

Monterey County Bicycle Sharing Concept of Operations and Implementation Plan

Prepared for:

Transportation Agency for Monterey County (TAMC)

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Funded by a grant from the Monterey Bay Unified Air Pollution Control District

February 22, 2013

WC12-2934



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1. Introduction

The Transportation Agency for Monterey County (“TAMC”) is developing a program (“Bikesharing Program” or “Program”) to provide a bicycle sharing service for the people of Monterey County. The foundational concept of the Bikesharing Program is to provide convenient access for individuals to use bicycles on a short-duration, as-needed basis, without the burdens of bike ownership, such as purchase and maintenance costs, storage, and parking. The goals of the Program include:

- Provide a comprehensive, multi-modal, and functional bicycle sharing service.
- Improve mobility for Monterey County residents and visitors.
- Increase the use of bicycles for relatively short-range travel.
- Decrease the number of cold starts and the amount of vehicle idling.
- Promote transit usage and linkage with other transportation modes, such as walking.

This Concept of Operations and Implementation Plan describes the preferred functions and System components that stakeholders will use to achieve the Program’s goals. In the context of this document, the Program refers to the broadest description of the actions needed to provide bicycle sharing, while the System refers to the specific implementation of technology and equipment and the particular arrangement of System components that is used to achieve the Program’s goals.

- Chapter 2 describes the Operational Environment that provides context for the System.
- Chapter 3 identifies the key stakeholders who play roles in performing the Bikesharing Program’s functions. It also discusses some of the interactions among those entities.
- Chapter 4 describes the System components that compose a generic Bikesharing System.
- Chapter 5 describes Generic Operational Needs—the functional view of the Bikesharing Program—without regard to how the functions are specifically performed.
- Chapter 6 presents a matrix of three potential Implementation Models, including the major hardware and software System components and System design that could support the Bikesharing Program’s functions and realize the Concept of Operations:
 - Publicly Owned
 - Non-Profit Owned
 - Local Bike Rental model
- Chapter 7 describes the next steps in pursuing a bikesharing system and a rough timeline for implementation.

The Appendix provides performance metrics for evaluating the System Operator.



2. Operational Environment

The Operational Environment includes the built and natural environment as well as the social and regulatory context in which the Program and System will operate.

NATURAL ENVIRONMENT

The climate in Monterey and Pacific Grove is mild year-round with summer highs around 70 degrees Fahrenheit and winter lows around 45 degrees. Precipitation averages less than 20 inches annually and falls mainly during the winter months; snow at lower elevations is extremely rare. Steep and hilly terrain on the Monterey Peninsula presents a challenge for bikesharing. Two relatively flat areas in Pacific Grove and Downtown Monterey are divided by hilly terrain in the Presidio; however, the Monterey Bay Coastal Trail provides a flat route connecting the two along the coast. The climate in Salinas is slightly warmer than in Monterey and Pacific Grove in summer, but has similar winter lows. The terrain in Salinas is mostly level.

BUILT ENVIRONMENT

Figures 1 and 2 depict the street networks (white), bike trails (solid, dark green), and bike lanes (solid, light green) in Monterey/Pacific Grove and Salinas, respectively. Monterey and particularly Pacific Grove have a relatively fine-grained, regular street grid; however, steep terrain near the Presidio and south of Jefferson Street breaks up the grid somewhat. The Monterey Bay Coastal Trail provides good connectivity along the coastline of the peninsula and connects to a path along El Estero and to bike lanes on Camino Aguajito and Sloat Avenue.

The blocks in Salinas are slightly larger and more irregular than those in Monterey/Pacific Grove. The street network is also interrupted by railroad tracks and US-101 / El Camino Real, both of which run northwest to southeast through the City. The bike lanes on East Alisal Street provide connectivity across the railroad tracks and freeway. Bike lanes on Rossi Street, Pajaro Street, Front Street, and Abbott Street also serve the area surrounding the proposed bikesharing network.

In terms of residential and employment densities, Monterey/Pacific Grove and Salinas are fairly similar, though Salinas as a whole is slightly less dense. The cities of Monterey and Pacific Grove have a combined job density of 2,415 jobs per square mile, while Salinas has a density of 2,128 jobs per square mile. The combined housing density of Monterey and Pacific Grove is 1,919 housing units per square mile, while Salinas has 1,837 housing units per square mile.



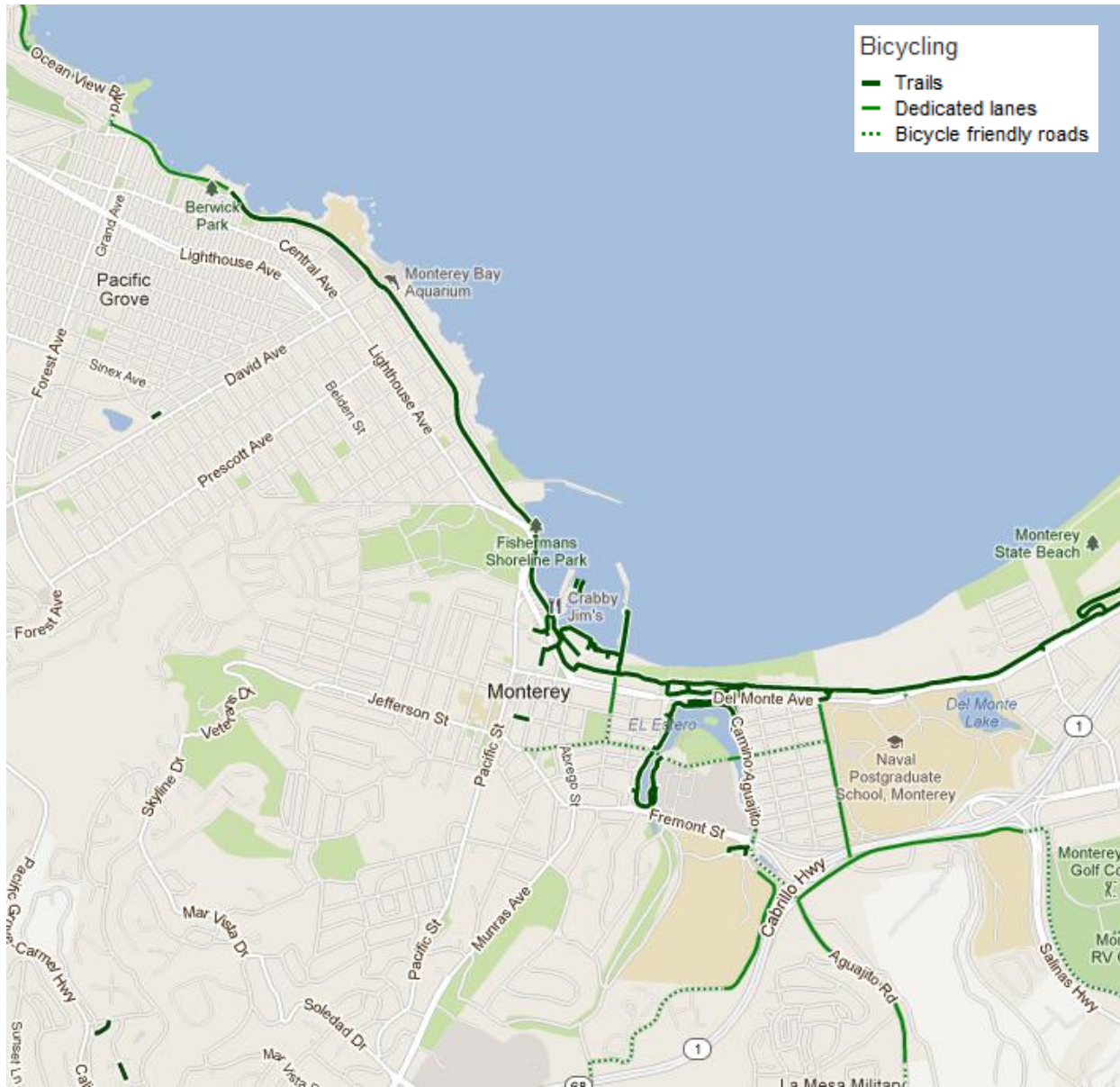


Figure 1. Monterey/Pacific Grove Street and Bikeway Networks

Source: Google Maps



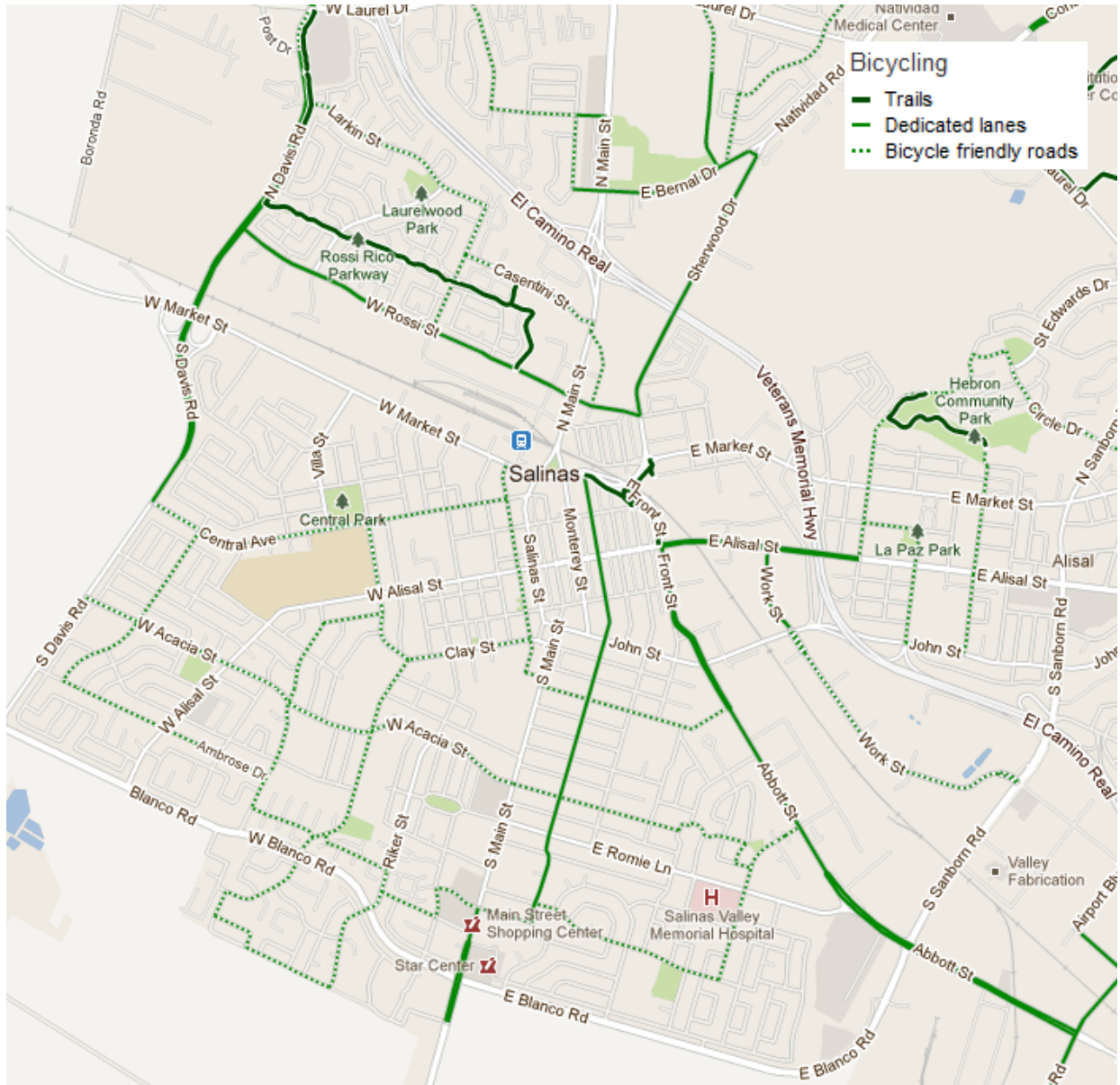


Figure 2. Salinas Street and Bikeway Networks

Source: Google Maps



SOCIAL CONTEXT

Table 1 provides a demographic summary of the cities of Monterey, Pacific Grove, and Salinas. In addition to the residential population, Monterey County is a popular tourist destination, drawing nearly 8 million visitors per year.

TABLE 1. DEMOGRAPHIC SUMMARY

Demographic Category	Monterey	Pacific Grove	Salinas
Total Population	27,810	15,041	150,441
Age 0-18	15.3%	16.5%	31.4%
Age 18-24	13.8%	6.6%	12.0%
Age 25-44	30.5%	23.0%	29.9%
Age 45-64	24.9%	32.3%	19.3%
Age 65+	15.5%	21.6%	7.5%
White	78.3%	84.5%	45.8%
All Other Races ¹	21.6%	15.4%	54.2%
Hispanic or Latino of any race ²	13.7%	10.7%	75.0%
Median Household Income	\$49,109	\$50,254	\$43,728

Source: 2010 Census, except Median Household Income from 2000 Census.

¹ Includes African American, Native American, Asian, Pacific Islander, "other races" and those from two or more races. Salinas reported 39.2% of the population from "other races" alone.

² Hispanic or Latino or any race is a subset of the White and All Other Races categories.



REGULATORY CONTEXT

Helmet laws, sign ordinances, and permitting processes all influence the implementation of a bikesharing program.

California Vehicle Code 21212 requires all Bicyclists and passengers under age 18 to wear an ANSI or Snell approved helmet when a passenger or riding upon a bicycle. Because of the difficulty of providing helmets to users, this might restrict the minimum age of bikesharing users to 18. In other locations, such as Seattle, Washington, helmets are required for all cyclists. The Seattle bikesharing program is planning to proceed with a helmet vending system that will allow users to check out helmets along with their bikes and return them for cleaning and inspection.³

The cities of Monterey, Pacific Grove, and Salinas all have ordinances that regulate the use of signs in their communities. The need for signs at bikesharing stations to inform the public and users about the system and potentially to raise sponsorship and advertising revenue might require modifications to or new interpretations of these ordinances. Monterey Municipal Code Chapter 31; Pacific Grove Municipal Code Chapter 20.04; and Salinas Municipal Code Chapter 37, Article V, Division 3 all regulate the use of signs in their respective jurisdictions.

Because bikesharing is a new concept in Monterey County, there is currently no streamlined process for permitting the installation of bikesharing stations. The Program Manager should coordinate with local jurisdictions and other regulatory and permitting agencies to develop a streamlined permitting process.

³ <http://grist.org/cities/bike-sharing-goes-bigtime-but-can-it-get-over-its-little-helmet-problem/>



3. Stakeholders

PUBLIC

Members of the public are the Program's most important stakeholders. They include residents, commuters, students, visitors, and anyone else who travels in Monterey County. Even members of the public who do not directly use the Program may interact with it in some way, for example:

- Owning or working at a business whose customers arrive by bikesharing bike;
- Seeing bikesharing stations and bikes;
- Traveling on streets with reduced automobile volumes and increased numbers of bikes;
- Experiencing improved air quality or a decreased demand for automobile parking; or
- Discussing the Bikesharing Program with friends, colleagues, and neighbors and increasing awareness of the Program.

Some members of the public will choose to become the Program's users (below).

USERS

Users are the stakeholders whom the Bikesharing Program addresses most directly. Users form a relationship with the Program by registering, which allows them to use the Program's bicycles for a limited period of time. Users are further subdivided into two groups: members, who register for a long-term (annual or 30-day) membership, and casual users, who register for a short-term (e.g., 24-hour or 7-day) pass. Because of the legal requirement for bicyclists under the age of 18 to wear helmets in California and the difficulty inherent in providing helmets to users, use of the Program might be limited to those 18 years of age and over.

PERMITTING AGENCIES

The permitting agencies include all government and regulatory agencies that have control over land use and approve implementation of the System. Permits to use public right of way and other public or private property for stations may be necessary; local governments might also have ordinances restricting informational signage or advertising on stations or bikes. These parties are likely to be involved with intergovernmental agreements.

LAND OWNERS

Land owners include all public or private entities that own land where the Program Manager might locate a station. This could include public rights of way such as sidewalks and city streets, utility easements along gas pipelines or electrical transmission lines, other public facilities, such as libraries or parks, or private or institutional land such as parking lots or courtyards.

FUNDING ORGANIZATIONS

Funding organizations typically have an interest in one or more of the Bikesharing Program's goals and provide funding to enable the System to operate. In exchange, funding organizations will likely expect to see results from their investments, perhaps in the form of improved mobility, community economic development, reduced emissions, healthy activity, Program visibility, etc. Funding organizations



encompass a variety of groups that might include local, state and federal governments and agencies, non-profit, grant-making organizations, or even private companies.

PROGRAM MANAGER

The Program Manager is the organization ultimately responsible for the Bikeshaaring Program. This organization takes the lead in setting the Program's policies, gathering and managing the expenditure of Program funding, and managing the operation of the Program. The Program Manager may establish performance metrics for evaluating the System Operator and ensuring that the System is meeting Program goals (see Appendix A for example performance metrics).

SYSTEM OWNER

The System Owner owns the System hardware and software, possibly including bikes, stations, repair vehicles, etc., needed to implement the goals of the Program. The System Owner typically purchases the equipment from the System Vendor, but the System Owner and System Vendor might be the same entity.

SYSTEM VENDOR

The System Vendor (or Vendors) provides the System hardware and software and is typically the entity that designed, developed the technology for, and manufactured many of the components of the System.

SYSTEM OPERATOR

The System Operator is directly responsible for the ongoing operations of the System, including maintaining System records, registering and serving users, and maintaining and redistributing the bikes. The System Operator operates the System to meet the Program's goals at the direction of the Program Manager.

The Program Manager, System Owner, System Vendor and System Operator could all be the same entity, or those roles could be divided between or among two or more entities. For example, a city transportation agency (A) might serve as the Program Manager and the System Owner, purchase System components from a separate System Vendor (B) and contract with two local bike shops to serve as the System Operators (C and D).



4. System Components

STATION

A station is a location where users can check out and check in Program bikes. Under the commonly-deployed “third generation” style of bikesharing, stations are automated, self-service locations where users conduct transactions through a terminal and check bikes in and out without the direct assistance of a staff person. However, as a System Component, the broad definition of a station could include any place that the System has designated for securing bikes when they are not checked out to users. These could be locations manned by System staff or the staff of local business and community partners, or even simple bike racks or other locations where bikes can be secured.

BIKE

The bike is the central component of the System. Bikes are secured at stations when not in use and are checked out to users to be ridden. The specific type of bicycle used is a choice for the Program Manager and System Operator; additional information on the Operational Needs for Program bikes is given in Chapter 5, below.

USER COMMUNICATION

The System communicates a variety of information to users, including information on membership and pricing, how to use the System, the locations and status of bikes, summaries of user activity, and information about special events. This information could be communicated through a variety of channels, including signage on stations and bikes, signage throughout the community, over the telephone, on a Program website, or through a mobile application.

PUBLIC COMMUNICATION

The System also communicates with the public at large, providing information such as Program goals and progress toward achieving them, and promotional information about joining the Program. This information might be communicated through traditional media campaigns, a Program website, social media campaigns, or partnerships with community businesses and organizations.

RECORD-KEEPING SYSTEM

The record-keeping system keeps track of which bikes are checked out to which users, where they were checked out and in, and for how long they were checked out. The record-keeping system can also track data on user registrations and maintenance and rebalancing activities. This could be a complex, IT-based software system or a simple ledger book.

BIKE REBALANCING

During the normal course of System operations, some stations tend to become full or empty, since patterns of user demand are not always in balance. For example, on a workday, stations in predominantly residential locations might empty as users check out bikes for the morning commute and stations in job centers will fill as commuters arrive. To ensure that stations have both bikes and check-in locations available to users, the System Operator will need to rebalance bikes to stations throughout the System. The System Operator might do this directly, by employing staff and vehicles to transport bikes from full stations to empty ones, indirectly, by providing financial or other incentives to users for checking



bikes out from full stations or checking them in at empty ones, or by a combination of direct and indirect approaches.

SYSTEM REPAIR

The Program Manager employs or contracts with staff to perform both routine, preventative maintenance on its bikes and repairs in response to bike or station malfunctions. The maintenance staff might perform maintenance on bikes that are checked in at stations, on bikes that are checked out to users in the field, or at a separate maintenance and operations facility. Maintenance staff might require vehicles to carry their tools, travel among the station locations or to a user in the field, or even to transport bikes to the maintenance and operations facility.



5. Generic Operational Needs

This chapter describes the desired functions of a generic Bikesharing Program without regard to a particular implementation technology or System design. A variety of models could be employed to achieve the functions described below.

PROVIDE INFORMATION

The Program Manager provides information about the Program, the System, and bicycling in general to both the public, who might want to become users of the Program, and to the users who have already registered to use the Program. Key pieces of information typically include:

- How to use the Bikesharing System (pricing structure, how to check bikes in and out, etc.)
- Contact information for customer support
- Safety information
- Laws affecting bicyclists
- Station locations
- Bike facilities (bike routes, retail, rental, and repair shops, etc.)

REGISTER USER

User registration ensures that the user is accountable for the bike while it is in use and facilitates collecting payment for use of the Program. User registration also enables the collection of data on how the user uses the Program.

When registering a user, the Program Manager:

- Allows users to register under a variety of membership options, including annual, 30-day, 7-day, and 24-hour memberships.
- Collects and maintains records of identifying and contact information about each user so that access to the Program's bikes can be limited to users. Users can be contacted to recover a missing bike or to collect survey information, and use data can be collected about each user.
- Collects payment information that can be used to charge users for memberships, use of the System, and repairs or replacements for lost or damaged bikes.
- Enables users to sign a liability waiver and consent to the System's terms of use.
- Provides users a physical or virtual (e.g., password, linked payment, or form of ID) key that confirms that they have successfully registered for a particular type of membership and allows access to a bike.

Casual users can register for a short-term membership at any station, while Members can sign up for longer-term memberships on the Program's website or mobile app. A mechanism for allowing Members to sign up for longer-term memberships at stations is also desirable.



COLLECT PAYMENT

The Program Manager oversees the collection of two primary kinds of payments from users: a membership fee, collected at registration, and a usage fee related to the duration of each trip and potentially collected at the end of each trip. The Program Manager may also collect payments for a bike that is lost or damaged while a user is accountable for it. These fees might be charged to the user at the station when the bike is checked out or in, or they might be charged automatically to a form of payment (such as a credit/debit card or transit pass) that the user provides at the time of registration.

ADJUST BIKE

Users can adjust any Program bike to fit them comfortably without their own tools, both at the point of check out and while using the bike away from the station.

CHECK OUT

The user provides the physical or virtual key that confirms Program membership in order to check out a bike. Once a user checks out a bike, the user becomes accountable for that particular bike. The Program Manager records information about the check-out, including the user, an identifier for the particular bike, the start time, and the location.

RIDE BIKE AND PARK BIKE TEMPORARILY

The Program Manager provides safe, comfortable, visible, and functional bikes for users. A user might ride a Program bike continuously from check-out to check-in, or might park the bike temporarily while stopping in to a destination en route. A means of securing the bike during such stop-overs is desirable. In addition to providing bikes to users, Program bikes in use can also support Program goals by increasing the visibility and awareness of the Program and of bicycling as a form of transportation. Program bikes include the following features:

- Lighting system (may include rear flasher and front headlight);
- Puncture resistant tires;
- Reliable and intuitive braking system;
- One size to fit majority of adult population with seat-only adjustment;
- Theft and tamper resistant (potentially through use of components not compatible with other bicycles and/or requiring tools not commonly available);
- Unique, visible design clearly distinguishing Program bikes from other bicycles.

Additional desirable features of Program bikes include:

- Protection from grease, dirt, and tire spray including enclosed drive train and full fenders;
- Multiple gears (3 or more);
- Pedal-powered front/rear lighting system;
- Corrosion resistant material with rust-proof external parts;
- Cargo capacity for items such as a typical briefcase, book bag, and/or grocery bag weighing up to 20 pounds;
- Chainless bike or bike with a chain-guard;
- Equipped with secondary lock to enable user to secure bike to any bike rack or post while making a quick stop;
- Light weight (less than 35 pounds);
- Capacity for sponsorship or advertising that can be easily changed;
- Front, rear, and side reflectors;
- Upright riding position allowing for confident riding in traffic;
- Easy to operate: easy to mount and to hold in stopped position, including for shorter rider;



- Kickstand or other device to allow the bicycle to be supported upright;
- Compatibility with racks on transit vehicles;
- Equipped with GPS tracking devices or equivalent;
- Equipped with sensors on bikes to diagnose and self-report mechanical problems.

CHECK IN

When checking a bike in, the user returns the Program bike and receives confirmation that the bike has been successfully returned. The Program Manager records information about the check-in, including the user, the particular bike, the end time, and the location. The Program Manager provides confirmation that the user is no longer directly accountable for the bike and that the bike has been. The Program Manager also calculates the duration of the trip, and charges the user a usage fee, if appropriate.

SECURE BIKE

When bikes are at stations and not checked out to an accountable user, they are physically secured to control access and prevent theft and damage.

GATHER USE DATA

At a minimum, the Program Manager collects basic use data for each trip and about the state of the System at any point in time.

Trip Data

The Program Manager collects basic trip data during the check-out and check-in process. The user, bike, time, and location of each check-out and check-in enable the Program Manager to calculate trip durations, straight-line travel distances, and trip patterns and frequencies. These metrics also enable rough calculations of calories burned, greenhouse gas emissions saved, and fuel not consumed. Equipping Program bikes with GPS devices can provide additional data about the travel routes chosen by users and provide more accurate estimates of transportation, health, economic, and environmental metrics.

System Status Data

The Program Manager maintains a real-time database of the state of the System, including the number of functional and malfunctioning bikes at each station, the capacity of each station to check in more bikes, and how many bikes are currently checked out to users. The Program Manager also maintains records of each bike's use and maintenance history and status.

REPORT USE DATA

The Program Manager reports use data in a variety of forms for a variety of stakeholders, including users, the System Operator, and the Program Manager:

Users

Users might be interested in secure access to their personal history of System use through a Program website or mobile application. Providing information such as a history of personal trips taken, miles traveled, and calories burned could encourage use of the Program. Allowing users to opt in to sharing their biking accomplishments with friends through social media could also encourage more use of the



Program. Presenting real-time bike and station availability to users can help them make decisions about where they will check out and check in bikes.

System Operator

The System Operator can use System data to manage, operate, and maintain the System. Bike repair and use records can be used to ensure that each bike receives attention at regular time intervals or after a certain number of trips. System status data can help the Operator balance bikes and recognize regular patterns of use.

Program Manager

The Program Manager can use System data for a variety of purposes:

- Reports on the number of empty and full stations or the repair status of bikes can help the Program Manager evaluate the performance of the System Operator.
- Data on Program usage can inform decisions about areas, such as bike infrastructure or transit policy, that can affect Program goals.
- Reports on frequency of use, number of miles traveled, calories burned, and other health, economic, and environmental metrics can help the Program Manager evaluate the effectiveness of the Program and provide information to funding organizations or the public.

SUPPORT USER

The user has access to a Program representative for support at any time that the System is in operation. The Program provides support to assist users in completing any of the Program functions described above, or in the case of an exceptional scenario (described below). The Program Manager might provide support in a variety of ways, including:

- Over the phone;
- Through email, the Program website, or a mobile application;
- In person at station locations;
- In person at the maintenance and operations facility.

EXCEPTIONAL SCENARIOS

Any number of unexpected operating conditions could arise. Operational needs for some exceptional operating conditions that can be foreseen are described below.

Bike Malfunction

A user might discover that a bike is not working properly at any point. The Program Manager provides a way to check the bike in and notify repair staff at each station. If the user cannot check the bike in at a station, she can contact a Program representative.



Bike Collision

If anyone is injured in a collision with a Program bike, the user should call 911 immediately. The user should also call the police department where the crash took place to file a report with an officer. This will help assure all important information is documented.

The user must notify the Program Manager of the facts of the crash by calling and speaking with a Program representative. The user remains accountable for the bike until it has been properly checked in at a station or handed over to a Program representative.

Bike Stolen

If a Program bike is stolen while a user is accountable for it, the user should call the local police department immediately to file a theft report. The user must then notify the Program Manager of the loss or theft of the bike as quickly as possible. The Program Manager may charge the user for the cost of recovery or replacement of the bike.

Station Full

If a user returns to a station to find that there is no capacity to check in a bike, she can provide her physical or virtual key to receive additional, free time to reach another station with available capacity. The Program Manager also provides real-time capacity information about nearby stations at each station, on the Program website, and through the mobile application; information about these information sources is provided on the station and on the bike.

Station Empty

If a user arrives at a station to find that there are no Program bikes available for check-out, she can request real-time information about available bikes at nearby stations through the channels described above.

Large Event

When a large event such as a sporting event or special celebration takes place in or near the Program's service area, demand for Program bikes and check-in stations might exceed the Program's capacity. The Program Manager will communicate with users in advance of the event to explain the Program's event strategy. A special, staffed station or "bike corral" might be set up to accommodate the check-in of additional Program bikes.

Inclement Weather or Emergency

In the event of inclement weather or another emergency, the Program Manager can restrict access to Program bikes, allowing users to check bikes in but not to check them out. The Program Manager can also use user contact information to inform users of the emergency and instruct them to return their bikes or take shelter. In extreme events with advance warning, the Program Manager might also close the System and relocate bikes and even stations to a safer location to protect the equipment.



6. IMPLEMENTATION MODELS

This chapter presents three potential Implementation Models, including the major hardware and software System components and System design that could support the Bikesharing Program’s functions and realize the Concept of Operations. The three models considered most appropriate for Monterey County are:

- **A Public model** that is owned by a public agency or local government, operated by a contractor, and employs third-generation, automated bike-sharing hardware;⁴
- **A Non-Profit model** that is owned and operated by a non-profit organization and employs third-generation, automated bike-sharing hardware; and
- **A Local Bike Business model** that is owned and operated by a new or existing local bike business or businesses in Monterey and employs conventional bikes and staffed stations, with the option of expanding to include third-generation, automated bike-sharing hardware.

Table 2 presents the three models side-by-side, describing how each of the elements presented in Chapters 3, 4, and 5 would be implemented under each model. In each model, the implementation of many elements is flexible, but the table presents the recommended or most likely option.

TABLE 2. IMPLEMENTATION MODELS

Element	Public	Non-Profit	Local Bike Business
<i>Stakeholders</i>			
Public	Residents, commuters, students, visitors, and anyone else who travels in Monterey County		
Users	A user could be anyone who decides to join the Bikesharing Program. A Public or Non-Profit Program might be more inclined to serve local residents.		Because of existing experience serving the tourist population, Local Bike Businesses might be more inclined to serve tourists.
Permitting Agencies	All government and regulatory agencies that have control over land use and approve implementation of the System, including the use public rights of way, public and private property, and signage or advertising.		

⁴ The “contractor” could be a local bike business; the key differences between the Public model and the Local Bike Business model are the ownership of the system and the operational approach used.



Element	Public	Non-Profit	Local Bike Business
Land Owners	Public and Non-Profit Programs will need to enter agreements with any public or private entities that own land where the Program Manager might locate a station, to allow the station to be located there and to establish an understanding of the expectations for the location, appearance, operation, and maintenance of the station.		Local bike rental and retail businesses already have rights to rent bikes from certain locations that they own or lease, or where they have formed partnerships with the landowner or tenant (e.g., a hotel). To the extent that a Local Bike Business expands its rental model to include automated stations, it will need to form similar arrangements with land owners to those made under the Public or Non-Profit model.
Funding Organizations	Likely to include government agencies and programs; less likely to receive funding from non-profit or private donors. Sponsoring businesses are also possible funding organizations.	Likely to include non-profit grant-making organizations, private donors, and sponsoring businesses. Also eligible for grants from state and federal programs, or capable of partnering with a local or regional government agency or jurisdiction to apply for state and federal grants.	Likely to be primarily privately funded. Sponsoring businesses are still likely, but non-profit organizations are less likely to fund a privately-owned system. Could potentially include a government agency that subsidizes operations.
Program Manager	The Program Manager is a government agency or jurisdiction.	The Program Manager is a non-profit organization.	The Program Manager is most likely one or more existing or new Local Bike Businesses. A government agency, jurisdiction, or non-profit organization could also manage the Program and contract out operation and/or ownership responsibilities for the bikesharing System to a Local Bike Business.



Element	Public	Non-Profit	Local Bike Business
System Owner	The government agency or jurisdiction would likely act as the System Owner. The agency or jurisdiction could also form an agreement with a contractor to both own and operate the System, but would risk losing control over the System, or would require more complex agreements with the contracted owner/operator.	The non-profit owns the System.	The Local Bike Business owns the System.
System Vendor	The Program Manager contracts with a third-party bikesharing hardware vendor (System Vendor), such as Public Bike System Company/BIXI, B-cycle, DecoBike, or Bike Nation, among others.		The Local Bike Business could contract with a third-party System Vendor in the case of using a third-generation, automated bikesharing system. The Local Bike Business could also use its existing bicycle fleet or purchase additional bicycles from vendors with which it has existing contracts.
System Operator	The System Operator is likely contracted to operate the System on behalf of the Program Manager.	The Non-Profit likely acts as the System Operator.	The Local Bike Business acts as the System Operator.
System Components			
Station	Third-generation, automated Stations, typically composed of an electronic kiosk that facilitates transactions; an information panel that presents advertising or sponsorship information, a System and local bike map, and/or information about how to use the System; and a number of modular docks for securing bikes. Power is typically supplied by a solar panel and communication with the System's back-end computer		Staffed Stations in a variety of possible contexts, including conventional retail storefronts on leased or owned property; temporary or seasonal outdoor locations with a simple table, chair, and series of



Element	Public	Non-Profit	Local Bike Business
	<p>system is wireless. AC power can also be used in the event that solar access is insufficient to power the station. Depending on the hardware used, stations are typically approximately 6 feet deep with an additional 4 feet of clearance needed to dock and undock bikes. Docks are usually attached in a single row. A linear Station with 10 docks is typically 25 to 30 feet long; stations can also be configured in two rows, back to back. Example Station configuration options for three System Vendors are provided in Figure 1.</p>		<p>bike racks; or within partner businesses, such as hotels, cafes, restaurants, fitness centers, or retail establishments. The Local Bike Business model could also expand to include third-generation, automated Stations, but would also require compatible bikes (below).</p>
Bike	<p>A durable, secure bike with an unusual or distinctive design that contributes to a System identity and awareness and allows secure docking at automated stations. Optional on-board GPS allows the collection of use data. See Chapter 5 for additional desired bike specifications.</p>		<p>Any variety of bicycles could be used, allowing the model to meet the needs and desires of various users. Bikes will ideally incorporate a common paint scheme or design to promote System identity and awareness. Bikes could also incorporate GPS units for collecting usage data, but secure integration with standard bike models might be a challenge. If the model expands to include third-generation, automated stations, compatible bikes, like those used in the Public and Non-Profit models, will be required.</p>
User Communication	<p>Information will be communicated through a variety of channels, including signage on stations and bikes, signage throughout the community, over the telephone, on a Program website, and through a mobile application.</p>		<p>In addition to the channels available to the Public and Non-Profit models, staff can communicate directly with users at staffed stations.</p>
Public Communication	<p>Information might be communicated through any of the User Communication channels above, as well as through traditional media campaigns, social media campaigns, or partnerships with community businesses and organizations.</p>		



Element	Public	Non-Profit	Local Bike Business
Record-Keeping System	Automated, IT-based record keeping system that records usage information seamlessly when bikes are checked in and out of stations. GPS data, if available, are also automatically collected. Communications equipment at each station uploads usage data to the back-end computer system in real time.		Check-in and check-out information can be recorded automatically by scanning a membership ID and barcode, RFID tag or other unique identification method on the bike. Information can also be recorded manually by the station staff recording a bike number on a computer or hard-copy ledger. The level of technology required for record-keeping will depend on the level of functionality desired in using data to manage and report on the System.
Bike Rebalancing	Staff use vans, trailers, or other motor vehicles to relocate bikes from full stations to empty ones. Use and capacity data help inform staff about where to redistribute bikes. Price incentives or other rewards for users to return bikes to empty stations and check them out from full stations might also be used to promote system balance.		Staff use vans, trailers, or other motor vehicles to relocate bikes from full stations to empty ones. Direct communication with staff at different stations can inform staff about where bikes or check-in capacity are needed.
System Repair	Staff perform minor repairs and maintenance at stations and in the field and use vehicles to transport bikes needing more intensive repairs to a maintenance and operations facility.		Staff are available to perform repairs at each station, or to send bikes needing more intensive repairs to a station with more experienced repair staff.
Operational Needs			
Provide Information	Full range of communication channels, except for in-person assistance at stations.		Full range of communication channels, including in-person



Element	Public	Non-Profit	Local Bike Business
			assistance at stations.
Register User	Short-term (24-hour and 7-day) users can register for membership at the station kiosk. Long-term (annual and 30-day) Members can register online and receive a membership key or card in the mail. Ideally, stations can also accommodate the registration of long-term Members.		Staff can assist with registration for any duration of membership and issue membership cards at each staffed station.
Collect Payment	Payment is collected by debit or credit card only.		Staff at staffed stations could collect payment by debit card, credit card, check, cash, or other forms.
Adjust Bike	Users must be able to adjust bike seat height without assistance, using a quick-release or other easy-to-use adjustment mechanism. Reference marks help users to remember the seat height they find comfortable for easier adjustment on future rides.		Staff at staffed stations can help users adjust bikes in any number of ways before users leave the station. Seat height should also be adjustable by quick-release or other easy-to-use adjustment mechanism so that users can further adjust seat height after leaving the station.
Check Out	The user provides the physical or virtual key that confirms Program membership in order to check out a bike. The station automatically records information about the check-out, including the user, an identifier for the particular bike, the start time, and the station location.		The user provides the physical or virtual key that confirms Program membership to the staff member at the station. The staff member records information about the check-out, including the user, an identifier for the particular bike, the start time, and the station location.
Ride Bike and Park Bike	Riding the bike is similar for all implementation models; however, the Local Bike Business model might be able to provide an increased variety of bikes and features.		



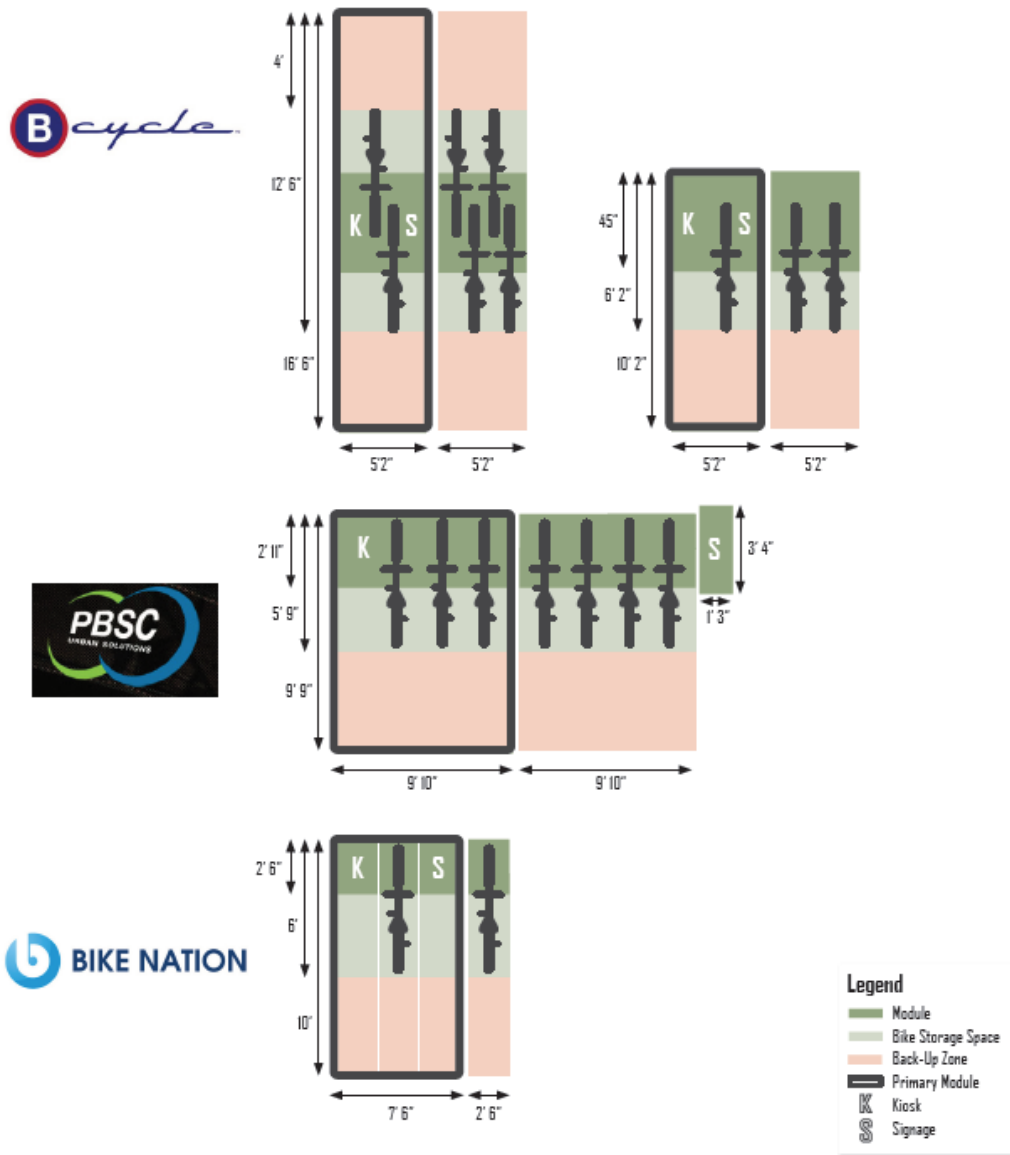
Element	Public	Non-Profit	Local Bike Business
Temporarily	See Chapter 5 for desired bike specifications.		
Check In	Users may return a bike to any station, regardless of where the bike was checked out. When checking a bike in, the user returns the Program bike and receives confirmation (a flashing green light and/or audible tone) that the bike has been successfully returned. The station automatically records information about the check-in, including the user, the particular bike, the end time, and the location. The back-end computer system automatically calculates the duration of the trip, and charges the user a usage fee, if appropriate.	Users may return a bike to any station, regardless of where the bike was checked out. The staff member helps the user check in the bike, records information about the check-in, determines the length of the rental period, and charges additional usage fee, if appropriate.	
Secure Bike	Upon return to the station, the dock locks automatically, securing the bike to the station. Proprietary hardware requiring special tools is essential to ensure that the station and bikes aren't tampered with.	The staff member secures the bike in a locked or under-surveillance storage room or rack. Physical access to bikes is restricted so proprietary hardware is not necessary to prevent tampering while the bike is secured.	
Gather Use Data	Trip and System status data are collected automatically by the System. Staff need to manually update maintenance records.	Staff members are responsible for manually recording trip, system status, and maintenance data.	
Report Use Data	The System can prepare automated reports for users (through the Program's website and/or mobile application), and for the System Operator and Program Manager (through the back-end computer system).	If an IT-based system is used for staff to record Program data, reports can be generated automatically as with the third-generation, automated-station models. If the record-keeping system is not computerized, staff would need to prepare reports manually.	



Element	Public	Non-Profit	Local Bike Business
Support User	The Program Manager can provide user support over the phone, through email, and in person at the maintenance and operations facility. Staff performing routine checks at stations can also assist users, but will only be available sporadically.		In addition to user support over phone and email, staff at staffed stations can provide direct support to users.
Exceptional Scenarios	Most exceptional scenarios can be handled by all Implementation Models as described in Chapter 5, above. Special distinctions are described below.		
Bike Malfunction	A user can report a bike that is not functioning properly by (a) pressing a button on the dock or kiosk when checking the bike in or (b) contacting a Program if unable to return to a station.		A user can (a) verbally inform a staff member upon returning to the staffed station or (b) contact a Program representative if unable to return to a station.
Station Full	If a user returns to a station to find that there is no capacity to check in a bike, she can provide her physical or virtual key to receive additional, free time to reach another station with available capacity. The System also provides real-time capacity information about nearby stations through kiosks at each station, on the Program website, and through the mobile application; information about these information sources is provided on the station and on the bike.		During operating hours, staffed stations should be able to accommodate the check-in of any number of bikes, which can be stored in a secure location or monitored by station staff. If the station truly has no physical space to accommodate additional bikes, station staff can direct the user to a nearby station with available capacity.
Station Empty	If a user arrives at a station to find that there are no Program bikes available for check-out, she can request real-time information about available bikes at nearby stations through the same channels described under "Station Full," above.		Staff at the station can direct the user to the nearest station with an available bike.



Figure 3. Bike Sharing Systems Module Breakdown



NOTE: Diagrams shown are for non-bolted, solar-powered stations, and assume a 4' back-up zone.

Bike Sharing Systems Module Breakdown (Plan View)



7. NEXT STEPS: IMPLEMENTATION PLAN

The Monterey County Draft Bicycle Sharing Feasibility and Implementation Plan describes two initial bikesharing system configurations: one in the Monterey/Pacific Grove area and one in Salinas. Either one of these networks could be implemented independently without implementing the other, or the two networks could be implemented together, either simultaneously or in sequence. Because the Salinas and Monterey/Pacific Grove networks are separated by a large enough distance that trips between the two networks are unlikely, both networks could be operated under the same Program Manager and System Operator, or a separate Program Manager, System Operator, or both could be selected for each network. This would also allow separate vendors to be selected for each network, since bikes from one network would not necessarily need to dock at stations of the other network; however, the capability for a user to access both networks with a common membership would be desirable.

The level of ridership forecast for each system configuration relies on a complete and contiguous network of stations. Although the station locations can be adjusted to accommodate space requirements and maximize visibility, and a few stations on the periphery of each system could potentially be removed, substantially altering the networks proposed in the Draft Bicycle Sharing Feasibility and Implementation Plan is not recommended; relocating or removing stations in a way that disrupts the continuity of the network or moves stations away from high-demand areas could reduce ridership significantly.

The remainder of this chapter outlines recommended steps leading to initiating a Request for Proposals (RFP) process, a timeline for implementation once the RFP process has been conducted and a hardware vendor and operator have been selected, and guidelines for future expansion of the system after the initial launch.

PREPARATION FOR REQUEST FOR PROPOSALS

Identify Program Manager and Implementation Model

The first step necessary for implementing a bikesharing Program is to identify a bikesharing “champion” that will serve as the Program Manager, shepherd the Program through the implementation process, and ensure that the Program is operated to successfully meet its goals. The Program Manager that emerges to lead the process will be a key factor in determining the Implementation Model that will be used.

Coordinate with Local Jurisdictions

The Program Manager will need to coordinate with the regulatory agencies and local jurisdictions under whose authority the Program falls. The initial station networks proposed in the Draft Bicycle Sharing Feasibility and Implementation Plan require coordination among the cities of Salinas, Monterey, and Pacific Grove. These negotiations should also include areas into which the system or systems might eventually expand, such as Carmel by the Sea, Del Rey Oaks, Marina, Sand City, and Seaside as early in the process as possible. Provisions need to be made for permitting bikesharing stations and the accompanying signage, sponsorships, and advertising that could potentially be included on bikes and stations so that the Program can have a uniform image across jurisdictional boundaries.

Identify Specific Sites for Bikesharing Stations

The planning-level station locations identified in the Draft Bicycle Sharing Feasibility and Implementation Plan should be assigned to specific sites, based on the availability of space on public rights of way and institutional and private land. This may require outreach to local businesses, landowners, and institutions, and/or agreements with local jurisdictions and transportation and public works departments. Some



flexibility should remain for input from the to-be-selected System Vendor and System Operator, but a clear plan for the proposed station sites should be in place.

Statement on California Environmental Quality Act (CEQA)

As temporary installations, bikesharing systems are not required to undergo CEQA analysis, but can instead be observed to note any negative consequences that may result from the temporary installation. To the extent that negative consequences of the bikesharing system are identified by the Program Manager, the System or station(s) can be adjusted such that the negative consequences are reduced. Bikesharing system components are flexible so that they are easily removed and relocated. In some bikesharing systems, such as those in Minneapolis and Denver, some stations are removed each winter and replaced in the spring. Other systems, such as Capital Bikeshare in Washington, DC, have relocated stations due to construction or to better serve demand.

Issue Request for Proposals

The Program Manager will need to issue a Request for Proposal (RFP) for System hardware and, if the Program Manager and System Operator will be separate entities, for a contracted System Operator as well. The Request for Proposal should further detail the System Components and Operational Needs outlined in this Concept of Operations and Implementation Plan in as much detail as possible, while still allowing proposers to creatively meet the System needs and Program goals. The definition and negotiation of Performance Metrics, like those outlined in Appendix A, may help to ensure that the contracted System Operator operates the System in a way that meets the Program’s goals.

IMPLEMENTATION TIMELINE

Table 3 provides a proposed timeline for the System Operator to implement the System once the RFP and selection process has been completed. This timeline should be discussed as part of the RFP process and proposers should have an opportunity to suggest alternative dates that are mutually acceptable to the proposer and the Program Manager.

TABLE 3. IMPLEMENTATION TIMELINE

	Milestone Description	Deliverables Required	Proposed Date (Period Prior to “go live”)
1	IT System Plan approval	IT System Plan	6 months
2	Beta test of central computer system	Beta test and demonstration of central computer system, database, and networks	6 months
3	Security Policy approval	Security Policy	6 months
4	Bicycle prototype development	Prototype bicycle submitted to Program Manager	5 months
5	Station prototype development	Prototype station (including docks, user interface, and complete functionality) submitted to Program Manager	5 months



	Milestone Description	Deliverables Required	Proposed Date (Period Prior to “go live”)
6	User experience prototype development	Present station and “walk-through” of user interface to Program Manager	5 months
7	Station siting plan development	Station sites selected by System Operator and submitted to Program Manager for approval	5 months
8	Initial development of promotions campaign	Draft promotions plan	5 months
9	Initial bicycle redistribution plan development	Draft bicycle redistribution plan	4 months
10	Initial organization and staffing plan development	Draft organization and staffing plan	4 months
11	Initial system maintenance and cleaning plan	Draft bicycle and station maintenance and cleaning plan(s)	4 months
12	Final development of promotions campaign	Final promotions plan	4 months
13	Initial development of website	Beta website for Program Manager review	4 months
14	Implementation of promotions campaign	Promotional campaign go-live	3 months
15	Fully operational database and central computer system	Fully operational and tested database and central computer system	3 months
16	Final bicycle prototype delivery	Final prototype bicycle delivered to Program Manager	3 months
17	Final station prototype development	Final prototype station delivered to Program Manager	3 months
18	Final bicycle redistribution plan development	Final bicycle redistribution plan	2 months
19	Development of station siting plans	Detailed station site plans for each site	2 months
20	Final system maintenance and cleaning plan	Final bicycle and station maintenance and cleaning plan(s)	2 months



	Milestone Description	Deliverables Required	Proposed Date (Period Prior to “go live”)
21	Final organization and staffing plan development	Final organization and staffing plan	2 months
22	Fully operational accounts system in central computer system	Fully operational and tested accounts system in central computer database	2 months
23	Fully operational subscriptions section of website	Fully operational and tested live subscriptions page on website	2 months
24	Fully operational website	Fully operational and tested live complete website	30 days
25	Fully operational central computer system	Fully operational and tested live central computer system	30 days
26	Station delivery	All stations delivered for installation	21 days
27	Final bicycle delivery	All bicycles delivered	14 days
28	Implementation of bike redistribution plan	Fully staffed redistribution team and center location(s)	14 days
29	Implementation of organization and staffing plan	Fully staffed and operational back office functions	14 days
30	Implementation of system maintenance and cleaning plan	Fully staffed maintenance and IT team	14 days
31	All stations installed	All stations installed and fully operational	10 days
32	Reevaluation of potential negative consequences	Review station and system elements for negative consequences and adjust as necessary	+1 year after go-live

SYSTEM EXPANSION GUIDELINES

There are two main approaches to expanding the bikesharing System: (1) organically growing the existing network or networks by adding more stations or expanding existing stations, or (2) adding a new, separate network to the system.

Organic expansion of an existing network allows the System to take advantage of the success of the stations already in place. A key innovation of bikesharing is the ability to check out a bike at one station, ride it, and check it in at another station; the potential value of the system increases along with the number of possible origins and destinations. In the case of organic expansion, new stations should be



placed to complement existing stations, ideally within one-quarter to one-half mile of one or more existing stations. The Bikesharing Ridership Demand Modeling section of the Draft Bicycle Sharing Feasibility and Implementation Plan describes additional considerations for bikesharing station locations. The System can also be expanded by adding capacity and bikes at popular stations to meet greater levels of demand; additional bikes and capacity (in the form of additional docks) are typically added in a ratio of two docks to one bike.

Adding a separate but compatible network to the system is also an option, although it does not benefit from the network effects produced by adding on to an existing network. New stations more than one or two miles beyond an existing station are not likely to interact with the rest of the network; users will likely consider them part of a separate network. One potential option for a new expansion network in the Monterey County System is the campus of and area surrounding California State University at Monterey Bay (CSUMB). The CSUMB campus is approximately five miles from the nearest proposed station in the initial Monterey/Pacific Grove network, so it is unlikely that users would ride bikesharing bikes between a station on the campus and the other stations in Monterey and Pacific Grove; however, if there is financial and institutional support for bikesharing at CSUMB, an on-campus bikesharing network that primarily serves trips within the campus could be a valuable service to CSUMB students, faculty, and staff. Students arriving on campus by transit could use bikesharing for trips within the campus, and also make use of the Pacific Grove and Monterey stations when they are in those areas for dining, shopping, or leisure trips. Students arriving by private automobile would also benefit from the ability to park once and use bikesharing for mobility within the campus.



**APPENDIX A:
PERFORMANCE METRICS**

For each Performance Metric (PM), the Program Manager and System Operator should agree on appropriate Thresholds and the corresponding dollar value the System Operator will pay if it does not meet these Thresholds (Col. 7 & 8) A System Operator may propose additional or alternative Service Level Agreements (SLAs).

DEFINITIONS

Clean All surfaces and components are intact, unbroken, and free of graffiti, "scratch-itti," stickers, trash, and other waste.

In service Bicycles are functional (e.g. working brakes, lights, gears), clean and available to users. This includes both Bicycles docked at Stations and those currently in use by members. Bicycles that are checked out to users for more than 24 hours are not considered to be in service.

Stations can perform all of their required functions, are clean and available to users.

Website is online and can accurately perform all of its required functions.

Back-end computer system is up and accurately performing all of its required functions.

Ref.	Performance Metric (PM)	Description	Measurement Tool	Measurement Period	Units	Threshold 1	Threshold 2
PM-1	Overall System functionality	Combined total minutes that Stations are out of service per week	Central computer database	Weekly	Minutes	Example: 30 min. or less Penalty = \$XXX.xx per minute	Example: More than 30 minutes. Penalty = \$XXX.xx per minute

Ref.	Performance Metric (PM)	Description	Measurement Tool	Measurement Period	Units	Threshold 1	Threshold 2
PM-2	Stations in service	Percentage of stations in service	Extrapolation from field checks by Program Manager staff and maintenance logs	As needed	% of Stations		
PM-3	Bicycles in service	Percentage of bicycles in service	Central computer database	Daily	% of Bicycles		
PM-4	Bicycle cleanliness	Percentage of bicycles that are clean	Extrapolation from field checks by Program Manager staff	As needed	% of Bicycles		
PM-5	Station cleanliness	Percentage of stations that are clean	Extrapolation from field checks by Program Manager staff	As needed	% of stations		
PM-6	Graffiti, "scratch-itti," sticker removal from stations and bicycles	Time taken to remove graffiti, "scratch-itti," and stickers, etc. after notification	Maintenance logs with photo	From time of notification to Contractor's resolution	Hours		

Ref.	Performance Metric (PM)	Description	Measurement Tool	Measurement Period	Units	Threshold 1	Threshold 2
PM-7	Bicycle distribution	Bicycle-to-dock ratio, total combined minutes stations are completely full or empty, or other method to be defined by System Operator					
PM-8	Station removal and site refurbishment upon request by the City	Time taken to remove stations and refurbish the site after requested to do so by the City	Field checks by Program Manager staff	From time of request to System Operator's resolution	Days		
PM-9	Website in service	Percentage of time that the website is in service	Central computer database	Weekly	% of total minutes per week		
PM-10	Central computer system in service	Percentage of time that the central computer system will be in service	Central computer database	Weekly	% of total minutes per week		

