



Memorandum

Project: LA Metro Bike Share

Subject: Planning and Evaluation Framework Memo

Date: March 28, 2017

To: Lia Yim, LA Metro

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The intention of this memorandum is to outline a framework for LA Metro to obtain expressions of interest and prioritize communities for expansion of the Metro Bike Share program as well as develop a framework to evaluate implemented systems to maximize their performance.

The planning and evaluation framework includes the following steps:

Planning Framework

1. An annual or bi-annual call for interest to join the Metro Bike Share program conducted by LA Metro,
2. A community preparedness survey that communities can use to assess their readiness for a bike share program and identify areas where they need improvement,
3. An initial assessment of which communities meet the key eligibility criteria,
4. Technical assistance provided by LA Metro to interested and eligible communities to identify an appropriate system size and layout for that community,
5. A methodology for prioritizing the implementation of bike share in interested and eligible communities,

Evaluation Framework

6. A methodology for evaluating short- and long-term system performance every six months and identifying interventions to maximize service area and station performance.

This framework will allow Metro to make decisions that ensure resources are being deployed effectively toward the program vision. Ridership is a critical measure and will be used both on a service area and station-specific basis. However, other factors including providing equitable access to the program and encouraging communities to continue investment and improvement in bicycling infrastructure and multi-modal transportation programs, are also important.

Planning Framework

During the planning stage of bike share implementation, bike share readiness is evaluated on several levels. Political, financial, community, and administrative support are necessary to begin conversations about introducing Metro Bike Share to a new service area. Additionally, a technical analysis should be completed to help communities identify the most effective system to meet the program's goals. These communities would then be prioritized using several criteria that reflect the program's goals. This process is described below and outlined in **Table 1**.

Step 1: Call for Interest

Metro should develop a formal request for expressions of interest as a process to formally identify communities interested in being a Metro Bike Share partnering jurisdiction. This process could be conducted annually or bi-annually.

Step 2: Community Preparedness Evaluation

The application for the Call for Interest program should include the "Community Preparedness Survey" that communities fill out to evaluate their preparedness for bike share. This should be available at any time so that cities can start developing plans for how to improve their preparedness prior to submitting a formal application for partnership with Metro. A copy of the Community Preparedness Survey is included in **Attachment A**.

Step 3: Initial Assessment of Eligibility Criteria

The community survey responses would be evaluated by Metro, especially considering three key metrics that will be used as eligibility criteria for assessing community preparedness. The community would need to show the political, staff, and public support for the program, staff capacity to take on implementation and ongoing oversight of the program, and a financial commitment to cover the local portion of capital and operating costs.

This process should very clearly communicate the types of assistance that Metro will provide for planning, capital, and operations, as well as outline how communities will be prioritized, and the expectations for ridership and other program outcomes.

Table 1: Community Preparedness Criteria for LA Metro Bike Share

| Goal | Objective | Measure |
|---|---|---|
| Interest for a bike share program | The jurisdiction has shown interest in a bike share program | Staff have contacted LA Metro or responded to LA Metro's call for interest and believe bike share would be an effective tool in their jurisdiction? |
| | | The jurisdiction's political leaders have expressed interest in exploring a bike share program? |
| | | Based on LA Metro's online crowd sourcing map, there is public demand for bike share in their jurisdiction? |
| Funding for a program | Based on LA Metro's MOU, the jurisdiction has made a commitment to fund their portion of system costs | The jurisdiction is prepared to make a commitment for funding 50% of capital costs and 65% operations and maintenance costs |
| Capacity to take on a bike share program | The jurisdiction has the capacity to take an active role in implementation and ongoing oversight of the program | Based on the Community Preparedness Survey, the jurisdiction has capacity to take on implementation and ongoing support |

Step 4: Technical Assistance

Once a community has expressed interest in the program and meets the eligibility criteria (i.e., interest, capacity, and a commitment to funding), then Metro will provide technical assistance to help the community identify an appropriate size for the system and a preliminary layout that will be used in the prioritization process.

The layout of the system will consider the bike share suitability index, underserved portions of the community including areas with concentrations of people with low incomes, non-white populations, and lower-paying jobs, the results of the online crowdsourcing map, and consideration of the bikeway network. The bike share suitability index incorporates metrics such as population, occupied households, zero-car households, population with college degrees, jobs, retail jobs, food service jobs, intersection density, peak hour transit frequency, and daily transit ridership. These metrics are combined to develop a bike share suitability rating by ¼ square mile hexagons and are assigned a value of high, moderately high, moderately low, or low based on the overall rating. This bike share suitability index will be used to develop a preliminary service area.

Preliminary ridership estimates will be developed once a preliminary service area has been identified and the jurisdiction has identified the quantity of bike share infrastructure investment is desired. The ridership estimates

take into account the following factors that correlate with high ridership: proximity to other bike share stations, proximity to transit service, job density, food service job density, and population density.

Step 5: Community Prioritization

Once the technical assistance has identified a suitable service area, size, and layout, each community would be analyzed to determine several key characteristics seen as important to the success of bike share. These metrics will be used to prioritize communities for implementation. Metro's objective is to ensure visible success of the system through high ridership, providing service in line with the agency's equity framework, and implementation in areas that show a commitment to sustainable transportation. In line with this, the suggested prioritization criteria include:

- **Potential ridership:** the bike share suitability index and ridership model will be applied to the proposed system layout to develop a forecast for expected ridership. The model accounts for population, jobs, food service jobs, access to rail, and proximity to other bike share stations. Estimates are based on bike share systems in Chicago, New York, Minneapolis/St. Paul, and the Bay Area and area characteristics are matched to develop the ridership estimates in Los Angeles. Proposed expansions that are contiguous or within close proximity to existing systems have the potential for higher ridership and are prioritized expansion areas.
- **Inclusiveness:** LA County is diverse in its landscape and Metro promotes equitable access to mobility options. Ridership is not the only metric to identify expansion areas for the program; consideration of demographics also plays a role in this process. Using the American Community Survey 5-year estimates and the U.S. Census' Longitudinal Employer-Household Dynamics, environmental justice communities will be identified as areas with a high density people in poverty, people of color or Latino, and low-income jobs (\$1,250 per month or less). Higher involvement of environmental justice locations in the service area will increase allocated points in the evaluation. These areas often have barriers from achieving high ridership and require extra outreach to engage these demographics. Consideration will be given to proposed programs that target increased participation from these communities.

For Metro Bike Share expansion, a Title VI and Environmental Justice equity evaluation is completed consistent with the requirements set forth in Executive Order 12890 and 49CFR Section 21.5. While thresholds have not been established for programs such as bike share, this equity evaluation seeks to determine whether or not there is reason to believe that the siting of bike share facilities might cause a Disparate Impact or Disproportional Burden. Two separate analyses are performed: one taking into consideration the minority population share, the other taking into consideration the poverty population share aggregated for all block groups within the existing and proposed bike share service areas and comparing both demographic characteristics with that of the Los Angeles County population. The findings determine if any proposed bike share expansion is equitable among minority and low-income populations in Los Angeles County.

- **Bicycling infrastructure:** low-stress bikeways including bike lanes, protected/buffered bike lanes, cycle tracks, and bike paths are overlaid on the bike share suitability map to understand existing and proposed bikeway infrastructure and how they relate to the higher bike share suitability areas.
- **Longevity:** this metric is a reward for communities that continue to pursue participating in the program and a way to minimize the possibility of new communities "jumping" an existing community on the list – though this is recognized as entirely possible.

A list of performance metrics for community prioritization is included in **Table 2**. In addition to the prioritization criteria, a minimum estimated ridership threshold is needed to move forward with expansion. Each phase of Metro bike share expansion will set a target ridership threshold. Communities wishing to expand must meet these criteria to be considered further. Once all jurisdictions wishing to expand with bike share and meet this threshold have been exhausted, Metro may consider lowering the threshold to allow lower suitability communities to enter the system. This insures that Metro expands in a manner that promotes a healthy system with sustainable ridership. While some jurisdictions may have strong political will to expand bike share, it is important for the overall system that systems with healthy ridership are expanded to first.

Table 2: Community Prioritization Criteria

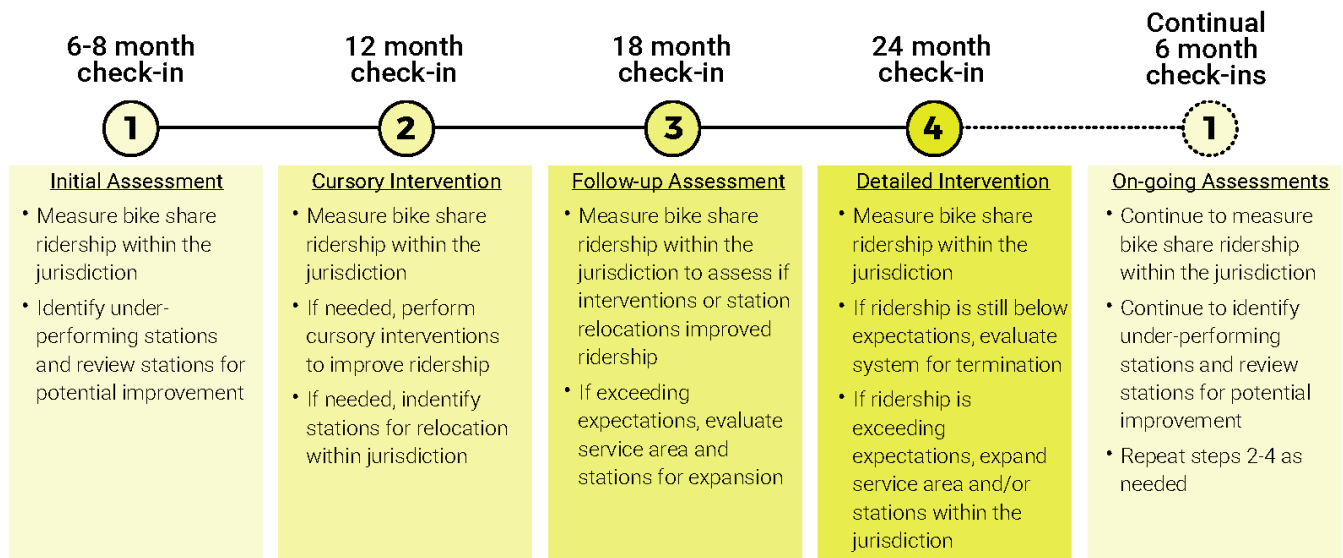
| Goal | Objective | Measure | Points |
|---------------------------------|--|--|---|
| Potential Ridership | The program has been defined as suitable based on demand per the suitability analysis and is a contiguous expansion of the existing system | Number of Highly Suitable hexagons | 10 points = 5 or less 20 points = 5-10 35 points = 10+ |
| | | Proximity to existing system service areas | 0 points = mile+ 10 points = 0-1 mile 20 points = contiguous |
| Equity | The program includes access for low income populations, people of color or Latino, and areas with low income jobs | Percentage of stations that are within the top-ranking 10 th percentile for the composite of the following metrics: (a) highest ranking 10 th percentile for density of people in poverty, (b) highest ranking 10 th percentile for density of people of color or Latino, or (c) highest ranking 10 th percentile of density of low income jobs (See Attachment B) | 0 points = 10% or less 5 points = 10-20% 10 points = 20%+ |
| | | The jurisdiction has planned programs for targeted outreach to people with low incomes and who are of color or Latino | 0 points = no program 10 points = planned programs |
| Bicycling Infrastructure | The program is supported by a comfortable bike network | Percentage of stations that are within the top-ranking quartile for density of bike facilities | 0 points = 25% or less 5 points = 25-50% 15 points = 50-75% 20 points = 75%+ |

| | | | |
|------------------|--|-------------------------------|---|
| Longevity | The jurisdiction has supported the idea of bike share and shown progress towards improving suitability | Number of years on grant list | 1 points = 2 or less 2 points = 2-5 5 points = 5+ |
|------------------|--|-------------------------------|---|

Evaluation Framework

The evaluation framework is intended to be used once a system is up-and-running and provides LA Metro and its partners with regular check-in points to understand system performance and provide interventions where necessary to maximize the program’s effectiveness. Evaluations are generally made every 6 months (with an exception to the first check-in at 6-8 months), and action items vary in severity as time in service lengthens. Monitoring occurs at the service area and station levels.

Step 6: Short- and Long-term System Evaluation



6-8 Month Check-in

After the launch of Metro Bike Share in a new service area, a 6-8 month check-in will track actual ridership to compare to the ridership estimates of the service area / community and also to flag any individual stations that should be monitored closely. If the system is performing below expected ridership levels, preparations should be made for future intervention. If the system is performing at or above expected ridership levels, attention may be focused on making the system even better. The lowest performing quartile of stations with regard to usage will be flagged for potential relocation and where possible interventions to improve Station Performance Metrics will be started.

6-8 Month Data Analysis steps

1. Measure System Area Ridership as shown in **Table 3** (System Area Performance Metrics)
2. Identify under-performing station list (bottom quartile) and measure the under-performing stations using the metrics in **Table 4** (Station Performance Metrics)

12 Month Check-in

After one year of operations, there will be another check on the overall ridership of the service area and the flagged lower performing stations. If ridership is still below anticipated estimates, the lower performing stations will be relocated to better suited areas based on an analysis of the System Area Performance Metrics and Station Performance Metrics.

For the service area, other interventions might include:

- Programs to encourage people to use bike share, including programs that reach out and support low-income and minority communities to use the system
- An analysis of the existing system and program membership zip codes to identify areas of the community that do not have a station nearby and need access to bike share
- An analysis of the existing stations to understand if additional points of interest warrant being added to the system
- An evaluation on how marketing strategies, including education, events, and outreach, have performed to determine, 1) how they could be modified to be more effective and 2) to help Identify new marketing strategies

12 Month Data Analysis steps

1. Measure System Area Ridership as shown in **Table 3** (System Area Performance Metrics)
2. Identify under-performing station list (bottom quartile) and measure the under-performing stations using the metrics in **Table 4** (Station Performance Metrics)

18-Month Check-in

At a year and a half of operations, there will be another check-in to see if station relocation or programmatic interventions benefitted the service area. Based on the service area performance levels (below, at, or above estimates), additional strategies will be employed to improve the system.

Service areas exceeding the projected ridership should be considered for expansion based on planning metrics described previously (bike share suitability index and ridership estimates).

18 Month Data Analysis steps

1. Measure System Area Ridership as shown in **Table 3** (System Area Performance Metrics)
2. Identify under-performing station list (bottom quartile) and measure the under-performing stations using the metrics in **Table 4** (Station Performance Metrics)

24-Month Check-in

After two years of operations, there will be another service area check-in. Service areas not meeting these levels are subject to termination of service by either Metro or the jurisdiction and redeployment of equipment to

another service area. When considering termination of the service area based on ridership, equity, upcoming infrastructure/development, etc. should be accounted for and determined if additional time is needed to evaluate the service area.

Service areas exceeding the projected ridership should be considered for expansion based on planning metrics described previously (bike share suitability index and ridership estimates).

24 Month Data Analysis steps

1. Measure System Area Ridership as shown in **Table 3** (System Area Performance Metrics)
2. Identify under-performing station list (bottom quartile) and measure the under-performing stations using the metrics in **Table 4** (Station Performance Metrics)
3. For Service Areas under consideration for termination, measure the remaining System Area Performance Metrics as shown in **Table 3** (System Area Performance Metrics)

Continuous Monitoring Every 6 Months

After two years of Metro Bike Share in a new service area, a continual check-in every 6 months will track actual ridership to compare to the ridership estimates of the service area / community and also to flag any individual stations that should be monitored closely. If ridership drops below anticipated estimates or a low performing station is identified, follow the steps at 12, 18, and 24 month check-ins.

Continual Data Analysis steps

1. Measure System Area Ridership as shown in **Table 3** (System Area Performance Metrics)
2. Identify under-performing station list (bottom quartile) and measure the under-performing stations using the metrics in **Table 4** (Station Performance Metrics)

System area and station performance metrics were developed based on existing ridership and demographic information. It is recommended that Metro test these metrics against current systems to determine potential outcomes before implementing. It is also recommended that Metro reevaluate these metrics and update accordingly at yearly intervals or at each phase of expansion.

Table 3: System Area Performance Metrics

| Goal | Objective | Measure |
|-------------------|---|---|
| Ridership | The average ridership of the system is sustainable and reflects the ridership goals in the region | The average trips per bike per day is within +/- 10% of the comparable system's trip per bike per day (see Attachment C) |
| Operations | The cost to operate the program meets typical transit metrics | The average farebox recovery is within +/- 10% of the comparable system's trip per bike per day (see Attachment D) |

| | | |
|-----------------------------|---|--|
| | | The average operating cost per trip is within +/- 10% of the comparable system's trip per bike per day (see Attachment D) |
| Equity | Members of LA Metro Bike Share are diverse and representative of communities of color | Based on the member demographic information collected, the percentage of members who are populations of color (24%) or Latino (17.3%) are representative of the demographics of the county |
| | | Based on the number of LIFE memberships, the percentage of members that are eligible for the program are representative of the households below the county wide median income |
| Support of Bicycling | Bike share can help reach the mode split goals of the community | A planned (near term, approximately 1 year) bike facility or development that could support bike share is within a block of the bike share station |

Table 4: Station Performance Metrics

| Metric | Metric | Objective |
|------------------------------------|---------------------------|--|
| Ridership | Average monthly ridership | Identify under-performing station list (bottom quartile) for both interior and edge stations |
| Distance to Nearest Station | Feet | Check for redundancy or scarcity if station is underperforming |
| Maintenance Issues | Yes / No | Operator input on water ponding, vandalism, and other issues |
| Solar Issues | Yes / No | Operator input on solar performance of the station |
| Number of Docks | Docks | Compare with ridership and number of full/empty events to check capacity |
| Full and Empty Events | Average events per month | Compare with ridership and number of docks to check capacity |
| Visibility | Yes / No | Check station visibility for people walking, biking, and driving |

Attachment A: Community Preparedness Survey

Jurisdiction Name:

Department within Jurisdiction:

Contact Name and Title:

Contact Email:

Contact Phone Number:

Interest

1. Describe why the jurisdiction is interested in and would like to assess its preparedness for bike share?
2. Which areas, destinations, and neighborhoods within the jurisdiction do you feel are best suited for bike share?
3. Which goals would you like to achieve with bike share? Check all that apply.
 - a. Mobility
 - b. Economic development
 - c. Support of active transportation
 - d. Equity
 - e. Health
 - f. Recreation
 - g. Tourism
 - h. Student Mobility
 - i. Other
4. Have elected officials in your jurisdiction expressed support of bike share? Please explain.
 - a. Yes
 - b. No
 - c. Other
5. Has the community shown support of bike share within the jurisdiction through the [crowdsourcing map](#) on LA Metro's website?
 - a. Yes, many people have shown support
 - b. Yes, some people have shown support
 - c. No support is evident from the map
6. When was the jurisdiction's bike plan last updated?
 - a. 0-5 years
 - b. 6-7 years
 - c. +8 Years
 - d. The jurisdiction doesn't have a bike plan
 - e. Other
7. Does the jurisdiction's bike plan include bike share?
 - a. Yes
 - b. No
 - c. N/A
 - d. Other
8. What is the jurisdiction's approximate annual budget for active transportation?
 - a. \$1 Mil +
 - b. \$0.5 mil - \$1 Mil

- c. \$0.25 - \$0.5 Mil
- d. \$0.1- \$0.25 Mil
- e. less than \$0.1 Mil
- f. 0
- g. Other

9. Is the jurisdiction actively implementing bike facilities in the community?

- a. Yes
- b. No
- c. N/A
- d. Other

10. How many bikes lanes/facilities are there?

- a. 5+ Miles of Bike Lanes/Paths
- b. 1-4 Miles of Bike Lanes/Paths
- c. No Bike Lanes/Paths

Funding

11. Based on LA Metro's Bike Share Memorandum of Understanding, the jurisdiction is prepared to make a commitment for funding 50% of capital costs and 65% of operations and maintenance costs?

- a. Yes
- b. No
- c. Other

12. Has the jurisdiction secured funding for the capital costs of bike share?

- a. Yes, funding is secured (grant awarded, council approved, etc.)
- b. Funding has been requested (awaiting decision/approval)
- c. No, funding has not yet been formally requested

13. Has the jurisdiction secured funding for the operating costs of bike share?

- a. Yes, funding is secured (grant awarded, council approved, etc.)
- b. Funding has been requested (awaiting decision/approval)
- c. No, funding has not yet been secured or formally requested

Capacity

14. How many staff members does the jurisdiction have that focus on active transportation?

- a. One or more FTE
- b. 0.1-0.9 FTE
- c. None
- d. Other

15. The planning, implementation, and on-going operations of bike share requires staff support from partnering jurisdictions. Which of the following do you feel the jurisdiction is equipped to handle? Check all that apply

- a. Regular coordination meetings
- b. Establish an MOU
- c. Lead local outreach
- d. Station identification and permitting
- e. Oversight of road treatment install by local resources
- f. Internal reporting

Attachment B: Equity Data for Community Prioritization Criteria

| | Density of Low Income Jobs by Census Tract (jobs per square mile) | Density of people on poverty by Census Tract (people per square mile) | Density of people of color or Latino by Census Tract (people per square mile) |
|-----------------------|--|--|--|
| Top 25% | Over 9,190 | Over 42,918 | Over 158,034 |
| Middle 25%-50% | 4,891-9,189 | 16,560-42,917 | 84,683-158,033 |
| Middle 50%-75% | 2,478-4,890 | 5,729-16,559 | 36,988-84,682 |
| Bottom 25% | Under 2,477 | Under 5,728 | Under 36,987 |

The numbers in the table above were determined from an analysis of the American Community Survey 5-year estimates and the U.S. Census' Longitudinal Employer-Household Dynamics, considering the densities of people in poverty, people of color or Latino, and low-income jobs by census tract in LA County.

Attachment C: Ridership Data for System Area Performance Metrics

| Trips Per Bike Per Day for: | DTLA | Pasadena | Port of LA | Venice | All |
|--------------------------------------|-------------|-----------------|-------------------|---------------|------------|
| Entire Service Area | 0.75 | 0.27 | 0.16 | 0.88 | 0.57 |
| Top 25% Stations (Average) | 1.49 | 0.42 | 0.33 | 1.97 | 1.32 |
| 25%-50% Stations (Average) | 0.82 | 0.29 | 0.20 | 0.79 | 0.53 |
| 50%-75% Stations (Average) | 0.43 | 0.22 | 0.08 | 0.37 | 0.29 |
| 75%-100% Stations (Average) | 0.15 | 0.14 | 0.02 | 0.23 | 0.12 |
| Bottom 10% Stations (Average) | 0.06 | 0.10 | 0.02 | 0.18 | 0.05 |
| Core Stations | 0.84 | 0.27 | 0.20 | 0.94 | 2.25 |
| Edge Stations | 0.52 | 0.29 | 0.09 | 0.55 | 1.44 |

The number in the table above are reported in trips per bike per day and were calculated using available ridership data from LA Metro Bike Share for the period from September 7 through December 31, 2017, which is the only period in 2017 when all four systems were operating. This represents a period of 116 days. All calculations were based on the assumption that all bikes in the system were in operation on all days. The formula used was: Trips in service area / # bikes allocated to service area / 116 days.

The quartile trips per bike per day were determined based on the following:

- Trips aggregated to starting station
- Assumed equal number of bikes per system per day
- Trips per day / (# bikes in individual system / # stations) / 116 days
- Split trips per bike per day into quartiles
- Calculated average trips per bike per day per quartile

Trips per bike per day for each system’s core and edge stations were determined based on infrastructure barriers within each system. The following infrastructure barriers were used to delineate each system:

- DTLA: stations located south of US 101, west of Alameda St, north of Interstate 10, and east of Highway 110 are considered core stations (42 stations); stations located south of Interstate 10, east of Alameda St, north of US 101, or west of Interstate 10 are considered edge stations (23 stations),
- Pasadena: stations located south of Interstate 210 (Foothill Freeway) are considered core stations (25 stations); stations located north or west of Interstate 210 are considered edge stations (6 stations),
- Port of LA: stations located south of the Vincent Thomas Bridge (Highway 47) are considered core stations (8 stations); stations located north of the Vincent Thomas Bridge are considered edge stations (4 stations),
- Venice: stations located south of Interstate 10 (Santa Monica Freeway) are considered core stations (12 stations); stations located north of Interstate 10 are considered edge stations (2 stations).

Attachment D: Operations Data for System Area Performance Metrics

| | DTLA | Pasadena | Port of LA | Venice | All (average) |
|--|--------------|-----------------|-------------------|---------------|--------------------------|
| Farebox Recovery Monthly Ranges | 12% to 18% | 4% to 9% | 2% to 7% | 26% to 36% | 11% to 17% |
| Cost per Trip Monthly Ranges | \$20 to \$23 | \$54 to \$84 | \$119 to \$174 | \$16 to \$18 | \$52 to \$75 |