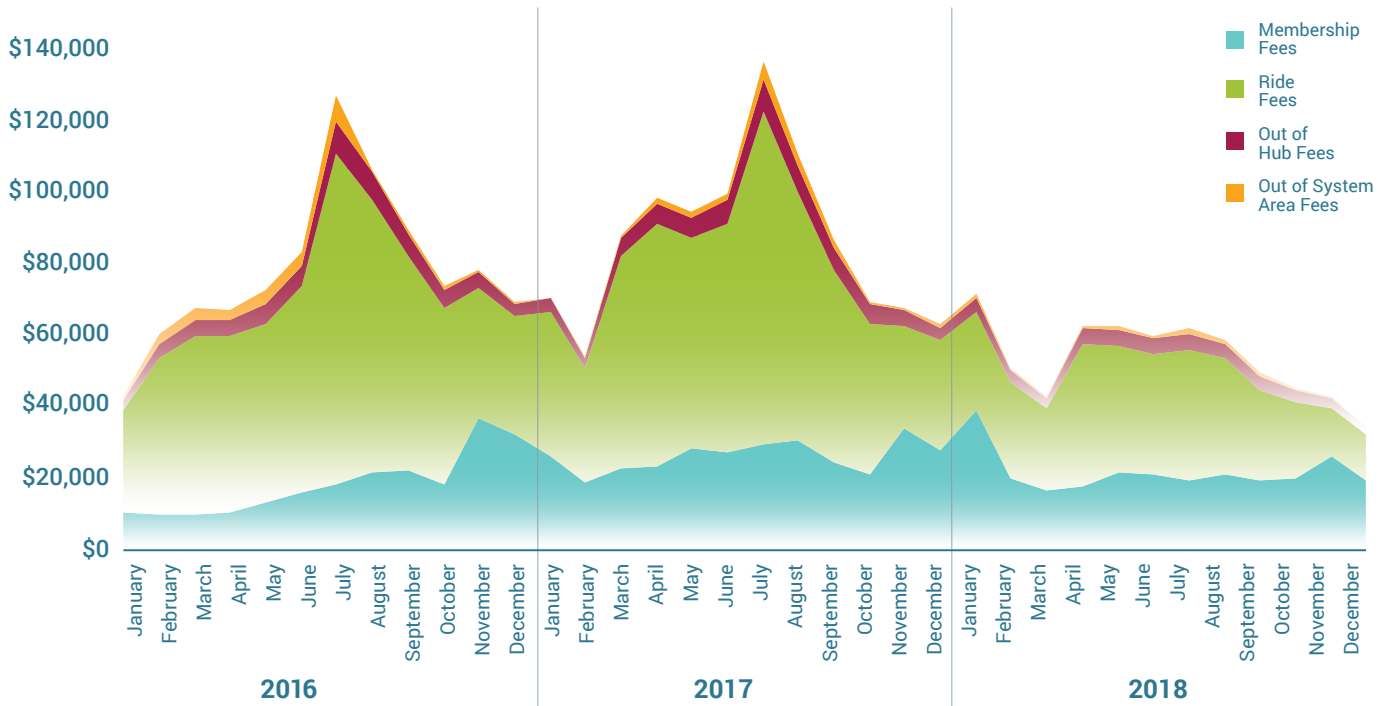
## What is the State of System Revenues and Operations?

Since Breeze’s launch in 2015, a majority of the revenue generated from the system has historically come from usage fees (costs to the user beyond an initial base membership fee or pass fee, including time overage fees and pay-as-you go fees).<sup>13</sup> Ride fees made up 56 percent of revenue generated in 2018, 63 percent in 2017, and 69 percent in 2016. Membership fees, out of hub fees, and out of system area fees account for 50 percent of the systems generated revenue in 2018, 39 percent in 2017, and 35 percent in 2016. These consistent revenue streams are critical, and provide a baseline for Breeze, whose revenues are closely tied to pay-as-you-go usage trends. Breeze’s Hulu sponsorship, which supports annual operations, offers additional consistency in funding.

Breeze’s 2016 and 2017 fiscal years saw similar revenue patterns to one another, with summer peaks centered on the month of July and winter drop-offs. The 2018 revenue has dropped due to a decline in usage fees generated from rides.

Metro Bike Share has experienced a gradual increase in revenue over the course of the 2018 fiscal year, with peaks in the fall and early summer. Passholder fees represented 61 percent of revenue generated in 2018 while usage fees represented only 34 percent. Metro carries a strong foundation of pass and member fees that are less impacted by sways in usage trends. Metro Bike Share does not have an external sponsor.

### BREEZE REVENUE TRENDS



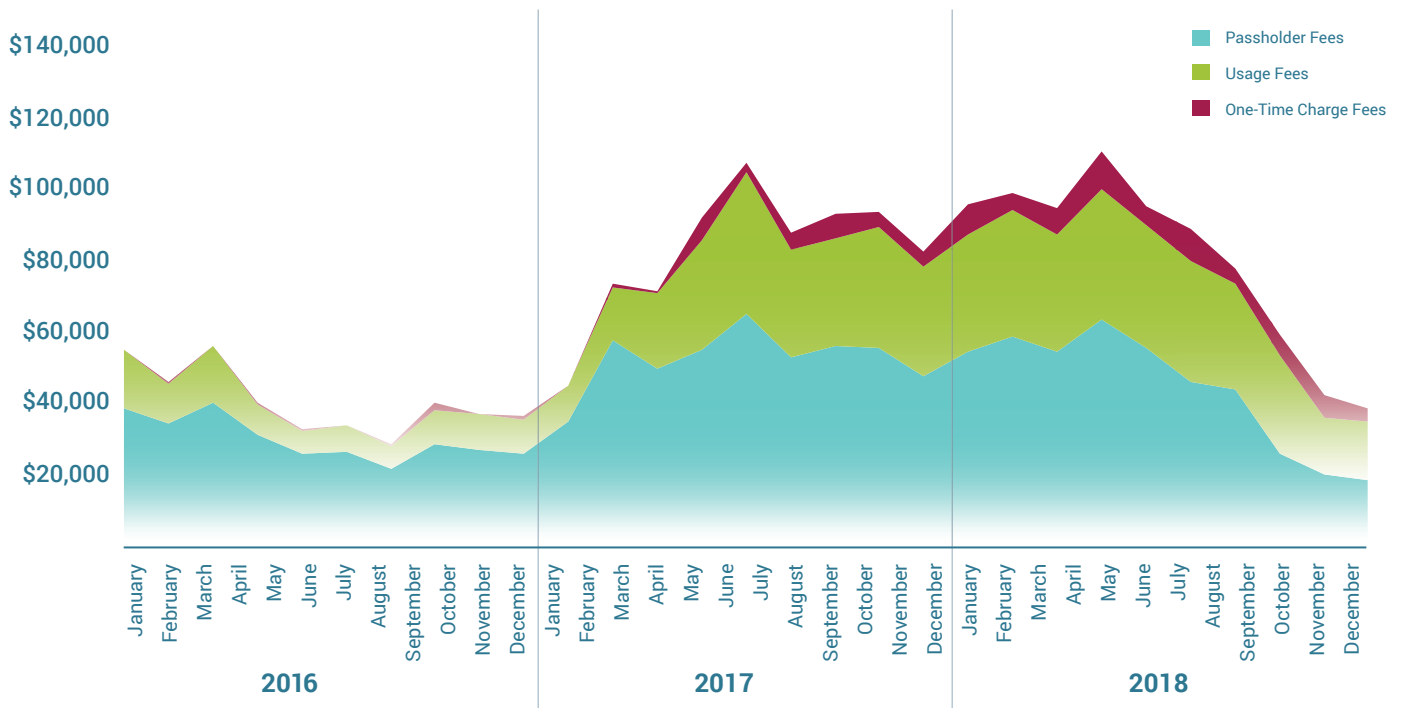
<sup>13</sup> Revenue from April 2018 onward includes the entire Bike Share Connect Regional Network which includes UCLA, West Hollywood, and Beverly Hills Bike Share Systems. Prior to that is Santa Monica Breeze only.

The Metro Bike Share system is relatively expensive to operate on a per trip basis due to the relatively low ridership and robust service obligations. Both Metro and Breeze have fixed costs with operator contracts based on a fixed per bike cost.

Over the course of 2018, Breeze's customer service center responded to over 7,000 inquiries. Of these instances, inquiries from members regarding their membership represented the largest portion of customer interactions (28%). Account management (17%) and billing inquiries (15%) were also major causes for customer contact. Issues with bicycle functionality represented 11 percent of customer service center contacts.

In 2018, Metro Bike Share's customer service center fielded over 16,000 inquiries. Customer contact with Metro Bike Share was primarily to report station issues (32%) and resolve billing and accounts requests (28%). Of station issues reported, 86 percent were regarding difficulties with docking bicycles. Billing and accounts inquiries were primarily regarding account cancellation (60%) and charge clarification (23%). Accounts that were canceled through customer service cited a number of motivating factors, the most common of which was lack of use (12%). Tourists (5%), customers moving (5%), and seasonal use (3%) were also reported more frequently than other factors. Less than 1 percent of canceling customers cited poor service as a motivating factor in canceling their account.

**METRO BIKE REVENUE TRENDS<sup>14</sup>**



<sup>14</sup> The first two quarters of the 2018-2019 fiscal year have seen a more substantial seasonal lull than the year prior. This may be partially attributable to unusually heavy rain conditions that occurred over the fall and winter.

## Metro Bike Share Customer Service 2018 Snapshot



**13,176**  
INCOMING  
CALLS



**1,970**  
INCOMING  
EMAILS



**1,024**  
INCOMING  
TEXTS



**15,600**  
ROUTINE BIKE  
INSPECTIONS



**97%**  
AVERAGE CUSTOMER  
SATISFACTION RATE



EXCEEDED SERVICE  
TARGET RATES IN

**9** out of **9** METRICS



# 04 WHAT COMMUNITY MEMBERS TELL US

A bike share system is more than the sum of its data points. To gain insight into user experiences and opportunities for improvement, the study team conducted a user survey and convened four focus groups.

## User Survey

Available both online and in a paper format for intercept surveying, translated versions of the survey in English, Spanish, and Mandarin provided additional access to feedback opportunities for non-English speakers in the region. The survey remained open for 2 months (February 3 through April 8, 2019) and garnered 351 valid responses (201 from Metro users and 150 from Santa Monica users).<sup>15</sup>

Demographics of the survey respondents generally matched findings from the statistical analysis of ridership data. According to the survey results, the typical bike share user in the Los Angeles region:

- Speaks English;
- Is between the ages of 25 and 44;
- Is more frequently male than female;
- Earns a household income of at least \$75,000;<sup>16</sup>
- Uses the pay-as-you-go/single-ride option;
- Would like to see a station/kiosk closer to destinations as well as a larger service area;
- Has used bike share for at least one year, but is not a regular rider;
- Does not receive an employer-subsidy towards membership;
- Believes the cost of the service to be reasonable and is satisfied with the fare options available;
- Would walk if bike share were not available;
- Has decreased the number of vehicle trips made because of bike share;
- Perceives a positive impact on personal health from riding; and
- Prefers the bike share service over other shared mobility options.

Looking more closely at results differentiated by system revealed a more granular understanding of user experience and insights.

### By the Numbers



**2** MONTHS OF SURVEY AVAILABLE



**4** BILINGUAL SURVEYORS



**8** INTERCEPT SURVEY LOCATIONS



**351** VALID RESPONSES

**201**  
from Metro bike share users

**150**  
from Santa Monica bike share users

<sup>15</sup> This results in a confidence level of 95 percent and a margin of error of ±5.2 percent overall.

<sup>16</sup> The low-income limit for the Los Angeles metropolitan area, adjusted for high housing costs, was \$55,440 in 2018. Around one-fourth of survey respondents qualify as low-income, according to this threshold.

### FARE AND PAYMENT OPTIONS

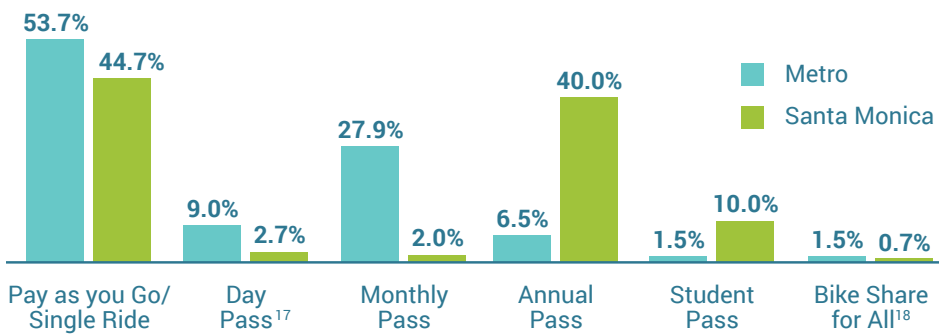
Respondents indicated they most commonly use the pay-as-you-go/single-ride fare type. When becoming members, Santa Monica participants more often use the annual pass, whereas Metro participants prefer the monthly pass.

The majority of respondents found the cost of both programs to be reasonable (67 percent for Metro users; 82 percent of Santa

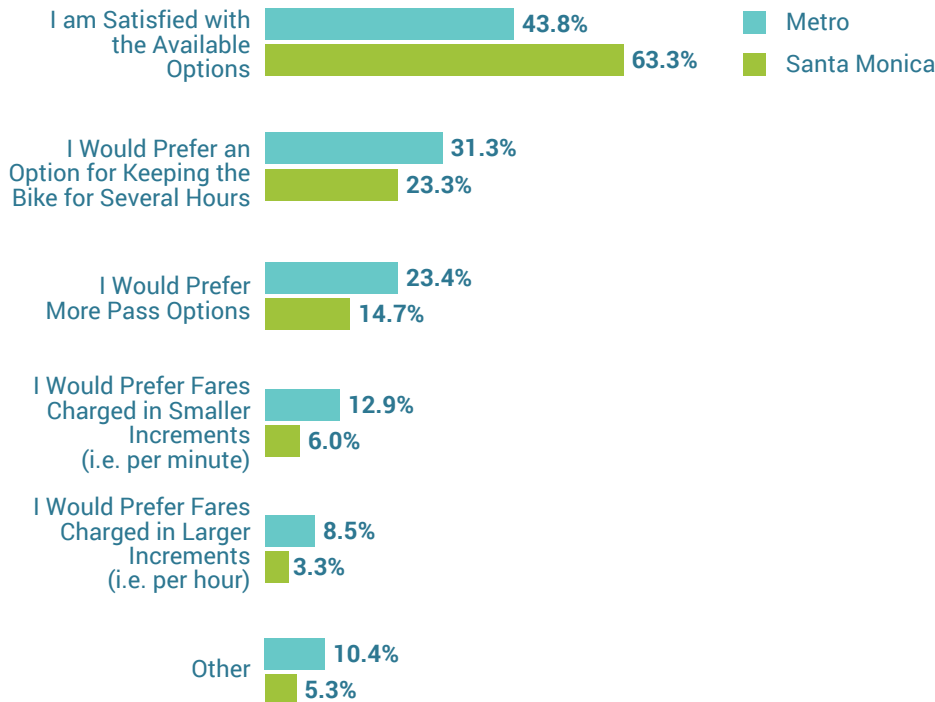
Monica users). Users of both services would prefer an option for keeping the bike longer, while Metro participants expressed a desire for additional fare/payment options.

**The majority of respondents found the cost of both programs to be reasonable** (67 percent for Metro users; 82 percent of Santa Monica users). Users of both services would prefer an option for keeping the bike longer, while Metro participants expressed a desire for additional fare/payment options.

#### FARE TYPES



#### FARE OPTIONS



<sup>17</sup> Breeze does not offer a day pass.

<sup>18</sup> Metro Bike Share does not offer a Bike Share for All pass.

Respondents appreciated student pricing options, particularly among Santa Monica users.

#### Respondents wanted:



**FREE TRANSFERS TO OTHER TRANSIT MODES**



**MORE ACCESSIBLE DAY PASSES**



**INTEGRATION WITH TAP STORED VALUE**



**LOWER PRICES**



**CLEARER NOTIFICATION OF SUCCESSFUL PARKING (Metro program)**

*"I'd like to pay with TAP stored value. And have it work like a transfer on bus/train." (Metro rider)*

*"Cheaper options for leaving bikes out of the dock." (Santa Monica rider)*

*"Day pass is useful but confusing to get at Metro kiosk" (Metro rider)*

*"Sometimes, it's difficult to know if you've docked the bike into the station." (Metro rider)*

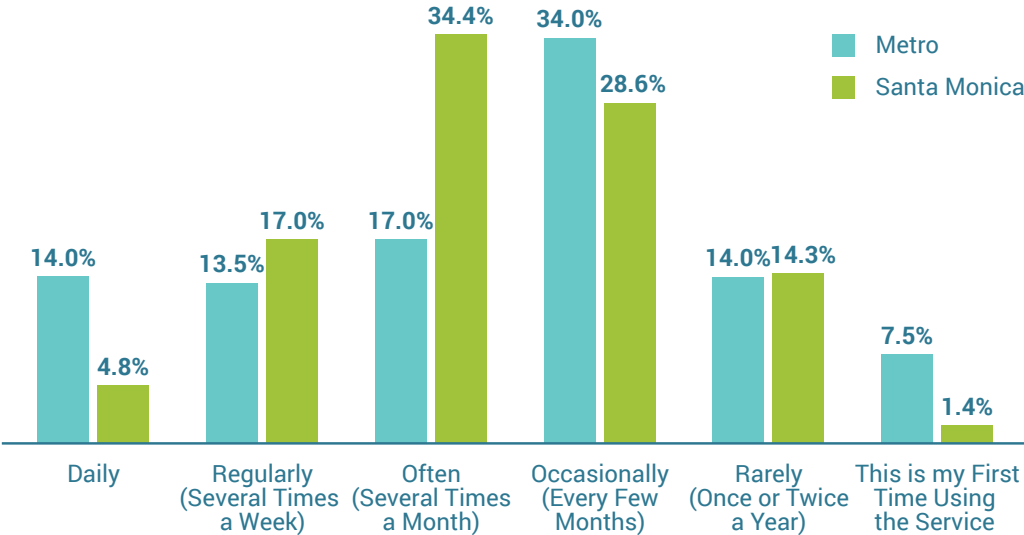


**PROGRAM USE, FREQUENCY, AND PURPOSE**

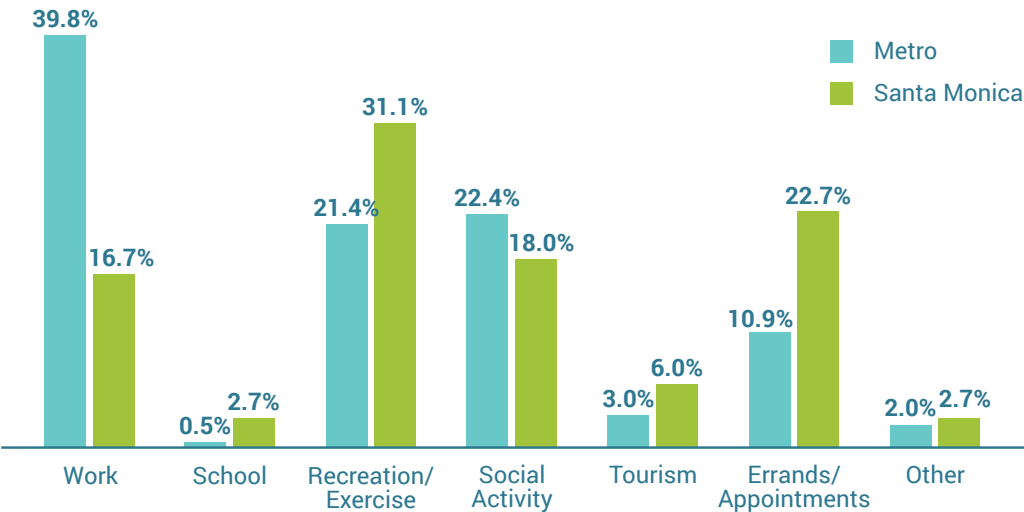
Santa Monica participants were more likely to have used the service for at least one year (77%) compared to Metro participants (53%). While relatively few respondents reported riding daily, more Metro riders than Santa Monica riders use the service every day.

The survey asked about a range of reasons for taking a bike share trip. Trips for recreation, exercise, social activity, and tourism provide important physical activity and quality of life benefits. In some cases, those trips also provide transportation to and from destinations (such as tourists that bike from a hotel to the beach rather than drive).

**FREQUENCY OF USE**



**TRIP PURPOSE**



Over **50%** OF METRO RESPONDENTS and over **43%** OF SANTA MONICA SURVEY RESPONDENTS reported using bike share primarily for transportation.\*



THESE TRIPS SUGGEST THAT BIKE SHARE IS INFLUENCING MODE CHOICE AND EXPANDING TRANSPORTATION ACCESS.

\*When trips to/from work, school, and errands or appointments are combined.

### CONNECTING TO BIKE SHARE

Walk times to and from the bike share locations were comparable for both systems. Both Metro and Santa Monica participants walk an average of 5.5 minutes to reach the kiosk/station and an average of 5.3 minutes and 4.9 minutes, respectively, to their destinations.

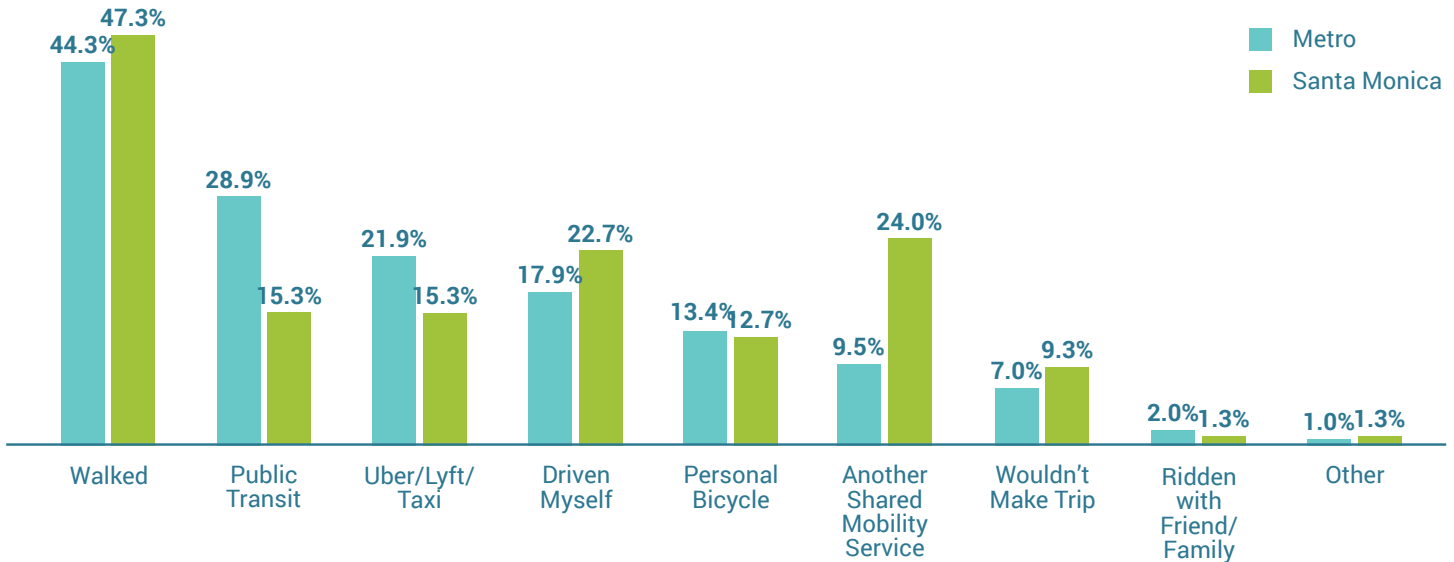
**Fifty percent of Metro respondents transfer to a bus, train, or light rail as part of their use of bike share.** In Santa Monica 17 percent transfer to transit.

Around 60 percent of Santa Monica and 48 percent of Metro respondents reported checking ahead of time regarding the availability of a bike. The app was more popular than the website for both systems.

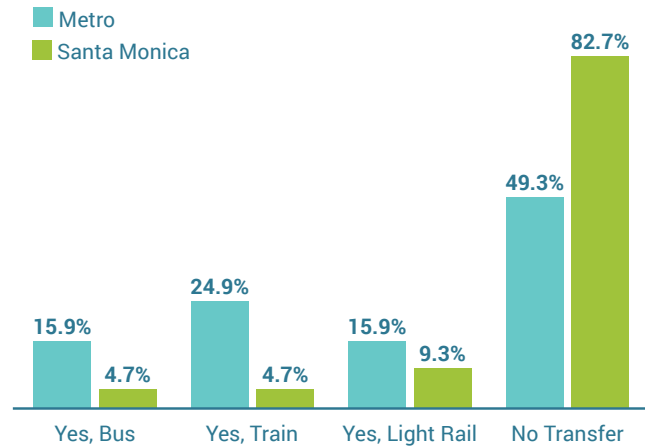

### ALTERNATIVES TO BIKE SHARE

For both systems, users were most likely to walk if bike share was not available (47.3 percent of Santa Monica participants; 43 percent of Metro participants). Metro respondents were also likely to use public transit or Uber/Lyft/taxi, while Santa Monica users were likely to drive themselves or use another shared mobility service.

#### ALTERNATIVE TO BIKE SHARE




#### TRANSFERS

**50%**  
OF METRO SURVEY  
RESPONDENTS



**17%**  
OF SANTA MONICA SURVEY  
RESPONDENTS



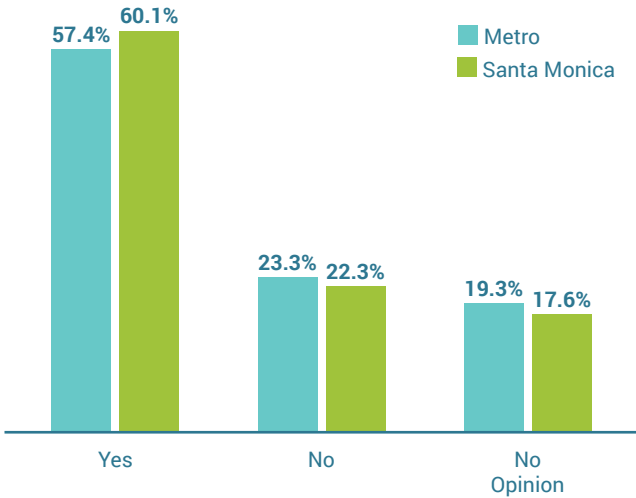
transfer to a bus, train,  
or light rail as part of  
their use in bike share.

IMPACTS OF THE SERVICE

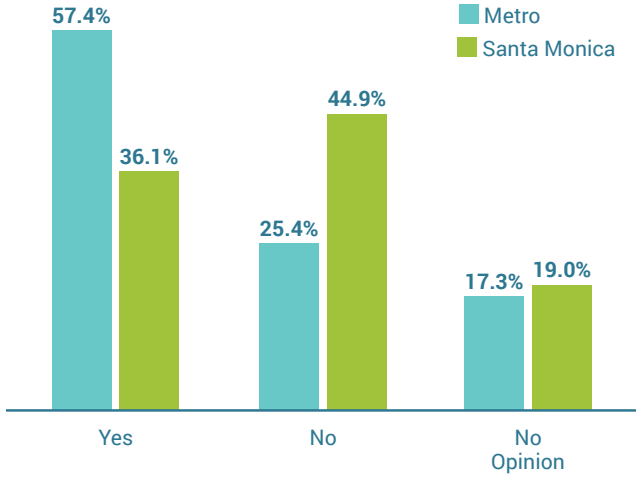
Bike share is influencing mode choice. Around 60 percent of both Metro and Santa Monica participants indicated that bike share has decreased the number of trips made in their personal vehicles. Similarly, approximately two-thirds of the users of both programs felt that bike share has improved their health.

Fifty-seven percent of Metro and 36 percent of Santa Monica respondents said that bike share has increased their use of transit. Half of the participants reported that bike share has decreased their use of ridehailing services (identified as Lyft and Uber in the survey).

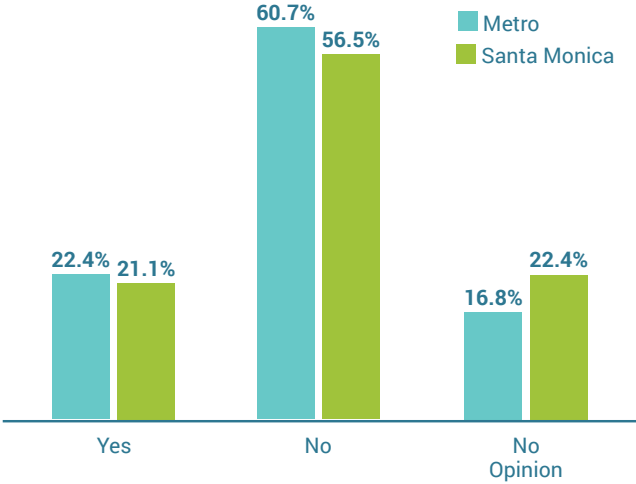
DECREASED NUMBER OF TRIPS MADE IN PERSONAL VEHICLE



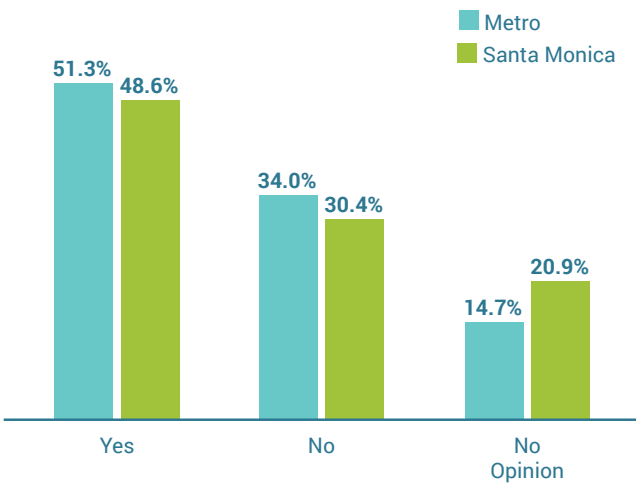
INCREASED USE OF PUBLIC TRANSIT (I.E., BUS, TRAIN, ETC.)



DECREASED USE OF PUBLIC TRANSIT (I.E., BUS, TRAIN, ETC.)



DECREASED USE OF LYFT/UBER



Users of both systems report:



## SATISFACTION

Overall, bike share users were satisfied with the programs' operations and maintenance. The following shows overall satisfaction and the top three highest rated attributes of each system based on mean rating on a scale of one to four by respondents:

### **Metro Bike Share:**

3.63 for overall satisfaction  
3.70 for customer service (highest rated attribute)  
3.68 for cleanliness of equipment  
3.61 for condition of equipment

### **Santa Monica Breeze:**

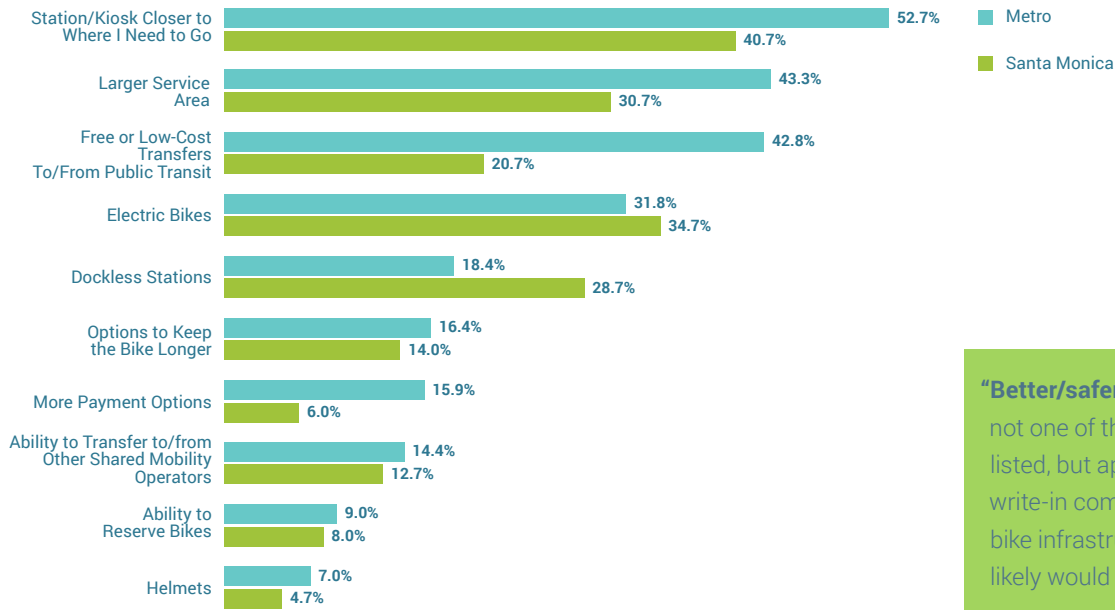
2.97 for overall satisfaction  
3.21 for ease of payment (highest rated attribute)  
3.07 for ease of registration  
2.96 for customer service

## WAYS TO INCREASE RIDERSHIP

Across both programs, installing stations/kiosks closer to where they need to go and expanding service areas would increase respondents' bike share usage.

- For Metro respondents, the top three preferred service improvements were the proximity of stations/kiosks closer to user destinations, a larger service area, and free or low-cost transfers to/from public transit.
- For Santa Monica respondents, the top three preferred service improvements were the location of stations/kiosks closer to user destinations, electric bikes, and a larger service area.

PREFERRED SERVICE IMPROVEMENT



**“Better/safer bike infrastructure”** was not one of the original answer options listed, but appeared many times in write-in comments. Had “better/safer bike infrastructure” been an option, it likely would have received more votes.

Respondents who selected “other” specified a desire for:

- Better bikes, particularly in Santa Monica (e.g., lighter, faster to unlock, better maintained, increased legibility and functionality of computers)
- Enhanced TAP card integration (Metro riders)
- Coverage in un/underserved neighborhoods (Boyle Heights, Mid City, Silver Lake, San Fernando Valley)
- Safer streets and infrastructure

**“I should be able to use my phone to unlock a bike. Pressing the buttons on the bikes is increasingly frustrating as they are often unresponsive.” (Santa Monica rider)**

**“No stations in my neighborhood, Boyle Heights.” (Metro rider)**

**“Safer roads. This one is a top priority. There are too many crazy drivers with no regards to bikers.” (Metro rider)**

**“More protected bike lanes and places I feel like I won’t be run over by angry drivers.” (Metro rider)**

## Focus Groups

In focus groups held in both downtown Los Angeles and Santa Monica, a mix of 26 non-riders, Metro users, and Santa Monica users shared insights that echoed findings from the community survey.

**“This program totally encourages people to ride a bicycle who wouldn’t normally do so.”**  
- Joe, Focus Group Participant

As with survey respondents, focus group participants who predominantly use the Metro program expressed a desire for:

- free transfers between bike share and other public transit;
- easier processes for purchasing a day pass and renewing business memberships;
- clearer integration with the TAP card and stored value;
- a faster check-out process of the bikes (e.g., through an app); and
- more flexibility in docking locations,

Santa Monica users, on the other hand, noted that inputting numbers via the built-in keypad and reading the computer screens can be difficult, particularly during the day time.

Safety came up as being both a deterrent to riding (due to dangerous drivers and inadequate bike facilities, and concerns about the night-worthiness of built-in lights), as well as an impetus for riding: for some, bike share allows users to zip through areas they would otherwise feel unsafe walking in. Others reported they do not bike—and instead opt for other options such as scooters—because the bike share programs do not serve the areas they want to go. With regards to infrastructure concerns, participants voiced a lack of faith in political will to change roadway conditions and expressed frustration about elected leaders denying bike projects even when the community had demonstrated their support.

Participants shared that they have used bike share both in place of and in conjunction with transit, noting for some routes that **riding a bike is faster than a multi-legged bus trip, and**

**that stations at transit stops help circumvent the need to bring a personal bike on the train.** Similarly, some reported that the availability of bikeshare eased concerns about owning, maintaining, and preventing theft of a personal bike, ultimately helping them bike more.

**“I can’t take the bike share because there is no dock near my work. A lot of places are a “transit deserts.”**  
-Maylin, Focus Group Participant

E-bikes are an attractive addition to the bike share fleet. However, attendees wanted to ensure that fleets would be reliable and regularly recharged so that they would not find the battery depleted only part-way up a hill. Other areas for improvement include station siting to ensure they are more visible, intuitive to find, and placed near existing bike facilities.

With regards to getting more people to try bike share, participants recommended including celebrities in marketing campaigns.

**“LeBron James uses bike share when he comes down here.”**  
-Michael, Focus Group Participant

# 05 RECOMMENDATIONS FOR THE FUTURE



## Key Takeaways

More than a decade ago, bike share made its mark as the original shared mobility system to come to the streets of U.S. cities.

**Over the last four years, in Los Angeles County, bike share has shown its staying power and ability to influence the local transportation system.** Within that time, the rapid emergence and evolution of new transportation technologies and business models dramatically changed the landscape in which it operates.

This study reviewed the performance of two bike share systems in Los Angeles County. Analyzing the data of both systems clearly shows the link between bike share and first and last mile access to transit, access to jobs (by way of employment density), and transportation choice (specifically, an alternative to ridehailing and personal vehicles), in addition to simply getting more people on bikes and expanding public demand for active transportation infrastructure.

**Users are happy with what these systems offer and for the most part simply want more of it – more availability of bikes, more flexibility for trip times, more e-bikes, more geographic reach, and more integration with transit.**

**The study has also shown a distinction between regional shared mobility operations and local operations.** The two serve different needs and different contexts - and there is room for both. Metro Bike Share plays a critical role in leveraging the Metro transit system, providing a reliable commuter option, and serving high density areas of the Los Angeles metro region. Breeze – along with the Bike Share Connect network – is an essential part of filling mobility gaps at the local level and supporting a range of trip types (including a high volume of trips for errands and appointments). Metro Bike Share is operated from a regional vantage point where areas with less trips and revenue generation can be balanced by areas of high demand. Metro is a large regional agency with the capacity to invest in bike share as an extension of transit and substantial staff resources for devoting time and expertise to ongoing operations and monitoring. The City of Santa Monica, and other bike share communities of

similar size, have more limited resources by nature but also have the benefit of more nimbleness. This factor is important for the ongoing success of bike share at the local level and in the context of a fast-changing environment. **Local control in decision-making for bike share planning, operations, and financing are important to remaining nimble.**

In the Los Angeles County context, smaller communities are choosing between:

- Joining the Metro Bike Share system (like Port of LA)
- Self-funding a system (like City of Santa Monica and West Hollywood), or
- Inviting a private mobility provider (such as JUMP or Lime-E).

Many factors play into this decision. Even if buying into the station-based regional bike share system offers long-term benefits, some communities may not have the resources to do so, or may see working with a private provider as the more feasible option despite possible trade-offs. Additionally, it is unknown what effect the introduction of 30,000 scooters in the City of Los Angeles may have Metro Bike Share. This could include impacts to ridership, as well as the ability to attract a major sponsor. And there are other unknowns related to private mobility providers. The permitted scooter and dockless bike systems have very different cost structures and service/equipment requirements than public systems, and reports show that permitted systems are not yet recovering costs. This complexity necessitates broader consideration of service quality, equity, and public subsidy needs for shared mobility.

**Given these takeaways, a variety of actions will be needed to achieve the goal of optimizing bike share systems and advancing mobility options for Los Angeles County in the future.**

The following recommendations are presented as:

- actions to continue that are working well now,
- short-term actions to develop and implement in the near future, and
- longer-term considerations to keep in mind into the future.

Some actions are specific to Metro Bike Share only, as a regional system, and are noted as such.



## What to Continue

### 1 PRIORITIZE THE CUSTOMER EXPERIENCE

To-date, operator contracts have required a focus on consistency in customer service and system operations and maintenance. The existing level of customer satisfaction has established a positive reputation and engendered loyalty among users. This reputation and consistency in service and product is an important differentiator in the face of new privately owned and operated micro-mobility programs whose track records are still limited in tenure, and where maintenance needs and replacement cycles of vehicles are still undetermined.

### 2 REMAIN NIMBLE, LEARN FROM OTHERS

Both bike share systems have taken steps to be nimble, while also remaining stable, in the face of industry disruption. Examples of this include the Santa Monica Breeze's Bike Share Connect program offering regional operability, as well as Metro Bike Share's pilots of smartbikes and e-bikes intermingled within a station-based system. Additionally, scooter share and dockless bike share programs showed customer demand for new pricing structures. This led to Metro Bike Share dramatically reducing prices, which spurred new usage. Continuing to learn from new tactics in the industry can ultimately benefit existing systems.

### 3 INTEGRATE WITH TRANSIT

Payment integration, and shifts towards mobility-as-a-service (MaaS) models, must continue to be a priority. Metro's role as a bike share system owner has enabled the development of one of the first successful payment integration platforms for shared mobility and transit in the country (via the TAP wallet). This is critical for remaining relevant in the changing mobility landscape. It improves access to bike share for low-income populations, while also demonstrating the role that government can play in advancing a platform that is highly valued by the private sector and by customers but to-date has been difficult to establish.

#### FOR METRO BIKE SHARE

#### Lead with Transit

As a transit provider and a bike share program owner and operations funder, Metro has solidified bike share's role as "transit by bike" and as a feeder mode for accessing transit in LA. Metro Bike Share should continue to be positioned as an extension of transit and be funded, priced, and evaluated as an integral part of the system:

- Matching fare options to transit passes.
- Mirroring transfer fees with those applied to other transit modes in the system.
- Evaluating the system using the same standards as bus and rail transit instead of cost-per-trip basis.
- Consider expansions of bike share around transit hubs

#### Invest in a Bigger Footprint and Expand Contiguously

The Metro Bike Share system was likely rolled out far too small for a city the size of Los Angeles. After the initial downtown pilot, expansions of Metro Bike Share underperformed due to isolation from high density areas and separation from the larger bike share network. In May 2018, the Metro Board shifted to focus on contiguous geographic expansion. Beyond system performance, expansion will also be critical for serving equity goals and for expanding access to the full customer base of the TAP card, as integration with that program continues to develop.

#### Open Communication between Operators and Local Government

Close coordination between a city/municipal agency and the contracted operator is a unique relationship and an important strength of the existing bike share program. Metro Bike Share should improve and expand coordination between each city/municipal agency and the contracted operator. This could include engaging local agencies in a discussion around what aspects of decision-making they would like to lead or be more involved in and how that can work as a collaborative and also timely process. Clarifying how this occurs within the parameters of Metro's contract with the operator may also be needed. This move will not only improve coordination but also enable customized solutions, new innovations, and strategic decision-making, particularly regarding pilots and expansions.





## What to do Next

### 1 INVEST IN EQUITABLE ACCESS

Both bike share systems should expand access for low-income community members while also taking steps to increase usage among equity-based passholders. This will not only serve transportation equity goals but may also bolster bike share performance and usage data. Metro Bike Share's users' demographics are not representative of the demographics of the LA community, which suggests there is an opportunity to capture a broader market of users. Breeze's Bike Share for All passes make up 20% of all Breeze members, but only 3% of member trips (as of December 2018). This suggests an opportunity to encourage more use among targeted members. Additionally, prices for using permitted e-bike and scooter shared mobility services have fluctuated significantly in the last year (in some cases more than doubling). This underscores the importance of offering consistent and affordable prices through public bike share systems.

### 2 IDENTIFY NEW USER REVENUE AND SPONSOR OPPORTUNITIES

Both systems may have opportunities to target gaps in user revenues. Breeze's user revenues are closely tied to Pay-as-you-go usage trends. Marketing to casual users (particularly repeat casual users) to encourage purchasing a membership, may create added stability in revenues. For Metro Bike Share, data shows that efforts to recruit new members through promotions are successful but those members are often not renewing. Develop strategies to retain monthly members past the first month of joining. This can include marketing to large employers to establish employee memberships that are renewed in bulk. Additionally, Metro Bike Share should continue the effort to identify a presenting or title sponsor of the system. Breeze has benefited from a successful sponsorship by Hulu since the program's launch, which has provided an important financial backstop for the system during the current fast-changing context. As Metro Bike Share expands, sponsors will have increased opportunities for brand exposure.

### 3 INCENTIVIZE OPERATORS

The current bike share contracts in Santa Monica and Los Angeles are based on number of bicycles in service per year. While this is a simple approach that is standard practice across public bike share systems and is easy to oversee, it also lacks the incentives for operators to maximize usage and efficiency. We recommend that, at contract renewal, the contracts be modified to reward operators for increased usage/revenue and cost efficiency.

### 4 UPDATE SYSTEM EQUIPMENT

Both systems need to evaluate the life cycle of the equipment and establish a replacement strategy. This will be important for maintaining the positive reputations these programs have for quality maintenance and customer service.

### 5 MAKE STREETS SAFER, BUILD MORE BIKE INFRASTRUCTURE

Identify high demand or high priority station locations where bike infrastructure is lacking and prioritize those for improvements. While some regional programs lack direct control over right-of-way and roadway design, community members would like to see emboldened political leadership on bicycle safety, educational efforts about safe bicycling, and the need for bike facilities.

### 6 INTEGRATE WITH MOBILITY HUBS

In addition to serving as an extension of transit service, bike share systems should be considered for dedicated space in all mobility hub planning. Mobility hub design should assess the need for bike share stations or smart bike hubs, as well as the use of flexible secure bike parking structures where demand is sufficient to include universal chargers for electric bikes and scooters. This will maximize the usefulness and the systems and micro-mobility users in general, while keeping sidewalks clear and free of parked vehicles.



## Looking Ahead

1

### COORDINATE REGIONALLY TO MANAGE MOBILITY SERVICES

New shared micro-mobility modes and business models present both an opportunity and challenge for public agencies. Opportunities include better mobility services for the general public at lower costs or no cost to public agencies. Challenges include uncertainty around the long-term commitment of the operating businesses, fluctuating usage fees, and a lack of public oversight and management for public safety and welfare.

**Actively managing these services through contracting or permitting processes with associated rules/regulations (used by both Santa Monica and City of Los Angeles) as well as through right-of-way management (such as parking zones) is critical. This will stabilize the context within which Metro Bike Share and Breeze operate, while also supporting an overall increase in demand for and use of shared micro-mobility services.**

Contracts and permits issued to scooter and bike share operators should include specific requirements on maintenance practices, safety education, data sharing, customer service, and related items, with enough fees to cover the administration and oversight of these items by the public agency, and clear, graduated penalties/fines (including suspension and termination) where appropriate to enforce the contract terms. Across the region, finding ways to make the management of these services more effective and relatively consistent across jurisdictions will create a more seamless user experience and also may offer new efficiencies for local agencies. Local jurisdictions should have access to resources about strategies and lessons learned and to identify areas where there is overlap. A regional agency such as SCAG may serve as a resource and, based on needs identified by the participating jurisdictions, lead the development of guidance for successfully managing mobility services.

Given the region's multiple bike share systems and operators, the rapid growth in technology and companies offering these services, and the desire to provide safe and effective micro-mobility for the public, we recommend that SCAG regularly analyzes the following along with appropriate recommendations for all systems in Los Angeles County:

- Performance of the overall municipal owned as well as privately owned bike share and micro-mobility systems
- Financial performance and stability
- Service to low income residents
- Summary of adjustments to permitting requirements, fees and penalties and bike share contracts
- Expansion recommendations based on a reliable micro-mobility demand model
- Best practices for oversight of operator compliance with contract requirements and/or with permitting requirements
- Greater coordination between systems for user convenience
- Review of equipment quality and maintenance, safety education, and customer service
- Recommendations to protect subsidized systems where appropriate
- Recommendations on how to better integrate micro-mobility into Metro transit services and use of mobility hubs

## 2

### EXPLORE NEW WAYS TO INTEGRATE REGIONALLY

Metro and local bike share systems operate parallel to and in competition with each other including in overlapping service areas. This poses a potential market issue for competition when synergy could encourage greater use of the system. Recognizing this complexity and the unique value that both systems offer, Metro should explore more ways to partner with interested jurisdictions within a contiguous expansion area. Additionally, opportunities to capture cost efficiencies across operators should be considered if areas of mutual benefit can be found. This could include collaborating on the work of servicing or rebalancing bikes in overlapping service areas or creating combined marketing campaigns that promote bike share use across multiple types of systems. This type of shared investment of funding, staff time, or resources from operators would require a formal agreement.

## Case Study in Equity Biketown for All

With Portland, OR's bike share program Biketown, **discounted passholders (known as Biketown for All) make up 7% of Portland's members but have taken 20% of trips.** Steps taken by Biketown to encourage this include:

- removed all fees as these users are typically more sensitive to unexpected costs (out of service area, out of hub, per minute fees over the included minutes)
- still provide the \$1 credit for returning to stations (helps with re-balancing and operating costs)
- cash payment (65% of members use this option)
- hosted 38 workshops led by the Community Cycling Center through other community organizations (e.g. Street Roots, Sisters of the Road).



# APPENDIX A

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Technology Integration Memo



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Portland, OR 97214  
(503) 230-9862  
www.altaplanning.com

## MEMORANDUM

To: Rye Baerg, SCAG

From: Jean Crowther, Alta Planning + Design

Date: May 16, 2019

Re: **Technology Integration Memo: New Mobility in Los Angeles and Santa Monica**

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The following memorandum is intended to provide background and context relevant to an analysis of bike share in the Los Angeles region. It provides a baseline understanding of how recommendations developed through that process may align with broader trends in new mobility.

### Defining A New Era of Mobility

In recent years it has become clear that developed economies are entering into a new era of personal mobility that will be uniquely defined by the rapid emergence and evolution of new transportation technologies and business models. A myriad of converging factors, related to both market trends (demand) and advancements in technology (supply), have enabled this shift in personal mobility. Understanding this changing shared mobility landscape is important for interpreting SCAG Bike Share Study results and proposing relevant next steps for the system.

In 2018, the Society of Automotive Engineers developed the following definitions for shared mobility modes (Shared Mobility, 2018):

**Bikesharing** provides users with on-demand access to bicycles at a variety of pick-up and drop-off locations for one-way (point-to-point) or roundtrip travel. Bikesharing fleets are commonly deployed in a network within a metropolitan region, city, neighborhood, employment center, and/or university campus.

**Carsharing** offers members access to vehicles by joining an organization that provides and maintains a fleet of cars and/or light trucks. These vehicles may be located within neighborhoods, public transit stations, employment centers, universities, etc. The carsharing organization typically provides insurance, gasoline, parking, and maintenance. Members who join a carsharing organization typically pay a fee each time they use a vehicle.

**Microtransit** is a privately or publicly operated, technology-enabled transit service that typically uses multi-passenger/pooled shuttles or vans to provide on-demand or fixed-schedule services with either dynamic or fixed routing.

**Ridesharing** (also known as carpooling and vanpooling) is defined as the formal or informal sharing of rides between drivers and passengers with similar origin-destination pairings. Ridesharing includes vanpooling, which consists of 7 to 15 passengers who share the cost of a van and operating expenses, and may share driving responsibility.

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**Ridehailing** services (sometimes referred to as transportation network companies or TNCs) are prearranged and on-demand transportation services for compensation in which drivers and passengers connect via digital applications. Digital applications are typically used for booking, electronic payment, and ratings.

**Scooter sharing** allows individuals access to scooters by joining an organization that maintains a fleet of scooters at various locations. Scooter sharing models can include a variety of motorized and non-motorized scooter types. The scooter service provider typically provides gasoline or charge (in the case of motorized scooters), maintenance, and may include parking as part of the service. Users typically pay a fee each time they use a scooter. Trips can be roundtrip or one way.

## A Brief History of New Mobility in the LA Metropolitan Area

### Ridehailing

Ridehailing giants Uber and Lyft, along with a handful of smaller service providers, launched service in the City of Los Angeles in 2013. While ridership data is safeguarded by rideshare companies, it is clear that in just five years the ridehailing model has become a fixture within LA's transportation network. UCLA's Daily Bruin recently quoted university transportation officials claiming an average of roughly 11,000 ridehailing trips per week both begin at and end on the campus alone (Kidambi, 2019). What limited research has been published on the subject of ridehailing's impact on modal splits and congestion indicate that most riders would have chosen walking, cycling, or transit had on-demand service not been available. Rider survey data indicates that approximately 60% of riders in dense urban areas would have chosen transit, walking, or biking to make their trip if ridehailing had not been available according to Schaller Consulting's report, (Schaller, 2018).

Despite their controversial emergence and current impact on congestion, rideshare providers like Uber and Lyft have stated a desire to better compliment other regional transportation modes, namely transit. This is both in recognition of the sustainability benefits that come with utilizing flexible ridehailing service as a first and last mile connector to bus or rail, as well as the profit margin benefits associated with concentrating rideshare service on short trips to high volume destinations. Uber reports that "trips near metro stations" account for over 16% of the company's rides that begin or end in Los Angeles, though it is unclear whether those trips culminated in transfer to transit service or another mode of travel (Uber and LA's Public Transportation Working Together, 2015).

Ridehailing providers have historically operated at a loss under driver-based models (Lyft's recent performance being an exception to this trend); most recently, Uber posted a \$1.8 billion loss in 2018 (O'Brien, 2019).

### Carshare

Zipcar is the most prominent carshare company throughout Southern California, with a strong presence in the Los Angeles and Santa Monica area (Zipcar Pricing, 2019). In the past, the platform has exhibited interest in working to compliment public transit. Zipcar partnered with LA Metro in the past via MOD Sandbox funds to provide carshare opportunities near transit (Los Angeles Metro Partners with Zipcar for More Car Sharing Locations on Transit Lines, 2015).

Car2Go, Zipcar's largest national competitor, also briefly served the Los Angeles area but exited the market less than one year after launch due to operation zone limitations (Dryden, 2015).

BlueLA's electric car-share fleet launched in April of 2018 with the goal of scaling to 100 vehicles, 40 self-service stations, and 200 charging points across Downtown LA, East Hollywood, Rampart Village, and Pico-Union (Faust,

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2018). The two-year pilot partnership between the California Air Resource Board, City of Los Angeles, and Shared-use Mobility Center leverages cap and trade funds to promote more sustainable vehicular transportation. In the first year of the program, the pilot has grown to include 80 electric vehicles, 130 charge points, 26 charging stations, 2,000 members, and over 12,000 trips (Gray, 2019).

### **Bikeshare**

Metro Bike Share launched in July of 2016 with 61 stations and approximately 700 bicycles in Downtown Los Angeles. Metro's 2017 bike share expansions extended service to the City of Venice, the Port of Los Angeles area, and City of Pasadena (who has since withdrawn from the program due to expense and utilization). The station-based system has grown to around 1,400 bikes that average approximately one ride per day (Metro Announces Launch Dates for Bike Share Expansions in Pasadena and the Port of Los Angeles, 2017). Angelenos have also had the choice of private systems; Lime, Spin, Jump and Ofo have all operated dockless bike share within LA. Several major private bike share providers in the United States, including Lime and Jump, have largely turned toward dockless electric pedal assist bicycles as their preferred model of delivering bike share service. Additionally, some companies that got their start as bike share vendors (including Lime, Jump, and Spin) have expanded or shifted their service and branding to scooter share. Lime, for example, has phased out e-bikes in a multitude of markets, including: San Francisco, St. Louis, Tacoma, Hartford, and several regions of Ohio (Russell, 2019). Spin went even further, replacing the entirety of its bike share operations with scooter share (About Spin, 2019). Furthermore, some companies that originated as ridehailing services (including Uber, Lyft, and Gotcha) have expanded to include dockless micromobility services in an attempt to provide a comprehensive package of shared mobility options (Siddiqui, 2018).

Breeze is a long-term bike share fixture in the City of Santa Monica, with over 60 lock-based bicycles and the ability to lock to standard bike racks. In September of 2018 the City once again expanded bike share options for residents and visitors with the approval of its joint e-scooter and e-bike program. In addition to the deployment of e-scooters, the program authorized Lyft and Jump (owned by Uber) to add 1,000 dockless electric bikes to the City's network.

The introduction of e-bike technology is known to stimulate longer bike share trips in studied urban markets. Cherry and Cervero's 2007 study of two major bike share markets in China found that riders, on average, rode e-bikes 9% farther than conventional bike share in Shanghai and 22% farther than conventional bike share in Kunming (Cherry & Cervero, 2007). Additionally, e-bikes are believed to make bike share systems more accessible to limited fitness and elderly riders. Early studies of e-bike ownership have revealed that purchasers of electric bicycles are disproportionately likely to be older adults. One report on North America's e-bike market found that 71% of owners included in the study were 44 years of age or older (MacArthur, Dill, & Person, 2014).

### **Scooter Share**

The residents of Los Angeles and Santa Monica were early adopters of scooter share in 2017. In June of 2018, Santa Monica's City Council decided to formalize and regulate the deployment of e-scooters with the approval of a 16-month Shared Mobility Pilot, which included the deployment of up to 2,000 e-scooters (fleets managed under the terms of the program utilize dynamic caps, which calculates allowable fleet size based on per unit utilization). The city ultimately selected four vendors to deliver the program, including: Bird, Jump, Lime, and Lyft (Scooter and Bike Share Services, n.d.).

Several months after the approval of regulated e-scooter share in Santa Monica, LA City Council approved a 12-month Dockless Mobility Pilot in September of 2018. To inform the program's development, the city issued 120-day conditional permits with a minimum fleet of 500 units and a maximum fleet cap of 3,000 bikes/scooters per



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operator (of which 50% must have electric assist) (LADOT, Dockless On-Demand Personal Mobility Conditional Permit, 2018). After studying the results of the 120-day conditional permit trial, the City awarded one-year permits to six vendors (Wheels, Jump, Lime, Spin, Bird, and Lyft) for a total of 5,000 e-bikes and 26,500 e-scooters. Of the approved scooter fleet, 14,000 units will be located in “Disadvantaged Communities”. An additional five vendors are currently under consideration for one-year permits, which could expand the city-wide fleets by an additional 2,170 e-scooters and 500 bicycles (Scooter and Bike Program: LADOT Expands Dockless Scooter and Bicycle Program to be Largest in Country, 2019).

### **Electric Vehicles (EV)**

With approximately 340,000 zero-emission vehicles, California has the most EVs on US roads. Given California’s current number of electric vehicles, Governor Jerry Brown’s goal of increasing the state’s EV fleet to 5 million zero-emission vehicles by 2030 (Executive Order B-48-18) came as a shock to many transportation organizations and professionals (Office of the Governor, 2018). None the less, electric vehicles are being purchased in record numbers. By some projections, EV sales grew by 81% in 2018 (partially attributable to the growing popularity of Tesla) after seeing a 45% increase in 2017 with an average annual growth pattern of 32% annually for the preceding five years (EV Sales Scorecard, 2018).

Electric vehicle technology will only become increasingly attractive with breakthroughs in battery technology that allow for more energy storage, shorter charging times, and less expensive electric vehicles. As EV fleet share expands, cities will need to build out charging infrastructure networks capable of accommodating growing demand. EV charging infrastructure has been installed on a piecemeal basis by various public and private agencies across LA, including the Bureau of Street Lighting (EV Charging Stations, n.d.), the Department of Water and Power (LADWP’s Electric Vehicle Charger Installed on Power Pole in Watts Likely the First in the Country, n.d.), and BlueLA. The City of Santa Monica also has a system of public and private charging ports available for EV owners, 85 of which are mapped by the City. Santa Monica’s partnership with the company ChargePoint features a unique waitlist program that enables EV owners to ensure a charging port is available before they drive up. Waitlisted drivers seeking a charging port at Virginia Avenue Park and on Montana Avenue can elect to receive text notifications when a spot is available and confirm to reserve their charging window (Office of Sustainability and the Environment, 2019).

### **Autonomous Vehicles (AV)**

After the addition of § 227.38 to title 13 of California’s state vehicle code, AV development firm Waymo received the first California state permit to test unmanned level 5 (fully-autonomous) vehicles in late 2018 (Shepardson & Sage, 2018). Under these updated regulations, technology developers must submit documentation of “the intended operational design domains” to the DMV and certify that the vehicle in question meets SAE’s specifications for a level 4 or 5 automated driving system and is capable of operating without a test driver. Testing firms must also provide written notification of planned driverless testing to the DMV, as well as the counties and municipalities it intends to test within (Title 13 § 227.38. Manufacturer’s Permit to Test Autonomous Vehicles That Do Not Require a Driver).

In recent months the Los Angeles City Council has expressed a desire to more actively shape state and federal legislation on AV technology. While Mayor Eric Garcetti does represent the City on a subject matter federal advisory committee, council hopes to see future legislation authorizing local government access to AV crash and disengagement data. In March of 2019, Los Angeles City Council voted to apply for the FHA’s Automated Driving System Demonstration Grants to secure up to \$10 million in funding for data collection and analysis, safety

## Technology Integration Memo

evaluation, rulemaking, and collaboration on the topic of AV deployment (California News Wire Services, 2019). Similarly, the City of Santa Monica is also in the early stages of defining community values and organizational priorities. This past June the City hosted its first panel discussion of subject matter experts to postulate what AV deployment might mean for traffic congestion, public safety, jobs, and environmental sustainability in Santa Monica. Moving forward the City plans to work with a consultant team to assist in engaging the community on major changes relevant to AV testing and deployment (Wedig, 2018).

### **Microtransit**

Microtransit may be the next frontier of new mobility in the Los Angeles metropolitan area. LA Metro is in the midst of developing its Microtransit Pilot Project, which will enable riders to hail on-demand Metro shuttles to pick-up and drop-off at “virtual stops” within designated service zones yet to be identified. Additionally, LA Metro’s smaller-scale MOD Sandbox partnership with private microtransit provider Via launched in early 2019. This 12-month program offers shared on-demand rides to three select transit stations (Artesia, El Monte, and North Hollywood) at a more affordable rate than traditional ridehailing service r ride if the passenger has a TAP card. LIFE (Low Income Fare is Easy) program members are eligible for free fare to these three locations. The program is currently only \$1.75 pe (LA Metro Launches Partnership with Via to Provide On-Demand Service to Three Busy Transit Stations, 2019).

## Data Considerations

### **Mobility Data Specification (MDS)**

Over the course of planning and developing LA’s Dockless Mobility Pilot, Mobility Data Specification (MDS) emerged as the preferred data and API standard for collecting, sharing, and storing information regarding bike share and scooter share rides across Los Angeles and Santa Monica. MDS provides the City and mobility providers with the platform and format necessary to communicate data regarding the location and status of micromobility fleets in real time. This specification includes data regarding trip origins, destinations, timestamps, active fleet size, trip duration, trip distance, and more (LADOT, Mobility Data Specification Information Briefing, 2018). MDS data is not directly linked to personal identifier information (such as name, home address, or contact information); however, technological privacy advocates have expressed concern that the ride history linked to each user’s unique device identifier (UDID) could, in theory, be used to identify specific individuals under certain circumstances or make inferences about a rider’s organizational affiliations if access to the raw data isn’t adequately secure (Duarte & Jerome, 2018).

## Anticipating the Next Wave of Innovation

Anticipating future transportation conditions during this period of shifting market preference and advancing technological development is a challenge local jurisdictions across the globe are confronting. While no one can predict what the future of personal mobility will look like in the Los Angeles metropolitan area with complete certainty; local and regional jurisdictions have the ability to deliver efficient, thorough, and informed responses to changing conditions. The following core principles will provide a framework for interpreting the outcomes of the bike share data analysis and proposing next steps and future investments:

**Flexibility:** Commuters are increasingly choosing alternative transportation options over personal vehicles. The surging popularity of shared mobility and micro mobility travel options may be reflective of several key trends among younger age cohorts, including: the decreasing popularity of car ownership/driving and the increasing popularity of dense urban living conditions. On a per capita basis,

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Millennials are almost 30% less likely to purchase a car than Generation X (Cortright, 2015). Furthermore, Generation Z may be less interested in personal vehicles than teenagers of the past. While 80% of teenagers over the age of 18 had a driver's license in the 1980's, only 60% of teenagers over the age of 18 possess a driver's license in recent years according (Sivak & Schoettle, 2016). Related to shifting transportation preferences, real estate market analysis also reveals that young adults prefer walkable urban neighborhoods to lower density suburban and rural life (Dill & Morris, 2015).

Adapting to these radically changing market preferences and transportation conditions will be best served by re-evaluating professional opinions as more information becomes available. Professionals should keep in mind that the new mobility best practices of tomorrow are being pioneered today. Conducting in-house pilot programs and staying up to date on the results of other pilots will facilitate this collective learning process across the transportation industry. Furthermore, sharing relevant data with partner/stakeholder organizations may stimulate better regional planning and decision-making to benefit residents and commuters of the Los Angeles metropolitan area.

**Data collection and analysis:** Defining project objectives and organizational values early in the pilot process will help identify specific data required. Incorporating specific data definitions into partnership agreements will maximize the educational value of each pilot and culminate in more informed decision making.

**Scaleability:** Small pilot partnerships may want to consider how the program might expand if it proves successful with the public. Is a successful program expected to expand its service area, add more units, serve a more diverse population, or is the goal of a successful program strictly to collect data to support effective decision-making?

**Modal integration:** While much is still uncertain about the future of personal mobility, it is clear that our ecosystem of transportation options is expanding. Current trends outlined in this paper indicate that the commuters of tomorrow will have more readily available modes at their disposal, denser residential environments, and fewer personal cars than previous generations. In an environment of waning personal car ownership and increasingly diverse and shareable mobility options, multimodal trips will likely become more prominent than ever. Making transfers as seamless as possible between biking, walking, transit, and shared modes that extend those networks will be instrumental in encouraging sustainable transportation behaviors that reduce the influence of single occupancy vehicles. This integration between modes and service models will be both geographic and virtual.

In a geographic sense of the word, integration will mean physically consolidating modes in mobility hubs and high-volume destinations. Physical integration also means public agencies will need to adapt and evolve traffic management principles to reduce new modal conflict that emerge between pedestrians, conventional cyclists, micro-mobility service users, and autonomous vehicles.

In a virtual sense of the word, integrating technology-based modes may mean public or private providers develop integrated multimodal mobility apps aimed at providing trip planning, ride-hailing, check-out and payment processing services to travelers that works across transit, bike-share, ride-hailing, scooter-share, car-share, microtransit, and business models yet to emerge.

## Additional Resources on New Mobility in Los Angeles

## Technology Integration Memo

- City of Los Angeles Mobility Plan 2035
- Sustainable City pLAn (2018 update)
- Los Angeles Shared Mobility Climate Equity Report
- Regional Bikeshare Implementation Plan for Los Angeles County
- Charge Ahead California Initiative: Senate Bill 1275

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# APPENDIX B

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**Statistical Analysis Methodology and Findings**



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## Memorandum

**Date:** May 17, 2019  
**To:** Southern California Association of Governments  
**From:** Jean Crowther and Mike Sellinger, Alta Planning + Design  
**Re:** **SCAG Bike Share Statistical Data Analysis Results**

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The consultant team completed an analysis of available data provided by SCAG, LA Metro, and City of Santa Monica. The purpose of the task is to understand overall system performance, ridership and geographic implications of each system. The analysis considers:

- Equipment inventory and types, including the number of bicycles and stations per phase of implementation
- Station and bicycle performance
- System balancing
- Theft and vandalism
- Customer Service
- Ridership
- Built environment factors

The analysis is complemented by information gained through Agency and Vendor interviews with questions related to many of the same topics, as well as through user surveys and focus groups. The consultant team will work to identify influential events and decision points that may have influenced performance.

Based on the cumulative results of all findings, the consultant team will work with SCAG, the City of Santa Monica, and Metro to develop context-specific performance measures and develop recommendations for optimizing bike share usage in the future.

The following provides a high-level summary of key takeaways related to system performance.



## Summary Findings

Statistical analysis of usage data from the LA Metro Bike Share and Santa Monica Breeze programs yielded the following findings:

- Metro has shown steady overall increase in both cumulative trips and also trips per bike per day (t/b/d), since launch
- Breeze showed consistent strong performance until April 2018, at which point the system pivoted to a steady decline in both cumulative trips and trips per bike per day (t/b/d)
  - Trips by Casual users (Pay-as-you-go) declined at a faster rate than Member users since April 2018
- Both systems show consistent spikes at morning and afternoon commute times for Member users, but not for Casual users
  - This is true for all types of Breeze Member users - including Students and Bike Share for All
  - Metro also shows an additional spike in usage at lunch time for Member users (but not Casual)
- Breeze shows a consistent spike in usage during summer months
  - Breeze's Casual users (Pay-as-you-go) are major contributors to the spikes in summer months
  - Metro's Casual users (Walk-up) and Member users track closely during summer months until 2018, when Casual users showed a higher spike
- Member user trips are shorter than Casual user trips for both systems
  - Metro Casual user trips are more than triple the duration of Member user trips
  - Breeze Casual user trips are more than double the duration of Member user trips

In evaluating the relationship to land use context, the project team's analysis found the following factors are correlated with the number of trips taken from a station in the Metro system (the strength of the correlation is noted in parenthesis):

- Employment density (strong)
- Population density (moderate)
- Proximity to light rail or bus rapid transit (moderate)
- Bike share stations within a half mile (strong)
- The number of docks at the station (moderate)

For the breeze system, the following factors are correlated with the number of trips taken from a station (the strength of the correlation is noted in parenthesis):

- Employment density (moderate)
- Bike share stations within a half mile (moderate)

The project team found no correlation between regular bus service and trips in either system.

## Bike Share System Data Analysis

### Trips Analysis Methodology

Bike share trips were analyzed for Metro Bike Share and Breeze Bike Share from the system's respective launch dates through the end of 2018. Metro Bike Share launched in July 2016 and Breeze Bike Share Launched in January 2016. Trips were removed from the analysis for both Breeze and Metro if they had any of the following qualities:

- Missing trip ID numbers
- Negative time value
- Trips less than 30 seconds
- Missing latitude/longitude data
- Trips originating/ending outside service area or within known water bodies
- Missing trip begin/end date
- Trip end date before begin date
- Trip end or start date outside of the study time period

The Metro trip analysis also removed all trips starting at stations in Pasadena.<sup>1</sup> For the Breeze analysis, trips were removed that began closest to hubs in West Hollywood, Beverley Hills, or UCLA<sup>2</sup>. Overall, 583,260 on Metro Bike Share and 720,513 trips on Breeze Bike Share were included in the analysis.

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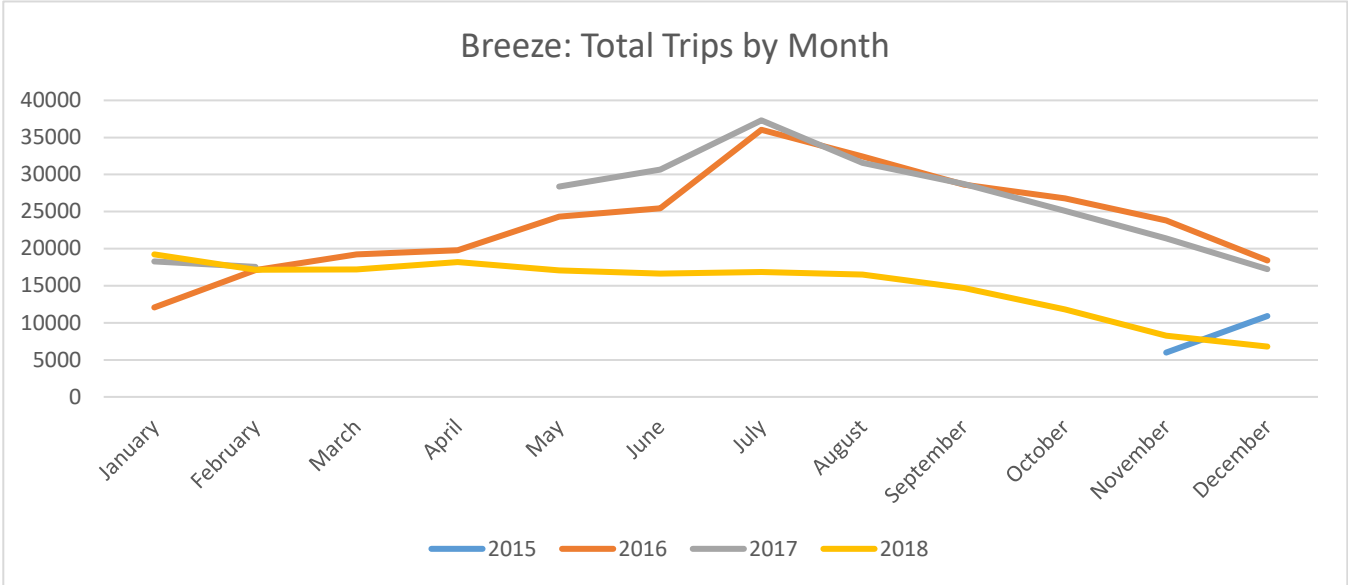
<sup>1</sup> Pasadena participated in the Metro Bike Share program from July 2017 to August 2018. The jurisdiction is not included in the study due to a lack of multi-year data relevant to the trends and performance factors under consideration.

<sup>2</sup> While these communities participate in the Bike Share Connect program linked to Breeze, these communities are not included in the study analysis.

### Total Trips

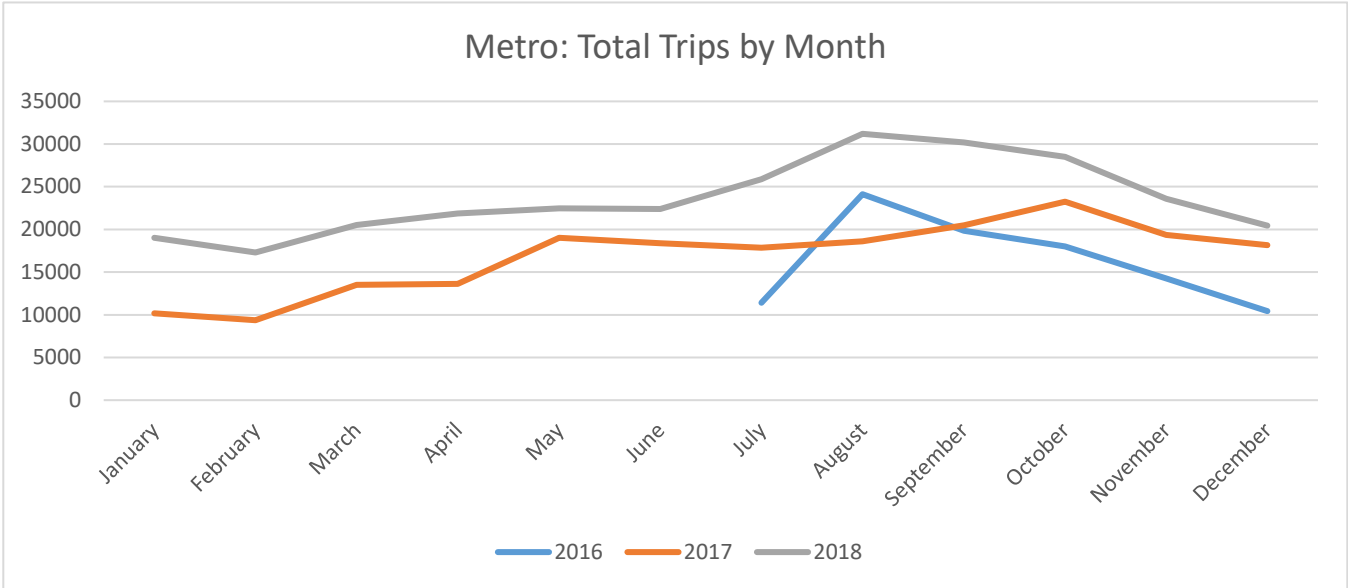
Breeze:

There have been between 6,800 and 37,300 trips per month on Breeze Bike Share. Trips on the system peaked in Summer 2016 and 2017. From May through December of 2018, the number of bike share trips has been lower than in the preceding two years. December 2018 had the lowest number of trips of any month.



Metro:

Since its launch, Metro Bike Share has averaged between 10,000 and 31,000 trips per month. In general, monthly tips have increased year over year. August and September 2018 had the highest number of trips with both over 30,000 trips.



### Trips Per Bike Per Day

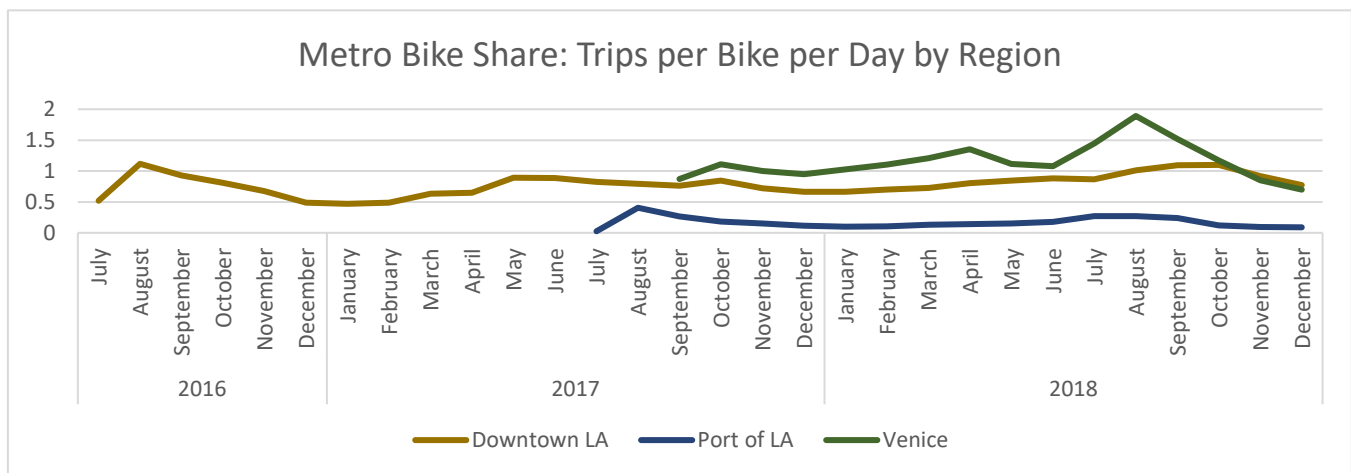
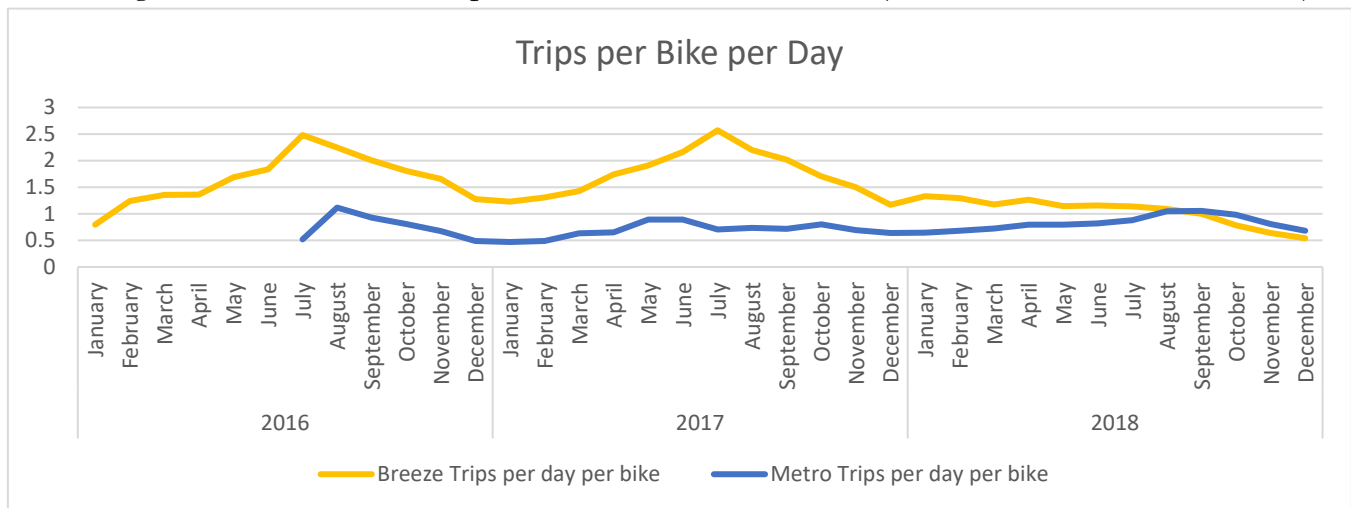
Breeze:

Trips per bike per day (t/b/d) have ranged from an average of 0.5 to 2.6 t/b/d over the analysis period. In both 2016 and 2017, t/b/d remained over 1.5 from May through November, with both years peaking in July with approximately 2.5 t/b/d. In 2018, t/b/d remained steady from January through April, before declining over the rest of the year. The major spikes in t/b/d in Summer 2016 and 2017 were due to an increase in pay-as-you-go trips. The drop-off in 2018 was consistent across casual users and all of the different membership types.

Metro:

Trips per bike per day (t/b/d) have ranged from an average of 0.5 to 1.1 t/b/d over the analysis period. Taking seasonality into account, t/b/d have grown slowly but steadily. In 10 of 12 months, trips per bike per day were higher in 2018 than 2017. Trips per bike per day vary by region within the Metro system, with the Port of LA seeing a much lower usage rate than the other regions in the system. Population, employment, and station density are much lower surrounding the Port of LA stations, compared to Venice and Downtown LA (see Land Use Context section below).

Region	Trips per Bike per Day
Downtown Los Angeles	0.8
Port of Los Angeles	0.2
Venice	1.1



### Time of Day

Breeze:

Breeze usage varies throughout the day, but over 90% of trips occurred between 7 am and 9 pm. On weekdays, members and casual users exhibit different travel patterns. Members show a commute pattern, with spikes in usage from 8-10 am and 5-7 pm. All four membership options offered by Breeze (annual, monthly, bike share for all, and student) exhibited a similar commute pattern. Student and bike share for all memberships are discounted memberships available to college students and people with low incomes, respectively. Casual usage of the system increased throughout the day with a sustained peak from noon-7pm. On the weekends, members and casual users

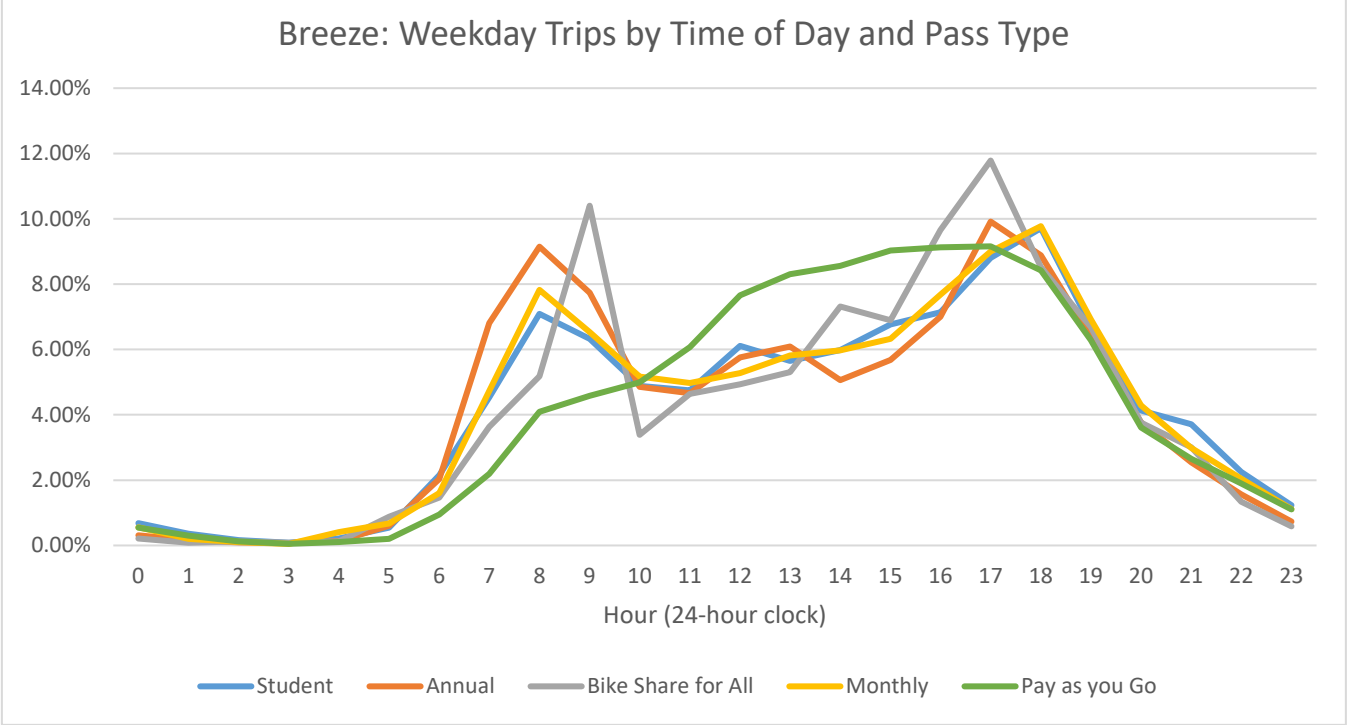
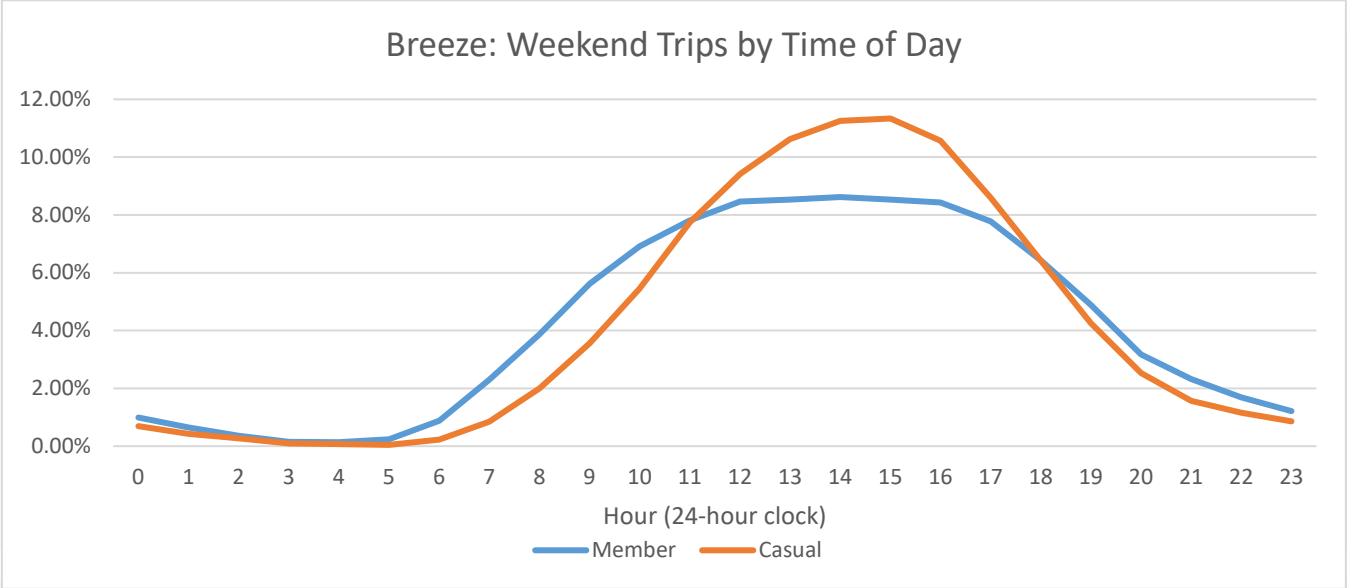
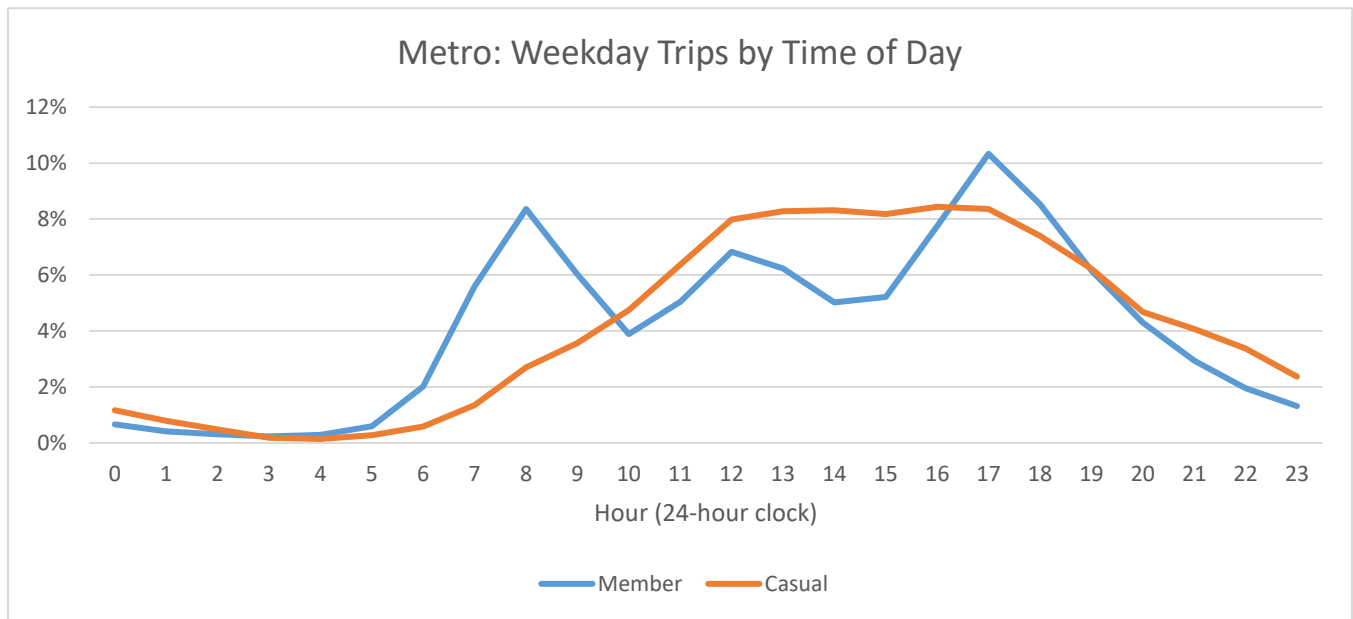
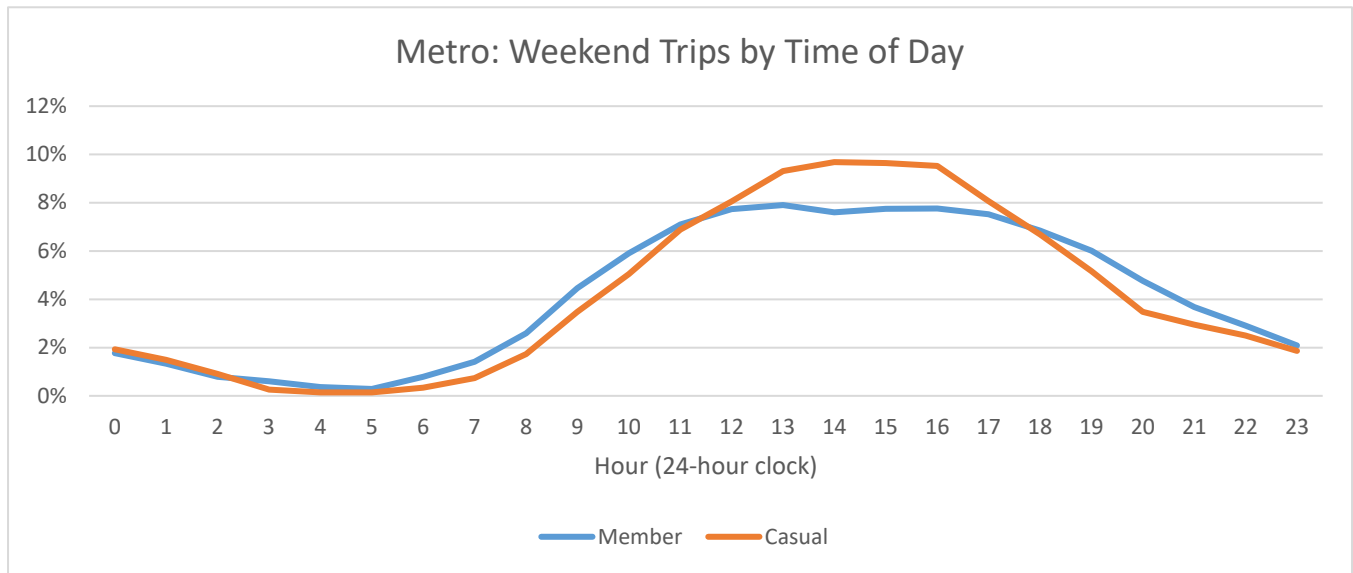


exhibit similar behavior with the higher number of trips occurring between 2-4pm. However, casual users made a higher proportion of trips between the hours of noon and 5 pm.

Metro:

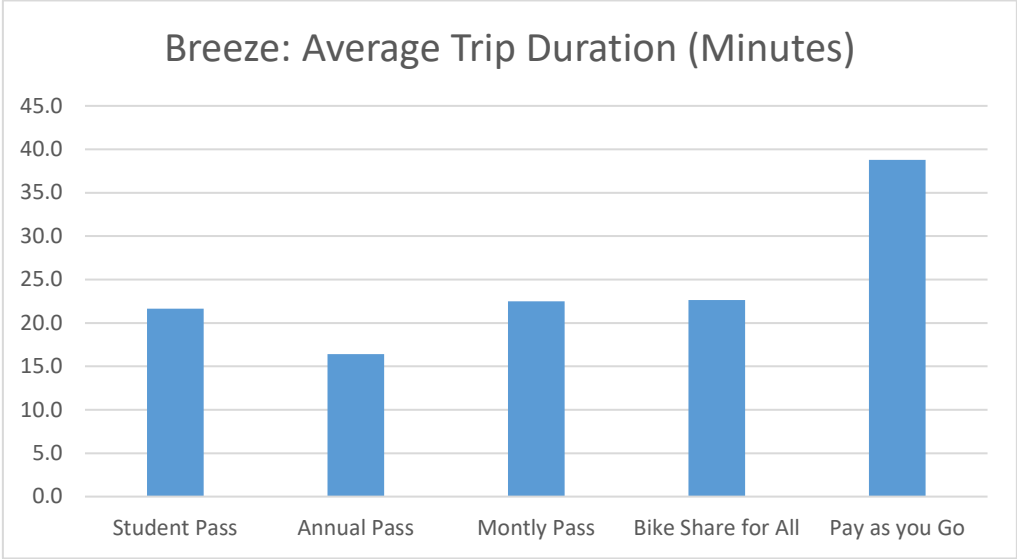
Metro Bike Share usage varies throughout the day, but over 90% of trips occurred between 7 am and 10 pm. On weekdays, members and casual users exhibit different travel patterns. Members show a commute pattern, with spikes in usage from 7-10 am and 4-7 pm. There was also a smaller spike in usage around lunchtime. Casual usage of the system increased throughout the day with a sustained peak from noon-5 pm. On the weekends, members and casual users exhibit similar behavior with the higher number of trips occurring between 2-4pm. However, casual users made a higher proportion of trips between the hours of 1 pm and 5 pm.



### Trip Duration

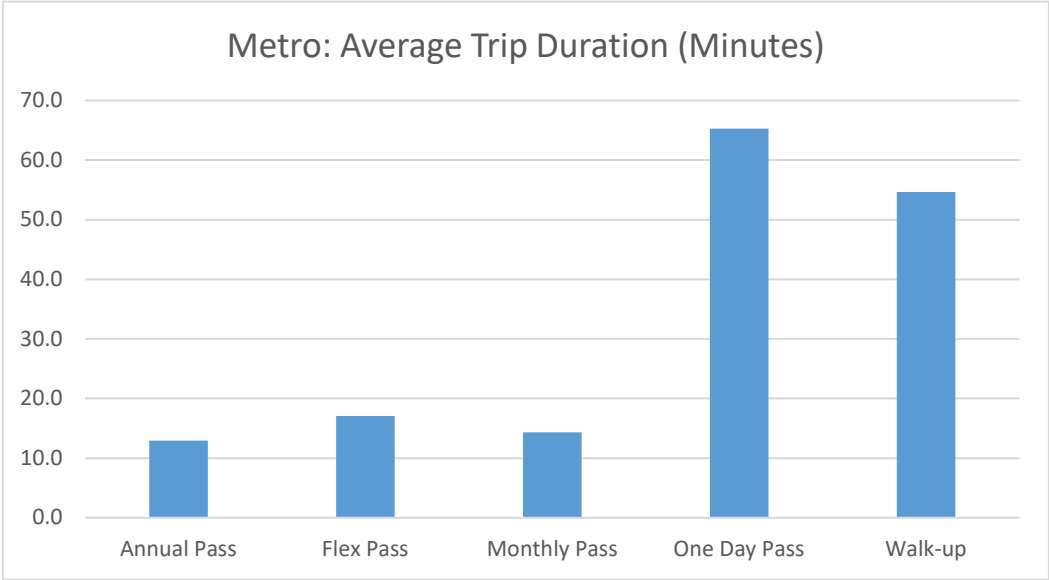
Breeze:

Breeze members take far shorter trips than casual users of the system. Members average 19 minutes per trip while casual users average 39 minutes. Amongst the different members, annual members take the shortest trips with an average of just over 15 minutes per trip.



Metro:

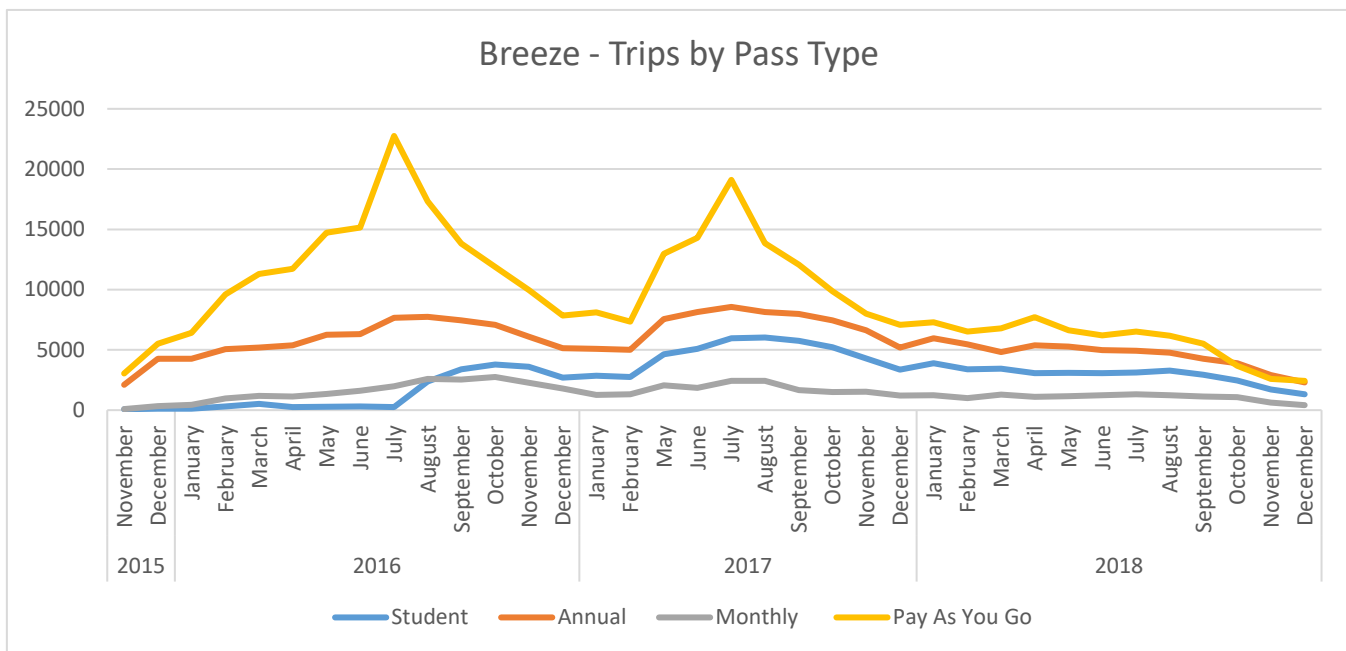
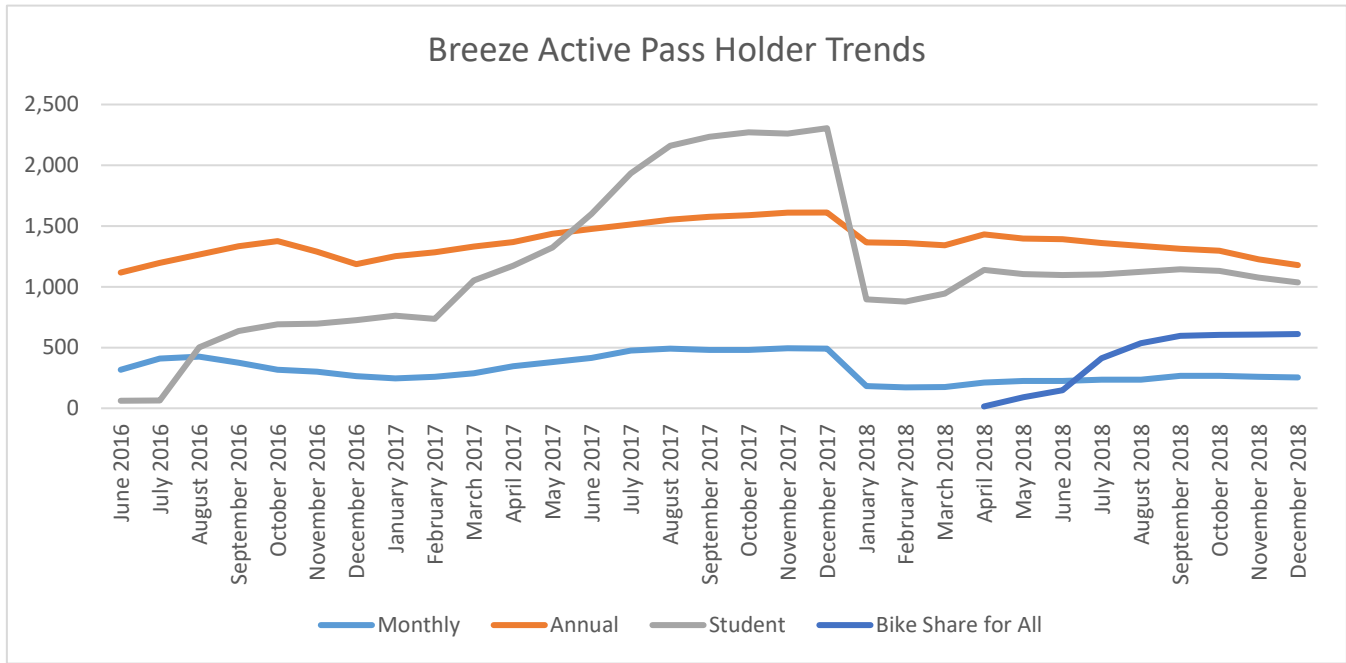
The average casual user trip on Metro Bike Share is over three and a half times longer than the average duration of a member trip. Members average 14.5 minutes per trip, while casual trips average 56 minutes.



### Pass Data

Breeze:

An analysis of active passholder accounts revealed that annual passes have generally been consistently more popular amongst subscribing members than monthly options. Subscriptions to annual, student, and monthly membership plans all saw decreases beginning in December of 2017, with the most radical decrease occurring in student passes.

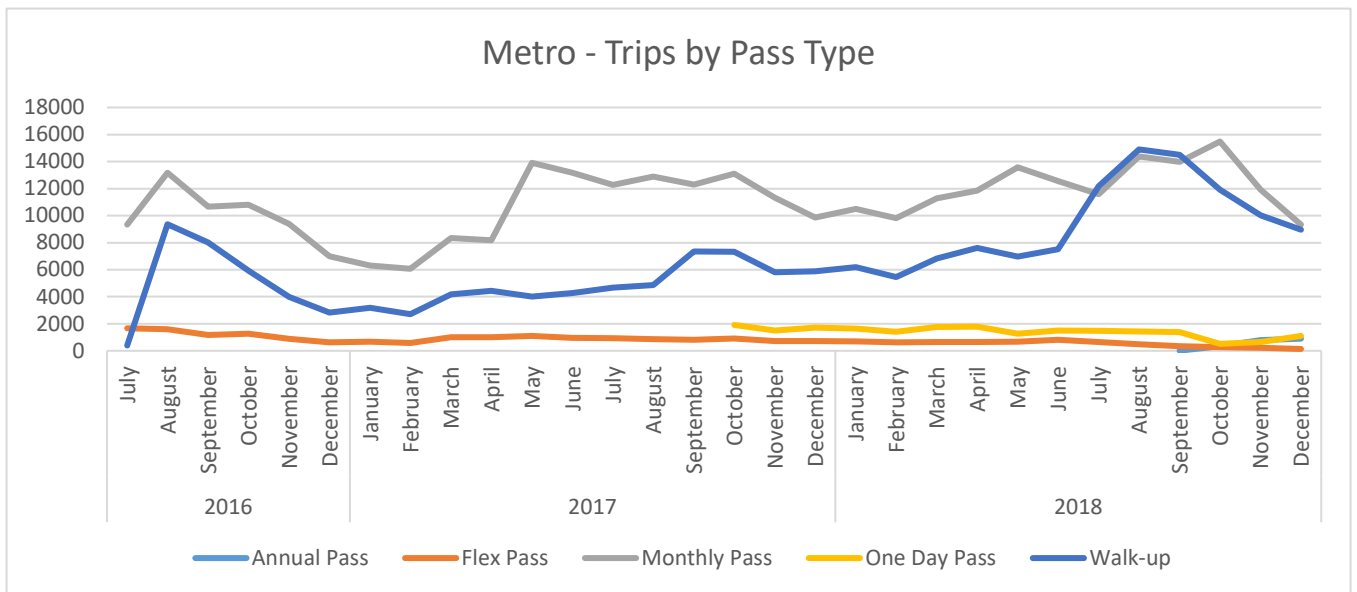
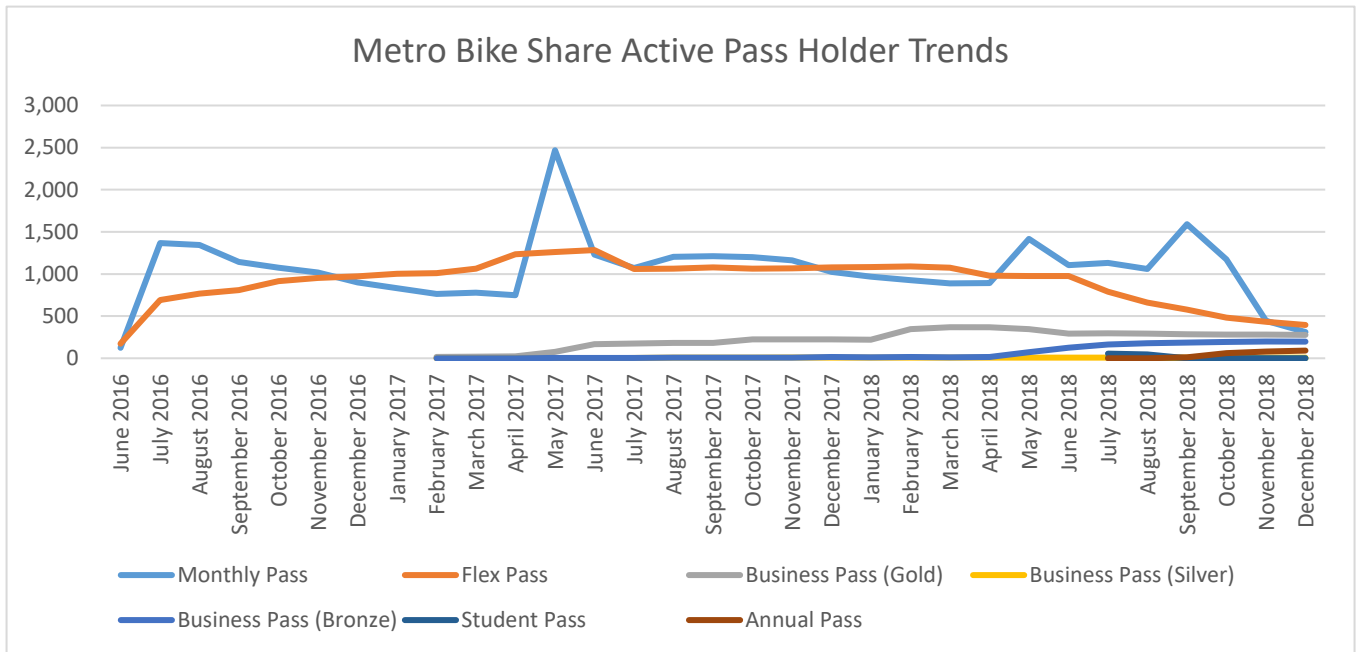




Trips by the three membership types (annual, monthly, and student) have generally followed the same usage patterns. Student member trips jumped from just to 262 in July 2016 to over 3,000 in September 2016, surpassing trips by monthly members. The drop-off in 2018 was consistent across all of the different membership types.

Metro:

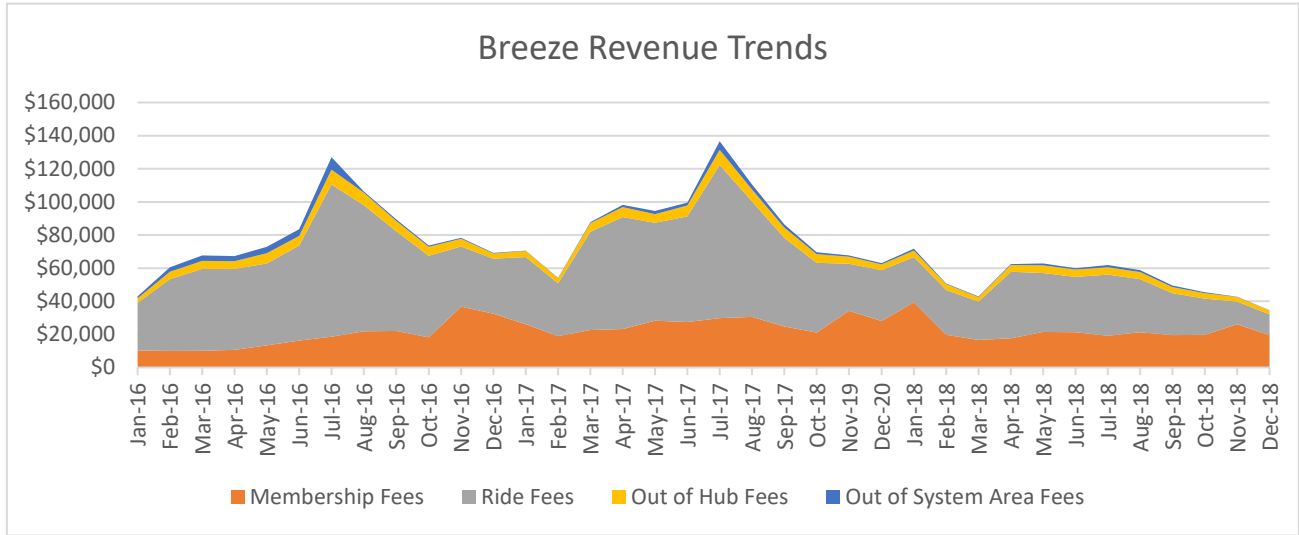
The majority of trips on Metro Bike Share come from monthly pass holders. The most popular months for trips by members have been May through October. Active pass holder trends reveal that monthly passes and flex passes are Metro Bike’s bestselling membership plans. Monthly pass sales experience spikes in sales during certain months, followed by a notable increase in membership lapses the subsequent month. This suggests many who choose to try monthly membership during these spikes only do so for a single month. Flex pass membership increases and decreases at a more gradual and stable rate than monthly passes due to the annual nature of renewal.



## Revenue Data

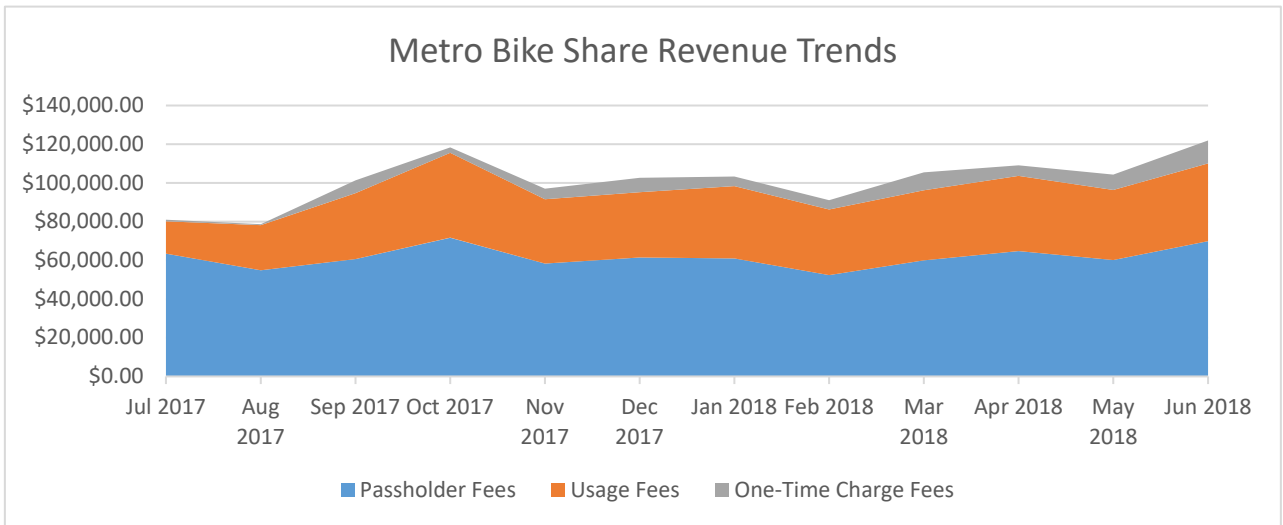
Breeze:

Breeze’s 2016 and 2017 fiscal years saw similar revenue patterns, with summer peaks centered on the month of July and winter drop-offs. Since Breeze’s launch in 2016, a majority of the revenue generated from the system has historically come from ride fees. The 2018 fiscal year has deviated from this pattern drastically. July 2018’s total revenue represents less than half that of July 2017. This drop-in revenue is reflective of substantial decreases in ride fees, which made up only 56% of revenue generated in 2018 in comparison to the 63% it contributed in 2017 and 69% it contributed in 2016. Membership fees, out of hub fees, and out of system area fees have stayed far more stable.



Metro:

Metro Bike has experienced a gradual increase in revenue over the course of the 2018 fiscal year, with peaks in the fall and early summer. Passholder fees represented 61% of revenue generated in 2018 while usage fees represented only 34%. Fiscal Year 2019 revenue data is not displayed on this chart due to the consolidation of membership fees and usage fees paid by monthly passholders in FY 2019 operations reports.



## Land Use Context

The consultant team performed a statistical analysis to understand variation in station performance within the Metro and Breeze bike share systems. The number of average daily trips beginning at each bike share station was analyzed in relation to the variables displayed in Table 1. Land Use Variables. For the Breeze system, trips were joined to the nearest hub, if they began within 1,000 feet of a hub. Trips not beginning within 1,000 feet were excluded from this analysis.

Table 1. Land Use Variables

	Breeze Data Source	Metro Data Source
Population Density	US Census Bureau: American Community Survey	US Census Bureau: American Community Survey
Employment Density	US Census Bureau: Longitudinal Employer-Household Dynamics	US Census Bureau: Longitudinal Employer-Household Dynamics
Transit	Metro, City of Santa Monica	Metro
Bike share stations	City of Santa Monica	Metro

Breeze:

For the breeze system, the following factors are correlated with the number of trips taken from a station (the strength of the correlation is noted in parenthesis):

- Employment density (moderate)
- Bike share stations within a half mile (moderate)

There was no significant correlation between trips and population density or proximity to transit service.

Metro:

The following variables were found to have a significant correlation with the number of daily trips beginning at a station:

- Employment density (strong positive correlation)
- Population density (moderate positive correlation)
- Proximity to light rail or bus rapid transit (moderate positive correlation)
- Bike share stations within a half mile (strong positive correlation)
- The number of docks at the station (moderate positive correlation)

There was no significant correlation between regular bus service and trips.

Table 2. Variation in Station Performance by Land Use (Pearson Correlation Coefficients)

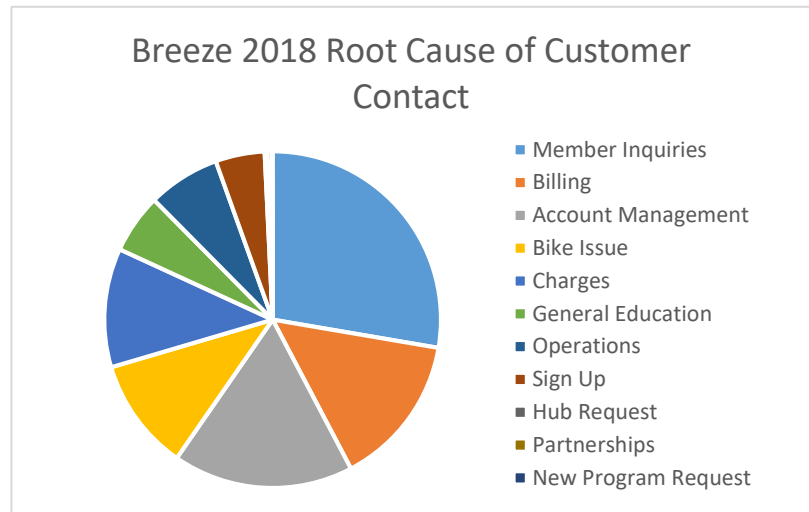
System	Population Density	Employment Density	Rapid Transit	Bus Service	Stations within ½-mile	Number of docks
Metro	.315*	.568*	.383*	-.054	.521*	.326*
Breeze	.190	.389*	.179	.008	.498*	.090

\* Correlation is significant at the 0.01 level (2-tailed).

## Customer service Data

Breeze:

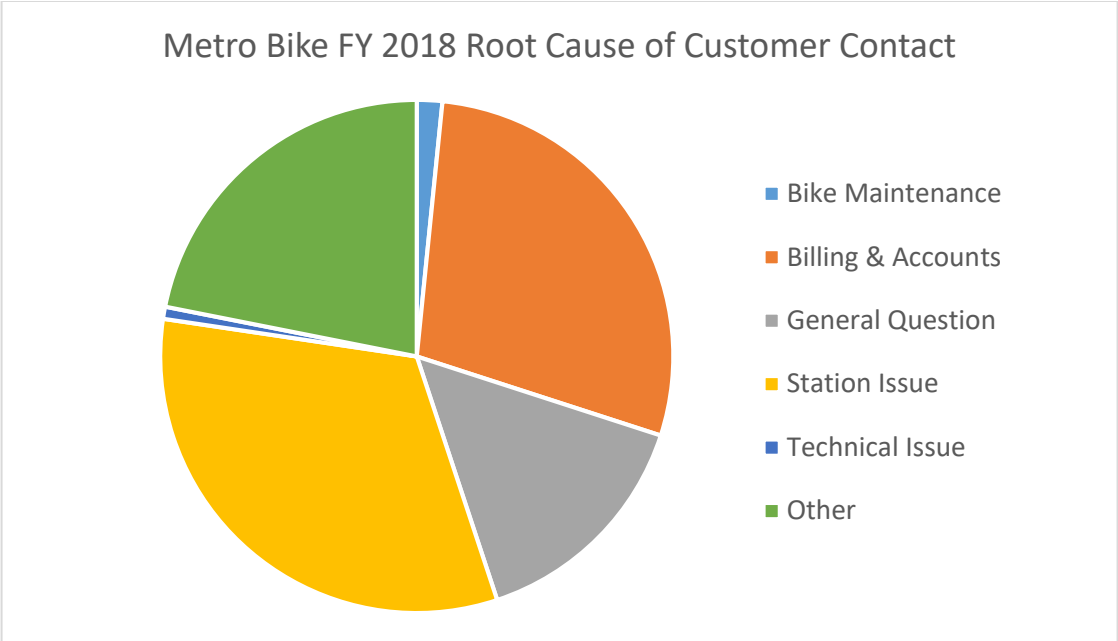
Over the course of 2018, Breeze’s customer service center responded to over 7,000 inquiries. Of these instances, inquiries from members regarding their membership represented the largest portion of customer interactions (28%). Account management (17%) and billing inquiries (15%) were also major causes for customer contact. Issues with bicycle functionality represented nearly 11% of customer service center contacts.



Metro:

In the 2018 fiscal year customer support staff received over 13,000 calls, nearly 2,000 emails, and over 1,000 texts. Analysis revealed station issues and billing and accounts inquiries were the two most prominent reasons riders needed assistance. Of station issues reported, 86% were regarding difficulties with docking bicycles. Billing and accounts inquiries were primarily regarding account cancellation (60%) and charge clarification (23%). Accounts that were cancelled through customer service cited a number of motivating factors, the most common of which was lack of use (12%). Tourists (5%), customers moving (5%), and seasonal use (3%) were also reported more frequently than other factors. Less than 1% of cancelling customers cited poor service as a motivating factor in cancelling their account.

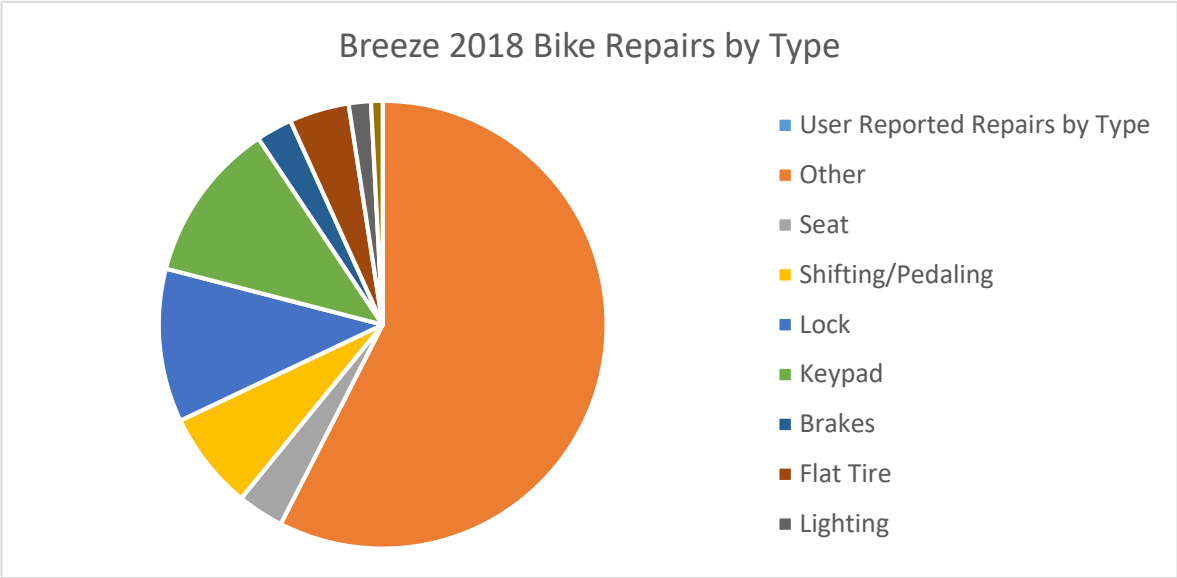
An average of 97% of customers reporting these issues were satisfied with the support they received.



**Operations Data**

Breeze:

Breeze bikes also had a diversity of maintenance requirements, with locks, keypads, and shifting/pedaling being some of the more common causes for repair. Over half of logged repairs were categorized in a miscellaneous “other” category, which could include aesthetic repairs to a bicycle and repairs to auxiliary parts (such as kickstands, fenders, baskets, etc).

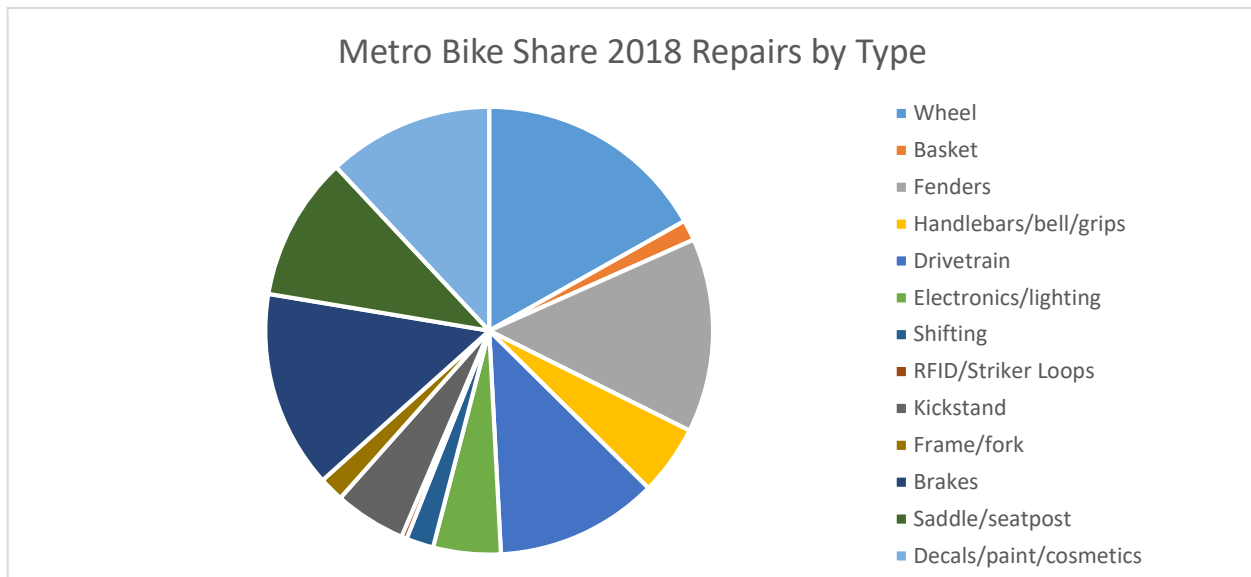


Metro:

Metro Bike Share met or exceeded all performance measures for system operations and services in 2018. This included:

- Resolving critical system issues within 6 hours of reporting
  - Target Rate: 95%
  - Actual Rate: 97%
- Resolving non-critical system issues within 24 hours of reporting
  - Target Rate: 95%
  - Actual Rate: 96%
- Percentage of fleet in service
  - Target Rate: 95%
  - Actual Rate: 97%
- Percentage of bicycles meeting or exceeding cleanliness expectations
  - Target Rate: 90%
  - Actual Rate: 99%
- Percentage of stations meeting or exceeding cleanliness standards
  - Target Rate: 90%
  - Actual Rate: 96%
- Removal of offensive graffiti, scratches, and stickers from stations and bicycles within 24 hours of reporting
  - Target Rate: Not Defined
  - Actual Rate: 100%
- 15-minute complaint resolution for phone calls
  - Target Rate: 85%
  - Actual Rate: 93%
- 24-hour complaint resolution for emails
  - Target Rate: 85%
  - Actual Rate: 96%
- Percentage of time stations or adjacent stations were available during peak hours
  - Target Rate: 90%
  - Actual Rate: 100%

In addition to meeting the above service provision goals, an analysis of operations data revealed that Metro Bike receive regular inspection. In 2018 alone, Metro Bike units received over 15,600 monthly inspections. During this period of time 351 bikes received annual refurbishment and 8,226 bikes received repair for damage. Damaged bikes had a diversity of issues, with wheels, paint/decals, brakes, fenders, shifts, and drivetrains being among the more common causes for repair.



## Pass Holder Demographics

### Breeze:

Breeze passholder demographic data was not available for analysis at the time of the study. However, we know that the Bike Share for All passes, a program intended to provide bike share access for low-income community members, make up 20% of all Breeze members, but only 3% of member trips (as of December 2018).

### Metro:

An analysis of Metro Bike Share pass holder demographics was conducted to better understand what populations currently use the system. The analysis found that passholders were mostly likely to be white, male, in their 30's, and earning \$95,000 or more annually.

Across the 2017 and 2018 fiscal years, pass holding members were disproportionately white. During this period of time white users represented 51% of pass holding members despite the fact that non-hispanic white residents only make up 28% of the city's population according to the US Census Bureau. Similarly, Asian riders made up 18% of pass holding members, while representing 11% of Angelenos. On the other hand, Black and Latino groups were underrepresented in the demographic data. Latino users represent 49% of Los Angeles residents, however, comprised just 19% of Metro Bike passholding members. Black users made up just 5% of pass holders, while making up 9% of Angelenos.

On average, 64% of pass holding members identified as male at any given time across the 2017 and 2018 fiscal years, while only 36% of pass holders identified as female.

Adults between the ages of 20 and 39 represented over 58% of pass holders, while 90% of pass holders fell between the ages of 20 and 49. Few pass holding members were in their teens or senior years. Just 6% of pass holders during this timeframe exceeded the age of 49, while only 4% were under the age of 20 (riders are required to be at least 16 years old to use the system).

Demographic analysis shows that Metro Bike pass holders were overwhelmingly high-income earners. Approximately 55% of pass holding members earned an annual income of \$95,000 or more. The second most prevalent income category, \$70,000 to \$95,000, represented 15% of pass holders. Users making less than \$25,000 per year (all of whom would meet HUD's "Very Low Income Level" definition for single workers in LA County) made up 8% of pass holders. Middle income populations also represented a comparably small portion of pass holders. Pass holders earning median income for Los Angeles (\$55,909) plus or minus \$5,000 represented around 7% of pass holders.

The demographic trends highlighted through the data analysis process may warrant a more comprehensive examination of barriers to bike share entry for women, ethnic minorities, and middle to low income populations.

## Trip Patterns

The following maps display the most popular trips between stations or hubs<sup>3</sup>. Thicker lines indicate more frequent trips.

In Santa Monica:

- The top five most frequent trips are between stations along the beachfront
- The most popular trips are either between beachfront stations or between downtown stations, but not between downtown and the beach.
- Seven of the top twenty-five trips start or end at Arizona Street and 4th Street
- The most common downtown trip is between Colorado Ave and 17th St, and Santa Monica College at 17th St.

In Venice:

- Nine of the top eleven most popular trips start or end at the Downtown Santa Monica Expo Line and are between Los Angeles and Santa Monica
- The top two most popular trips start or end at the Downtown Santa Monica Expo Line Station and locations along Venice Beach.
- Other popular trips are 1) between stations along Rose Avenue and 2) between inland centers of activity and Venice Beach

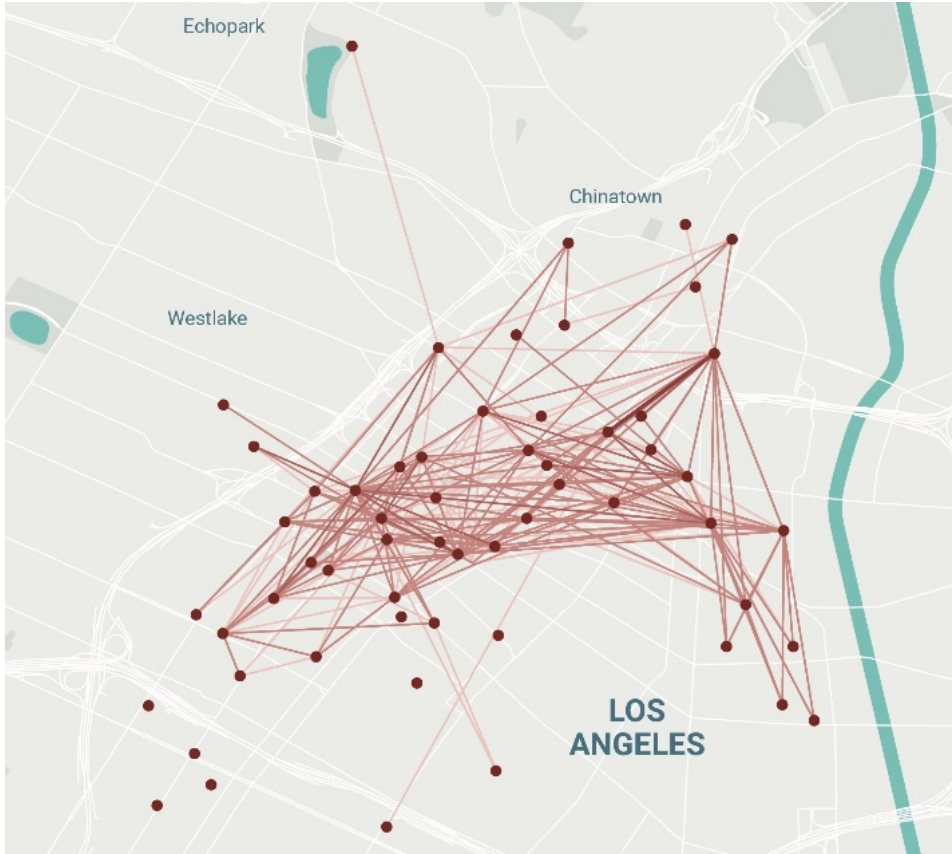
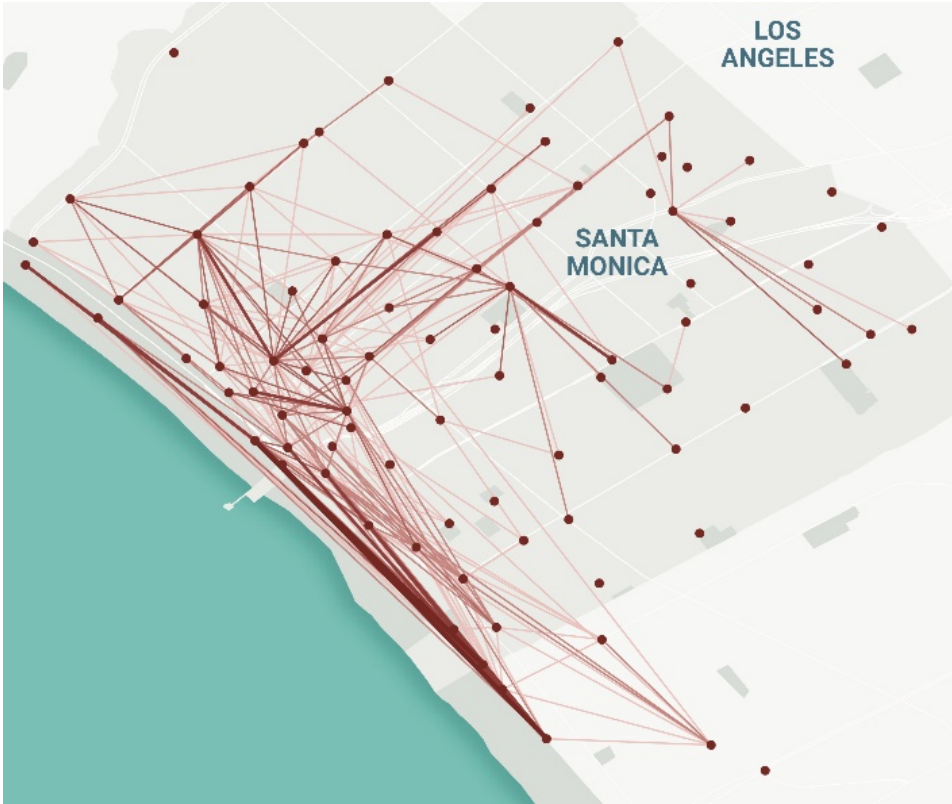
In Downtown LA:

- The most common trip is between Union Station and 1st and Main St
- The next most popular trip is between the stations at 7th and S Flower Streets and 7th and S Spring Streets and is:
  - Half as frequent of the most popular one
  - At least twice as frequent as every other trip
- Many of the most popular trips are circulating internally within the Financial District near Pershing Square
- A number of the most frequent trips either start or end within the Arts District near E 4th and S Alameda Streets and connect to Downtown to the west (linking district to district rather than circulating internally)

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<sup>3</sup> Breeze trips were joined to the nearest hub, if they began within 1,000 feet of a hub.







# APPENDIX C

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Agency & Operator Interview Questions

# LA Metro Bike Share Analysis

## *Agency and Vendor Interviews*



March 1, 2019

### 1. Purpose of Interviews

In December 2018, SCAG kicked-off a study to analyze data and information related to Metro Bike Share and Santa Monica Breeze bike share systems. The goal is to understand conditions that have supported bike share program usage, identify impediments to the program's success, and develop recommendations that will support bike share growth regionally.

As part of this project, Alta Planning + Design is conducting four interviews, one with each bike share operator and one with each agency, to identify lessons learned related to the launch and operation of each system.

### 2. Interview Questions

The following are the full range of interview topics to consider during the one-hour conversation. The questions are organized into 3 themes; new mobility context, workflows and communication, and potential actions. Not all interviews will cover all questions and the conversation will guide how much time to spend on any given topic. Our goal is to listen and ensure you have the time and format needed to share a wide range of helpful insights.

#### Agency and Vendor Interview Questions

- 1) Please describe the duration of time, study process, and planning that went into Bike Share system design and decision making.
- 2) How many Bike Share units were deployed at the program's advent? Did you need to increase or decrease fleet size as the program went on? If so, why?
- 3) What type of equipment does your program utilize? Are Bike Share units station based or dockless? Do they utilize integrated locks that allow them to park at standard bike racks? Does your system contain e-bikes or ADA bikes? If so, what portion of your fleet falls under these categories?
- 4) Describe the coordination and relationship building process your organization underwent with other public agencies/vendors to plan and implement Bike Share. What successes and challenges has your organization experienced communicating with project partners?
- 5) Has the Bike Share vendor met pre-established performance criteria? Are system rebalancing, bicycle maintenance, and cleanliness expectations being met?
- 6) How many rides per unit per day does the Bike Share system average? Is this in line with City expectations? If not, have project partners established a strategy for increasing ridership?
- 7) Describe the program's fare structure and payment methodology. What, if any, additional options are available for prospective riders without smartphones or credit cards? Are there reduced fare options for low-income riders?

- 8) Does your organization track rider demographics? If so, what gender, age, income, and/or racial/ethnic trends have been observed?
- 9) Has the service area seen an increase in cycling since the implementation of Bike Share? Has this increase been quantified?
- 10) Has your organization noted modal conflict between Bike Share riders, motorists, and/or pedestrians? Does your organization collect Bike Share crash data? If so, how many reported incidents are you aware of?
- 11) Do you feel the contract in place between project partners provides adequate clarity on the responsibilities of vendors and public agencies? Do you believe the terms of the contract, including penalties for violating its terms, are fair? Do you have any thoughts on how the clarity or fairness of the contract might be improved?
- 12) Describe standard operating and maintenance procedures (and their associated costs), including: rebalancing, bike maintenance, and complaint response.
- 13) What type(s) of damage to Bike Share units most frequently occur? Do you have a sense of how many units require repair or maintenance over the course of an average day and/or average week?
- 14) How frequently would you say theft or vandalism occurs? Does your agency track how many incidents of this nature occur in-total over the course of a month, quarter, or year?
- 15) Would you characterize the Bike Share system as a financially sustainable operation? Do you believe public subsidies are (and will continue to be) necessary for the success of the system?
- 16) Does your organization track origins and destinations data? If so, what methodology do you deploy for data collection, management, and reporting?
- 17) What, if any, actions has your organization taken to promote using Bike Share as a first and last mile transportation connection to and from transit trips?
- 18) If your system utilizes stations or defined operation areas, how easy or difficult have you found it moving, expanding, or shrinking service/station areas?



# APPENDIX D

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User Survey

Office Use Only

Location of Survey: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Bike Share Operator: Metro / SM



## Bike Share Survey 2019

The Southern California Association of Governments (SCAG), in partnership with LA Metro and the City of Santa Monica, is seeking user feedback regarding regional bike share systems. Please take a moment to complete this user survey. Your feedback will help provide important insight into program performance.

### Section A: Tell Us About Today's Ride

- How did you pay for **today's** ride?
  - Pay as you go/single ride     Day Pass
  - Monthly Pass                       Annual Pass
  - Student Pass                          Bike Share for All
- What is the purpose of **today's** bike share trip? (If you are going home, tell us what type of place you are coming from)?
  - Work                                       School
  - Recreation/exercise                 Social activity
  - Tourism                                  Errands/appointments
  - Other (specify): \_\_\_\_\_
- How far did you have to walk to get to the kiosk/station to pick up your bike? \_\_\_\_\_ minutes
- How far will you have to walk from the place where you will leave your bike to your final destination or the next leg of your commute? \_\_\_\_\_ minutes
- Will **today's** trip include a transfer to/from...?
  - Bus (specify system/route): \_\_\_\_\_
  - Train (specify): \_\_\_\_\_
  - Light rail (specify line): \_\_\_\_\_
  - No transfer
- Did you check to see if there was a bike or docking station available before you arrived here **today**?
  - No                                          Yes, on the website
  - Yes, on the app     Yes, I reserved a bike in advance
- If this bike share service were not available how would you have made **today's** trip?
  - Public transit (bus, train, light rail, etc.)
  - Walked                                  Driven myself
  - Uber/Lyft/Taxi                         Ridden my personal bicycle
  - I would have used another shared mobility service (scooter, JUMP bikes, etc.).
  - I would have gotten a ride with a friend or family member.
  - I would not have made this trip.
  - Other (specify): \_\_\_\_\_

### Section B: Tell Us About Your Bike Share Experience

- How did you first learn about bike share? (Select only one)
  - Social media                             Word of mouth
  - Radio/TV                                  Newspaper
  - Saw the kiosks/stations             Saw the bikes
  - Print advertisement (i.e. poster, billboard, etc.)
  - Other (specify): \_\_\_\_\_
- What would cause you to increase your bike share usage?
  - Station/kiosk closer to where I need to go
  - More payment options                 Dockless stations
  - Helmets                                  Electric bikes
  - Ability to reserve bikes               Larger service area
  - Options to keep the bike longer
  - Free or low-cost transfers to/from public transit
  - Ability to transfer to/from other shared mobility operators
  - Other (specify): \_\_\_\_\_
- On average, how often do you use the bike share service?
  - Daily                                         Regularly (several times a week)
  - Often (several times a month)
  - Occasionally (every few months)
  - Rarely (once or twice a year)
  - This is my first time using the service
- How long have you been a bike share service customer?
  - This is my first time using bike share
  - Less than 6 months                     6 months – 1 year
  - 1 -2 years                                  More than 2 years
- Does your employer pay for all or part of your use of bike share?
  - Yes                                          No
- How would you describe the cost?
  - Much too high     High
  - Reasonable         I would be willing to pay more

Continue on back



**Section C: Customer Satisfaction**

14. Please rate the following characteristics of the bike share service by checking the appropriate box.

	Excellent	Good	Fair	Poor	Neutral/ No Opinion
Overall satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pricing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cleanliness of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Condition of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of bicycles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Locations of kiosks/stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of access and return	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of payment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of registration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
App	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. What is your opinion regarding the fare options?

- I am satisfied with the available options.
- I would prefer an option for keeping the bike for several hours.
- I would prefer fares charged in smaller increments (i.e. per minute).
- I would prefer fares charged in larger increments (i.e. per hour).
- I would prefer more pass options.
- Other (specify): \_\_\_\_\_

16. How much do you agree with the following statements:

	Strongly Agree	Agree	Disagree	Strongly Disagree	Neutral/ No Opinion
The availability of bike share has decreased the number of trips I make in my personal vehicle.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The availability of bike share has improved my health.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The availability of bike share has <i>increased</i> my use of traditional public transit (i.e. bus, train, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The availability of bike share has <i>decreased</i> my use of traditional public transit (i.e. bus, train, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The availability of bike share has <i>decreased</i> my use of Uber/Lyft.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The availability of bike share has influenced my lifestyle choices (i.e. where to live, work, go to school, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer this bike share service over other shared mobility options (i.e. scooters, JUMP bikes, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section D: Tell Us About Yourself**

18. Which of the following groups includes your age?

- Under 18
- 18 - 24
- 25 - 44
- 45 - 61
- 62 and older
- Decline to state

19. Which of the following describes your employment status? (Select all that apply)

- Employed
- Student
- Work at home/homemaker
- Unemployed
- Retired
- Decline to state
- Other (specify): \_\_\_\_\_

20. What is your home ZIP code (if you are a college student please indicate the ZIP code of your local residence)?

\_\_\_\_\_

21. Is there a language other than English in which you would like to have bike share information provided?

Indicate below:

- Spanish
- Tagalog
- Chinese
- Other (specify): \_\_\_\_\_
- I do not need bike share information in another language.

22. Which group includes your household's annual income from all sources?

- \$15,000 or less
- \$15,001 - \$19,999
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- Decline to state
- \$40,000 - \$49,999
- \$50,000 - \$74,999
- \$75,000 - \$99,999
- \$100,000 +

**Thank you for your time!**  
**To be entered into a random drawing for one of several \$50 VISA Gift Cards or an annual pass, provide your contact info.**

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

- Check here if you would be interested in participating in a bike share focus group.



# APPENDIX E

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## Survey Results



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# memo

**to:** Jean Crowther, Alta Planning + Design

**from:** Jim Moore

**re:** SCAG: Technical Memo: User Survey Analysis

**date:** April 18, 2019

## Methodology

A user survey was developed to gain insight regarding the user experience as well as to identify opportunities for improvement and increase bike share activity. The initial sampling target was 600 valid surveys, to be split between the two systems.

The survey was prepared in a paper format (for intercept surveying) as well as an electronic format available online (using the SurveyMonkey platform). It was provided in English, Spanish, and Mandarin. It was accessible using the URL [www.BikeShareSurvey.com](http://www.BikeShareSurvey.com) from February 3 through April 8, 2019.

Initial intercept surveying took place February 7-8, 2019. This effort only garnered eight valid responses due to a number of factors including 1) significantly lower activity at the bike stations than forecast and 2) the length of the questionnaire. Given modest promotion of the survey by the project partners, as of February 14 we had garnered only 28 total responses. As a result, the sampling target was reduced to be more consistent with actual system use. The resulting target was between 250 and 380 surveys, which would ensure statistical validity at a 95-percent confidence level.

Subsequent promotion of the survey also included outreach to area cycling groups and inclusion in newsletters distributed by LA Metro and the City of Santa Monica. This ultimately resulted in a total sample size of 351 valid responses (201 from LA Metro and 150 from Santa Monica), which translates to a confidence level of 95 percent and a margin of error of  $\pm 5.2$  percent overall.

## User Profile

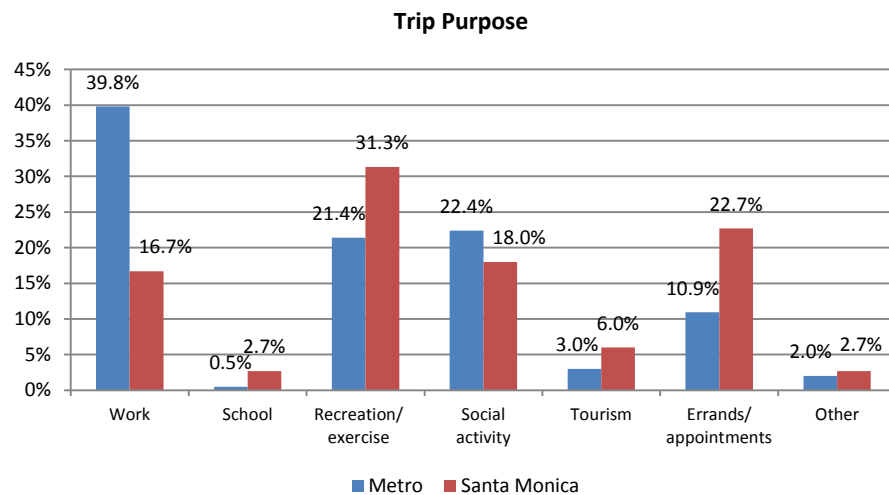
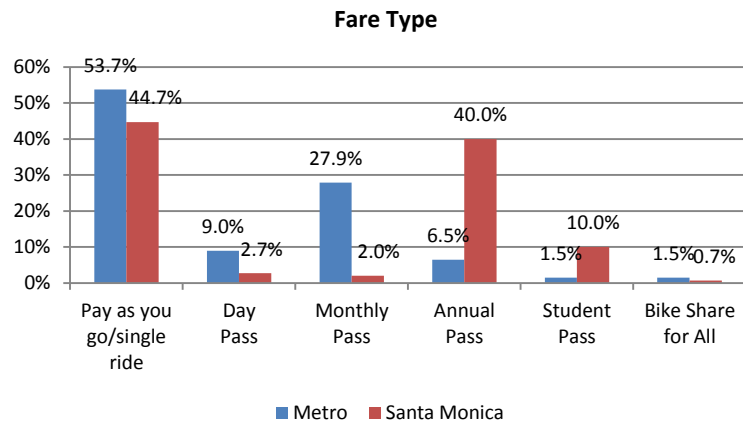
User-provided data was used to develop a profile of the typical bike share user. We further segregated the data by program to identify differences between users of the two programs.

The typical bike share user is an English-speaking, employed male between the age of 25 and 44 with a household income of at least \$75,000. He uses the pay-as-you-go/single-ride option when using bike share. He does not transfer from public transit as part of his bike share trip and would walk if bike share were not available. He would like to see a station or kiosk closer to where he wants to go as well as a larger service area. He has used bike share for at least one year and is not a regular rider. His employer does not pay for his use of bike share. He believes the cost of the service to be reasonable and is satisfied with the fare options available. He has decreased the number of vehicle trips he makes as the result of bike share, and it has had a positive impact on his health. It has not impacted his use of public transit. He prefers the bike share service over other shared mobility options.

**Key Comparisons between Programs**

In order to better understand the characteristics of users of the individual bike share programs, we segregated the data for review. Notable differences between the programs are provided below.

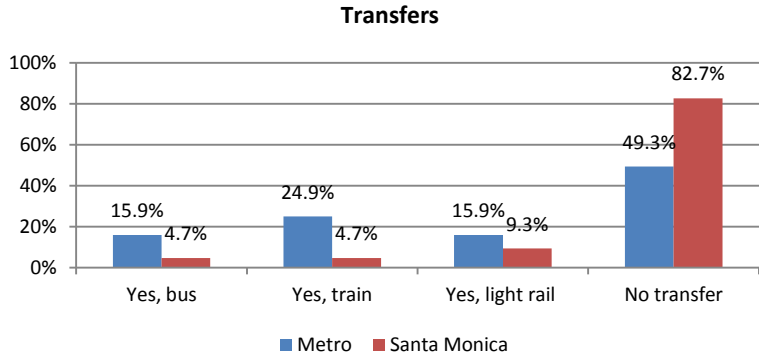
**Fare Type:** While pay-as-you-go/single-ride was the most common fare type on both systems, Santa Monica users were far more likely to use the annual pass, while Metro users preferred the monthly pass.



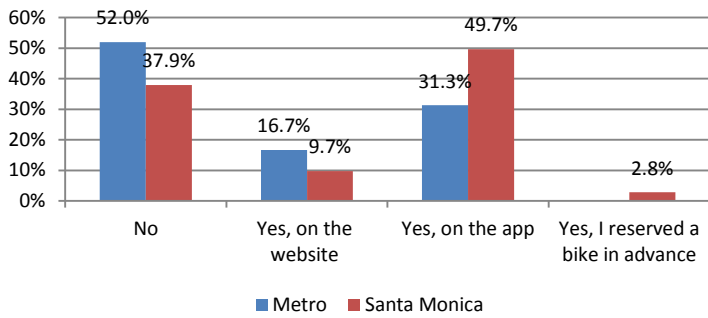
**Trip Purpose:** Metro users were more likely to use bike share for work purposes, while Santa Monica users used the service for recreation/exercise and errands/appointments. Relatively few users of either system cited using bike share to travel to/from school.

**Walk Time:** Walk times to and from the bike share locations were comparable for both systems. Metro users walked an average of 5.5 minutes to reach the kiosk/station and an average of 5.3 minutes to their destinations. Santa Monica users walked an average of 5.5 minutes to reach the kiosk/station and an average of 4.9 minutes to their destinations.

**Transfers:** Metro users were more likely to transfer to a bus, train, or light rail as part of their use of bike share. This is consistent with trip purpose, as Santa Monica users were more likely to undertake (presumably more local) recreation or errands via bike share, versus using the bikes to travel to and from work (which could be part of a more extensive commute).



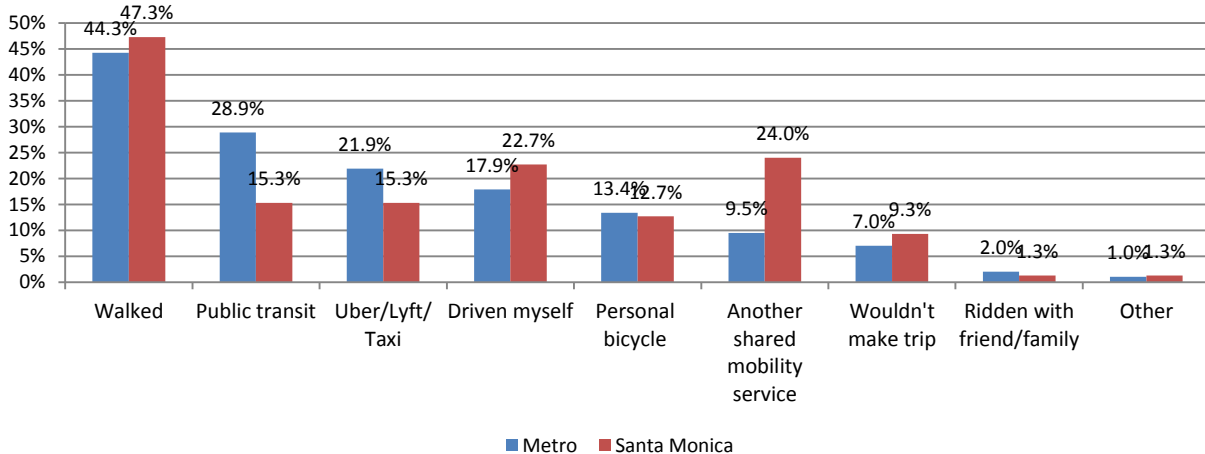
**Checking Availability of Bikes**



**Checking Availability of Bikes:** Santa Monica users were more likely to check ahead of time regarding the availability of a bike. The app was more popular than the website for both systems.

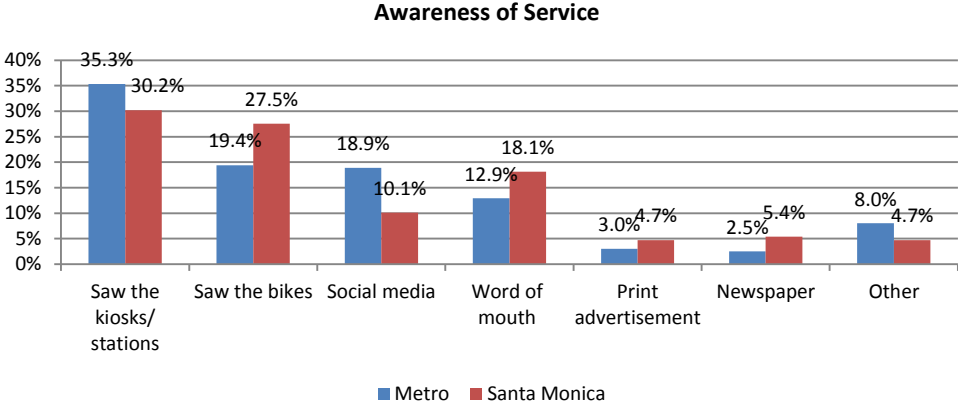
**Alternative to Bike Share:** For both systems, users were most likely to walk if bike share was not available. Metro users were more likely to use public transit or Uber/Lyft/taxi, while Santa Monica users were more likely to drive themselves or use another shared mobility service.

**Alternative to Bike Share**

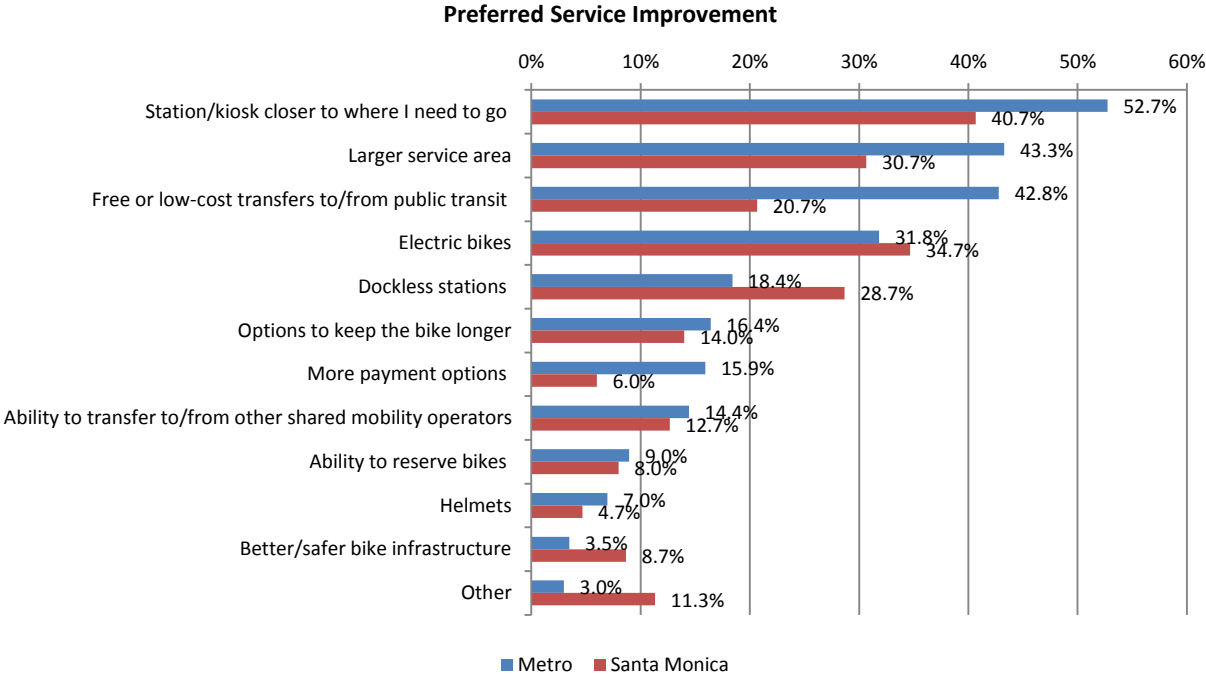


**Awareness of Service:**

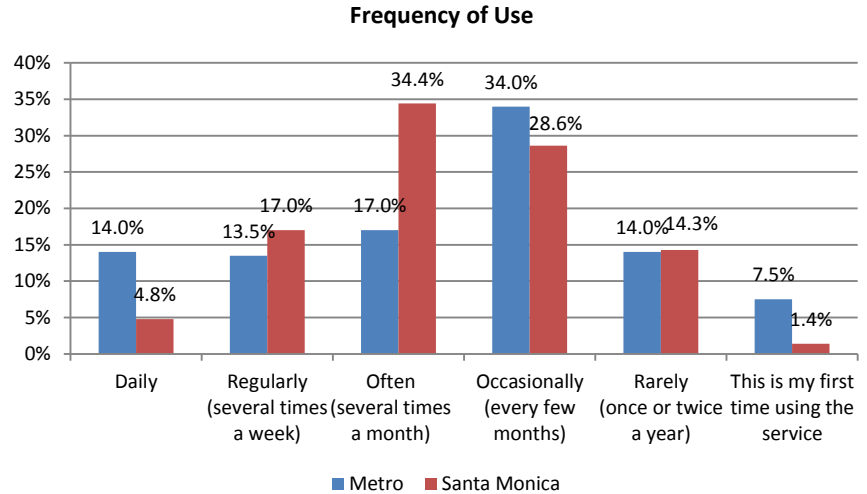
For both systems, the kiosks/stations and the bikes themselves are some of the greatest generators of program awareness. Additionally, Metro users learned about the program through social media, while Santa Monica users learned of the program via word-of-mouth.



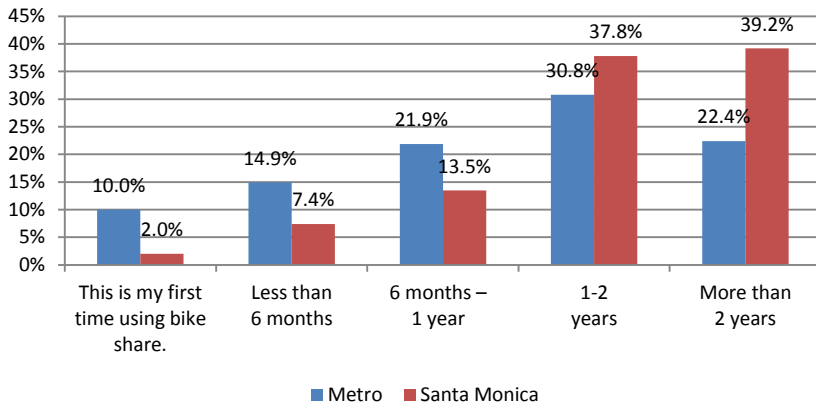
**Preferred Service Improvements:** For Metro users, the top three preferred service improvements were the proximity of stations/kiosks closer to user destinations, a larger service area, and free or low-cost transfers to/from public transit. For Santa Monica users, the top three preferred service improvements were the location of stations/kiosks closer to user destinations, electric bikes, and a larger service area.



**Frequency of Use:** While there were relatively few daily users, Metro users were most likely to use the service every day. Metro users were far more likely to use bike share occasionally (every few months). By contrast, Santa Monica users were most likely to use bike share often (several times a month), followed by occasionally. More Metro first-time users took the survey than Santa Monica first-time users.



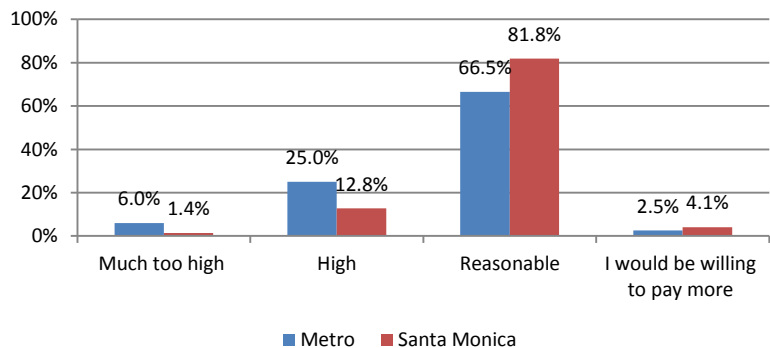
**Tenure of Use**



**Tenure of Use:** Santa Monica users were more likely to have used the service for at least one year (77 percent) (compared to 53.2 percent of Metro users).

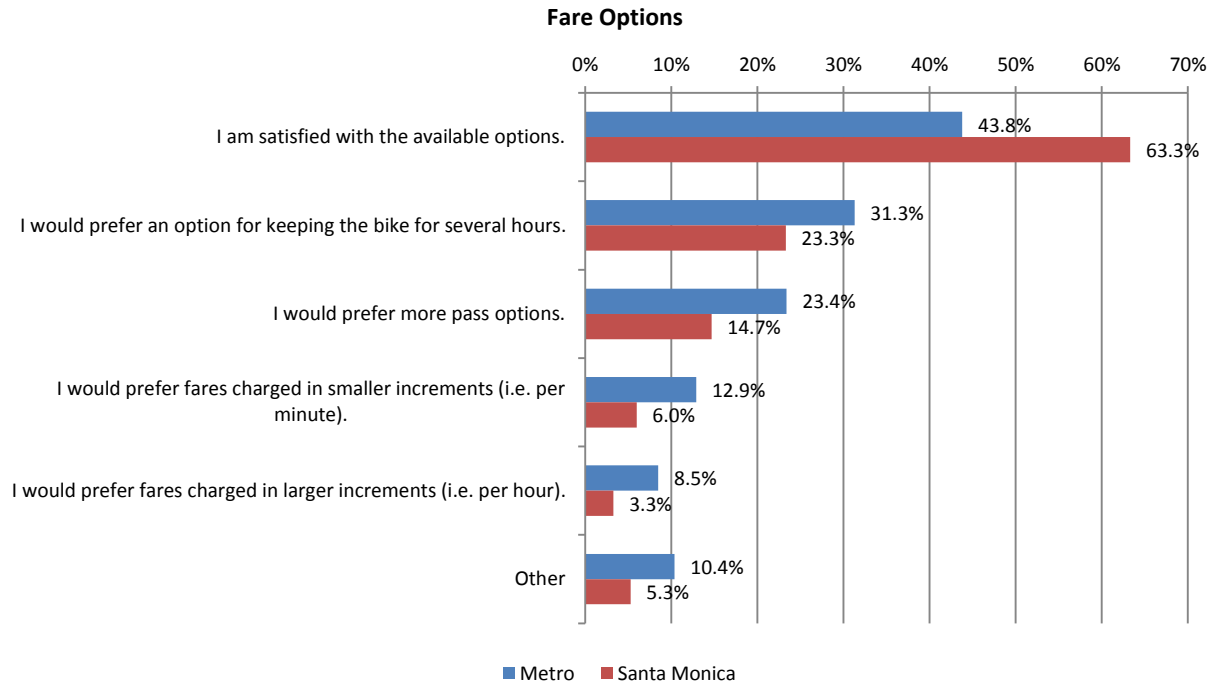
**Reasonableness of Cost:** The majority of users found the cost of both programs to be reasonable. Metro users were more likely to perceive the cost as being too high.

**Reasonableness of Fares**





**Fare Options:** Santa Monica users were more likely to be satisfied with the available fare options. This was the top preference for Metro users as well. Users of both services would prefer an option for keeping the bike longer, while Metro users expressed a desire for additional fare/payment options.



**Impact of the Service:** While most responses were similar between the two services, Metro users indicated use of bike share has increased their use of public transit. Santa Monica users said that use of bike share has little or no impact on their use of public transit.

**Satisfaction:** Overall, Metro users were more satisfied with the bike share service than Santa Monica users. Metro users rated their overall satisfaction as 3.63 (mean rating on a scale of one to four). The highest-rated attribute for Metro users was customer service (3.70), followed by cleanliness of equipment (3.68), and condition of equipment (3.61). Santa Monica users rated their overall satisfaction as 2.97 (mean rating on a scale of one to four). The highest-rated attribute for Santa Monica users was ease of payment (3.21), followed by ease of registration (3.07), and customer service (2.96).







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