

# bike share business plan

Sacramento Metropolitan Air Quality Management District

## Technical Working Paper #7: On-Going Evaluation Methods



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Evaluation Methods*

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## **OVERVIEW**

The Sacramento Metropolitan Air Quality Management District (SMAQMD) has requested a Bike Share Business Plan for a bike share system in the Sacramento area. This report describes potential methods and metrics for on-going evaluation of the bike share program. The metrics described can be used to manage program finances; evaluate the accomplishment of program goals; improve operations and maintenance; better serve existing members; market the program to potential grant funders, sponsors, and members; and make decisions about adding new stations, and expanding or relocating existing stations.



## FINANCIAL SUSTAINABILITY

The definition of financial sustainability will vary depending on the goals of the organization and the mix of funding sources the Sacramento Area Bike Share Program is capable of securing. One concept for financial sustainability could be the financial ability to continually cover the cost of operating the system with a combination of usage fees and membership fees (collectively, “user fees”), federal, state, and local funds, grants, donations, sponsorships, and advertising revenues. Understanding the share of each of these funding sources will be essential to successful financial management of the Sacramento Area program.

The extent to which the combination of membership fees (for initially joining the system) and usage fees (for trips that exceed the duration of the free period) cover the program’s operating costs can be likened to the transit concept of a farebox recovery ratio – the fraction of operating expenses which are met by the fares paid by passengers. The highest farebox recovery ratios among large, U.S. transit systems range from 60 to 65 percent, with many other U.S. systems’ farebox recovery ratios in the 15 to 30 percent range.<sup>1</sup> Sacramento Regional Transit’s fact sheet indicates that 26.1 percent of its operating expenses are funded by fare receipts, with the remaining funds coming from state and local taxes, federal assistance, and other sources.<sup>2</sup> Denver Bike Sharing suggests that funding as large a share of operating expenses as possible through member and usage fees is desirable; user fees are more stable and require less staff effort than other sources. However, placing the full cost burden of operating the system on members and day users could deter would-be riders by making bike share less cost competitive with other transportation modes or by creating a barrier for low-income individuals.

### User Fees and Farebox Recovery Ratios of Transit and Bike Share Systems (% of operating expenses)

• San Francisco (BART)	65%
• Nice Ride, MN	64%
• Washington, DC (WMATA)	62%
• Arlington County (Capital Bikeshare)	59%
• New York City (MTA)	56%
• Denver B-Cycle	44%
• Boulder B-Cycle	36%
• Los Angeles (LACMTA)	31%
• Sacramento (RT)	26%
• Portland (TriMet)	22%
• Detroit (DDOT)	14%
• Austin (CMTA)	9%

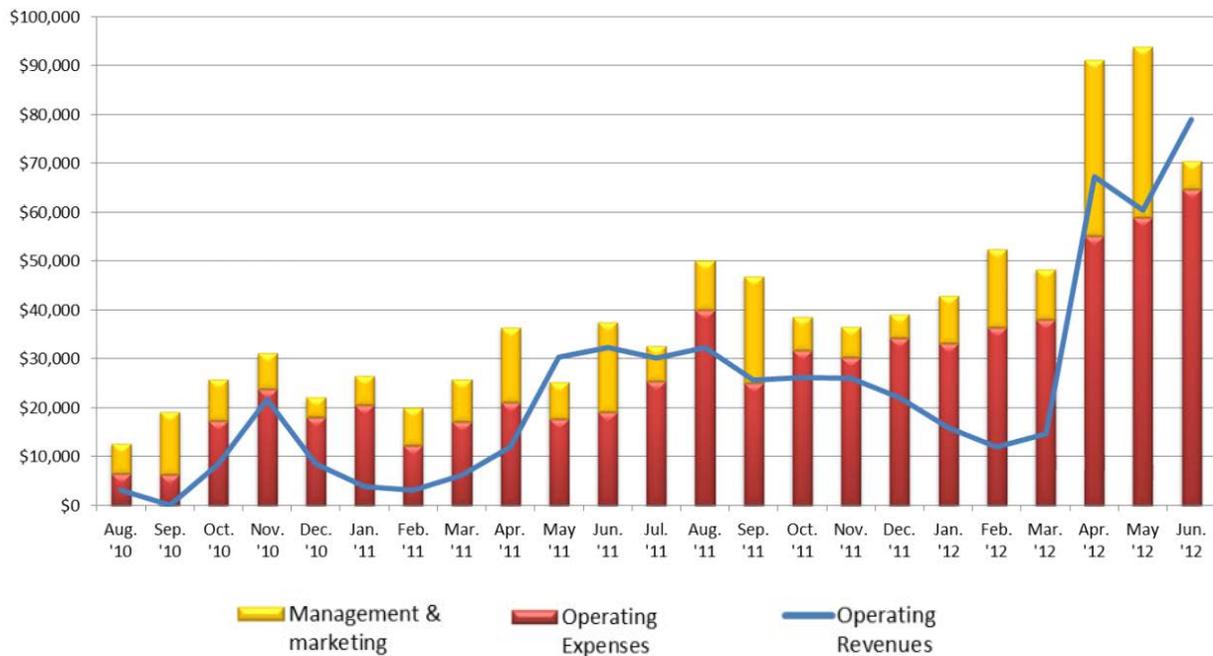
<sup>1</sup> [http://en.wikipedia.org/wiki/Farebox\\_recovery\\_ratio](http://en.wikipedia.org/wiki/Farebox_recovery_ratio)

<sup>2</sup> <http://www.sacrt.com/documents/RT%20Fact%20Sheets/RT%20Fact%20Sheet.pdf>



Non-user based sources can also generate sustainable funding. A variety of station-level sponsors, donors, and small grants may be necessary to fund early bike share operations. However, because renegotiating advertising contracts and sponsorship agreements, and renewing or pursuing new grant funding require significant staff time and effort, Denver Bike Sharing would prefer to pursue fewer funding streams with longer terms and larger amounts. Please see Technical Working Paper #3: Operating Costs, Funding Options, and Business Model for additional discussion of funding sources.

The Arlington portion of Capital Bikeshare also tracks the direct cost of contracting with Alta Bicycle Share to operate its system separately from the management and marketing costs of promoting and expanding the system, administering the operations contract, and pursuing funding sources. Tracking both the types of revenues used to fund the program and the effort and investment required to secure various funding streams can help the Sacramento Bike Share Program best direct its development efforts.



Capital Bikeshare Cost Recovery (Arlington).

Image: Arlington County FY12 Summary Report on Capital Bikeshare. Arlington County Commuter Services. October 2012.



## **IDENTIFYING NEW BIKE SHARE STATIONS**

New bike share station locations can either be:

- New stations. These may include stations purchased with system revenues, stations funded through grants, or stations sponsored and funded by a local business.
- Relocations of existing bike share stations; for example, Denver Bike Sharing reviews the bottom 10 percent of stations (ranked by checkouts) annually for relocation. They also consider whether they need to increase station density or marketing efforts in the area.

When identifying a new bike share station location for new or relocated stations, the operator may choose to add a station within the existing service area or to add a station that expands the service area.

Adding a station within the existing service area should focus on serving key destinations not already served by a bike share station. For example, redeveloping areas may prove to be desirable locations for a bike share station over time. Characteristics of a good station site include mixed land use, high population/employment density, connections to public transit, contiguity to bike-friendly streets, and close proximity to other bike sharing stations.

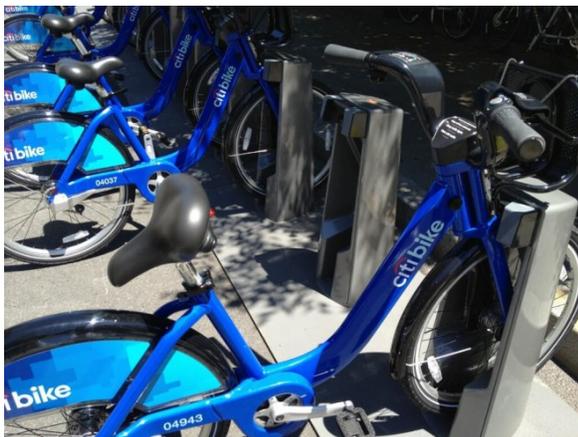
Expansion of the service area should be done in areas that demonstrate high levels of bike share suitability as defined by the Regional Demand Screening summarized in Technical Working Paper #2. In general, highly suitable areas have high population/employment density, high land use diversity, and urban design factors that contribute to a bike-friendly environment. In addition, service area expansions should consider opportunities to improve the system's accessibility by all groups within the community by locating stations in communities traditionally underserved by bike share. Expansion of the service area should be done in places that contain key destinations within a large, relatively contiguous, highly-suitable area. Special care should be taken before implementing isolated stations or isolated clusters of stations as a bike share station's ridership is heavily dependent on the number of other stations within approximately two miles.



## CUSTOMER FEEDBACK MECHANISMS

Bike share systems provide a variety of channels for customer feedback and support, including social media, a “contact us” email form on the system website, and a customer service telephone number. Denver Bike Sharing receives most of its general comments and suggestions for improvement through the “Contact Us” page of its website; comments made there are delivered by email to a staff person who manages the account. Customer service issues, including mechanical difficulties with bikes and billing and payment questions are mostly received by phone.

To solicit additional feedback and better understand its members, Capital Bikeshare commissioned surveys of its registered members in 2011 and again in 2013.<sup>3</sup> In 2011, every registered user was emailed a survey, while in 2013, half of registered users received email surveys; in both years, the response rate was over 30 percent, a high level considering the surveys contained over 50 questions. Capital Bikeshare collected information on member demographic characteristics, bike share trip characteristics, the effect of bike share on travel choices, and user satisfaction of Capital Bikeshare members.



Citi Bike users informally warn other riders of broken bikes by turning the seat backward.

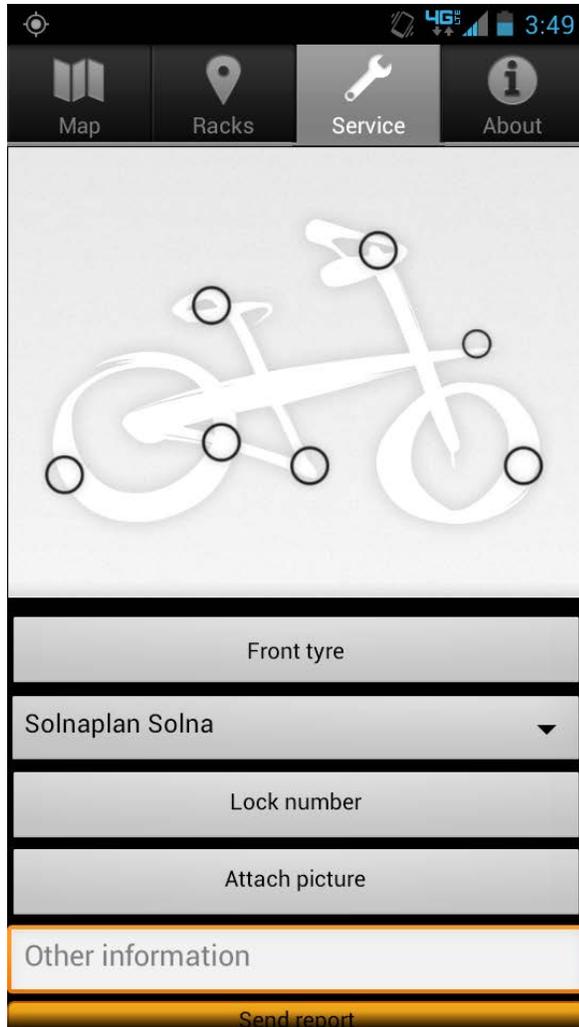
Photo: Twitter user @BrooklynSpoke

Users of PBSC bike share systems can alert maintenance staff that a bike has an issue by pressing a maintenance button on the dock when returning the bike; these incidents are logged in the tracking software used by staff. In New York, Citi Bike users also informally warn staff as well as other riders of broken bikes by turning the seat backward.

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<sup>3</sup> <http://capitalbikeshare.com/assets/pdf/Capital%20Bikeshare-SurveyReport-Final.pdf>  
<http://capitalbikeshare.com/assets/pdf/CABI-2013SurveyReport.pdf>





The Stockholm City Bikes app facilitates user service reports.  
Image: Fehr & Peers.

Mobile bike share applications (“apps”) are also useful for providing information to users and for soliciting feedback. Most mobile bike share applications include links to customer service e-mail addresses and telephone numbers. Stockholm City Bikes also has a service feature as part of the mobile app that allows users who find that a bike needing service to send a detailed report. Users can tap on a bike diagram to indicate the part of the bike needing service. Providing the station and lock number can help maintenance crews locate the bike. Users can also include a picture of the maintenance concern and additional description for special cases not covered by the diagram.



## HEALTHY LIVING AND ACTIVE TRANSPORTATION BENEFITS

To the extent that bike share promotes healthy living and active transportation, it has the potential to deliver substantial health, environmental, and other benefits. Quantifying these benefits can help the Sacramento Area Bike Share Program to evaluate its goals related to health and the environment. Tracking these measures can also build the case for funding from government and nonprofit initiatives and for sponsorships from health- and environmental-oriented companies and organizations.

Many measures of active transportation benefits can be calculated from simple system data such as number of trips or miles traveled by bike share with some simplifying assumptions. For example, Denver Bike Sharing used total distance traveled, combined with the percentage of bike share trips that replace car trips, to calculate pounds of carbon dioxide (CO<sub>2</sub>) emissions avoided, pounds of toxic air pollutants avoided, dollars saved on car parking, gallons of gasoline not used, total calories burned, and total pounds lost. In 2011, users:<sup>4</sup>

- Rode over 430,000 miles;
- Avoided nearly 730,000 pounds of carbon emissions;
- Avoided over 22,000 pounds of toxic air pollutants;
- Saved over \$500,000 on car parking
- Saved over 37,000 gallons of gasoline
  - (Over \$125,000 at \$3.25 per gallon)<sup>5</sup>
- Burned almost 13 million calories; and
- Lost over 3,700 pounds.

“Blue Cross and Blue Shield of Minnesota is committed to helping all community members achieve or maintain good health, so Nice Ride is a great fit with how we’re working to make the healthy choice the easy choice for Minnesotans. Seeing hundreds of riders on shiny green bikes, more people are recognizing that it’s possible to build physical activity into a daily routine — and that it doesn’t have to involve a gym and workout clothes or a lot of time. With the option of taking a Nice Ride bike rather than a car, many residents are losing weight and realizing health benefits such as controlling high blood pressure or reducing the risk for type 2 diabetes and heart attack. Blue Cross is proud that our title sponsorship of Nice Ride is helping people to save on health care costs and, most important, improve their quality of life.”

Dr. Marc Manley  
Vice President & Chief Prevention Officer  
Blue Cross and Blue Shield of Minnesota

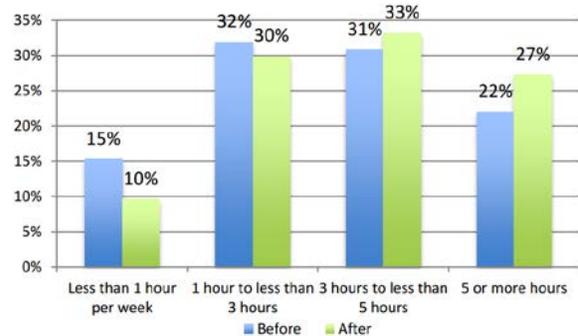
<sup>4</sup> Denver Bike Sharing. “2011 Annual Report.” [http://www.denverbikesharing.org/files/DBS\\_2011\\_Annual\\_Report.pdf](http://www.denverbikesharing.org/files/DBS_2011_Annual_Report.pdf)

<sup>5</sup> Low price of regular gasoline for Denver, CO during 2011 operating season. [gasbuddy.com](http://gasbuddy.com).



Member surveys are also useful for evaluating active transportation benefits. Denver B-Cycle Annual Members self-reported weight loss (14 percent), increased fitness (26 percent), reduced stress (33 percent), and better moods (50 percent).<sup>6</sup> Surveys of Capital Bikeshare users in 2011 and 2013 included questions on:

- Motivations for joining the system (including “exercise, fitness,” and “reduce carbon footprint, environmental reasons”);
- Change in frequency of bicycle use due to Capital Bikeshare;
- Extent to which Capital Bikeshare contributes to personal reduction in driving;
- Whether a Capital Bikeshare membership was a factor in a decision to sell a personal vehicle; and
- How much money the user saves on travel.



Weekly exercise before and after joining Capital Bikeshare.

Image: Alberts, A., J. Palumbo, and E. Pierce.

A separate Capital Bikeshare member survey on health found that “many respondents reported an increase in the amount of time per week spent performing moderate to strenuous physical activities, which suggests the program has a notable (and beneficial) effect on health.”<sup>7</sup> Survey respondents also reported specific health improvements, including reduced stress (31.5 percent), improved stamina (26.7 percent), increased energy (21.8 percent), increased aerobic capacity (20.6 percent), and weight loss (over 30 percent).

<sup>6</sup> Ibid.

<sup>7</sup> Alberts, A., J. Palumbo, and E. Pierce. “Vehicle 4 Change: Health Implications of the Capital Bikeshare Program.” December 2012. [http://capitalbikeshare.com/assets/pdf/v4c\\_capstone\\_report\\_final.pdf](http://capitalbikeshare.com/assets/pdf/v4c_capstone_report_final.pdf)



## ACCESSIBILITY BY MINORITY AND LOW-INCOME COMMUNITIES

Tracking the accessibility of the system by minority and low-income communities can help evaluators determine how well the program is serving all potential user groups. Measures of actions taken to attract a diverse rider base as well as the outcomes of those actions should both be tracked.



Nice Ride partnered with Blue Cross and Blue Shield of Minnesota to distribute over 10,000 custom helmets.

Photo: Nice Ride, Minnesota Annual Report

Nice Ride, Minnesota's 2011-2012 Annual Report touts the program's various outreach efforts, including the number of free annual subscription coupons distributed, the number of subsidized memberships provided to public employees, the number of community events to which Nice Ride sent outreach staff, the number of helmets donated, and the number of free bikes and repairs given to kids.<sup>8</sup> The number of discounted memberships provided to various groups, and the number and cost of targeted outreach campaigns could also be tracked.

The outcomes of outreach efforts are also important to program evaluation. Comparisons of the demographic profile of bike share members with those of the general population or general cycling population in the Sacramento area can provide an indication of how well the membership base represents the broader community in which the program operates, and inform outreach efforts to areas already served by bike share as well as efforts to expand coverage to underserved areas.

Please see Technical Working Paper #2: Demand, Density, Transit and Technology Integration, Tourism, and Equity, for further discussion of accessibility by minority and low income communities.

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<sup>8</sup> Nice Ride Minnesota. "2011 Annual Report | 2012 Mid-Season Update." [https://www.niceridemn.org/\\_asset/9n2z8n/](https://www.niceridemn.org/_asset/9n2z8n/)



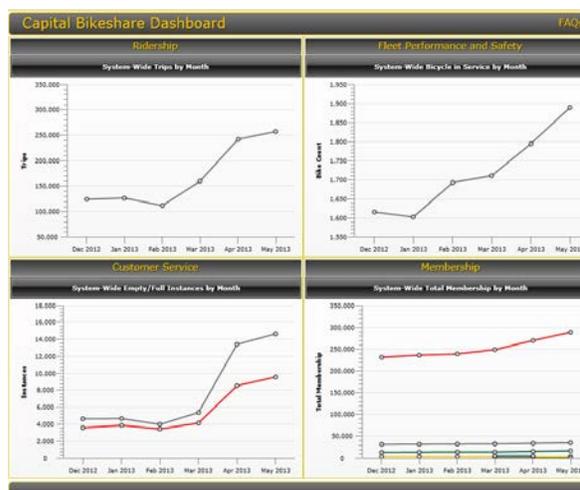
## DATA TRACKING AND PROCESSING

Bike share system software collects data on users and system activity to assist with managing system finances, operations, and maintenance; evaluating program goals; targeting marketing and outreach efforts; and sharing with researchers and the general public. Data on credit/debit card transactions, trip origins and destinations, and user profiles from online registrations can help system managers understand their membership base and activity patterns. Real-time monitoring of the number of available docks and bikes at each station helps the rebalancing team provide a reliable customer experience. Data on the number and duration of server downtime incidents and station-level cellular disconnections help staff to identify and address excessive disruptions to system operation. Hardware trouble tickets and electronic bike and station maintenance records can help system managers understand the level of effort required to maintain the system and ensure that bikes and stations are inspected regularly.

In addition to the data available through existing software and hardware, Denver Bike Sharing would also like the capability to collect full alphanumeric data at bike share kiosks to enable the collection of e-mail addresses from users who register at the kiosk. Improvements to reporting on business-related metrics that are not currently available, such as the kiosk location of 24-hour membership purchases, the number of currently active members, and the number of memberships approaching expiration would also help Denver Bike Sharing to better manage the system and prepare marketing and membership renewal efforts.

In addition to analyzing data internally, Capital Bikeshare also makes many of its operations metrics available to the public through the Capital Bikeshare Dashboard. Dashboard users can browse data interactively by topic, time period or location, or download detailed tables. Users have access to a variety of ridership, customer service, membership, fleet performance, and safety metrics, including:

- **Ridership**
  - Number of trips per Month
  - Trip Origin/Destination by Municipality

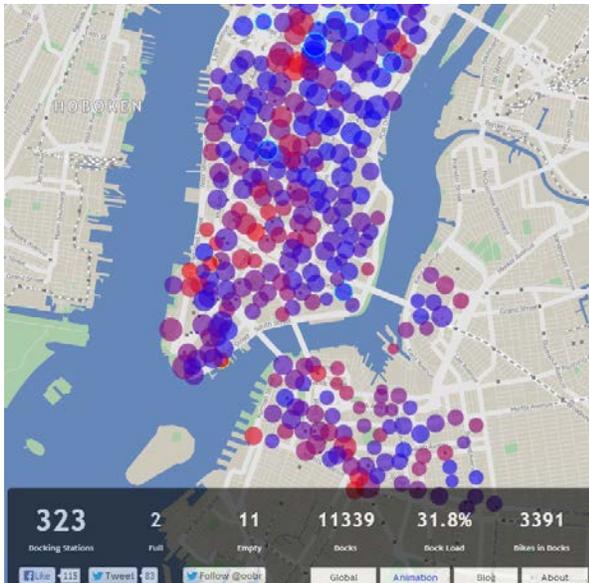


Capital Bikeshare Dashboard.

Image: <http://cabidashboard.ddot.dc.gov/CaBiDashboard/>



- Trip Origin/Destination by Station
- Trips per Time Interval
- Percentage of trips per time interval
- Miles Travelled per Month
- **Fleet Performance and Safety**
  - Bicycles in Service
  - Fleet Maintenance (Number of Bikes Inspected/Repaired) per Month
  - Bicycles Damaged per Month
- **Customer Service**
  - Stations Full or Empty - Number of Instances
  - Stations Full or Empty - Time Interval
  - Stations Full or Empty - Percentage of Instances per Time Interval
  - Stations Full - Instances of Additional Time Granted
  - Stations Full - Total Number of Extra Minutes Granted
  - Rebalancing - Number of Times Bicycles Picked up and dropped off at Stations
  - Customer Service Calls - Number of Incoming Calls and Lost Calls
- **Membership**
  - Total Number of Users
  - New Members



Oliver O'Brien's Bike Share Map shows station utilization.

Image: <http://bikes.oobrien.com/newyork/>

Many bike share systems provide information on station and dock availability to users through their websites and mobile applications. Making these data available to software developers has also inspired the creation of third party applications.

Spotcycle, a mobile app, provides hand-held access to bike and dock availability maps for over twenty bike share systems.

Oliver O'Brien at the Centre for Advanced Spatial Analysis has created a global bike share web map that visualizes bike and dock availability at stations in over 100 systems around the world. At the global level, users can view the total number of cities,





docking stations, docks, bikes (in docks and in use), as well as the busiest systems and the number of stations in each city. By clicking on a city, the user moves to a local view of stations, docks, and the number and percentage of full and empty docks and stations. Clicking on any station reveals a trend graph of the station load over the past 24 hours.

