Metro Bicycle Transportation Strategic Plan

June, 2006

Los Angeles County
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Las Virgenes-Malibu Council of Governments
South Bay Cities Council of Governments
North County Sub-Region
San Gabriel Valley Council of Governments
Westside Cities Sub-Region

Working Group and Sub-Regional Meeting Participants

We wish to thank the many cities and organizations that attended our meetings and participated with us in developing this countywide bicycle plan. We couldn't have accomplished this without you. We look forward to further collaborations.

Table of Contents

Tables

Maps

SECTION 1: INTRODUCTION AND PLAN PURPOSE

INTRODUCTION

The Los Angeles County Metropolitan Transportation Authority (Metro) prepared two companion transportation planning documents to improve mobility in the region through the use of bicycles: the Metro Bicycle Transportation Strategic Plan (Strategic Plan) and the Bicycle Transportation Account Compliance Document (BTA Document). These planning documents replace earlier 1996 sub-regional bicycle master plans but do not replace local planning documents.

- The Strategic Plan is designed to be used by the cities, the County, and transit agencies in planning regionally significant bicycle facilities, setting priorities for improving mobility through the use of bicycles with transit, and filling gaps in the inter-jurisdictional bikeway network. The goal is to integrate bicycle use in all transportation planning: with existing and future transit and transportation oriented development. This Plan provides a new look at bicycle use to relieve congestion, improve air quality, reduce vehicle miles traveled (VMT), and increase transit viability.
- The BTA Compliance Document is a reflection of local priorities and programs. The information is primarily a compilation of data collected from each city and the County: (1) existing and proposed bicycle facilities, activity centers, transit facilities, and bicycle parking mapped for use by local agencies; (2) estimates of past and future bicycle ridership; and (3) estimates of past and future expenditures.

We used a collaborative process in developing the Strategic Plan and the BTA Document. Over the course of a year, all cities, the County and local interest groups were invited to participate in Project Working Group Meetings and a series of sub-regional briefings. Each city and the County were individually contacted by mail and phone to collect local information and seek local participation. The Project Team, Working Group, Consultant Team, cities and stakeholder groups participating in the planning process are listed in the Acknowledgements.

Metro Bicycle Transportation Strategic Plan

The 2005 Strategic Plan describes a vision for Los Angeles County that promotes bicycling as a viable transportation mode. This vision furthers the regional goals of improving the quality of life and economic well being for people residing, working and visiting Los Angeles County by outlining a bicycle infrastructure that improves overall mobility, air quality, and access to opportunities and resources.

The Strategic Plan also establishes regional bicycle planning policies and provides tools that can be used by local agencies in creating their own bicycle plans. The Plan includes:

- A listing of 167 identified “bike-transit hubs” in the County
- Audit procedures for evaluating obstacles to bicycle access
- Non-motorized “best practices” in a tool box of design measures
- Gaps in the inter-jurisdictional bikeway network
- 12 prototype Bike-Transit Hub Access Plans in different geographical and demographic regions in the County

At this time, a few cities in the county have their own plans and Metro encourages and supports local planning efforts in all cities to accommodate bicycle use. The Strategic Plan does not attempt to duplicate local planning that accommodates bikeway infrastructure on inter-city arterials or rights-of-way. The cities and County benefit from developing local bicycle master plans, which supplement the regional plan.

The Strategic Plan can be used by local agencies:

- To locate bike-transit hubs and obtain data on each hub;
- To conduct a bike-transit hub audit;
- In applications for grant funding for the 12 Bike-Transit Hub Access Plans;
- To incorporate recommendations into larger arterial improvement projects;
- To identify gaps in the regional bikeway network; and
- As a component of sub-regional priorities.

BTA Compliance Document

The 2005 BTA Compliance Document contains an inventory of existing and proposed bicycle facilities and maps in the county. To enable the maps to be legible, the county was divided into 17 map segments and each map is in the plan.

Each city and the County of Los Angeles provided the information for the tables and maps contained in the BTA Compliance report. All agencies were contacted numerous times to solicit local information, and each agency was asked to review the documentation and maps for accuracy. Only a few cities chose not to participate.

The BTA Document serves two purposes. First, it provides an inventory of all existing and proposed bicycle facilities in Los Angeles County. This information was used to publish a new Metro Bike Map for the public in 2006. Second, the BTA Document can be used by local agencies as the core component of a Bicycle Transportation Plan (BTP) to become eligible for the annual State Bicycle Transportation Account (BTA) grant program. A BTP is required only if cities intend to apply for State grant funds and it must contain specific information as listed in The Streets and Highway Code and described on the Caltrans website. The BTA Document will need to be supplemented by additional local information not available to Metro before being adopted by local resolution. A BTP is not required for Metro's Call for Projects, but is highly recommended. See the BTA Compliance Document for more information on BTA requirements.

New Plan Differs from Previous Plan

The first Metro bicycle plans were developed 10 years ago for each sub-region and consisted of a compilation of countywide local plans proposing 1,365 miles of on-street and off-street bicycle facilities. Only a fraction of these facilities were built. With the current situation of scarce resources, urban congestion and a handful of cities in the County with bicycle plans, it is unlikely to see this trend change. Metro's 2006 regional plan has shifted the focus from arterial bikeways to a strategy of using bicycles with transit to fully utilize and enhance the regional transit system. To be effective, this strategy is not reliant on the build-out of an entire arterial bikeway system in every city, but does rely on improved access to transit. Focusing improvements at bike-transit hubs is a relatively simple opportunity for linking bikes with transit and increasing the effectiveness of bicycles for travel without a huge investment of infrastructure and right-of-way.

The plan also includes a section devoted to gap closures on a regional network primarily composed of bike paths not necessarily reliant on transit. The gaps can be filled by on-street or off-street facilities. These include completion of the river bike paths, rails-with-trails, or on-street connectors between two facilities or communities.

What resources were used to develop these plans?

The Plans were developed through the input and/or review of the following:

- Metro Project Team and Metro staff
- Strategic Plan Working Group (local agencies and interest groups)
- Consultant Team
- Metro Technical Advisory Committee, Streets and Freeways Subcommittee, and Transportation Demand Management Subcommittee
- 1994 MTA Los Angeles Countywide Bicycle Policy Document
- 2001 MTA Long Range Transportation Plan for Los Angeles County
- 2004 Bike Transit Center Implementation Plan
- 2004 Enhanced Public Outreach Project for Metro's Bicycle Transportation Strategic Plan
- Regional bicycle policies from around the country, including Portland (OR), San Francisco Bay Area Metropolitan Transportation Commission (MTC), St. Louis (MO), North Texas Council of Governments, Puget Sound Council of Governments, St. Paul (MN)

SECTION 2: METRO'S BICYCLE TRANSPORTATION POLICIES

PURPOSE

There is tremendous untapped potential for bicycle use in place of automobile trips to work, to transit, for short errands or to recreational destinations. This document identifies strategies that, if implemented, would increase the use of bicycles. In addition to reducing automobile trips, bicycle use increases personal mobility, reduces traffic and parking congestion, decreases energy use, makes public transit more viable, and improves air quality and health.

As the Regional Transportation Planning Agency for Los Angeles County, the Los Angeles County Metropolitan Transportation Authority (Metro) has prepared a Bicycle Transportation Strategic Plan (BTSP) to be used as a guide for Metro and local jurisdictions in setting regional bicycle transportation priorities. The BTSP identifies bike-transit hubs around the County, gaps in the regional bikeway network, and recommends access improvements in selected locations.

The Bicycle Transportation Policies included in this section provide a vision for the County, along with policies, strategies, actions and performance indicators to implement the vision for more bicycle transportation use in the region. Unless another department or agency is specifically identified, the majority of strategies are intended for implementation by Metro Planning. Due to the far-reaching actions called for in this document, many of the strategies suggested go beyond the current scope of Metro's bicycle planning activities. Additional planning resources will be required to fully realize the vision. It is important to increase agency cooperation, identify new revenue sources, and develop community partnerships for Metro's BTSP policy objectives to be achieved.

VISION

The overall vision for the Strategic Plan is to provide regional leadership in making bicycling an integral part of travel choices in the region, integrating bicycle planning and facilities in transportation projects, and promoting the linkage between bicycling and the countywide transit network.

POLICY OBJECTIVES

The Metro policy objectives are as follows:

I. Bicycle Planning & Funding: Provide Visionary Leadership in Planning and Funding Projects and Programs that Improve Access and Mobility
II. Bicycle Parking: Encourage High Quality End-of-Trip Facilities at Commercial, Employment, Residential and Transit Locations
III. Bikes-to-Transit: Improve Bicycle Access to Transit Systems
IV. Bike to Work: Promote and Increase Employer Bicycle Incentives
V. Bicycle Promotion: Provide Leadership in Building Partnerships, Funding, and Resources for Marketing Bicycle Use as a Legitimate and Healthy Means of Transportation
VI. Bicycle Education & Safety: Increase and Promote Bicycle Education and Safety Programs

For each policy objective, strategies, actions and performance indicators have been developed. The key performance indicators in each section provide the framework to evaluate progress toward these goals.

Policy Objective I

Bicycle Planning & Funding: Provide Visionary Leadership in Planning and Funding Projects and Programs that Improve Access and Mobility.

Strategy	Action Steps	Key Performance Indicators
1. To meet Metro's Long Range Transportation Plan goal of doubling bicycle ridership.	a) Provide funding for bikeway projects. b) Update Metro Call for Projects (CFP) eligibility criteria to reflect regional priorities. c) Prioritize bikeway project applications of regional significance. d) Metro and cities work together to support, develop and encourage legislation for advancing bicycle use. e) Encourage cities/agencies to staff a bicycle coordinator or non-motorized position.	*a-c) Metro CFP* *d) Coordinate with cities and Metro Government Relations and Regional Programming Staff annually.* *e) In outreach to cities, promote need for local expertise; create model job description.*
2. To regularly update Metro's Bicycle Plan.	a) Update Metro Bicycle Transportation Strategic Plan (BTSP) every five years. b) Metro staff will evaluate proposed gap closure projects for regional significance..	*a) By 2009.* *b) Before next CFP.*
3. To incorporate bicycle accommodation in Metro-funded and Metro-led transportation projects.	a) Continue coordination with Metro's Countywide Significant Arterial Network Plan. b) Train Metro Project Managers to encourage bicycle accommodation in all transportation projects. c) Encourage arterial or parallel corridor improvement projects to include bicycle facilities. d) Continue to encourage multi-modal projects in Metro CFP and bicycle accommodation in roadway improvements. e) All bicycle-related projects funded through Metro CFP must be designed according to Caltrans design standards.	*a) Transmit GIS bicycle shapefiles to South Bay Area Team to produce maps that include bicycle facilities.* *b) Arrange for one bikeway training in LA per year beginning in FY07.* *c) On-going.* *d Next CFP.* *e) Initiate site visits in cooperation with Caltrans; require design review.*

Strategy	Action Steps	Key Performance Indicators
4. To increase technical assistance to cities and County in grant applications.	a) Encourage local agencies to complete and adopt Bicycle Master Plans that meet Caltrans Bicycle Transportation Account (BTA) requirements. b) Assist cities in developing regionally significant projects and project funding applications for the CFP. c) Hold CFP Bikeway Mode Workshop. d) Provide feedback on unsuccessful Call for Projects applications. e) Provide technical design workshops to local jurisdictions.	*a) Provide cities with requirements, checklist, and guidance in adopting plans by July 2006.* *b) Outreach to each sub-region to generate project ideas for CFP.* *c) Within one month of the conclusion of a CFP.* *d) Conduct one bike mode workshop in each sub-region in advance of CFP application deadline.* *e) Conduct one workshop per year on bikeway design and publicize Caltrans training workshops.*
5. To research new sources of funding.	a) Seek additional funding sources for regionally significant projects and programs. b) Integrate bicycle improvements with other street improvements around transit that is funded by regional impact fees, if adopted as regional transportation mitigation. c) Publish annual funding list for bikeway projects on Metro website.	*a) On-going coordination with Metro Regional Planning and Programming; apply for annual planning grants.* *b) Coordinate with planning to incorporate bicycle infrastructure as part of regional impact fee mitigation.* *c) New opportunities and website notification to all sub-regions by July 2006 with updates.*

Policy Objective II

Bicycle Parking: Encourage High Quality End-of-Trip Facilities at Commercial, Employment, Residential, and Transit Locations.

Strategy	Action Steps	Key Performance Indicators
1. To expand the number of high quality end-of-trip bicycle facilities in the countywide region to create a Metro network of bike-transit centers.	a) Evaluate locations at Metro facilities where additional bicycle parking is needed. b) Prepare update of the Metro Bicycle Parking Plan to reflect current priorities. c) Submit annual bicycle parking report to the Metro Streets and Freeways Subcommittee highlighting program benefits. d) Promote bicycle parking facilities within all local jurisdictions and at bus and rail hubs. e) Pursue creative financing partnerships, as well as traditional methods, for funding capital investment and operating costs for bicycle parking facilities at regional transit hubs and other locations.	*a) Prepare annually.* *b) Update report by July 2007.* *c) Present annually.* *d) On-going.* *e) On-going.*
2. To expand and improve the efficiency and safety of the Metro Bicycle Locker Program and other bicycle parking facilities.	a) Initiate a secure bicycle parking system that allows for both reserved and on-demand lockers, and study the feasibility of using space-efficient solutions such as unattended bicycle cages or other options at stations with limited space. b) Evaluate emerging technologies for uniform access control and membership management systems. c) Develop a flexible bike parking pricing structure for bicycle lockers or bicycle stations. d) Encourage bike-transit centers in the design of new parking facilities. e) Improve security of bicycle parking.	*a) On-going – Implement and evaluate demonstration project at N. Hollywood for applicability elsewhere in the system by December 2006.* *b) On-going.* *c) Update pricing structure in FY07.* *d) On-going.* *e) Regularly meet with sheriffs to discuss and improve security of bicycle parking at Metro stations.*

Strategy	Action Steps	Key Performance Indicators
3. To implement bicycle parking design and management system.	a) Install bicycle racks in close proximity to station entrances and transit stops to increase rack use. b) Bicycle lockers should be located as close as the nearest car parking space at Park-and-Ride lots. c) Canopies (shelter) should be provided over bicycle parking wherever possible. d) Implement a consistent color, signage, and identification scheme for bicycle parking. e) Select an operating system for Metro that will simplify administration and facilitate multi-lingual and customer-friendly access.	*a-d) Develop design guidance in the Bicycle Parking Plan that can be revised as needed.* *e) Prepare a locker management RFP for implementation in FY07.*
4. To encourage bicycle facilities in commercial, business, and joint development projects around transit.	a) Encourage cities to adopt ordinances requiring the provision of bicycle parking and other amenities, such as shower and locker facilities. b) Require space for bicycle parking in all Metro Joint Development projects by adding language and changing documents to existing templates. c) Encourage wayfinding signage to bicycle parking and other facilities.	*a) Provide cities with copies of model ordinances.* *b) Prepare bicycle parking guidelines and design for Joint Development Projects.* *c) Coordinate with Metro's Joint Development staff by September 2006.* *d) Discuss in bicycle design workshops.*

Policy Objective III

Bikes-to-Transit: Improve Bicycle Access to Transit Systems.

Strategy	Action Steps	Key Performance Indicators
1. To improve bicycle access to existing and future bike-transit hubs.	a) Survey existing bicycle use on bus and rail. b) Survey existing bicycle parking use at Metro hubs to plan future needs. c) Identify and remove barriers and bicycle safety hazards and improve access, wayfinding, etc. in the area of bike-transit hubs. d) Work with Metro's Area Teams to budget bike-transit hub access plans and to ensure that bicycle access is addressed in the design of new and existing transit stations. e) Encourage development of and prioritize funding for bike-transit hub improvements in Metro CFP. f) Encourage local jurisdictions to seek funding and implement bike-transit hub improvements as stand-alone projects or incorporated into larger arterial projects. g) Research and document experience of shared bike-bus lanes and foster the use of bus-only lanes by bicycles.	*a) Work with bus and rail operations to determine feasibility of conducting bicycle counts, the method and frequency starting June 2006.* *b) By December 2006.* *c) As funds become available, conduct more bike-transit hub access plans.* *d) Quarterly Meetings to be held beginning July 2006.* *e) Develop incentives for next Call for Projects.* *f) Outreach to sub-regions and Streets and Freeways subcommittee.* *g) Report completed by January 2007.*
2. To coordinate with Rail Operations to facilitate bicycle access on Metro Rail.	a) Continue communications with Rail Operations to implement strategies to improve bicycle access on Metro Rail that work toward partial or full lifting of peak hour restrictions. b) Study the feasibility of bicycle racks on new light rail cars.	*a-b) Coordinate with Rail Operations and Rail Fleet Services to develop consensus and implement strategies.*
3. To coordinate with Bus Operations to facilitate bicycle access on buses.	a) Continue communication with Bus Operations to ensure all Metro buses go into service with functioning bicycle rack. b) Determine feasibility of increasing bicycle capacity on new and replacement racks for buses in County. c) Continue funding bicycle racks for buses.	*a) Request Bus Operations develop Operating Standards to measure compliance.** *a-c) Coordinate with Metro Bus Operations to study feasibility, develop consensus and implement strategies.; report findings to Metro Bus Operator Subcommittee.* *c) Metro CFP*

Policy Objective IV

Bike to Work: Promote and Increase Employer Bicycle Incentives.

Strategy	Action Steps	Key Performance Indicators
1. To increase bicycle commuting.	a) Coordinate with Metro Customer Communications program to jointly develop techniques for promoting bicycle ridership with employees; promote bicycle clubs. b) Develop methods to acknowledge employers and bicycle commuters (Metro Planning, Commute Services, and Marketing) c) Publicize number of employers promoting bicycling, number of new bicycle riders, etc. d) Provide information to local employers and businesses about employee bicycle commute trip incentives, and provide businesses with technical assistance in auditing their bicycle parking needs. e) Provide information to employers about promoting bicycle use: programs for loaner bicycles, electric bikes, and other options.	*a-b) Publish feature stories about employers in Metro publications.* *c) Provide report on bicycle employer programs and statistics in next plan update and in Metro publications.* *d) Create a bicycle commuting and parking brochure for local employers in FY06.*
2. To continue and expand support for "Bike to Work" (BTW).	a) Metro Planning to co-sponsor promotional events or campaigns (with giveaways). b) Work with cities, employers, and agencies in the County to create "BTW" events (Metro Media Relations, Public Relations, and Commute Services). c) Promote BTW theme throughout the year in employer outreach (Metro Commute Services)	*a-c) On-going*
3. To widely distribute bicycle map.	a) Create LA County Bike Map (Metro Program Development) b) Inventory new facilities (Metro Planning) and revise public bicycle map (Metro Program Development). c) Provide Metro bicycle maps on website.	*a) By June 2006.* *b) Update LA County Bike Map every five years with inventory.* *c) Update LA County Bike Map website as needed.*

Policy Objective V

Bicycle Promotion: Provide Leadership in Building Partnerships, Funding, and Resources for Marketing Bicycle Use as a Legitimate and Healthy Means of Transportation.

Strategy	Action Steps	Key Performance Indicators
1. To promote benefits of walking and bicycling as ways to improve mobility, congestion, air quality, and health.	a) Work with health care providers and school bicycle education programs to highlight benefits of bicycling. b) Support "active living" campaigns. c) Promote use of bicycles with Metro employees through Wellness Program, Safety Program, and/or Employee Rideshare; provide maps/brochures to Sector offices.	*a) Develop a plan for targeted outreach by June 2006.* *b) On-going.* *c) By June 2006*
2. To update and create promotional campaigns.	a) Work with local bicycle coalition and local jurisdictions to promote bicycle use, bike-friendly businesses, events, and programs (Metro Planning). b) Include locations of Metro bicycle parking on all Metro system maps (Metro Marketing). c) Update and create brochures, website, maps, etc. and other marketing materials to be used for handouts at conferences and workshops (Metro Planning & Marketing).	*a) Develop materials with Marketing & Rideshare targeting businesses; submit articles to the Los Angeles Bicycle Coalition for their newsletter by June 2006.* *b) Coordinate with Marketing Department to revise system maps and brochures in FY 06.* *c) On-going.*
3. To develop media campaign focus on bicycle transportation.	a) Use traditional public relations strategies, such as press releases, news features, PSAs, cable shows, public affairs shows, Metro Briefs advertising, Metro News on the buses and trains, and Metro Quarterly magazine (Metro Media & Marketing). b) Promote bicycle use with transit on on-board rail posters and bus cards (Metro Planning & Marketing).	*a) Coordinate with Media Relations.* *b) Coordinate with Marketing.*
4. To create Metro Bicycle Club.	a) Work with Metro Event Coordinator or Wellness Program and employers to create Bicycle Club.	*a) By FY07.*
5. To build alliances that promote bicycle facilities.	a) Participate in planning activities and coalitions that have as its objective to build more bicycle facilities that can be used for transportation. b) Promote Metro bicycle strategies for the next transportation reauthorization bill. c) Create partnership opportunities with WestStart in the "First Mile Challenge" campaign.	*a) Attend planning meetings around the County that involve bicycle facilities.* *b) Support regional projects for next TEA Reauthorization in five years.* *c) Contact WestStart to evaluate partnership opportunities by June 2006.*

Policy Objective VI

Bicycle Education & Safety: Increase and Promote Bicycle Education and Safety Programs.

Strategy	Action Steps	Key Performance Indicators
1. To promote youth and adult bicycle education and safety programs.	a) Support local agency efforts on bicycle education and safety. b) Contract with a bicycle professional and sponsor periodic educational classes on bicycle safety in targeted locations. c) Develop and seek funding for programs that make helmets, lights, and reflective clothing available in low-income communities. d) Use publications, websites, and other media to promote bicycle safety at rail stations.	*a) Incorporate bicycle safety into training courses for local agencies.* *b-c) Seek additional funds for annual programs.* *d) On-going*
2. To research opportunities for bicycle safety programs targeting motorists as part of Metro's on-going safety campaign.	a) Investigate partnerships with The Automobile Club of Southern California (AAA), law enforcement, the Office of Traffic Safety, and other relevant community organizations to reach motorists.	*a) Contact Auto Club and Office of Traffic Safety and law enforcement in calendar year 2006.*

SECTION 3: BIKE-TRANSIT HUBS

PURPOSE

This section identifies 167 bike-transit hubs and provides a systematic audit procedure and 12 conceptual bike-transit hub access plans. Bike-transit hubs are locations where a combination of elements – numerous transit and/or rail service lines, activity, and surrounding demographics – make them prime candidates to improve bicycle access. The goal is to allocate bikeway resources to areas that will improve both bicycle and transit ridership in the form of linked trips.

Effective public transit depends on people being able to walk or bicycle comfortably and safely to and from stations and stops, which also reduces the need for additional car parking. Other benefits to bike-transit connections are improved mobility choices, a denser and mixed-use urban environment, and improved physical health through active lifestyles.

Metro chose to focus on bicycle accessibility to transit hubs rather than an arterial system of bikeways for several reasons. Bike-transit hubs:

1. Provide benefits at a low cost
2. Provide seamless travel with transit
3. Leverage transit investments
4. Increase personal mobility by increasing options
5. Mitigate traffic congestion
6. Increase physical activity for better health
7. Meet federal and state legislative objectives
8. Help local agencies develop arterial bikeway systems
9. Reduce dependence on private automobiles
10. Reduce parking demand
11. Assist the ongoing effort to reduce air pollution
12. Decrease consumption of oil

What is a Bike-Transit Hub?

Bike-transit hubs are on-street or off-street transit stops or transit centers with one or more municipal transit operators and travel modes, and high volumes of transit riders.

1. **On-street Transit Stop**
   - Stop may be used by a single or combination of services including Metro Rapid, Metro Local, MUNI Operator, Other Service Provider and community-based operations; along with limited and express services where appropriate.
   - On-street customer service and bus layover facilities
   - Accessed by bus transfer, drop-off, walking, and bicycle
   - May be located adjacent to transit-oriented retail and/or mixed-use development
   - Customer services and amenities may include:
     - Service identity
     - Service maps/timetables
     - Lighting
     - Bicycle parking
     - Sidewalk/intersection paving improvements (for improved pedestrian and ADA access and safety).

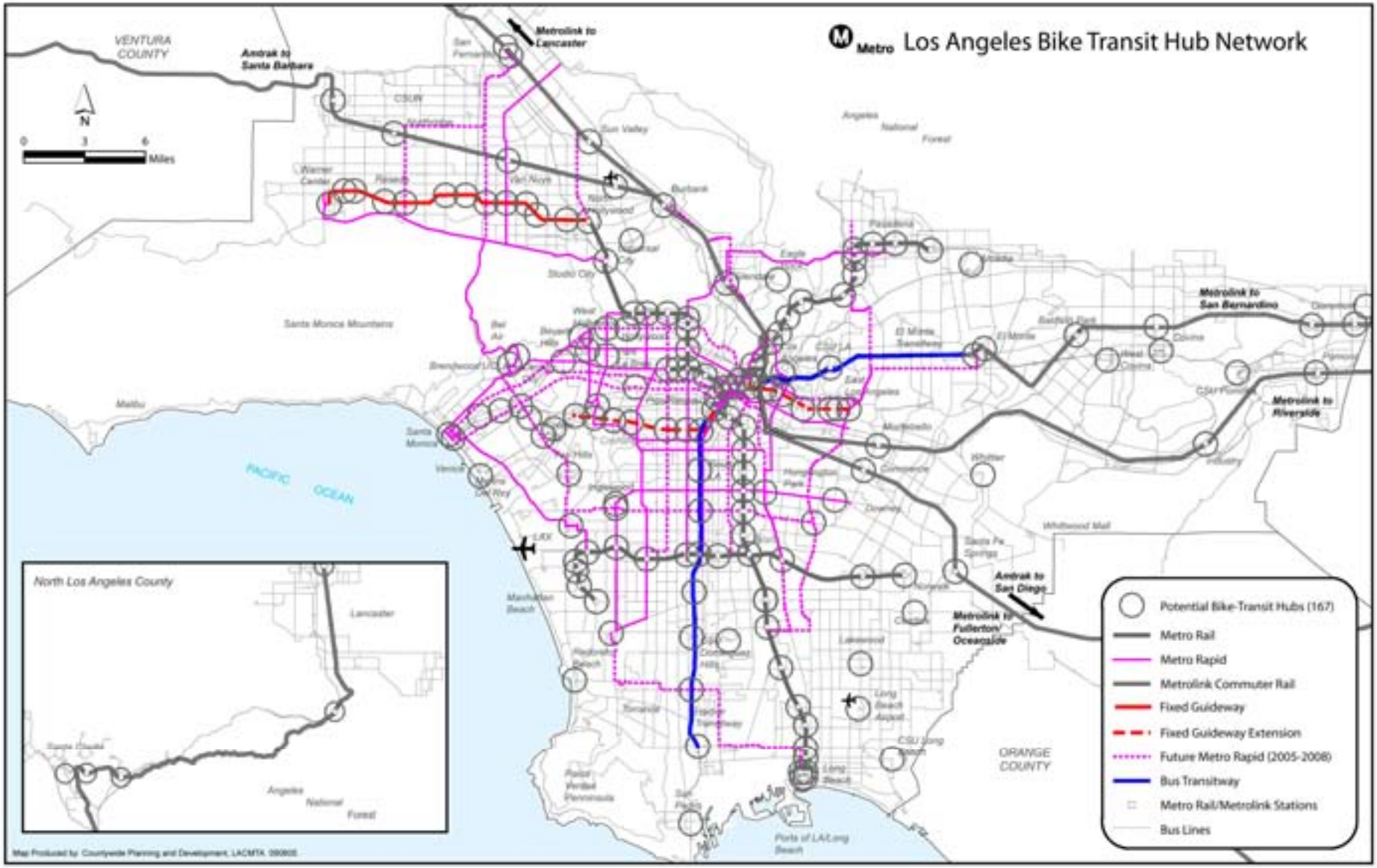
2. **On-street Transit Center or Community Transit Center**
   - Serves a high level of bus activity including Metro Rapid, Metro Local, MUNI Operator, Other Service Provider and community-based operations; along with limited and express services where appropriate
   - On-street customer service; primarily on-street bus service/layover facilities
   - Accessed by bus transfer, drop-off, walking and bicycle
   - May include shared park-and-ride opportunities in some locations
   - May be located adjacent to transit-oriented retail and/or mixed-use development
   - Customer services and amenities may include:
     - Service identity
     - Service maps/timetables
     - Lighting
     - Seating and phones
     - Neighborhood area maps/information
     - Ticket vending machines

- Communication systems (such as VMS) to provide real-time travel, service problem, and delay information
- Bicycle racks
- Sidewalk/intersection paving improvements (for improved pedestrian and ADA access and safety)

3. **Off-Street Transit Center or Subregional Transit Center**
   - Serves Metro Rail and/or the interface of two Metro Rapid lines along with Metro Local, MUNI Operator, Other Service Provider and community-based services; along with limited and express services where appropriate
   - May include a combination of on- and off-street customer service and bus service/layover facilities; may include some operational support facilities
   - Accessed by full range of modes: rail and bus transfer, auto, drop-off, walking, and bicycle
   - May include shared or transit-only park-and-ride facilities
   - May be located adjacent to transit-oriented retail and/or mixed-use development; may be integrated with on-site development
   - Customer services and amenities may include:
     - Service identity
     - Customer protection (canopy, shelter or building element)
     - Service maps/timetables
     - Neighborhood area map/information
     - Ticket vending machines
     - Lighting, seating, and phones
     - Bicycle racks/lockers
     - Sidewalk/intersection paving improvements (for improved pedestrian and ADA access and safety)
     - Communication systems (such as VMS) to provide real-time travel, service problem, and delay information
     - Closed-circuit television cameras and security speaker telephones
     - Landscaping
     - Public art

4. **Major Transit Center or Regional Transit Center**
   - Serves Metro Rail and the interface of two or more Metro Rapid lines along with Metro Local, MUNI Operator, Other Service Provider and community-based services; along with limited and express services as appropriate
   - May include a combination of on- and off-street customer service and bus service/layover facilities; may include some off-street operational support facilities
   - Accessed by full range of modes: rail and bus transfer, auto, drop-off, walking and bicycle
   - May include shared or transit-only park-and-ride facilities
   - May be located adjacent to transit-oriented retail and/or mixed-use development; may be integrated with on-site development
   - Customer services and amenities may include:
     - Service identity
     - Customer protection (canopy, shelter or building element)
     - Service maps/timetables
     - Neighborhood area map/information
     - Ticket vending machines
     - Lighting
     - Seating and phones
     - Bicycle racks/lockers
     - Sidewalk/intersection paving improvements (for improved pedestrian and ADA access and safety)
     - Communication system (such as VMS) to provide real-time travel, service problem and delay information
     - Closed-circuit television cameras monitored by security personnel and security speaker telephones
     - Landscaping
     - Public art

Map 1 – Bike Transit Hubs



Bike-Transit Hubs

The 167 bike-transit hubs identified in Los Angeles County are shown on Map 1, and a list of the hubs is in Appendix A.

As our stated goal is to improve bike-transit access to these hubs, the next step is to conduct an audit of the hub and surrounding streets. A Bike-Transit Hub Audit Process was developed that can be used by local agencies to identify the obstacles to bicycle access to the hub and, therefore, to transit. This Audit Process can be found in detail in Appendix B: How to Conduct a Bike-Transit Audit.

Next, we selected 12 of the 167 Bike-Transit Hubs to develop prototype, or "template," Bike-Transit Hub Access Plans. The following criteria was used for selecting the 12 hubs:

- Agency nomination
- Geographical distribution
- Diversity of transit use
- Site characteristics

It is important to note that Bike-Transit Hub Access Plans can be replicated by any local agency. The Audit and Access Plans are not a replacement for sound engineering, feasibility, and other efforts, but instead are intended to help local agencies develop enough information to move forward with obtaining funding and completing design work. Metro may prioritize bike-transit hub improvements in its next Call for Projects as well.

Bike-Transit Hub Access Plans

Staff conducted a field audit of each of the selected 12 bike-transit hubs, and Access Plans were developed for each. The Access Plans are as follows:

NORTH HOLLYWOOD BIKE-TRANSIT HUB

City of Los Angeles

NORTH HOLLYWOOD BIKE-TRANSIT HUB

Bike to Urban Heavy Rail

Hub ID: 215 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: North Hollywood (Metro Red Line Station, Orange Line)
Intersection: Lankershim Boulevard and Chandler Boulevard
Jurisdiction: City of Los Angeles

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

Metro's North Hollywood Red Line station is located at the east end of the San Fernando Valley just south of Burbank. North Hollywood ("NoHo") is an up-and-coming mixed-use district with many multi-story infill projects underway around the station and nearby. Theaters, restaurants, and a large city park (North Hollywood Park) are some of the attractions. It is the northwest terminus of the Metro Red Line subway and the east terminus of the Metro Orange Line busway. The station has a large and fully utilized park-and-ride lot.

- Terminus of Metro Red Line and Metro Orange Line busway.
- Medium density urban location, typically to 3- and 4-story.
- Land uses are a combination of commercial, auto dealership, restaurant, office, and multi-family mid-rise residential.
- Topography is flat.
- Major barriers include North Hollywood Park and the Hollywood Freeway (CA-170).

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). In comparison to other transit hubs in Los Angeles County, the North Hollywood Station had higher than average transit service and employment densities, slightly lower than average population and transit ridership densities and slightly higher than average median income. Our analysis of transit and bicycle ridership at this location indicates that it scores 180 out of 359, or in the 50th percentile of all bike-transit hubs. Transit hub scoring serves as a way to compare transit hubs across the County.

The table on the following page draws on 2000 Census data, SCAG population and employment projections for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	8,086	Local Bus Service (Other)	No
Metro Rail Riders	16,513	Population (3 miles)	51,128
BRT Service	Yes	Employment (3 miles)	59,483
Existing Transit Center	Yes	Household Income	$43,888
Metro Rapid	No	Transit Riders (3 miles)	6,133

In addition, the following major activity centers and destinations are located within the study area:

- Restaurant/theater district to the south.
- Several schools on McCormick Street, including a future high school site on Vineland.

- Major park (North Hollywood Park).
- Future development projects planned by Metro and the Community Redevelopment Agency on right-of-way westbound from Ethel Avenue and eastbound from Vineland Avenue.

Bicycle Access Conditions

Key bicycle access observations include:

- To the west, North Hollywood Park and the Hollywood Freeway constrain east-west route choices to Burbank Boulevard, Chandler Boulevard, Magnolia Boulevard, and Camarillo Street.
- To the east, Vineland Avenue, a difficult to cross 4- to 6-lane arterial, only has signals at Burbank Boulevard, Chandler Boulevard, Magnolia Boulevard, and Camarillo Street. A project is underway to improve bicycling conditions on Vineland and provide an additional Chandler Bike Path connection for one mile to the Burbank Chandler Bike Path.
- The district to the south and north has an intact street grid, but the old rail right of way paralleled by Chandler Boulevard interrupts it.
- Lankershim Boulevard cuts diagonally across the grid in the northwest-southeast direction and interrupts local-street access.
- Chandler Boulevard is the key east-west route with bike lanes. It crosses under the freeway without an interchange. Chandler jogs across the old rail right of way at Vineland Avenue; a project is underway to make this a safer bicycle and pedestrian link. To the west, a bikeway parallels the Orange Line from Lankershim Boulevard to Warner Center. To the east, a bike path is planned from Vineland Avenue to Clybourn Avenue. An existing bike path runs from Clybourn Avenue to Victory Boulevard.
- Bakman Avenue is a good north-south local-access alternative to Tujunga Avenue.
- Weddington Street is a good east-west local-access alternative to Chandler Boulevard between Tujunga Avenue and Vineland Avenue.

Bicycle Facilities

Existing bike lanes: Chandler Boulevard
Existing bike paths: Chandler Boulevard to the east
Existing Bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
NoHo Station	Racks	64	Good	Poor
NoHo Station	Lockers	12	Good	Good

Transit Connections

Transit Type	Agency	Description
Rail Lines	METRO	Red Line
Bus Rapid Transit Line	METRO	Orange Line
Bus Lines	METRO	152
		154
		156
		166
		183
		353
		363
	Burbank Bus	NOHO-Empire (Airport)
		Media District

Chandler Bike Path

Existing Conditions

North Hollywood Metro Red Line station

Bike racks and lockers at station

Rough pavement on Lankershim Boulevard, looking north from Killion Street

New High School on Vineland Avenue

Bike lane on Chandler Boulevard, eastbound past North Hollywood Park

Burbank Boulevard facing east

Recommended Improvements

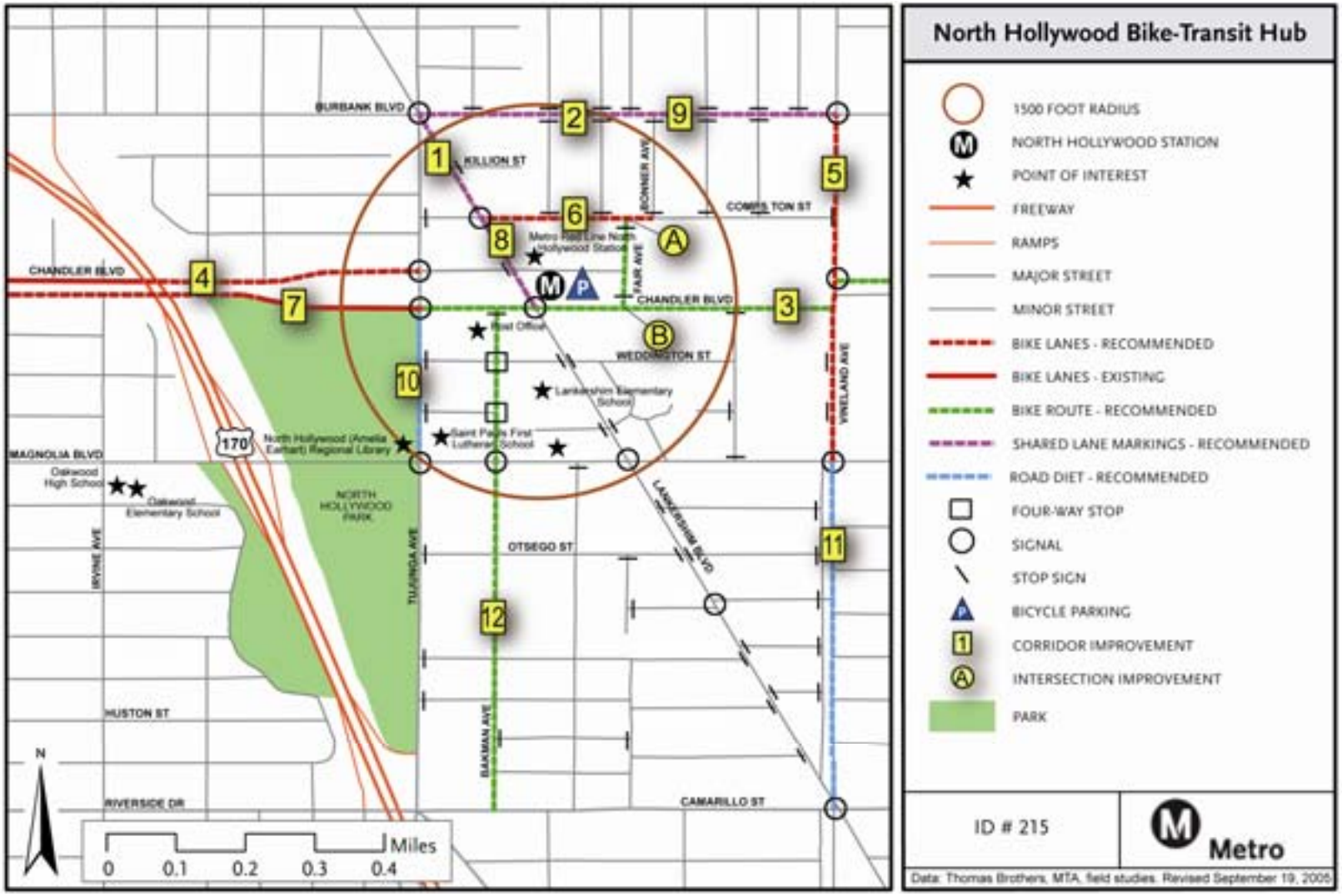
A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for the bicycle access routes to the Willow station are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Repair/replace damaged pavement	1	Lankershim Blvd: between Killion Street and Burbank Blvd	0.08	$10-20 per sq ft
	2	Burbank Blvd: between Lankershim and Vineland Ave.	1.03	$10-20 per sq ft
Add Bike Lanes	3	Chandler Blvd: between Fair and Vineland Ave. (Bike lanes already planned and roadway is being widened)	0.25	n/a
	4	Chandler Blvd: between 170 and Tujunga	0.83	$24,800
	5	Vineland Ave: between Burbank and Chandler. (This is planned for 2006.)	0.50	$15,000
	6	Compston St: between Lankershim and Bonner Ave.	0.21	$6,200
	On eastbound Chandler approaching North Hollywood Park, add a second line of bike lane dashes between the bus stop and the start of the diagonal parking.			

Corridor Improvements (Cont.)	Map Key	Location	Miles	Est. Cost
Add narrow painted island between bike lane and parking	7	Chandler St.: eastbound at the park.	0.04	$1,300
Shared lane markings	8	Lankershim Blvd: between Chandler and Burbank	0.31	$1,600
	9	Burbank Blvd: between Lankershim and Vineland Ave.	050	$2,500
Potential lane reduction (Road Diet)	10	Tujunga Ave: between Chandler and Magnolia	0.30	$12,500
	11	Vineland Ave: between Chandler and Camarillo	1.45	$65,400
Add bike route and directional signage	12	Bakman Ave: between Chandler and Camarillo	0.72	$7,200
Intersection Improvements	**Map Key**	**Location**		**Est. Cost**
Provide bicycle sensitive detector loop and bicycle detection marking	On all lead positions and left turn lanes. $2,500 per intersection.			
Place bicycle lane between left and right turn lanes on Fair Ave.	A	Fair Ave. at Compston St		n/a
	B	Fair Ave. at Chandler Blvd.		n/a
The intersection at Vineland and Chandler will be signalized to facilitate the transition from the Chandler bike path to the Vineland bike lanes.				
Bicycle Parking				
On sidewalks in retail/commercial/restaurant blocks, provide individual inverted-U's as needed. ($100 per 2-bike U-rack)				
Check supply of racks at North Hollywood Station.				

Map 2 – North Hollywood Bike-Transit Hub Recommendations



CHINATOWN BIKE-TRANSIT HUB

City of Los Angeles

CHINATOWN BIKE-TRANSIT HUB

Bike to Urban Downtown Light Rail

Hub ID: 501 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: Chinatown (Gold Line Station)
Intersection: Alameda Street/ College Avenue
Jurisdiction: City of Los Angeles

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

The Chinatown Station is located just under half a mile north of Union Station, in the northern part of Downtown Los Angeles. The Chinatown area is characterized by a moderate to high-density combination of commercial uses (offices, restaurants, shops), residential uses, and on the eastern side, heavy and light industry and warehousing. Chinatown itself is a tourist destination, as is Olivera Street, located a quarter mile southeast of the station.

Broadway Boulevard and Main Street lead to San Fernando Boulevard, which in turn leads to the start of the Los Angeles River Path approximately four miles north of the Chinatown Station. Chinatown's proximity to Union Station, downtown, Dodger Stadium, and the redeveloping Los Angeles River corridor makes it a very active location for bicyclists, especially those commuting to work.

- Metro Gold Line station.
- High density urban location.
- Land uses are a combination of office, restaurant, and residential.
- Topography is generally flat with low hills.
- Major barriers include the UPRR and Gold Line tracks to the east.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center (number of daily transit users, type of service and whether the stop is a terminus or not). The area surrounding the Chinatown Gold Line Station has slightly higher transit service and a significantly higher concentration of transit riders than the average transit hub in Los Angeles County. The surrounding area has very low median income and very low employment density compared to other transit hubs. Area population densities are average. Our analysis of transit and bicycle ridership at this location indicates that it scores 236 out of 359, or in the 66th percentile of all bike transit hubs.

The table on the following page draws on 2000 Census data, SCAG population and employment projects for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	1,989	**Local Bus Service (Other)**	Yes
Metro Rail Riders	1,531	**Population (3 miles)**	53,139
BRT Service	No	**Employment (3 miles)**	17,103
Existing Transit Center	Yes	**Household Income**	$26,303
Metro Rapid	No	**Transit Riders (3 miles)**	32,107

In addition, the following major activity centers and destinations are located within the study area:

- Ann Street and Castelar Street Elementary Schools
- Chinatown Branch Library
- Pacific Alliance Medical Center
- Dodger Stadium
- Union Station

Bicycle Access Conditions

Key bicycle access observations include:

- Streets in area are busy with on-street parking and double-parking by delivery trucks.
- Traffic speeds are relatively low and streets are reasonably wide.
- Intersections are complex, with many oblique angles, and no bicycle actuation.
- Security issues in the area lend themselves to bicycle lockers or other similar solutions.
- Street grid pattern is broken, making wayfinding difficult.
- The north ends of Broadway and Alhambra have higher traffic speeds, heavy peak hour flows, and traverse heavy industrial areas

Bicycle Facilities

Existing bike lanes: None
Existing bike paths: None
Existing bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
Chinatown Station	Racks	6	Good	Fair

Transit Connections

Transit Type	Agency	Description
Rail Lines	METRO	Gold Line
Bus Lines	METRO	45
		46
		58
		76
		81
		83
		84
		85
		90
		91
		94
		96
		394
	LADOT	B
	LADOT CE	409
		413
		419
	Antelope Valley	785
	Santa Clarita	794
		799

Existing Conditions

Bike racks at station

College Avenue facing west from rail line

College Avenue facing east from I-110

Spring Street facing south

Spring Street facing north towards station

Alameda Street facing south across College Avenue

Recommended Improvements

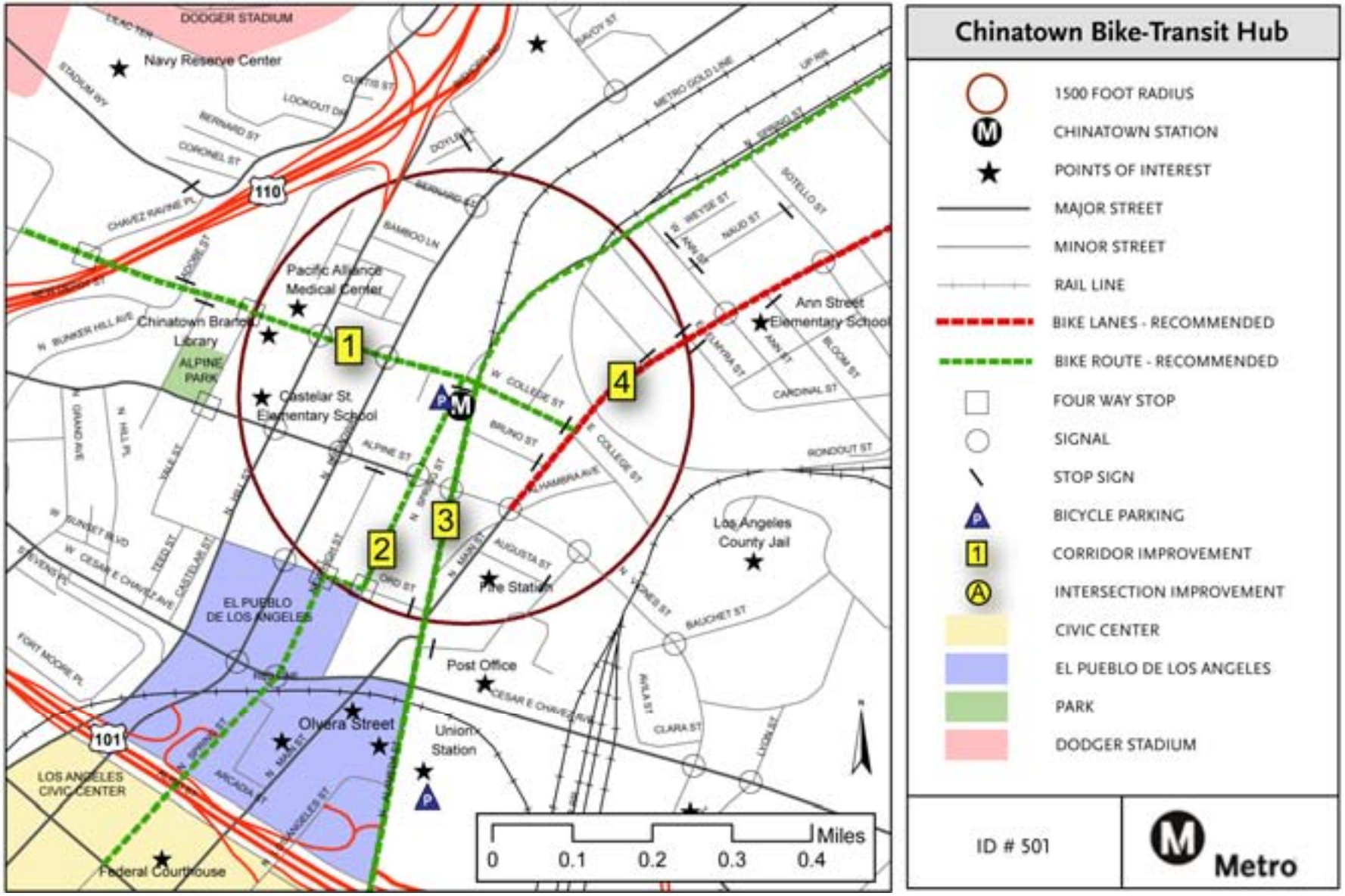
A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for bicycle access to the Chinatown hub are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing.

The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Add Class III bike route signage and stencils. Add directional signage.	1	College St: between Main St and Figueroa Terrace	0.64	$6,400
	2	Spring Street: from E. Temple St. over the 101 Freeway	1.23	$13,000
	3	Alameda St: between College St. and E. Commercial St.	0.73	$7,300
Add Class II bike lanes or consider for 3-4 lane road diet.	4	North Main St: between Alpine Ave and Lamar St. Bike lanes can be accommodated by removing parking and restriping to 6|11|11||11|11|6. Road diet can be accommodated by adding a center turn lane and restriping to 13|10||10||10|13	0.93	$27,900
Suggested Bicycle Parking				
Add bike lockers at Chinatown Station. ($1,500 per 2-bike locker)				
Install inverted-U racks in front of businesses in Chinatown where sidewalk widths allow. ($100 per 2-bike U-rack)				

Map 3 – Chinatown Bike-Transit Hub Recommendations



WILLOW BIKE-TRANSIT HUB

City of Long Beach

WILLOW BIKE-TRANSIT HUB

Bike to Urban Light Rail

Hub ID: 315 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: Willow Station (Metro Blue Line)
Intersection: Long Beach Boulevard and 27th Street
Jurisdiction: City of Long Beach

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

Metro's Willow Station is located on Long Beach Boulevard north of downtown Long Beach. It is in a medium density urban area with many parcels under redevelopment. Typical building heights are three to four stories. The station is bordered by a shopping center and an elementary school. Two medical centers, Long Beach Memorial Medical Center and Pacific Hospital, are within a quarter mile of the station. Veterans' Memorial Park is located just north of the station. .

- Medium density urban location with many parcels currently redeveloping, typically to 3- and 4-stories.
- Land uses include a major medical center, a shopping plaza with supermarket, two elementary schools (Jackie Robinson Academy and Oakwood School), a neighborhood park (Veterans Memorial Park), and single-family residential neighborhoods.
- Topography is mostly flat except for hills to the east.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). The three-mile area around Willow Station has slightly higher than average transit service and slightly lower than average median income than other transit hubs in the County. Population density is slightly lower in comparison to other transit hubs while the number of transit riders who live in the three-mile radius is slightly above average. Our analysis of transit and bicycle ridership at Willow Station indicates that it scores 183 out of 359, or in the 51st percentile of all bike-transit hubs.

The table on the next page draws on 2000 Census data, SCAG population and employment projects for the year 2010, and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	118	Local Bus Service (Other)	1515
Metro Rail Riders	6035	Population (3 miles)	63,964
BRT Service	Future	Employment (3 miles)	68,427
Existing Transit Center	Yes	Household Income	$34,288
Metro Rapid	No	Transit Riders (3 miles)	9533

In addition, the following major activity centers and destinations are located within the study area:

- Jackie Robinson Academy on Long Beach Boulevard
- Oakwood School at Pacific Avenue and 27th Street
- Long Beach Memorial Medical Center
- Pacific Hospital of Long Beach

Bicycle Access Conditions

Key bicycle access observations include:

- The at-grade Blue Line tracks on Long Beach Boulevard present hazards for cyclists.
- To the west there is an intact, fine-grained grid of residential streets all the way to the Los Angeles River.
- Willow Street (running east-west) and Long Beach Boulevard (running north-south) are arterials with narrow lanes and on-street parking.
- Both 27th and 28th Streets are candidates for east-west connectors to the L.A. River path because both line up well with the west side of the station, cross Pacific Avenue at signals and are residential local streets west of Pacific. However, 27th connects more directly to the station, the adjacent shopping plaza, and the gated crossing of the Metro Blue line to reach the Medical Center to the east.
- Southbound Long Beach Boulevard has a pinch point approaching the tracks and an angled crossing of the two tracks.
- A 1.2-mile Class I bike path is planned along the former Pacific Electric right-of-way starting at Long Beach City College and extending northwest toward the Willow Blue line station. Due to existing development, the Class I path will not extend the entire way to the station.

Bicycle Facilities

Existing bike lanes: Spring Street east of Long Beach Boulevard
Existing bike paths: Los Angeles River bike path and proposed Pacific Electric right-of-way bikeway improvements
Existing bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
Willow Station	Composition. Locker	8	Good	Good
Willow Station	eLocker	2	Good	Good
Willow Station	Racks	16	Good	Fair
Parking garage	Lockers	16	Good	Good

Transit Connections

Transit Type	Agency	Description
Rail Lines	METRO	Blue Line
Bus Lines	METRO	60
		360
	Long Beach	51
		52
		192
		102

Existing Conditions

Pine Street approaching 28th Street

Spring Street at Long Beach Boulevard

Willow Street diagonal railroad crossing

Bike lockers at Willow Station

Bike racks at Willow Station

Willow strip mall by station garage showing bike signage

Recommended Improvements

A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

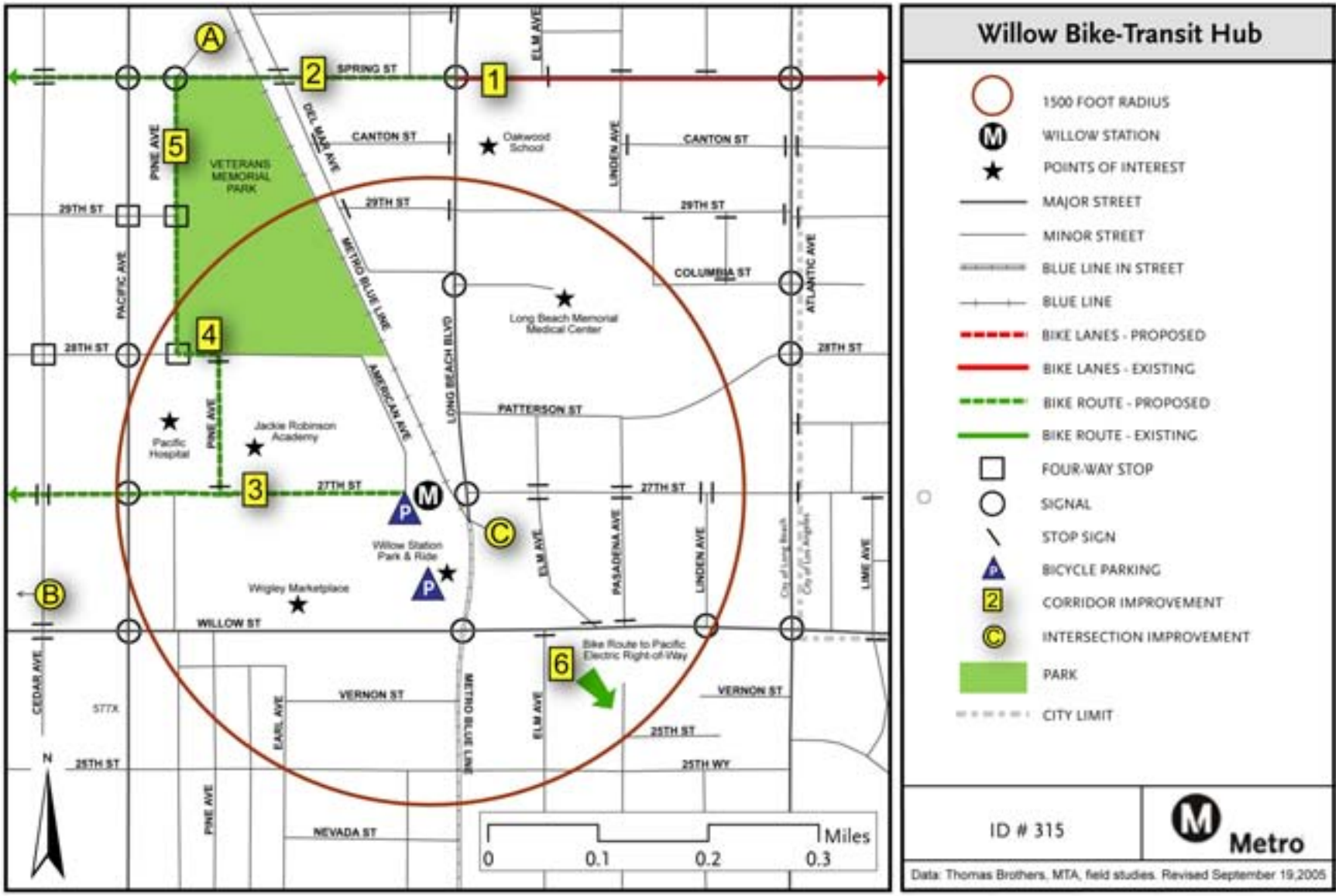
Improvements for the bicycle access routes to the Willow station are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Improve Pavement Condition	1	Spring Street: westbound at Long Beach Blvd	0.1	$10 to $20 per sq ft
Add Bike Lanes	1	Spring Street: westbound at Long Beach Blvd signal. Add through bike lane "pocket" by taking space from outer through lane	0.04	$1,000
Add bike route signage	2	Spring Street: between Long Beach Blvd and Pacific Avenue	0.21	$1,000
	3	27th Street: between LA River and Willow Station	0.84	$4,200
	4	28th Street: between east and west Pine Ave intersections	0.03	$400
	5	Pine Avenue: between Spring St and 27th St	0.38	$1,900
	6	Between Pacific Electric right-of-way Class I bike path and Willow Station – Route not yet determined. (Pacific Electric right-of-way not shown on map.)	Approx 1.25	TBD

Intersection Improvements	Map Key	Location	Estimated Cost
Provide bicycle sensitive detector loop and bicycle detection marking	On all lead positions and left turn lanes		
Install intersection improvements such as pavement markings and signage to improve cyclist left turn from Spring to Pine	A	Pine Avenue at Spring Street	Striping $2 per linear foot. Signs: $200 each.
Add directional signage to direct cyclists between Willow St. and LA River Path	B	Willow Street at LA River Path. Current access directs cyclists through the residential streets and is not clear or direct.	$200 per sign
Improve the safety of southbound Long Beach Blvd bicycle travel over the tracks.	C	Long Beach Blvd at Blue Line tracks. Install pavement markings, flexible posts, or an in-street curb to allow bicyclists to safely cross tracks at a right angle.	$200 per flexible post

Suggested Bicycle Parking
On sidewalks in retail/commercial/restaurant blocks, provide individual inverted-U's as needed; specify square tubing. ($100 per 2-bike U-rack)
On sidewalks in Wrigley Marketplace and along Willow Street retail.
Add Bike Parking Guide Signs near stations and parking garage.

Map 4 – Willow Bike-Transit Hub Recommendations



DOWNTOWN POMONA METROLINK BIKE-TRANSIT HUB

City of Pomona

DOWNTOWN POMONA METROLINK BIKE-TRANSIT HUB

Bike to Urban Commuter Rail

Hub ID: 614 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: Downtown Pomona (Metrolink)
Intersection: Main and Metrolink
Jurisdiction: City of Pomona

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

The Downtown Pomona Metrolink station is located four blocks north of downtown Pomona. The rail line that runs through Pomona carries Metrolink's Riverside line and Amtrak trains. The Amtrak station is across Main St. from the Metrolink station.

The city has an intact fine-grained street grid which connects well with the station and provides nearby at-grade crossings of the tracks. The downtown commercial and civic area is about 1/3 mile south of the tracks. Buildings in downtown are primarily four stories. North of the tracks the area becomes more residential. Holt Avenue roughly defines the commercial / residential boundary.

The major north-south arterials are Garey Avenue, White Avenue, and Towne Avenue, all of which cross the rail lines. North of the tracks, the major east-west streets are Holt Avenue, which is fairly busy, Monterey Avenue and Alvarado Street, which is about ½ mile north of the tracks. South of the tracks, the major east-west streets are 3rd Street, Mission Boulevard, and 9th Street.

- Served by Metrolink's Riverside Line and Amtrak.
- Railroad tracks divide the civic and commercial areas to the south from the residential areas to the north.
- Area characterized by a fine grained street grid.
- Topography is flat.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). While the area surrounding Downtown Pomona Station has lower than average population and employment density and higher than average median income than other transit hubs in the County, the area shows average levels of transit service. The density of transit riders that live within 3 miles of the transit hub is much lower than other transit hubs. Our analysis of transit and bicycle ridership at this location indicates that it scores 129 out of 359, or in the 36th percentile of all bike-transit hubs.

The table below draws on 2000 Census data, SCAG population and employment projections for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	1	Local Bus Service (Other)	Yes
Metro Rail Riders	346	Population (3 miles)	35,322
BRT Service	No	Employment (3 miles)	37,679
Existing Transit Center	Yes	Household Income	$43,374
Metro Rapid	No	Transit Riders (3 miles)	2403

In addition, the following major activity centers and destinations are located within the study area:

- Civic Center with City Hall, library, municipal court and fire station 1/3 mile south of transit hub.
- Western University of Health Sciences
- Pomona Catholic High School
- Amtrak Station
- Pomona Chamber of Commerce

Bicycle Access Conditions

Key bicycle access observations include:

- The railroad is not a significant barrier because it is crossed by north-south routes every two to three blocks.
- Park Avenue and Palomares Street are candidates for bike lanes south of Alvarado, extending at least to the tracks and (depending on available width) possibly south to 3rd or 9th. These streets cross busy Holt Ave. at signals. To reach either of these north-south streets from the station, a cyclist would proceed north on Main Street to Monterey, then east or west to Park or Palomares respectively.
- South of the tracks, 3rd Street and 9th Street may be candidates for east-west connectivity.
- Holt Avenue is a very busy street best avoided by cyclists.
- The ornate pedestrian overcrossing at the station (see photo below) is locked at night.

Bicycle Facilities

Existing bike lanes: None
Existing bike paths: None
Existing bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
Pomona Station	Wave	6	Good	Good

Transit Connections

Transit Type	Agency	Description
Rail Lines	Metrolink	Riverside Line Station
Bus Lines	METRO	684
	Foothill	191
		193
		195
		482
		480
		852
		855
	OMNI	161

Downtown Pomona Metrolink Station

Existing Conditions

Bike rack at station

Monterey Avenue, facing west

Intersection of Palomares Street and Holt Avenue

Pomona Metrolink Station

Alvarado Street and Park Avenue looking southbound

Intersection of Palomares Street and Holt Avenue

Recommended Improvements

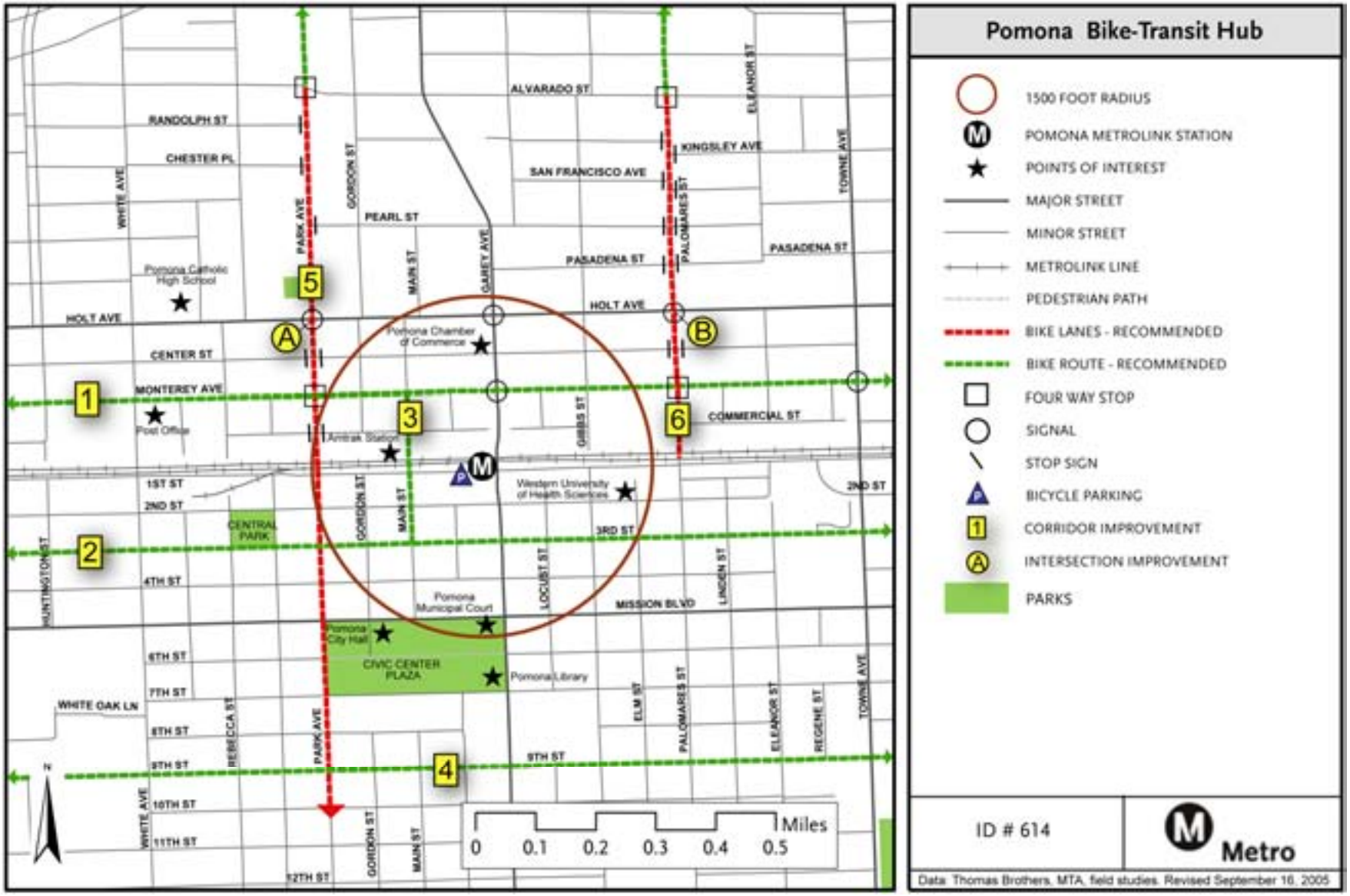
A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for the bicycle access routes to the Downtown Pomona hub are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Add Class III bike route signage and stencils. Add directional signage.	1	Monterey Ave: between White Ave and Towne Ave, extending east and west	1.22	$12,200
	2	Third St: between White Ave and Towne Ave, extending east and west	1.23	$12,300
	3	Main St: between Monterey Ave and 3rd St	0.25	$2,500
	4	9th St: between White Ave and Towne Ave, extending east and west	1.22	$12,200
Add Class II bike lanes, with bike route signage extending north of Alvarado	5	Park Ave: between 9th St and Alvarado St. Restripe to 13|10||10||10|13	1.20	$36,000
	6	Palomares St: between 9th St and Alvarado St	0.60	$18,100

Intersection Improvements	Map Key	Location	Est. Cost
Provide bicycle sensitive detector loop and bicycle detection marking	On all lead positions and left turn lanes.		
	A	Park Ave at Hold Ave.	$2,500
	B	Palomares St at Hold Ave.	$2,500
Suggested Bicycle Parking			
Add lockers at the Downtown Pomona Metrolink Station and at the Amtrak station. ($1,500 per 2-bike locker)			

Map 5 – Downtown Pomona Metrolink Bike-Transit Hub Recommendations



PALMDALE METROLINK BIKE-TRANSIT HUB

City of Palmdale

PALMDALE METROLINK BIKE-TRANSIT HUB

Bike to Suburban Commuter Rail

Hub ID: 625 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: Palmdale Transportation Center (Metrolink)
Intersection: Sierra Highway and 6th Street East
Jurisdiction: City of Palmdale

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

Metrolink's Palmdale station is near the north end of the Antelope Valley Line, which terminates at Lancaster. These two cities form the northernmost reach of the rail commute area of greater Los Angeles.

The Palmdale Transportation Center is situated on the west side of the Metrolink line at the northwest corner of an older, low-density downtown with many undeveloped and vacant parcels. West of the rail line and north of Palmdale Boulevard is mostly residential except for commercial and light industrial along 6th Street East, the street closest to the tracks. East of the rail line between Sierra Highway and the tracks is a linear park (Dr. Robert St. Clair Parkway). East of Sierra Highway between Avenue Q and Avenue R is the active area of the old downtown.

- Metrolink Antelope Valley Line station.
- Low density urban location with many undeveloped and underdeveloped parcels.
- Land uses are a combination of commercial, light industrial, and residential (mostly single-family).
- Topography is flat.
- Major barriers include the rail line (adjacent) and the CA-14 freeway (about 1 mile to the west). Palmdale Boulevard, a major commercial arterial, is also not very bike-friendly and is under Caltrans jurisdiction as SR 138.
- Barriers mostly run N-S; there are several good N-S route candidates.
- Avenue Q crosses under the freeway without an interchange.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). Compared with other transit hubs in Los Angeles County, the area surrounding the Palmdale Transportation Center has higher than average transit service, but lower population and employment densities and significantly fewer transit riders living within a three-mile radius. The median income for the area is slightly higher than the average median income of all transit hubs. Our analysis of transit and bicycle ridership at this location indicates that it scores 129 out of 359, or in the 36th percentile of all bike-transit hubs.

The table below draws on 2000 Census data, SCAG population and employment projections for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	N/A	**Local Bus Service (Other)**	Yes
Metro Rail Riders	N/A	**Population (3 miles)**	24,750
BRT Service	No	**Employment (3 miles)**	29,351
Existing Transit Center	Yes	**Household Income**	$43,659
Metro Rapid	No	**Transit Riders (3 miles)**	812

In addition, the following major activity centers and destinations are located within the study area:

- Two schools (Yucca School, Oak Tree Learning Center).
- Greenspace includes Desert Sands Park and Dr. Robert St. Clair Parkway.
- The City's Downtown is located 1 mile from the station. Downtown locations include: the Civic Center, main library, youth library, courthouse, recreation center, senior center, the Chimbole Center and the Palmdale Playhouse.

Bicycle Access Conditions

Key bicycle access observations include:

- Cyclists may access the Palmdale Transportation Center via Transportation Center Drive, 6th Street East and Clock Tower Plaza Drive.
- Residential and light commercial street grid in area provides alternative to busy east-west arterial (Palmdale Blvd.) and north-south arterial (Sierra Highway). Secondary grid has mostly wide unstriped streets that are comfortable for cycling.
- Traffic speeds on arterial are moderate to high on arterials and low to moderate on the secondary grid
- Major intersections are modest size with signals; some have through bike lanes on the minor street but no bike actuation at the intersections.
- Nearby street grid is well connected on both sides of north-south rail line, but track crossings are infrequent and could use improvement. Metro has awarded a grant for a pedestrian overcrossing at Avenue Q which will provide a strategic link across the rail line.
- Sierra Highway has wide shoulders suitable for experienced commuters but there are significant gaps in the shoulders, and its rail crossing needs "bow-outs" to enable crossing tracks at a safer angle.

Bicycle Facilities

Existing bike lanes: -6th St. E between Palmdale Ave and Transit Center
-10th St. E between Avenue R and Palmdale Blvd.
-Palmdale Blvd. westbound for 1 block between - Sierra Highway and 6th St. E (across RR tracks).

Existing bike paths: -Sierra Highway Bike Trail runs north from the station along Sierra Highway.
-Within Dr. Robert St. Clair Parkway (unsigned).

Existing bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
Palmdale Transportation Center	Racks	10	Good	Good
	Lockers	8	Good	Excellent

Transit Connections

Transit Type	Agency	Description
Rail Lines	Metrolink	Antelope Line Station
Bus Lines	Antelope Valley	1
		2
		3
		7
		8
		9
		97
		785
		786
		787
	Santa Clarita	795

Existing Conditions

Avenue Q-7 at 9th Street East

Dr. Robert St. Clair Parkway

Palmdale Transportation Center

Sierra Highway Bike Trail

Bike lane approaching Palmdale Transportation Center.
6th Street East, facing south

6th Street East, facing north

Recommended Improvements

A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for bicycle access to the Palmdale Transportation Center hub are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Install Class II bike lanes and close shoulder gaps by adding pavement	1	Sierra Highway south of Sierra Highway Bike Trail	1.08	$32,400+
Close shoulder gaps by adding pavement	2	3rd Street East	0.51	n/a
	3	Avenue Q	0.87	n/a
Widen (restripe) bike lanes	4	Palmdale Boulevard between Sierra Highway and 6th Street East	0.93	up to $14,500
Add Class II bike lanes where outside shoulder lane width allows	4	Palmdale Boulevard	0.93	up to $27,400
	5	Clock Tower Plaza Drive	0.40	$12,000
Install Class III bike route signage	6	5th St East between Avenue Q and Palmdale Boulevard	0.52	$2,600
	3	Avenue Q from west of rail line, under freeway to west terminus	0.87	$4,400

Corridor Improvements (Cont.)	Map Key	Location	Miles	Est. Cost
Install Class III bike route signage	7	9th Street East between Palmdale Blvd and Avenue Q	0.53	$2,700
	2	3rd Street East between Avenue Q and Technology Drive, with directions to Palmdale Transportation Center	0.51	$2,500
Perform regular maintenance such as sweeping	8	Sierra Highway Bike Trail between 6th Street East and Technology Drive	0.28	n/a
Restripe multi-lane segment for wider outside lane	9	Avenue Q: between 6th Street East and 5th Street East	0.9	$950
Improve pavement condition	1	Sierra Highway from Avenue Q-7 to Palmdale Boulevard	0.53	$10 to 20 per sq ft
Intersection Improvements	**Map Key**	**Location**		**Est. Cost**
Provide bicycle sensitive detector loop and bicycle detection marking	On all lead positions and left turn lanes, especially at the intersection of:			
	A	Palmdale Boulevard at 6th Street East		$2,500
Restripe arterial on both shoulders	B	6th Street East at Sierra Highway		$2 per linear foot
Move south-facing Sierra Highway Bike Trail sign to prevent blocking sightlines to the south where Trail users cross Sierra Highway east to west	C	Sierra Highway Bike Trail at Technology Drive		n/a
Fill in narrow grooves in valley gutter or re-pour gutter	D	Avenue Q-7 at 9th Street		$500+

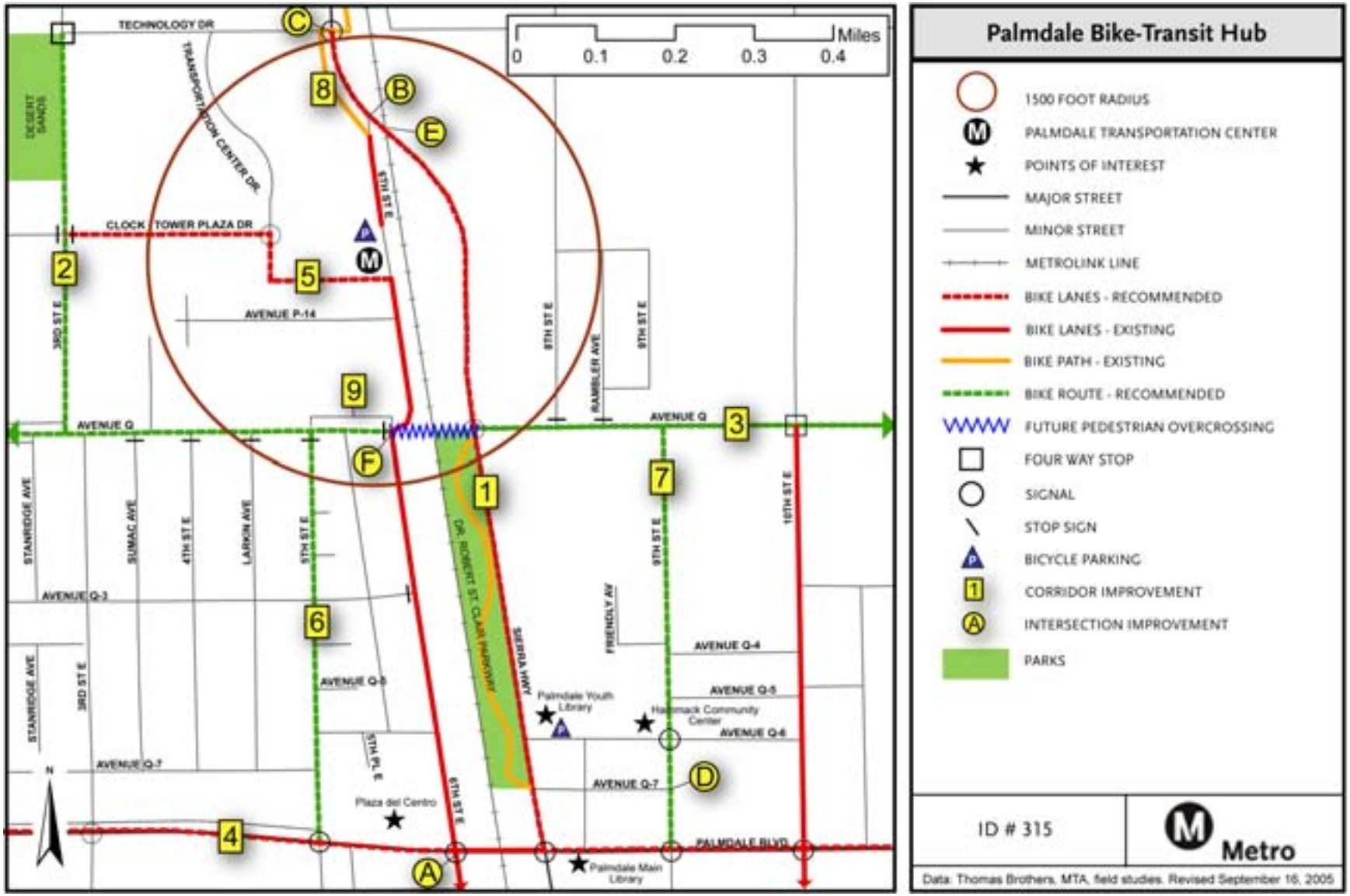
Intersection Improvements (cont'd)	Map Key	Location	Est. Cost
Provide bow-out at angled railroad crossing to enable safer crossing angle		Sierra Highway	n/a
Remove "Begin/End Bike Lane" signs		6th St East at Avenue Q	n/a
Suggested Bicycle Parking			
Provide key access (monthly rental) lockers at Palmdale Transportation Center. ($1,500 per bike locker)			

Other Notes

- 6th Street East between Avenue Q and Palmdale Boulevard is a good example of a segment for a 3-lane street with bike lanes and parking both sides.
- Catch basin inlets on Clock Tower Plaza Drive are a good example of well-designed inlets (flush with curb; no projection into gutter pan).

Metrolink Cycle Safe Lockers

Map 6 – Palmdale Metrolink Bike-Transit Hub Recommendations



EL MONTE BIKE-TRANSIT HUB

City of El Monte

EL MONTE BIKE-TRANSIT HUB

Bike to Regional Transit Center

Hub ID: 703 (Refer to the Bike-Transit Hub Data Spreadsheet)
Name: El Monte Transit Center
Intersection: Ramona Blvd. and Santa Anita Ave.
Jurisdiction: City of El Monte

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

The El Monte bike-transit hub is the east terminus of the El Monte (I-10) busway serving downtown Los Angeles. The transit center sits on a triangular area bounded by the Rio Hondo River to the northwest, the I-10 freeway to the south and Santa Anita Ave. to the east. The area east of the transit center and north of Ramona is a shopping district slated for redevelopment. . A single-family residential neighborhood is located east of the transit center, south of Ramona. Downtown El Monte is located just over half a mile to the southeast of the transit center, on the south side of the freeway. The area west of the Rio Hondo is currently commercial and light industrial, but is slated for residential redevelopment.

There are several recreational amenities adjacent to the transit center. The Rio Hondo River runs northeast-southwest just west of the hub and has a shared-use path on its east levee. Fletcher Park and Pioneer Park border the south and north sides of the transit center, respectively. The Amigos de los Rios advocacy group is collaborating with cities along the Rio Hondo and San Gabriel Rivers to develop a regional circular park network along these rivers.

- Terminus of the El Monte busway.
- Planned redevelopment for the commercial area to the east of the transit center and the neighborhood west of the River.
- Plans for development of a regional park network along the Rio Hondo and San Gabriel Rivers. (Emerald Necklace).

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center (number of daily transit users, type of service and whether the stop is a terminus or not). Compared to other transit hubs in the County, the area within a three-mile radius of the El Monte transit center had very high transit service, high employment and population densities, had slightly below average median income. The number of transit riders who live within a three-mile radius of the transit center was low compared to other transit hubs. Our analysis of transit and bicycle ridership at this location indicates that it scores 197 out of 359, or in the 55th percentile of all bike-transit hubs. The table on the next page lists the scoring for the El Monte Bike-Transit hub. Transit hub scoring serves as a way to compare transit hubs across the County.

The table below draws on 2000 Census data, SCAG population and employment projections for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	n/a	**Local Bus Service (Other)**	Yes
Metro Rail Riders	n/a	**Population (3 miles)**	93,782
BRT Service	Yes	**Employment (3 miles)**	68,180
Existing Transit Center	Yes	**Household Income**	$41,619
Metro Rapid	Future	**Transit Riders (3 miles)**	4852

In addition, the following major activity centers and destinations are located within the study area:

- Two local parks adjacent to the transit center (Fletcher and Pioneer Parks).
- El Monte Airport three-quarters of a mile northeast.
- Downtown El Monte is located half a mile to the southeast.
- Three elementary schools located within a mile of the transit hub (New Lexington, Wilkerson and Shirsper).

Bicycle Access Conditions

Key bicycle access observations include:

- One-way streets Brockway and Asher provide westbound and eastbound routes that parallel the freeway.
- Access under the freeway is possible on Santa Anita, Lexington, Tyler Avenues, and Meeker Road and via a pedestrian tunnel at Utah.
- Mildred Street provides a good east-west bike route connecting from Meeker Road, crossing Santa Anita at a light and connecting to Asher and the Rio Hondo River Path.
- Access to the Rio Hondo River Path is possible at Asher. Access gates at Fletcher Park and the transit center are locked, despite posted signs stating that gates will be locked only during storms.
- Bicycle access over the Rio Hondo is only possible at Valley Boulevard, a major east-west arterial. A direct connection across the river is needed at or near the transit center.

Bicycle Facilities

Existing bike lanes: None
Existing bike paths: Rio Hondo River Pathway
Existing Bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
Transit Center	Racks	48	Good	Good

Transit Connections

Transit Type	Agency	Description
Rail Lines	Metrolink	Riverside Line Station
Bus Lines	METRO	70
		76
		170
		176
		267
		268
		270
		376
		484
		487
		490
		577X
	Foothill	178
		269
		480/481
		482
		486
		488
		492
		494
	City of El Monte	Civic Line
		Exp-Flair Business Park

Existing Conditions

Bike racks at El Monte Transit Center

Looking at transit center from Rio Hondo Bike Path. Gate is locked.

Cut fence along Rio Hondo Bike Path, showing desire for access to park

Dark underpass along Rio Hondo Bike Path

Looking east down Brockway

Pedestrian undercrossing at Utah Avenue and the 10 freeway

Recommended Improvements

A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for the bicycle access routes to the El Monte Transit Center hub are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing.

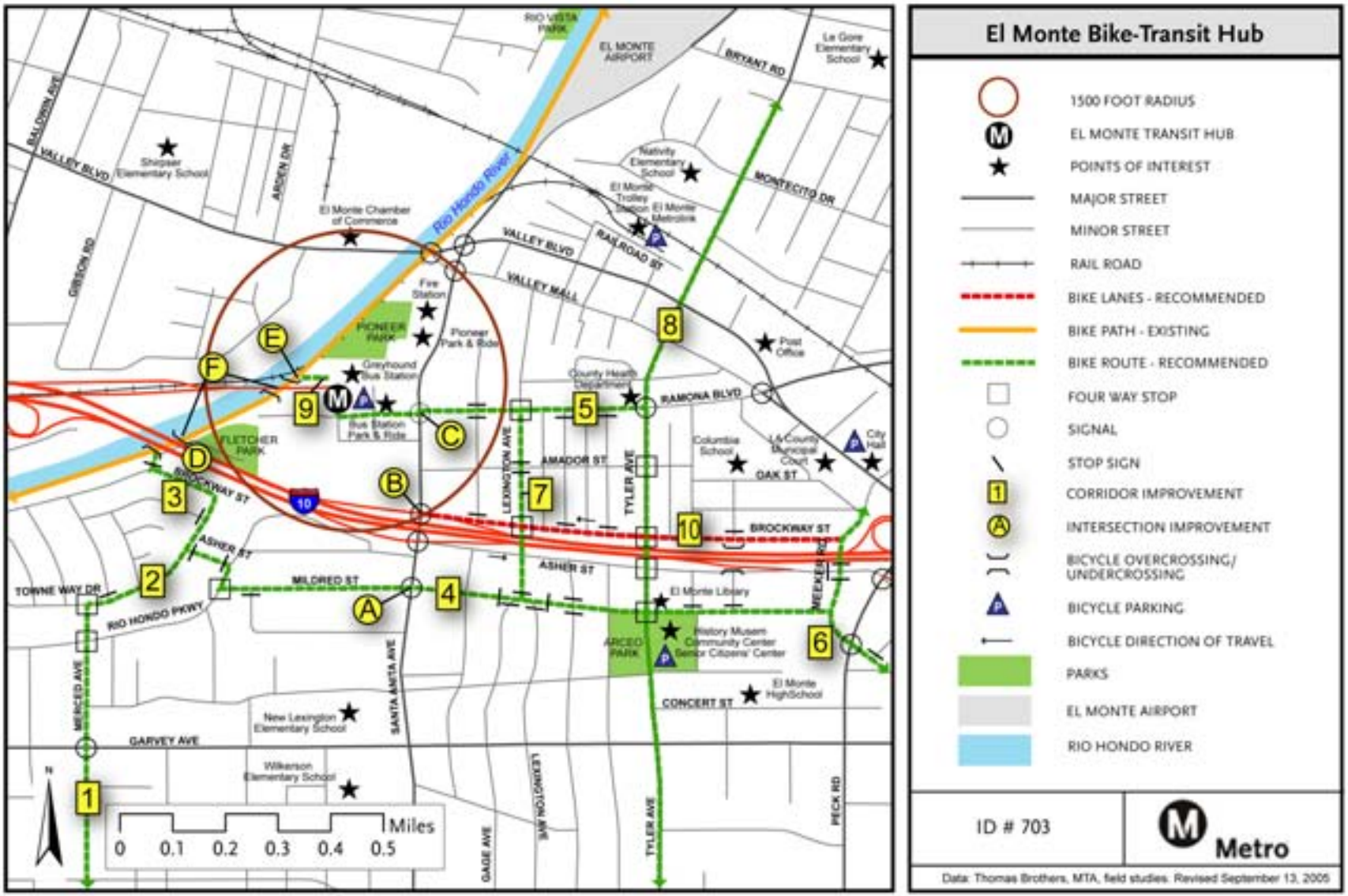
The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Add Class III bike route signage and pavement stencils. Add directional signage.	1	Merced Ave: from Towne Way Dr. south	0.54	$5,400+
	2	Towne Way Dr: from Merced Ave. to Brockway St.	0.31	$3,100
	3	Brockway St: west from Towne Way Dr connecting to Rio Hondo River Path	0.15	$1,500
	4	Mildred St: West from Meeker Rd, north on Rio Hondo Parkway, west on Asher Ave	1.09	$10,900
	5	Ramona Blvd: between Tyler Ave and the transit center	0.50	$5,000
	6	Meeker Rd: at Mildred, extending north and south	0.32	$3,200+
Add Class III bike route signage and pavement stencils. Add directional signage. Increase shoulders under I-10 freeway to 8' or consider Class II bike lanes	7	Lexington Ave: between Mildred St. and Ramona Blvd.	0.36	$3,600 to $10,800
	8	Tyler Ave: between Garvey Ave and Valley Blvd extending in both directions as appropriate	1.53	$15,300 to $45,900+
Open locked gate from the River Path and add directional signage through the parking lot to the transit center	9	Southwest corner of transit center	n/a	$1200 for six directional signs
Add Class II bike lanes	10	Brockway St: between Meeker and Santa Anita Ave. This can be accomplished by removing parking from the non-residential side and restriping the street to a 14|13|13 configuration.	0.67	$20,000

Intersection Improvements	Map Key	Location	Est. Cost
Provide bicycle sensitive loop detector and bicycle detection marking on pavement	On all lead positions and left turn lanes and specifically at:		
	A	Mildred St. at Santa Anita Ave.	$2,500
	B	Brockway St. at Santa Anita Ave.	$2,500
	C	Ramona Blvd at Santa Anita Ave.	$2,500
Open access gates to Rio Hondo River Path	D	River Path and Fletcher Park	n/a
	E	River Path and transit station	n/a
Add vandal-proof lighting	F	Rio Hondo River Path: at I-10 and Fletcher Park Driveway undercrossings.	$200 per light, plus installation

Suggested Bicycle Parking
Add lockers at the El Monte bus center. ($1,500 per 2-bike locker)

Map 7 – El Monte Bike-Transit Hub Recommendations



HARBOR TRANSITWAY (EXPOSITION PARK/USC) BIKE-TRANSIT HUB

City of Los Angeles

HARBOR TRANSITWAY (EXPOSITION PARK/USC) BIKE-TRANSIT HUB

Bike to Busway

Hub ID: 708 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: Exposition Park (USC)
Intersection: Flower Street and 37th Street
Jurisdiction: City of Los Angeles

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

The Exposition Park Transit Center is located just east of the University of Southern California, at the intersection of Flower Street and 37th Street. The transit center serves the Harbor Freeway (I-110) Transitway and provides bus access from the median of the I-110 freeway.

The area immediately surrounding the transit center is primarily parking lots. The Los Angeles DMV is located a block to the east. The University of Southern California main campus is less than a quarter mile to the northwest. The USC Campus is very bicycle-friendly, and many students bicycle from the surrounding neighborhoods to class. Exposition Park, with its museums and coliseum, are just to the west of the transit center. Student housing for USC is located a few blocks north of the transit center.

Surface streets at the transit center are designed to facilitate freeway access and are not comfortable for cyclists or pedestrians. Farther from the transit center are several streets that are good candidates for bicycle routes. To the east of the transit center, a north-east/south-west grid begins and provides good access to downtown Los Angeles.

- Transit Center serving the Harbor Freeway Transitway.
- Primarily parking lots and commercial use around area.
- Immediately adjacent surface streets designed to facilitate freeway access.
- Vermont Avenue, located to the east of USC, is one of the heaviest traveled transit corridors in Los Angeles County.
- A light rail line is planned along the median of Exposition Boulevard.
- Topography is flat.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). The Exposition Park Bike-Transit Hub has high levels of transit service and very high population and employment densities compared to other bike-transit hubs in the County. Median household income is slightly higher than the average median income of other transit hubs. Our analysis of transit and bicycle ridership at this location indicates that it scores 359 out of 359, or in the 100th percentile of all bike-transit hubs.

The table below draws on 2000 Census data, SCAG population and employment projections for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	625	Local Bus Service (Other)	Yes
Metro Rail Riders	n/a	Population (3 miles)	242,682
BRT Service	Yes	Employment (3 miles)	142,273
Existing Transit Center	Yes	Household Income	$47,888
Metro Rapid	Yes	Transit Riders (3 miles)	40,699

In addition, the following major activity centers and destinations are located within the study area:

- University of Southern California main campus.
- Los Angeles DMV.
- Exposition Park, which contains: Museum of Natural History, California Science Center, California African-American Museum, Los Angeles Memorial Coliseum, Los Angeles Memorial Sports Arena.

Bicycle Access Conditions

Key bicycle access observations include:

- Bicycle access to the transit center from northbound Flower and westbound 37th Streets are difficult. Both streets are one-way as they approach the transit center and the two right lanes are turn lanes for freeway access. To safely access the transit center, cyclists must walk bikes around three legs of the intersection, as the most direct crossing is prohibited.
- Exposition Park and USC create a barrier for cyclists as they break up the surrounding street pattern and routes through these areas do not have wayfinding signs.
- Grand Avenue is currently a good bike route from the transit center toward downtown Los Angeles.
- Exposition Boulevard and Martin Luther King Jr. Boulevard are major east-west connectors.
- Vermont Boulevard and Figueroa Street are major north-south routes. Both are heavily traveled with observed speeds of 45 to 50 mph. Vermont has very poor pavement quality on the curb lane due to the heavy bus traffic.
- Bike routes exist on Jefferson Boulevard, Vermont Avenue and Main Street, north west and east of the transit hub, respectively.

Bicycle Facilities

Existing bike lanes: None
Existing bike paths: None
Existing bicycle parking: None at the transit center

Transit Connections

Transit Type	Agency	Description
Bus Lines	METRO	442
		444
		445
		446
		447
		460
		450X
		550
	LADOT CE	438
		448
	OCTA	701
		721
	Gardena	1
	Torrance	1
		2

Existing Conditions

Harborway Transit Center at freeway grade

Harborway Transit Center at street grade

At 37th Street and Hope Street facing west, showing the prohibited pedestrian crossing

Grand Avenue facing north

Martin Luther King Boulevard, facing west

Exposition Boulevard at Figueroa Boulevard, facing east

Recommended Improvements

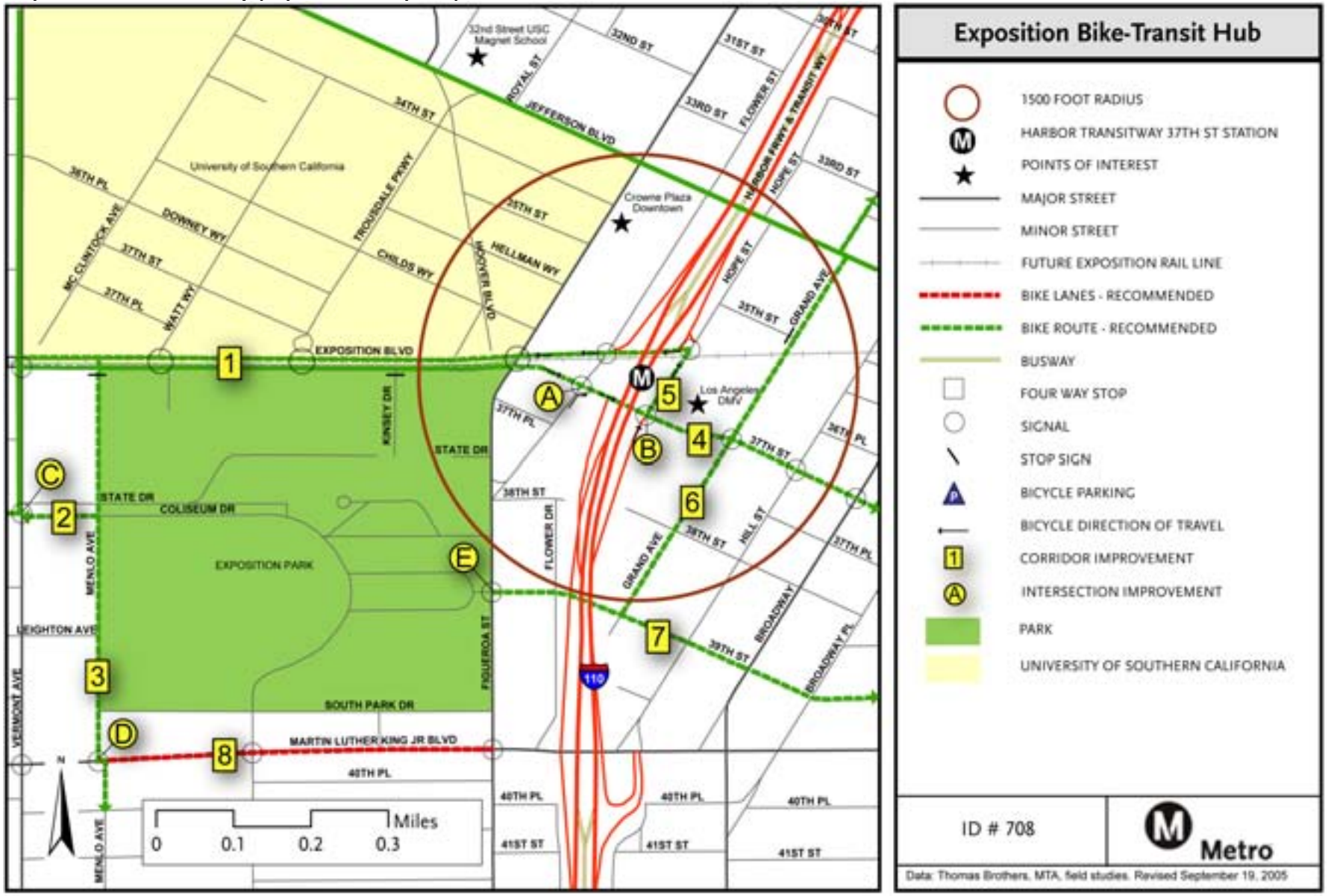
A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for bicycle access to the Exposition Park Transit Center are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The following map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Add Class III bike route signage and stencils. Add directional signage	1	Exposition Blvd: between Hope St and Vermont Ave.	0.72	$7,200
	2	39th St: from Menlo Ave west	0.13	$1,300 +
	3	Menlo Ave: from Exposition Blvd to Martin Luther King Blvd, continuing south	0.58	$5,800
	4	37th St: between Exposition Blvd and Main Street. Also repair pavement.	0.71	$7,100+
	5	Hope St: northbound on one-way section between 37th St and Exposition Blvd.	0.10	$1,000
	6	Grand Ave: from 39th St to 18th Street, east on18th Street from Grand to Main St. connecting to the bike route on Main St.	1.86	$18,600
Add Class III bike route signage and stencils. Add directional signage	7	39th St: between Main and Figueroa St.	0.45	$4,500
Add Class II Bike Lanes – traffic study needed	8	Martin Luther King Blvd: between Figueroa St and Menlo Ave. Study to see if the center turn lane can be removed. (cost given for bike lanes)	0.42	$12,700

Intersection Improvements	Map Key	Location	Est. Cost
Add fourth leg of cross walk, install pedestrian/bicycle actuated signal and signage enabling cyclists to use crosswalk	A	Flower St and 37th St: Install east crosswalk across 37th. Adjust signal timing to prevent conflicts between pedestrians and cars turning right from Flower onto 37th.	$5,000 +
	B	37th St and Hope St: Install north crosswalk across 37th. Adjust signal timing to prevent conflicts between pedestrians and cars turning right from 37th onto Hope	$5,000 +
Provide bicycle sensitive detector loop and bicycle detection marking	On all lead positions and left turn lanes, and especially at the following intersections:		
	C	On 39th St at Vermont Ave	$2,500
	D	On Menlo Ave at Martin Luther King Blvd	$2,500
	E	On 39th St at Figueroa St	$2,500
Suggested Bicycle Parking			
Provide bike lockers at surface level of transit center. Ensure that they are located in a visible, well-lit spot. ($1,500 per 2-bike locker)			

Map 8 – Harbor Transitway (Exposition Park/USC) Bike-Transit Hub Recommendations



LAX BIKE-TRANSIT HUB

City of Los Angeles

LAX BIKE-TRANSIT HUB

Bike to Metropolitan Airport

Hub ID: 711 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: Lax City Bus Center (Metro Bus)
Intersection: Airport Way at 96th Street (LAX Lot C)
Jurisdiction: City of Los Angeles

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

The LAX City Bus Center is a bus transit center located next to the Los Angeles Airport (LAX) near the intersection of Airport Boulevard and 96th Street. The Bus Center is located at LAX Parking Lots C and D and is a transfer point between the airport bus system and the municipal and Metro bus systems. The surrounding land uses are primarily airport-oriented services, such as rental car operations, hotels and parking.

The surrounding area is characterized by a grid of major arterials. Manchester Boulevard runs east-west about 4/5 of a mile north; Century Boulevard runs east-west two blocks south. Bordering the area on the west is Sepulveda Boulevard and on the east is Aviation Boulevard. These roads are very heavily traveled, and intimidating to all but the most experienced cyclists. Sepulveda and Aviation connect south to bike lanes on Imperial Highway, but Sepulveda passes under the Airport's south runways through an underpass that is closed to cyclists.

A master plan for Los Angeles Airport was adopted in 2004. The plan calls for extensive changes to ground transportation to the airport, including construction of a people mover that would connect Metro Green Line Aviation Station and regional and local buses to the central airport terminal. The City Bus Center will likely change dramatically in the next 5-7 years as the plan is implemented. These recommendations are based on existing conditions.

To the north of the bus center, accessible via Jenny Avenue and Westchester Parkway, lies a residential section of Westchester, the Westchester Branch Library, and Westchester Center.

- Located at LAX Parking Lots C and D.
- Transfer point between LAX bus and local/Metro buses.
- Surrounded by grid of heavily traveled arterials.
- Residential area of Westchester located half a mile north.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service, and whether or not the stop is a terminus). The LAX City Bus Center bike-transit hub has higher than average employment densities and transit service than other transit hubs in Los Angeles County. The density of transit riders and residents that live within three miles of the hub is lower than the countywide average. The median income of the surrounding area is also lower than the average transit hub. Our analysis of transit and bicycle ridership at this location indicates that it scores 141 out of 359, or in the 39th percentile of all bike-transit hubs.

The table below draws on 2000 Census data, SCAG population projections for the year 2010, LAX employment figures, and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	846	Local Bus Service (Other)	Yes
Metro Rail Riders	N/A	Population (3 miles)	45,737
BRT Service	No	Employment (3 miles)	59,000
Existing Transit Center	Yes	Household Income	$35,598
Metro Rapid	Future	Transit Riders (3 miles)	4634

In addition, the following major activity centers and destinations are located within the study area:

- Los Angeles International Airport
- Numerous hotels and rental car agencies
- Westchester Center
- Escuela de Montessori

Bicycle Access Conditions

Key bicycle access observations include:

- The bus center is situated within a 1 mile grid of major arterials: Manchester Avenue, Century Boulevard, Aviation Boulevard and Sepulveda Boulevard.
- Sepulveda Boulevard crosses under the Airport through an underpass that is closed to cyclists. The underpass is in Caltrans jurisdiction.
- Almost a mile south, Imperial Highway carries bike lanes and connects to the South Bay Bike Path, which runs south from Santa Monica along the Ocean.
- Westchester Parkway/Arbor Vitae Street provides east-west connectivity. Arbor Vitae connects to the City of Inglewood to the east.
- 96th Street, where the bus center is located, has two travel lanes in each direction with wide (18-foot) outside lanes. It is a main route for several airport and rental car shuttle buses.
- Cyclists using this bus center could be grouped into three types: those who are bicycling to the airport and will be leaving their bicycle at the bus center or disassembling it to take on the plane; those who are arriving on a plane and will be bicycling away from the airport; and those who are cycling to and from employment at the airport.
- Cycling to, from and around the airport could be further improved with a "bike-station" area that provides amenities such as bicycle parking, storage, repairs, changing/restroom. Cyclists would also benefit from improved access signage and area maps that provide route and destination information for employees and travelers. The bike-station may be most appropriate at the planned Intermodal Transportation Center at Metro Green Line's Aviation station, 1.5 miles south of the City Bus Center.

Bicycle Facilities

Existing bike lanes: Imperial Blvd (1 mile south of transit center)
Existing bike paths: North-south bike path 2 miles west of the airport
Existing bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
Lot C	Plastic Madrax 2-door lockers	16	Fair	Good
Lot C	Inv-U	10	Good	Good

Transit Connections

Transit Type	Agency	Description
Bus Lines	METRO	111
		115
		117
		315
		625
	Torrance	8

Existing Conditions

Metro Local Bus with Bike Rack

Bike cabled to pole with lockers in background

Lockers at Bus Center

Lockers with Bus Center Terminal in background

Bike Racks

City Bus Center Terminal

Recommended Improvements

A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for the bicycle access routes to the LAX City Bus Center are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

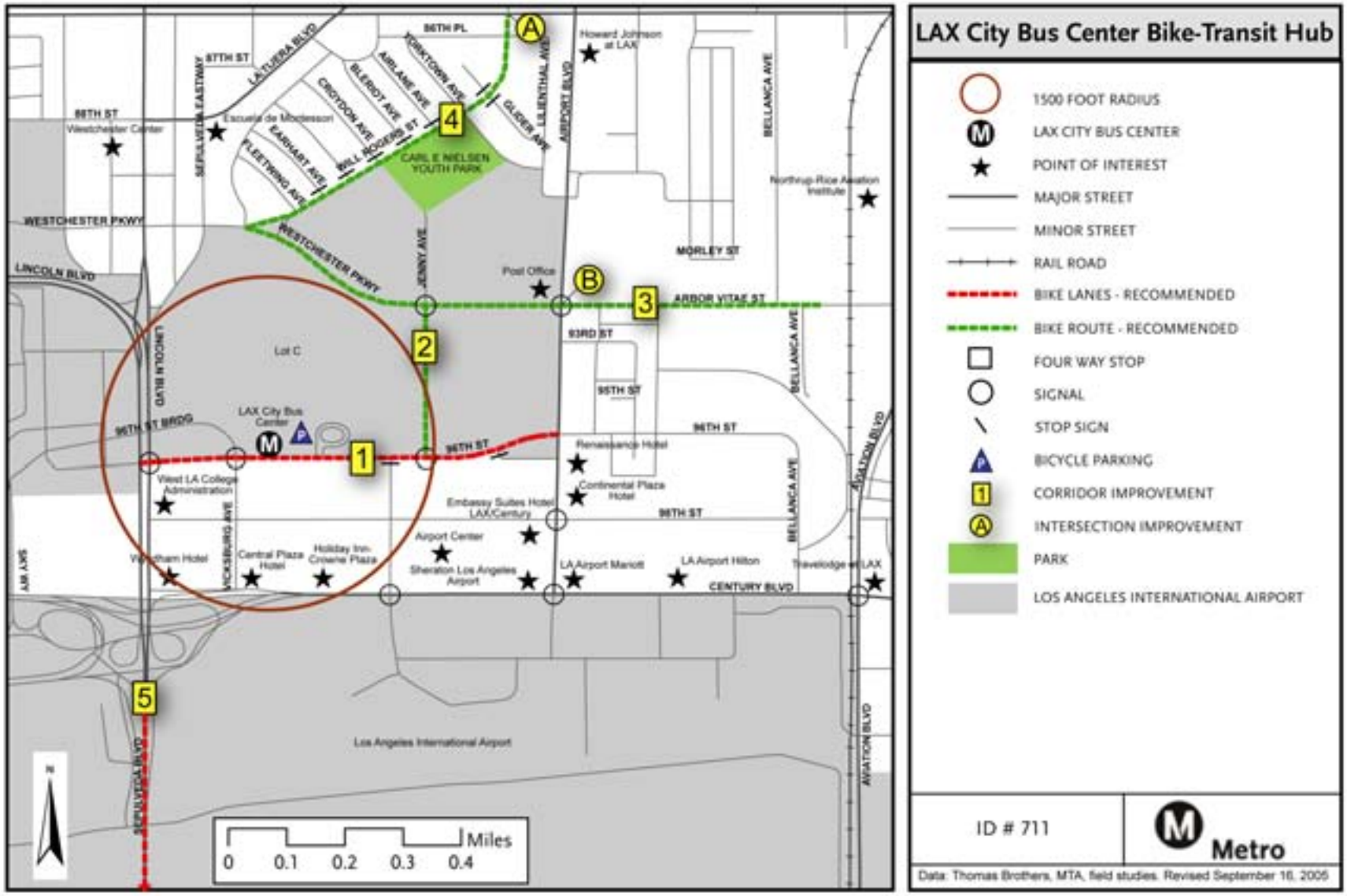
Corridor Improvements	Map Key	Location	Miles	Est. Cost
Install Class II bike lanes	1	96th Street between Airport Boulevard and Sepulveda	0.60	$18,100
Install Class III bike route signage and stencils	2	Jenny Avenue between Westchester Parkway and 96th Street	0.26	$2,600
	3	Arbor Vitae Street/Westchester Parkway between Will Rogers Street and Bellanca Avenue.	0.86	$8,600
	4	Will Rogers Street between Westchester Parkway and West Manchester Avenue	0.56	$5,600
Install Class II bike lanes or additional curb width in both directions as part of tunnel rehabilitation	5	Sepulveda Tunnel under LAX runway	0.25	TBD

Intersection Improvements	Map Key	Location	Est. Cost
Provide bicycle sensitive detector loop and bicycle detection marking	On all lead positions and left turn lanes. These improvements are specifically needed at the following intersections:		
	A	Will Rogers Street and West Manchester Avenue	$2,500
	B	Arbor Vitae Street and Airport Boulevard.	$2,500
Suggested Bicycle Parking			
Provide employee racks in Lot D, behind security perimeter protected from vehicles with bollards. ($100 per 2-bike U-Rack, $200 per bollard, plus installation)			
Convert/replace current rental lockers with smart lockers, ideally with a remote reservation system. ($1,500 per bike locker, plus installation costs)			
Install bike racks at the bus shelter ($100 per 2-bike U-lock, plus installation costs)			
Install signage on lockers to inform cyclists who they can contact regarding locker rental.			

Other Notes

- Workstand clamps could be installed near the airport shuttle building. This would allow cyclists who are arriving from LAX with their stored bicycles to rebuild the bicycles before riding off. This would also allow cyclists who are riding to the airport the ability to disassemble their bicycles and box them before accessing the airport via the shuttle bus.
- Though retrofitting the Sepulveda Boulevard underpass to allow cyclists will be difficult, this route provides key north-south access and retrofitting should be considered as a long-term project.

Map 9 – LAX Bike-Transit Hub Recommendations



INGLEWOOD BIKE-TRANSIT HUB

City of Inglewood

INGLEWOOD BIKE-TRANSIT HUB

Bike to Metro Rapid and Local Bus at Neighborhood Transit Center

Hub ID: 705 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: Inglewood Bus Center (Metro Bus)
Intersection: La Brea Avenue and Kelso Street
Jurisdiction: City of Inglewood

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

The Inglewood Bus Center is located in Inglewood's historic and revitalizing downtown commercial district, atop a low hill surrounded by relatively flat terrain except to the north. The Bus Center is a bus turnaround and layover area on the east side of La Brea Avenue at Kelso Street. The district is approximately bounded on the east by Prairie Avenue, on the south by Arbor Vitae Street, on the west by Fir Avenue and on the north by Florence Avenue. La Brea Avenue runs north-south and divides the commercial district from the civic center west of La Brea Avenue. Manchester Boulevard runs east-west through the commercial district and is a key cross-town arterial for the Los Angeles region. Most intersections within the study area are controlled by signals or four-way stops.

Approximately one-half mile east of the bus center, the land use changes sharply from small-scale commercial to large-scale regional entertainment venues. East of Prairie Avenue are the Great Western Forum, the Hollywood Park racetrack, and the Hollywood Park Casino. North of these complexes are Daniel Freeman Hospital, the Inglewood Park Cemetery, and the 51-acre Vincent Park. The City proposes to build a bicycle path along the Park's south edge.

- Located in downtown Inglewood.
- Bus Center is on top of a low hill surrounded mostly by flat terrain.
- Most streets controlled by signals or four-way stops.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). Compared to other transit hubs in Los Angeles County, the area around Inglewood Bus Center has higher than average transit service and employment, average transit ridership, and higher than average median income. Our analysis of transit and bicycle ridership at this location indicates that it scores 183 out of 359, or in the 51st percentile of all bike-transit hubs. Transit hub scoring serves as a way to compare transit hubs across the County.

The table below draws on 2000 Census data, SCAG population and employment projections for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	n/a	**Local Bus Service (Other)**	Yes
Metro Rail Riders	n/a	**Population (3 miles)**	94,324
BRT Service	Future	**Employment (3 miles)**	84,916
Existing Transit Center	Yes	**Household Income**	$52,544
Metro Rapid	Yes	**Transit Riders (3 miles)**	7515

In addition, the following major activity centers and destinations are located within the study area:

- Hollywood Park Casino
- Great Western Forum
- Hollywood Park Racetrack
- Caroline Coleman Stadium
- Daniel Freeman Hospital
- Downtown Inglewood (City Hall, Police and Fire Stations, Library, Juvenile Court)
- Inglewood High School
- Inglewood Park Cemetery
- Vincent and Rogers Parks

Bicycle Access Conditions

Key bicycle access observations include:

- Pincay Drive is a good candidate for a bike route as an alternative to the heavily traveled Manchester Boulevard. It passes through the Great Western Forum and Hollywood Park area.
- Kelso Street is a bike route to the west of the bus center. The street comes to a T at the bus center, and then continues to the east of the bus center. The eastern half of Kelso is a bike route candidate as it crosses Prairie Avenue at a signal. Kelso Street becomes Pincay Drive after crossing Prairie.
- Hillcrest Boulevard, which runs along the hilltop between Florence and Manchester, is a bike route candidate.
- Eucalyptus Avenue is a bike route candidate as it crosses Manchester Boulevard and Florence Avenue at signals.
- Arbor Vitae Street and Florence Avenue are candidates for bike lanes.
- The remaining streets in the commercial district form a fine-grained grid with mostly signal and all-way-stop control; speeds are low to moderate so all streets are good for bicycling.
- The city plans to modify the street connectivity of the block where La Brea meets Spruce Avenue and Market Street.
- The City is planning to reconstruct La Brea Avenue from Florence Avenue to Century Boulevard and is studying the feasibility of installing bike lanes south of Hillcrest Boulevard as part of this reconstruction.

Bicycle Facilities

Existing bike lanes: None
Existing bike routes: Kelso Street from bus center west
Existing bike paths: None
Existing bicycle parking: None

Transit Connections

Transit Type	Agency	Description
Bus Lines	METRO	40
		111
		211
		212
		442
		711
		740

Existing Conditions

Inglewood Bus Center, looking south on La Brea Avenue

Inglewood Bus Center bus turnaround

Facing east on Arbor Vitae Street at Myrtle Avenue

Facing north on Market Street

Market Street with “bicycles prohibited” sign on lamp post

Path to the Bus Center

Recommended Improvements

A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map at the end of this document. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

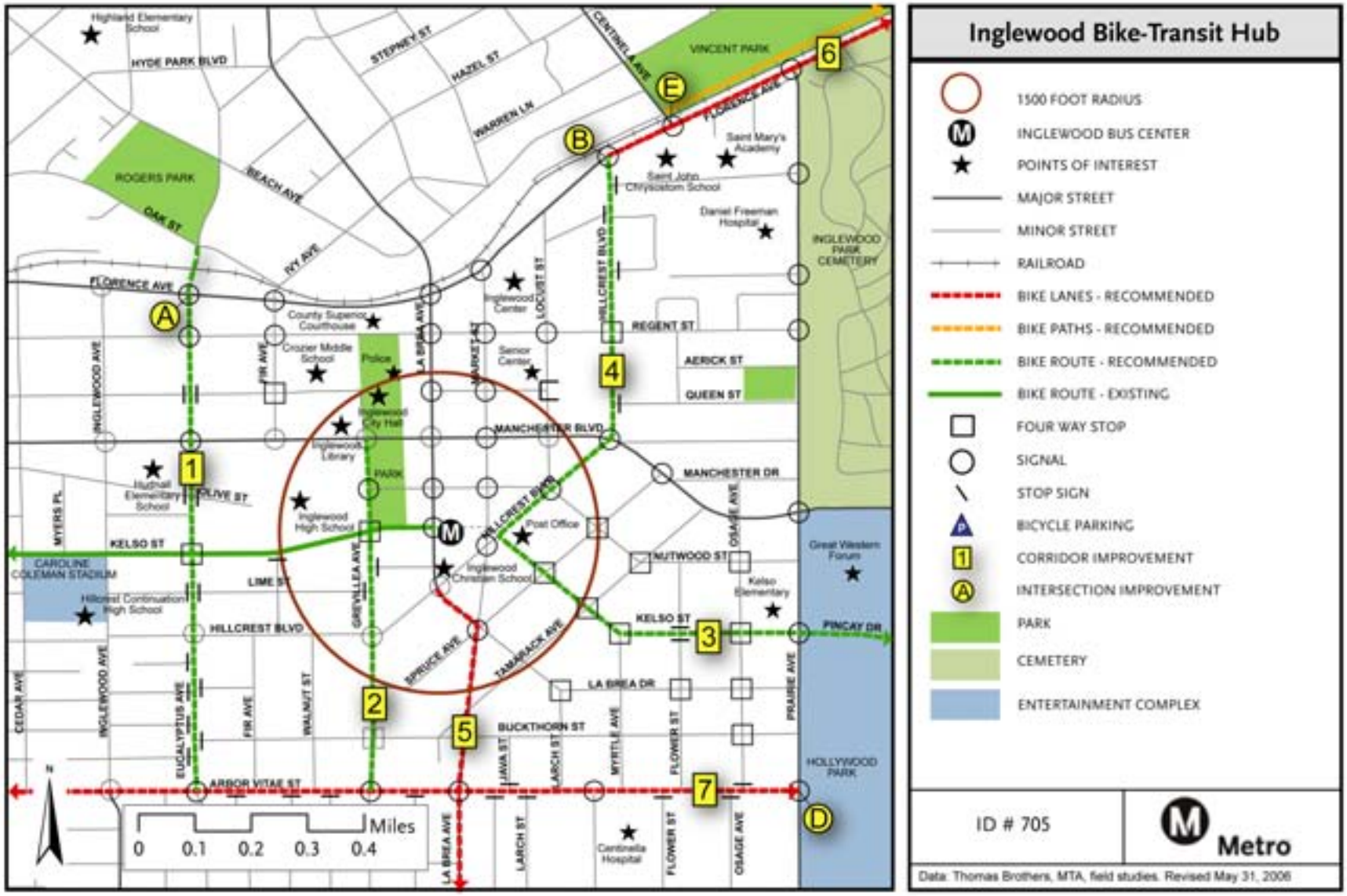
Improvements for the bicycle access routes to the Inglewood Bus Center are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing.

The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Add Class III bike route signage and stencils. Add directional signage	1	Eucalyptus Ave: Arbor Vitae St. to Rogers Park	0.88	$8,800
	2	Grevillea Ave: Arbor Vitae to Manchester Blvd	0.62	$6,200
	3	Kelso/Pincay Dr: Hillcrest Blvd to Prairie Ave, continuing east	0.64	$6,400
	4	Hillcrest Blvd: Florence to Kelso	0.74	$7,400
Add Class II bike lanes	5	La Brea Ave: Hillcrest Blvd to Hardy St, continuing south	0.64	$19,100
	6	Florence Ave: from Hillcrest Ave East. Bike lanes recommended as a less costly alternative to Class I path in park.	0.48	$14,423
Add Class II bike lanes	7	Arbor Vitae St from Prairie Ave to Eucalyptus Ave, continuing west. Restripe to 12|11||11|12 or 13|10||13|10	1.16	$30,900

Intersection Improvements	Map Key	Location	Est. Cost
Provide bicycle sensitive detector loop and bicycle detection marking		On all lead positions and left turn lanes, especially at the following intersections:	
	A	On Eucalyptus Ave at Florence Ave	$2500
	B	Hillcrest Blvd. and Florence Ave.	$2500
	C	On Kelso and 90th at Prairie	$2500
	D	On Arbor Vitae St at Prairie	$2500
Ensure that the planned bike path in Vincent Park connects to the street.	E	Centinela and Florence Avenues.	n/a
Suggested Bicycle Parking			
Install bike racks at transit hub. ($100 per 2-bike U-rack)			
Install bike lockers at transit hub. ($1,500 per 2-bike locker)			
Install inverted-U racks in front of businesses in downtown area. Recommend square tubing to prevent theft. ($100 per 2-bike U-rack)			

Map 10 – Inglewood Bike-Transit Hub Recommendations



SOUTH GATE BIKE-TRANSIT HUB

City of South Gate

SOUTH GATE BIKE-TRANSIT HUB

Bike to Metro Rapid and Local Bus at Commercial Center

Hub ID: 1009
Name: South Gate (Refer to Bike-Transit Hub Data Spreadsheet)
Intersection: Atlantic Avenue and Firestone Boulevard
Jurisdiction: City of South Gate

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

The South Gate Hub is located at the intersection of Atlantic Avenue and Firestone Boulevard in a commercial area in the City of South Gate just south of the Cudahy/South Gate border. The transit hub is served by Metro Rapid and Metro local bus service. It is slated to become a transit center in the future.

The land use in the study area is primarily commercial and industrial to the north and northeast, with a residential area south of Southern Avenue and west of South Gate Park. Shultz steel occupies a large parcel of land adjacent to the Los Angeles River. Union Pacific Rail lines cross through the study area, intersecting just a quarter-mile northwest of the transit center. South Gate Park is located a quarter-mile southwest of the transit hub. Plans for redevelopment of a parcel north of Firestone Boulevard and west of Atlantic Avenue include a college.

Two off-road paths are nearby. A utility corridor running east-west, parallel to Southern Avenue, serves as the location of the Southern Avenue Bicycle and Pedestrian Path. This 10-foot-wide concrete path is used by students to reach a middle school located at the intersection of Otis Street and Southern Avenue. The Los Angeles River Bike Path runs north-south about a half-mile east of the transit hub. During the field study, access to the river path was possible through Firestone Boulevard.

- Two rail lines cross the study area.
- Land use primarily commercial and industrial.
- Class II bike paths located along Los Angeles River and parallel to Southern Avenue.
- The area north of Firestone Boulevard and west of Atlantic Avenue is slated for redevelopment.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). Compared to other transit hubs in Los Angeles County, the South Gate transit hub has slightly higher than average transit service levels, higher employment, population, and transit ridership densities, and lower median income within a three-mile radius. Our analysis of transit and bicycle ridership at this location indicates that the transit hub scores 194 out of 359, or in the 54th percentile of all bike-transit hubs. Transit hub scoring serves as a way to compare transit hubs across the County.

The table below draws on 2000 Census data, SCAG population and employment projections for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	2246	**Local Bus Service (Other)**	Yes
Metro Rail Riders	N/A	**Population (3 miles)**	79,622
BRT Service	No	**Employment (3 miles)**	72,448
Existing Transit Center	Future	**Household Income**	$35,224
Metro Rapid	No	**Transit Riders (3 miles)**	10,899

In addition, the following major activity centers and destinations are located within the study area:

- South Gate Civic Center on Otis Street near Firestone Boulevard
- South Gate Park and South Gate Golf Course
- Three elementary schools (Tweedy and Bryson Avenue Schools are in South Gate, Park Avenue School is in Cudahy)
- Schulz Steel on Rayo Avenue

Bicycle Access Conditions

Key bicycle access observations include:

- Existing bicycle amenities provide good bicycle access east-west along Southern Avenue to the north-south Los Angeles River Path, but do not connect directly to the transit hub or nearby worksites. The Southern Avenue Bicycle Pedestrian Path does not directly connect with Atlantic Avenue.
- Firestone Boulevard has heavy traffic and on-street parking and is a difficult street to bicycle on. It is the most direct east-west route from the transit center and is the only road that crosses the Los Angeles River within a mile of the transit center.
- Atlantic Avenue has heavy traffic and on-street parking, and is also a difficult street to bicycle on. It is the most direct route north from the transit center over the railroad tracks and south to the bike lanes on Southern Avenue.
- The LA River path is accessible from ramps connecting Firestone Boulevard and the Firestone Boulevard Bridge with the path.
- Southern Avenue runs along South Gate Park and provides access to the Los Angeles River Path. West of Atlantic, it is paralleled by the Southern Avenue Bicycle and Pedestrian Path. This path runs along a power line corridor and curves away from Southern Avenue to avoid the power line towers approximately every third street. The intersections of the path and the perpendicular residential streets have blind spots due to parking, and are in need of safety improvements such as bulb-outs or median refuge islands.
- There may be an opportunity for a direct connection from Shultz Steel to the Los Angeles River Path for steelworkers.

Bicycle Facilities

Existing bike lanes: Southern Avenue between Los Angeles River and Vosller Avenue

Existing bike paths: Los Angeles River Path
Southern Avenue Bicycle and Pedestrian Path

Existing bicycle parking: None

Transit Connections

Transit Type	Agency	Description
Bus Lines	METRO	115
		260
		315
		361

Existing Conditions

Bike Trailer on Atlantic Avenue at Ardine Street

LA River Bike Path approaching Firestone Boulevard

Atlantic Avenue south of Firestone Boulevard, facing south

Southern Avenue, facing east

A worker uses a bicycle on Rayo Avenue near Schulz Steel

Hildreth Avenue at Southern Avenue, showing Southern Avenue Bicycle and Pedestrian Path

Recommended Improvements

A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for bicycle access to the South Gate hub are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Stripe Class II bike lanes	1	Salt Lake Avenue between Atlantic Avenue and Ardine Street (City of Cudahy) Restripe to 6|14|14|6	0.21	$6,300
	2	Atlantic Avenue between Salt Lake Avenue and Ardine Street (City of Cudahy) Bike lanes can be accommodated by removing parking on one side and restriping to 11 foot lanes and 11 foot turn lane or removing parking on both lanes and restriping to 12 foot lanes.	0.11	$3,300
Install Class III bike route pavement markings and signage	3	Salt Lake Avenue between Ardine and Santa Ana Street (City of Cudahy)	0.27	$2,700
	4	Firestone Place between Rayo Avenue and Firestone Boulevard	0.22	$2,200
To eliminate intersection conflicts on existing Class I bike paths, install Class III bike route pavement markings and signage. Eliminate center turn lane, restripe lanes to 16' westbound and 23' eastbound with parking. Add turn pockets.	5	Southern Avenue between Atlantic Avenue and Otis Street.	0.87	$36,100
Extend Southern Avenue Bicycle Pedestrian Path to Atlantic Avenue	6	Utility corridor from Burke Avenue to Atlantic Avenue	0.25	$139,400
Consider creating bicycle routes, lanes or paths through the redevelopment area north of Firestone and west of Atlantic	7	East-west route through redevelopment area, connecting to Atlantic Avenue, possibly along Mason Street.	0.57	$5,700
	8	North-south route through redevelopment area, connecting Salt Lake Avenue to Mason Avenue	0.20	$2,000
Study the feasibility of narrowing inside travel lane to give width to the outside lane and/or removing parking on one or both sides of street	9	Atlantic Avenue between Salt Lake Avenue and Firestone Street	0.24	n/a
Restripe road to provide more outside width for cyclists	10	Atlantic Avenue between Firestone Boulevard and Southern Avenue Narrow inside lane from 12' to 11', widening the outside lane and parking to 21'	0.41	$13,000
	11	Rayo Avenue from Southern Avenue to north end of street. Restripe to 13|14|14|13	0.65	$19,400

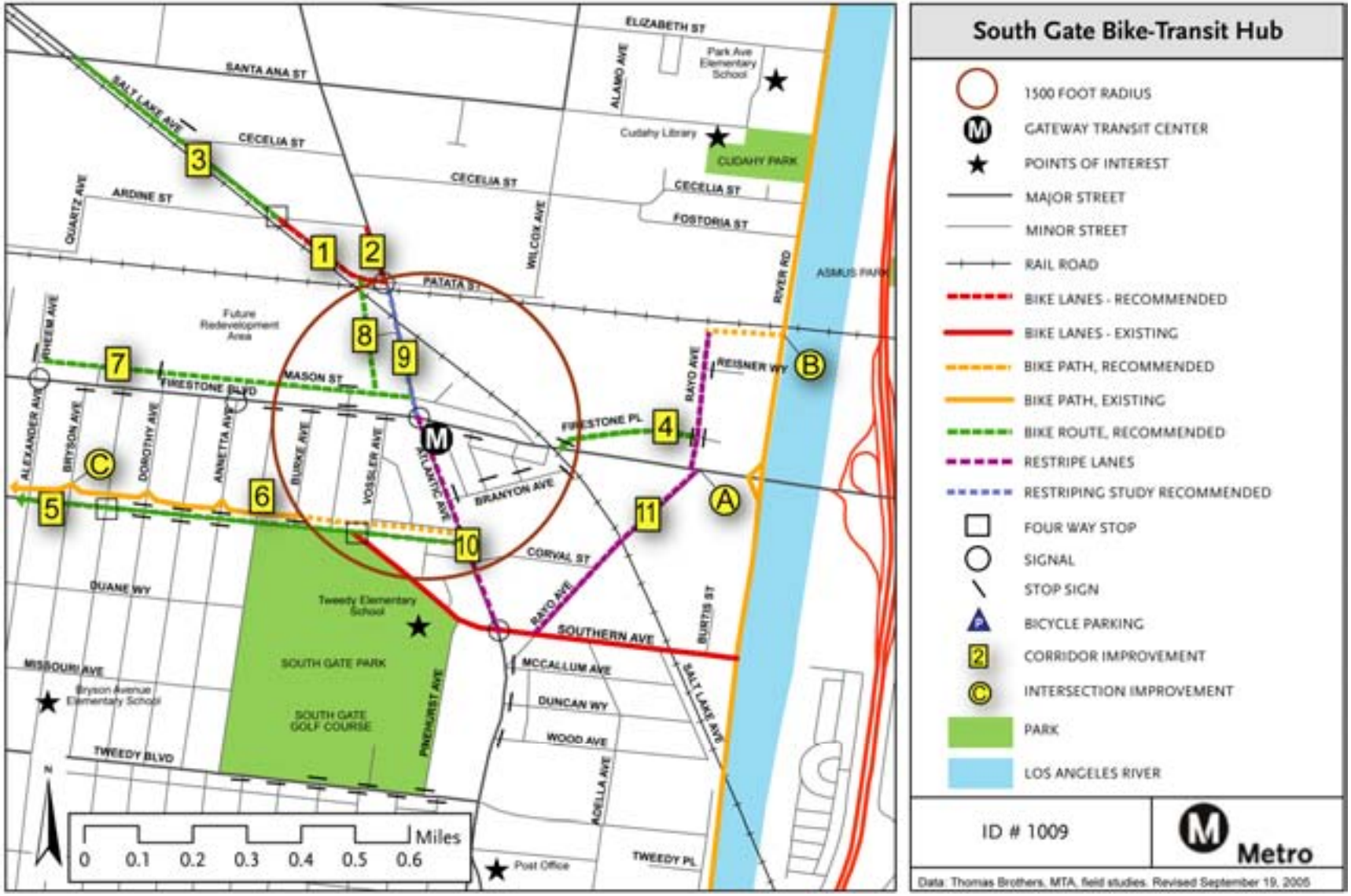
-continued-

Intersection Improvements	Map Key	Location	Est. Cost
Provide bicycle sensitive detector loop and bicycle detection marking	On all lead positions and left turn lanes and especially at :		
	A	Rayo Avenue at Firestone Boulevard	$2,500
Install directional signage	B	LA River path at Schulz Steel	$200 per sign (4 signs)
Install crossing improvements such as bulb outs or medians along length of Class I bikeway	C	Utility corridor Class I path parallel to Southern Avenue	$15,000 per bulb-out (8 bulb-outs)

Other Notes

- Proposed redevelopment in the area north of Firestone Boulevard and west of Atlantic Avenue includes a college. Future plans for any educational facilities in the area should include accommodations for bicycles. Both a north-south and an east-west route through the redevelopment area are recommended. The north-south route, if connected to Salt Lake Avenue and Mason Avenue, could provide a safer alternative to Atlantic Avenue.
- Atlantic Avenue is a difficult route to bicycle on due to high traffic volumes, narrow lanes and on-street parking, and as such is not recommended as a bicycle route. Improvements to this street are limited as it is in a commercial area which requires parking. However, between Firestone Boulevard and Southern Avenue it may be possible to narrow the inside lane by a foot and thereby provide an extra foot to cyclists sharing the outside lane with motorists.
- Improvements 1, 2, and 4 on Salt Lake Avenue and Atlantic Avenue north of Firestone are in the jurisdiction of the City of Cudahy.
- Encourage Shultz Steel to install bike route signage from Los Angeles River Path to the factory and bike parking to allow workers to bike to work.

Map 11 – South Gate Bike-Transit Hub Recommendations



SOUTH BAY GALLERIA BIKE-TRANSIT HUB

City of Redondo Beach

SOUTH BAY GALLERIA BIKE-TRANSIT HUB

Bike to Metro Rapid and Local Bus at Commercial Center

Hub ID: 722 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: South Bay Galleria (Metro Bus)
Intersection: Kingsdale Ave. and Artesia Blvd.
Jurisdiction: City of Redondo Beach

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

South Bay Galleria is a major regional shopping mall in Redondo Beach. The transit center is a bus turnaround / layover on the mall side of Kingsdale Avenue between Grant Avenue and Artesia Boulevard; the mall's west parking garage forms the east wall of the transit center area.

The mall is bounded on the north and east by two major arterials with raised medians: Artesia Boulevard and Hawthorne Boulevard. To the south and west, it is bounded by smaller 182nd Street and Kingsdale Avenue. There are signals at all four corners. Within these four streets, much of the mall property is given over to parking.

Streets within the study area form a rough grid but are broken by the mall, the Pacific Crest Cemetery, railroad tracks and a freeway. A block to the west of the transit center, the Burlington Northern Santa Fe Rail Road tracks run north-south and reduce access to the residences to the west. Grant Avenue runs under the tracks from the west and connects directly to the transit center. Less than a mile northeast of the transit center, the San Diego Freeway (405) creates another barrier to bicycles. Redondo Beach Boulevard runs under the freeway.

East of Hawthorne Boulevard and west of the railroad tracks the land use changes dramatically to residential.

- Terminus of 740 Metro Rapid.
- Major barriers include BNSF Railroad tracks and 405 Freeway.
- Located at the South Bay Galleria, a major regional shopping center.
- Within half a mile of surrounding residential areas.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). The South Bay Galleria bike-transit hub shows below average transit ridership levels compared to other transit hubs in the County. It shows much higher median incomes than the other transit hubs, and somewhat higher population and higher employment density. Our analysis of transit and bicycle ridership at this location indicates that it scores 123 out of 359, or in the 34th percentile of all bike-transit hubs.

The table on the next page draws on 2000 Census data, SCAG population and employment projects for the year 2010, and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	not available	Local Bus Service (Other)	Yes
Metro Rail Riders	not applicable	Population (3 miles)	64,285
BRT Service	No	Employment (3 miles)	60,749
Existing Transit Center	Yes	Household Income	$63,740
Metro Rapid	Yes	Transit Riders (3 miles)	3067

In addition, the following major activity centers and destinations are located within the study area:

- South Bay Galleria
- Several schools (Washington Elementary School, Adams and Magruder Middle Schools and Torrance Children's Center)

Bicycle Access Conditions

Key bicycle access observations include:

- One-seventy-seventh Street is a bike route / bike boulevard candidate between the mall and Prairie Avenue. It could be extended east beyond Prairie if a signal were added at the intersection.
- Prairie is a candidate for bike lanes between 177th, to 182nd and possibly further south.
- One-Eighty-Second Street is a candidate for bike lanes between Prairie Avenue and Inglewood Avenue and, with a traffic study, may qualify for a 4-to-3 lane "road diet" between Prairie and Hawthorne Boulevard.
- Kingsdale is a 40-foot wide street with no parking and two 20-foot wide lanes. Starting at 182nd St. and continuing north along the west edge of the mall's parking lots, Kingsdale has no parking on either side, so its 40-foot width can accommodate 6-foot bike lanes and 14-foot travel lanes. The wide travel lanes would be ideal for the buses that use this segment to reach the transit center. However, for one block before the Grant Avenue signal there are houses and on-street parking on Kingsdale's west side, precluding bike lanes. That segment should have bicycle warning signage and perhaps "Share the Road" signs.
- Grant's bike lanes should be extended the remaining one block distance to Kingsdale if possible. This appears to be straightforward in the westbound direction but may not be possible eastbound due to the 2-lane storage layout approaching the Kingsdale/Grant signal.

Bicycle Facilities

Existing bike lanes: Grant Avenue west of Kingsdale
Existing bike paths: None
Existing Bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
South Bay Galleria Transit Center	Wave	10	Good	good

Transit Connections

Transit Type	Agency	Description
Bus Lines	METRO	40
		210
		211
		740
		710
	Torrance	8

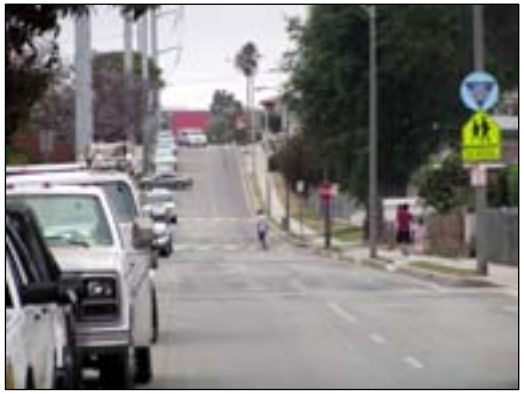
Existing Conditions

South Bay Galleria Transit Center

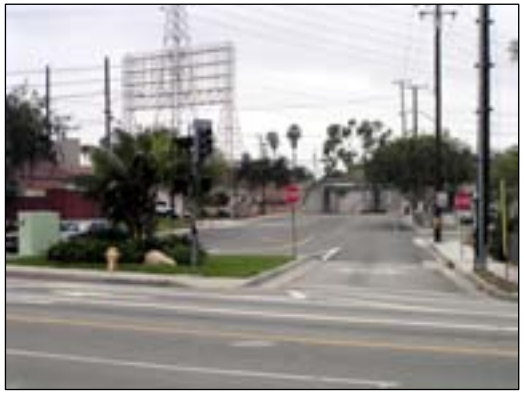
Bike rack at transit center and adjacent sidewalk

Bike Lanes on Grant Avenue, eastbound toward South Bay Galleria

Slots in the valley gutters at Grevillea Avenue and 166th Street



Grevillea Avenue and 166th St looking southbound



Intersection of Kingsdale Avenue and Grant Boulevard

Recommended Improvements

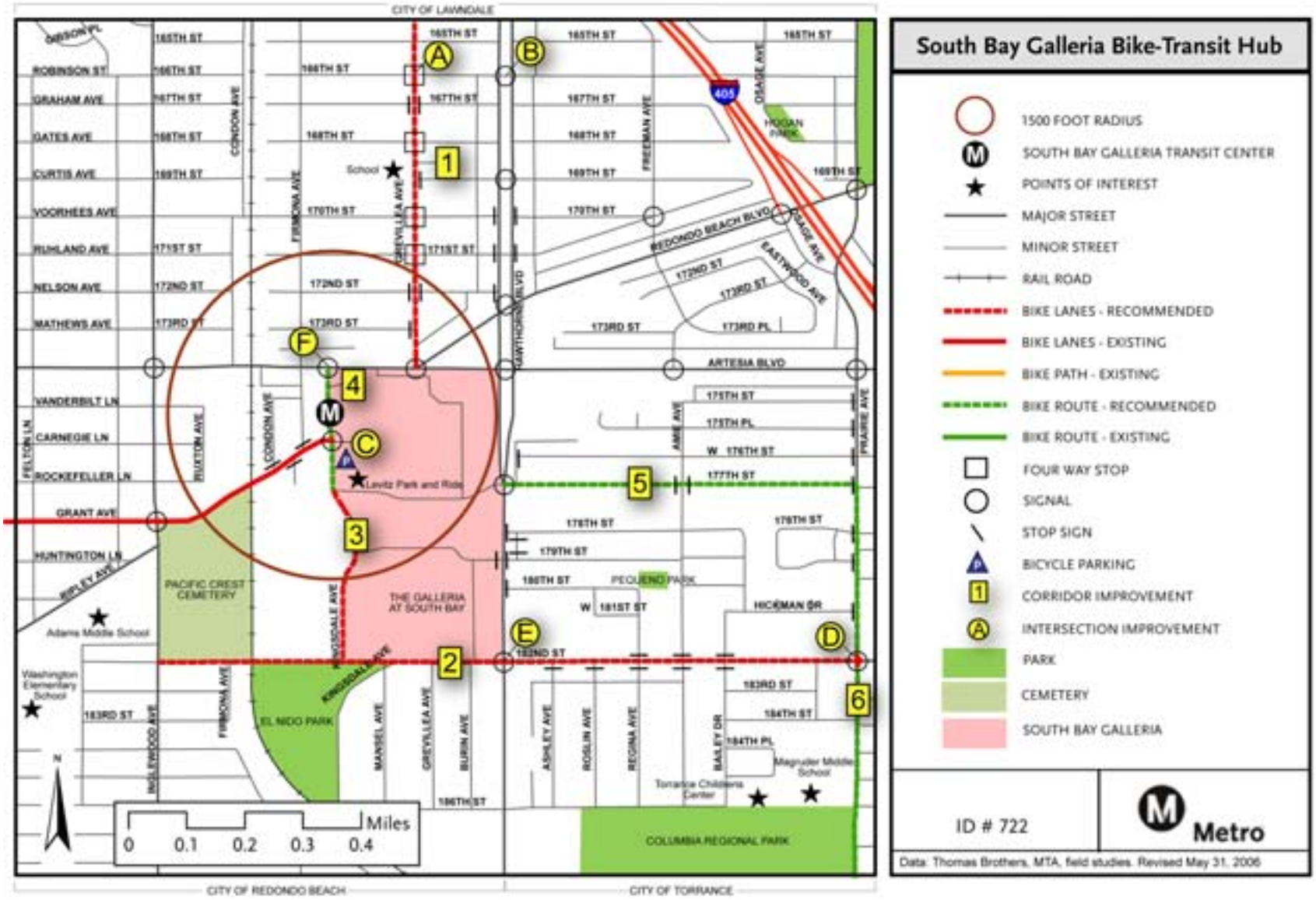
A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for the bicycle access routes to the South Bay Galleria hub are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

Corridor Improvements	Map Key	Location	Miles	Est. Cost
Add Class II bike lanes	1	Grevillea Ave: from Artesia to 166th, extending north, City of Lawndale	0.59	$5,900
	2	182nd St: between Inglewood Ave. to Yukon Ave. (connection to N. Torrance High School to the east) Cities of Redondo Beach and Torrance	1.0	$10,200
	3	Kingsdale Ave: between 177th St. and 182nd St. City of Redondo Beach	0.21	$2,100
Add Class III bike route signage and stencils. Add directional signage	4	Kingsdale Ave: between Artesia Blvd. and 177th St. City of Redondo Beach	0.3	$9,200
	5	177th St.: between Hawthorne Blvd. and Prairie Ave. City of Torrance	1	$30,000
	6	Prairie Ave: between 177th St and 182nd St, extending south	0.68	$20,300
4-to-3 lane "Road Diet"	2	182nd: between Prairie Ave and Hawthorne Blvd. City of Torrance	0.5	$22,500

Intersection Improvements	Map Key	Location	Est. Cost
Remove slots from valley gutters	A	Grevillea Ave and 166th St	n/a
	B	Hawthorne Blvd and 166th St	n/a
Relocate bike rack away from pedestrian path of travel	C	South Bay Galleria Transit Center Grant Ave and Kingsdale Ave. Currently, bikes parked on the bike rack will impede pedestrian travel. Turning the bike rack so it is perpendicular to the walkway will fix this problem.	n/a
Provide bicycle sensitive detector loop and bicycle detection marking	D	182nd St and Prairie Ave	$2,500
	E	182nd St and Hawthorne Blvd	$2,500
	F	Artesia Blvd and Kingsdale Ave	$2,500

Map 12 – South Bay Galleria Bike-Transit Hub Recommendations



WEST HOLLYWOOD FAIRFAX BIKE-TRANSIT HUB

City of West Hollywood

WEST HOLLYWOOD FAIRFAX BIKE-TRANSIT HUB

Bike to Local Bus and Future Metro Rapid at Commercial Center

Hub ID: 1023 (Refer to Bike-Transit Hub Data Spreadsheet)
Name: West Hollywood-Fairfax (Metro Bus)
Intersection: Santa Monica Blvd. and N. Fairfax Ave.
Jurisdiction: City of West Hollywood

Introduction

This Bike Transit Hub Access Plan is part of the Metro Bicycle Transportation Strategic Plan (BTSP), a countywide effort to improve bicycle facilities. The BTSP focuses on bicycle accessibility to major transit hubs in Los Angeles County, along with gaps in the regional bikeway system. One hundred sixty seven (167) bike-transit hubs were identified and evaluated as part of the BTSP. Of those, 12 hubs were selected for field review and completion of an Access Plan. The purpose of the Access Plan is to identify potential improvements to bicycle access and parking at the transit hubs in order to expand the range of the bicycle and transit modes of transportation. Local agencies can use these plans to make improvements as part of roadway and transit projects. This or similar Access Plans can be used for seeking funding. Local agencies may choose to complete other Access Plans as well using the methodology and tools provided in the BTSP.

Existing Conditions

The West Hollywood-Fairfax hub is a major bus stop centrally located at the junction of two thriving commercial arterials, Santa Monica Boulevard and Fairfax Avenue. The arterials run through a grid of high density residential streets. West of the transit hub, parts of Santa Monica Boulevard have a landscaped median, mid-block crossings, Class II bike lanes, and a proposed Class I bike path. Fairfax Boulevard is a heavily traveled four- to six-lane arterial.

The hub is served by Metro Bus 218, West Hollywood City bus, and Metro Rapid Fairfax line. It will be served by Metro Rapid along Santa Monica Boulevard in the near future.

The transit hub is in the jurisdiction of the City of West Hollywood; however, West Hollywood city limits end approximately a quarter-mile north and south of the transit hub. Beyond the city limits, the jurisdiction switches to the City of Los Angeles. The location is characterized by:

- High density urban location.
- Land uses: One- to four-story retail/commercial/office along arterials. Single-family and multi-story multifamily off the arterials. Santa Monica Boulevard is a major retail and restaurant street.
- Topography: East-west streets run nearly flat; north-south streets have a modest grade that climbs to the north, toward the Hollywood hills.
- There are no barriers other than the mild grade.
- Served by Metro Rapid (Fairfax), Metro Local and West Hollywood City Line buses. Metro Rapid service will be implemented on Santa Monica Blvd. in the near future.

Transit Service and Demographics

Transit hub scoring is based on the demographics of residents within three miles (population, median income), characteristics of the surrounding three miles (number of jobs) and characteristics of the transit center(number of daily transit users, type of service and whether the stop is a terminus or not). The area within three miles of the West Hollywood transit hub has very high employment and population densities compared with other transit hubs in the County. The number of transit riders who live within three miles of the transit center is higher than average, as is the median income. Our analysis of transit and bicycle ridership at this location indicates that it scores 193 out of 359, or in the 54th percentile of all bike-transit hubs. Transit hub scoring provides a way to compare hubs across the entire County.

The table below draws on 2000 Census data, SCAG population and employment projections for the year 2010 and Metro Bus and Rail average weekday boardings and alightings within 1/8 mile of the transit hub.

Metro Bus Riders	5244	**Local Bus Service (Other)**	Yes
Metro Rail Riders	n/a	**Population (3 miles)**	113,613
BRT Service	No	**Employment (3 miles)**	99,706
Existing Transit Center	Future	**Household Income**	$50,657
Metro Rapid	Yes and Future	**Transit Riders (3 miles)**	10,670

In addition, the following major activity centers and destinations are located within the study area:

- Sunset Boulevard and Hollywood Boulevard are major tourist and entertainment destinations.
- Whole Foods supermarket on northeast corner of study intersection.
- West Hollywood City Hall and the Chamber of Commerce are located west of the transit hub.
- Hollywood Highland Center, including the Red Line Station is east of the study area and accessible via buses from the transit hub.
- The La Brea Gateway Center at La Brea and Santa Monica Boulevard.
- There is direct transit service between this hub and Cedars-Sinai Medical Center, the Beverly Center, the Farmer's Market at 3rd and Fairfax, and the Red Line subway.
- The Avenues of Art and Design.
- The Pacific Design Center.
- The concentration of nightclubs and restaurants on the west side of West Hollywood.

Bicycle Access Conditions

Key bicycle access observations include:

- Excellent bicycle connectivity parallel to and across the arterials. There is a completely intact grid of narrow side streets along both axes with low-to-moderate speeds. Typical width ranges from 29 feet (parking one side only) to 36 feet (parking both sides). Volumes on these streets can be high, especially during peak commute times.
- Fairfax Avenue has signals every 1,000 feet and Santa Monica Boulevard has signals every 500 to 1,000 feet, providing many opportunities to cross the arterials on alternative minor streets.
- Traffic speeds on the two arterials are moderate. Fairfax has 3 lanes each way and its speeds are higher than Santa Monica Boulevard. An experienced commuter/utility cyclist can keep up with traffic on Santa Monica Boulevard. A cyclist can also ride at high speeds in the downhill (south) direction on Fairfax. Traffic volumes on these arterials are very high.
- West Hollywood completed its Bicycle and Pedestrian Mobility Access Plan in Spring 2003. This Plan contains recommendations for several corridors within the bike-transit hub study area. Recommendations in this Access Plan are consistent with the West Hollywood Mobility Access Plan and in some cases duplicate recommendations made in that plan.
- Metro Rapid Bus service will be starting on Santa Monica Boulevard in the near future.

Bicycle Facilities

Existing bike lanes: Santa Monica Boulevard from King/Flores west
Existing bike routes: Fairfax Avenue south of Fountain Avenue and Fountain Avenue east of Fairfax
Existing bike paths: None
Existing bicycle parking: Table

Location	Parking Type	Spaces	Accessibility	Security
At bus stop on northeast corner of Santa Monica & Fairfax Blvds	Post and hoop	6	Good	Fair

Additional bicycle parking is available at:

- West Hollywood City Hall
- Gelson's Market at Kings Road and Santa Monica Boulevard
- Retail establishment across Santa Monica Boulevard from City Hall
- Kings Road Park at Kings Road and Romaine Avenue
- Plummer Park at Martel Avenue
- LaBrea Gateway Center at LaBrea Boulevard
- Sunset Millennium Project at Almont
- Kings Road Municipal Parking Structure at Kings Road
- Various locations adjacent to business establishments

Transit Connections

Transit Type	Agency	Description
Bus Lines	METRO	4
		217
		218
		304
		717

Existing Conditions

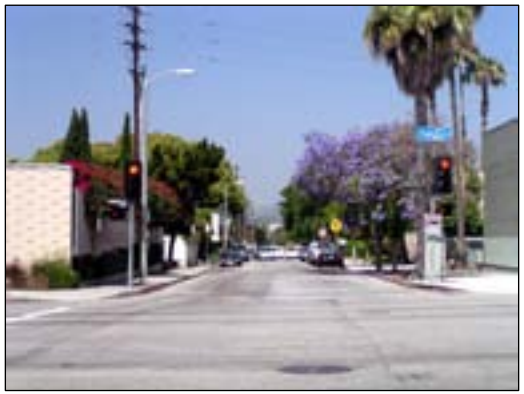
Looking west on Santa Monica Boulevard toward the Fairfax Avenue intersection

La Jolla Avenue, facing south

La Jolla Avenue facing north to Santa Monica Boulevard

Santa Monica Boulevard pedestrian crossing with median refuge

Bike Racks on Fairfax Ave at Santa Monica Boulevard



Willoughby Street, looking west from Fairfax Boulevard

Recommended Improvements

A field audit was performed on major corridors within a 1,500 foot radius of the bike-transit hub. Potential improvements are summarized below and on the map on the following page. More detailed descriptions of each improvement type are provided in the Design Toolbox in the Appendix. Additional feasibility, traffic, and other studies will be needed to finalize any improvement plans.

Improvements for the bicycle access routes to the West Hollywood Fairfax hub are identified below. Corridor improvements include bike lanes, re-striping, and other linear projects that lend themselves to corridors. Intersection improvements include items such as bicycle signal detectors, re-configured crosswalks, and modifications to signal timing. The map keys can be used to locate the improvement area on the Access Plan Map at the end of this document.

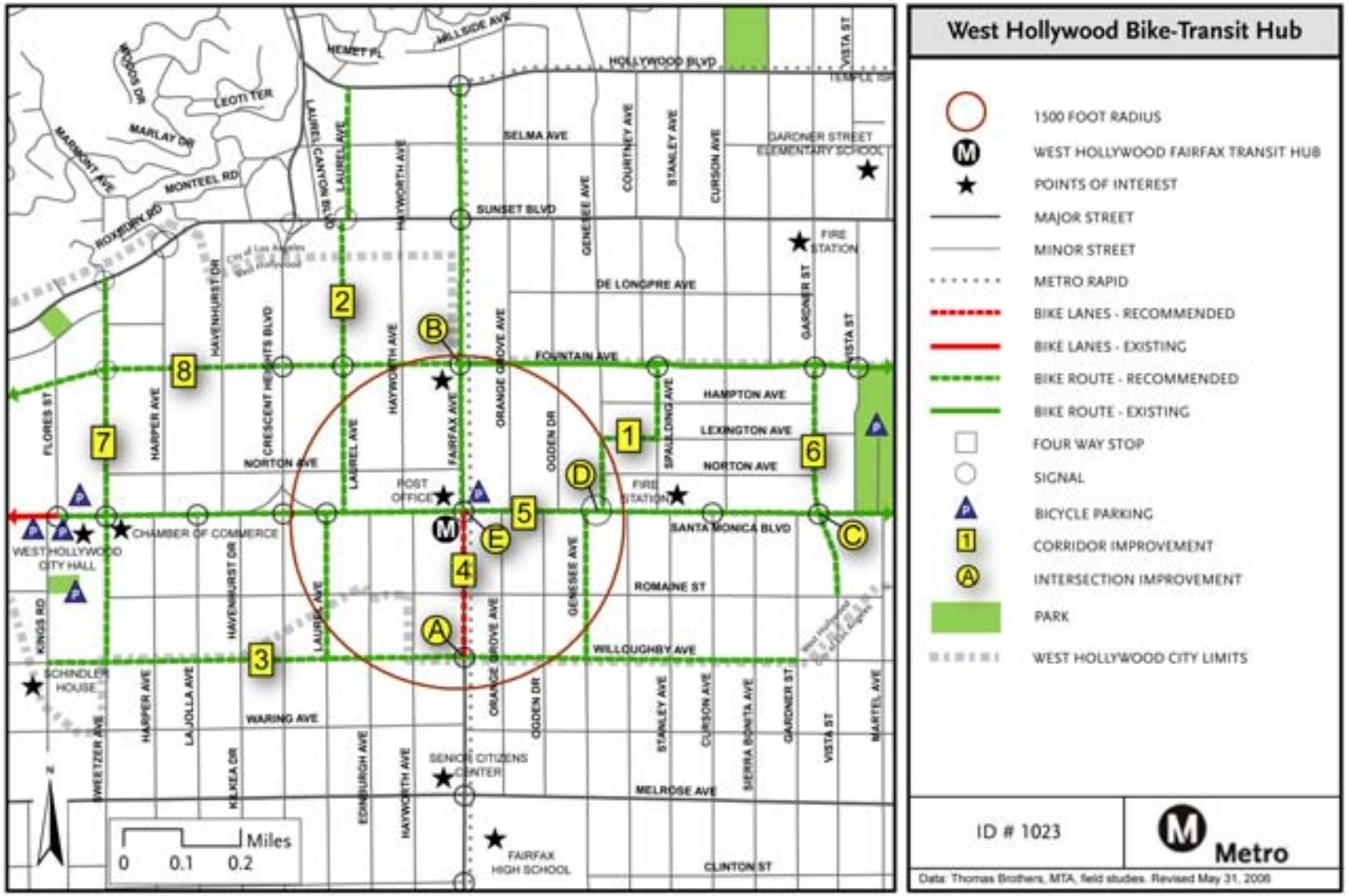
Corridor Improvements	Map Key	Location	Miles	Est. Cost
Install Class III bike route striping, signage and pavement stencils, and consider traffic calming	1	Spaulding Ave. from Fountain to Lexington, Lexington Ave. from Spaulding to Genesee, Genesee Ave. from Lexington to Willoughby	0.6	$9,000
	2	Laurel Avenue from Hollywood Blvd. to Willoughby Ave.	1.0	$10,000
	3	Willoughby Ave. from Kings Rd. to Gardner St.	1.1	$10,600
Remove travel lane in each direction, stripe Class II bike lanes and install directional signage	4	Fairfax Blvd. between Santa Monica Blvd. and Willoughby Ave.	.25	$12,500
Install Class III bike route striping, signage and pavement stencils	5	Santa Monica Boulevard: from Kings Rd. to La Brea Ave.	1.75	$26,250
	6	Gardner /Vista St between Romaine St. and Fountain Ave.	0.4	$4,000
	7	Sweetzer Avenue: from Sunset Blvd. to Willoughby Ave.	0.7	$6,500
	8	Fountain Ave. from Fairfax to La Cienega	1.9	$28,500
Intersection Improvements	**Map Key**	**Location**		**Est. Cost**
Provide bicycle sensitive detector loop and bicycle detection marking	On all lead positions and left turn lanes, especially at the following intersections:			
	A	Fairfax Avenue and Willoughby Avenue		$2,500
	B	Fairfax Avenue and Fountain Avenue		$2,500
	C	Gardner/Vista Street at Santa Monica Boulevard		$2,500
	D	Santa Monica Boulevard and Genesee Avenue		$2,500
	E	Santa Monica Boulevard and Fairfax Avenue		$2,500
Bicycle Parking				
Install additional bike racks along the Santa Monica Boulevard Corridor near businesses and other uses. .($100 per 2-bike U-rack, plus installation costs)				

Other Notes

- Recommendation 1 is the same as Project 21: Genesee Avenue Neighborhood Bikeway/Safe Routes to School Project in the West Hollywood Mobility Plan.
- Recommendation 2 is an addition to the Mobility Plan.
- Recommendation 3 is an addition to the Mobility plan. The route is multi-jurisdictional as it runs through West Hollywood and the City of Los Angeles.

- Recommendation 6 is an addition to the Mobility plan.
- Loop detectors and markings are also recommended at :
  - Santa Monica Boulevard at Laurel, Crescent Heights, La Jolla, Sweetzer, Kings/Flores and Curson.
  - Fountain at Sweetzer, Crescent Heights, Laurel, Spalding, Gardner, Vista.
  - Sunset at Sweetzer, Roxbury/Harper, Crescent Heights, Laurel, Fairfax.
- It is recommended that the City continue to encourage businesses to provide secure bicycle facilities near entrances and exits.

Map 13 – West Hollywood Fairfax Bike-Transit Hub Recommendations



SECTION 4: GAPS IN THE INTER-JURISDICTIONAL BIKEWAY NETWORK

PURPOSE

This section identifies some of the gaps in an inter-jurisdictional bikeway network primarily composed of bike paths not necessarily reliant on transit. The gap list provides guidance for local planners on where connectivity is needed. These gaps can be filled by on-street or off-street facilities. These include completion of the river bike paths, rails-with-trails, or on-street connectors between two facilities or communities.

We are defining the term "inter-jurisdictional bikeway network" as an interconnected system of bikeways, not necessarily reliant on transit, but connecting to major destinations, linking cities or as routes to transit destinations. One or a combination of the following design options can be used to close gaps in the network:

- Class I: Separated bi-directional bike path
- Class II: Striped on-street bike lane
- Class III: Signed on-street bike route
- Grade separations
- Striping and signage

Each city and the County are encouraged to consider projects that fill these gaps in the bikeway network so that a completed network can be realized. Projects can be developed as stand-alone, elements of larger improvements to streets or bridges, or as part of street repaving projects. When infrastructure is upgraded, bicycle facilities need to be accommodated. Improving access to the network is also important. Ridership significantly increases with the completion of networks.

While each gap is unique, the constraints and approaches can generally be classified into one of several basic types, described below. The final type of project selected to overcome the gap depends on the results of an in-depth feasibility study. When considering the completion of a gap, it is important to assess the potential user groups likely to use the facility. While a gap closure project may look good on a map, in reality very few people may use the new project for reasons unrelated to the new project itself. For example, the route may traverse a heavy industrial area that is isolated and discourages commuter travel.

Gap constraints can be classified into the following topics:

Engineering Issues

Remaining gaps in the regional bikeway network include many with significant engineering obstacles. The most common engineering challenge is where the facility is identified on a local roadway, and the road cannot be easily widened to provide bike lanes or shoulders. Technical solutions may be found on these projects, but the cost or traffic impacts may be so substantial in some cases as to impact overall feasibility.

Operational Issues

Many remaining segments would need to traverse potentially incompatible land uses, such as airports, active ports, railroad corridors, and freeway interchanges. In some cases, technical and operational solutions can be found to overcome these gaps. In others, the cost or impacts may impact the project feasibility.

Property Issues

While some of the gaps are located on public property, some agencies may be reluctant to allow access or assume liability, and in other cases, adjacent landowners may protest allowing access because of perceived losses of privacy, security, and other issues.

SETTING

Los Angeles County has one of the largest networks of Class I bike paths in California, with some of the longest and most heavily used pathways as well. The diversity of pathway locations throughout the County ranges from beach pathways to paths along channelized rivers, abandoned and active railroad and transit lines, and even road median strips. Many local agencies in the County are actively planning for new or expanded pathways to meet the growing demand for places to walk and/or bicycle away from traffic.

While many gaps are short missing segments of a larger system, they have a very large impact on usage and safety. Gaps exist typically where there are physical impediments to completing a bike path, such as steep cliffs, rights-of-way ownership, perceived or real safety concerns, narrow, busy roadways or major crossings of waterways or roads. Gaps may also include impediments to access, making use of the pathway difficult for users of bike paths – bicycle commuters, recreational riders, and children.

An analysis of existing gaps was conducted in Los Angeles County, focusing on connections. An initial list of gaps was created and mapped, and submitted for review and comment. Stakeholders identified additional gaps and staff added these to the table and maps. These gaps are listed in Table 1 beginning on page 102 and shown in Map 14 on page 105 and Map 15 on page 106.

LA River Bike Path

Table 1 – Gaps in the Inter-Jurisdictional Bikeway Network

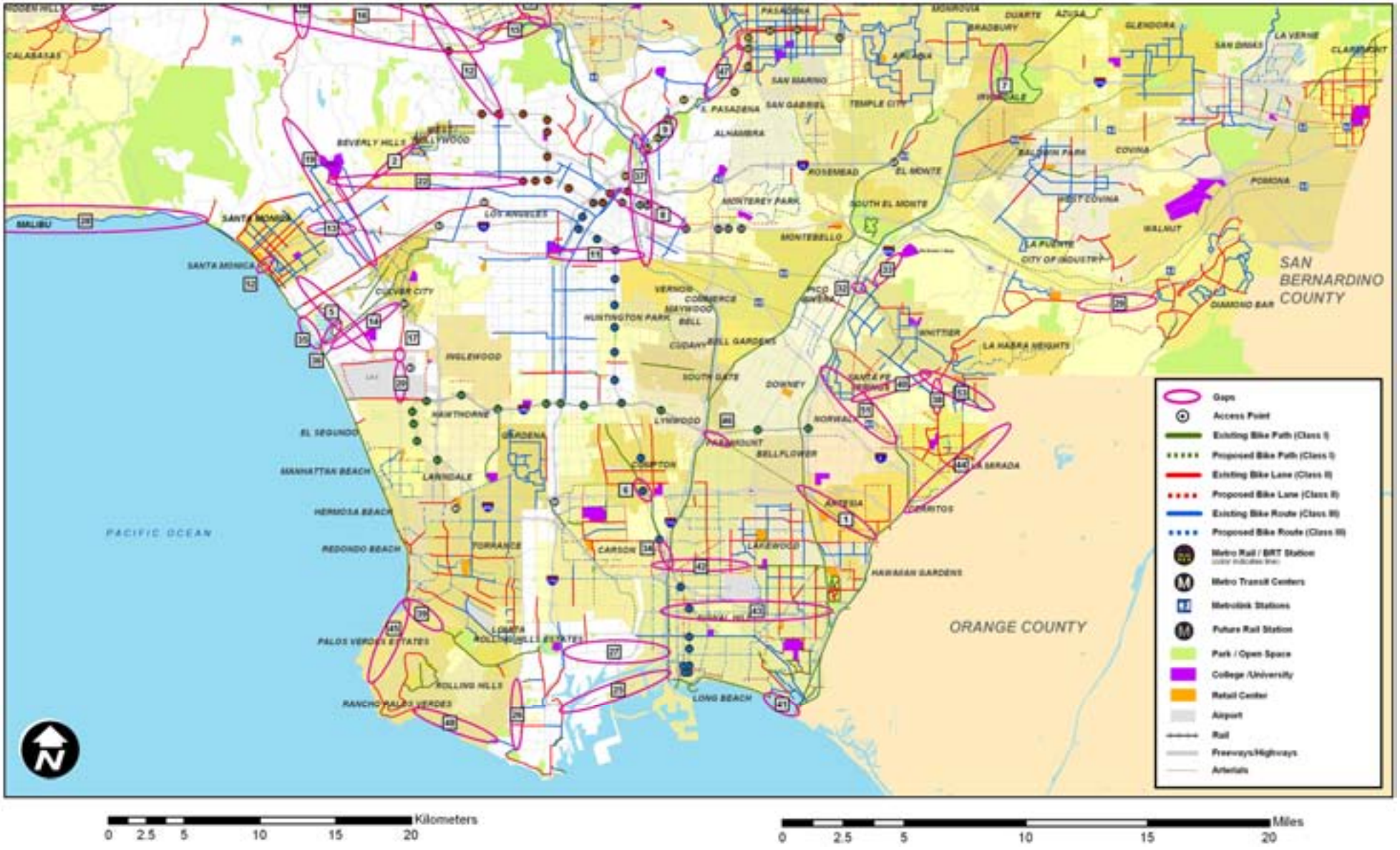
Gap	Corridor Name	Jurisdiction	Location	Description (From/To)	Constraints	Proposed by	Shown in Map #
1	West Santa Ana Branch Metro Right-of-Way	Artesia/Cerritos	West Santa Ana Branch ROW	Bike path between Bellfower and Coyote Creek/Orange County border	ROW	Metro/Stakeholder Meeting	2
2	Santa Monica Blvd	Beverly Hills	Beverly Hills/Santa Monica Blvd	Gap in Class II bike lanes between Moreno and Doheny	City concurrence & sponsorship	Stakeholder Meeting	1,2
3	Chandler	Burbank	Burbank	Chandler/Mariposa to Olive/Front and Metrolink Station	Active rail on Front St corridor	Metro / SFV-NC Team	1
4	Connector	Burbank	Los Angeles River through Burbank	Connection to San Fernando Rd Metrolink ROW Bike Path	Route not identified	Metro / SFV-NC Team	1
5	Lincoln Blvd	Caltrans	Lincoln Blvd	Connection between Westchester/LAX & Santa Monica	ROW, Crossing over Ballona Creek	Stakeholder Meeting	2
6	Compton Creek	Compton	Compton Creek near Alameda Street	Connection from Greenleaf to SR-91	Compton Autoplaza Site divides two completeed portions of bike path.	SGRWC	2
7	Duarte to San Gabriel River Bike Path Connection	Duarte, Irwindale	South of Duarte Bike Path, through Sante Fe Dam Recreation Area	Royal Oaks to SGR via Highland Ave and adjacent to I-605	ROW	Duarte	1,2
8	1st Street	LA City	Downtown/Boyle Heights	Connection between downtown and Boyle Heights/East LA	Narrow Bridge, Light Rail	LACBC	1,2
9	Arroyo Seco/LA River	LA City	Lincoln Heights area	Connection from future LA River path to existing Arroyo Seco path	ROW	Metro/LACBC/ Stakeholder Meeting	1,2
10	Balboa Blvd	LA City	Balboa Blvd	Connection between Victory Blvd and Roscoe (Van Nuys Airport)	Urban arterial	LA City	1
11	Exposition Bikeway	LA City	Ballona/Expo connection to LA River	Connection from Expo Bikeway eastern terminus to LA River	Route not identified	Metro	2
12	Cahuenga Pass	LA City	Cahuenga Blvd	Connection between Hollywood and North Hollywood/Studio City	Congested mountain pass and freeway adjacent	LA City	1,2
13	Exposition Bikeway	LA City	Western Extension Exposition Bikeway	Connection between Sepulveda and Centinela	ROW or on-street	LA City	1,2
14	Jefferson Blvd	LA City	Jefferson Blvd	Connection between Culver City (Fox Hills Mall/Transit Center) & Playa del Rey	Urban arterial	Stakeholder Meeting	2
15	LA River	LA City	Phase 4 Riverside Dr to Barham	Western extension of LA River Bike Path	134 Fwy /will require phases	Metro/LA City	1,2
16	LA River	LA City	Right of way for Los Angeles River future segments, Barham to Owensmouth	Final phases of river bike path as yet undetermined.	Requires feasibility study	Stakeholder Meeting	1,2
17	Sepulveda Blvd	LA City	Westchester	Manchester to Westchester Pkwy	Urban arterial	LACBC	2
18	Sepulveda Blvd.	LA City	Sepulveda Blvd in Sherman Oaks	Connection from northern terminus of existing bike lanes north to Balboa Park	Urban arterial	LA City	1
19	Sepulveda Pass	LA City	Sepulveda Blvd	Connection Sepulveda bike lanes south to Expo ROW	Congested mountain pass and freeway adjacent	LA City	1,2
20	Sepulveda Tunnel	LA City	LAX/Sepulveda Blvd	Connection between Manchester and Imperial	Narrow Tunnel	LA City	2
21	Woodland Hills - Orange Line to Chatsworth	LA City	Metro ROW - north/south	Orange Line terminus to Chatsworth Metrolink Station	Some leases on ROW	Metro / SFV-NC Team / LA City	1
22	Wilshire Blvd/UCLA	LA City/Beverly Hills	Wilshire Blvd	Mid Wilshire corridor to Westwood/UCLA	Urban arterial	Stakeholder Meeting	1,2
23	West San Fernando Valley	LA City/Calabasas	Woodland Hills	Orange Line terminus to Calabasas	Route not identified	Metro / SFV-NC Team / LA City	1,2

Gap	Corridor Name	Jurisdiction	Location	Description (From/To)	Constraints	Proposed by	Shown in Map #
24	Foothill Blvd	LA City/Glendale/LA County/La Cañada-Flintridge	Foothill Blvd	Connection between Wentworth (LA City) and Oak Grove (La Cañada)	Urban arterial	Stakeholder Meeting	1
25	Ocean Blvd	LA City/Long Beach	Harbor Area	Connection between Harbor Bike Lanes & LA River terminus	Vincent Thomas and Gerald Desmond Bridges	LA City/Stakeholders	2
26	Western Ave	LA City/Rancho Palos Verdes	Western Ave/Harbor Area	Connection between Westmont & 25th Street	Route not identified	Stakeholder Meeting	2
27	Connector to LA River Path	LA City/Wilmington	Anaheim Street or other corridor	Connectionr between Figueroa and Long Beach/LA River	Route not identified	Stakeholder Meeting	2
28	Beach	LA County	Pacific Palisades/Malibu	Northern extension of South Bay Beach Bike Path through Malibu	Requires feasibility study	LA County	1,2
29	Colima Road	LA County	Rowland Heights (Unincorporated)	Colima Road between Fullerton Rd and Diamond Bar City Limits	ROW width	Stakeholder Meeting	2
30	Old Road	LA County	Old Road adjacent to Golden State Fwy	Connection between Valencia/Santa Clarita & San Fernando Rd Metrolink ROW Bike Path in the San Fernando Valley	Class II or III. Might require shoulder improvements/road widening in some places.	Metro/Stakeholder Meeting	1
31	Route 126	LA County	NW LA County unincorporated	Connection between Santa Clarita and Ventura County Line	Class II or III. Might require shoulder improvements/road widening in some places.	Santa Clarita/LA County	1
32	Whittier Greenway	LA County	Unincorporated county area	Connection between Whittier City limits and SGR trail	Route not identified	RMC	2
33	Workman Mill Road	LA County	Workman Mill Road	Connection between Whittier Bike Path & Rio Hondo College	Route not identified	Stakeholder Meeting	2
34	Connector	LA County/Carson	Los Angeles River near Del Amo Blvd.	Connection between LA River path and Compton path terminus	Route not identified	Stakeholder Meeting	2
35	Beach	LA County/LA City	Marina del Rey	South Bay Beach Bike Path through the Marina	Existing Class II on Washington	LA County	2
36	Beach	LA County/LA City	Fisherman's Village	Connection between Fisherman's Village and Ballona Creek Bike Path	Existing Class III on Fiji Way	LA County	2
37	LA River	LA County/LA City	Los Angeles River through central LA	Corridor being studied as part of Los Angeles River revitalization	Active railroad and industrial uses	LA City/Metro	1,2
38	La Mirada/Colima Connector	LA County/La Mirada	La Mirada Blvd	Connection between Whittier (La Colima Rd) and La Mirada Blvd in La Mirada	Route not identified	Stakeholder Meeting	2
39	Beach	LA County/Palos Verdes Estates	Torrance Beach/Palos Verdes Drive	Southern extension of beach bikeway, connector to Palos Verdes Dr. path	Route not identified	Stakeholder Meeting	2
40	Mills Avenue	LA County/Santa Fe Springs	Mills Ave	Connection between Norwalk Blvd. & Whittier Greenway Bike Path	Route not identified	Stakeholder Meeting	2
41	Beach	Long Beach	Long Beach Harbor	Connection between beach path and Orange County/San Gabriel River	Route not identified	Stakeholder Meeting	2
42	Carson Blvd	Long Beach/Lakewood	Carson Blvd	Connector between LA River and Carson Blvd bike path	Urban arterial	Stakeholder Meeting	2
43	Willow	Long Beach/Signal Hill	Willow St	Connection between LA River & SGR	Urban arterial	Stakeholder Meeting	2
44	Coyote Creek	Orange County/LA County	Coyote Creek Channel	Completion of Coyote Creek Bike Path east of North Fork	ROW, bridges, jurisdictional issues	Stakeholder Meeting	2

Gap	Corridor Name	Jurisdiction	Location	Description (From/To)	Constraints	Proposed by	Shown in Map #
45	Palos Verdes Drive West	Palos Verdes Estates	Palos Verdes Drive West	Connection between beach bike path terminus in Redondo Beach & Bike Lanes in Rancho Palos Verdes	Route not identified	Stakeholder Meeting	2
46	West Santa Ana Branch	Paramount/LA County	NW terminus of planned multi-city project	Connection between San Gabriel River & West Santa Ana Branch ROW	DWP ROW, Active RR, adjacent 105 fwy	RMC	2
47	Arroyo Seco	Pasadena	Arroyo Seco Park	Connection from existing Arroyo Seco path into Pasadena	Route not identified	LACBC	1,2
48	Palos Verdes Drive South	Rancho Palos Verdes	Palos Verdes Drive South	Connection between Abalone Cove Shoreline Park & LA City limit	Route not identified	Stakeholder Meeting	2
49	Castaic/San Francisquito Creek	Santa Clarita/LA County	Castaic Creek; San Francisquito Creek; Golden State Fwy	Connector between Santa Clarita & Castaic Lake	Class II or III improvement: might require shoulder improvements/road widening.	Stakeholder Meeting	1
50	Sierra Highway	Santa Clarita/LA County	Sierra Highway	Connection between the Old Road & Soledad Canyon Bike Path	Class II or III improvement: might require shoulder improvements/road widening.	Stakeholder Meeting	1
51	Connector	Santa Fe Springs	Surface streets	Connection between Coyote Creek and SGR path	Route not identified	Santa Fe Springs	2
52	Beach	Santa Monica	Central Santa Monica/Colorado	Connection between downtown Santa Monica to Beach Path	Cliff & narrow high traffic road	Stakeholder Meeting	2
53	Whittier Greenway	Whittier	Whittier/RR ROW	Extending Whittier Bike Path to Orange County Line	ROW	Stakeholder Meeting	2
NOTE: Meetings were held in which Metro received input from local agencies and stakeholder groups. All identified gaps were included on the map. Every project does not necessarily reflect Metro regional priorities.							
Acronyms: LACBC (Los Angeles County Bicycle Coalition), RMC (Rivers and Mountains Conservancy), SGRWC (San Gabriel River Watershed Council),							
SFV-NC (San Fernando Valley-North County Area Team)							

Map 14 – Gaps in the Inter-Jurisdictional Bikeway Network, #1

Map 15– Gaps in the Inter-Jurisdictional Bikeway Network, #2



Summary of Major Gaps

Beach Bike Paths

From Pacific Palisades north of Santa Monica to the Orange County line in Long Beach, beach bike pathways exist for approximately 65% of the coastline. The beach paths are some of the most heavily used pathways in the County, primarily for recreational purposes but also for limited commute and utilitarian trips. A connected beach pathway system would benefit those who wanted to travel or exercise on a pathway separated from busy roadways.

The major existing gaps on the beach bike path system are located in the Los Angeles and Long Beach harbors. All of these gaps have major physical impediments, including the perceived lack of right-of-way, busy roadways, and the bike prohibitive bridges.

The entire beach bikeway system needs a consistent signage system for identity, access, and directions. Public agencies along this corridor should consider establishing consistent designs and operations. The Los Angeles County Department of Public Works' *Los Angeles River Signage Guidelines* is an example of an effort to develop such a system.

Los Angeles River Bike Path and Tributary Paths

This bike path system is the second longest in Los Angeles County, following the San Gabriel River system. It connects the central County, San Gabriel Valley, and San Fernando Valley with Long Beach, and links diverse communities in between. The path network also includes the Arroyo Seco, Compton Creek, and the Upper Rio Hondo Trail. Located on the maintenance road for the channelized river, the paths are well used in areas but suffer from a combination of poor access, unattractive surroundings, a lack of lighting at key locations, and perceptions of safety problems in other areas.

LA River Downtown facing north

The major gap of the system is from Vermont through downtown Los Angeles. This area is currently heavily industrialized and congested by railroads and freeways. Any redevelopment of this area should include improvements to bicycle circulation in the area. Future connections from the Los Angeles River to the Arroyo Seco path and into Glendale will help this corridor serve as a major bicycle commuter route. Elsewhere, the facilities can be improved through a combination of enhanced maintenance and security, landscaping, lighting, and access and crossing improvements.

San Gabriel River Bike Path and Tributary Paths

The longest continuous pathway in Los Angeles County, and one of the longest urban bike paths in the country, the San Gabriel River Bike Path extends from Azusa in the San Gabriel foothills, more than 38 miles to Long Beach, traversing more than 10 cities en route. Its tributary, the Coyote Creek Trail, extends along the Orange County border from Long Beach to La Mirada. Usage levels vary on the pathway, with the busiest areas being the upper end at the Santa Fe Dam (Whittier Narrows, Emerald Necklace) and the lower end in the city of Long Beach.

Whittier Greenway Trail to San Gabriel River Trail

This pathway system is relatively continuous and does not have any major gaps, except at the southern terminus where it has a gap at the Long Beach

Marina connecting to the beach pathway and at the northern section in the City of Duarte. The pathways could use enhanced maintenance and security, landscaping, support amenities, and better crossings and access.

Rail-to-Trail Corridors

Numerous abandoned rail corridors in Los Angeles County, such as the Whittier Greenway, are being considered or have been utilized for bike paths. Many of these corridors are former Pacific Electric Railway rights-of-way. The corridors offer a unique opportunity to provide a separate bike path for bicyclists and others, instead of busy roadways. The major challenges of using these corridors are (a) current ownership, (b) potential future use as a transit corridor, (c) current leases on the property, (d) concerns from adjacent neighbors, (e) numerous mid-block street crossings, often at sharp angles, and/or (f) location of the right-of-way in the median of an existing street. Cities such as Whittier, Long Beach, Redondo Beach, Burbank, and others are finding ways to overcome these challenges and are actively developing bikeways in these corridors.

Rails-with-Trails

Bike paths have been proposed, and in some cases developed, within active rail corridors in Los Angeles County. The San Fernando bike path is one of the oldest in the County, and others (such as the San Fernando Road Bike Path) are being planned or constructed. While rails-with-trails have been developed successfully in Los Angeles County, there are many potential constraints that could affect feasibility. In some cases, space needs to be preserved for future planned transit or commuter rail service. In other cases, limited width, inadequate setbacks, concerns about trespassing, and numerous mid-block crossings may affect a project's feasibility. The Southern California Regional Rail Authority (SCRRA) has published guidelines for rail-with-trails which identify the normal requirements for this type of facility.

Bikeways and Transit Lines

These facilities are similar to rails-with-trails and have many of the same issues. A key difference is that a bikeway can be constructed as part of a new transit project, such as the Expo LRT bikeway and Orange Line Busway bikeway. Integration of the bikeway into the planning and design process allows planners to resolve technical issues as part of the larger project, and the cost of the new facility is typically included in the overall project cost. Having policies calling for multi-modal facilities is key to ensuring that bikeways are integrated into future transit lines.

Steps to Completing Gap projects

Solutions for each type of gap can be classified, and include:

On-Road Options for Paths

When connecting existing bike paths, an off-road option is always the first preference. However, in many cases there is simply no available right-of-way and connections must be made along public roads. Unless the connecting road is a very low-traffic, wide, and low-speed roadway (which is not common), an on-street connector may not be used by the vast majority of pathway users. While the gap will appear to be closed on a map, in effect there will still be two disconnected pathways with the connector being used by a small number of more experienced riders who probably ride the route already. Basic steps and considerations in selecting the appropriate road and treatments include:

Step 1: **Select a Roadway**. Identify a road that offers the best combination of direct connectivity, lower traffic volumes, the lowest speeds, the widest curb lane, intersection protection, and the least commercial driveways. The selected roadway may have trade-offs between these criteria. For example, a slightly more circuitous route may offer less traffic and vehicle speeds than a direct route, and be a viable alignment. However, a very circuitous route through residential neighborhoods may not function as a connector at all. An alternatives analysis will help select the top ranked alignment.

Step 2: **Bike Lanes versus Bike Routes**. Bike lanes provide a demarcated space for bicyclists within the roadway right-of-way, which is especially important on streets with moderate or higher volumes

and speeds. Bike routes offer very little benefit to cyclists on busy roadways, but can help to guide them through a network of streets. On any street carrying over 10,000 vehicles per day (vpd) at speeds of 30 mph or higher and is proposed to serve as a connector for Class I bike paths, bike lanes should be provided. Travel and turn lane widths should be evaluated to determine if they can be narrowed or eliminated based on long-term traffic projections and local level of service (LOS) standards.

Step 3: **Innovative Techniques**. There are a wide variety of innovative techniques that can help make an on-street connector bikeway attract a wide variety of user groups. Any technique that helps to slow traffic and maximize separation between bicyclists and vehicles is beneficial. This may include traffic calming techniques (such as curb extensions, narrower travel lanes), streetscape projects (medians, planting strips), bicycle boulevards, and bicycle stencils. In downtown and commercial areas, for example, it may be beneficial to slow traffic speeds through a variety of traffic calming and streetscape treatments

Grade Separations

Waterways such as Long Beach Marina, Los Angeles Harbor, Marina Del Rey, and the channelized rivers all serve as major constraints to Class I bike paths. In most cases, major new structures would need to be constructed to cross these waterways, either as part of a new roadway bridge, a new dedicated bikeway bridge, and/or a new bikeway undercrossing of a roadway along a channelized river. The best option in terms of cost efficiency is to simply program bikeways to be included when new bridges or crossings are constructed. Where this is not possible, the priority should go to structures that serve the greatest demand, address existing safety problems, and provide a connection that does not currently exist. Where a new roadway or bridge has been constructed that does not provide bicycle access, viable alternatives may include enhanced transit links or alternative signed routings.

Future Transportation Corridors

Bike paths have been constructed and are being planned and proposed along many of the Metro-owned railroad and transit lines in Los Angeles County. When they can be planned in conjunction with future rail services (such as the Exposition LRT line) they can provide excellent connections for bicycle commuters. In other cases, concerns about safety, liability, and trespassing, especially on the part of private and public railroad operators, may make the use of an active railroad corridor difficult. Refer to the SCRRA rail-with-trail guidelines and the FHWA/FRA Rails-with-Trails: Lessons Learned publication.

Rails-to-Trails

Many of the abandoned railroad lines in Los Angeles County have had bike paths developed or are being considered for bike paths. In order to be functional and provide an adequate level of safety, bike paths with numerous street crossings must be very carefully designed. Where the crossings occur more than every 500 feet on average, with many mid-block crossings, the corridor may be more suitable for a series of neighborhood greenways than a Class I bike path.

RESOURCES

Numerous planning and design resources exist to help local agencies find appropriate solutions to completing gap closure projects. Some of the most relevant documents are listed below.

Chapter 1000: Bikeway Planning and Design, Caltrans Highway Design Manual (2001)

Guide for the Development of Bicycle Facilities, AASHTO (2004)

Implementing Bicycle Improvements at the Local Level, USDOT, FHWA (1998)

MUTCD 2003 California Supplement: Part 9: Traffic Control for Bicycle Facilities (2004)

Rails-with-Trails: Lessons Learned, FHWA/FRA (2005)

Selecting Roadway Design Treatments to Accommodate Bicycles, USDOT, FHWA (1994)

The Bicycle Compatibility Index: A level of Service Concept, Implementation Manual, USDOT, FHWA (1998)

A set of design guidelines has been developed by Caltrans and Alta Planning + Design as part of the Technical Reference Guide (2004).

SECTION 5: PROJECT IMPLEMENTATION AND FUNDING

PROJECT IMPLEMENTATION STEPS IN DEVELOPING A BIKEWAY PROJECT

There is a standard sequence of implementation steps that all new bikeway projects go through, and could be used by local agencies to initiate or complete development of the project.

1. Identify the project (see the Bike-Transit Hub List in Appendix A and the Gap List on page 102).
2. Conduct a feasibility analysis. Also known as a preliminary engineering study, this is a critical step for almost all bikeway projects. Feasibility studies are important for several reasons. They:
   a. allow local agencies and the public an opportunity to provide input;
   b. evaluate multiple alignment and design options;
   c. include an understanding of potential users, their needs and patterns;
   d. consider connectivity, access, safety, and other elements; and
   e. help develop more accurate cost estimates.

   With the completion of a feasibility study, public agencies stand a much greater chance of receiving competitive funding for final design and construction as well.

Many bikeway projects that have received funding may have been conceived differently had they gone through a feasibility study process. Early in the feasibility process, fatal flaws and viable alternatives can be identified that help ensure timely project completion. Basic elements of a feasibility study include:

Existing Conditions: A summary of existing bikeways, activity centers, destinations, land use zoning, traffic volumes and speeds, collision patterns, right-of-way ownership, plans and policies, and environmental issues.

Needs Analysis: A summary of user needs and patterns, input from the public and local agencies – typically through a public workshop and/or surveys, and estimates of future demand.

Alternatives Analysis: An evaluation of each alternative using criteria based on the adopted goals and policies, plus factors such as cost, demand, right-of-way availability, and other issues.

Preferred Alignment: A preferred alignment and design is selected and shown in maps, sections, and plans. Normally, base mapping is done on available aerial photos.

Preliminary Design: In California, the primary design standards are the Caltrans Highway Design Manual Chapter 1000 and the Manual on Uniform Traffic Control Devices (MUTCD) – California Edition. Details of the project such as crossings, bridges, and other features may be developed in concept-level detail. Items such as signing and striping, drainage, landscaping, trailheads, and other support features may also be developed.

Cost and Phasing: Cost estimates are developed based on the plans and designs, and broken down by item and segment. As needed, the project phasing over time is shown along with priorities for implementation.

Management Plan: A summary of how the pathway will be operated and maintained, including safety, security, liability, emergency response, and other topics are addressed.

There are a variety of potential funding sources including local, state, regional, and federal funding programs that can be used to construct the proposed bicycle improvements. Most of the Federal and State programs are competitive, and involve the completion of extensive applications with clear documentation of the project need, costs, and benefits. Local funding for projects can come from sources within jurisdictions that compete only with

other projects in each jurisdiction's budget. A detailed summary of available funding programs along with the latest relevant information is provided on the following pages.

FEDERAL FUNDING PROGRAMS

ISTEA

In 1991, The Intermodal Surface Transportation Efficiency Act (ISTEA) was passed by Congress, recognizing the increasingly important role of bicycling and walking in creating a balanced, intermodal transportation system. Important provisions require State DOTs to fund a bicycle and pedestrian coordinator, and increase use of nonmotorized modes and public and safety programs. Other selected provisions are as follows:

- When Federal-aid funds are being used to replace or rehabilitate bridge decks, except on fully access controlled highways, safe bicycle accommodations must be considered and provided where feasible.
- Construction of a pedestrian walkway or a bicycle transportation facility are deemed to be highway projects; hence, the Federal share is 80 percent.
- No motorized vehicles should be allowed on any trails except as necessary for maintenance.
- Bicycle projects must be principally for transportation rather than recreational purposes.

The National Bicycling and Walking Study, published in 1994, outlines a plan of action to promote bicycling and walking as viable transportation options. The goals are to double the percentage of trips made by bicycling and walking, and reduce the number of casualties by 10 percent. (www.fhwa.dot.gov)

SAFETEA-LU

The Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), adopted in 2005 and scheduled to expire in 2010, is the new federal transportation legislation that affects virtually all federal bikeway funding. Federal funding is administered through the California Department of Transportation (Caltrans) and the Los Angeles County Metropolitan Transportation Authority (Metro). Most, but not all, of the funding programs are transportation (versus recreation) oriented, with an emphasis on (a) reducing auto trips and (b) providing inter-modal connections. Funding criteria often requires quantification of the costs and benefits of the system (such as saved vehicle trips and reduced air pollution), proof of public involvement and support, California Environmental Quality Act (CEQA) compliance, and commitment of some local resources. In most cases, SAFETEA-LU provides matching grants of 80 to 90 percent – but prefers to leverage other funds at a lower rate.

Projects that receive funding through Metro must apply through the biennial Call for Projects. The required local match for these funds is 20 percent and projects compete based on a number of criteria. Metro administers local SAFETEA-LU funds through the Call for Projects. Metro encourages projects that include attributes such as the following.

1. Provide more Class II bike lanes.
2. Improve the bicycle-transit connection.
3. Provide a low-cost transportation option.
4. Complete a regional spine of Class I bike paths.
5. Provide bicycle parking.
6. Provide safety and/or directional amenities.

Regional Surface Transportation Program Fund (STP)

The Surface Transportation Program is a block grant fund. Funds are used for roads, bridges, transit capital, bicycle projects – including bicycle transportation facilities, bike parking facilities, equipment for transporting bicycles on mass transit vehicles and facilities, bike-activated traffic control devices, preservation of abandoned railway corridors for bicycle trails, and improvements for highways and bridges. SAFETEA-LU allows the transfer of funds from other SAFETEA-LU programs to the STP funding category.

Transportation Enhancements Program (TE)

The TE Program is a 10 percent set-aside of funds from the Surface Transportation Program. Projects must have a direct relationship to the intermodal transportation system through function, proximity, or impact. Two Enhancement Activities are specifically bicycle related: (1) provision of facilities for bicyclists, (2) preservation of abandoned railway corridors (including the conversion and use thereof for bicycle trails).

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

Funds are available for projects that will help attain National Ambient Air Quality Standards (NAAQS) identified in the 1990 federal Clean Air Act Amendments. Projects must come from jurisdictions in non-attainment areas, and the South Coast Air Quality Management District is a non-attainment area. Eligible projects include bicycle transportation facilities intended for transportation purposes, bicycle route maps, bicyclist activated traffic control devices, bicycle safety and education programs and promotional programs.

Highway Safety Improvement Program (HSIP)

This is a new program to replace the Safety Set-aside program. It significantly increases funding to $5 billion over four years (2006-2009). Bicycle and pedestrian projects historically accounted for one percent of safety construction funds, which would mean $50 million over the life of SAFETEA-LU. The program is very similar in scope and purpose to the safety set-aside program in TEA-21; projects to improve the safety of bicyclists and pedestrians are eligible.

- Installation of rumble strips "if the rumble strips or other warning devices do not adversely affect the safety and mobility of bicyclists, pedestrians and the disabled.
- An improvement for pedestrian or bicyclist safety.
- Construction of traffic calming feature.
- Installation and maintenance of fluorescent yellow-green pedestrian/bicycle crossing warning signs (Section 1401).
- Is developed after consultation with "representatives of major modes of transportation."
- Produces a "program of projects" to reduce safety problems.
- Is evaluated regularly.
- Includes an annual report to the Secretary of Transportation.

Recreational Trails Program (RTP)

This is a five-year federal funding program at $370 million. At least 30% must be spent on nonmotorized trail projects, which will mean at least $110 million over the life of SAFETEA-LU.

Transportation, Community, and System Preservation Program (TCSP)

This federal program was created as a pilot by TEA-21. The program is made permanent with $270 million over five years. Funding is eligible to be used for bicycle and pedestrian projects; a number of projects funded under TEA-21 were for NMT programs. (Section 1117)

Highway Safety Programs

Section 2001 authorizes $1,060 million for Section 402 Highway Safety Programs and $500 million for Section 403 Highway Safety Research. Both of these programs are administered by the National Highway Traffic Safety Administration and are focused on education and enforcement. This has been an important but small source of funding for bicycle and pedestrian safety education programs.

STATE FUNDING PROGRAMS

Bicycle Transportation Account (BTA)

The State Bicycle Transportation Account (BTA) is an annual statewide discretionary program that is available through the Caltrans Bicycle Facilities Unit for funding bicycle projects. Available as grants to local jurisdictions, the emphasis is on projects that benefit bicycling for commuting purposes. The program is currently funded at $5-million annually through fiscal year

2005/06. Agencies may apply for these funds through the Caltrans Office of Bicycle Facilities. Applicant cities and counties are required to have a bicycle plan that conforms to Streets and Highways Code 891.2 in order to qualify to compete for funding on a project-by-project basis. A local match of 10% is required for all awarded funds.

Safe Routes to School (AB1475)

The Safe Routes to School program is a state program using allocated funds from the Hazard Elimination Safety program of SAFETEA-LU. This program is meant to improve school commute routes by eliminating barriers to bicycle travel through rehabilitation, new projects, and traffic calming. A local match of 11.5% is required for this competitive program, which allocates $18-million annually. Planning grants are not available through this program.

Community Based Transportation Planning (CBTP) Grants

The CBTP grant program funds local planning activities that encourage livable communities. The intention of the grants is to help communities better integrate land use and transportation planning, to develop alternatives for addressing growth, and to ensure that infrastructure investments are efficient and meet community needs. Funding is provided by 80% Federal/State and 20% local match.

Office of Traffic Safety (OTS)

The primary objective of the program is to reduce motor vehicle fatalities and injuries through a national highway safety program. Priority areas include police traffic services, alcohol and other drugs, occupant protection, bicycle safety, emergency medical services, traffic records, roadway safety, and community-based organizations. The Office of Traffic Safety (OTS) provides grants for one to two years. The California Vehicle Code (Sections 2908 and 2909) authorizes the apportionment of federal highway safety funds to the OTS program. Eligible agencies are: state, city, and county governmental agencies, school districts, fire departments, public emergency service providers, state colleges, and universities. Non-profit and community-based organizations are eligible through a "host" governmental agency.

A bicycle safety program should strive to increase safety awareness and skills among pedestrians, bicyclists, and drivers. The program should include the following three components: education, enforcement, and engineering. Educational efforts may address specific target groups or the entire community. Enforcement efforts may include speed enforcement, bicycle helmet and pedestrian violations, and the display of radar trailers near schools and areas of high bicycle usage. Engineering includes developing a "Safe Routes to School" component to complement educational efforts.

Environmental Enhancement and Mitigation Program

Funds, when available, are allocated to projects that offset environmental impacts of modified or new public transportation facilities including streets, mass transit guideways, park-n-ride facilities, transit stations, tree planting to equalize the effects of vehicular emissions, and the acquisition or development of roadside recreational facilities. This program is currently unfunded (2005).

AB 2766

AB 2766 Clean Air Funds are generated by a surcharge on automobile registration. The South Coast Air Quality Management District (AQMD) allocates 40 percent of these funds to cities according to their proportion of the South Coast's population for projects that improve air quality. The projects are up to the discretion of the city and may be used for bicycle projects that could encourage people to bicycle or walk in lieu of driving. The other 60 percent is allocated through a competitive grant program that has specific guidelines for projects that improve air quality. The guidelines vary and funds are often eligible for a variety of bicycle projects.

LOCAL FUNDING

Metro Call for Projects

Metro programs a variety of federal, state, and local revenues to regionally significant projects in the Transportation Improvement Program (TIP) for Los Angeles County through a competitive "Call for Projects." Projects that create benefits for bicycle transportation can be funded, if eligible and competitive, through the Transportation Demand Management (TDM), Bikeway, and Regional Surface Transportation Improvements (RSTI) modal categories. In the past, Metro awarded $10 million in TDM, over $83 million in Bikeway, and funds in the RSTI modal categories for bicycle facilities.

Prop C 20% Local Return

These revenues are generated from L.A. County's ½ cent sales tax for public transit purposes. Funds can be used for congestion management programs, bikeways and bike lanes, transit-related TDM programs, street improvements supporting public transit service and related services to meet the Federal requirements for Americans with Disabilities Act (ADA). Metro is required to distribute Local Return funds directly to the cities on a per capita basis. To expend the Prop C 20% funds, local jurisdictions must submit forms for Metro approval.

Transportation Development Act (TDA)

The TDA creates a Local Transportation Fund (LTF) in each county in which a ¼ cent sales tax of the state sales tax is deposited annually based on the amount of sales tax collected. The funds are allocated based on population. Bicycle and pedestrian facilities are eligible for up to 2% of the total TDA funds available.

New Construction

Future road widening and construction projects are one means of providing bikeways. To ensure that roadway construction projects provide bike lanes where needed, it is important that an effective review process is in place to ensure that new roads meet the standards and guidelines presented in this Plan. Developers may also be required to dedicate land toward the widening of sidewalks and roadways in order to provide for enhanced pedestrian and bicycle mobility.

Impact Fees and Developer Mitigation

Another potential local source of funding is developer impact fees, which typically tie to trip generation rates and traffic impacts produced by a proposed project. A developer may reduce the number of trips (and hence impacts and cost) by providing or paying for on- or off-site bikeway improvements that will encourage residents to bicycle rather than drive. In-lieu parking fees may be used to help construct new or improved bicycle parking. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical in avoiding a potential lawsuit.

Mello Roos

Bike paths, lanes, and routes can be funded as part of a local assessment or benefit district. Defining the boundaries of the benefit district may be difficult unless the facility is part of a larger parks and recreation or public infrastructure program with broad community benefits and support.

Business Improvement Districts

Bicycle improvements can often be included as part of larger efforts at business improvement and retail district beautification. Similar to Mello Roos assessments, Business Improvement Districts collect levies on businesses in order to fund area-wide improvements that benefit businesses and improve access for customers. These districts may include provisions for pedestrian and bicycle improvements, such as wider sidewalks, landscaping, and ADA compliance.

Other opportunities for implementation will appear over time.

APPENDIX A: BIKE-TRANSIT HUB LIST

BIKE-TRANSIT HUB EVALUATION

As part of the Bicycle Transportation Strategic Plan (BTSP), Metro identified over 167 bike-transit hubs in Los Angeles County. A detailed summary of each location is shown in Table A-1, including transit activity, demographics, and an overall raw score that indicates general levels of existing or potential bicycling activity.

A description of the criteria used in the table is provided below.

Hub Number

Each hub is numbered in a series related to the transit line location.

Line

Metro line or transfer location

Hub Name

Location of bike-transit hub

Sub-region

Metro sub-region (C = Central, SFV = San Fernando Valley, NC = North County, etc.)

Transit Ridership

Number of persons using transit within three miles of the hub, based on U.S. Census Journey-to-Work, 2000.

Population

Population within three miles of the hub, based on U.S. Census, 2000.

Employment

Employment within three miles of the hub, based on the U.S. Census, 2000.

Household Income

Household income within three miles of the hub, based on U.S. Census, 2000.

Service

Number of transit and rail lines serving the hub.

The columns with normalized scores convert the raw data from the previous columns into a score. For example, the highest number of transit lines (service) serving any hub was nine. Each hub was scored between one and five, based on the possible range of lines between zero and nine. A hub with eight lines would score 4.44 out of five possible points. Each factor is then weighted according to its estimated importance, from five to 25. For a hub with a 4.44 service score, this would translate into a raw score of 22.2 (5 x 4.44). The row is added up for each criteria and a raw score is presented in the final column. This indicates the general level of potential activity at a bike-transit hub. A low score indicates a relatively low level of potential bicycling and transit activity, while a high score indicates a relatively high level of bicycling and transit activity.

Table A-1 – Bike-Transit Hub List

				59451	269915	142273	76992	9	5.00	5.00	5	5.00	5.00	5.00	359
		Highest number in category													
		Weighting factor							10	25	5	25	15	25	
Hub	Line	Hub Name	Subregion	Transit Ridership <3 miles	Population_3mi	Employment_3mi	HH_Income_3mi	Service_TOTAL	Normalized_Service	Normalized_Ridership	Normalized_Terminus	Normalized_Population	Normalized_Employment	Normalized_HH_Income	SCORE_RAW
100	UNION	Union Station													
101	UNION	Union Station	C	34210	53211	17302	25110	8	4.44	2.88	0	0.99	0.61	3.37	234
200	RED	Metro Red Line													
201	RED	Civic Center	C	41520	61809	23795	24064	7	3.89	3.49	0	1.14	0.84	3.44	253
202	RED	Pershing Square	C	44812	60972	23449	23104	7	3.89	3.77	0	1.13	0.82	3.50	261
203	RED	7th / Metro Center	C	49087	60106	24047	23027	5	2.78	4.13	0	1.11	0.85	3.50	259
204	RED	Westlake / MacArthur Park	C	55321	70053	39793	24971	7	3.89	4.65	0	1.30	1.40	3.38	293
205	RED	Wilshire/Vermont	C	58514	78092	49737	26345	7	3.89	4.92	0	1.45	1.75	3.29	307
206	RED	Wilshire/Normandie	C	59451	78636	50115	26538	7	3.89	5.00	0	1.46	1.76	3.28	309
207	RED	Wilshire/Western	C	58916	56656	51987	27153	7	3.89	4.95	5	1.05	1.83	3.24	322
208	RED	Vermont/Beverly	C	56058	68539	47716	27441	7	3.89	4.71	0	1.27	1.68	3.22	294
209	RED	Vermont/Santa Monica	C	48831	38017	44174	28939	7	3.89	4.11	0	0.70	1.55	3.12	260
210	RED	Vermont/Sunset	C	38569	36895	42296	29467	7	3.89	3.24	0	0.68	1.49	3.09	237
211	RED	Hollywood/Western	C	27320	36127	46535	33059	5	2.78	2.30	0	0.67	1.64	2.85	198
212	RED	Hollywood/Vine	C	22919	70717	76350	44223	7	3.89	1.93	0	1.31	2.68	2.13	213
213	RED	Hollywood/Highland	C	17513	45142	53316	39747	5	2.78	1.47	0	0.84	1.87	2.42	174
214	RED	Universal City	SFV/NC	3703	38688	54658	50122	7	3.89	0.31	0	0.72	1.92	1.75	137
215	RED	North Hollywood	SFV/NC	6133	51128	59483	43888	6	3.33	0.52	5	0.95	2.09	2.15	180
300	BLUE	Metro Blue Line													
301	BLUE	Pico	C	51985	59359	27153	22819	5	2.78	4.37	0	1.10	0.95	3.52	267
302	BLUE	Grand	C	50386	59932	28012	22659	5	2.78	4.24	0	1.11	0.98	3.53	264
303	BLUE	San Pedro	C	40396	57041	22872	22268	5	2.78	3.40	0	1.06	0.80	3.55	240
304	BLUE	Washington	C	27553	58649	21733	22742	5	2.78	2.32	0	1.09	0.76	3.52	212
305	BLUE	Vernon	C	22395	30425	21895	24149	7	3.89	1.88	0	0.56	0.77	3.43	197

		Highest number in category		59451	269915	142273	76992	9	5.00	5.00	5	5.00	5.00	5.00	359
		Weighting factor							10	25	5	25	15	25	
Hub	Line	Hub Name	Subregion	Transit Ridership <3 miles	Population_3mi	Employment_3mi	HH_Income_3mi	Service_TOTAL	Normalized_Service	Normalized_Ridership	Normalized_Terminus	Normalized_Population	Normalized_Employment	Normalized_HH_Income	SCORE_RAW
306	BLUE	Slauson	C	22713	53004	16808	25251	5	2.78	1.91	0	0.98	0.59	3.36	193
307	BLUE	Florence	GW	21317	22653	33029	26236	5	2.78	1.79	0	0.42	1.16	3.30	183
308	BLUE	Firestone	GW	17892	28875	34136	27033	5	2.78	1.50	0	0.53	1.20	3.24	178
309	BLUE	103rd St. / Kenneth Hahn	GW	14372	24874	34199	28408	5	2.78	1.21	0	0.46	1.20	3.16	166
310	BLUE	Imperial/ Wilmington / Rosa Parks	GW	10689	22904	28610	30464	5	2.78	0.90	0	0.42	1.01	3.02	151
311	BLUE	Compton	GW	5912	22257	18658	34378	6	3.33	0.50	0	0.41	0.66	2.77	135
312	BLUE	Artesia	GW	5114	22324	18194	37049	5	2.78	0.43	0	0.41	0.64	2.59	123
313	BLUE	Del Amo	GW	3544	26586	22530	42734	5	2.78	0.30	0	0.49	0.79	2.22	115
314	BLUE	Wardlow	GW	6094	43098	45408	35135	5	2.78	0.51	0	0.80	1.60	2.72	152
315	BLUE	Willow	GW	9533	63964	68427	34288	5	2.78	0.80	0	1.18	2.40	2.77	183
316	BLUE	Pacific Coast Highway	GW	9592	44828	57126	32917	5	2.78	0.81	0	0.83	2.01	2.86	170
317	BLUE	Anaheim	GW	9370	111705	107476		5	2.78	0.79	0	2.07	3.78	5.00	281
318	BLUE	5th Street	GW	9013	40309	52036	31126	5	2.78	0.76	0	0.75	1.83	2.98	167
319	BLUE	1st Street	GW	8841	89835	94810		5	2.78	0.74	0	1.66	3.33	5.00	263
320	BLUE	Long Beach Transit Mall	GW	8787	43649	52752	31149	6	3.33	0.74	5	0.81	1.85	2.98	199
321	BLUE	Pacific	GW	8922	41019	53210	30633	5	2.78	0.75	0	0.76	1.87	3.01	169
400	GREEN	Metro Green Line													
401	GREEN	I-605/I-105 Norwalk	GW	3263	71188	60525	46012	7	3.89	0.27	5	1.32	2.13	2.01	186
402	GREEN	Lakewood	GW	3812	54282	51160	42532	5	2.78	0.32	0	1.01	1.80	2.24	144
403	GREEN	Long Beach (Blvd)	GW	8967	29121	25992	33182	5	2.78	0.75	0	0.54	0.91	2.85	145
404	GREEN	Avalon	GW	10150	24513	30494	28693	5	2.78	0.85	0	0.45	1.07	3.14	155
405	GREEN	Harbor Freeway	GW	9650	27321	31700	29561	7	3.89	0.81	0	0.51	1.11	3.08	166
406	GREEN	Vermont	SB	9541	25005	29457	30226	7	3.89	0.80	0	0.46	1.04	3.04	162
407	GREEN	Crenshaw	SB	9577	52418	37278	34869	7	3.89	0.81	0	0.97	1.31	2.74	171
408	GREEN	Hawthorne	SB	7754	42464	32933	38005	5	2.78	0.65	0	0.79	1.16	2.53	144
409	GREEN	Aviation	SB	5783	41460	29091	45165	7	3.89	0.49	0	0.77	1.02	2.07	137

		Highest number in category		59451	269915	142273	76992	9	5.00	5.00	5	5.00	5.00	5.00	359
		Weighting factor							10	25	5	25	15	25	
Hub	Line	Hub Name	Subregion	Transit Ridership <3 miles	Population_3mi	Employment_3mi	HH_Income_3mi	Service_TOTAL	Normalized_Service	Normalized_Ridership	Normalized_Terminus	Normalized_Population	Normalized_Employment	Normalized_HH_Income	SCORE_RAW
410	GREEN	Mariposa	SB	4481	37219	27046	49559	5	2.78	0.38	0	0.69	0.95	1.78	113
411	GREEN	El Segundo	SB	4244	37621	28080	50361	5	2.78	0.36	0	0.70	0.99	1.73	112
412	GREEN	Douglas	SB	4190	39266	34914	53740	5	2.78	0.35	0	0.73	1.23	1.51	111
413	GREEN	Redondo Beach	SB	4512	192371	114621		5	2.78	0.38	5	3.56	4.03	5.00	337
500	GOLD	Metro Gold Line													
501	GOLD	Chinatown	C	32107	53139	17103	26303	5	2.78	2.70	5	0.98	0.60	3.29	236
502	GOLD	Lincoln / Cypress	C	17134	37853	19927	30702	7	3.89	1.44	0	0.70	0.70	3.01	178
503	GOLD	Heritage Square	C	13910	25070	17645	33920	5	2.78	1.17	0	0.46	0.62	2.80	148
504	GOLD	Southwest Musuem	C	9869	11590	17596	38259	5	2.78	0.83	0	0.21	0.62	2.52	126
505	GOLD	Highland Park	C	8428	12027	18243	42691	5	2.78	0.71	0	0.22	0.64	2.23	116
506	GOLD	Mission	SGV	6337	35528	29486	47048	5	2.78	0.53	0	0.66	1.04	1.94	122
507	GOLD	Fillmore	SGV	5005	30844	29877	49904	5	2.78	0.42	0	0.57	1.05	1.76	112
508	GOLD	Del Mar	SGV	4047	27957	25845	53008	5	2.78	0.34	0	0.52	0.91	1.56	102
509	GOLD	Memorial Park	SGV	3784	28100	26370	56067	7	3.89	0.32	0	0.52	0.93	1.36	108
510	GOLD	Lake	SGV	3348	99839	86039	53740	5	2.78	0.28	0	1.85	3.02	1.51	164
511	GOLD	Allen	SGV	3321	32384	29557	59831	5	2.78	0.28	0	0.60	1.04	1.11	93
512	GOLD	Sierra Madre Villa	SGV	1811	24628	27694	60670	5	2.78	0.15	5	0.46	0.97	1.06	109
600	MLINK	Metrolink Commuter Rail													
601	MLINK	Glendale	AV	9913	60415	46692	39889	6	3.33	0.83	0	1.12	1.64	2.41	167
602	MLINK	Burbank	AV	2080	45302	39149	49911	6	3.33	0.17	0	0.84	1.38	1.76	123
603	MLINK	Burbank Airport	AV	5771	58782	57454	41619	6	3.33	0.49	0	1.09	2.02	2.30	160
604	MLINK	Van Nuys	SFV/NC	11962	100539	95771	36777	6	3.33	1.01	0	1.86	3.37	2.61	221
605	MLINK	Northridge	SFV/NC	4067	79958	76914	52544	6	3.33	0.34	0	1.48	2.70	1.59	159
606	MLINK	Chatsworth	SFV/NC	1700	42416	31769	61432	6	3.33	0.14	0	0.79	1.12	1.01	99
607	MLINK	Sun Valley	SFV/NC	4430	32483	29686	40397	6	3.33	0.37	0	0.60	1.04	2.38	133
608	MLINK	Sylmar/San Fernando	SFV/NC	3212	46693	50195	47888	6	3.33	0.27	0	0.86	1.76	1.89	135

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		Weighting factor							10	25	5	25	15	25	
Hub	Line	Hub Name	Subregion	Transit Ridership <3 miles	Population_3mi	Employment_3mi	HH_Income_3mi	Service_TOTAL	Normalized_Service	Normalized_Ridership	Normalized_Terminus	Normalized_Population	Normalized_Employment	Normalized_HH_Income	SCORE_RAW
609	MLINK	Cal State LA	C	12225	24198	27618	33697	6	3.33	1.03	0	0.45	0.97	2.81	155
610	MLINK	Montebello/Commerce	GW	5365	54789	35768	38094	6	3.33	0.45	0	1.01	1.26	2.53	152
611	MLINK	Commerce	GW	7433	49557	39378	35598	6	3.33	0.63	0	0.92	1.38	2.69	160
612	MLINK	Norwalk/Santa Fe Springs	GW	1927	55075	48140	50816	6	3.33	0.16	0	1.02	1.69	1.70	131
613	MLINK	Industry	SGV	1257	39346	34795	66475	6	3.33	0.11	0	0.73	1.22	0.68	90
614	MLINK	Downtown Pomona	SGV	2403	35322	37679	43374	6	3.33	0.20	0	0.65	1.32	2.18	129
615	MLINK	El Monte	SGV	4696	86269	62901	40932	6	3.33	0.39	0	1.60	2.21	2.34	175
616	MLINK	Baldwin Park	SGV	3011	47034	47795	46178	6	3.33	0.25	0	0.87	1.68	2.00	137
617	MLINK	Covina	SGV	2901	62072	64084	51639	6	3.33	0.24	0	1.15	2.25	1.65	143
618	MLINK	Pomona (North)	SGV	2453	37351	39789	48589	6	3.33	0.21	0	0.69	1.40	1.84	123
619	MLINK	Claremont	SGV	1653	25639	26785	48301	6	3.33	0.14	0	0.47	0.94	1.86	109
620	MLINK	Santa Clarita	SFV/NC	1392	14208	25782	71611	6	3.33	0.12	0	0.26	0.91	0.35	65
621	MLINK	Princessa	SFV/NC	769	6534	15182	63740	6	3.33	0.06	0	0.12	0.53	0.86	67
622	MLINK	Janheidt / Newhall	SFV/NC	919	10220	15626	71281	6	3.33	0.08	0	0.19	0.55	0.37	58
623	MLINK	Vincent Grade/Acton	SFV/NC	29	2048	8928	53322	6	3.33	0.00	0	0.04	0.31	1.54	77
624	MLINK	Lancaster	SFV/NC	734	32772	38124	40053	6	3.33	0.06	5	0.61	1.34	2.40	155
625	MLINK	Palmdale Transportation Center	SFV/NC	812	24750	29351	43659	6	3.33	0.07	0	0.46	1.03	2.16	116
700	TC	Busways / Transit Centers													
701	TC	Eastland Center	SGV	2519	38251	48469	39889	4	2.22	0.21	0	0.71	1.70	2.41	131
702	TC	Fox Hills Mall /Culver City TC	W	6591	45842	49747	49911	5	2.78	0.55	0	0.85	1.75	1.76	133
703	TC	El Monte	SGV	4852	93782	68180	41619	9	5.00	0.41	0	1.74	2.40	2.30	197
704	TC	Inglewood TC - North	SB	7545	94809	82939	36777	6	3.33	0.63	0	1.76	2.91	2.61	202
705	TC	Inglewood TC - South	SB	7515	94324	84916	52544	7	3.89	0.63	0	1.75	2.98	1.59	183
706	TC	CSULB Transit Hub / VA Hospital	GW	2375	46993	55926	61432	2	1.11	0.20	0	0.87	1.97	1.01	93
707	TC	USC Medical Center	C	15916	269915	90872	40397	4	2.22	1.34	0	5.00	3.19	2.38	288
708	TC	USC/Exposition Park/37th	C	40699	242682	142273	47888	7	3.89	3.42	0	4.50	5.00	1.89	359

		Highest number in category		59451	269915	142273	76992	9	5.00	5.00	5	5.00	5.00	5.00	359
		Weighting factor							10	25	5	25	15	25	
Hub	Line	Hub Name	Subregion	Transit Ridership <3 miles	Population_3mi	Employment_3mi	HH_Income_3mi	Service_TOTAL	Normalized_Service	Normalized_Ridership	Normalized_Terminus	Normalized_Population	Normalized_Employment	Normalized_HH_Income	SCORE_RAW
709	TC	Artesia TC	GW	2459	45988	29703	33697	8	4.44	0.21	0	0.85	1.04	2.81	157
710	TC	Carson	SB	2107	52024	44555	38094	6	3.33	0.18	0	0.96	1.57	2.53	148
711	TC	LAX City Bus Center	SB	4634	45737	27888	35598	5	2.78	0.39	0	0.85	0.98	2.69	141
712	TC	Manchester	SB	17084	46592	85331	50816	6	3.33	1.44	0	0.86	3.00	1.70	178
713	TC	PCH	SB	2775	40205	49278	66475	6	3.33	0.23	0	0.74	1.73	0.68	101
714	TC	Pico Rimpau TC	C	32393	44386	56989	43374	5	2.78	2.72	0	0.82	2.00	2.18	201
715	TC	Rosecrans	GW	5764	68795	59341	40932	6	3.33	0.48	0	1.27	2.09	2.34	167
716	TC	Slauson	C	24744	101306	106545	46178	6	3.33	2.08	0	1.88	3.74	2.00	238
717	TC	West LA TC	W	11677	55160	52139	51639	5	2.78	0.98	0	1.02	1.83	1.65	147
718	TC	UCLA Ackerman Terminal	W	4463	99011	56250	48589	6	3.33	0.38	0	1.83	1.98	1.84	164
720	TC	UCLA Hilgard Terminal	W	4094	100121	55052	48301	2	1.11	0.34	0	1.85	1.93	1.86	142
721	TC	Cal Poly Pomona TC	SGV	996	27221	27947	71611	4	2.22	0.08	0	0.50	0.98	0.35	60
722	TC	South Bay Galleria	SB	3067	64285	60749	63740	6	3.33	0.26	0	1.19	2.13	0.86	123
723	TC	Santa Monica Transit Mall	W	3667	69735	66370	71281	7	3.89	0.31	0	1.29	2.33	0.37	123
724	TC	West Covina TC	SGV	3874	59637	66968	53322	4	2.22	0.33	0	1.10	2.35	1.54	132
800	ORANGE	Metro Orange "Rapidway" (Future)													
801	ORANGE	Laurel Canyon	SFV/NC	7603	52407	74358	42624	2	1.11	0.64	0	0.97	2.61	2.23	146
802	ORANGE	Valley College	SFV/NC	8942	53198	66178	41827	2	1.11	0.75	0	0.99	2.33	2.28	147
803	ORANGE	Woodman	SFV/NC	9702	51543	64662	41550	2	1.11	0.82	0	0.95	2.27	2.30	147
804	ORANGE	Van Nuys	SFV/NC	8879	51214	58206	42725	3	1.67	0.75	0	0.95	2.05	2.23	145
805	ORANGE	Sepulveda	SFV/NC	7818	47943	45906	43197	3	1.67	0.66	0	0.89	1.61	2.19	134
806	ORANGE	Woodley	SFV/NC	7719	45925	44062	46022	2	1.11	0.65	0	0.85	1.55	2.01	122
807	ORANGE	Balboa	SFV/NC	5871	44135	40499	52370	2	1.11	0.49	0	0.82	1.42	1.60	105
808	ORANGE	Reseda	SFV/NC	3415	46457	32773	51270	3	1.67	0.29	0	0.86	1.15	1.67	104
809	ORANGE	Tampa	SFV/NC	4301	60859	37242	51040	2	1.11	0.36	0	1.13	1.31	1.69	110
810	ORANGE	Pierce College	SFV/NC	4941	58045	45154	56130	2	1.11	0.42	0	1.08	1.59	1.35	106

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		Weighting factor							10	25	5	25	15	25	
Hub	Line	Hub Name	Subregion	Transit Ridership <3 miles	Population_3mi	Employment_3mi	HH_Income_3mi	Service_TOTAL	Normalized_Service	Normalized_Ridership	Normalized_Terminus	Normalized_Population	Normalized_Employment	Normalized_HH_Income	SCORE_RAW
811	ORANGE	De Soto	SFV/NC	3969	58338	39915	63919	2	1.11	0.33	0	1.08	1.40	0.85	89
812	ORANGE	Warner Center	SFV/NC	2733	55258	36771		4	2.22	0.23	5	1.02	1.29	5.00	223
900	GOLD_X	Gold Line East LA extension													
901	GOLD_X	Little Tokyo	C	36806	54487	18135	24086	3	1.67	3.10	0	1.01	0.64	3.44	215
902	GOLD_X	Pico/Aliso	C	26600	53374	16025	25217	2	1.11	2.24	0	0.99	0.56	3.36	184
903	GOLD_X	Mariachi Plaza	C	20958	53351	15027	26003	2	1.11	1.76	0	0.99	0.53	3.31	171
904	GOLD_X	Soto	C	14254	48550	13317	27455	4	2.22	1.20	0	0.90	0.47	3.22	162
905	GOLD_X	Indiana	C	12465	33240	16256	29296	2	1.11	1.05	0	0.62	0.57	3.10	139
906	GOLD_X	Maravilla	C	11879	29402	23604	32349	2	1.11	1.00	0	0.54	0.83	2.90	135
907	GOLD_X	East LA Civic Center	C	10986	30065	23304	33035	2	1.11	0.92	0	0.56	0.82	2.85	132
908	GOLD_X	Eastside Gold Line Terminus	C	9138				3	1.67	0.77	5	0.00	0.00	5.00	186
1000	OTHER	Other Centers (Transfers)													
1001	OTHER	Santa Anita Mall	SGV	1788	55143	60845	57389	3	1.67	0.15	0	1.02	2.14	1.27	110
1002	OTHER	Bell Gardens	GW	7724	88694	61947	36112	5	2.78	0.65	0	1.64	2.18	2.65	184
1003	OTHER	Beverly Hills	W	6650	162532	99240	59824	4	2.22	0.56	0	3.01	3.49	1.11	192
1004	OTHER	Cal State Dominguez Hills	SB	2610	58448	32398	42198	3	1.67	0.22	0	1.08	1.14	2.26	123
1005	OTHER	Cerritos College	GW	2699	76255	71880	50054	3	1.67	0.23	0	1.41	2.53	1.75	139
1006	OTHER	Claremont Colleges	SGV	1110	27755	26687	53074	4	2.22	0.09	0	0.51	0.94	1.55	90
1007	OTHER	Compton	GW	5886	50080	42071	33916	5	2.78	0.50	0	0.93	1.48	2.80	155
1008	OTHER	Huntington Park	GW	16889	73362	78998	28591	5	2.78	1.42	0	1.36	2.78	3.14	217
1009	OTHER	Gateway	GW	10899	79622	72448	35224	5	2.78	0.92	0	1.47	2.55	2.71	194
1010	OTHER	Lakewood Mall	GW	2904	61207	64204	47286	4	2.22	0.24	0	1.13	2.26	1.93	139
1011	OTHER	Long Beach Airport	GW	3635	60619	66743	46934	3	1.67	0.31	0	1.12	2.35	1.95	136
1012	OTHER	San Pedro	SB	1164	23371	37707	51919	3	1.67	0.10	0	0.43	1.33	1.63	91
1013	OTHER	Venice/Marina Del Rey	W	3795	78470	69714	52519	4	2.22	0.32	0	1.45	2.45	1.59	143
1014	OTHER	Occidental College	C	8687	72738	95150	43603	4	2.22	0.73	0	1.35	3.34	2.17	179

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		Weighting factor							10	25	5	25	15	25	
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1015	OTHER	Studios	SFV/NC	3250	85431	62773	46321	3	1.67	0.27	0	1.58	2.21	1.99	146
1016	OTHER	Beverly Center	C	7939	119938	94424	56324	4	2.22	0.67	0	2.22	3.32	1.34	178
1017	OTHER	Park La Brea	C	14891	123288	113209	45549	4	2.22	1.25	0	2.28	3.98	2.04	221
1019	OTHER	Downtown Redondo Beach (Pier)	SB	548	56637	71746	72765	4	2.22	0.05	0	1.05	2.52	0.27	94
1020	OTHER	San Fernando	SFV/NC	961	50031	57949	46092	5	2.78	0.08	0	0.93	2.04	2.01	134
1021	OTHER	McBean Transfer Station	SFV/NC	3762	22149	37284	76992	3	1.67	0.32	0	0.41	1.31	0.00	54
1022	OTHER	West Hollywood - San Vicente	W	6010	111488	86580	61419	4	2.22	0.51	0	2.07	3.04	1.01	157
1023	OTHER	West Hollywood - Fairfax	W	10670	113613	99706	50657	4	2.22	0.90	0	2.10	3.50	1.71	193
1024	OTHER	West Hollywood - La Brea	W	20603	127217	129696	40134	4	2.22	1.73	0	2.36	4.56	2.39	253
1025	OTHER	Downtown Whittier	SGV	1498	52571	49256	50968	3	1.67	0.13	0	0.97	1.73	1.69	112
1100	EXPO	Exposition Line (Future)													
1102	EXPO	Vermont	C	41494	206309	119167	23662	4	2.22	3.49	0	3.82	4.19	3.46	354
1103	EXPO	Western	C	35351	116266	112041	25826	3	1.67	2.97	0	2.15	3.94	3.32	287
1104	EXPO	Crenshaw	C	20423	56813	74675	31731	3	1.67	1.72	0	1.05	2.62	2.94	199
1105	EXPO	La Brea	C	13908	46050	61920	40041	2	1.11	1.17	0	0.85	2.18	2.40	154
1106	EXPO	La Cienega	W	10809	46207	55977	45233	4	2.22	0.91	0	0.86	1.97	2.06	147
1107	EXPO	Venice/Washington	W	10092	59688	55567	49244	3	1.67	0.85	5	1.11	1.95	1.80	165
1108	EXPO	Venice/Overland	C	7858	60385	51600		1	0.56	0.66	0	1.12	1.81	5.00	202
1109	EXPO	Venice/Sepulveda	C	7865	58952	49568		1	0.56	0.66	0	1.09	1.74	5.00	201
1110	EXPO	Sepulveda/National	W	9906	91844	64649		1	0.56	0.83	0	1.70	2.27	5.00	228
1111	EXPO	Pico/Sawtelle	W	9503	82591	63171		1	0.56	0.80	0	1.53	2.22	5.00	222
1112	EXPO	Bundy	W	9336	108213	77360		1	0.56	0.79	0	2.00	2.72	5.00	241
1113	EXPO	Cloverfield	W	6856	84600	67871		1	0.56	0.58	0	1.57	2.39	5.00	220
1114	EXPO	Ocean/Colorado	W	3737	51916	45654		1	0.56	0.31	5	0.96	1.60	5.00	212

APPENDIX B: HOW TO CONDUCT A BIKE-TRANSIT AUDIT

CONDUCTING BIKE-TRANSIT AUDITS

As part of the BTSP process, Metro consultants conducted Bike-Transit Audits of 12 selected locations in Los Angeles County. The process included intensive field review by an experienced bikeway planner, followed by a meeting between the local agency, Metro, and the auditor to discuss the findings. The worksheets from this effort are shown in this Appendix. The Audit process was developed to be usable by local agencies to create their own Access Plan. A reproducible version of the Audit worksheet is available at the end of this Appendix.

Requirements

In order to conduct a Bike-Transit Audit, the following minimum requirements must be met:

1. (Auditor) Licensed traffic engineer or transportation planning professional with experience and qualifications in analyzing roadways, traffic conditions, and safety conditions.
2. (Auditor) Working knowledge of bikeway planning, including AASHTO Guide for the Development of Bicycle Facilities, Caltrans Highway Design Manual, Chapter 1000: Bikeway Planning and Design, and MUTCD 2003, California Supplement: Part 9: Traffic Controls for Bicycles.
3. Blank Audit worksheets.
4. Maps and/or aerial photographs of the study area (typically 1,500 feet radius around the hub) at a scale of 1" = 200' or less.
5. Where available, local agency (city or county) bicycle route maps, or bicycle route network planning maps.

Audit Process

Using the worksheet, follow this process:

1. Identify and highlight the bicycle access routes based on a combination of (a) existing and planned bikeway routes, (b) input from the bicycling community, and (c) local knowledge of routes that provide reasonable access for bicycles in all directions.
2. Number each route segment.
3. Record the field review date, time, street name, compass direction facing, 'from and to' limits, and length of segment in feet. Segment length can be scaled from a map or aerial photograph; it need not be measured in the field.
4. Record the width information (pavement width). This can be done in the field, or from maps if they are available.
5. Record street classification (arterial, collector, local), existing bikeway class (if any, I=bike path, II=bike lanes, III=bike route), posted speed, actual speed (from speed surveys if available, or estimated in the field), average daily traffic (ADT), pavement quality (good, average, poor), and grade (none, low =0-5%, moderate =5-10%, steep = over 10%).
6. The next section provides a 'snapshot' of the public right-of-way cross-section. This should be done as often as needed to show right-of-way conditions across the street from left to right, relative to the "facing" (compass) direction recorded earlier. A description of each item is shown below:

Land use (C=Commercial retail or service, O=Office, R=Residential, P=Public, I=Industrial, V=Vacant, RR=Railroad or rail right-of-way, PARK=Park or open space)

Curb type = (C=curb, R=rolled curb, 0=no curb)

W. gutter pan = width of gutter pan

Parking type = (P=on-street parking, NP=no parking, ST-=short term, LT=long term)

W. shoulder or bike lane = width of shoulder or bike lane

W. lanes = width of lanes

Once field data has been collected on the worksheet and on marked-up maps, an analysis of potential improvements can be made. Typically, the evaluation process follows this sequence:

1. Does the access route appear to be a likely route used by bicyclists accessing the transit hub?
2. Were any specific safety or other hazards or problems observed on the segment?
3. Given traffic volumes and speeds, is additional bicycle travel width needed in the form of a bike lane or wide outside curb lane?
4. Can the road be re-striped to provide bike lanes or wide outside curb lanes (at least 14 feet in width; 15 feet where there is heavy bus or truck traffic)?
5. Can the road be easily widened?
6. Is the on-street parking used during peak periods (over 50% occupied)?
7. Can the travel lanes be narrowed down to 10.5 feet based on traffic volumes, speeds, and mix of trucks and buses?
8. Can the number of travel and turn lanes be reduced based on traffic and turning movement volumes?
9. Is the two-way left turn lane justified based on turning movements? Could the two-way left turn lane be replaced with a narrow raised median combined with U-turns at major intersections?
10. Can traffic speeds be reduced through physical measures (curb extensions, timed signals, etc.) or increased enforcement?
11. Does the intersection provide a place for through bicyclists to wait for a signal? Or are bicyclists pinned against the curb? Are there heavy unrestricted right turn volumes?
12. Is there a bicycle signal detector and adequate green clearance time at the signalized intersections?
13. Is there adequate access to the transit center, including curb cuts and wheel channels on stairways, and (where applicable) crosswalks and pedestrian buttons for crossing perimeter streets?
14. Is the bicycle parking adequate in terms of capacity, security, and access?

Corridor, intersection, and bike parking improvements will evolve out of these and other questions. It is recommended that the professional conducting the analysis take one of several classes taught by Caltrans, the Institute of Transportation Studies (ITS), and other organizations to learn techniques and case studies for various improvements.

PROJECT DEVELOPMENT PROCESS

Once an audit has been completed, it can be used, along with the data in Table 1 and Table A-1, to develop a Bike-Transit Access Plan. The Access Plan can be used to generate cost estimates, garner political and public support, and to pursue funding. The typical sequence of project development from completion of a Bike-Transit Access Plan onwards is shown below, and shows how an audit fits into this process.

1. Problem Recognition. Through the Bike-Transit Audit process and completion of an Access Plan, existing problems and potential improvements are identified. The Plan is used to generate political, public, and department support.
2. Project Definition. Problems and potential improvements identified by local agencies through the Audit and Access Plan process will need to define and package the project so that it will be competitive. The project may be defined as a 'bike-transit,' corridor, streetscape, safety, traffic-calming, or transit project.
3. Feasibility Study. Once a sponsor defines a project, resources need to be allocated to perform an initial analysis of the project so that the full extent of conditions, needs, and costs can be identified. For larger projects, this could be a formal feasibility study (also known as preliminary engineering). This study will indicate right-of-way needs, preferred alignments or designs, safety analysis, traffic analysis, costs, needs, phasing, standards, and other information.
4. Funding. The feasibility study will help develop reasonably accurate costs for the project, which can then be used to obtain funding. The funding could come from a variety of sources ranging from local General Funds to competitive grants, Call for Projects, Capital Improvement Program budget, or earmarks.

5. Final Design. Once a project obtains funding, it moves into final design. This is likely to include engineering (civil, traffic), landscape architecture, urban design, and other specialties. This effort often also includes obtaining environmental, encroachment, and other permits associated with the project, along with any needed easements and management agreements.
6. Construction. The final effort is the construction of a project.

Metro Bicycle Transportation Strategic Plan

Bike-Transit Hub / Activity Center Audit

Updated 8 June 2005

HUB (information from hub table)

ID		Group	
Name			
Intersection			
City			
Audit date			
By			

BICYCLE PARKING (at hub. R=rack, L=locker)

Run	R/L	Type	Bikes	Replace	Notes
1					
2					
3					
4					
5					
6					

INTERSECTIONS (only on existing or potential bike routes)

Int #	Street1	Street2	Toolbox	Notes
1				
2				
3				
4				
5				
6				
7				
8				

STREET SEGMENTS

Survey | Roadway | Left (N or E) side | Median | Right (S or W) side | Improvements

Seg #	Date	Time	Street	Facing compass direction	From	To	Length, ft (from map)	W paved	W incl. sidewalks	Street classification	Exist. bikeway class	Posted speed	Actual speed	ADT	Pavement Quality	Grade	Land Use	W, Sidewalk	W, Landscape	Curb Type	W, Gutter pan	Parkikng type	W, Shoulder or Bike Lane	W, lanes	W, island or turn lane(s)	(R)aised / (P)ainted?	W, lanes	W, Shoulder or Bike Lane	Parking	W, Gutter pan	Curb Type	W, Landscape	W, Sidewalk	Land Use	Toolbox	Notes
1																																			
2																																			
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*This table is available from Metro.

APPENDIX C: TOOLBOX OF BICYCLE FACILITY DESIGN MEASURES

TOOLBOX OF MEASURES

This section identifies typical improvements applicable to bicycle environments in Los Angeles County. The bicycle audit methodology not only indicates the general 'score' of a location or area, but also identifies the types of measures that can be implemented by MTA or local agencies. This toolbox is not intended to replace sound engineering practices, nor to supplant Caltrans Highway Design Manual Chapter 1000, MUTCD, AASHTO, or other standards or guidelines. In all cases, final selection of measures should be based on professional engineering expertise in conformance with established standards and practices.

Table A-2 – Summary of Measures

Measure	Purpose	Where to Use	Caltrans Standard	Page No.
Bicycle Lanes	Delineate and designate a preferential area for cycling	Collector and arterial roadways Through movements beside right turn lanes	X	A-19
Colored Bike Lanes	Highlight bicycle crossing movements at conflict points	High-conflict transition areas such as exits and merges		A-20
Wide Outside / Curb Lane	Provide ample width for vehicles to overtake bicycles	Collector and arterial roadways without bicycle lanes	X	A-21
Shared Lane Marking	Designate a safe line of travel along parked vehicles	Along parked cars in a lane too narrow for bicycle lanes	X	A-22
Shoulders	Delineate an area for bicycle travel on rural roads	Rural roads with moderate to high volume and/or high average vehicle speeds	X	A-23
Bicycle Paths	Provide a separated facility for non-motorized users	Along waterways and rail corridors with few crossing conflicts	X	A-24
Bike Boulevards	Calm traffic	Low volume streets parallel to busy corridors		A-25
Wayfinding Signage	Guide bicyclists	Beginning of route, before/after decision points		A-26
Road Diet	Reduce traffic speeds by replacing two lanes of traffic with a turn lane	Four lane arterials with frequent left turn movements		A-27
Access Management	Reduce driveway conflicts	Arterial streets with commercial driveways		A-28
Grade Separation: Overpasses	Provide a way across major barriers	Where on-street intersections are not feasible, or interchanges are too busy		A-29
Grade Separation: Underpasses	Provide a way across major barriers	Where on-street intersections are not feasible, or interchanges are too busy		A-30
Bridge Side Paths	Provide a separated facility on a bridge or through a tunnel	On bridges, tunnels and occasionally narrow segments where street travel is infeasible	X	A-31
Signal Timing	Provide sufficient time to cross the intersection	All signals		A-32
Pedestrian Signals	To stop traffic at crossing locations	Crossings of high speed / high volume roadways, or where safety is paramount		A-33
Bicycle Signals	Provide exclusive movement for bicycles through an intersection	Intersections with high bicycle volumes and/or unique bicycle movements		A-34
Bicycle Push Buttons & Loop Detectors	Provide a better waiting position for bicyclists than if they used the pedestrian push button	Actuated or semi-actuated signals where there are no right turn lanes, or a pork chop island		A-35, A-36
Crosswalks	Provide a safe crossing path	Any street crossing (several types)	X	A-37, A-38

Measure	Purpose	Where to Use	Caltrans Standard	Page No.
Curb Ramps and Landings	Enable bicyclists to enter and leave the street	Street intersections, street-path intersections, major destinations	X	A-40
Curb Extensions	Calm vehicle parking and turning movements	Street corners and mid-block parking lanes		A-41
Median Refuge Islands	Enable pedestrians to cross one direction of traffic at a time	Mid-block crossings		A-42
Bicycle Racks	Enable locking of bicycles	Rail stations, bus transfer hubs, destinations		A-43
Bike Stations	Covered secure bicycle parking	High use locations		A-44
Bike Cages	Covered secure bicycle parking in locations/special events with large bike parking needs	High use locations, especially employment centers and special events.		A-44

Corridor Treatments

BICYCLE LANES – ADOPTED CALTRANS STANDARD

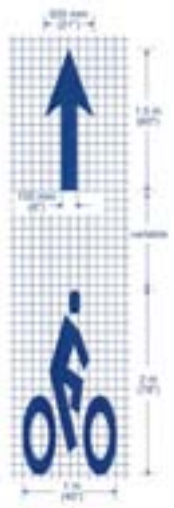
Purpose

To provide bicycles a section of roadway designated by striping, signing and pavement markings for preferential bicycle use. Bicycle lanes must be well marked.

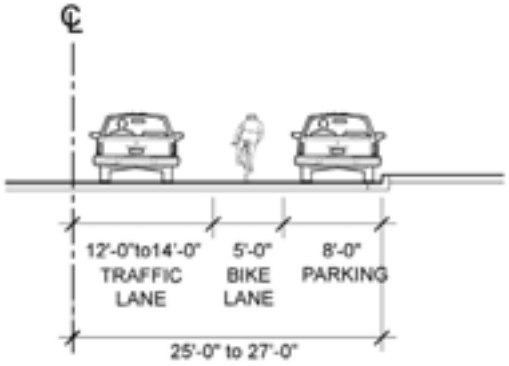
Where to Use

- On urban arterial and major collector roadways
- Average vehicle speeds > 48 km/h (30 mi/h)
- ADT > 10,000
- Vehicle mix includes a significant number of heavy trucks and/or buses

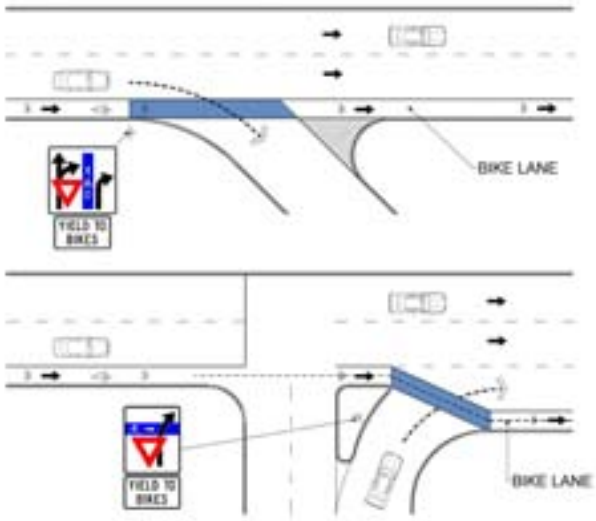
Guidelines

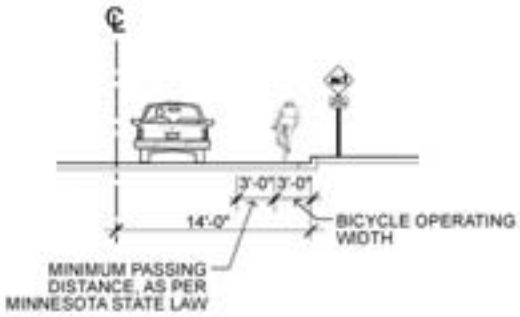


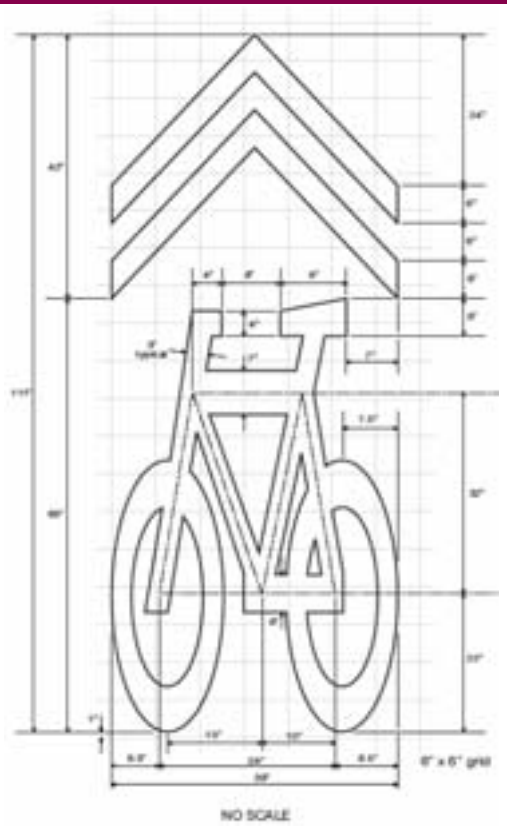
- To retrofit existing lanes, reduce width of (or eliminate) travel, turning or parking lanes.
- Bike lanes should be 1.5 m (5 ft) wide from face of curb or guardrail to the bike lane stripe. There should be at least 1.2 m (4 ft) of rideable surface if the gutter pan joint is not smooth.
- Wider bike lanes (e.g., 1.8 m [6 ft]) are recommended adjacent to parallel parking lanes to account for the door-opening zone.
- In outlying areas without curbs and gutters, a minimum width of 1.2 m (4 ft) is recommended. A width of 1.5 m (5 ft) or greater is preferable where substantial truck traffic is present or where motor vehicle speeds exceed 80 km/h (50 mi/h).



Source: Oregon Department of Transportation

COLORED BIKE LANES		
Purpose	Colored bicycle lanes are used to increase visibility of bicyclists by explicitly defining the bicyclist's path of travel and to remind motorists that they are crossing a bicycle lane and a high-conflict zone. The color is obtained by using a dyed asphalt mix, thermoplastic treatment, or paint.	
Where to Use	• At high-conflict locations where motorists are permitted or required to merge into or across the bicycle lane • Conflict points at highway or bridge on/off ramps and busy intersections • On commuter and/or high use bicycle routes	
Guidelines	• A high visibility lime green color may be preferable • Identify high-conflict locations • Pavement markings similar to standard bicycle lane but filled with color at the transition point • "Yield to Bikes" signs must accompany the treatment • May be used in combination with bicycle pavement markings	

WIDE OUTSIDE / CURB LANE – ADOPTED CALTRANS STANDARD		
Purpose	A 4.2 m (14 ft) minimum outside travel lane can better accommodate bicyclists and motorists in the same lane. In most cases, the motorist will not need to change lanes to pass the bicyclist. Bicyclists will have more maneuvering room at driveways and in places with limited sight distance.	 WIDE CURB LANE 
Where to Use	• Vehicle speeds < 48 km/h (30 mi/h) • ADT < 10,000 • In urban areas on major streets where experienced cyclists will likely be operating	
Guidelines	• Usable width is from edge stripe to lane stripe or from the longitudinal joint of the gutter pan to lane stripe • Gutter pan should not be included as usable width. If there is no gutter pan, add 0.3 m (1 ft) minimum shy distance from face of curb • 4.5 m (15 ft) of usable width is desirable on sections of roadway where bicyclists need more maneuvering room (e.g., steep grades, limited sight distance) • If traffic speeds exceed 64 km/h (40 mi/h) and ADT exceeds 10,000, 4.5 – 4.8 m (15 – 16 ft) lanes are desirable	

SHARED LANE MARKING – ADOPTED CALTRANS STANDARD		
Purpose	To direct bicyclists to where they should ride in the roadway out of the "door zone"; to alert motorists that bicycles are riding in a shared roadway.	 Shared Lane Marking
Where to Use	• Vehicle speeds < 48 km/h (30 mi/h) • ADT < 10,000 • On urban roadways with width constraints due to on-street parking and/or limited right-of-way. • On suburban/rural roadways to indicate	
Guidelines	• The center of the marking should be 11'0 ft from the curb where parking is allowed, marking placement can be increased for: • Downhill sections (greater then 5%) • Areas where wider vehicles park • Where cyclists at 11' still may encourage motorists to pass without changing lanes • The center of the marking should be 4' from curb face to centerline where parking is not allowed, but could be shifted according to: • Lane widths, to position cyclist to either completely take lane or allow for side by side sharing of lane • Obstacles along curb such as seams, depressed grates, etc	

SHOULDERS – ADOPTED CALTRANS STANDARD

Purpose	The roadway shoulder is striped and divided for one-way bicycle traffic.
Where to Use	• On designated bicycle routes and/or popular bicycling roadways • ADT > 2,000 • Average vehicle speeds > 56 km/h (35 mi/h) • When there is inadequate sight distance (e.g. corners and hills)
Guidelines	• Shoulder should be ≥ 1.2 m (4 ft) • Shoulder should be ≥ 1.5 m (5 ft) from the face of the guardrail, curb or other roadside barriers • Shoulder should be ≥ 2.4 m (8 ft) if motor vehicle speeds exceed 80 km/h (50 mi/h) or if the percentage of trucks, buses and recreation vehicles is high • Shoulders should be wider where higher volumes of bicyclists are expected • In the absence of parking, and away from intersections and exits, a striped shoulder functions much like a bicycle lane. At exits and right turn in-out areas, stripe a through bike lane to the left to reduce conflicts for through bicyclists

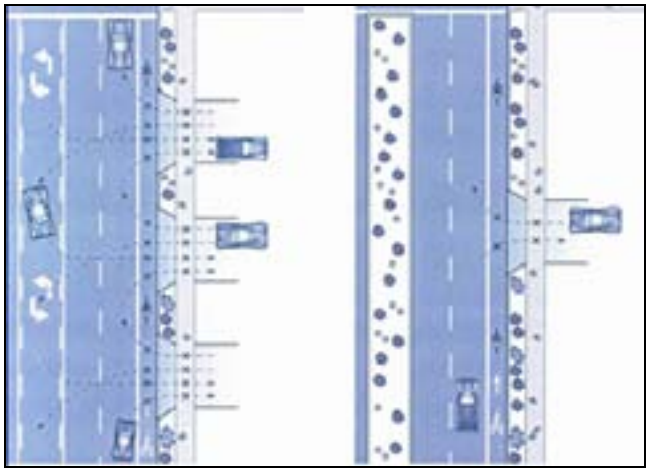
BICYCLE PATHS – ADOPTED CALTRANS STANDARD

Purpose	Bicycle paths (or shared use paths) can enhance bicycle and pedestrian travel in urban areas where the existing road system does not adequately serve these modes. They are also used in natural or manmade corridors.
Where to Use	• In corridors along rivers, lakes, greenbelts, power lines, railroad tracks, or limited access freeways that link parks, schools, shopping, and/or public transportation • Where there are fewer than 2 driveway/ intersection/road crossings per 1.6 km (1 mi) with a combined ADT of less than 500 • In areas of poor connectivity – to link neighborhoods to schools, parks, shopping and community centers
Guidelines	• 3.0 m (10 ft) standard width, 3.7 m (12 ft) minimum width in high use areas • Well-signed with destination and directional information • Pathway overhead clearance of at least 3.0 (10 ft) • Accessible to sweeping machines and maintenance/emergency vehicles • Provide safe crossings at intersections and mid-block crossings 

BIKE BOULEVARDS		
Purpose	A series of improvements calm traffic on a low volume street to create a safer cycling environment.	
Where to Use	• Low volume streets • Streets parallel to and with a quarter mile of higher volume arterials. • On routes that provide access to key destinations.	
Guidelines	• Traffic calming improvements such as traffic circles, chokers and medians should be used to slow traffic and prevent cut-through traffic. • Road stencils and signs may be used to indicate boulevard. • Stop signs along the boulevard should stop perpendicular traffic. • Bicycle push buttons and loop detectors should activate traffic signals to allow safe crossings of higher volume roadways. • 20 mph speed limits should be considered. 	

WAYFINDING SIGNAGE		
Purpose	Special signs used to guide touring, commuter, and recreational bicyclists through communities and to specific activity areas and destinations, including transit centers.	
Where to Use	• On designated or popular bicycling routes • To guide bicyclists through an urban area	
Guidelines	• Use signs sparingly, primarily at intersections and junctions with other bicycle routes • A consistent and recognizable logo, arrows and a destination should be on the sign to clearly direct bicyclists • Bicycle route sign should be accompanied by destination and direction plaques	 **MUTCD Bike Route Sign**

ROAD DIETS		
Purpose	To reduce traffic speeds and enhance the quality of cycling on a multi-lane undivided road by removing one or more lanes of traffic and reallocating the extra space to a turn lane, additional parking, a bike lane or a combination.	 NE Glisan, Portland, OR before  NE Glisan, Portland, OR after Source: "Pedestrian and Bicycle Facilities in California: A Technology Reference and Technology Transfer Synthesis for Caltrans Planners and Engineers." Prepared by Alta Planning + Design for Caltrans, July 2005.
Where to Use	• Four lane undivided arterials with less than 20,000 ADT. • Where traffic calming measures are supported. • Where left turn movements are common.	
Guidelines	• Four lane undivided roads are generally converted into three-lane roads with a center turn lane. • The typical 48 foot collector can be restriped to accommodate two twelve foot through lanes, one 14 foot center shared turn lane 48, and two 5 foot bicycle lanes.	

ACCESS MANAGEMENT		
Purpose	To avoid conflict at access points onto the main right-of-way between cyclists and motor vehicles	 Before After Source: Oregon Department of Transportation
Where to Use	• On roads with multiple driveway access points. • At entryways for parking garages. • At entryways for apartment complexes or other locations of high vehicular use.	
Guidelines	• Driveways can be consolidated from several parking lots to reduce vehicle-cyclist conflict points. • Enough parking spaces should be provided to prevent vehicles parking in the public right-of-way. • A median preventing turning to/from the far right-of-way lane(s) can significantly reduce the potential conflict points for cyclists. • Stop or yield signs, mirrors, flashing lights, or audible signals can be directed to drivers, not cyclists, in places of low sight distance.	

GRADE SEPARATION: OVERPASSES

Purpose	A shared use bridge structure allows bicyclists and pedestrians to cross over busy roadways, railways, or bodies of water, and to reach popular destinations
Where to Use	• At locations that would otherwise be unsafe, difficult, or impossible for bicycles and pedestrians to cross (over freeways, rivers/creeks, multiple railroad tracks, etc.) • Connecting neighborhoods to local schools over high volume and high speed arterials/highways where signalized crossings more than 137.2 m (450 ft) apart • Use only when a safe and direct on-road alignment is not available • Use only when bicyclists and pedestrians aren't required to negotiate significant elevation changes
Guidelines	• Full engineering and design analysis required

Los Angeles River at Los Feliz

GRADE-SEPARATION: UNDERPASSES		
Purpose	A shared use tunnel allows bicyclists and pedestrians to cross high volume/high speed roadways, railroads and/or freeway ramps.	
Where to Use	• When a safe and direct on-street alignment is not available to cross a high volume/high speed roadway or railroad • If the high volume/high speed roadway is elevated • If an existing motor vehicle undercrossing is too narrow for a bicycle and pedestrian facility • Use only when bicyclists and pedestrians aren't required to negotiate significant elevation changes	
Guidelines	• Full engineering and design analysis required • Must have adequate lighting and sight distance for safety • Must have adequate overhead clearance of at least 3.1 m (10 ft) • Tunnels should be a minimum 4.3 m (14 ft) for several users to pass one another safely; a 3.0 m x 6.0 m (10 ft x 20 ft) arch is the recommended standard • "Channeling" with fences and walls into the tunnel should be avoided for safety reasons • May require drainage if the sag point is lower than the surrounding terrain	

BRIDGE SIDE PATHS – ADOPTED CALTRANS STANDARD

Purpose	In *very rare* cases the sidewalk on a bridge or in a tunnel is used by both bicyclists and pedestrians. Generally these sidewalks are at least 2.4 m (8 ft) wide.
Where to Use	• On bridges with constrained right-of-way or narrow outside travel lanes, steel grating, or other unfriendly bicycle and pedestrian elements • In tunnels with restricted lane width without shoulders
Guidelines	• If bridge does not have a sidewalk, a sidewalk with a curb must be installed with appropriate • Approaches to the bridge must be accessible to bicyclists and pedestrians • According to the Caltrans Highway Design Manual, Chapter 1000, page 1000-24: "In general, the designated use of sidewalks (as a Class III bikeway) for bicycle travel is unsatisfactory. It is important to recognize that the development of extremely wide sidewalks does not necessarily add to the safety of sidewalk bicycle travel, as wide sidewalks will encourage higher speed bicycle use and can increase potential for conflicts with motor vehicles at intersections, as well as with pedestrians and fixed objects. Sidewalk bikeways should be considered only under special circumstances, such as: (a) To provide bikeway continuity along high speed or heavily traveled roadways having inadequate space for bicyclists, and uninterrupted by driveways and intersections for long distances. (b) On long, narrow bridges. In such cases, ramps should be installed at the sidewalk approaches. If approach bikeways are two-way, sidewalk facilities should also be two-way."

Intersection Treatments

SIGNAL TIMING		
Purpose	To provide sufficient time for bicyclists and pedestrians to fully cross the street without having to rush	 Proper signal timing  Countdown signal
Where to Use	• At all signalized intersections	
Guidelines	• While MUTCD defines a "normal" walking speed as 1.22 m/s (4 ft/sec), research indicates that elderly pedestrians and women cross slower than younger pedestrians and men, respectively. Therefore, a signal timing of 2.5 ft/sec is recommended when possible. • Signal timing can be combined with a countdown signal to display the number of seconds remaining in the pedestrian clearance interval. This information benefits pedestrians, bicyclists and motorists. • Sufficient yellow time should be provided to enable bicyclists entering the intersection at the end of the green interval to safely exit the intersection • In addition to sufficient yellow time as described above, sufficient minimum green time should be provided to enable bicyclists starting from a stopped position at the beginning of green to safely exit the intersection.	

PEDESTRIAN SIGNALS

Purpose	To stop traffic at crossing locations.
Where to Use	• All traffic signals should be equipped with pedestrian signal indications except where pedestrian crossing is prohibited by signage. • On mid-block crossings of high volume/high speed roadways • On roadways adjacent to schools or other high pedestrian activity areas where safety is paramount • Anticipated use must be high enough for motorists to get used to stopping frequently for a red light (a light that is rarely activated may be ignored when in use)
Guidelines	• Signal needs to be timed with other local signals • Signal may be accompanied by other traffic calming treatments (e.g., raised medians, curb extensions) • Warning signs should be installed for motorists

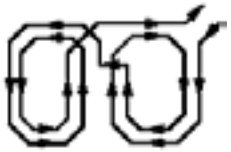
BICYCLE SIGNALS		
Purpose	A bicycle-dedicated signal used in conjunction with a pre-existing traffic signal that directs bicyclists to take specific action to address recommended problems	
Where to Use	• At an intersection at which two or more bicycle-related collisions have occurred in one year that could conceivably have been prevented by a bicycle signal. • Intersections at which the volume warrant (product of bicycle traffic count and vehicular traffic count at the same peak hour) is greater than 50,000, provided the bicycle traffic count is greater than 50.	
Guidelines	• Bicycle signals can allow abnormal bicycle movements similar to a pedestrian scramble phase. • Engineering studies must be completed to ensure that the bicycle signal will have the desired effect.	

BICYCLE PUSH BUTTONS

Purpose	For certain intersection approach configurations, to permit through bicyclists to request a crossing phase without having to ride onto the sidewalk and press a pedestrian push button. To minimize intersection delay by requesting a shorter crossing phase than would be needed for pedestrians
Where to Use	• At an actuated or semi-actuated traffic signal at crossings with (a) no right turn only lanes, or (b) right turn only lanes separated from through lanes by a "pork chop" island
Guidelines	• When bicycle push buttons are used, they should be located approximately six feet before the crosswalk so the bicyclist can actuate the button without encroaching into the crosswalk

Bicycle push button

Bicycle push button
on post before crosswalk

LOOP DETECTORS		
Purpose	Detects cyclist and activates the signal to allow cyclist to proceed across the intersection. Loop detectors can be used to either give cyclists extra green time to proceed through the intersection or to activate the green light so cyclists can proceed across a heavy cross street.	 Quadruple Loop: Used in Bike Lanes  Standard Loop: Used for Advance Detection
Where to Use	• At signal-controlled intersections where bicycle traffic is high.	
Guidelines	• Advance detection loop detectors should be used to activate green lights. • A bicycle stencil should be painted on the roadway to direct the cyclists where to position themselves to activate the signal.	

CROSSWALKS – ADOPTED CALTRANS STANDARD		
Purpose	To provide a safe path for pedestrians, including walking bicyclists, to cross a motor vehicle right-of-way.	 Type 1+ Crossing  Type 1 Crossings
Where to Use	See Table 1 for crosswalk type based on ADT, speed, and number of lanes.	
Guidelines	• Type 1 Marked/unprotected crossing consists of a crosswalk, signing, and often no other devices to slow or stop traffic. o The approach depends on an evaluation of vehicular traffic, line of sight, trail traffic, use patterns, vehicle speed, road type and width, and other safety issues such as the proximity of schools. o Warning signs should be installed warning both pedestrians and drivers of the crossing. • Type 1+ Enhanced crossings are designed for multi-lane, higher volume arterials over 15,000 ADT. o High ADT streets may have enhanced crossings if the following guidelines are met: ▪ excellent sight distance ▪ sufficient crossing gaps (more than 60 per hour) ▪ median refuges ▪ active warning devices like flashing beacons or in-pavement flashers ▪ inappropriate if many school children use the crossing ▪ must consider existing and potential future usage ▪ A flashing yellow beacon activated by pedestrians may be used.	

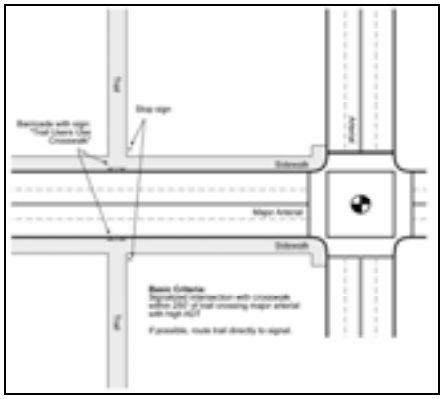
CROSSWALKS (continued) – ADOPTED CALTRANS STANDARD		
Guidelines	• Type 2 Pedestrians are diverted to a signalized intersection with an existing pedestrian crosswalk within 250 ft, rather than unsafe mid-block crossings. o Barriers and signing may be needed to direct trail users to the signalized crossings o Generally, signal modifications would be made to add pedestrian detection and to comply with ADA. o Often, such as on most community trails parallel to roadways, crossings are simply part of the existing intersection and are not a significant problem for trail users. • Type 3 To be used at pedestrian crossings on high-speed corridors more than 250 ft. from an existing signalized intersection to which pedestrians can be diverted. o Where 85th percentile speeds are 40 mi/h and above and/or ADT exceeds 15,000 vehicles. o Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety. o The maximum delay for signal activation should be two minutes, with minimum crossing times determined by street width. o The signals may rest on flashing yellow or green for motorists when not activated, and should be supplemented by standard advanced warning signs. o Typical costs for a signalized crossing range from $150,000 to $250,000. o Trail signals are normally activated by push buttons, but also may be triggered by motion detectors.	 Type 2 Crossing  Type 3 Crossing NOTE: The Pedestrian Volume signal warrant is intended for the application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street. For signal warrant analysis, a location with a wide median, even if the median width is greater than 9 m (30 ft), should be considered as one intersection.

Table A-3 – Summary of Bike Path-Roadway Crossing Recommendations[1]

Roadway Type (Number of Travel Lanes and Median Type)	Vehicle ADT ≤ 9,000			Vehicle ADT > 9,000 to 12,000			Vehicle ADT > 12,000 to 15,000			Vehicle ADT > 15,000		
	Speed Limit **											
	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h
2 Lanes	1	1	1/1+	1	1	1/1+	1	1	1+/3	1	1/1+	1+/3
3 Lanes	1	1	1/1+	1	1/1+	1/1+	1/1+	1/1+	1+/3	1/1+	1+/3	1+/3
Multi-Lane (4 or more lanes) with raised median ***	1	1	1/1+	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3
Multi-Lane (4 or more lanes) without raised median	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3

* **General Notes:** Crosswalks should not be marked at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices. Adding crosswalk markings alone **will not** make crossings safer, nor will they necessarily result in more motorists stopping for pedestrians. Whether or not crosswalks are marked, it is important to consider other pedestrian facility enhancements (e.g., raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions), as needed, to improve the safety of the crossing. **These are general recommendations; good engineering judgment should be used in individual cases for deciding which treatment to use.**

For each trail-roadway crossing, an engineering study is needed to determine the proper location. For each engineering study, a site review may be sufficient at some locations, while a more in-depth study of pedestrian volume, vehicle speed, sight distance, vehicle mix, etc. may be needed at other sites.

** Where the speed limit exceeds 40 mi/h (64.4 km/h), crosswalk markings alone should not be used at unsignalized locations.

*** The raised median or crossing island must be at least 4 ft (1.2 m) wide and 6 ft (1.8 m) long to adequately serve as a refuge area for pedestrians in accordance with MUTCD and AASHTO guidelines. A two-way center turn lane is not considered a median.

1= Type 1 Crossings. Ladder-style crosswalk markings with appropriate signage should be used.

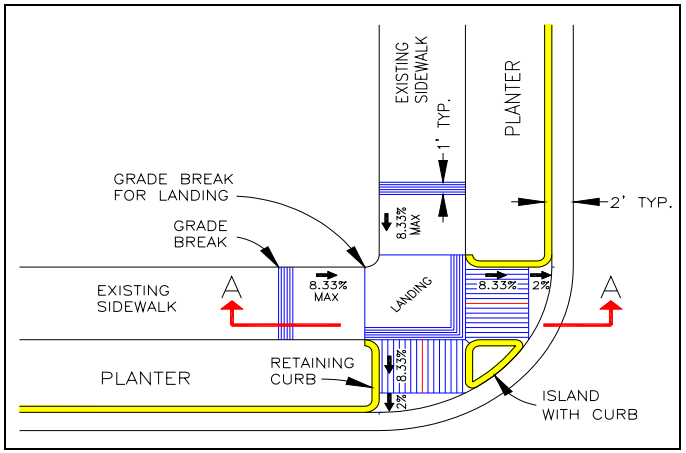
1/1+ = With the higher volumes and speeds, enhanced treatments should be used, including ladder style crosswalk markings, median refuges, flashing beacons, and/or in-pavement flashers. Ensure that there are sufficient gaps through signal timing, as well as sight distance.

1+/3 = Carefully analyze signal warrants using a combination of Warrant 2 or 5 (depending on school presence) and EAU factoring. Make sure to project trail usage based on future potential demand. Consider Pelican, Puffin, or Hawk signals in lieu of full signals. For those intersections not meeting warrants or where engineering judgment or cost recommends against signalization, implement Type 1 enhanced crosswalk markings with marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

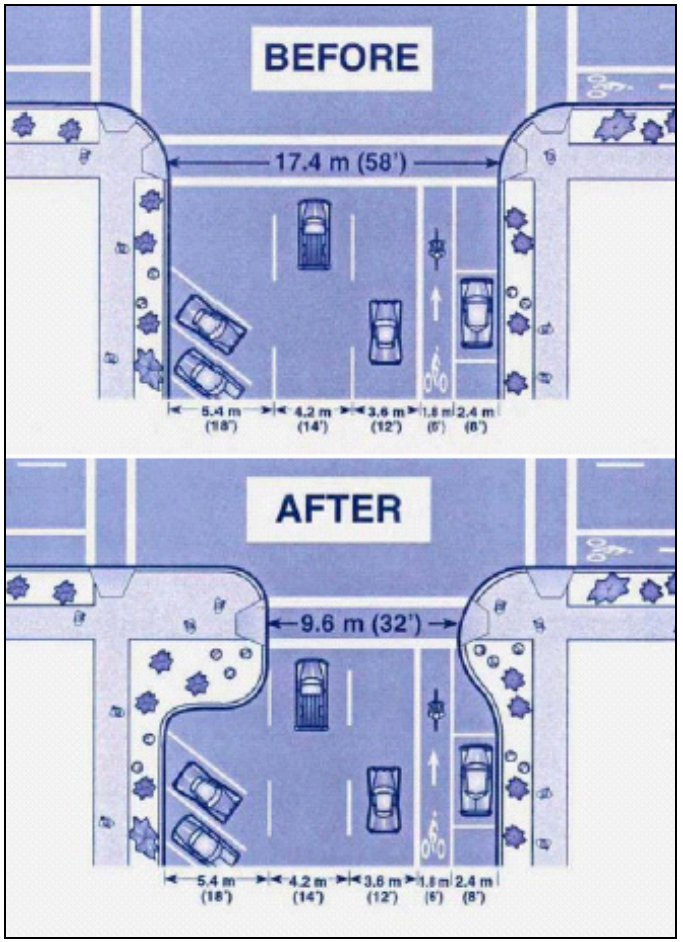
[1] This table is based on information contained in the U.S. Department of Transportation Federal Highway Administration Study, " Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations," February 2002.

CURB RAMPS AND LANDINGS – ADOPTED CALTRANS STANDARD

Purpose	Following ADA guidelines, curb cuts make the sidewalk accessible from the roadway level of the crosswalk, while curb ramps make it possible to change direction after completing the ascent from street level, rather than during the rise, avoiding travel across the compound slope of a side flare. Top landings also allow pedestrians to bypass curb ramps entirely when traveling around a corner.
Where to Use	• At every intersection location where there is a crosswalk, whether or not the crosswalk is marked.
Guidelines	• Ramp runs shall have a running slope not steeper than 1:12 • Cross slopes of ramp runs shall not be steeper than 1:48 • Counter slopes for of surfaces adjacent to curb ramps shall not exceed 1:20 • The landing shall be at least as wide as the ramp leading to it • The landing length shall be at least 1.5m (5 feet)



Curb cuts

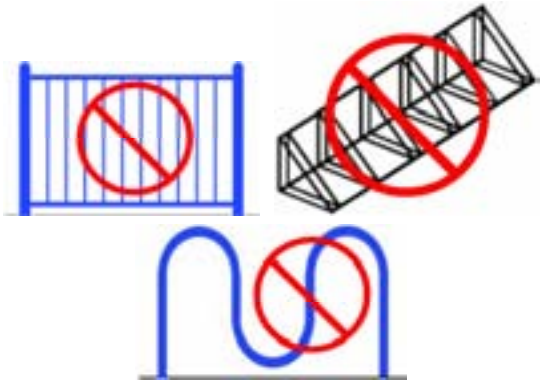
CURB EXTENSIONS		
Purpose	If designed correctly, this measure could reduce vehicle speed, making the conditions safer for bicyclists and pedestrians. To minimize pedestrian exposure during crossing by shortening crossing distance and give pedestrians a better chance to see and be seen before committing to crossing. To help slow traffic and improve conditions for bicycling	 (Source: Oregon Department of Transportation) Curb extensions
Where to Use	• Appropriate for any crosswalk where it is desirable to shorten the crossing distance and there is a parking lane adjacent to the curb. • The outside face of a curb extension in a parallel parking lanes should not be more than 9 feet from the curb, to partly block the "door zone" from bicycle travel without impeding bicyclists on safe lines of travel • If there is no parking lane, curb extensions may be a problem for bicycle travel and truck or bus turning movements.	
Guidelines	• In most cases, the curb extension should be designed to transition between the extended curb and the running curb in the shortest practicable distance. • For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 3m (10 ft) and the two radii should be balanced to be nearly equal.	

MEDIAN REFUGE ISLANDS		
Purpose	To minimize exposure of pedestrians (including walking bicyclists) during crossing by shortening crossing distance and increasing the number of available gaps for crossing.	 Median refuge islands
Where to Use	• Appropriate where the roadway to be crossed is greater than 15.2 m (50 ft) wide or more than four travel lanes; can be used where distance is less to increase available safe gaps. Use at signalized or unsignalized crosswalks.	
Guidelines	• The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings. • A median refuge island should be at least 1.8 m (6 ft) wide between travel lanes and at least 6.1 m (20 ft) long. On streets with speeds higher than 25 mph there should also be double centerline marking, reflectors, and "KEEP RIGHT" signage. • If a refuge island is landscaped, the landscaping should not compromise the visibility of pedestrians crossing in the crosswalk. Tree species should be selected for small diameter trunks and tree branches should be no lower than 4.3 m (14 ft). Shrubs and ground plantings should be no higher than 457 mm (1 ft 6 in). • Refuge islands at intersections should have a median "nose" that gives protection to the crossing pedestrian (see illustration).	

Station-Area Treatments

BICYCLE RACKS	
Purpose	To provide a safe place for bicyclists to lock their bikes.
Where to Use	• Urban retail and commercial centers • Pedestrian malls • At specific juncture points: carpool lots, bus and train stations, trailheads for bicycle paths • At any location with a high current or expected amount of bicycle traffic • Bicycle parking should be situated no farther than the closest motor vehicle parking space from a building, and within 15.2m (50 ft) from the building's main entrance.
Guidelines	• Quality racks should be properly secured to the ground using vandal-proof hardware to prevent theft. • Racks should allow the user to lock her bike frame and front wheel to the rack using a standard "U-Lock". • Unacceptable racks include "wheelbender" racks or others that do not allow proper locking. • Weather protection should be afforded whenever possible • Placement of racks is very important – allow enough room between racks and away from a barrier. • Use vandalproof hardware.

Acceptable Bicycle Racks



Unacceptable Bicycle Racks

BIKE STATIONS		
Purpose	Provide covered, secure bicycle parking.	 Long Beach BikeStation (Photo courtesy of BikeStation®)
Where to Use	• At high use locations	
Guidelines	• Typically an attended facility that also provides bicycle rentals and/or servicing. • May also provide food and drink.	

BIKE CAGES		
Purpose	Provide covered, secure bicycle parking.	 **Source: Missoula Institute for Sustainable Transportation, "Elements of Sustainable Transportation" http://www.strans.org/parkpix.html**
Where to Use	• In parking structures and larger employment centers • At special events	
Guidelines	• May be attended or self-access via a key or cord. • May require high capacity racks • Should be in visible location.	

APPENDIX D: TECHNICAL GUIDANCE FOR PLANNERS AND ENGINEERS

TEA-21

The Transportation Equity Act for the 21st Century (TEA-21), passed by Congress and signed into law in 1998 and expired in 2003, continued the integration of bicycling and walking into the transportation mainstream. TEA-21 required that local jurisdictions consider bicycling and walking in transportation plans and projects. Section 1202 states that bicycling and walking facilities "shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation facilities, except where bicycle and pedestrian use is not permitted."

Like ISTEA, bicycle projects could be funded through one of the TEA-21 programs, the Congestion Mitigation and Air Quality (CMAQ) Improvement Program, the Recreational Trails Program, the Regional Surface Transportation Program (RSTP), and the Transportation Enhancement Activities (TEA) programs.

Federal Highway Administration (US DOT)

Numerous resources and publications are listed on the FHWA Bicycle and Pedestrian Program website on legislation, design, and safety. There is a link to State Bicycle and Pedestrian Coordinators, the Pedestrian and Bicycle Information Center (PBIC), and the Association of Pedestrian and Bicycle Professionals (apbp). Reference materials can be downloaded from http://www.fhwa.dot.gov/environment/bikeped/ in the areas of Planning and Design Guidance, Traffic Calming, Forecasting Demand, Shared-Use Paths, Transit, and Benefits.

State Department of Transportation (Caltrans) Guidelines

1. Deputy Directive Number 22: Context Sensitive Solutions

Caltrans approved DD-22 in November 2001. The statement reads, "The Department uses Context Sensitive Solutions as an approach to plan, design, construct, maintain, and operate its transportation system. These solutions use innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. Context sensitive solutions are reached through a collaborative, interdisciplinary approach involving all stakeholders."

2. Deputy Directive Number DD-64: Accommodating Non-Motorized Travel

Caltrans approved DD-64 in June 2005. The statement reads, "The Department fully considers the needs of non-motorized travelers (including pedestrians, bicyclists and persons with disabilities) in all programming, planning, maintenance, construction, operations and project development activities and products. This includes incorporation of the best available standards in all of the Department's practices. The Department adopts the best practice concepts in the US DOT Policy Statement on Integrating Bicycling and Walking into Transportation Infrastructure." For the full text, see the Caltrans website at www.dot.ca.gov..

3. California Blueprint for Bicycling and Walking

The Blueprint describes Caltran's implementation goals to increase bicycling and walking, improve bicycling and walking safety, and develop appropriate funding for bicycle and pedestrian projects, pursuant to DD-64.

For more information on these items, refer to www.dot.gov.

4. California Highway Design Manual

It is a requirement that California Highway Design Manual standards be followed for all federal and state funded bicycle projects.

Chapter 80, Application of Standards, includes Highway Design Manual Standards, Requirements for Approvals for Nonstandard Design, Use of FHWA and AASHTO Standards and Policies, and Mandatory Procedural Requirements.

Chapter 200, Geometric Design and Structure Standards, includes standards for Pedestrian Overcrossings and Undercrossings, and Bicycle and Bridge Railings.

Chapter 1000, Bikeway Planning and Design, includes General Planning Criteria, Design Criteria, and Uniform Signs, Markings and Traffic Control Devices.

5. Pedestrian and Bicycle Facilities in California: A Technical Reference and Technology Transfer Synthesis for Caltrans Planners and Engineers, July 2005

Included in this document are: DD-64, acronyms, Federal and State Statutes, design practices for bicycles and pedestrians, and other useful materials in the Appendices.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO last updated The Guide for the Development of Bicycle Facilities in 1999. This guide is designed to provide information on the development of facilities to enhance and encourage safe bicycle travel and to help accommodate bicycle traffic in most riding environments. Safe, convenient, and well-designed facilities are essential to encourage bicycle use. The majority of bicycling will take place on ordinary roads with no dedicated space for bicyclists.

Manual on Uniform Traffic Control Devices (MUTCD)

The MUTCD is published by the Federal Highway Administration and defines the national standards used by road managers to install and maintain traffic control devices on all streets and highways. Traffic control devices regulated under the MUTCD include signs, pavement markings, and signals. The purpose of the MUTCD is to promote safety and efficiency on the nation's streets and highways by ensuring that traffic control devices are uniform. Bikeway signs and markings are contained within Chapter 9 of the MUTCD. The State of California has issued a supplement to the MUTCD, the MUTCD 2003 California Supplement, which contains additional guidance on traffic control devices, including bikeways.