BICYCLE ACCESS PLAN

Supporting Bicycle and Capitol Corridor Intercity Passenger Train Travel

CAPITOL CORRIDOR
JOINT POWERS AUTHORITY

FINAL: Adopted: February 2013

2013

300 LAKESIDE DRIVE • 14TH FLOOR EAST • OAKLAND, CA • 94612

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Table of Contents

LISTING OF FIGURES

LISTING OF TABLES

1 Executive Summary

The Capitol Corridor Joint Powers Authority's (CCJPA) Bicycle Access Plan (hereafter "Plan") identifies specific actions both on the train and at stations, which, working together with its partners, CCJPA can take to improve bicycle access to/from train stations, and on the train. Demand for bicycle access to and from the trains has grown sharply as a percentage of total ridership and has outstripped the designated bicycle capacity on the train. Supporting bicycle access to/from Capitol Corridor service remains a core goal of the CCJPA for the benefits that accrue to the service, the riders, and the communities along the route. With the assistance and support of community experts, local and regional agencies, bicycle advocacy experts--including the train riders who regularly travel with bicycles--the CCJPA presents the Bicycle Access Plan as a tool to ensure safety onboard the train but also to continue the vital role bicycles play for existing and future Capitol Corridor customers, the environment and the economies that are supported by Capitol Corridor service. This final Plan was refined based on a mode of access survey conducted between November 15-December 15, 2012 and adopted February 2013 by the CCJPA Board.

1.1 Background

The Capitol Corridor Joint Powers Authority (CCJPA) manages the Capitol Corridor intercity passenger rail service. The CCJPA is governed by a Board of Directors comprised of sixteen (16) elected officials from six (6) member agencies along the approximately 170-mile Capitol Corridor route:

- Placer County Transportation Planning Agency (PCTPA)
- Solano Transportation Authority (STA)
- Yolo County Transportation District (YCTD)
- Sacramento Regional Transit District (Sac RT)
- San Francisco Bay Area Rapid Transit District (BART)
- Santa Clara Valley Transportation Authority (VTA)

CCJPA works with its partners: Amtrak for train operations, its two host railroads Union Pacific Railroad and Caltrain for train dispatching, and the State of California, specifically, Caltrans Division of Rail for rolling stock. Other partners in supporting Capitol Corridor service are the local jurisdictions. CCJPA, as administrator of the service, and its partners focuses on the continuous improvement of the Capitol Corridor train service through effective cost management, revenue enhancement, as well as customer- focused delivery of a safe, frequent, reliable, and green transportation alternative to the congested I-80, I-680, and I-880 highway corridors.

The Capitol Corridor service began in December 1991 with six (6) daily trains between San Jose and Sacramento. The CCJPA assumed management responsibility for the service in October 1998. Since then, it has grown into the third busiest intercity passenger rail service in the nation. The CCJPA currently runs 30 weekday round trips and has an annual ridership of nearly 1.8 million passengers. Improved on-time performance, reliability, and numerous other factors, such as rising gas prices, offering a number of customer amenities including free Wi-Fi, are all reasons which helped to increase ridership and make this service popular.

1.2 Education, Encouragement, and Enforcement

As the demand for more onboard bicycle access grew, CCJPA has continued to communicate with its riders in an effort to assess the situation and determine appropriate solutions. Informed by a 2011 Bicycle User survey, the CCJPA has already implemented an educational element to encourage behavioral change but it must also enter a phase of enforcing safe and secure storage of bicycles.

1.3 Bicycle Access Improvements on the Train

Operational changes have resulted in more efficient bicycle storage use on trains. Train equipment rotations have been modified to ensure a minimum bicycle storage capacity and to match larger capacity train sets with busier trains where possible. CCJPA also has modified operations to ensure that the Berkeley Station stop, which does not allow all the train cars to be accessible at the same time, now can utilize 'double stops' when needed. Train car assignments shared with the San Joaquin intercity service were optimized to try to regularly bring more bicycle storage equipped trains to the Capitol Corridor service when feasible. Physical modifications to some existing cab cars will gradually ensure that in two years all cab cars will be equipped with a thirteen (13) bay bicycle storage facility. For long- term solutions, Caltrans is in the process of ordering new railcars which will increase regular train-consist size and thus bicycle storage, and are also exploring the possibility of greater bicycle car storage options.

1.4 Bicycle Access Improvements at Stations

The real option to cost effectively resolve existing challenges and actually grow the mode share of bicycling with the Capitol Corridor service is to address bicycle access and storage solutions at stations. The CCJPA has researched the industry, gathered feedback from other transit providers and identified three strategies that will reduce the demand for onboard bicycle storage: bicycle sharing, secure bicycle facilities, and leased folding bicycles. These three programs have strong environmental benefits across the board and solid community integration components to them as well.

The CCJPA would like to encourage bicycle sharing in all interested communities. Bicycle sharing provides and stores bicycles for members in a designated service area. CCJPA will not be responsible for adopting and running bicycle sharing but will help to offer communities with whatever resources it can (e.g., the CCJPA has contributed $10,000 to help fund a bicycle sharing deployment plan in Sacramento.).

The CCJPA plans to provide comprehensive and cohesive electronically accessed secure bicycle storage facilities (e.g., bicycle lockers) across all stations to facilitate the option to not take a bicycle on the train. Rather than being reserved to one person with a key, the use of technology with modern secure bicycle storage systems can overcome and expand the viability of bicycling and Capitol Corridor travel. The CCJPA has a tiered list of prioritized stations to deploy such systems in addition to installing basic bicycle racks in stations lacking those improvements.

The last option is to lease folding bicycles to riders. A new innovation from a company called Brompton Dock, features the Brompton folding bicycle. This innovation is a bicycle share-like program except these bicycles are available for a day or more at a time to members who sign up for the service. Sacramento, Davis, Oakland Jack London, and Berkeley are ideal locations to feature these services and the folding aspect is crucial since it supports personal mobility options associated with the Capitol Corridor while not using valuable space on the train. The market potential of this system will be evaluated via the pending mode of access survey.

1.5 Funding , Economy, and Environment

Local funding opportunities for at-station bicycle amenities can be realized by combining a variety of locally administered funding sources with a good base of State funding programmed for secure bicycle facilities for the Capitol Corridor service. All indications are that with local and regional support, local economies and the environment benefit from implementation of this Plan and methodologies are outlined which will provide the basis for inclusion in funding grant applications.

2 Introduction

The Capitol Corridor intercity passenger rail service, managed by the Capitol Corridor Joint Powers Authority (CCJPA), is California's premier passenger rail service; yet, it is a victim of its own success. Bicycling combined with the Capitol Corridor train ride has become almost too compelling - it's a modal combination that is reaching capacity given the supply for bicycle storage on the train and at stations. While many trains in the off peak periods can accommodate the bicycle demand, demand on the busier trains has resulted in bicycles stored in aisle ways where people are meant to pass unimpeded. In some extreme situations, demand has been so high, and storage capacity so low that bicycles are stacked on top of other bicycles. These situations are unsafe. Blocked aisle ways and improperly secured bikes do not comply with train operations as mandated by the federal government. Looking deeper past the bicycle access plan aspects, this Plan is a safety plan addressing bicycle use and Capitol Corridor train travel.

2.1 Perspectives Forming this Plan

The CCJPA manages the Capitol Corridor service and values the customer experience and safety issues for all passengers on the train. We have developed this Plan accounting for strongly held perspectives within the bicycling community, within the disabled community, and with a focus on the regular train rider who simply has the perspective of making a safe and timely trip on the Capitol Corridor. This Plan would not have been possible without the help of peer review and a sincere debt of gratitude goes out to our far more "bicycle planning" peers supporting bicycling initiatives from the local to the regional, and even national scale. Prior draft versions of this Plan were updated based on peer input from a September 6, 2012 meeting CCJPA hosted. A crucial outcome of that meeting suggests the need to complete a focused mode of access survey whose results would be used refine deployment of the final version of this Plan slated for adoption in February 2013.

Several years ago, capacity for bicycle storage was adequate for the demand. More recently, with the increase in ridership and the growing popularity of bicycling, there are occasions when bicyclists have been denied travel with their bicycle due to lack of available storage space. The on-train bicycle crowding, the occasional travel denial, and the lack of an organized set of storage alternatives at stations have resulted in (whether they have a bicycle or not) a general concern of passengers who ride the train that their journey may not always unfold as planned, in a comfortable and safe environment. Persons who require a wheelchair may feel their mobility is compromised and feel unsafe, trapped by the presence of so many bicycles stored somewhat chaotically around them. Then there are those people who are simply walking the train to use the restroom, who may be navigating aisles past jutting bicycle handlebars only to find bicycles stored in the restrooms. In contrast to those perspectives, there are some bicyclists who believe their combined bicycle-train-bicycle journey is ideal for a low-impact, healthy way to travel in Northern California and believe Amtrak, the CCJPA, and/or the State, should do all we can to make sure that they can travel with their bicycle but who may also experience travel uncertainty once they get to the train (e.g., "Will I be able to take my bicycle today?") since the train may already be crowded with bicycles.

The challenge presented by trying to adjust to these perspectives has crept up so rapidly that even if funding were plentiful, simply throwing money at the problem is not going to solve much without an organized framework in which to implement solutions. That is the primary mission of this Plan. Out of sheer need, the CCJPA has pursued some policy program efforts and a limited set of physical/operational modifications to try to stem the tide of demand or increase the supply. While there has been some success, a missing element in these programs need the support of real physical

change (e.g., organized bicycle storage solutions at stations) along with continued evolution policies to support the growth of bicycle access to/from Capitol Corridor trains.

Together, the program and policies comprise a system. The system approach, to borrow a useful concept from other similar bicycle plans, include the five "E's:" Engineering, Education, Encouragement, Enforcement, and Evaluation. Out of need, CCJPA has already ventured into the education, encouragement, and enforcement elements yet it lacked a complete engineering solution and has only a rudimentary evaluation process. This Plan organizes those elements and organizes them as a system.

As a matter of convenience in this Plan, the CCJPA will be referring to persons on the train with a bicycle or at a station as 'bicyclists'. We are aware that there are many categorizations of persons who happen to ride a bicycle within the bicycle policy, planning, engineering, and advocacy professions. When a particular category of bicyclist is identified, (e.g., such as a bicyclist riding for fitness or sport) it will be to make a more specific point related to the needs of that particular type of bicyclist. For those readers who are attuned to a more precise definition of 'bicyclist' please accept our more casual usage which includes all types of bike users: from the lycra-clad racer to the casual user who just happens to ride a bicycle on occasion.

3 Background

The Capitol Corridor is an intercity passenger train system that provides an alternative to traveling along the congested I-80, I-680 and I-880 freeways by operating intercity rail service to seventeen (17) stations in eight (8) Northern California counties: Placer, Sacramento, Yolo, Solano, Contra Costa, Alameda, San Francisco, and Santa Clara, along a 170-mile rail corridor (see Figure 3-1). There are also connecting motorcoach services that extend the reach of the Capitol Corridor train service backbone. The Capitol Corridor is governed by the CCJPA.

The CCJPA administers the Capitol Corridor Intercity Passenger Rail service as a partnership. The San Francisco Bay Area Rapid Transit District (BART) provides day-to-day management support to the CCJPA. CCJPA works with its partners, Amtrak for train operations, its two (2) host railroads (Union Pacific Railroad [UPRR] - for 168 miles of the route and Caltrain for 2.5 miles) for train dispatching, and the State of California, specifically, Caltrans Division of Rail for rolling stock and capital improvement funding. Other partners in supporting Capitol Corridor service are the local jurisdictions who generally own the station land but lease the station to Amtrak for operations. Together, CCJPA, as administrator of the service, and through its partners, focuses on the continuous improvement of the Capitol Corridor train service through effective cost management, revenue enhancement, and customer-focused delivery of a safe, frequent, reliable, and green transportation alternative to the congested I-80, I-680, and I-880 highway corridors. The CCJPA is governed by a Board of Directors comprised of 16 elected officials from six member-agencies along the approximately 170-mile Capitol Corridor route:

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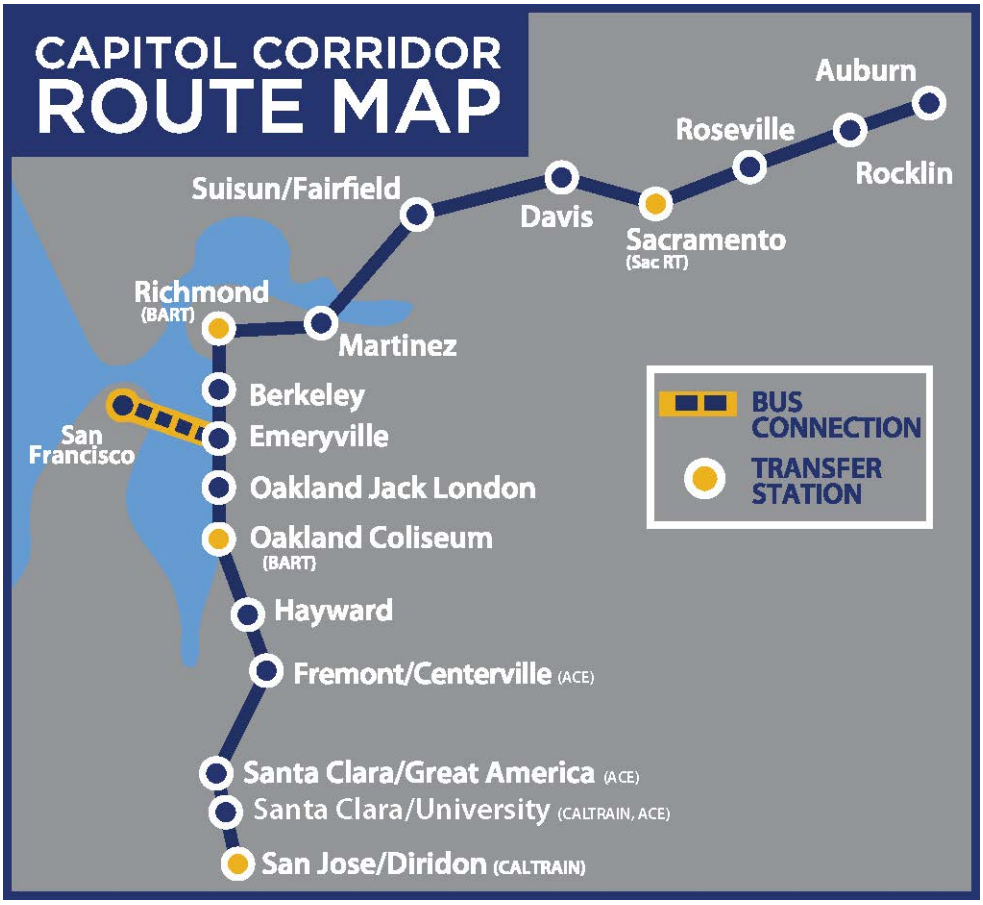


Figure 3-1 Capitol Corridor Route Map

In February 2012 the CCJPA Board (as shown in Appendix A – CCJPA Board Principles for CCJPA Policy on Bicycle Access) approved principles that have guided the development of this Bicycle Access Plan.

Institutionally, CCJPA maintains close relationships with Amtrak, the Caltrans Division of Rail, and the two owners of the right-of-way where Capitol Corridor operates: Union Pacific Railroad, and Caltrain. In depth partnership with each local jurisdiction where there is a station is done mostly through the local transit agency or with the city staff as the need arises. On a corridor wide basis, CCJPA has never had a project quite like the at-station bicycle projects discussed in this Plan that requires coordination across the seventeen (17) jurisdictions. The success of this Plan will, in large part, involve the involvement of CCJPA with each local jurisdiction to realize each project at each station.

3.1 History of the Service

The growth of the Capitol Corridor as a viable transportation alternative in the Northern California mega-region is a story of transportation investment success (see Table 3-1). The Capitol Corridor service began in December 1991 with six (6) daily trains between San Jose and Sacramento. The CCJPA assumed management responsibility for the service in October 1998. Since then, it has grown into the third busiest intercity passenger rail service in the nation. In August 2006 the CCJPA expanded service by 33 percent from 24 to 32 weekday trains between Sacramento and Oakland, and 14 daily trains continuing on to San Jose. With the rebuild of the Sacramento station in August 2012 CCJPA was able to optimize its train service efficiency reducing service to 30 weekday round trips but retain a service pattern that has been essentially steady since August 28, 2006. Since

September 2006, ridership (despite no increase in service frequency), has grown from a 12-month total of 1.27 million to nearly 1.8 million. Improved on-time performance, reliability, and numerous other factors, such as rising gas prices, a variety of amenities, including free Wi-Fi, are all reasons that helped to grow ridership.

PERFORMANCE THIRTEEN YEARS OF CCJPA MANAGEMENT

	SERVICE LEVEL	RIDERSHIP	REVENUE	REVENUE TO COST RATIO
FY 2011	32 DAILY TRAINS	1,708,618	$27.2 MILLION	48%
(PRE-CCJPA) FY 1998	8 DAILY TRAINS	463,000	$6.25 MILLION	30%
THIRTEEN YEAR IMPROVEMENT	+300%	+269%	+335%	+60%

Table 3-1 Capitol Corridor Performance Record

3.2 Stations

There are seventeen (17) stations along the Capitol Corridor route and each is owned by a local agency, usually the city where the station resides. Stations are assets of the community and as such, beyond the usual platform amenities, there is a great variety as to the bicycle storage/parking at these stations (see Table 3-2). While one station may have unsecured bicycle racks and a few secure lockers that have long ago been reserved by frequent patrons, other stations may have no bicycle racks at all. This variation has not been planned from the CCJPA's service management perspective but rather from a local perspective, albeit one that was benevolently trying to provide station patrons some viable bicycle storage options. This area is clearly one in which a more comprehensive approach organized from the perspective of the CCJPA's management working with their local partners could be better organized from the customer perspective – this is a key objective for this Plan.

Station	# of Bicycle Racks at Station	Bicycle Rack Capacity	Bicycle Lockers	Lockers Administered By:
ARN	2	16	0	
RLN	6			
RSV	1	5	4	City of Roseville
SAC	8	8	0	
DAV	>6	unknown	19	City of Davis
SUI			4	BikeLink
MTZ	0	0	0	
RIC			16	BikeLink
BKY			8	BikeLink
EMY			10	City of Emeryville
OKJ	10	20	0	
OAC			0	
HAY			0	
FMT			8	BikeLink
GAC	2	12	30	
SCU	2	12	30	Caltrain, VTA
SJC	18		48	Caltrain

Table 3-2 Existing Bicycle Facilities at Capitol Corridor Stations

3.3 Rolling Stock and Train Operations

The rolling stock used in the Capitol Corridor service is shared with the San Joaquins, its sister intercity passenger rail service. This shared fleet, the "Northern California Passenger Rail" fleet, is owned by the State of California and is managed by the Caltrans Division of Rail. All non-Café Cars in the fleet have some amount of official bicycle storage. There are ongoing upgrades and maintenance to the rolling stock but generally in every area bicycles can be stored, there are also racks that can be raised or lowered to accommodate luggage space. This flexibility to favor luggage or bicycles is important for each conductor who must oversee that the train consist presented for each train service run and ensure that it is ideally configured for the passenger needs for that journey. In general, the San Joaquin service skews highly in favor of more luggage rack space for each train whereas the Capitol Corridor service skews toward more availability for bicycle storage (there are also luggage racks that don't convert on most cars and overhead bin or shelf space to accommodate luggage and bags).

One of the most common customer complaints about providing enough bicycle spaces is the inconsistency of the cars and thus availability of bike space for passengers on train routes they take every weekday. Commonly, customers suggest we dedicate cars with more bicycle storage to those trains where demand is highest. As much as that makes sense, within the world of limited train car resources and the way the trains are cycled and maintained, this is not entirely feasible. Demand for lengthier cars can be met by available supply within the fleet but there are factors, which can cause the supply to be limited or demand to reduce the number of cars that can be consistently added to each trainset. In general, there is greater demand for cars on the San Joaquin in the summer, which means there are fewer cars available to be put on Capitol Corridor service during that period. As well, heavy maintenance, scheduled car rehabilitation, and random events such as cars damaged by trespasser accidents, derailments or objects left on the tracks, can all contribute to a reduction in the number of available cars at any one time for the two intercity services. This already introduces fluctuation, and on top of that, each train set goes out on a multi-day cycle. This is why on a Monday, for example, the number of train cars for Train 524 is four cars with 19 official bicycle parking spaces and on Tuesday, in the same exact time slot, Train 524 has five cars but 25 bicycle spaces. In essence the Train 524 trainset used on the Monday is now serving as another train number on Tuesday, and that will continue cycling until after three or four days the cycle repeats itself. Given these factors, about the best that a train operations master can accomplish is to shuffle what cars are available to try to put as many cars and types of cars with more bicycle racks into the rotation where more bicycle storage is demanded.

The type of bicycle storage permitted on each train car is governed by federal standards. Caltrans Division of Rail in consultation with CCJPA and Amtrak has installed on-train bicycle storage devices that comply with the federal regulations but also that try to meet the functional and physical needs of the passengers and their bicycles. Excessively lengthy (long wheel-based) bicycles (many recumbent bicycles, tandems, cargo bicycles) are not accommodated on the train rolling stock.

No. of Cars	Type	Bicycle Capacity
37	Coach	3
14	California 1 Cabcar	7
5	Surfliner Cabcar	14
6	California 1 Coach/Baggage	9
4	Superliner Coach w/lower level seats removed or Coach/Baggage	12
2	Surfliner Snack/Coach	0
14	California 1 Diner	0
3	Superliner Snack/Coach	0

Table 3-3 Northern California Fleet Cars by Designated Bicycle Capacity

3.4 Motorcoach Operations

Motorcoach operations connect to and from Capitol Corridor trains at specific high volume stations (Sacramento, San Jose, Oakland, Emeryville, Davis, Sacramento) and extend into many areas of Northern and Central California. There are far fewer bicycles using the motorcoach services than on the core train system however, the storage for any bicycles is usually done in luggage areas under the main seating area of each motorcoach. At times, especially with luggage or multiple bicycles, storage is constrained. The motorcoach services are contracted to outside bus companies that make any physical solutions for additional bicycle storage, such as front racks, other than in the luggage areas difficult. This Plan will not focus on bicycle solutions for these motorcoach services except to indicate the various at-station solutions proposed in this plan which involve promoting the use of folding bicycles by customers, and featuring a folding bicycle rental program and bicycle sharing focused at stations could play a role in reducing the need to take a bicycle on the connecting motorcoach service in the first place.

4 Capitol Corridor's Bicycle Challenges

In short, the problem facing Capitol Corridor managers and those who use the service is a classic demand versus supply problem. The CCJPA and its customers observe these challenges on a daily basis.

When bicycle storage demand exceeds storage supply on the Capitol Corridor, in practice, bicyclists park their bikes in designated wheelchair spots or in the aisle way. Capitol Corridor is obligated by federal law to keep a clear accessible route with a width of at least 32 inches under the Americans with Disabilities Act (Code of Federal Regulations, Section 38.125, Section D3). Furthermore, mobility impaired or disabled passengers take precedence over bicycles. Some conductors are reluctant to permit all available on-train wheelchair spaces to be occupied with bicycles out of fear that they will have to remove a bicyclist later down the line. As well, bicycles stored in any unsecured manner do not meet the luggage restraint requirements also mandated in federal regulations administered by the Federal Railroad Administration (FRA). The restraint requirements are designed to prevent loose objects from flying around freely within the cab in the event of a sudden stop. This combination of providing safe mobility as well as restraining objects, such as bicycles, on the train was met before demand exceeded supply. Now, under the pressure of bicycle storage demand exceeding supply, CCJPA must consistently ensure bicycles stored on the train meet federal requirements before a legal

and regulatory response to an incident related to improperly stored and secured bicycles sets in motion a process that dictates a more draconian response to bicycles stored on the train.

At present, conductor and passenger reaction to excessive bicycles on the train is mixed reflecting the variation in human behavior. In limited sample surveys conducted in early 2011, four respondents on the survey claim that they were denied passage on the train due to a lack of bicycle space. Intense reaction via e-mail or customer comments are usually not far behind each time a passenger with a bicycle has been denied travel. The judgment of the conductor is questioned by the customer, which leads to an investigation to try to resolve what actually happened and, at times, elected officials are drawn into the debate. Each incident damages Capitol Corridor's reputation as a reliable alternative to driving; bicyclists will only use Capitol Corridor for their regular commute if they know that it is reliable and that they may be able to safely secure their bike or take it with them. If Capitol Corridor cannot accommodate bicyclists with sufficient on-train storage or supply safe bicycle parking at the station, supporting future bicyclists let alone deal with the existing bicycle demands is compromised. Through implementing this Plan, the CCJPA can create a more efficient and safe use of the on-train bicycle storage areas as well as implement solutions for more bicycles to be safely stored or used via the stations along the route which, in turn, can reduce demand for the limited bicycle spaces on the train.

Figure 4-1 The "Bike Car", Train 524 in October 2011 Photo taken by CCJPA staff

The CCJPA surveys its riders twice a year consistently asking on each survey passengers' mode of access to and from stations. In four years, as shown in Figure 4-2, the bicycle mode of access has

risen from the range of 7 percent to more than 11 percent but also over the time, ridership has grown. So not only has the percentage increased but ridership as a whole has grown over 7 percent in the last 12-month period over the prior 12-month period. So when the math is applied, when ridership grows so does the absolute demand and supply can keep up.

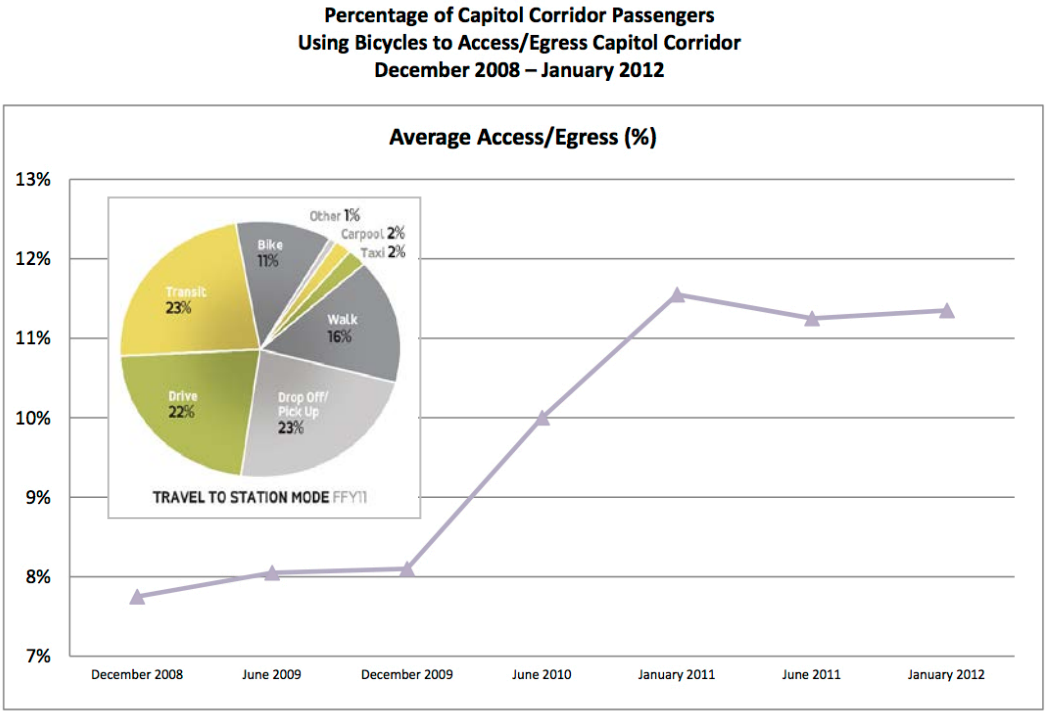
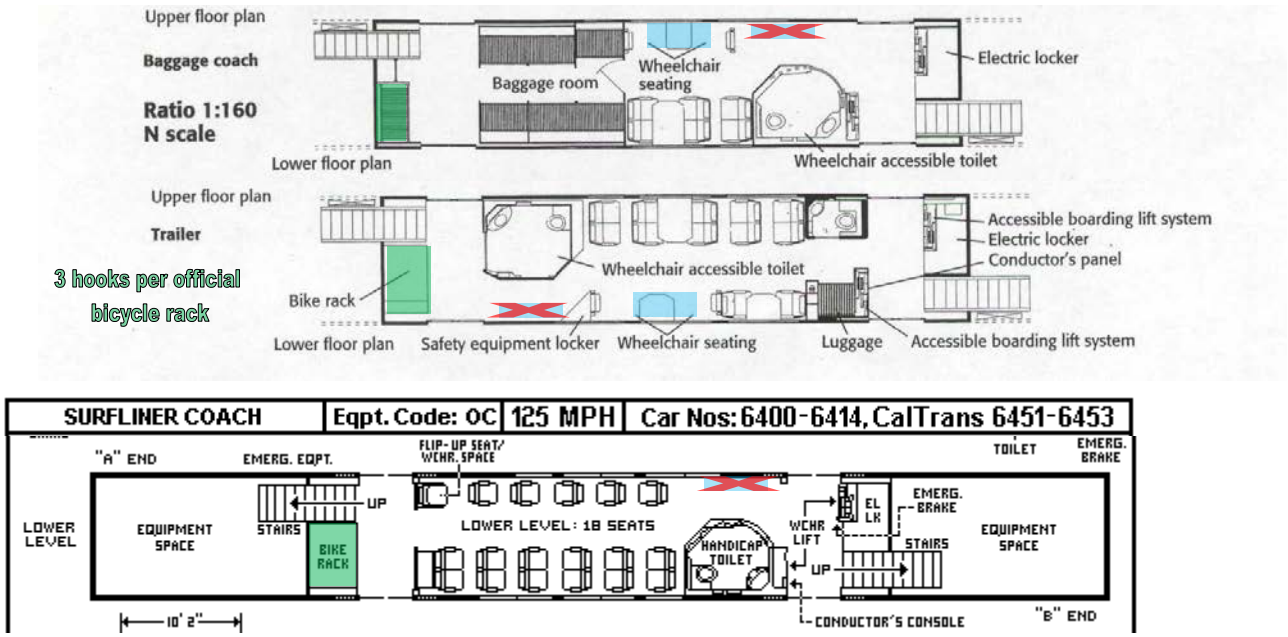


Figure 4-2 Bicycle Mode of Access Trend and FY 2011 Mode of Access across Modes

As bicycle use has grown over the years in conjunction with Capitol Corridor travel, a much more restrictive Amtrak policy on the books to limit bicycle storage to the officially designated spots was not enforced. As a result, tacit conductor approval to accommodate more and more bicycles evolved; first, to a few bikes stored outside the designated locations, and then a few more, and pretty soon the matter of storing bicycles just about anywhere it seemed reasonable was tolerated (see Figure 4-3). These locations were generally outside the normal path of travel and involved using the designated wheelchair locations so long as they were not in use by wheelchair users. While out of the way in those wheelchair spots (but with those bicycles generally not secured to the train), crowding in that space would drive people to the next seemingly available location. The next location is hooking bicycle handlebars between the wall of the car and the handrail along one of the aisle-ways near an exit door, where they would be in the path of travel, but ironically, the bicycles were usually secured with bungee cords or by using buckled bicycle helmet straps that looped around the hand rail and the bicycle frame. From there, it did not take long for the very next storage improvisation move on the highest demanded trains (such as bicycles stacked on top of a layer of bicycles). Some of these were tolerated to a point by a number of conductors whereas other conductors drew the line differently. Regardless, original policy was surpassed in practice with the tolerable middle ground now having been exceeded by demand.



California Cab/Baggage, Coach, (above) and Surfliner Coach (below) lower level floor plans. Designated bike rack highlighted in green; unofficial bicycle storage shown in blue; unsuitable aisle-way locations are shown crossed out.

Figure 4-3 Designated and Unofficial Bicycle Parking for Northern California Fleet Train Cars

4.1 Early 2011 Bicycle User Survey

Due to increased demand for bicycle storage on the train, in January and February of 2011 the CCJPA designed and administered an on-line survey seeking responses from those persons on the train who had brought bicycles into the train with them on their trip. Completing the survey required an individual to remember to log-in to the hosted survey at some other time and answer the questions. Despite that survey barrier, there were 167 responses. CCJPA staff asked a variety of questions which, when tabulated, have shaped the on-train and at-station access plan measures already being taken or to be taken in the future. Key question categories were:

- Frequency of riding Capitol Corridor and frequency of bring along bicycle
- Trip purpose
- Typical on-train bicycle storage rack availability when the individual boards
- Need assessment for bicycle to be with the individual on both ends of the train trip
- Reaction to using a bicycle locker/storage system
- Distance to departure station and distance from arrival station
- Comfort with using the existing on-bicycle rack system
- Whether the individual locks the bicycle when on the train
- Whether the individual was ever denied passage on the train with their bicycle
- Whether a conductor has ever directed the individual regarding where to store their bicycle
- Whether the person carries a restraining device (to secure the bicycle to some on-train fixture)
- How attentive the person is to a bicycle stored outside a bicycle rack when on the train
- Awareness of yielding space used by bicycle to persons with disabilities
- General comments about bicycle use and Capitol Corridor train travel

Cross tabulation of the survey responses yielded a mixture of unanticipated results but also confirmed many anecdotal observations. CCJPA's methods for the survey involved taping a strip of

paper to the bicycle handlebars with the weblink to the survey. The survey was also posted on the bicycle webpage of the CCJPA website. Under those two methods we can't be sure which percentage of persons who brought a bicycle on the train completed the survey or how many may have left a bicycle at a station and then got on a train, or have never associated a bicycle with the train yet for some reason completed the survey. What is almost certain is that persons that left a bicycle at the station and then boarded the train were under represented and that factor alone may contribute to underestimating how effective at- station solutions might be in the grand scheme of making bicycle improvements.

A surprise that has implications for station-based solutions and other modes of travel to/from stations, such as transit, is that the majority of persons travel a further distance than was expected. Conclusions are that land use patterns are such that bicycle trip reliability is desired over a transit and/or walking option.

Mileage To (trip 1) and From (trip 2) Train Station (for those 70%+ bringing a bicycle)

	Trip 2					Grand Total
Trip 1	Less than 1/2 mile	1/2 - 1 mile	1 - 2 miles	2 - 5 miles	more than 5 miles	
Less than 1/2 mile		3	2	8		13
1/2 - 1 mile		1	10	12	4	27
1 - 2 miles			11	31	4	46
2 - 5 miles				8	20	28
more than 5 miles					1	1
Grand Total	0	4	23	59	29	115

TOTAL Miles by day	Under 1	1-2 miles	1-4 miles	2-7 miles	5-7 miles or more
		3.5%	20.0%	51.3%	25.2%

Table 4-1 Mileage for Capitol Corridor Bicycle Journeys To/From the Train Stations

There was extremely high correlation between trip frequency, trip purpose, and use of a bicycle. This was most correlated with a trip purpose of "work" or "school." Ignoring the bicycle mode of travel, this is not unexpected as the trip purpose and trip frequency correlations are similar to data for many of the regular users of the Capitol Corridor. Not shown on Table 4-2 but significant, a large portion of users in the recreational trip category were road bike users who will use the train to complete a recreational road ride loop using a station or ride back to their origin point from a more distant station.

Bicyclists represent a key demographic to Capitol Corridor's ridership success. Bicyclists tend to be regular riders. Based on the survey, more than a third of a 167 respondents claimed to ride Capitol Corridor five (5) or more days a week. One hundred and thirteen (113) or about two-thirds of the respondents commuted for work.

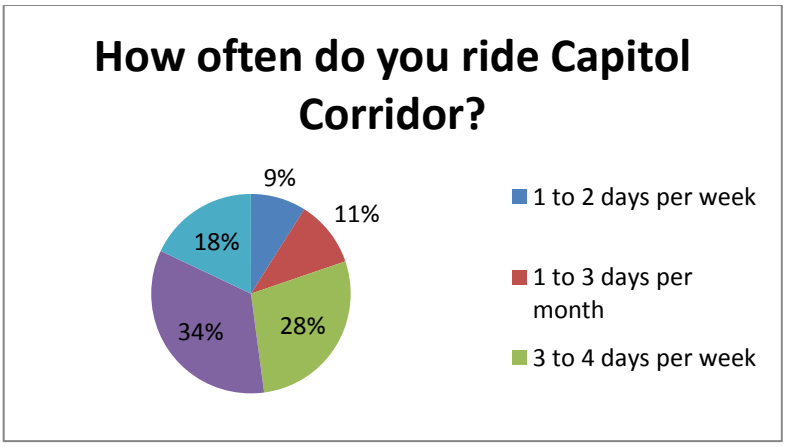


Figure 4-4 Weekly Ridership Frequency for Bicyclists on Capitol Corridor

Capitol Corridor Ride Frequency and Frequency of Bicycle Use by Trip Type

Frequency of Bicycle Use	Between 91% - 100% of the time				
How often do you ride Capitol Corridor?	Travel to work	Travel to school	Shopping	Recreation or social activities	Other
1 to 2 days per week	5	2		1	
1 to 3 days per month	2	1		2	
3 to 4 days per week	32	6		2	1
5 or more days per week	45	3	1	2	1
Less often	4		1	7	1
Grand Total	88	12	2	14	3

Table 4-2 Capitol Corridor Ride Frequency and Frequency of Bicycle Use by Trip Type

Survey respondents asked to typically indicate which train, from their experience, (outbound/departure and inbound/return) had full racks based on their station. This information not only lets CCJPA target the most crowded trains (this was generally known) but also look at which stations rank highly as stations where at-station bicycle storage solutions may be helpful. On the later point, the stations identified here are not necessarily the station where boarding with bicycles creates the lack of available rack spaces en route the busiest bicycle activity station is likely to have been in advance of the station reported in Table 4-3.

Outbound/Departure Train - Rack Availability	Bicycle racks are typically full.

Outbound/Departure Train - Station

Outbound/Departure Train - Train Number	Berkeley	Davis	Fremont	Martinez	Oakland Coliseum	Oakland Jack London	Richmond	Grand Total
521						1		1
522		1		3			1	5
523	1		1		2	6		10
524	8			1				9
525		2						2
Grand Total	9	3	1	4	2	7	1	27

Return Train - Rack	Bicycle racks are typically full.

Return Train - Station

Return Train - Train Number	Auburn	Berkeley	Davis	Emeryville	Hayward	Richmond	Sacramento	Santa Clara/Great America	(blank)	Grand Total
528						1				1
540				1			1			2
541			1							1
542		1		1	1			2		5
544								10		10
545			3							3
547	1						1		1	3
549			1							1
(blank)			1							1
Grand Total	1	1	6	2	1	1	2	12	1	27

Table 4-3 Train and Departure/Return Station Bicycle Rack "Full" Observations

In an attempt to determine the viability of using secure bicycle storage at stations, survey respondents answered a hypothetical question about the use of a bicycle locker or secure storage facility. These responses were cross-tabulated against those who responded to needs of a bicycle on both ends of their trip. Unfortunately, this comparison does not compare two equal questions but it does (see Table 4-4) provide some indication that a secure storage solution is certainly an option for some bicyclists. When compared to departure and return stations, the hypothetical response indicates which stations have the highest likelihood to be a promising secure bicycle storage option (see Table 4-5).

Bicycle Use on Both Trip Ends vs. Hypothetical Use of a Bicycle Locker on One End of the Trip

	If Bicycle Locker Available on One-End of Your Trip - Would You Use It?				
In general, is your bicycle crucial on BOTH ends of your train trip?	I don't know	No	Yes	(blank)	Grand Total
No	2	6	16		24
Yes	44	31	41		116
(blank)				27	27
Grand Total	46	37	57	27	167

Table 4-4 Conceptual Use of Bicycle Locker/Secure Storage by Current Bicycle Use on Both Trip Ends

Outbound/Departure Train - Station

Would you consider using an electronic bicycle locker*, if provided?	Auburn	Berkeley	Davis	Emeryville	Fremont	Martinez	Oakland Coliseum	Oakland Jack London	Richmond	Rocklin	Roseville	Sacramento	San Jose	Suisun/Fairfield	(blank)	Grand Total
I don't know	1	4	12	5	1	2	1	3			2	15				46
No	1	8	7	3		2		3	1	2		7	2	1		37
Yes	1	10	11	3	1	1	3	10	4	1	1	11				57
(blank)															27	27
Grand Total	3	22	30	11	2	5	4	16	5	3	3	33	2	1	27	167

Return Train - Station

Would you consider using an electronic bicycle locker*, if provided?	Auburn	Berkeley	Davis	Emeryville	Fremont	Hayward	Martinez	Oakland Jack London	Richmond	Sacramento	San Francisco	San Jose	Santa Clara/Great America	Suisun/Fairfield	(blank)	Grand Total
I don't know	1	5	10	8				3	4	6	1	1	6	1		46
No		2	9	3	1	1	1	2	1	10			5		2	37
Yes		4	11	3		1		2	2	14	1	4	12	2	1	57
(blank)															27	27
Grand Total	1	11	30	14	1	2	1	7	7	30	2	5	23	3	30	167

Table does not include Santa Clara University station that opened in 2012

Table 4-5 Outbound and Return Station Response to Use of a Hypothetical Bicycle Locker/Secure Storage Use

The above cross-tabulated results provide the strongest indication of what and where solutions can be applied at a station level. These results will be applied when planning the at-station solutions.

Other responses to other questions indicate most people are comfortable using the existing bicycle racks. A number regularly lock their bicycle when on the train. Out of 167 responses, only four respondents indicated they had been "kicked off" their train trying to bring their bicycle on the train due to the train being too crowded already with bicycles.

If your bike is not able to be secured in a rack due to lack of space, how often throughout your train trip do you check on your bicycle to ensure that it is not in the way of other passengers	Total	%
I check on my bicycle at every stop or sit within view of my bicycle	43	25.7%
I pay attention to how many people are boarding, and if it looks busy I check on my bicycle to make sure it's not in the way	25	15.0%
It depends on where I secure my bicycle (please explain)	28	16.8%
Once I secure my bicycle, I typically do not check on it until I off-board the train	44	26.3%
(blank)	27	16.2%
Grand Total	167	

Table 4-6 Bicyclists Self-Monitoring Unofficial Bicycle Parking

These results were compiled shortly after the survey ended and were fashioned into the initial policy and program responses for the CCJPA well in advance of this Plan. However, the legacy of this survey is that the information provides a basis for not only demonstrating the bicycle challenges facing the Capitol Corridor service but also guiding the on-train and at-station solutions.

As a follow up to the survey, CCJPA staff visited Train 524, a train that is notorious for regular bicycle overcrowding. Most 524 riders board at Emeryville and Berkeley and get off at Davis and Sacramento. A weeklong study done in October 2011, yielded the following results as shown in Figure 4-4. With the number of bicycles riding on average each weekday, it is almost certain that the trainsets that cycle on their rotation as 524 over the course of a week were not always able to accommodate the storage demand.

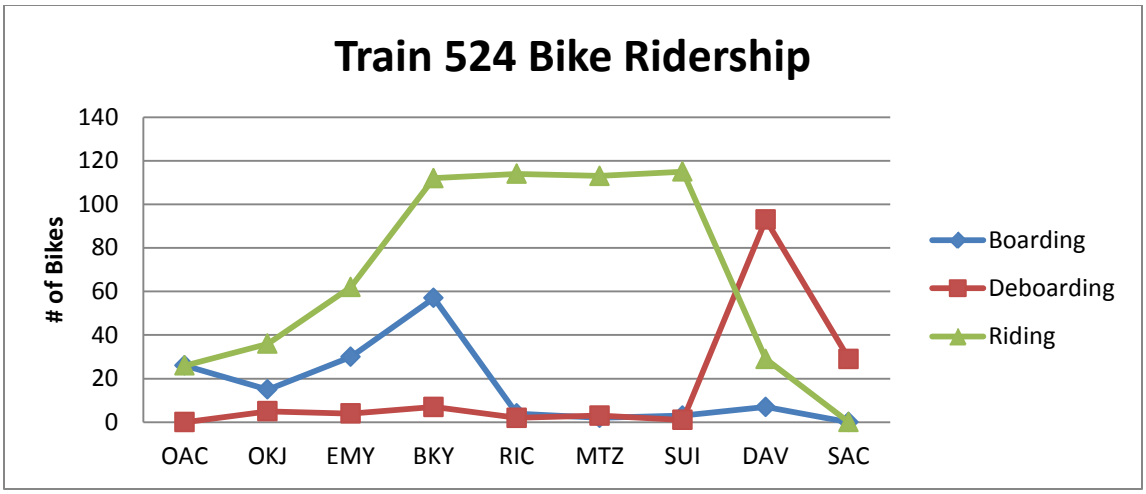


Table 4-7 Train 524 (a weekdays only train) Daily Average Bicycle Ridership

4.2 Mode of Access Survey Results

A prior draft version of this Plan was circulated to bicycle planning peers working at various levels of government as well as local bicycle policy advocacy groups in advance of a September 6, 2012 meeting where CCJPA gathered their combined input to refine this Plan. There was general group consensus that an additional survey that builds upon the early 2011 survey would help inform deployment of the final version of this Plan. Taking that advice, CCJPA administered a comprehensive mode of access survey to all Capitol Corridor riders who were willing to take the online survey which was open between November 15-December 15, 2012. CCJPA provided prize incentives for participation and sought to better understand people's mode of access to and from their origin and destination stations as well as asked a number of follow-up questions related to their responses. The survey focussed on all major modes of access to/from stations and have utility in areas beyond just bicycle access. However, key questions were asked about the potential for each individual's utilization of various at-station bicycle solutions contained in this Plan. The responses were compiled after December 15 and used to make a final refinement of this Plan prior to its adoption. Survey experts with CCJPA's parent agency, BART, helped to design the survey questions along with the assistance of a UC Berkeley graduate student and CCJPA staff.

4.3 Summary of Bicycle Challenges

In summary, the factors that contribute toward the bicycle access challenges facing the CCJPA and its customers are listed as follows:

1. The demand for bicycle access to/from the Capitol Corridor has outstripped the on-train supply for safe and secure bicycle parking.
2. Bicycle storage options at the 17 stations along the Capitol Corridor route are variously insufficient in quantity, quality, and/or are not cohesively organized for utilization from a train user perspective (i.e., a passenger in Fremont does not know what to expect for bicycle storage in Suisun City). This contributes excessively toward on-train demand for bicycle storage.
3. The increase in unofficial storage of bicycles throughout the trains as practiced by train customers but tacitly permitted by train conductors is increasing the probability of violation of federal regulations concerned with on-train mobility and safety.

4. Inconsistent responses to overcrowding of bicycles on the train by conductors make customers uncertain of the viability or Capitol Corridor as a means of travel with their bicycle, thus damaging Capitol Corridor's reputation as a practical alternative to driving.
5. Program policies emphasizing behavioral change to address mobility and safety regulations are only marginally effective at present.
6. Demographic trends show bicycle use will continue to grow relative to other modes of access at Capitol Corridor stations.
7. Modified train operations and rolling stock capacity for bicycle storage can only marginally address supply constraints facing bicycle storage.
8. Adding brand new cars to the fleet for only reasons of increasing bicycle storage supply is fiscally impractical and infeasible from a timing perspective (additional cars with the standard bicycle storage capacities will be delivered in three to four years).

5 Education, Encouragement, and Enforcement

Short of drastically modifying the interaction of bicycles and Capitol Corridor trains (such as requiring advance ticketing for bicycles, restricting bicycles to only official storage slots), the CCJPA has been relying upon a variety of customer communication methods for altering customer behavior to comply with the two key safety factors, storing bicycles out of aisle-ways and ensuring bicycles on the train are secured. Together, these are the education, encouragement, and enforcement aspects of the five "E's" discussed previously.

To assist with three of the "E's", in late 2011, the CCJPA convened a Bicycle Policy Advisory Group comprised of three (3) regular Capitol Corridor riders, CCJPA and Amtrak staff, with Caltrans Division of Rail staff participating at some meetings. Two (2) of the Capitol Corridor riders were regular bicycle users and the third one utilized a power-assisted wheelchair. Over the span of about four (4) meetings a year, policies, approaches, and all the tactics used in developing an effective education, encouragement, and, to some extent, enforcement approach were vetted and discussed with this group. The CCJPA owes a large debt

Bicycles Must be Stored Securely

Securing a bicycle means it must be attached to designated mounted infrastructure with a sufficiently robust restraining device to prevent the bicycle from flying through the air in the event of a sudden stop. All bicycles must be secured; this is not an issue that can be discussed or debated with the conductor. Bicycles secured in a loose, flimsy or inappropriate manner, as deemed by the conductor, will not be permitted.

How to Secure Your Bike:

You can use bicycle locks, bungee cords, or other restraining devices that can be affixed tightly to mounted infrastructure on the train. Bungee cords are sold in the Café Car (for an affordable cost) if you did not bring a device of your own.

The hanging bicycle storage areas typically have Velcro straps on the black stabilizing bars, which can be used as long as the straps tightly restrain the bicycle. Some of the stabilizing bars may be missing Velcro straps due to en-route damage, but these will be replaced as they go through the maintenance cycle. If the strap is not present, you must use another restraining device such as a bungee cord, to secure your bike.

Please bear in mind that the conductor will ultimately judge whether or not a bicycle is properly secured.

Bicycles Must be Stored Out of Aisle Areas

If you bring your bike on board, you must secure it in a designated bike storage area. Bicycles may not be stored in restrooms. If the bike rack spaces are full, please carefully put your bike between other bikes in the floor-mounted bike racks or in an area where it can be 1.) secured; and, 2.) out of the aisles and walkways. Bicycles cannot impede or block the aisles or walkways. All aisles and walkways must provide sufficient space for free movement of passengers with or without a wheelchair or walker. If the conductor feels the walkways are impeded, the bicycle owner must relocate the bicycle to another suitable storage space on the train or take another train that has sufficient storage space.

We thank you for your cooperation and understanding in keeping Capitol Corridor a safe mode of transit for all.

http://www.capitolcorridor.org/on board/bikes on board.php

of gratitude to these volunteer participants and feels that their thoughtful comments have largely shaped the initial efforts to respond effectively to the challenges and their input to date has feed the three "E's" discussed below. The CCJPA will continue to utilize the Bicycle Policy Advisory Group to shape the implementation of the Bicycle Access Plan.

CCJPA began an education program with on-train workshops just after the bicycle users surveys in early 2011 were implemented. Both the surveys and interviews with regular riders with bicycles were the first direct chance CCJPA staff used to convey program information to passengers and receive feedback about how to address the challenges facing all. The give and take permitted CCJPA staff to educate those bicyclists who attended the workshops to the concerns the CCJPA faced with the high demand and a limited, in the temporal and fiscal sense, ability to increase capacity anytime soon. CCJPA also expressed the safety concerns experienced by all as bicycles begin to fill up the lower levels of some trains. This was also an educational period for CCJPA staff and coupled with the advice from the Bicycle Advisory Working Group, the CCJPA shaped some of the initial in-car modifications, the operational changes, and the overall policy effort.

The CCJPA website is the key tool for the education program for bicycles on Capitol Corridor trains. The CCJPA has also started a blog entitled "Spoke and Word" which is a more conversational way to keep subscribers and casual readers up to date on the efforts CCJPA staff are making to improve bicycle access with the Capitol Corridor service, and also get any general information related to bicycling, with a bent towards combining it with trains.

The CCJPA will continue to use the website as it is the most cost effective and timely means of conveying educational information with the occasional use of printed media. When various at-station bicycle improvements are installed, CCJPA will revise its information and utilize cost effective media and marketing opportunities to make existing and potential riders aware of the improvements and CCJPA's overall support of bicycling in combination with Capitol Corridor travel.

5.1 Encouragement

CCJPA understands encouraging behavioral changes alone will not be effective; however if we couple it with the other measures, especially when engineering solutions (on-train and at-stations) are considered, encouragement has the opportunity to become the glue that holds the other parts together. Based on the survey results, discussions with bicyclists, the Bicycle Advisory Working Group, a series of suggestions were conveyed to bicyclists using the train. These are summarized below.

The context of CCJPA's "encouragement program" has been, to date, limited to driving people to refer to the CCJPA's website for more information and a limited amount of printed information in newsletters. CCJPA did not have the budget for any other approach.

Encouragement means different things to different people. There is no practical way to overcome the fact that boarding stations midway in the train's overall route will be more difficult for bicycle storage. Those who board at or closer to the start of a train's route will usually find a designated space to park their bicycle, however, as those spots fill up en route, subsequent persons boarding with bicycles may find difficulty storing their bicycle. In general, peak train ridership is between Suisun and Martinez, but bicycle spots may be filled well before reaching those stations. Berkeley is a prime example of a high bike-use station that is relatively early/ late on the train run where all bike storage areas could fill up. This situation creates persons who may have no trouble either direction storing their bicycle, trouble in one direction, or trouble in both directions. This means that persons who regularly board empty or nearly empty trains on their journey don't generally have as much

motivation to respond to the encouragement as those persons who must be more creative on a train where most or all of the designated bicycle spaces are already filled. No matter which type of boarding situation (early in the route or mid-route) the encouragement messages will only resonate to a degree. Still, one bicycle space freed up because someone could accommodate their bicycle use in another way, is a space to accommodate future growth.

The following messages of encouragement have been conveyed. Whether they are having some effect is a matter of opinion (the evaluation process is also not well funded). Regardless, these messages will be applicable now and into the future as more at station engineering solutions become available.

5.1.1 Obtain Folding Bicycles and Store Them in the Folded Position on the Train

If travel on both ends of the train trip via a bicycle is critical, a folding bicycle (that is stored folded on the train) is one of the best options the CCJPA has suggested. Not everyone can afford a new (or new to them) folding bicycle or even wants to entertain this, but for some, a folding bicycle can mean nearly a guaranteed ride to a destination. A folding bicycle can be stored as luggage and if the train is crowded with bicycles already, a folding bicycle is assurance that there is a usable bicycle on both ends of a passenger's journey.

In the United Kingdom, especially with the vast system of trains feeding London, space for bicycles is extremely limited or non-existent. To get around, the popularity of folding bicycles fitting the need for mobility has become so popular that the folding bicycle has become a cultural icon of life in the United Kingdom. By no means is this limited to just London. Worldwide folding bicycles and train systems serving major metropolitan centers are paired and marketed almost as if they were married modes of travel. This is only growing over time and CCJPA's suggestion to consider a folding bicycle is consistent with that trend and one of the best ways to ensure travel by bicycle and train regardless of how crowded the train is with traditional bicycles.

To help promote the use a folding bicycle with Capitol Corridor service, CCJPA staff are assembling a joint marketing and promotions campaign with local bicycle shops who feature folding bicycles. The CCJPA will target Capitol Corridor's e-mail subscriber list and social media outlets to make subscribers aware of the promotion, and the local bicycle shops involved in this promotion will do likewise to their contacts. These activities will commence during November and December 2012.

5.1.2 Using a Second Bicycle

We know that some passengers choose to get a second bicycle that they keep locked up on one end of their trip while the first bicycle is locked up at their origin point. At present the shortage of secure storage spaces means that most bicycles are exposed to outright theft or parts are taken from bicycles as they are stored but these factors are largely dependent on the surrounding environment, presence of law enforcement, but more often than not, the quality of the bicycle stored. Those people who do exercise this option today often use "junker" bicycles; usually older bicycles that are functional but not as attractive to would be thieves. Two "junker" bicycles are not likely to become pilfered for parts and this remains the most likely outcome of somebody adopting this suggestion until more safe and secure bicycle parking options can be presented at stations.

5.1.3 Other Fold-up Devices

For those who have an origin point or destination within close enough proximity to the train station, fold-up scooters can be an option. Like a folding bicycle, they store away nicely on the train as luggage, and they provide an option to go a greater distance than might be comfortable with a walk.

Our survey data suggests that only a limited number of individuals may avail themselves of this option (see Table 4-1) due to average mileage distances that are generally a bit lengthy for this mode. Coupled with the use and storage of a bicycle on one end, if distances are less on one end, the portable and foot powered foldable scooter (gas powered scooters are not permitted on the train) can be an option.

5.1.4 Use of a Bicycle Locker

Concern over storing an expensive bicycle overnight or longer durations can be overcome if locker space on one end (or both ends) of a regularly traveled origin-destination journey is available. The CCJPA acknowledges that the present day number of lockers at stations is limited, and the availability of lockers across the stations is minimal. In the interim until a revised locker or station storage program can be established, the CCJPA is doing an inventory of the current lockers and policies. We intend to create a guide of how to use those current lockers. Improving the viability of this secure bicycle storage at stations is a key focus of the engineering solutions presented in this plan.

5.1.5 Change the Boarding Station

While not really changing the net number of bicycles on a train, some people may seek an alternate boarding station that is earlier in the train's run. Grabbing the train earlier may present a greater likelihood of having more available bicycle storage space. Station spacing distance is usually too great but the most popular example of this is boarding at Emeryville instead of Berkeley on an eastbound train.

5.1.6 "Buddy-Up" Bicycle Storage

The hanging bicycle racks are spaced just enough apart to fit, in a pinch, more bicycles if squeezed in effectively and politely (e.g., without taking out a potential neighbor's derailleur). By using bungee cords, chains, and/or hooks it is possible to share the designated space that both bicycles are secure and out of the way. This option is not desirable on a regular basis but rather something to do on that busy bicycle day, when it becomes an option to at least bring the bicycle on the train.

5.1.7 Talking It Out at the Station

It is no secret which trains are bound to be crowded with bicycles and those waiting at stations with their bicycles are encouraged to get to know each other and talk over how, collectively, bicycles can be stored if certain cars on an arriving train are full or near full with bicycles. The linear nature of train car boarding makes using a bicycle queue to create a first-come, first-served challenging although it may ultimately be the best approach to establishing clear communications between bicyclists at stations.

Painting a bicycle queue line on the platform remains an option but as a matter of encouragement, the CCJPA, for now, is suggesting that bicyclists at the station use the tools of communication and allow common courtesy to prevail.

5.1.8 Call Ahead

Conceptually the CCJPA could invest more time and resources to build a text-based, electronic message system to alert users at stations to which cars have free designated spaces. We know enough about this option to know the challenges to automate this. We certainly can't ask conductors to become involved as they are already busy maintaining safe operations. Therefore, the CCJPA has suggested that the best system is an informal one where a friend or an acquaintance who is already on the train and can text/call the other bicyclist with how many bicycle spaces are left and on which

car. Like other measures this does not create more spaces but it does allow for a more efficient use of the spaces in the car.

5.1.9 Quick-Release Wheels

Wheels with quick-release hubs can allow more bicycles to fit together in cramped quarters and out of the way. The CCJPA permits the out-of-aisle spaces designated for wheelchairs to be used provided there are no wheelchairs needing the space. Removing even just the front wheel can allow handlebars to twist and align with the frame thus narrowing the space required and perhaps permitting two or even three bicycles to be stored in that area. Removing wheels can allow more bikes to fit in the designated hanging space locations.

5.2 Enforcement

Enforcement is a necessary tool to use with all the other tools to manage the existing and future growth of bicycle access to and from Capitol Corridor trains. Without enforcement, important safety regulations are likely to be violated. Those regulations require bicycles are stored outside of aisle-ways and are secured, in some manner, to the train. Enforcement also supports and enhances all the other "E's" and introduces consequences to those persons who are not changing behavior or adapting, in some way, to the regulations.

In late 2011 CCJPA planned to introduce a concurrent enforcement/education/encouragement program as a means to "ensure compliance" with the bicycle storage regulations. Word of this program approach eked out to the public in a disorganized fashion and the approach of immediately enforcing the regulations proved to be unpopular with the public especially without much in the way of new bicycle storage capacity immediately available. Among the concerned comments from our riders were recommendations that we separate the new policy into two phases. CCJPA was receptive to this approach in the hopes that it would give more time for education and encouragement to take hold. The first phase was an education/encouragement program to raise awareness led by CCJPA and Amtrak.

After the educational/encouragement period, beneficial to both conductors and the customers with bicycles, the second phase would launch, and this would incorporate the enforcement component.

For phase one, CCJPA provided the public a detailed discussion (see Section 5.2, Encouragement) of alternative bicycle use methods described above via the CCJPA website and followed up with written communications in the CCJPA Managing Director's Message to Riders and other published information. As well, the CCJPA developed 'alert' tags for conductors to hang on bicycles that were improperly stored and/or secured. If issued, these which would drive people to the website for more information about the intent of the program. As well, the CCJPA provided conductors a bicycle access program reference card so on quick glance, the conductors would observe the methods and protocols to assist with bicycles on the train during phase one (education/encouragement) and phase two (enforcement).

Conductors are a crucial element in the success of the enforcement phase. Conductors have ultimate authority on the train with regard to how the train operates and how they interact with the passengers. Consistency between conductors has been a common complaint. The Bicycle Access Program conductor reference card (a 'bicycle storage cheat sheet') is aimed at achieving a level of consistency among conductors for how they deal with bicycles.

As of this writing, the enforcement phase has not commenced yet. CCJPA management understands that receptivity to enforcement will be better tolerated when means to store more bicycles on a

regular basis is achieved. CCJPA staff believe that by March 2013 there will be just enough converted cab-cars in the fleet that CCJPA can regularly feature train consists with much greater dedicated bicycle storage (see the section below on Conversion of Cars to add Bike Spaces – Short/Medium Term [in). This will also coincide with adoption of the final version of this Plan by the CCJPA Board.

The CCJPA' Bicycle Advisory Working Group suggested that before a full enforcement program is launched that various CCJPA management staff and the Amtrak managers ride the trains, to make sure the conductors are making public service announcements that the enforcement period will commence in a matter of weeks. For conductors to be effective in the enforcement phase, they must feel that their decisions are not going to be second-guessed by management at Amtrak, and by CCJPA. The suggestion for a two to four week warning period would be helpful not only to the public, but also to conductors who expressed their own reservations about enforcing the on-train bicycle storage requirements.

To assist with the enforcement, CCJPA will also make available to the public, via the website, the information presented on the Bicycle Access Program conductor reference card. In this way, there will be a clear and consistent protocol for enforcing, but also encouraging and educating bicyclists using the Capitol Corridor. This action should lead to a 'no surprises' approach for both the conductor and bicyclist who is trying to travel on the Capitol Corridor.

6 Engineering: On-Train Improvements and Operations

Engineering on-train improvements and operations go to the heart of what CCJPA's role is with Amtrak and the Caltrans Division of Rail. Based on information from the 2011 Bicycle User Survey, the CCJPA was able to directly work with these partners to effect short, medium, and long term change. Some of the changes are a matter of simply changing the way the trains are assembled for and used in operation. These operational solutions, which have proven to be effective, have little tangible cost and directly increase bicycle storage. The several physical modifications to increase supply of bicycle storage on the trains are of higher cost but have been funded and are underway but since they require physical modification or will result in additional equipment, the lead times before obtaining greater storage are not as immediate. For the short term, the operational modifications coupled with the education, encouragement, and enforcement techniques are the only tools CCJPA and its partners can employ. The longer lead time items, the car modifications and the at-station improvements (see Engineering: At- Station Bicycle Facilities) will take several years.

6.1 Operational Modifications

Based on the 2011 Bicycle Survey Results, the CCJPA and its partners have optimized, to the extent feasible given other operational constraints, the bicycle storage space (and its use) on trains operating on the Capitol Corridor. These modifications have bought CCJPA, its partners, and its customers with bicycles a bit of relief on many of the busiest trains, but these measures will not be effective for long given the growth of bicycling as a popular mode.

6.1.1 Reassigned Roomier Train Cars – Short Term [accomplished]

As a short-term effort, in 2011, the Capitol Corridor worked with Caltrans and Amtrak to assign all available Cab Control Coach Baggage Cars to the Capitol Corridor service to improve onboard bike space. These Amtrak-owned cars have had their lower seats removed to provide luggage storage room and are usually dispatched to run on the San Joaquin service but are being made available to the Capitol Corridor when possible. There are exceptions as the need arises, but we hope to maintain

this arrangement, to provide as many compliant bicycle storage spaces on the Capitol Corridor as possible.

6.1.2 "Double Stops" at Berkeley - Short Term [Completed]

At Berkeley, we've implemented "double stops" for times when trains can only safely open doors for two cars at a time due to the shorter platform. Double stopping the train allows the train to shift to allow more passengers and bicycles off and on the train, as well as to help bicycle riders board cars that have available bicycle storage.

6.1.3 Modified Equipment Rotation – Short Term [Completed]

We have modified the car rotations to optimize capacity for the trains with the most bicycles. Because the equipment rotates through the trains on our schedule and is shared with the San Joaquin service, the best we could do with the limited fleet shared with the San Joaquin service, is to modify Capitol Corridor equipment usage so that about five of the eight trainsets used on our busiest "bicycle- crowded" trains will have more bicycle storage.

6.1.4 Conductor Directions/Announcements for Bicycle Storage – Short Term

There is not consistency among conductors as to if they direct bicyclists at station platforms as to where to store their bicycles. In association with improved bicycle storage signage and the cab-car retrofits to allow more bicycle storage on-board, the overall storage and boarding of bicycles would be aided by greater consistent conductor direction and communication across the service. The CCJPA will work with Amtrak staff who supervises the conductors to gain a greater level of consistent communications regarding bicycle storage for bicyclists they encounter at stations.

6.2 Physical Modifications on the Trains

Physical modifications that CCJPA requested with the administrative owner of the rolling stock, Caltrans Division of Rail, were limited to those programs already underway or represent larger capital programs that happen to positively affect the supply of designated bicycle spaces on the train.

6.2.1 No Luggage in the Bike Racks Decals – Short Term [Completed]

New bike rack bulkhead decals informing Capitol Corridor passengers that luggage must not be placed or stored in bike rack areas were installed. As long as people comply and the conductors enforce the provision, applying these decals will generally preserve the function of the designated bicycle storage in each car.

6.2.2 Revised/Updated Side of Car Bicycle Storage Signs – Short/Medium Term

Clear visual indication of which end and how many designated bicycle slots are available in each car has been an identified objective of bicycle riders and peer groups providing input to CCJPA staff. Existing cars largely have just a bicycle sticker that has been said to be too small and not conveying what bicycle capacity is available. Revised or upgraded side of car signage would have to be planned and approved by Caltrans Division of Rail and then a program of replacement begun to improve signage.

6.2.3 Conversion of Cars to add Bike Spaces – Short/Medium Term [in process]

In 2009 to supplement the three bicycle rack space on cab cars, the 14 first generation California Cab Cars (8300-series) were fitted with an additional bike rack in the lower level seating area which raised

bicycle storage capacity for these cars to seven bicycles, supplementing the five Surfliner Cab Cars (6000-series), which already have storage space for up to 13 bicycles in the lower level baggage area.

In an effort to further increase space on the 8300 California Cab Cars, Caltrans funded and commenced a more extensive retrofit in July 2012 to increase storage from seven to 13 spaces. These cars will need to go out of service to be modified, but once complete, the four floor slots and three hanging bicycle slots will be removed and will then create space for 13 hanging bicycles. As each retrofitted car re-enters the service, there will be more bicycle storage, bit by bit. It will take about 16 months to get through this entire retrofit process. The first retrofitted car arrived during the drafting of this Plan and it is expected that by March 2013, there will be just enough retrofits that can be directed toward Capitol Corridor service that enforcement actions for proper bicycle storage can be initiated.

Figure 6-1 Bicycles on train 540 after leaving Berkeley in a 8300 series California cab car

Photo taken August 15, 2012 by Alta Planning + Design (used with permission)

6.2.4 Additional Hooks – Medium Term [future project]

CCJPA mechanical staff is researching ways to install another series of hooks in the three-rack space area commonly seen on most coach cars. These would be less than desirable locations for bicycle storage since staff will try to fit the hooks between the ideally spaced three-rack storage area. If CCJPA can design a system that folds away nicely to allow passengers to easily use the luggage racks, room for up to additional two spaces next to hanging bicycles might be a way to provide more storage. We are still exploring if hanging a bicycle this way is compliant and feasible without damage to other bicycles. This is akin to putting in a permanent solution suggested in the "Buddy-Up" Bicycle Storage discussed in the Encouragement section of the plan.

6.2.5 Added Rolling Stock – Long Term [in process]

A fully funded procurement process using federal and State of California funds is in process at this time to deliver entirely new bi-level rolling stock into the fleet. These new cars are on order to

expressly to consistently create longer trains to allow more passenger seating as well as the ancillary benefit of additional bicycle storage on each trainset. In general, the challenges of sometimes getting four car consists and the attendant bicycle storage would be eliminated and five and six car consists would be the norm.

6.2.6 Dedicated Bicycle Cars - Long Term [future project]

There is insufficient rolling stock and too high a cross utilization of rolling stock between the Capitol Corridor and the San Joaquins to permit dedicated bicycle cars to be added to each Capitol Corridor train at this time. Creating a dedicated Capitol Corridor rolling stock out of the overall Northern California fleet would reduce the flexibility needed given maintenance and repair cycles and hurt both the Capitol Corridor and San Joaquin intercity passenger rail services as a whole. Sharing the rolling stock fleet with the San Joaquin service, where there is far greater luggage demand, would result in eliminating some revenue seating for passengers, which is never desirable. In the future, as service patterns change, as more rolling stock is added, this is expected to change and potentially become feasible.

The design of any future dedicated bicycle car requires that each "California"-model car, new or old, must provide access for passengers using wheelchairs, in accordance with the Americans with Disabilities Act. This means that each "California"-style car in service must provide safe wheelchair access to the lower level and our customer feedback of bicycles and wheelchair interactions is already an indication that bicycles are not a good spatial match with wheelchair users. Regular seating would also have to be provided adjacent to the dedicated wheelchair location so any persons assisting or accompanying the individual in the wheelchair can be present. A design effort to come up with a suitable bicycle storage and limited (ADA accessible) arrangement of seating will be needed.

7 Engineering: At-Station Bicycle Facilities

Present day at-station bicycle facilities are not integrated or optimized to support the existing and future bicycle needs for Capitol Corridor customers. To present a complete bicycle access plan and ensure the greatest chance to successfully address demand, CCJPA, along with the local jurisdictions, must make at- station bicycle investments to compliment the other actions in this plan. CCJPA's early 2011 survey data clearly indicates that bicyclists will respond if given options to not take their bicycle on the train but use a bicycle at one or more ends of their journey. For every bicycle-riding passenger who can exercise an at-station bicycle option, it frees up a bicycle slot on the train in both directions thus accommodating future bicycle demand. The opportunity to refine the next version of this Plan based on the results of the planned mode of access survey (see 4.2 Mode of Access Survey Planned) will be refined for the final version of the Plan however, given the present level of understanding, this section outlines the planned at-station facilities and their initial deployment plans.

At-station solutions are the most cost effective means of supporting existing and future demand for bicycle access to the Capitol Corridor trains. If adding more standard coach cars to the Northern California fleet for the sole purposes of adding bicycle storage (plus the benefit of the additional seats) were pursued, each new bicycle slot would cost approximately $1,000,000 (a standard coach car costs approximately $3,000,000). If each new coach car were designed to hold 13 bicycle slots, like the converted 8300 cab cars, each slot would cost over $230,000. In contrast, the at-station bicycle options CCJPA is targeting will be a fraction of the on-train cost of new bicycle storage.

Like the three legs of a stool, CCJPA has identified three (3) at-station bicycle solutions which, when applied across the route in the right measures, will compliment all the other actions in this plan. The three solutions are summarized in Table 7-1.

Solution	Summary	Project Benefits	Target Demographic[1]
Bicycle Sharing	Supporting local communities considering bicycle sharing, when ready, install bicycle share pods at stations, and promote mega- regional cohesive bicycle sharing.	• Reduced on-train bicycles • Increases last mile access in origin/destination community • Trip compatibility with secure bicycle program • Supports mode shift to bicycling	All in or going to participating communities
Secure Bicycle Storage	Installing a cohesive and coordinated system of secure bicycle storage facilities (bicycle lockers or secure bicycle cages) that are based on electronic card access policies established by CCJPA.	• Reduced on-train bicycles Trip compatibility with bicycle sharing • Supports mode shift to bicycling • Improved at station bicycle security	Existing and future bicyclists using the train
Folding Bicycle Lease	Installing a membership–based folding bicycle lease system (akin to city car-share programs) at select Capitol Corridor stations initially, station expansion based on utilization.	• Reduced on-train full sized bicycles • Promotes complete train/bicycle mobility for trips Supports mode shift to bicycling • Greater space utilization	Existing and future train riders, some existing bicycle/train riders

1. Analysis of the future Mode of Access Survey results (see **Table 4-2**) will be used to fine tune the target demographics

Table 7-1 At-Station Projects Summary Table

In identifying the at-station solutions in Table 7-1, the CCJPA is borrowing from other examples around the world where bicycles and trains interact. Each of the solutions above is rooted in taking some of the grander bicycle sharing concepts and limited installations from the past, which were sometimes not all that successful, and refining them by the use of telecommunications and mobile technology. The bicycle/bicycle facility concepts from the past were, depending on one's perspective, either under- delivered or were instrumental in demonstrating what exactly was missing for more successful integration into people's travel plans. The marriage with the communication technology of today and the convenience of internet-based service sign-ups means these modernized concepts actually meet the needs of travelers, and the actual managers of such services. Each solution is described in detail below.

7.1 Supporting Bicycle Share Programs

Bicycle sharing is, by its nature, not a program where CCJPA would be the lead project implementer. Bicycle sharing programs have the potential to greatly reduce the number of bicycles onboard the train and significantly grow bicycle access as a mode share to/from the train but for this option to work in conjunction with Capitol Corridor service, it will take leadership from those who see a vision for bicycle sharing within their communities.

7.1.1 What is Bicycle Sharing?

Traditional bicycle sharing systems operate by having a network of sharing stations spread throughout the service area. Anyone who would like to use a bicycle simply has to register him or herself into the program. Once registered, the user can rent a bicycle from any station and take it to any other (or the same) station. The success of bicycle sharing is the flexibility for the user, however the flexibility can only be realized if there are sufficient bicycle storage pods or stations in the right areas, thus the success of bicycle sharing is really based upon density but also coupled with origin-destination pairs and use by time of day. Bicycle sharing has great promise to reduce car dependency and bridge the 'last mile' gap between transit systems and end destinations. Several major cities have bicycle sharing programs and some notable programs to study are Paris, France, Hangzhou, China, and London, England, Washington DC, and Boston, MA. For those who are curious to see the city-wide view of bicycle sharing activity from the London system (early in its deployment), the video at http://vimeo.com/19486470 shows real-time behavior of users of the London, England bicycle sharing program and this video demonstrates the concepts of density, time of day, and origin-destination pairings.

At this time, bicycle sharing is experiencing growing pains. There are many entities that are in different stages of bicycle sharing growth: cities that are considering starting such systems, cities that are launching their programs and cities in the midst of expanding their systems. The fledgling industries that support bicycle sharing (manufacturers of the bicycle share compatible bicycles and the companies that manage the systems) are slipping launch dates on a regular basis. While missing a launch date is not a good trend, the cities engaged in bicycle sharing remain determined to be patient for a good product.

The public response, worldwide, for bicycle sharing is encouraging and for elected officials, there is growing motivation to provide bicycle sharing for their community. An excellent overview of how bicycle sharing titled "Public Bikesharing in North America: Early Operator and User Understanding" can be found on the Mineta Transportation Institute's website: http://www.transweb.sjsu.edu/project/1029.html

7.1.2 Why Is Bicycle Sharing Good for CCJPA?

The CCJPA recognizes that it is ultimately a community decision to adopt bike sharing. As a part of the community, CCJPA would encourage the adoption of bicycle sharing in cities that are appropriate for such an amenity and offer assistance in publicizing the program and supporting bicycle sharing at the train station. The ultimate decision to adopt a bicycle share program rests with the local jurisdiction. A bicycle share pod at any particular Capitol Corridor station would be ineffectual without many other locations with similar pods located throughout the local area. The deployment of any such a bicycle share system and the funding support for that action would have to rest within the community, communities, or potentially regions, depending on how such a system is envisioned.

Clearly, the train station in any city is an excellent origin or destination point for the community and therefore a prime location for a bicycle share pod. Regardless of all the other measures CCJPA can take (with its partners) to increase the supply of bicycle storage on the trains and at stations, bicycle sharing offers the greatest potential to help deal with the growth of bicycling as a mode share to/from the train. As bike sharing grows in popularity and becomes widely adopted, then there's a strong chance riders may switch from using their own personal bicycles to joining a sharing program. Such a shift would reduce the need for riders to bring their bicycles on board; riders would be able to "rent" a bicycle at their end destination. Bicycle sharing is also a compliment to transit and secure bicycle storage at stations. Where bicycle sharing programs are developed or expanded along the Capitol Corridor route, they are likely to be established slowly. There may even be stations that never opt for a bicycle share pod. Regardless, of how or where bicycle share systems are developed

along the Capitol Corridor route, they can effect travel behavioral change in distant communities. CCJPA would be certain to publicize the existence of bicycle sharing along the route so that when people are considering their travel plans, the option of Capitol Corridor and bicycle sharing is foremost in their travel decision.

Existing bicyclists, even if they never have had to worry about space onboard the train, may also switch from their using their own bicycle to a bicycle share program. Reasons for switching include:

- Flexibility and sense of security that a bicycle sharing network can provide. As long as one is within the bicycle sharing system, one has access to a bicycle.
- Ability to leave one's bike safely at home; one can take public transit without having to take a bicycle as well.
- Reduced cost of theft. A person who lost his or her own bicycle (or just parts of it) suffers all the costs of the lost. In a bicycle sharing network, the cost is distributed throughout the network.
- Reduced instances of theft as bicycles in the sharing program are distinct, locked securely, and are designed to deter vandalism and theft.

Ultimately, bicycle sharing is seen as desirable as it increases the viability and attractiveness of Capitol Corridor. Potential travelers who could only drive to the starting station but could not find an easy way from the end station to their end destination will consider the Capitol Corridor train if their end destination is within bicycling distance.

7.1.3 Bicycle Sharing Pricing Options and Management

Generally, bicycle sharing programs operate like being a member of a club. People who want to join the program usually have to provide a deposit or credit card information; this is needed to deter people from stealing the bicycles rather than renting them. Once registered within the program, people are eligible to rent bicycles.

Bicycle sharing programs typically generate money through membership fees and charging users for the amount of time spent on the bicycle. Most programs offer annual memberships for regular users and single or week long memberships for tourists. A sample of membership fees for bicycle sharing programs in the United States are shown in Table 7-2.

Name of System	City	Annual Fee	30-day fee	3-day fee	1-day fee
Capitol Bicycle Share[i]	Washington, DC	$75	$25	$15	$7
Hubway[ii]	Boston, Massachusetts	$85	NA	$12	$5
Chattanooga Bicycle Transit System[iii]	Chattanooga, Tennessee	$75	NA	NA	$6
Madison B-cycle	Madison, Wisconsin	$65	NA	NA	$5

Table 7-2 Sample Bicycle Share Membership Plans in the United States

A common pricing strategy outlined for most programs is to rent out the first 30 minutes for free. This encourages the small trips that are most suitable for biking and is a marketing point for potential users. Usage fees generally start to accrue after the first 30 minutes. If a bicycle is not returned within a certain time limit, the bicycle is assumed stolen or lost. The user responsible for the bicycle is then charged to replace the bicycle. Shown in Table 7-3 are some usage rates for bicycle sharing in the United States.

System name	Capitol Bicycle Share (Washington DC)	Hubway (Boston, MA)	Chattanooga (Chattanooga, TN)	Madison B-cycle (Madison, WI)
Time of Usage				
0 – 30 min	$0.00	$0.00	$0.00	$0.00
0 – 59:59 min	$2.00	$2.00	$0.00	$2.00
60:00 – 89:59 min	$6.00	$6.00	$5.00	$7.00
90:00 – 119:59 min	$14.00	$14.00	$10.00	$12.00
2:00:00 – 2:29:59 hours	$22.00	$22.00	$15.00	$17.00
2:30:00 – 2:59:59 hours	$30.00	$30.00	$20.00	$22.00
3:00:00 – 3:29:59 hours	$38.00	$38.00	$25.00	$27.00
3:30:00 – 3:59:59 hours	$46.00	$46.00	$30.00	$32.00
4:00:00 – 4:29:59 hours	$54.00	$54.00	$35.00	$37.00
4:30:00 – 4:59:59 hours	$62.00	$62.00	$40.00	$42.00
5:00:00 – 5:29:59 hours	$70.00	$70.00	$45.00	$47.00
5:30:00 – 5:59:59 hours	$78.00	$78.00	$50.00	$52.00
6:00:00 – 6:29:59 hours	$86.00	$86.00	$55.00	$57.00
6:30:00 – 6:59:59 hours	$94.00	$94.00	$60.00	$62.00
7:00:00 – 7:29:59 hours	$94.00	$100.00	$65.00	$67.00
7:30:00 – 7:59:59 hours	$94.00	$100.00	$70.00	$72.00
8:00:00 – 8:29:59 hours	$94.00	$100.00	$75.00	$75.00
8:30:00 – 8:59:59 hours	$94.00	$100.00	$80.00	$75.00
9:00:00 – 9:29:59 hours	$94.00	$100.00	$85.00	$75.00
9:30:00 – 9:59:59 hours	$94.00	$100.00	$90.00	$75.00
10:00:00 – 10:29:59 hours	$94.00	$100.00	$95.00	$75.00
10:30:00 – 10:59:59 hours	$94.00	$100.00	$100.00	$75.00
11:00:00 – 23:59:59 hours	$94.00	$100.00	$100.00	$75.00

Table 7-3 Sample Bicycle Share Usage Rates in the United States

Bike sharing works best in large urban environments with existing bicycle infrastructure in place. European guidelines recommend bike sharing only in cities with a population of at least 200,000 although smaller cities like Chattanooga, Tennessee have experienced some success. The important thing is to match the scale of the bike sharing program with the city size; Italy and Spain have implemented many small programs of about fifty bikes. The most important conditions should be met before the implementation of bike sharing. Bicyclists and drivers alike must be educated on how to share the road. Bicycle routes, lanes, and signage should be established before the program.

Challenges for existing programs are the temporal redistribution of bikes. Several cities with steep grades or concentrated job areas face the challenge of maintaining a balanced distribution of bikes. Many stations fill up rapidly so that other bicyclists can't park close to their end destination; others are completely empty. Many programs have resorted to redistributing bikes throughout the day to compensate. Modified pricing options have also shown a modest effect to reduce the uneven distribution. The program in Paris, France gives more time to bicyclists that bike to stations that are, at the time of bicycle return, low on bikes; over 300,000 instances of this happened in the first three (3) months of the new policy.

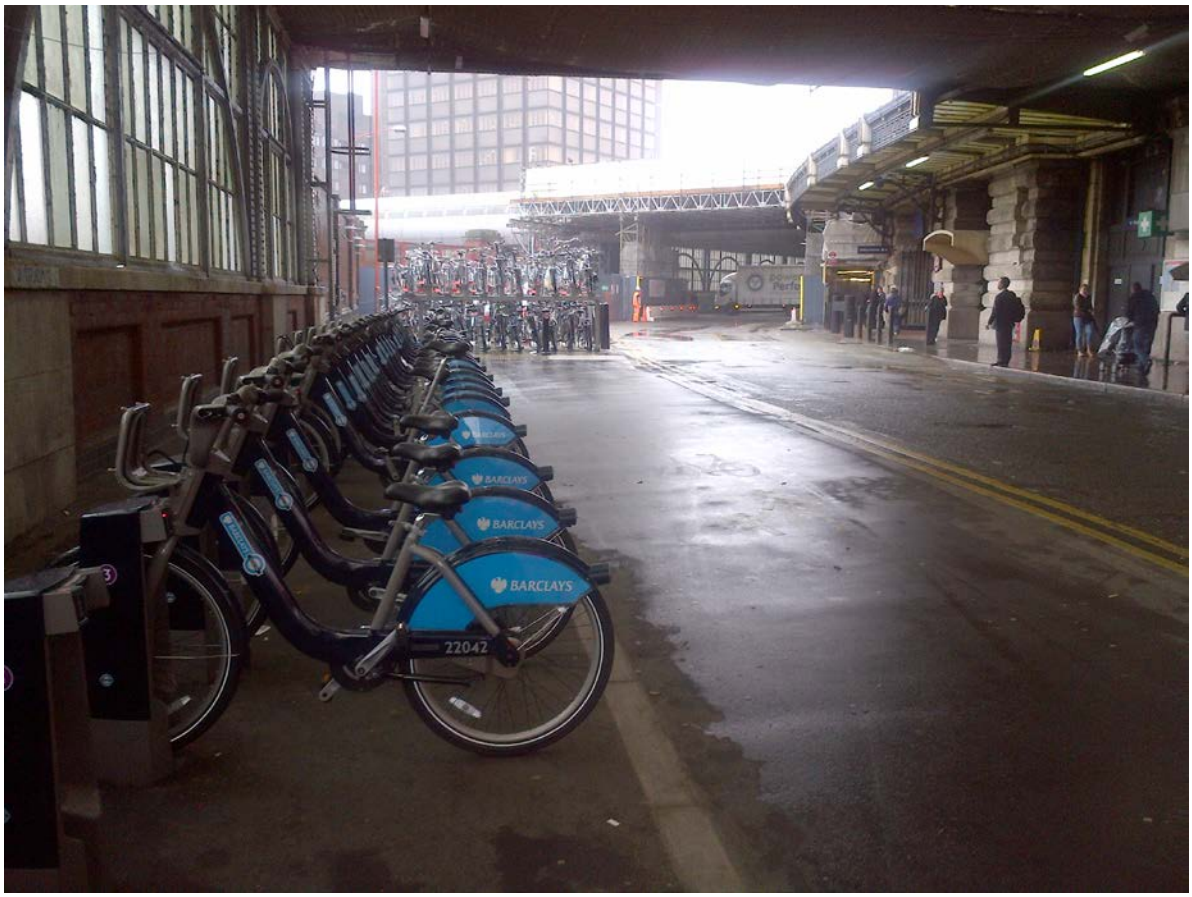


Figure 7-1 London Cycle-Hire (foreground); Unsecured Stacked Bicycle Parking (background) at London's Waterloo Station

Photo by CCJPA staff

Urban train stations are strong bicycle sharing sites but sometimes the sharing program is too successfully linked to the train mode. In London the real estate around train stations is in such high demand that it was very difficult for Transport for London (TfL) to consistently establish bicycle pods at the main train stations. Even where some were provided, the demand for the use of the shared bicycles themselves was so great that there could not possibly be enough bicycles available. In this case, TfL does not try to accommodate all the demand at train stations and this elicits several responses from travellers; some people walk several blocks to where additional bicycle sharing pods are provided, some arrive earlier to snatch up the limited bicycle share bicycles that are provided at the station; and finally, some do not try to adapt and utilize the methods they did before bicycle sharing was introduced (using transit, storing a second bicycle at the train station, if that is an option, walking to the destination, or using their own folding bicycle). The passenger activity loads at Capitol Corridor station are no where near the activity seen at the London stations yet, should bicycle sharing become available at a Capitol Corridor station, it would be a worthwhile effort to monitor the utilization, and be prepare to adjust the numbers of bicycles in a pod (up or down) as warranted.

Country	City	Name	System	Year inaugurated	Stations	Bicycles
United States	Atlanta, GA	viaCycle@GT	viaCycle	2011	8	40
United States	Bay st. Louis, MS	Bay Bike Project	BBP	2011	Infinite	10
United States	Boston	Hubway	Bixi	2011	61	610
United States	Boulder, Colorado	Boulder B-Cycle	B-Cycle	2011	15	120
United States	Broward County, Florida	Broward B-Cycle	B-Cycle	2011	35	
United States	Charlotte, North Carolina	Charlotte B-Cycle	B-Cycle	Summer 2012	20	200
United States	Chattanooga, Tennessee	Bike Chattanooga Bicycle Transit System	Bixi	Summer 2012	30	300
United States	Chicago	Chicago B-Cycle	B-Cycle	2011	7	100
United States	Des Moines, Iowa	Des Moines B-cycle	B-Cycle	2010	4	18
United States	Denver	Denver B-cycle	B-Cycle	2010	52	520
United States	Houston, Texas	Houston B-cycle	B-Cycle	2012	3	18
United States	Kailua, Hawaii	Hawaii B-cycle	B-Cycle	2011	2	12
United States	Kansas City, Missouri	Kansas City B-cycle	B-Cycle	2012	12	90
United States	Madison, Wisconsin	Madison B-Cycle	B-Cycle	2011	27	270
United States	Miami Beach, Florida	DECOBIKE	SandVault	2011	100	1,000
United States	Minneapolis	Nice Ride	Bixi	2010	146	1,330
United States	New York City	Citi Bike	Bixi	Spring 2013 (planned)	600	10,000
United States	Omaha	Omaha B-Cycle	B-Cycle	2011	5	35
United States	Phoenixville, PA	Bike Schuylkill	Community Access Bicycles	2011	1	10
United States	Portland, Oregon		No Vendor Chosen	Spring 2013		
United States	Pottstown, PA	Bike Schuylkill	Community Access Bicycles	2008	2	30
United States	Salt Lake City	SLC Bike Share		Spring 2013	10	100
United States	San Antonio	San Antonio B-Cycle	B-Cycle	2011	23	230
United States	Spartanburg, South Carolina	Spartanburg B-Cycle	B-Cycle	2011	2	14
United States	Washington, D.C. area	Capital Bikeshare	Bixi	2010	175	1,670

Table 7-4 Bicycle Sharing in the United States

Source: Wikipedia list of 'bicycle sharing systems'- http://en.wikipedia.org/wiki/List_of_bicycle_sharing_systems

7.1.4 How Would CCJPA Implement Bicycle Sharing?

The CCJPA is not positioned to be the lead for bicycle sharing in any community but will instead be supporters/participants in bicycle sharing initiatives communities may lead. Implementing and managing a bicycle sharing system is a huge undertaking; bicycle sharing is essentially another transit system with its own set of costs and challenges. Bicycle sharing systems are generally run by local governments or authorities; the CCJPA spans four different air quality districts, many cities, seven counties, and two metropolitan planning organizations. As expressed in the September 6, 2012 meeting with many of the regional entities who were commenting on the prior draft version of this Plan, there is a desire to try to provide a common system or at least common payment system between the communities the Capitol Corridor serves. This is an overarching recognition of the Northern California Mega-region and has broad implications but would, if it could be realized, be an excellent pairing with Capitol Corridor train travel as the only transit mode to link the mega-region together. Procurement and institutional barriers are considerable however, if the vision is compelling to many of the policy makers around the mega-region, it would have a greater chance of success.

The CCJPA realizes that the upfront cost of bicycle sharing can be significant and that the necessary infrastructure and demand to support such an option does not exist in all the cities that the CCJPA serves. In May 2011, it was reported that it cost Alta Bicycle Share $41,500 to install a pod with six docks, and $49,300 for larger stations with 14 docks. Each pod is equipped with solar panels and a wireless data link allowing for relatively easy reconfiguration or initial deployment. Each bicycle costs about $1,000 with an annual operating cost of about $1,860. Depending on the fiscal and budget situation at the time, CCJPA can be a partner to the local jurisdiction to financially support bicycle share facilities at stations. With the uncertainty concerning how individual communities might roll-out bicycle sharing, CCJPA is not prepared to identify capital funding sources to participate in a matching program or purchase a pod for a particular station. Funding CCJPA has regularly received on an annual basis for minor capital projects is an option.

In the greater regional sense, there are initial steps toward bicycle sharing taking place in the two main regions (Sacramento and the San Francisco Bay Area) served by the Capitol Corridor. The CCJPA anticipates that both programs will expand in the case of the San Francisco Bay Area and mature into a regional transportation initiative for the Sacramento region. And, as stated above, there may be a potential for these efforts to link together with Capitol Corridor service being a unifying mega-regional factor.

7.1.5 The San Francisco Bay Area Bicycle Sharing Program

The effort to bring bicycle sharing to the San Francisco Bay Area is being spearheaded by the Bay Area Air Quality Management District (BAAQMD). BAAQMD is working with several agencies to implement and oversee this project and it is in its early stages. The local area implementing agencies are San Francisco Metropolitan Transportation Authority (SFMTA), San Mateo Transit Authority (SAMTRANS), San Mateo County, City of Redwood City, and Santa Clara Valley Transportation Authority (VTA). The oversight agencies are Caltrans, Federal Highways Administration (FHWA), and the Metropolitan Transportation Committee (MTC). About $7 million will be invested into the program: $1.4 million from BAAQMD, $1.3 million from partners and $4.29 million from MTC. The pilot phase of the program will last a year or two. The launch date of this program has been postponed to January 2013. Alta Bicycle Share won the bid to install and manage the program for the duration of the trial program and is positioned to operate the system after the trial phase.

Based on representations from BAAQMD staff, this program must be implemented and evaluated before it is a suitable option to potentially be expanded to other Bay Area communities and BAAQMD may not be the appropriate entity to carry it forward – if so, the appropriate leadership and implementation arm must be identified. Overcoming persistent funding challenges and bicycle share applicability within communities is also paramount for the program to expand in a way where this system may come to Capitol Corridor station communities in the Bay Area. Regardless, there is unquestionable the interest of many Bay Area cities in the outcome of this limited pilot program and indeed, the Sacramento region is interested in the outcome pursuant to the mega-regional potential there may be to link the two regions. CCJPA will monitor the development of the BAAQMD program and work to explore what future integration options there may be between the two regions.

Collectively, Figure 7-2 and Figure 7-3 show the maps of where the initial pilot phase will operate. The plan calls for fifty (50) stations in San Francisco, 10 in Redwood City, 10 in Palo Alto, 10 in Mountain View, and 20 in San Jose.

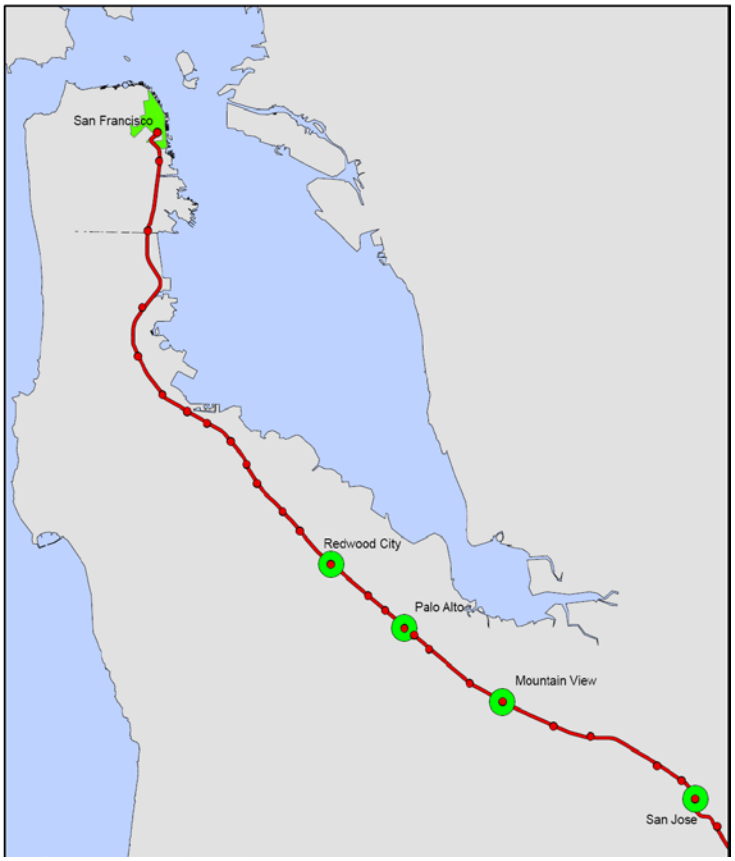


Figure 7-2 BAAQMD Initial Bicycle Share Locations

Source: BAAQMD website

Figure 7-3 San Francisco Portion of the BAAQMD Bicycle Share Program

Source: BAAQMD website

7.1.6 Bicycle Sharing in the Sacramento Region

The Sacramento area, including the communities around Sacramento are in the initial stages of considering a bicycle share program and are assembling funding to complete a implementation plan

for bicycle sharing in the region. The CCJPA and the Sacramento Metropolitan Area Air Quality Management District (SMAAQMD) have each pledged an initial $10,000 toward what is expected to be about a $90,000-$100,000 plan. Staff associated with various Sacramento-based interests comprised of the private and public sector are working to gather the additional funding for the plan. The plan will assess Sacramento's characteristics for supporting and using bicycle share and if deemed viable, policies and design for the Sacramento bicycle share program will be initiated. At this time the concept of "Sacramento Bicycle Share" is certainly encompassing Sacramento but also surrounding communities of Davis, Roseville and Folsom, and like the San Francisco Bay Area, there may be a "regional standard" and then cities can opt in as a participant. There are obvious benefits to membership across the larger region especially associated with Capitol Corridor travel between Sacramento and Davis. SAAQMD leadership has indicated the interest to build upon the mega-regional aspects of bicycle sharing in joining with the Bay Area bicycle share program as it expands. The CCJPA and SAAQMD will continue to work towards a cohesive mega-regional corridor approach. But for now, starting on a more local basis, the program implementation, the same group of private and public sector teams will work with a lead agency (to be determined) to implement the next steps.

Previously, the Midtown Business Association (MBA) completed a small six-month trial bicycle share program in Midtown Sacramento. There were some lessons learned about the management of the program by the MBA and indications in the local press are that the MBA has agreed to move forward with an expanded program that would be under private ownership of 'The Last Mile'. There are plans to have a slow rollout of thirty (30) stations each with 10 bicycles each; the slow rollout is intended to allow 'The Last Mile' to work out the kinks in the system as it goes along. With the more extensive effort gathering momentum with the greater Sacramento effort, it appears based on their participation with the larger Sacramento group exploring bicycle sharing, that the MBA may shift their focus toward the larger effort.

7.2 Creating a Cohesive and Comprehensive Secure Bicycle Storage System

For this plan, the CCJPA is focusing on solutions that best match the needs of the Capitol Corridor ridership and especially those who use bicycles one or both ends of their Capitol Corridor journey. Recommendations from transit agencies and bicycle planning professionals indicate that building more Class 2 bicycle parking (i.e., bicycle racks) in association with transit facilities are better than nothing; however, experience and customer feedback from transit riders trying to use bicycles with their transit trip indicate bicycle racks do not meet their bicycle security needs, thus, do not ideally support the transit/bicycle association. In turn, the economic and environmental benefits associated with transit facilities are not as great when considering Class 2 bicycle parking. To best meet the needs of travelers who want to regularly travel via transit using a bicycle on one or both ends of the transit trip, these same professionals recommend installing Class 1 bicycle facilities, which involve some aspect of secured storage.

There are secure bicycle storage facilities at Capitol Corridor stations and for many people they work fine, however, as a whole the bicycle parking situation at stations is not cohesively organized or optimized to best serve the largest swath of bicyclists using the Capitol Corridor. For instance, there are stations with lockers who have long ago been checked out to individuals some of whom only use the locker six months out of the year. For the new or casual user who is trying to utilize the train and park their bicycle, they are faced with barriers to determine just how they might get to use of a secure storage locker at a distant station. Even in their hometown, the process is not always clear. A prime objective of the CCJPA is to add more secure bicycle parking at the stations and also organize access to the secure facilities under a common basis. This approach achieves the goals of cohesive

and comprehensive secure bicycle storage across the system – no matter which station you might use, the method of securely storing your bicycle is the same.

As of now, each station is owned by the host city, and the host city decides whether or not it wants to install secure bicycle parking, and if so, how much. Or they maintain what facilities they have at the station, usually in the form of bicycle lockers and bicycle racks.

7.2.1 Traditional Bicycle Racks

There are several stations where bicycle racks are not in place or inadequate. Hayward and Oakland Coliseum stations are such locations but are also locations where high theft and crime probably have deterred those jurisdictions from introducing bicycle racks. Additional study and interaction with each jurisdiction lacking any or adequate bicycle rack space will be considered by CCJPA in accordance with the discussions with each jurisdiction regarding secured bicycle storage. While less costly than secure bicycle storage solutions, CCJPA doesn't have any funding at present to direct towards bicycle racks. As well, bicycle racks leave locked bicycles extremely prone to theft especially at unstaffed stations and when locked for the durations of time that are typical of Capitol Corridor travelers. Regardless, they are an important component of a complete bicycle solution. The pending access mode survey will provide greater insight into their applicability and incorporation into the final version of this Plan.

7.2.2 Secured Bicycle Storage System – What Does That Mean?

There are several categories of what acts like a secure bicycle storage system. CCJPA's working definition of a secured bicycle storage system for this plan is a system which allows riders to park their bicycles in a secure location providing safe and secure protection for their private property (i.e., bicycles) as well as the safe access for the rider, and restricted access by the general public.

For each of the following categories there are various access nuances that further differentiate each category.

- Designated indoor bicycle room with locking system
- Bicycle cage in a garage
- Garage racks directly adjacent to an attendant booth
- Bicycle lockers
- Designated bicycle space inside an office

In addition to bike lockers there are several other actions that can be implemented under the umbrella of an integrated secured bicycle storage system and these usually involve the application of technology to administer and control the "secure" aspect of the storage system.

7.2.3 How Can Securely Storing a Bicycle At a Station Really Help?

The main benefit of a secured bicycle storage system for CCJPA is that we want to give our riders who use bicycles as their main form of transportation to get to/from our stations every viable option for leaving their bike at the stations and getting on/off our trains knowing that their bicycle is safe. The CCJPA can even facilitate an environment where a Capitol Corridor rider could potentially have two bicycles stored - one at their origination station and one at their destination state so that they don't feel that they absolutely need to bring that bicycle on the train. To the extent that secure bicycle storage based at stations helps with that aspect; there is more room on each train for those riders with bicycles who possibly can't exercise any of the bicycle options available at either their origin and/or destination station. There is also more room on the train for that person who must bring on their bicycle to safely store the bicycle without question by the conductor who is charged with ensuring safe train operations for all passengers.

7.2.4 Elements of Secured Bicycle Storage System

Secure bicycle parking is currently as effective as it has ever been, mainly through the application of technology. For years, secure bicycle parking was mainly thought of as controlled by some entity who would issue a key to an individual for "their" locker who signed up for, and possibly even paid for, a secure space to store their bicycle. That individual would hopefully use the locker as intended and all would be well, except that in popular locations, lockers were all snatched up quickly and waiting lists grew for the next available locker. CCJPA staff knows of a regular Capitol Corridor rider that "rents" a locker and utilizes it about six (6) months out of the year, usually when weather is conducive to bicycling. Conceptually, CCJPA could help expand storage lockers under this option at stations that have no lockers or are in need of additional lockers due to demand. CCJPA or the local jurisdiction could determine which entity would be the keeper of a list (although the city may need to be in possession of the keys) and, in concept, this partnership would help to serve as many more bicyclists as we add lockers. A challenge to meet if we pursued such a system would be how to address those stations that have varying systems. There may be those who were successful at their "home" station which have elaborate systems of controlled access driving the software behind the access control, but are user- friendly in their customer interface. Today such systems are using electronic key cards but these systems can also evolve to use other stored value cards or even interface with smart-phone technologies for end-user control.

There are two main types of technology-enabled storage systems applicable to Capitol Corridor station solutions. We will discuss "shared bicycle lockers" and "secure bicycle parking areas" next.

7.2.4.1 *Shared Bicycle Lockers*

Shared bicycle lockers (shown in Figure 7-4) store individual bicycles for a period of time as long as the end-user maintain sufficient funding associated with their unique access code (coded to the electronic activation technique). These types of shared bicycle lockers are proving very popular associated with travel on the Bay Area Rapid Transit (BART) system.

Figure 7-4 BikeLink lockers at BART Ashby Station Photo taken by CCJPA staff

The "shared" portion of the bicycle locker is enabled by the technology. The primary benefit of the advancement with technology depends on the perspective. From the perspective of an end-user, the bicycle is just as secure as ever, there is a "help desk" to call if there is ever an issue, and the electronic access method, depending on how extensive a system, is good across several locations and this has some significant utility. A downside is that perhaps there are usually nominal charges for storage based on time of use. Potentially the older "key-issued" storage system was free or of lesser net cost. From the perspective of an operator, like a transit agency, there is a wealth of data coming from the use of the devices and potentially a means to be in contact with that user. The newer storage system cost more to acquire and operate over time but when considering life-cycle cost and utility, the storage systems based on this technology provide about ten times the utility of the "key-issued" storage systems. For a public expenditure of funding, this is a far greater rate of return for the public investment. These bicycle locker spaces can accommodate bicycles of nearly any type or size with the exception of tandems and other lengthy wheelbase bicycles. The lockers are designed to keep debris out, and may be moved easily, placed on a shallow incline if necessary, and the access module (secure user interface) runs on both solar and battery power. The bicycle lockers are delivered in sets or pods that can be set up in various configurations. A typical set up is with a series of rectangles with one rectangular space made of two oppositely angled locker spaces. Alternatively, there are circular arrangements where each locker is like a slice of pie combined in one larger circle. Each locker costs between $2,000 and $3,000 to purchase depending on the specifications desired.

The bicycle lockers shown in Figure 7-4 are run by modules that allow the rider to use an activation card and start clocking the amount of time the bike will be in the locker, which in turn decrements the amount of funds that are on the card. For every two bike spaces in the locker, one module governs access to those spaces. However multiple modules are mounted on the structure of the locker so as to prevent system failure should one module go down. The modules can read contact less cards, and in the future voice activation and linkage to the Bay Area's stored transit value card, the Clipper Card, will be integrated into the feature set. Also, there are plans to utilize some of the payment options that are increasingly being linked to smart phones, such as near-field communications. These shared bike lockers are monitored remotely, as it's important in an urban setting to monitor who uses the lockers.

The bicycle lockers used with the BART system, the BikeLink system, are paid for just like at a parking meter – the individual purchases secure time in the locker for their bicycle (or other mobility device). The smart BikeLink card is both the cash and key for use of the system. Parking rates vary by location, but are typically three to five cents per hour (charged by the minute.) There are no recurring membership fees and unused time is always refunded. And members can reserve a space for their bicycle an hour ahead of time.

Based on discussions with those persons experienced with the administration of bicycle locker systems, it appears that at-station bicycle storage solutions are probably best done as lockers as opposed to secure bicycle parking areas discussed below. Capitol Corridor trains get a fraction of the daily ridership experienced on a system like BART who sometimes have a mixture of both or one of the solutions.

Regardless, the recommendation of which of the two viable options must be a joint decision of the hosting landowner with the consultation of the CCJPA and bicycle planning experts. A final word of caution from those experienced with these systems: when considering how many lockers to install, there is an element of latent demand which has a gestation period of about a year. Operational costs are low and are usually bundled in a multi-year service plan from the initial capital purchase.

7.2.4.2 *Secure Bicycle Parking Areas*

Secure bicycle parking areas operate on the same electronic activation principles as do shared bicycle lockers. A significant advantage is that they can store many more bicycles than lockers and at some stations this might be the proper solution due to the sheer number of bicycles. There are varieties of these used around the world in association with transit facilities. At busy transit locations there is sometimes an association of the secure bicycle parking area with a bicycle shop. Regardless of the facility being coupled with a bicycle shop or not, usually the bicycle owner would use the electronic access method to gain access to the secured bicycle parking area, and then they bring their bicycle in and load it onto a metal docking unit that has a poly carbon tether or similar system to secure (lock) the bicycle to the docking unit. In many bicycle areas there is an upper and lower level thus maximizing the use of space. The level of activity at Capitol Corridor stations does not match the activity conditions it usually takes to associate secure bicycle parking areas with a bicycle shop. Sacramento being the busiest overall station on the route or Davis, due to the high bicycle access rate, would be the likely candidates.

Figure 7-5 Secure Bicycle Parking Area at BART Ashby Station Photo taken by CCJPA staff

There are, however, several detracting points to secure bicycle parking areas. Safety is a crucial concern since people can follow others in with intent to steal bicycles or assault and then steal the bicycle of the person opening the secure door. As well, the door is a single point of failure for the electronic activation system. Also, while difficult to enforce, many of the policies for secure stations request that there is only one person accessing the secure parking area at a time (i.e., the policy is to lock the door after complete entry to prevent theft). This anti-theft policy leads to queuing issues, which is not good when several bicyclists are trying park while time ticks down to the train departure. For reasons of theft and use, there have to be elaborate access protocols and usually it is recommended that a camera is present to record access. The use of the electronic access card is a means to check up on any access incidents that may arise.

The cost of a secure bicycle parking area is, by its nature, more capital cost effective on a per bicycle parking space than a shared bicycle locker. However, the operating costs for secure access areas can be quite high due to the maintenance and diligence required for such system. If, for instance there is a failure at the electronic access point, or if the access point is vandalized to the point where it does not function, there are a great many people who are inconvenienced (those who can't get to or store their bicycle, and those who must come out to service and resolve the issue). For these reasons and as discussed above, secure bicycle parking areas are probably not the ideal solution for Capitol Corridor stations. Again, which solution goes in for each station needs to be worked out with the partners who would be involved with each secure bicycle facility installation.

7.2.5 Pricing Options and Management For Capitol Corridor Stations

Secured bicycle storage rates (for both shared bicycle lockers and secure bicycle parking areas) present a policy dilemma for CCJPA. Generally bicycle lockers need to charge money to incentivize turnover.

However, this conflicts with how bicycle storage substitutes on the train might become viable. The CCJPA wants to make the secured bicycle storage system as inexpensive as possible for the end-user because we know the alternative is onboard storage, which is free on the train (albeit there is not always a guarantee of a bicycle space on the most crowded trains today). To encourage use of the secure bicycle facilities, the CCJPA should not present any barriers to anyone who may be able to modify their behavior to stop using the bicycle storage on the train and take up use of the secure bicycle facilities at the stations. However, free (or subsidized) use is not sustainable without some cost offset by the end user for insufficient use (e.g., under 10 days, or 20 open/close actions).

Fortunately, a pricing option can be established which can be reflected in the electronic access database. The approach would be that frequent use, e.g., more than 30 door openings in a month period (which represents 15 days of bicycle use) could be free. There can be software controls for how many minutes or hours of time is required to be between openings (we don't want to count people opening and closing the door repeatedly just to pass the 30 door opening threshold). Those using the secure bicycle access system will require funds on their electronic access card but if they follow the usage policies (which encourages frequent use over the month), at the end of the month they can be refunded for their time of use. A sliding scale for utilization on a basis less than 30 door openings can be implemented but use under 10 days (20 times) is not ideal for CCJPA's purposes. This approach will allow bicyclists using the train to store one or even two bicycles in secure bicycle storage facilities and not incur the nominal charges for hourly storage. For more casual users of the storage facilities, there would be the nominal charges for the facilities just like there are at BART stations. If refunded, the CCJPA would offset the cost of the refund by reimbursing the vendor on a monthly basis – doing this on an ongoing basis is far less expensive losing the train ticketing revenue from a former train rider because their means of access to/from the train does not accommodate bicycling due to overcrowding. The ongoing cost of supporting this is also consistent with CCJPA's very successful policy of issuing free transit transfer passes upon request from the conductor which allows free local transit rides throughout the route (CCJPA reimburses the transit agencies for each transfer pass collected).

Implementing this type of a policy (the above usage thresholds are conceptual examples and could change subject to more extensive analysis) presents those who frequently use the Capitol Corridor (see Figure 4-4) a system that matches their needs and then frees up a space on the train for another user who is not able to utilize that option. The electronic access cards include value stored in the card upon purchase and can be sold in the Café Car of the train. There are already BikeLink lockers at the Fremont and Berkeley stations, but they do not function according to the policies discussed above (these were installed by the local jurisdiction without consultation with CCJPA). Regardless, the use of the cards can vary by location and right now, the CCJPA can begin offering these cards for sale prior to change in the policy or potential expansion of the BikeLink system to the rest of the Capitol Corridor stations. CCJPA will be required to put a comprehensive system solution out for tender but there are obvious advantages to joining into a system that is already becoming ubiquitous throughout many Bay Area locations.

7.2.6 How Can CCJPA Implement a System-wide Secure Bicycle Storage System?

CCJPA cannot be in the day-to-day bicycle management business, but it can bid out the job to a third party vendor such as other transit agencies like BART have done. Two larger issues remain to create a ubiquitous system – there are stations with the existing key-assigned bicycle lockers and then there are two stations with the standard charge policies that differ from policies that would align best with CCJPA's overall bicycle storage objectives. A second issue but less complicated would be if another vendor other than BikeLink won the bid. In that case, there could be two different systems residing at one station, which could be overcome, but it does not convey seamless function at stations. Going back to the existing key-assigned lockers, they may be possible to retrofit for function under the newer electronic access system, they could remain and room for the newer systems added, or they could be moved to other parts of the city to make room for the newer bicycle locker systems. The issue of changing the policies for the existing BikeLink systems at stations could be addressed with the local entity controlling the lockers.

7.2.7 The Secure Bicycle Storage Business Case

The cost for the CCJPA to support the annual operating costs for the lockers (given the policy where CCJPA reimburses the vendor for the refunded storage charges) is based on a series of assumptions. The CCJPA selected the upper reasonable bounds for costs and therefore will assume a high utilization rate and high per hour cost figure to assess the maximum exposure to supporting a program as described.

The number of bicycle lockers assumed on a per station basis for the 17 stations is approximately 11 bicycle lockers per station. In reality, some stations, such as Sacramento, would have more than 11 bicycle lockers. The calculations are as follows:

8,760 hours/year * 80 percent utilization rate * $0.05 per hour * 185 lockers = $64,941 per year

Both the utilization rate and charges per hour are quite high determining the upper bounds of the cost per year since weekday rates are usually a bit higher than weekend rates. Utilization also changes over the week and year. Looking at a range of costs and utilization rates, as shown in Table 7-5 it shows that costs are more likely to be in the $40,000 to $50,000 per year range. These costs have the potential to be partially offset by revenues collected as described in the Section 7.3 Establishing a Folding Bicycle Lease Program. The results of the access mode survey are likely to allow CCJPA to revise this analysis for the final Plan.

	Utilization Rates										
Cost/hour	30 percent	35 percent	40 percent	45 percent	50 percent	55 percent	60 percent	65 percent	70 percent	75 percent	80 percent
$ 0.03	$14,612	$17,047	$19,482	$21,918	$24,353	$26,788	$29,223	$31,659	$34,094	$36,529	$38,964
$ 0.04	$19,482	$22,729	$25,976	$29,223	$32,470	$35,717	$38,964	$42,212	$45,459	$48,706	$51,953
$ 0.05	$24,353	$28,412	$32,470	$36,529	$40,588	$44,647	$48,706	$52,764	$56,823	$60,882	$64,941

Table 7-5 Secure Bicycle Locker Annual Pass-through Costs Ranges

7.2.8 Marketing and Promoting the Concept

The CCJPA will organize a marketing and promotions campaign for the secure bicycle facilities for each station as they are installed and opened for use. The CCJPA would reach out to its media partners to make them aware of the opening. Primary communications will be aimed at all Capitol Corridor riders and the existence of the secure bicycle storage would be maintained in ongoing on-train inclusion in marketing and informational materials will promote usage across a broad category of Capitol Corridor users. A focused message may also go out with stapled loops around bicycle handlebars on the train making those riders who bring their bicycles on trains directly aware that there is free to low-cost alternative to bringing their bicycle on the train.

7.2.9 Other Secure Storage Possibilities

The installation of a secure bicycle storage system across the route introduces some other potential options. BikeLink, for example, can make bicycles available for personal bicycle sharing. This is where bicyclists put their bicycles into a shared pool of bicycles. Implementation and administration could prove a challenge considering the travel needs of bicyclists to/from the stations but this could be an option.

On behalf of the CCJPA's planning effort for bicycle lockers, BikeLink has offered to provide their existing customers using the Berkeley station the opportunity to respond to an online survey that CCJPA would make available. This will help reinforce and expand upon information from the 2011 bicycle survey and demonstrate with greater detail when people rent and what directions the bicyclist go to/from the lockers.

7.2.10 Performance Principles for Secure Bicycle Storage Systems for Capitol Corridor Stations

A canvas of the recommendations regarding bicycle parking options associated with transit trips for transit agencies around the United States strongly indicates a move from bicycle racks and the older key-assigned lockers. Transit agencies lean towards independently contracted e-lockers (or secure storage areas) as the best valued solution to encourage efficient use of the facilities and retain the utility of the solution to the transit customer/bicyclist. Given the state of these systems today and the discussion above, each new (or retrofitted) electronic access controlled storage device should be integrated in association with Capitol Corridor service with the following principles in mind:

- Secure access will be the same across all stations on the Capitol Corridor route to eliminate station to station differences that exist today (there are several stations with bicycle lockers that are individually administered by the local jurisdiction which presents a barrier for ease of use across the route) and create a ubiquitous solution better tailored to the way customers use Capitol Corridor service.

- Secured access will be controlled by some manner of card-key activated access code with technology in place to monitor frequency of usage and financial penalties for misuse of the otherwise free access parameters (free, but controlled access is important to not provide a financial disincentive when state policy dictates bicycles are free to be stored on the train).
- Use of the secured access will be enabled through a website interface which may include various interfaces via mobile devices to allow users to maintain their account and/or obtain access to the secure facilities.
- Maintenance of the secure storage facilities will be done by an outside contractor.
- An outside contractor will serve as the point of reference for customers using the bicycle access system and all service aspects of the service will be centralized through that contractor.
- Secure facilities may include the use of individual secured bicycle lockers or secured storage cages/areas that permit stacked bicycle parking; however, secured bicycle lockers are the preferred solution due to lower maintenance costs.

From these principles, the CCJPA has already developed a scope of work to go about developing a deployment and procurement plan. CCJPA will require outside expertise to optimize the capital funding provided ($25,000 in State Transportation Improvement Program funds for fiscal year 2012/2013) to complete a deployment and procurement plan.

7.2.10.1 *Scope of Work*

The scope of work for a deployment and procurement plan is as follows:

1. Working with CCJPA on a deployment plan (including development of a prioritized deployment plan) based on collected bicycle survey data, interface with Amtrak and local jurisdictions regarding usage and facility location and installation requirements.
2. Establishing appropriate physical specification designs for the types of secure bicycle storage facilities (e.g., lockers and/or cages) for procurement.
3. Establishing functional interface web-based standards for customer management and communications for a contractor.
4. Establishing a maintenance component for the storage facilities and reporting requirements for the storage facilities, the website usage, and usage statistics.
5. Writing, with CCJPA, a procurement document (with deployment based on a task order basis) incorporating the above scope elements for secure bicycle storage facilities at the existing stations along the Capitol Corridor route.
6. Assisting CCJPA staff with the procurement selection process and development of contract documents for the selected vendor(s) to perform the service.

CCJPA will begin the process of acquiring the funding for this in September 2012. A deployment plan will be developed prior to April 2013, and procurement will commence in time to request the California Transportation Commission to act in July 2013, pending passage of the state budget, to allocate the funding to build out a first phase of secure bicycle storage facilities.

CCJPA staff will manage the project and coordinate with Amtrak, the Caltrans Division of Rail, and local jurisdictions to develop a deployment plan. The project cost estimate to complete this scope of work is shown in Table 7-6.

Project Cost Estimate	
Task 1 Deployment Plan	$15,195
Task 2 Design Standards	$2,360
Task 3 Web Interface Standards	$1,795
Task 4 Maintenance Standards	$2,715
Task 5 Procurement Document	$1,445
Task 6 Procurement Selection	$1,445
Misc expenses	$45
TOTAL PROJECT COST	**$25,000**

Table 7-6 Secure Bicycle Storage Deployment Plan and Procurement Cost Estimate

This project does not result in any modification to existing transit facilities and is just to provide a service to CCJPA to develop design specifications, a deployment plan, and complete procurement. The construction phase is not requested for funding at this time but the installation of such bicycle storage facilities at transit stations is, with certain rare exceptions, exempt from the California Environmental Quality Act (CEQA).

7.2.11 An Initial Secure Storage Deployment and Prioritization Plan

In association with CCJPA's 2011 bicycle survey, which pre-dates some of the newer bicycle locker systems in place today, we were able to examine some of the stations where existing bicycle lockers or high demand for lockers was expressed by survey takers. This information is summarized in Table 7-7 doesn't provide for the named destination stations but this table already gives some strong indications of which station are primed for some sort of secure storage system.

Origin City	Available Lockers	Demand	Fraction of respondents whowould use a lockerat the departure station	Percent of respondents who said they would use one for departure.	Fraction of respondents who would use a locker at the return station	Percent of respondents who said they would use one for the return trip
Emeryville	10	Low	3/11	27.3 percent	3/14	21 percent
Berkeley	4	High	10/22	45.5 percent	4/11	36.6 percent
Davis	19	Waiting list	11/30	36.7 percent	11/30	36.7 percent
Sacramento	0	NA	11/33	33 percent	14/30	46.7 percent

Table 7-7 2011 Survey Data Relating to Bicycle Locker Demand and Stated Use (based on origin station)

Based on the number of responses for Berkeley, Davis, and Sacramento, there is a general unmet demand for additional bicycle lockers. Installing more lockers at both of these stations may go a long way in reducing the number of bikes onboard the train. Several respondents to the survey also specifically commented that they would like to see more bicycle lockers or other secured parking.

'I would like to use enclosed bicycle storage units at the Auburn train station so that I would not need to bring my bicycle onboard the train.'

'A locker in Sacramento would be great''

'More secure bike parking at the stations, particularly Berkeley, would help. I really only need my bike on my way to the station in Berkeley, but I am afraid to leave it locked up there. It has become a hassle to find space for my bike on my crowded evening train, so I am bringing my bike with me less frequently.'

From the 2011 Bicycle Survey we have built a tiered prioritization of stations which warrant the inclusion of secure bicycle facilities and for these purposes, the CCJPA is assuming that all facilities will be electronic activated lockers (see Table 7-8). The intention for final deployment is that there are slightly more lockers than used in an average use situation – this is done so that there is less likelihood of having random shortages based on demand. The prioritization is subject to change after greater analysis based on the pending access mode survey the CCJPA will conduct prior to final adoption of this Plan. Tier One stations are intended to receive at least some secure bicycle parking as soon as funding can allow the install to commence with a phased approach of deployment over time. Tier Two stations may receive less numbers of secure lockers or be postponed for a later phase. Tier Three stations would be installed in the last phase or with minimal deployment. These bicycle lockers come in pairs and can be configured linearly or can be arranged in full circle or half circle designs based on space and layout needs unique to each station.

Station	Priority	Estimated Number of e-Lockers
Auburn	Tier 3	4
Rocklin	Tier 3	4
Roseville	Tier 2	10
Sacramento	Tier 1	24
Davis	Tier 1	18
Suisun/Fairfield	Tier 3	6
Martinez	Tier 1	10
Richmond	Tier 2	6
Berkeley	Tier 1	16
Emeryville	Tier 1	12
Oakland JLS	Tier 1	12
Oakland Coliseum	Tier 3	4
Hayward	Tier 3	4
Fremont	Tier 2	6
Santa Clara/Great America	Tier 1	16
Santa Clara University*	Tier 3	TBD*
San Jose Diridon*	Tier 2	TBD*
		TOTAL Lockers 152

*These stations are also Caltrain stations and will require coordination and partnering for deployment.

Table 7-8 Prioritized Listing of Bicycle Locker Deployment and Estimated Locker Amounts

The access mode survey will be used to refine the numbers below and also provide guidance as to how fast to scale deployment using the funding available between CCJPA and participating jurisdictions.

7.3 Establishing a Folding Bicycle Lease Program

Establishing a folding bicycle lease program is a very new development worldwide and pairing that with train service is a very recent event. Worldwide, folding bicycles and trains are shown to be the ideal compatible travel modes. Transit and train operators worldwide permit folding bicycles on their vehicles as luggage (the bicycles must be folded mode!) nearly without exception. Thus, the folded bicycle is a guarantee of travel to and from the train and permits the freedom to the customer of both modes of travel. Short of owning a folding bicycle and using it in conjunction with train travel (which the CCJPA is trying to encourage), a folding bicycle lease program could permit existing and new Capitol Corridor riders to use the Capitol Corridor with greater frequency and/or convenience.

That company, Brompton Dock is based in the UK. Not surprisingly, they feature the highly reputable Brompton Bicycle and are, as far as CCJPA is aware, the only supplier of this type of solution at this time. Given there are no other known competitors in the market, CCJPA will base much of the solution description for this plan on the characteristics of the Brompton Dock with certain modifications to tailor the service to the Capitol Corridor route.

7.3.1 Brompton Dock Function

Brompton Dock is a separate company from Brompton Bicycles but they sell each Dock fully kitted with the Brompton M3-L bicycle in options of 40, 20, and 10 bay configurations. It is a secure bicycle rental facility developed specifically for the Brompton folding bicycle. The dock holds the bicycles until members check out a Brompton Bicycle through the use of text messages. Members return the Brompton bicycle in reverse fashion texting to find a “locker” to replace the bicycle. There are charges for annual membership and charges for daily use.

Brompton Dock, at this point, is only installed in the United Kingdom (UK) and the membership program administered by Brompton Dock has been established as an amenity in various UK locations, certainly train stations, but also universities based on a membership pricing system attuned to the UK market.

The dock unit itself is solar powered. Brompton Dock arranges servicing for the bicycles through annual charges to the sponsoring entity, and if there is a problem with a particular bicycle, such as a flat, the user texts in the problem, replaces the bicycle, and has the option to get another bicycle. In concept,after sign-up, a member could check out a bicycle and retain it, turn it in for replacement if it required service, then check out another bicycle for as long as they keep their membership active.

For the UK, Brompton Dock has three membership levels, the frequent, occasional, and trial user levels. The UK charges as shown in Table 7-9 would be quite an expense for the Capitol Corridor

travel market but they are tailored to the more expensive UK travel market. Conveniently, since the docks are sold to the sponsoring entity, the CCJPA (and other entities) can work with Brompton Dock to customize the membership and charging program to suit the needs of the local market.

For more information about the Brompton Dock, visit http://www.bromptondock.co.uk/. To learn more about the Brompton Bicycles, visit http://www.brompton.co.uk/.

Frequent:	Occasional:	Trial:
£50.00 ANNUAL MEMBERSHIP	£10.00 ANNUAL MEMBERSHIP	1 week membership + hire = £10
£4 per day	£8 per day	
£15 per week	£25 per week	
£50 per month		

Table 7-9 Brompton Dock UK Membership and Use Fees

7.3.2 CCJPA's Brompton Dock Business Model

CCJPA has been in contact with Brompton Dock management to get cost data and methodology to establish a business model that can work with the Capitol Corridor service. The costs of the Brompton Dock include the up-front capital costs of the Brompton Dock (including the bicycles), the setup, shipping, and installation charges. Ongoing charges are the annual maintenance fees for the dock unit itself and the bicycles supported by each dock.

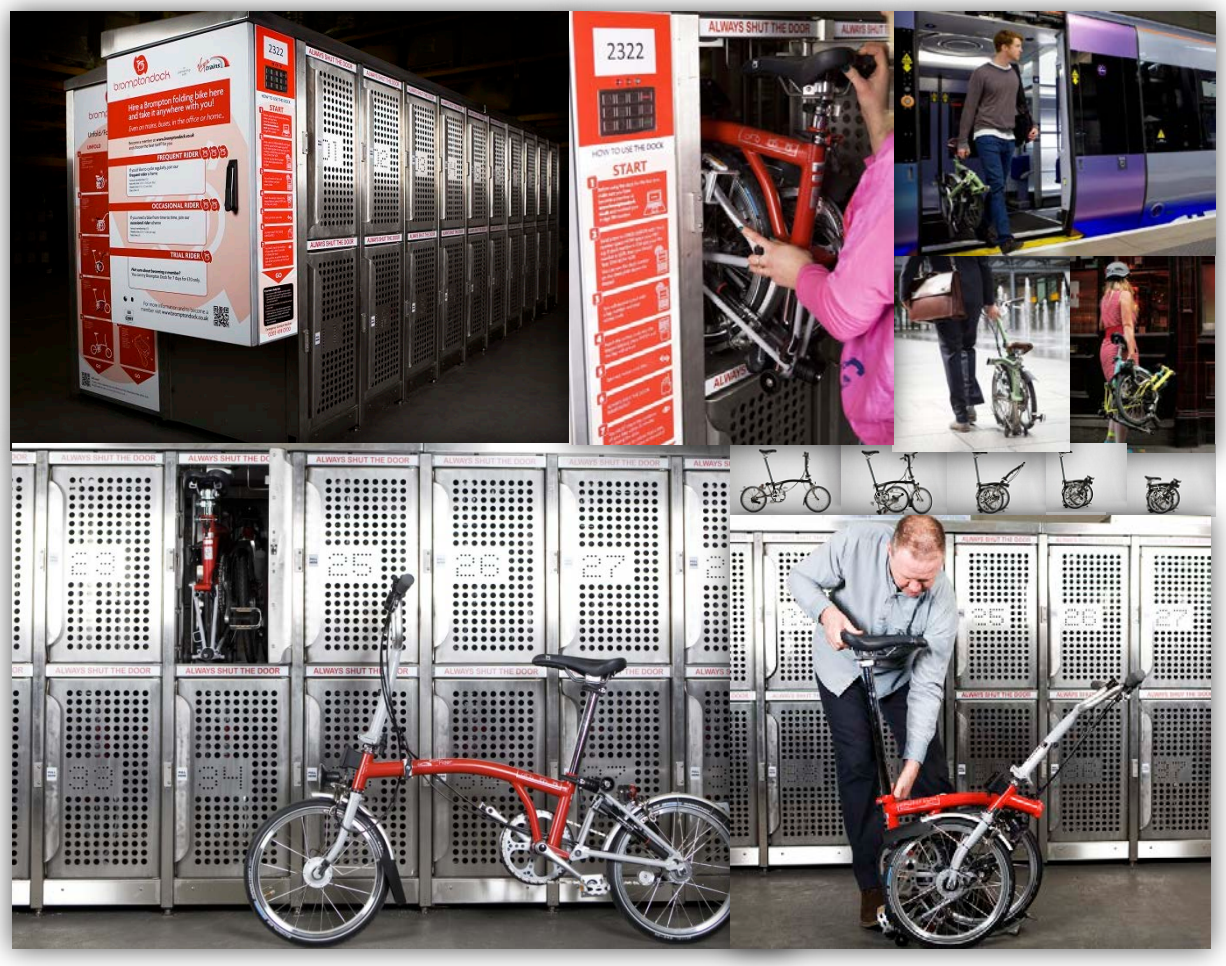


Figure 7-6 Brompton Dock Photo Collage

CCJPA's business model for the Brompton Dock is based on obtaining a capital grant for the capital portion of the costs. Brompton folding bicycles have a reputation as providing a ride quality similar to a full-sized bicycle, but mostly noted for their quick and well-designed fold and their utility in conjunction with other modes of travel. Capital costs include the price for the bicycles, the dock, software and texting customization for the US market, testing, commissioning, and website and service design and installation. The software and text options are one-time costs for the first Dock and subsequent docks would not have those costs. The costs by Dock size are as shown in Table 7-10. One time costs may be able to be recovered as other entities would be able to rely upon the CCJPA's initial communications setup.

BROMPTON DOCK CAPITAL COSTS			
One Time Costs	$94,258.16	Communications Setup (estimated based on UK costs)	
	DOCK SIZES		
Per Dock Costs	40 Dock	20 Dock	10 Dock
(w/bicycles #s) and Installation	$102,827.09	$62,776.00	$40,019.70
Software Customization (estimated)	$7,847.00	$7,847.00	$7,847.00
Commissioning Costs (e.g. setup)	$5,885.25	$5,885.25	$5,885.25
Total Per Dock Costs	**$116,559.34**	**$76,508.25**	**$53,751.95**

Table 7-10 Brompton Dock Capital Costs

The pricing model that CCJPA is using is geared toward the regular to occasional Capitol Corridor rider. For a model basis, CCJPA has presumed there are 20-bay docks, one each installed in Sacramento, Davis, and Berkeley. With an assumed total of sixty (60) bicycles and conceptual pricing options, the CCJPA built a model to determine what usage and membership rates would sustain the Brompton Dock's annual operating costs given various assumptions based on daily utilization rates, membership levels, and average price paid (length of use assumptions using rates shown in Table 7-11).

Various pricing models were tested and for the purposes of providing a conservative estimate (to see what minimal level of usage would cover costs), rates were selected to be about as low as could be envisioned for the Capitol Corridor market. Certainly compared to the UK rates, these low 'test' Capitol Corridor rates reflect a profound difference in modal choice as compared to the UK. Mobility comes at a premium in the UK and the use of a Brompton to support low cost mobility before and/or after a train trip, especially in London where transport costs are quite high compared to in the United States, supports the pricing options Brompton Dock is using.

Utilization rates among the Brompton Dock stations in place as of this writing (see Figure 7-7) are impressive; there are 120 members of the 40-bay Manchester dock, Stoke has an 80 percent utilization level, and a dock at Ealing, within 10 days of installation, had 14 members prior to the marketing and promotions campaign. As well, based on conversations CCJPA staff have had with various train operators in the UK, when train franchise agreements are up for renewal, train operator bids are including Brompton Dock expansions at additional train stations to enhance the customer service and "green" factor in the bid. CCJPA will remain in contact with Brompton Dock

staff to monitor how remaining UK launches proceed but are also using the access mode survey to establish what the potential interest there is for the Capitol Corridor market for this service.

Conceptual Usage Rates (by membership)	
Occasional daily rates	Membership = $40/year
1-5 days	$2.50
6-15 days (blanket $0.25 less per day)	$(0.25)
16+ days (another $0.25 less per day)	$(0.25)
Frequent Rate Options	Membership = $20/year
1-5 days	$2.00
6-15 days (blanket $0.25 less per day)	$(0.25)
16+ days (another $0.25 less per day)	$(0.25)
One Membership Rate Options	Membership = $30/year
1-5 days	$2.25
6-15 days (blanket $0.25 less per day)	$(0.25)
16+ days (another $0.25 less per day)	$(0.25)

Table 7-11 Conceptual Brompton Dock Usage Rates

Based on CCJPA's analysis of revenue generation versus costs shown in Table 7-12 for three 20-bay docks, the membership levels at the upper end exceed the rates experienced in the UK and are unlikely; however, conceptually, the lower figures of under 200 members are sustainable at Sacramento, Davis, and Berkeley stations. Using the Manchester UK station membership rate as a guide, with 100 members using 40 docks, a suggestion that over the 60 docks shown in the CCJPA business model, we may expect upwards of 120 members are supported. This suggests a utilization rate that exceeds 25 percent will ensure CCJPA can cover the annual operating costs. If CCJPA adjusts the rates slightly upwards, then a lower utilization rate still will still cover the annual operating costs. Of course, usage and/or membership levels that exceed those conservative values will most certainly more than validate the program. The three 20-bay docks are also only a starting premise to evaluate the financial performance. It would be possible to scale back or scale up a program as merited. However, the numbers are not the only figures that matter for a successful program; an integration, marketing, and promotions program will be required. Again, the access mode survey CCJPA is conducting prior to the development of the final Plan will provide the analytics to further tailor this aspect of the overall at-station program.

# of Members	50	100	150	250	300	350
Dock Utilization Rates						
10%	$5,333	$10,665	$15,998	$21,330	$26,663	$31,995
15%	$7,249	$14,498	$21,746	$28,995	$36,244	$43,493
20%	$9,165	$18,330	$27,495	$36,660	$45,825	$54,990
25%	$11,081	$22,163	$33,244	$44,325		
30%	$12,998	$25,995	$38,993	$51,990		
35%	$14,914	$29,828	$44,741			
40%	$16,830	$33,660	$50,490			
45%	$18,746	$37,493				
50%	$20,663	$41,325				
55%	$22,579	$45,158				
60%	$24,495	$48,990				
65%	$26,411					
70%	$28,328					
75%	$30,244					
80%	$32,160					
85%	$34,076					
90%	$35,993					
95%	$37,909					
100%	$39,825					
Annual Operating Costs*			$26,366			

Notes:

- Revenue figures in yellow cells represent revenues that exceed annual operating costs.
- Revenue figures in pink cells show rate percentages and membership rates which fall below annual operating costs.
- Cells that are blank where utilization exceeds the number of available bicycles.

* Annual operating costs include all bicycle and dock maintenance and handling of all customer interactions for 3 20-bay docks

Table 7-12 Annual revenue projections for various utilization rates and membership level for 3 20 bay docks

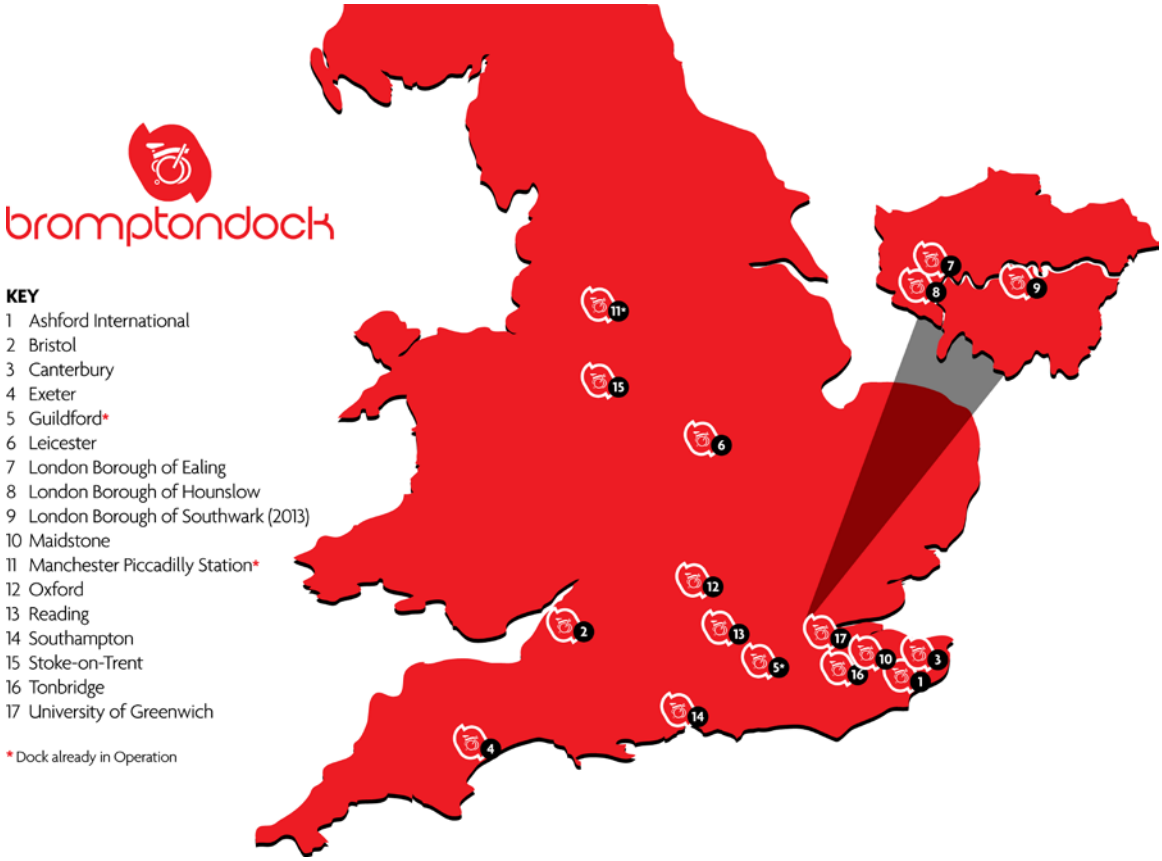


Figure 7-7 Brompton Dock locations in the UK planned and in operation as of August 2012

Source: Brompton Dock via Michael Foster, Sales at Brompton Dock

7.3.3 Brompton Dock Maintenance

The Brompton bicycles stored in the docks are maintained by local authorized Brompton repair specialists, aka, bicycle shops that sell and repair Brompton Bicycles. There are two annual servicing requirements for each bicycle included in the maintenance costs and then any bicycle turned in with a fault is also sent in for service. The two service periods include the follow maintenance work:

184 lease-days service to include:

- Frame to be cleaned and inspected for damage and folding function checked, especially lower stop disc position and handlebar catch position.
- Wheels hubs and rims checked for damage and wear.
- Wheel bearings checked for free movement and adjusted (if applicable).
- Wheels trued and spokes retensioned.
- Tires and sidewalls checked for wear and inflated to correct pressure.
- Headset checked for free movement and adjusted as necessary.
- Bottom bracket checked for movement.
- Crank bolts checked and tightened to correct torque.
- Chain cleaned, checked for wear, re-lubricated and replaced if necessary, complete with rear sprocket.
- Brakes checked for effective operation and adjusted, replace cables if necessary.
- Pedals checked for damage or bearing play, replace if necessary.

- Check rubber bung is present in bottom of saddle tube. Replace if missing.

365 lease-days service to include:

- Frame cleaned and checked for damage.
- Headset removed, cleaned, regreased (if applicable), refitted and checked for movement. Replacement fitted if necessary.
- Bottom bracket checked for movement. Replacement fitted if necessary.
- Other components removed, checked for wear, cleaned and re-lubricated.
- New handlebar grips fitted.
- Brake cables and gear cables replaced if necessary.

Additional servicing and part controls mainly related to ensuring the bicycle markings that identify is with its unique Brompton Dock number are also included for those servicing the bicycle. The comprehensive maintenance process ensures that safe and reliable bicycles are presented to members for their use.

7.3.4 Deployment Plan

Moving forward as a public agency, the CCJPA will have to undergo a procurement process to identify a suitable vendor when it comes time to procure a physical and service solution as described using the Brompton Dock model. In fact, California Code requires any procurement officer would have to survey a good faith effort to see if there was an equivalent manufacturer/supplier based in California when it comes time for writing procurement specifications if the pending mode of access survey information indicates there is a suitable market for such a service.

The Brompton Dock concept is new for the United States and California, but expanding rapidly in the United Kingdom. Even as utilization looks promising in the UK, the CCJPA must be certain that the mobility offered of a Brompton Dock program in association with the Capitol Corridor service is a desired option. The access mode survey includes precisely aimed questions to ascertain the viability of this option, and if viable, will also point towards an ideal deployment plan. There will be an inherent challenge of having people understand the proposition due to folding bicycles not being familiar with many people and the very prospect of a membership based bicycle “lease” program. These challenges are built into the analysis but when presented to the September 6, 2012 gathering of peer bicycle planning professionals, there was realization of the appropriateness of the offering coupled with Capitol Corridor service. However, universally, the peer group suggested conducting the mode of access survey to better understand the proposition. It will not be possible to measure what effect the notoriety of a deployed Brompton Dock might have in attracting new train riders since it might just be the thing that makes travel by Capitol Corridor more feasible among the various alternatives people may have. There may be some existing riders who will utilize the offering instead of their own bicycle thus reducing demand for limited on-train storage (the Bromptons are carried as luggage) and hopefully the survey results will reveal any such preferences.

For the purposes of this Plan, the CCJPA plans on using some FY 14 STIP funding that is already programmed to launch three 20-bay stations as contemplated above. The stations selected for this plan as Tier One priority stations are Sacramento, Davis, Oakland Jack London, and Berkeley. Sacramento is a natural for the business conducted there, the fact that the station is the busiest on the Capitol Corridor route (20 percent of all trips on the route begin or end in Sacramento), the geography, an ever improving bicycling infrastructure, and land use patterns support just the trip patterns envisioned for folding bicycles in general. Davis is a natural location due to regularly being recognized as one of the top bicycling cities in the United States. The land use, infrastructure and the

proximity of the University of California Davis will likely mean a strong pattern of use. As well, Davis has a strong connection with the University of California Berkeley and students travelling to/from the Bay Area. Oakland Jack London Station has a very strong connection with travel in the Silicon Valley area where the mobility of a folding bicycle will have excellent utility. Berkeley is as well since it has such a strong bicycling ethic, an excellent land use pattern and the University of California Berkeley is ideally situated a nice folding bicycle ride away. At the time of deployment, the CCJPA will conduct further analysis between choosing the Oakland Jack London or Berkeley location as the initial costs may be cost prohibitive for four of the Docks. However, for each of these Tier One stations, the 2011 Bicycle Survey supports these stations as key locations for Brompton Docks (or the equivalent).

There are several Tier Two stations which are likely to be strong Brompton Dock concept stations but funding limitations and the stronger Tier One stations need time to prove themselves first. Tier Two candidate stations are Emeryville, and Great America/Santa Clara Station. If funding were no object, these stations would also be added to the list as they do have strong characteristics and rated higher in the 2011 survey. Tier Three stations are all the remaining stations. A special note about the shared Caltrain stations of Santa Clara University and San Jose Diridon is that Caltrain's high level of service and own bicycle accommodations for their service would make CCJPA's own plans to serve these stations overtly complicated. CCJPA will contact Caltrain to see if there is interest for sharing the deployment at these stations as a partner.

Certainly, these considerations will be adjusted or entirely modified as per the results shown from the mode of access survey and those will be evident in the final Plan.

7.3.5 Marketing and Promoting the Concept

The CCJPA will organize a marketing and promotions campaign for the Brompton Dock (or its equal) around the notoriety it would be expected to receive and also reach out to the normal customer communication channels (email subscribers and social media) and on-train signage to promote the Brompton Dock. In addition, coordinated with the promotional programs to supporting folding bicycles, the CCJPA will expand on the discounted promotional relationship with local bicycle stores who sell folding bicycles and reach out to their customers and local bicycle advocacy groups to spread the awareness of the docking program. Nevertheless, a full promotions campaign including printed collateral and a media launch event would be advised to gain the larger media awareness. This aspect is expected to cost between $10,000 and $12,000 and will be included to the capital grant request.

Membership in a Brompton Dock (or equivalent) will be aimed at all Capitol Corridor riders and it is also expected that the additional media awareness, and ongoing on-train inclusion in marketing and informational materials will promote usage across a broad category of Capitol Corridor users. Capitol Corridor lacks funding to complete a market study to assess demand however the surveys and knowledge of the riders, and the communities it serves provide CCJPA a basis for marketing a Brompton Dock (or equivalent). The CCJPA does not expect many existing bicyclists to stop using their bicycle in favor of using a leased folding bicycle. Although there may be some for whom a regularly serviced folding bicycle will serve as a replacement for their own bicycle, the primary market will be for utility of existing riders and for new and occasional riders. Across the trip purposes the Capitol Corridor serves, the attractiveness of having a bicycle that one could take with them has value across nearly all trip purposes with the exception of shopping. CCJPA staff feels that if there is a slight weighting of the market toward a trip purpose it would be toward business travelers and towards travelers on their own who will be visiting a community for several days. The CCJPA will continue to be in discussion with Brompton Dock as more are installed in the UK to learn more about passenger demographics for application in a Capitol Corridor launch.

7.4 At-Station Bicycle Options Complimenting Each Other

A principle of transit and what Capitol Corridor service offers is that it is an option for those who can and will use it and for most Capitol Corridor patrons, it is an option than driving. The provision of multiple bicycle access options follows on the same principle and the offerings of bicycle sharing, secure bicycle storage, and folding bicycle leasing provide Capitol Corridor patrons a variety of choices through which bicycling as a mode of access to and from stations is more feasible. The variety of bicycle options at- stations also promotes safe operations through reducing the bicycle storage conflicts described previously.

As mentioned above, bicycle sharing will be deployed according to a schedule other than that controlled by CCJPA. However, when and where it is deployed, it can support the use of either a secure bicycle storage facility or a folding bicycle lease program. With greater overall deployment of each option, each individual can opt into the single or combined at-station bicycle solutions that fit their mode of travel.

From a funding perspective, each of the options described will require capital funding grants. Fortunately, the CCJPA has access to some of the programmed funding to support all but the bicycle share program deployments. On the operations side, secure bicycle storage and the folding bicycle lease options each have ongoing operating costs associated with them. According to the programs described above, there are options to recover some revenue from both options. In concept, the bicycle lease program, much more so than the secure storage program, has the potential to not only offset its own annual operating costs but also cover the operating costs of the secure bicycle storage program. The pairing of these two options together in the expenditure of the capital is an important consideration.

Ideally, the mode of access survey will inform how this pairing should be realized and the final version of this Plan will reflect those implications.

8 Evaluation

An evaluation process is required to determine the efficacy and performance of the bicycle access plan on an ongoing basis. There will be a marked difference between performing on-train and at-station surveys and gathering data from the electronic data capture details inherent in each of the at-station projects.

CCJPA recommends that for both the on-train and at-station projects that an annual bicycle access plan report for the CCJPA Board meeting usually held in November. The annual report will compile the on- train and at-station survey results and when it becomes available, also incorporate data from any of the at-station solutions.

Based on the survey results and any trends gathered, the CCJPA staff will recommend adjustments to the Bicycle Access Plan action items and measure the effectiveness of any adjustments on an ongoing basis.

8.1 On-Train and At –Station Surveys

CCJPA will conduct two (2) online surveys a year and request bicyclists encountered on the train and at the stations to go online and complete the survey. We expect to administer the survey in the June and December time frames. The survey instrument will ask similar questions to the 2011 survey and a baseline data point will be established with the first survey. CCJPA has been successful in the past providing a strip of paper, suitable for stapling around the handlebars or

handing directly to people and getting responses. We will replicate that process to obtain general trip information. Survey questions will maintain continuity so that trends can be gathered.

8.2 At-Station Data Evaluation

Each of the three (3) at-station solutions is, by their nature, very easy to evaluate. Each of the systems will produce data and feed into data systems where respective vendors can report to CCJPA usage characteristics by data and time.

CCJPA will require monthly reports and one annual report from vendors who win the service contracts for the secure bicycle storage systems and for the Brompton Dock (or equivalent) system. If and when bicycle share facilities, we will request data for the annual report for each of the stations with bicycle share pods.

9 Capital Funding Plans for CCJPA's Bicycle Access Plan

The CCJPA is quite familiar with supporting capital investment plans and projects with railroad infrastructure and quite a bit less so with capital funding opportunities for bicycle infrastructure. CCJPA's standard funding has been entirely focused, with only minor exceptions, around the use of state funding narrowly allocated for use with intercity passenger rail projects. The funding for implementing bicycle projects will chart a decidedly unfamiliar path for CCJPA staff but that is about to change for state fiscal year (FY) 2013. Through the hard work of staff at Caltrans District 4, CCJPA is poised to receive its first bicycle project funding. In FY 12-13, $25,000 in State Transportation Improvement Program (STIP) funding is programmed to support bicycle storage at Capitol Corridor stations. Following, in FY 13-14, an additional $556,000 in STIP is also programmed for bicycle storage solutions suitable to each station.

CCJPA's general principle will be to partner with local jurisdictions using these core funds and obtain additional funding support as "match" to what CCJPA can offer. This will ensure the funding CCJPA has will extend its reach as far as possible. Doing so, however, will require a great deal of CCJPA staff time as our partnerships to do this will require project management and administration for each station. The CCJPA will welcome the participation of our local partners as we attempt to cohesively organize the program elements in this plan, especially those focused with the at-station improvements.

In identifying the myriad of funding options, the CCJPA has relied upon documentation contained in other bicycle plans and the input of peer agencies to develop this section and owes a debt of gratitude upon whose work this effort stands. There are numerous grant funding options for bicycle facilities but a good many of them relate to bicycle trail development or maintenance. These options will not be featured in this plan as they are not pertinent to the projects included in the plan.

Many funding sources require local funding match. Unless the CCJPA partners with a willing local jurisdiction, lacking any taxing authority (the CCJPA has no authority in that regard) the CCJPA has no source of local funding and is only supported, with very rare exceptions, by state funding, whether operating or capital. Funding sources are described below as to the applicability to CCJPA's Bicycle Access Plan projects and other parameters related to being eligible for funding.

9.1 Federally-Administered Funding

At the time of this plan's publication, the picture of funding from the federal level is unclear for bicycle projects. On July 3, 2012, President Obama signed the long awaited transportation bill (HR

4348) or MAP-21 that will at least be in effect for the next two years. Overall levels of funding for bicycle and pedestrian programs were reduced from $1.2 billion annually to approximately $800 million – a reduction of one third. MAP-21 combines prior dedicated bicycle and pedestrian programs into a single source called 'Transportation Alternatives.' MAP-21 sets the total funding now placed in a Transportation Alternatives program at two percent of total highway funding out of the Highway Trust Fund (not including the Mass Transit account). Then it splits that amount in half, with one part going to local agencies and the other part going to states to allocate through a competitive process that could mean allocation to non-bicycle/pedestrian projects, at the state's discretion. MAP-21 also cut the broader eligibility requirements contained in the prior transportation bill that used to allow bicycle and pedestrian projects to qualify for traditional "highway" funding. The downstream effects from the change at the federal level is still being processed but it is almost certain to negatively affect bicycle project programming for the State of California as whole and also at the regional and local level.

9.2 State-Administered Funding

The State of California will continue to administer MAP-21 affected federal sources of bicycle funding and also continue to use state funding to support the following bicycle projects and programs.

9.2.1 State Transportation Improvement Program

The STIP is a multi-year capital improvement program of transportation projects on and off the State Highway System, funded with revenues from the Transportation Investment Fund and other funding sources. STIP programming generally occurs every two years. The programming cycle begins with the release of a proposed fund estimate in July of odd-numbered years, followed by California Transportation Commission (CTC) adoption of the fund estimate in August (odd years). The fund estimate serves to identify the amount of new funds available for the programming of transportation projects. Once the fund estimate is adopted, Caltrans and the regional planning agencies prepare transportation improvement plans for submittal by December 15th (odd years).

STIP funds come from a variety of sources parsed by formula to interregional and regional pots of funding. The intercity passenger rail system and interregional projects that Caltrans alone might lead are typically received funding via the Interregional Transportation Improvement Plan (ITIP) whereas regional agencies prepare Regional Transportation Improvement Plans (RTIPs). Public hearings are held in January (even years) in both northern and southern California. The STIP is adopted by the CTC by April (even years).

Local agencies should work through their Regional Transportation Planning Agency (RTPA), County Transportation Commission, or Metropolitan Planning Organization (MPO), as appropriate, to nominate projects for inclusion in the STIP. Once projects are programmed, agencies may begin the project implementation process. The CCJPA is familiar with the ITIP process working with the Caltrans Division of Rail for rail infrastructure projects and sometimes using that source of funding to support a local project. Conversely, local entities have used RTIP funding in the STIP to support a CCJPA led project.

9.2.2 Bicycle Transportation Account

The Bicycle Transportation Account (BTA) provides state funding for local projects that improve the safety and convenience of bicycling for transportation. The targeting for transportation purposes is aligned with the bicycling needs of Capitol Corridor customers. Funds are available for both planning and construction. Caltrans administers BTA funds, and requires eligible cities and counties to have adopted a Bicycle Transportation Plan. To become eligible for these funds, CCJPA's at-station

projects will have to be included in local city and county bicycle master plan documents. Subsequently, individual city Bicycle Transportation Plans must be approved by the Metropolitan Transportation Commission (MTC – in the San Francisco Bay Area) or the Sacramento Area Council of Governments (SACOG in the Sacramento region), each being the regional MPO, or Regional Transportation Planning Agency (RTPA) prior to Caltrans approval. No applicant shall receive more than 25 percent of the total amount transferred to the BTA in a single fiscal year out of $7.2 million available statewide, the maximum amount available for individual projects is $1.8 million but actually being awarded that amount is very unlikely.

Online resource: www.dot.ca.gov/hq/LocalPrograms/bta/btawebPage.htm

9.2.3 Transportation Planning Grant Program

Caltrans administers the Transportation Planning Grant Program where there are two grant funds that are suitable for bicycle project planning and construction. Both funds are to "help foster sustainable economies, increase affordable housing, improve housing and jobs balance, encourage transit-oriented and mixed-use development, expand transportation choices, increase safety, improve health, and reflect community values." Eligible applicants include MPOs, RTPAs, cities and counties, transit agencies, and Native American tribal governments. A 20 percent local match is required and projects must demonstrate a transportation component or objective. The projects in this plan would require partnership with a local authority for project development. While CCJPA is not officially a transit agency, but it functions like one, either CCJPA or a local authority would need to be the lead and regardless, the local authority would be the only source for the 20 percent local funding match.

The Community-Based Transportation Planning Grant funds projects that exemplify livable community concepts, including bicycle improvement projects. There is $3 million available annually statewide. The maximum grant award is $300,000.

The Environmental Justice Grant funds promote context sensitive planning in diverse communities and funds planning activities that assist low-income, minority, and Native American communities to become active participants in transportation planning and project development. This grant is funded by the State Highway Account at $1.5 million annually statewide. The maximum grant award is $300,000.

Of the two grants under this Caltrans program, the Community-Based Transportation Planning Grant funds appear to be better suited for the projects in this plan.

Online resource: http://www.dot.ca.gov/hq/tpp/offices/ocp/cbtp.html

9.2.4 Petroleum Violation Escrow Account (PVEA)

In the late 1970s, a series of Federal court decisions against selected United States oil companies ordered refunds to the states for price overcharges on crude oil and refined petroleum products during a period of price control regulations. To qualify for PVEA funding, a project must save or reduce energy and provide a direct public benefit within a reasonable time frame. In the past, the PVEA has been used to fund programs based on public transportation, computerized bus routing and ride sharing, home weatherization, energy assistance and building energy audits, highway and bridge maintenance, and reducing airport user fees. The projects included in this plan may be eligible provided quantifiable data providing energy savings can be demonstrated. In California, Caltrans administers funds for transportation-related PVEA projects. PVEA funds do not require a match and can be used as match for additional Federal funds.

Online resource: http://www.dot.ca.gov/hq/LocalPrograms/lam/prog_g/g22state.pdf

9.3 Locally-Administered Funding

Local funding sources are generally administered by MPOs, Congestion Management Agencies (CMAs), Transportation Improvement Authorities (TIA), or other regional agencies. Counties or cities may administer some funding sources. Depending on the fund source, there are numerous of the above entities along the Capitol Corridor route. These funding sources are supported by federal, state, or local revenue streams.

9.3.1 Regional Surface Transportation Program

The Regional Surface Transportation Program (RSTP) is a block grant program sourced from the federal government, slightly modified under MAP-21, but that still can provide funding for bicycle projects as well as many other transportation projects. Under the RSTP, Metropolitan planning organizations, such as the Metropolitan Transportation Commission's (MTC), prioritize and approve projects that will receive RSTP funds through the Regional Transportation Plan (RTP) process. CCJPA would have to get the projects in this plan incorporated into the respective MPO planning and project selection processes to be eligible to use these funds. The projects in the CCJPA's Bicycle Access plan appear to be the type that would be eligible for use of these funds.

Online resource: http://www.mtc.ca.gov/funding/STPCMAQ/

9.3.2 Transportation for Livable Communities Program

The Transportation for Livable Communities Program (TLC) provides grant monies to public agencies to encourage land use decisions that support compact, bicycle-friendly development near transit hubs.

MTC's Transportation Plan 2035 stipulates all eligible TLC projects to be within Priority Development Areas (PDAs), which focus growth around transit. Several Capitol Corridor stations appear to be in PDA areas (notably Richmond, Berkeley, Oakland, and Hayward). MTC selects projects based on their status (planned or proposed) and their development intensity. The nature of the projects in this plan would require a strong nexus to the livable community concepts and require local coordination to evaluate appropriateness for funding under the TLC program. MTC administers the TLC program with funds from the Regional Surface Transportation Project and caps grants at $400,000. Funds may be used for capital projects or planning.

Online resource: www.mtc.ca.gov/planning/smart_growth/tlc_grants.htm

9.3.3 Transportation Fund for Clean Air

Administered by the Bay Area Air Quality Management District (BAAQMD), the Transportation Fund for Clean Air (TFCA) is a grant program funded by a $4 surcharge on motor vehicles registered in the Bay Area. This surcharge generates approximately $22 million per year in revenue. TFCA funds are available through two main channels: the Regional Fund and the County Program Manager Fund. The Regional Fund receives about 60 percent of the TFCA revenues and is administered directly by the Air District. The Program Manager Fund receives approximately 40 percent of the TFCA revenues and is administered in coordination with the Bay Area's nine county congestion management agencies (CMAs). That the TFCA program includes bicycle facility improvements such as bike lanes, bicycle racks, and lockers, it would appear TFCA funds are eligible to support the projects in this plan. Projects must be conducted within the Air District's jurisdiction. Public agencies may apply for all project categories either directly to the Air District for Regional Funds, or to the County Program Manager Fund via the CMA in the respective county.

Online resource: http://www.baaqmd.gov/Divisions/Strategic-Incentives/Funding-Sources/TFCA.aspx

9.3.4 Bicycle Facilities Program

The BAAQMD Bicycle Facility Program (BFP) provides grant funding to reduce motor vehicle emissions through the implementation of new bikeways and bicycle parking facilities in the Bay Area. The BFP is a project funded through the TFCA program (see above). Projects must cost between $10,000 and

$120,000 and the applicant must have secured 50 percent in matching funds. The CCJPA would require matching funding but would be eligible to utilize state funding as match.

Online resource: http://www.baaqmd.gov/Divisions/Strategic-Incentives/Bicycle-Facility-Program.aspx

9.3.5 Safe Routes to Transit (SR2T)

Regional Measure 2 (RM2), approved in March 2004, raised the toll on seven state-owned Bay Area bridges by one dollar for 20 years. This fee increase funds various operational improvements and capital projects that reduce congestion or improve travel in the toll bridge corridors.

From RM2, MTC allocates the $20 million in funding to the Safe Routes to Transit Program, which provides competitive grant funding for capital and planning projects that improve bicycle access to transit facilities. Eligible projects must reduce congestion on one or more of the Bay Area's toll bridges. Transform and the East Bay Bicycle Coalition administer SR2T funding. The projects in this plan appear to be eligible for funding under this program. Future funding cycles will be in 2011 and 2013.

Online resource: http://transformca.org/campaign/sr2t

9.3.6 TDA Article 3

Transportation Development Act (TDA) Article 3 funds, derived from a quarter-cent of the general state sales tax, are state block grants awarded annually to local jurisdictions for transit and bicycle projects in California. LTF funds are returned to each county based on sales tax revenues. MPOs and RTPAs provide estimates of revenues to counties and a list of projects are typically prioritized and then the county receives funding to distribute to local agencies.

Eligible bicycle projects include: construction and engineering for capital projects; maintenance of bikeways; bicycle safety education programs (up to five percent of funds); and development of comprehensive bicycle facilities plans. A city or county may apply for funding to develop or update bicycle plans not more than once every five years. TDA funds may be used to meet local match requirements for federal funding sources. Two percent of the total TDA apportionment is available for bicycle and pedestrian funding. For the projects in this plan to become eligible, the CCJPA would need to work with local counties in the Bay Area to get the projects in this plan considered.

Online resource: http://www.mtc.ca.gov/funding/STA-TDA/

10 Economic and Environmental Evaluation of CCJPA's Bicycle Access Plan

A growing body of research also is demonstrating the economic benefits of non-motorized travel. Combine that with the signs of economic activity around train stations and again, the train and bicycle trip pairing is a winning combination. There is abundant documentation of the environmental benefits of bicycling and also of using passenger trains in lieu of automobiles for personal transportation and combining the two modes makes the benefit even greater. In repeated surveys of

our customers, the CCJPA also sees concern for the environment as ranking high (usually second) as the reasons why the train trip is taken in the first place.

It is not feasible to provide an economic analysis of this plan in anything more than qualitative terms. Many of the economic benefits that policy makers may believe accrue when supporting bicycling, whether it associated with a train or not, is supported by academic research. Environmentally, there are slightly more quantitative tools available to assess this plan. It is possible to provide estimations of the air quality benefits that come from the overall bicycle use associated with Capitol Corridor service but a bit more challenging to assess the at-station actions coupled with the on-train improvements and bicycling public responding to the education, encouragement, and enforcement education, encouragement, and also with the on-train improvements, there may be a way to safely accommodate the bicycle demand today. But it will take the at-station improvements to accommodate real growth of this mode of access to reap the economic and environmental benefits.

These economic and environmental benefits presented in this plan are to provide the basis for a Capitol Corridor system-wide plan organized around common and cohesive at-station solutions and provide the basis for descriptions of benefits for any required grant or funding applications.

10.1 Economic Benefits

As much as benefits will accrue to Capitol Corridor service (especially in the peak hour) by implementation of this plan, it is the communities that stand to benefit as well. Environmentally and economically, train stations usually are the core of a transportation hub which concentrates a higher percentage of non-motorized transport than is found in other urban locations. As quoted in "Evaluating Non-Motorized Transportation Benefits and Costs, July 26, 2012, by Todd Litman of the Victoria Transport Policy Institute, supporting the growth of bicycling (and walking):

> "…can help create more efficient transport system and more accessible land use development patterns, particularly in conjunction with complementary strategies such as public transit improvements and smart growth development policies. By improving accessibility and providing savings to commuters, businesses and governments, they tend to increase economic productivity. For example, businesses benefit if shifts to walking, cycling and public transit reduce freight and service vehicle delays, or the costs to businesses of providing employee and customer parking."
>
> "Non-motorized travel represents a relatively large portion of total trips and travel time (typically 10-20 percent in urban areas), and many of the trips it serves are high value, and would be costly to perform by motorized modes. More comprehensive evaluation considers additional non-motorized transport benefits, including indirect reductions in vehicle travel, and additional benefit categories."

Economic factors that implementation of this plan will support are increased employment, income, productivity, property values and tax revenues. Emeryville is a testament to the role a train station can play as a core element of economic redevelopment and Sacramento has built a multi-phased land use plan with the rebuilt Sacramento Valley Station as a regional transit hub. These and other communities know that making train stations hubs for development which is friendly to non-motorized transportation is good for the economic vitality of the community. In "Evaluating Non-Motorized Transportation Benefits and Costs", Litman provides a focused discussion demonstrating how non-motorized transport and the mobility it offers can affect economic development:

- Transport efficiency: Walking and cycling improvements can increase transport system efficiency by reducing costs such as traffic congestion, road and parking facility costs, and accident damages. To the degree that this reduces costs to commuters, businesses and governments it reduces production costs, which increases economic productivity and competitiveness.
- Labor productivity: Walking and cycling improvements (alone and with public transit improvements) tends to improve access to education and employment opportunities, particularly by non-drivers, increasing the quantity and quality of the lower-wage labor pool, which can reduce business costs and increase productivity and competitiveness. Active transport can also increase labor productivity by increasing worker fitness.
- Land use efficiency: Walking and cycling can support more accessible and compact land use patterns, which can provide various accessibility benefits, agglomeration efficiencies, and resource cost savings
- Consumer expenditures: Impacts on consumer spending, particularly vehicles and fuel expenditures, which affect regional economic activity.
- Supports specific industries: Certain industries benefit from improved walking and cycling conditions, including bikeshops, tourism, retail activity, construction, and real estate development that highlights livability.

CCJPA is not in a position like a city to reap the direct tax base benefits of supporting the bicycle access mode at stations but we do get the feedback that supporting bicycling is important for our own revenue performance. Our anecdotal information is backed up by a study commissioned by a sister rail operator called "Bicycle-Rail Trip Analysis and Greenhouse Gas Emissions Reduction Focused Study – Los Angeles County Metropolitan Transportation Authority (LA-MTA), June 2011" which focused on the relationship between rail and bicycle travel. In this study, the marriage between rail and bicycle was touted for the mobility benefits it provided. For LA MTA, their study showed:

- Thirteen percent of bicyclists would not make their trip if they couldn't bicycle and take the train.
- Respondents are more transit dependent than the general population, with 11 percent of respondents stating that they "rarely" have access to a motor vehicle and over a third of respondents (37 percent) stating that they "never" have access to a motor vehicle. In Los Angeles County, 9.4 percent of households do not have access to a motor vehicle.
- Allowing bicycles on trains is a major reason why people choose to bicycle, particularly for riders who have access to a motor vehicle.

- Survey respondents overwhelmingly said that being allowed to take their bike on the train influenced their decision to travel by bike and rail. Of the 477 people who responded to the question, 65 percent chose "allowed to take bike on train" as a factor that influenced their decision.
- Respondents with access to a motor vehicle are more likely than those without access to a motor vehicle to cite "allowed to take bike on train," "no car parking at station," "bike lockers at station," and "have to pay for car parking at station" as factors that influenced their decision to bicycle.

The findings these studies indicate that communities and the Capitol Corridor service itself will be economically well served by acting in a fiscally responsible manner, but aggressively, to increase the support for bicycles as a mode of access provided bicycles on the train can be stored in a safe and secure manner. These above arguments can be utilized for explaining project benefits usually required in applying for capital grant programs.

10.2 Environmental Benefits

There are two aspects of "train + bicycle" trips which come into play for Vehicle Miles Travelled (VMT) and air quality benefit calculations which are common measures of the environmental benefits when it comes to transportation. First, how much did being able to have a bicycle on the train or able to be securely stored at a train station causal for the train trip? Second, regardless of whether the bicycle was causal, how far was the bicycle traveled before and/or after the train trip? And finally, how many people fell into each of these categories? There are, of course, other spin off effects of bicycle travel (and train travel) that have environmental benefits with respect to water quality, health, and community awareness. Most of these later are not quantifiable but concentrating on the air quality and VMT reductions are approachable for this plan and key elements to include with capital grant applications.

10.2.1 Environmental Benefits of Bicycling and Capitol Corridor Travel Today

The overall environmental benefits of using Capitol Corridor especially in conjunction with bicycles is summarized in the points below:

- Reduces air pollution including GHG emissions (consistent with regional/local air quality plans, climate action plans and sustainable communities plans)
- Reduces demand for motor vehicle parking and promotes more efficient use of space at stations and destination locations
- Reduces dependence on petroleum and imported oil (energy independence)
- Increases physical activity and better health (active transportation/helps address obesity) Increases human activity and economic development in downtown/station areas while reducing congestion
- Potential to increase ridership on other transit systems

There is already a high bicycle mode share (in excess of 11 percent based on the most recent two bi-annual system wide surveys) accessing Capitol Corridor as compared to many transit modes. Using annual ridership (1,708,618 passengers in FY 11) as a basis for the number of bicycle trips (a trip is considered each direction of travel so a daily commute is two trips), at 11 percent, there were approximately 187,948 bicycle trips done in association with a Capitol Corridor trip last fiscal year. CCJPA only has the survey data from 2011 from the on-train bicyclists that asked about mileage for

bicycle trip 1 to the train and bicycle trip 2 from the train. This data did not ask each bicyclist to identify their mileage but instead gave them a range. Taking the midpoints of the mileage ranges provided to the respondents (and using 7 miles for trips in excess of five miles), the average mileage for a Capitol Corridor bicyclist before or after the train trip is about 2.8 miles per bicycle trip. The resulting bicycle- miles travelled (BMT) before and after all train trips is 526,254 for FY 11 calculated using those methods.

If the bicycle were not available the way that it is today, we do not know what substitute people may have for their bicycled portion of their trip(s) to make a definitive claim that "X" many bicycle trips results in so many automobile trips reduced. If we were just considering the train portion of the trip, the Capitol Corridor has survey information that for the train portion of the trip that 90.4 percent of people would, if they didn't take a train trip, otherwise drive in their own automobile. As stated in the economic analysis, the non-motorized portion of the trips that people do make are high-value trips where taking an automobile can be quite inefficient and as such, we can't assume that 90.4 percent of the bicycle trips would otherwise be made in an automobile. This may be the incorrect

to this point for CCJPA to assign a value to the net worth of the bicycle portion of the trip but in the case of the LA Metro survey, that value was 65 percent. If CCJPA had similar results, 122,166 trips or nearly the entire ridership for February 2011 would never have taken the train. At an average mileage of 69 miles per Capitol Corridor train trip, and a 90.4 percent substitution of automobile travel, this could mean that having bicycles on the Capitol Corridor trains and stations accounts for VMT reductions of 7,620,238 for FY 11.

When CCJPA is able to conduct the next survey of persons who have bicycled to/from the train, it would be ideal to ascertain the actual percentage of people who are on the train due to being able to bicycle to/from the train. As well, there may be a lesser number that might have otherwise driven than the general 90.4 percent that would have used their automobile but even if that value drops to 80 percent, the value of a bicycle enabling a train trip vs. an automobile trip is powerful.

For now, we can only build upon the assumptions and data from a similar rail/bicycle survey. Liberally taking this step, the combined results suggest that 8,146,492 VMT are reduced from Northern California roads as a result of existing bicycle use in association with the train.

Translating the air quality benefits of that suggested VMT reduction yields the results shown in Table 10-1. These values are somewhat overstated since the average passenger car emissions data is from the year 2000 and the fleet has gotten cleaner but the main gist of the emissions picture is that the train and bicycle combination significantly reduces pollutant emissions over using the automobile for the same trip.

Passenger Car Emissions Summary			Using 8,146,492 FY 11 VMT Reduction	
	Emission Rate[1]		Suggested FY 2011 Annual Pollution Reduction*	
Hydrocarbons	2.8	gm/mile	50,243	lbs
Carbon Monoxide	20.9	gm/mile	375,026	lbs
NOx	1.39	gm/mile	24,942	lbs
Carbon Dioxide	0.916	lbs/mile	3,731	tons

[1] US Environmental Protection Agency estimates of average passenger car emissions in the United States for July 2000

*grams converted using 454 grams in a pound; lbs converted using 2,000 lbs/ton

Table 10-1 Suggested FY 11 Emission Reductions Due to Bicycling Associated with Capitol Corridor Service

10.2.2 Environmental Benefits of Bicycle Access Plan Implementation

Measuring the environmental benefits of the type of bicycle improvements in this plan is a challenge. Transportation professionals and academic researchers studying the environmental effects of bicycling have always had this challenge due to the free and disparate use of bicycles and the nature of trip making in general. Usually the means to evaluate environmental benefits involves costly survey instruments from which the results are not transferable to each transit/bicycle use situation. A common repeated qualitative statement in many bicycle plans is that doing "X" to support bicycling will help improve air quality and reduce congestion and improve health where "X" is any bicycling improvement and this plan is no different - we loosely quantify and more feasibly qualify the environmental benefits of the various projects and policies.

At the end of the day, people want to make a trip and they have a choice. In general, along the Capitol Corridor route the trip decisions boil down to taking a car or taking Capitol Corridor. They made a modal decision how to get from their origin and destination, and if they choose the train, they have additional trip decisions to make as shown in Figure 10-1. We know at this time over 11 percent of the people choosing the train mode also choose to use a bicycle at some point in their journey. As shown in Figure 10-1 where the choices are labeled, option B is the train mode, option 2-c (to the station) and/or options 8 and 9 (from the station) are the bicycle modes in effect today. As well, these modes are the ones on peak trains bicyclists are having trouble being able to safely store and secure their bicycle because of insufficient bicycle storage supply.

This plan focuses on increasing the bicycle options from those limited choices and adding in the options 2-a, 2-b, 2-c-iii (to the station), and options 6, 7, 8 (if a folding share bicycle), and 9. Also shown in Figure 10-1 are average mileage figures for Capitol Corridor train trips and for bicycle trips to/from train stations. Using average automobile pollutant emissions as shown in Table 10-1, the trip in an automobile (option A) produces the highest emissions. A trip on the Capitol Corridor is measured in per person emissions and varies greatly based on ridership but is usually less than half the same trip in an automobile for most pollutant categories. An automobile used at any end of a train trip again raises the overall trip emissions. A transit trip included at any one of the train trip ends generates about half or less (like a Capitol Corridor trip) the emissions of an automobile trip. The zero emission options of bicycling or walking (non-motorized transportation) remain the largest environmental benefit coupled with a train trip, producing zero emissions[1].

[1] Some aspects of emissions analysis look at life-cycle emissions for the particular mode and even go as far as accounting for caloric intake and emissions costs for food production and individual consumption. Based on

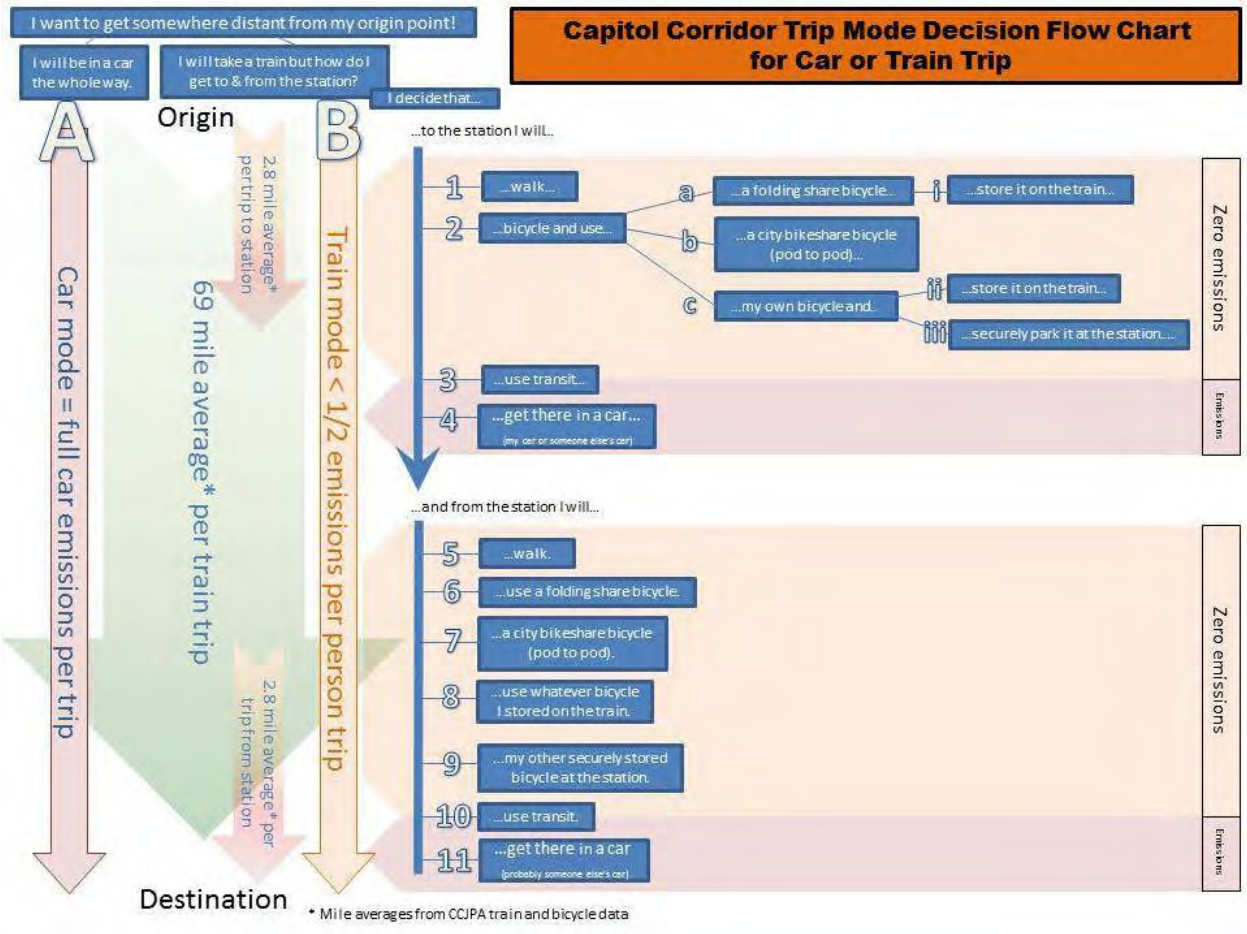


Figure 10-1 Capitol Corridor Trip Mode Decision Flow Chart

Projects included in this plan to increase bicycling are environmentally beneficial under all these following outcomes:

- Overall ridership grows and bicycling access remains at the 11 percent mode share Overall ridership grows and bicycling access also grows above the 11 percent mode share
- Overall ridership stays stagnant and bicycling access grows above the 11 percent mode share Overall ridership declines yet bicycling access grows above the 11 percent mode share

The only one of the overall plan elements that alone has the potential to reduce environmental benefits, which can't be avoided due to the safety regulations, is if enforcement alone reduces bicycle mode share. However, enforcement also is required to urge bicyclists to seek other options (on-train or at- station improvements) when they are provided. In the purest sense of the plan elements, all plan elements aside from enforcement can be thought of as mitigation for enforcement

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European Union calculations, life-cycle CO_2 emissions for automobiles are nearly 13 times that of bicycles. These and additional considerations such as accounting for traffic flow by adding/removing automobiles from traffic flow are far beyond the level of analysis for this planning effort. Generally the emission reductions attributable to bicycling projects in general are not sophisticated enough to warrant comparison between such fine and course values.

yet there remains the undeniable element that enforcement brings which is to drive people to utilize other options.

10.2.2.1 *Bicycle Sharing*

As stated above, bicycle sharing would not be an initiative led by the CCJPA except for the Brompton Dock concept which is more like bicycle leasing yet for the purposes of environmental analysis it can be lumped with bicycle sharing. To complete this analysis it is useful to examine what trip types bicycle sharing will serve. What will be the split between substituting a shared bicycle trip for existing bicycle trip vs. how many will be new trips via bicycle will be generated and of those, are those trips replacing former automobile or transit or walking trips? Or is bicycle sharing (in all its forms) bringing new people to the train that were never there before (i.e., bicycle sharing inducing train travel)? Some existing bicyclists using the train will opt out of using their bicycle and use a shared bicycle on one or both ends of their trip. This action would not reduce overall emissions but it would free up a bicycle space on Capitol Corridor trains.

Bicycle sharing is usually effective at gaining new riders and therefore two factors can be at play. As show in Figure 10-1 there will be those Capitol Corridor riders who opt to now utilize a bicycle whereas they utilized a polluting mode of transportation to and/or from the train. There will be those who will opt to ride the Capitol Corridor in the first place once they have heard about and plan to use the bicycle sharing facilities. Under the first situation, pollutant reductions accrue to the true origin and/or destination related to the train trip. In the second situation, probably an automobile trip is eliminated and the individual is induced to ride the Capitol Corridor and ride a bicycle on one or two segments of their overall trip. CCJPA can indicate what might be the pollutant reduction on a per person basis for each person that opts for one of the two scenarios (see Table 10-2). The actual number of people who might change their behavior is debatable bit indications are from existing bicycle share is that they are excellent at inducing behavioral change.

Pollutant	Per person pollutant reductions		Units
	Induced bicycle trip (already takes Capitol Corridor)	Induced bicycle with new Capitol Corridor trip +1 bicycle and CC trip	
Hydrocarbons	1,176	30,156	**gm**
Carbon Monoxide	8,778	225,093	**gm**
NO_x	584	14,970	**gm**
Carbon Dioxide	**385**	**9,865**	**lbs**

Notes: One trip is each one-way trip; assuming 150 one way trips per year for each individual (a mix of single trip and high frequency travelers); emission rates based on EPA, 2000; Assumed all bicycle or Capitol Corridor trips previously done via automobile.

Table 10-2 Annual Per-person Emissions Reductions for Two Scenarios of Modal Shift

10.2.2.2 *Secure Bicycle Storage*

Secure bicycle storage is aimed at the existing bicyclist who is already on the Capitol Corridor and primarily is a means to allow them to change their behavior and not have to bring their bicycle on the train. Secure storage may influence a non-bicyclist on the Capitol Corridor to use a bicycle perhaps for a sense of greatly reduced theft potential.

It is also likely that some new Capitol Corridor riders may be generated by the addition of secure bicycle lockers. In a study[2] examining the role electronic bicycle lockers play in association with Pleasant Hill BART station, the question was asked to self-identified transit and non-transit users, what would you do if the bicycle lockers were not available. For transit users, 41 out of 102 indicated they would drive alone and for non-transit users 17 out of 38 would drive alone to get to the Pleasant Hill BART station. Overall, the study indicates that based on these results, the eLockers may be enabling 15 to 20 percent of the sample to use a bicycle instead of an automobile.

Per person air pollutant reduction for secure bicycle facilities at stations would tend to not be as strong as bicycle share at inducing bicycle trips or bicycle and Capitol Corridor trips. We would expect to see some amount of the existing 11 percent mode share shift toward using secure storage which would greatly assist opening up on-train bicycle storage spaces. This alone would permit more people to start to take their bicycle on the Capitol Corridor – more of an indirect inducement. Existing data from bicycle locker use, however, does show that it does induce latent demand which means it does help grow the bicycle mode share. The data as shown in Table 10-2 for bicycle sharing would tend to not drive as many new inductees of either category, but due to the nature of using the secure storage in the first place, it would be expected that the annual number of days for either scenario would be greater than under a bicycle share situation on an annual per person basis. CCJPA estimates the annual days of use would be significant enough to result in about 67 percent greater emissions reductions, albeit multiplied by lower overall levels of inducement.

10.2.2.3 *Other Project/Policy Evaluated*

The remaining projects suggested in this plan are aimed at maintaining the current status quo, and if successful, allowing moderate growth of the bicycle access mode. Plans to establish more on-train storage, either physically by car modification or by adding new cars for additional bicycle storage will allow bicycle use to hopefully remain as vibrant as CCJPA has seen it. The promotion to offer a discount on folding bicycles will be as effective as it is adopted by current or new Capitol Corridor riding bicyclists. All told, these measures are primarily about maintaining the bicycle access share that Capitol Corridor enjoys today. There may be some modest growth allowed by better utilization of safe and available space but it would not be expected to be as dramatic as for the at-station solutions proposed in this plan. The calculations shown in Table 10-2 would apply yet it would be very difficult to claim that these measures as a whole would induce more Capitol Corridor ridership. Capitol Corridor does carry more riders who happen to ride the train because they believe they can take their bicycle on the train, and overall, that is convenient for them. Whether this growth could be

[2] EasyConnect II: Integrating Transportation, Information, and Energy Technologies at the Pleasant Hill BART Transit Oriented Development UCB-ITS-PRR-2010-2 California PATH Research Report by Caroline Rodier, Susan A. Shaheen, Tagan Blake, Jeffrey R. Lidicker, Elliot Martin; March 2010

[3] Bicycle Parking: A Plan for the Los Angeles County Metropolitan Transportation Authority, Prepared by Matthew T. Benjamin; June 2003

accommodated, especially on the busiest trains, remains to be seen. Certainly enforcement, as discussed above, will serve to depress the bicycle mode share because some individuals who may have been former riders will determine that taking a bicycle is too risky, if they even still choose to use the Capitol Corridor in the first place. It is CCJPA's hope that through effective and fair enforcement to ensure a safe journey for all riders on the train that persons who are concerned about regularly being able to use the train will avail themselves of the encouragement tactics suggested and employed today by Capitol Corridor.

11 Project Action Plan Summary

This section presents a page by page overview of the variety of actions proposed within this plan. Actions are grouped according to the same manner in which they were detailed above.

Operational Modifications

Project/Program	Description	Estimated Cost	Benefits	Schedule of Implementation	Project Manager
Reassigned Cars	Cab cars with greater bicycle storage are assigned to the Capitol Corridor route	None	Increase the capacity of the train	Done	CCJPA
"Double Stops" at Berkeley	Stop twice at Berkeley so that all train cars are accessible to the platform.	None	Existing capacity is optimized	Done	CCJPA
Conductor Directions/Announcements for Bicycle Storage	Consistent conductor direction and management of bicyclists	None	Optimizes existing capacity	Coordinated with enforcement phase	CCJPA and Amtrak
Modified Equipment Rotation	Trains with larger bicycle capacity (e.g., 8200 series cars) are paired with busier schedules	None	Optimized use of train sets	Done	CCJPA

Physical Modifications on the Train

Project/Program	Description	Estimated Cost	Benefits	Schedule of Implementation	Project Manager
No luggage decals	Decals inform passengers not to place luggage in bike areas	Very low	Optimized use of onboard space	Done	CCJPA
Conversion of cars to add bicycle space	8300 CA cab cars bike capacity increased from 7 to 13	High	Increase onboard capacity for all trains	July 2012 through November 2013	Caltrans
Revised/Updated Side of Car Bicycle Storage Signs	Updated and revised side of car decals to direct patrons	Low	Improves boarding and storage utilization, reduces confusion	Planned for FY 13/14	Caltrans with CCJPA
Additional hooks	Add two more hooks where there are currently only three	Very Low	Increase onboard bicycle capacity	Future project	CCJPA
Added Rolling Stock	Procure new rolling stock	Very high	Add new rolling stock with higher capacity	In progress but for the purposes of adding seating capacity	Caltrans
Dedicated bicycle cars	Build/rebuild a non cab-car specifically to store bicycles	Very high	Increase bicycle capacity. Create a consistent minimum capacity for all trainsets	Future unknown	Caltrans with CCJPA

At Station Projects

Project/Program	Description	Estimated Cost	Benefits	Schedule of Implementation	Project Manager
Support Bicycle Sharing	Encourage bike sharing in interested cities.	$10,000 provided for Sacramento; $100,000 pledged from CCJPA for Sacramento capital cost	Increased attractiveness of bicycling; reduced need for bicycle storage and auto parking	N/A	Local government with CCJPA support
Secured Bicycle Storage	Install secure bike storage at all viable stations	Lockers are $3,000 per unit	Allows riders to store bicycles at station securely	Apply for grant funding in Spring 2013. Begin installing by FY 14	CCJPA and local governments
Folding Bicycle Lease Program	Install Brompton docking stations (or the equivalent) at SAC, DAV, OKJ, and BKY	Annual operating cost of about $26,366 for two 20-bay stations; medium high capital cost	Provides riders the option of "leasing" as bicycle for the day for many days on end. Bicycle stores easily on the train using up no rack space.	Utilize FY 14 funding to begin installation	CCJPA and local governments

12 APPENDICIES

12.1 Appendix A – CCJPA Board Principles for CCJPA Policy on Bicycle Access

Item VI.4

CAPITOL CORRIDOR JOINT POWERS AUTHORITY

MEMORANDUM

TO: Capitol Corridor Joint Powers Board **DATE:** February 7, 2012

FROM: David B. Kutrosky
Managing Director, CCJPA

SUBJECT: PRINCIPLES FOR CCJPA POLICY ON BICYCLE ACCESS

PURPOSE
For the CCJPA Board to review, comment, and adopt principles that will guide the policy for bicycle access on Capitol Corridor trains and stations.

BACKGROUND
With the increase in ridership growth on the Capitol Corridor service, there has been an increased use of bicycles accessing the Capitol Corridor trains which has caused demand for on-board bike storage to exceed capacity in some instances. While the CCJPA wishes to encourage alternative, green access to the Capitol Corridor trains, it cannot come at the expense of safety, which is the CCJPA's top priority. Bicycle access on the trains must comply with federal regulations and law primarily through the Federal Railroad Administration (FRA). The intent of the applicable regulations is to ensure that (1) bicycles on trains are secured in some manner so that they are not subject to flying through the air in the event of a sudden stop and (2) bicycles do not restrict passenger access of any form (e.g. passengers with a wheelchair or cane) within the train.

To address the increased bicycle demand and the regulatory issues, CCJPA conducted a survey of riders with bicycles in January and February 2011 with the intent to identify what options could be applied to address this demand. To assist with identifying solutions and adopting a policy, a Bicycle Policy Working Group was convened. This group is comprised of CCJPA staff, Amtrak staff, and two Capitol Corridor riders who use bicycles and one Capitol Corridor rider who uses a wheelchair. This group considered how to develop a policy that is responsive to federal requirements while also identifying on-board and station programs to increase bicycle storage capacity and ensuring proper, open communications.

Prior to releasing any policy, it was decided to (1) have the CCJPA adopt a broad set of principles which will guide the development of the policy, (2) gain further input from Capitol Corridor bicycle users and (3) begin an educational period for several months which will allow conductors as well as the riding passengers to get familiar with the policy and its implementation. (Primarily, the conductors will be placing tags on bicycles stored in such a way that they do not comply with the policy.) After several months of this process, the policy would go into full effect. The intervening time will allow several measures to advance - - more conductor training; better dissemination of existing bicycle locker information; secure grants to add more bicycle lockers; and identify other on-board modifications to increase bicycle storage.

To support these efforts to improve safety while trying to best accommodate on-train bicycle storage demand, the CCJPA Board is being asked to adopt a set of principles regarding the development of a bicycle policy which will assist CCJPA staff in implementation of the policy itself and in implementing measures which help reduce demand for bicycles used on the train or, conversely, increase capacity for bicycles on the train.

RECOMMENDATION
The SCG recommends that the CCJPA Board adopt the principles that will guide the policy for bicycle access on Capitol Corridor trains and stations.

Motion: The CCJPB adopts the attached principles.

DRAFT

PRINCIPLES OF BICYCLE ACCESS POLICY

Capitol Corridor Intercity Passenger Train Service
(Auburn-Sacramento-Oakland/San Francisco-San Jose)
Introduced February 15, 2012

- Safety of all passengers in transport on the Capitol Corridor service is the CCJPA's highest priority.
- The use of a bicycle in conjunction with travel on the Capitol Corridor is a travel mode combination that is good for the environment and one that many Capitol Corridor customers value.
- Storage of bicycles on the Capitol Corridor train must be accomplished in a safe and responsible manner for all users on the train and in compliance with regulations for passenger train operations.
- When developing train maintenance cycles and rail car assignments, train equipment consists (or trainsets) used in Capitol Corridor service shall be optimized to maximize designated bicycle storage.
- The CCJPA shall work with its partners to determine if the Northern California fleet, shared with the San Joaquins, can be allocated in a manner to allow more designated bicycle storage on equipment used in Capitol Corridor service.
- The CCJPA staff shall seek funding and enter into funding and related agreements to advance and implement projects which can support additional secure bicycle storage capacity at stations (e.g., bicycle lockers, locked bicycle parking areas).
- The CCJPA shall continue to engage and openly communicate with existing and prospective passengers and bicycle advocates regarding the bicycle policy (as updated) and other bicycle related matters.

ADOPTED_____
CCJPA BOARD OF DIRECTORS

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15