City of Riverside Bicycle Master Plan Update: Addendum

March, 2012

PREPARED BY:
Alta Planning + Design
PREPARED FOR:
City of Riverside

Table of Contents

3 Existing Conditions . . . 1

3.1 Setting . . . 1

3.2 Existing Bicycle Facilities . . . 9

3.3 Bicycle Facility Maintenance . . . 17

3.4 Past Bicycle Program Expenditures . . . 17

3.5 Existing Bicycle Programs . . . 17

5 Needs Analysis . . . 20

5.2 Aggregate Demand Model . . . 20

5.2.1: Current Benefits . . . 22

5.2.2: Potential Future Walking and Bicycling Trips . . . 23

6 Recommended Improvements . . . 26

6.1 Recommended Bikeway Network . . . 26

6.2 Recommended Support Facilities and Programs . . . 32

List of Tables

Table 3-2: Public Elementary, Middle, and High Schools in Riverside . . . 7

Table 3-3: Parks with Restroom Facilities in Riverside . . . 9

Table 3-4a: Index of Existing City of Riverside Class I Bike Paths . . . 10

Table 3-4b: Index of Existing City of Riverside Non-Standard Trails . . . 10

Table 3-5: Index of Existing City of Riverside Class II Bike Lanes . . . 12

Table 3-6: City of Riverside Bicycle Shops . . . 14

Table 3-7: Bicycle Racks and Support Facilities at Riverside's Largest Employers . . . 16

Table 5-1: Walking and Bicycling Commute Modeshare in Riverside . . . 20

Table 5-2: Current Walking and Bicycling Trips 21

Table 5-3: Current Walking and Bicycling Trip Replacement 22

Table 5-4: Benefits of Current Bicycling and Walking Trips in Riverside 22

Table 5-5: Projected Future (2030) Demographics 23

Table 5-6: Future (2030) Bicycling and Walking Trips. 24

Table 5-7: Benefits of Future Bicycling and Walking Trips in Riverside 25

Table 6-1: Recommended Class I Bike Paths 26

Table 6-2: Recommended Class II Bike Lanes 26

Table 6-3: Recommended Class III Bike Routes 28

List of Figures

Figure 3-2: City of Riverside Annexation Proposals. 6

Figure 3-3 City of Riverside Existing Bikeways. 11

Figure 3-4 City of Riverside Downtown Bike Loop 15

Figure 6-1: City of Riverside Existing and Proposed Bikeways 29

Figure 6-2: Share Lanes Marking Placement Guidance. 30

Figure 6-3: Bicycle Boulevard Application Levels 31

1 City of Riverside Bicycle Master Plan Update - 2012 Addendum

The following addendum to the City of Riverside 2007 Bicycle Master Plan provides an updated inventory of all bicycle infrastructure and non-infrastructure improvements implemented over the past five years within the City of Riverside. It also presents current and future bicycle and walking impact analysis, which includes estimated bicycle and walking trips, reduced vehicle miles traveled, and emission reductions for current and future conditions. The addendum also provides an updated list of recommended bicycle improvements, including a new network of proposed bicycle facilities and programs that will help the City of Riverside upgrade their current designation as a bronze level bicycle friendly community.

The addendum is organized as follows:

- Chapter 3: Existing Conditions
- Chapter 5: Needs Analysis
- Chapter 6: Recommended Improvements

3 Existing Conditions

This chapter provides an update of the following key elements of the City of Riverside 2007 Bicycle Master Plan:

- Planning and policy context to ensure that the Bicycle Master Plan is consistent with other local and regional plans.
- City of Riverside current and potential annexation proposals, presented in **Figure 3-2.**
- Inventory of all elementary, middle, and high schools in Riverside, presented in **Table 3-2.**
- Inventory of parks with restroom facilities, presented in **Table 3-3.**
- City of Riverside existing bicycle infrastructure map, presented in **Figure 3-3.**
- List of existing Class I and Class II bicycle facilities, presented in **Tables 3-4** and **3-5.**
- An overview of existing bicycle related programs offered by the City of Riverside.

3.1 Setting

Relationships to Other Plans and Policies

As per the Bicycle Transportation Account (BTA) requirements, the 2007 City of Riverside Bicycle Master Plan is consistent with relevant local, state and federal plans. Chapter 4 provides an overview of relevant plans and policies to the Bicycle Master Plan (please refer to pages 4-1 to 4-11). Relevant plans and polices implemented after the adoption of the 2007 Bicycle Master Plan include the Riverside County General Plan Addendum, the Western Riverside Council of Governments (WRCOG) Non-Motorized Transportation Plan (NMTP), the Green Riverside Action Plan, and the UC Riverside

Campus Aggregate Master Planning Study. The Bicycle Master Plan is consistent with these plans, which are summarized below.

Riverside County General Plan Addendum, 2008

This document was adopted in 2008 by the Board of Supervisors and includes amendments to the Land Use, Circulation, Area Plans, Policy Areas and other elements. The amended Circulation element establishes a multi modal transportation system that is safe, achievable, efficient, environmentally sound, accessible and coordinated with the Land Use Element. Planned Circulation Policies adopted by this plan include:

C.1.1 Design the transportation system to respond to concentrations of population and employment activities, as designated by the Land Use Element and in accordance with the Circulation Plan, Figure C-1. (AI 49)

C.1.2 Support development of a variety of transportation options for major employment and activity centers including direct access to transit routes, primary arterial highways, bikeways, park-n-ride facilities, and pedestrian facilities.

C1.3 Support the development of transit connections that link the community centers located throughout the County and as identified in the Land Use Element and in the individual area plans. (AI 26)

C1.4 Utilize existing infrastructure and utilities to the maximum extent practicable and provide for the logical, timely, and economically efficient extension of infrastructure and services.

C1.5 Evaluate the planned circulation system as needed to enhance the arterial highway network to respond to anticipated growth and mobility needs. (AI 49)

C1.6 Cooperate with local, regional, state, and federal agencies to establish an efficient circulation system. (AI 4, 41, 46, 50)

C1.7 Encourage and support the development of projects that facilitate and enhance the use of alternative modes of transportation, including pedestrian-oriented retail and activity centers, dedicated bicycle lanes and paths, and mixed-use community centers.

Non-Motorized Transportation Policies envision a well-planned and built system that can improve resident's quality of life through alternative transportation. This section encourages pedestrian, bicycle and other non-motorized transportation modes to connect community centers, residential neighborhoods, recreational amenities, and other key destinations through the use of trails, natural open space and proper infrastructure. Adopted policies include:

C 15.1 Implement and later expand an effective non-motorized transportation system.

C15.2 Seek financing to implement an effective non-motorized transportation system. This funding can include such things as state and federal grants. (AI 36)

C15.3 Develop a trail system which connects County parks and recreation areas while providing links to open space areas, equestrian communities, local municipalities, and regional recreational facilities (including other regional trail systems).

C15.4 Review and update the Regional Trail Map in accordance with the review procedures and schedule of the General Plan, in order to assure compatibility with the other elements of the County General Plan, and with the similar plans from the Western Riverside Council of Governments, Coachella Valley Association of Governments, Riverside County Transportation Commission, and all jurisdictions within and abutting Riverside County.

C15.5 Compliance with the Americans with Disabilities Act (ADA) standards will be assured so as to make the entire trails system user- friendly.

Policies for bikeways were also developed to improve connectivity, encourage bicycle commuting, and ensure alternative modes of motorized transportation can support bicycle commuters. The policies include:

C 17.1 Develop Class I Bike Paths, Class II Bike Lanes and Class I Bike Paths/Regional Trails (Combo Trails) as shown in the Trails Plan (Figure C-7), to the design standards as outlined in the California Department of Transportation Highway Design Manual, and other County Guidelines.

C17.2 Require bicycle access between proposed developments and other parts of the County trail system through dedication of easements and construction of bicycle access ways.

C17.3 Ensure that the bikeway system incorporates the following :
1. Interconnection of cities and unincorporated communities;
2. Provision of lanes to specific destinations such as state or county parks;
3. Provision for bicycle touring; and
4. Encouragement of bicycle commuting.

C18.1 Ensure that alternative modes of motorized transportation, such as buses, trains, etc., plan and provide for transportation of recreational and commuting bicyclists and bicycles on public transportation systems.

Western Riverside Council of Governments (WRCOG) Non- Motorized Transportation Plan (NMTP), 2010

The NMTP is a regional guide whose purpose is to enhance bicycle, pedestrian and other non-motorized facilities to provide alternative low-emission transportation options for residents. The plan encompasses all 16 incorporated cities including the City of Riverside, which is categorized in the Northwest Zone, for the purpose of the plan. Section 4.0 Sub Regional Goals and Strategies sets out specific goals to develop an interconnected system of routes for cyclists and pedestrians and ensure connections between communities, to major transportation facilities and nodes of activity. The goals are the following:

- G-1. Increase the range of transportation options for travel within and between western Riverside jurisdictions and neighboring counties.
- G-2. Create safer travel accommodations for pedestrians and cyclists.

- G-3. Establish a sub regional backbone network of routes that enhances access to and from public transportation services and major attractions. The resulting network should complement rather than conflict with local plans. Ideally, regional components will be integrated into local plans as updates occur.
- G-4. Establish design classifications and typical design standards for the various corridor types that are adopted by individual WRCOG jurisdictions.
- G-5. Reduce auto generated emissions while encouraging healthier lifestyles and more sustainable development patterns.
- G-6. Maximize opportunities to fund bicycle and pedestrian improvements, as well as operations and maintenance costs associated with the sub regional backbone network, in cooperation with local jurisdictions.
- G-7. Achieve implementation of the sub regional backbone network by 2035.
- G-8. Determine an annual funding goal for Regional Backbone Network projects every year in western Riverside County, through both local and sub regional efforts.
- G-9. Create a branding program for the sub regional system that distinguishes it from local-serving routes and includes special signage and general promotion.

Additionally, Section 6.0: Design Guidelines discusses the desired implementation strategies and best practices to encourage the built environment to facilitate safe pedestrian and bicycle use. This section is consistent with the adopted 2007 Riverside Bicycle Master Plan in its definitions of Class I, II, and III bicycle lanes and supports the recommendations in this addendum for improved signage, bicycle boulevards, sharrow lanes, and bicycle parking corrals.

Green Riverside Action Plan, 2007

This plan serves as a step-by-step manual to assist the City in its commitment to a clean and sustainable future for the City of Riverside. The Action Plan addresses seven areas in which the City can promote awareness for cleaner and more environmentally friendly solutions. The Transportation section of this plan notes the significant environmental impacts that motorized vehicles have on the environment. Strategies recommended to decrease harmful emissions include:

- Item 26: Synchronize traffic signals along primary City arterials by the end of 2008.
- Item 27: Implement a program to design, construct or close at least one of the 26 railroad grade separations each year.
- Item 28: Reconstruct at least two freeway/street interchanges by 2012.
- Item 29: Increase the number of clean vehicles in the non-emergency City fleet to at least 60% by 2010.
- Item 30: Encourage the use of bicycles as an alternative form of transportation, not just recreation, by increasing the number of bike trails by 15 miles and bike lanes by 111 miles throughout the City before 2025.

- Item 31: Develop programs to reduce mobile sources of pollution, such as encouraging the purchase of alternative fuel vehicles or lower emission hybrids and plug-ins for the residential and business community before 2009.
- Item 32: Promote and encourage the use of alternative methods of transportation throughout the community by providing programs to City employees that can be duplicated by local businesses.
- Item 33: Implement a regional transit program between educational facilities by 2010.
- Item 34: Coordinate a plan with local agencies to expand affordable convenient public transit that will assist in reducing the per capita vehicle trips within the City limits by 2009.

UC Riverside Campus Aggregate Master Planning Study (CAMPS), 2008

This plan was developed to address the rapid growth of the student population and their needs for accommodation within the context of the 2005 Long Range Development Plan (LRDP). This study examines existing campus plans and tries to reconcile discrepancies between them to further the implementation of the LRDP. CAMPS primarily focuses on circulation reconciliation, campus greenways, open space, west campus capacity, the phasing plan, the school of medicine, and campus design guidelines. The plan addresses bicycle circulation for both east and west campus, both of which refer to the implementation of City bicycle lanes.

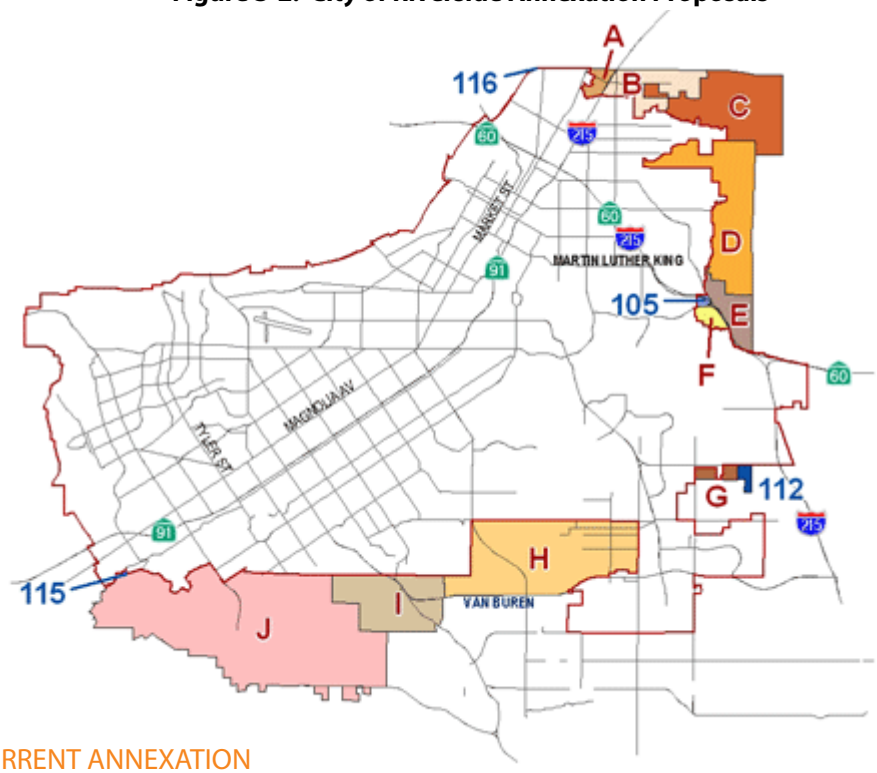
The East Campus Bicycle Circulation and Parking section describes the increased popularity of bicycling on campus and the existing on- street bike lanes on the Campus Loop Drive, Linden Drive, Aberdeen Drive and Big Springs Road. It states that there are currently no dedicated bike trails near campus but the City of Riverside has a long term vision of building a regional trail along the Gage Canal right-of – way, and another along the railroad corridor north and east of Watkins Drive. The West Campus Bicycle Circulation Section describes UC Riverside's plans to provide marked bicycle lanes or traffic calming infrastructure so that cyclists, pedestrians and vehicular traffic can all move about safely. This section also describes the City of Riverside's regional trail along the Gage Canal that will run through the academic core of West Campus and connect with future trail extensions to the north and south as well as bike lanes on the streets.

This plan also refers to the Campus Design Guidelines which provides information on bicycle parking, racks, corrals, storage and other amenities.

Future Land Use Development

Figure 3-2 shows the City of Riverside's current and potential annexations as reflected by the Riverside Local Agency Formation Commission (LAFCO) in May of 2010.

Figure 3-2: City of Riverside Annexation Proposals



CURRENT ANNEXATION PROPOSALS

105 - Sycamore/Central
112 - Kaliber
115 - Karger TT 34236
116 - PIM

POTENTIAL ANNEXATIONS

A - Center Street
B - Highgrove
C - Spring Mountain Ranch (92)
D - East Blaine (106)
E - Gateway (88)
F - University City (111)
G - Barton/Gem (203)
H - Woodcrest (To Be Determined)
I - Canyon Ridge (114)
J - Lake Hills/Victoria Grove/ The Orchards (Phase I) (108)

Schools

Alford and Riverside are the two School Districts serving the City of Riverside. They represent a total of 45 elementary schools, 12 middle schools and 9 high schools. Table 3-2 presents the Elementary, Middle and High Schools in Riverside. In addition, the City is home to the following private schools and college campuses

- California School for the Deaf
- Sherman Indian High School
- Riverside City College
- California Baptist University
- La Sierra Academy
- Christian Day School
- Immanuel Lutheran School
- Garden School – Riverside
- Notre Dame High School
- University of California, Riverside
- La Sierra University
- Woodcrest Christian School
- Riverside Christian School
- Harvest Christian School
- Hawarden Hills Academy
- Montessori Children's House

Table 3-2: Elementary, Middle, and High Schools in Riverside

School Name	School District	Address
Alvord High School	Alvord	3606 Pierce Street
Arizona Middle School	Alvord	11045 Arizona Avenue
Arlanza Elementary School	Alvord	5891 Rutland Street
Collett Elementary School	Alvord	10850 Collett Avenue
Foothill Elementary School	Alvord	8230 Wells Avenue
La Granada Elementary School	Alvord	10346 Keller Avenue
La Sierra High School	Alvord	4145 La Sierra Avenue
Lake Hills Elementary School	Alvord	16346 Village Meadow Drive
Loma Vista Middle School	Alvord	11050 Arlington Avenue
McAuliffe Elementary School	Alvord	4100 Golden Avenue
Myra Linn Elementary School	Alvord	10435 Branigan Way
Notre Vista High School	Alvord	6585 Crest Avenue
Orrenmaa Elementary School	Alvord	3350 Fillmore Street
Philip Stokoe Elementary School	Alvord	4501 Ambs Drive
Rosemary Kennedy Elementary School	Alvord	6411 Mitchell Avenue
Terrace Elementary School	Alvord	6601 Rutland Avenue
Twinhill Elementary School	Alvord	11000 Campbell Avenue
Valley View Elementary School	Alvord	11750 Gramercy Place
Villegas Middle School	Alvord	3754 Harvill Lane
Wells Middle School	Alvord	10000 Wells Avenue
Abraham Lincoln High School	Riverside	4341 Victoria Avenue
Adams Elementary School	Riverside	8362 Colorado Avenue
Alcott Elementary School	Riverside	2433 Central Avenue
Amelia Earhart Middle School	Riverside	20202 Aptos Street
Arlington High School	Riverside	2951 Jackson Street
Beatty Elementary School	Riverside	4261 Latham Street
Bryant Elementary School	Riverside	4324 3rd Street
Castle View Elementary School	Riverside	6201 Shaker Drive
Central Middle School	Riverside	4795 Magnolia Avenue
Chemawa Middle School	Riverside	8830 Magnolia Avenue
Earhart Middle School	Riverside	20202 Aptos Street
Emerson Elementary School	Riverside	4660 Ottawa Avenue
Franklin Elementary School	Riverside	19661 Orange Terrace Pkwy
Fremont Elementary School	Riverside	1925 N. Orange Street
Gage Middle School	Riverside	6400 Lincoln Avenue
Garden School	Riverside	1085 W. Linden Street

School Name	School District	Address
Grant Elementary School	Riverside	4011 14th Street
Harrison Elementary School	Riverside	2901 Harrison Street
Hawthorne Elementary School	Riverside	9174 Indiana Avenue
Highgrove Elementary School	Riverside	690 Center St, Riverside
Highland Elementary School	Riverside	700 Highlander Drive
Hyatt Elementary School	Riverside	4466 Mt Vernon Avenue
Jackson Elementary School	Riverside	4585 Jackson Street
Jefferson Elementary School	Riverside	4285 Jefferson Street
John W. North High School	Riverside	1550 3rd Street
Kennedy Elementary School	Riverside	19125 Schoolhouse Lane
Lake Matthews Elementary School	Riverside	12252 Black Burn Road
Liberty Elementary School	Riverside	9631 Hayes Street
Longfellow Elementary School	Riverside	3610 Eucalyptus Avenue
Madison Elementary School	Riverside	3635 Madison Street
Magnolia Elementary School	Riverside	3975 Maplewood Place
Mark Twain Elementary School	Riverside	19411 Krameria Avenue
Martin Luther King High School	Riverside	9301 Wood Road
Miller Middle School	Riverside	17925 Krameria Avenue
Monroe Elementary School	Riverside	8535 Garfield Street
Mountain View Elementary School	Riverside	6180 Streeter Avenue
Pachappa Elementary School	Riverside	6200 Riverside Avenue
Poly High School	Riverside	5450 Victoria Avenue
Ramona High School	Riverside	7675 Magnolia Avenue
Sierra Middle School	Riverside	4950 Central Avenue
Sunshine Elementary School	Riverside	9390 California Avenue
Taft Elementary School	Riverside	959 Mission Grove Pkwy
Tomas Rivera Elementary School	Riverside	20440 Red Poppy Lane
University Heights Middle School	Riverside	1155 Massachusetts Avenue
Victoria Elementary School	Riverside	2910 Arlington Avenue
Washington Elementary School	Riverside	2760 Jane Street
Woodcrest Elementary School	Riverside	16940 Krameria Avenue

Source: City of Riverside data, February 2012.

Parks, Recreation Facilities and Community Centers

The City of Riverside has a total of 52 city parks. These parks, in combination with additional open space, total more than 23,000 acres. Approximately 85% of these areas are open to cyclists. These parks and recreation facilities are an important source of bicycle support facilities for Riverside cyclists, especially those that provide additional features such as picnic tables, restrooms or community centers. **Table 3-3** lists Riverside parks that contain restroom facilities and additional amenities.

Table 3-3: Parks with Restroom Facilities in Riverside

Park	Location	Other Amenities
Andulka Park	5201 Chicago Avenue	
Arlington Park	3860 Van Buren Boulevard	
Arlington Heights Sports Park	9401 Cleveland Avenue	
Bobby Bonds Park	2060 University Avenue	Cesar Chavez Community Center
Bordwell Park	208 Martin Luther King Boulevard	Stratton Community Center
Bryant Park	7950 Philbin Street	Arlanza Community Center
Don Derr Park	3003 Monroe Street	
Don Jones Park	3995 Jefferson Street	
Don Lorenzi Park	4230 Jackson Street	
Evans Sports Complex	4557 Magnolia Avenue	
Fairmount Park	2601 Fairmount Boulevard	
Hunt Park	4015 Jackson Street	Renck Community Center
Hunter Park	1400 Iowa Avenue	
La Sierra Park	5215 La Sierra Avenue	La Sierra Community Center
Martha McLean/ Anza Narrows Park	5759 Jurupa Avenue	
Myra Linn Park	4540 Meredith Street	
Nichols Park	5505 Dewey Avenue	Joyce Jackson Community Center
Orange Terrace Community Park	20010 Orange Terrace Pkwy	Orange Terrace Community Center
Patterson Park	1841 Linden Street.	
Reid Park	801 N. Orange Street	Ruth Lewis Community Center
Shamel Park	3650 Arlington Avenue	

Source: City of Riverside data, February 2012.

3.2 Existing Bicycle Facilities

Since the adoption of the Bicycle Master Plan in 2007, the City of Riverside has added 0.5 miles of Class I bike paths to the Santa Ana River Trail and 50 miles of Class II bike lanes to its on-street bikeway network, for a total of 123.4 miles of existing bikeways as seen in **Tables 3-4a** and **3-5**. The city also has a network of 26.4 miles of unpaved trails, which are non-standard trails that are frequently used by bicyclists and pedestrians in the city. **Table 3-4b** lists the existing non-standard trails in the City of Riverside.

Riverside's existing network of designated bikeways and end-of-trip facilities is shown in **Figure 3-3**.

Table 3-4a: Index of Existing City of Riverside Class I Bike Paths

Name	Length (Miles)
Gage Canal Trail	1.9
Santa Ana River Trail	7.5
Victoria Avenue	7.6
Total	17

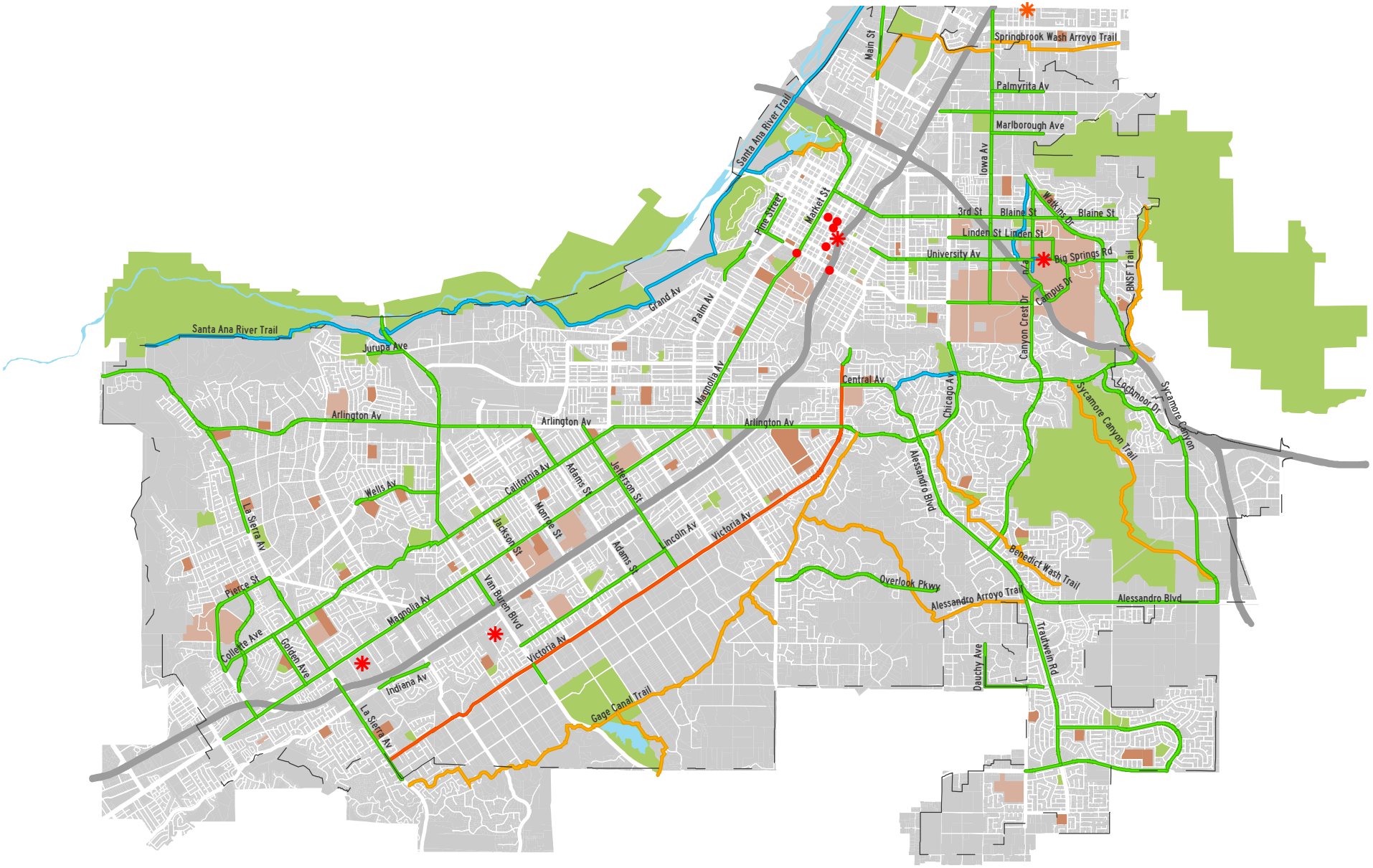
Source: Riverside GIS data, February 2012.

Table 3-4b: Index of Existing City of Riverside Non-Standard Trails

Name	Length (Miles)
Alessandro Arroyo Trail	3.6
Benedict Wash Trail	3.0
BNSF Trail	2.2
Gage Canal Trail	8.0
Mockingbird Canyon Trail	1.2
Prenda Arroyo Trail	0.5
Springbrook Wash Arroyo Trail	4.2
Sycamore Canyon Trail	3.7
Total	26.4

Source: Riverside GIS data, February 2012.

Figure 3-3: City of Riverside Existing Bikeways



Bicycle Facilities

- Class I Bike Path
- Class II Bike Lanes
- Bike Path and Bike Lane
- Trail

Existing

Land Uses

- Elementary and Middle Schools
- High Schools and Universities
- Parks

Bicycle Support Facilities

- Existing Bike Racks
- Existing Bike Lockers and/or Shower Facilities

0 1 2 Miles N

Source: City of Riverside GIS Data February 2012

Table 3-5: Index of Existing City of Riverside Class II Bike Lanes

Street	Extents	Miles
14th Street	Brockton Avenue to Redwood Drive	0.3
3rd Street	Market Street to Iowa	2.0
Aberdeen Drive	West Linden Street to North Campus Drive	0.2
Adams Street	Arlington Avenue to California Avenue	0.5
Alessandro Boulevard	Victoria Avenue to Sycamore Canyon Boulevard	5.3
Arlington Avenue	Crest View Drive to Alessandro Boulevard (with gaps between Adams Street and Streeter Avenue, and Magnolia Avenue and Indiana Avenue)	8.1
Big Springs Road	Campus Drive to Mount Vernon	0.6
Blaine Street	Iowa Street to Mount Vernon	1.5
Brockton Avenue	Nixon Drive to Indiana Avenue	0.9
California Avenue	Hole Avenue to Arlington Avenue	4.1
Campus Drive	University Avenue to North Campus Drive	1.4
Canyon Crest Drive	Watkins Drive to Alessandro Boulevard	4.3
Central Avenue	Victoria Avenue to Fairview Avenue and Chicago Avenue to Watkins Drive	3.0
Chicago Avenue	Alessandro Boulevard to Le Conte Drive	1.4
Collette Avenue	Pierce Street to Hole Avenue	1.6
Colorado Avenue	Arlington Avenue to Van Buren Boulevard	1.4
Columbia Avenue	La Cadena Drive to Michigan Avenue	1.6
Dauchy Avenue	Cactus Avenue to JFK Drive	0.5
Golden Avenue	Collett Avenue to Magnolia Avenue	0.7
Indiana Avenue	Vallejo Street to Tyler Street	0.7
Iowa Avenue	La Cadena Drive to Martin Luther King Boulevard	3.5
Jefferson Street	Arlington Avenue to Victoria Avenue	2.0
John F Kennedy	Dauchy Avenue to Branding Iron Ln	0.7
Jurupa Avenue	Van Buren Boulevard to Rutland Street	0.4
La Sierra Avenue	Arlington Avenue to Cleveland Avenue (gaps between Gramercy Pl and Hole Avenue, between Magnolia Avenue and Montlake Drive)	4.1
Lincoln Avenue	Van Buren Boulevard to Jefferson Street	2.1
Linden Street	Chicago Avenue to Aberdeen Drive	1.2
Lochmoor Drive	Central Avenue to Sycamore Canyon Boulevard	1.5
Magnolia Avenue	Buchanan Street to 14th Street	9.2
Market Street	14th Street to Hwy 60	1.9
Marlborough	Iowa Avenue to 600 Ft east of Northgate Street	0.6
Martin Luther King	Chicago Avenue To Canyon Crest Drive	1.0

Street	Extents	Miles
N. Main Street	Columbia Avenue to Placentia Ln	0.9
Orange Terrace Pkwy	Trautwein Road to Van Buren Boulevard	2.0
Overlook Pkwy	Washington Street to Crystal View Terrace	2.0
Palm Avenue	Bandini Avenue to Tequesquite Avenue	0.6
Palmyrita Avenue	Iowa Avenue to California Avenue	0.6
Pierce Street	La Sierra Avenue to Magnolia Avenue (with gap between Collett Avenue and Hwy 91	1.7
Pine Street	14th Street to University Avenue	0.5
Redwood Drive	14th Street to University Avenue	0.5
Riverwalk Pkwy	Pierce Street to Pierce Street	1.3
Sycamore Canyon Boulevard	Lochmoor Drive to Alessandro Boulevard	2.1
Trautwein Road	Alessandro Boulevard to Van Buren Boulevard	2.2
University Avenue	Park Avenue to Canyon Crest Drive	2.0
Van Buren Boulevard	North City Limits to Gage Canal Trail (With gaps between California Avenue and Magnolia Avenue, Indiana Avenue and Victoria Avenue, Cleveland and Wood Avenue.	5.36
Victoria Avenue	La Sierra Avenue to Arroyo Drive	7.8
Washington Street	John F Kennedy to Van Buren Boulevard	1.8
Watkins Drive	Spruce Street to Central Avenue	2.6
Wells Avenue	Crest Avenue to Van Buren Boulevard	1.0
	Total	**101.5**

Source: Alta Planning + Design field inventory, Riverside GIS data, February 2012.

Bikeway Signage

The City has identified and signed a 6 mile Downtown Bike Loop, shown in **Figure 3-4**. The Loop is complimented with traffic signals that detect bicyclists and with customized wayfinding signage (see signage at right).

Downtown Riverside Bike Loop customized signage

Bicycle Parking

The City of Riverside developed the following bike parking ordinances, which have been included in the Riverside Municipal Code:

- *Section 10.64.300 Parking.*

No person shall park a bicycle upon a street other than upon the roadway against the curb or upon the sidewalk in a rack to support the bicycle or against a building or at the curb, in such a manner as to afford the least obstruction to pedestrian traffic.

- *Section 10.64.170 Parking in rack required on business district sidewalks*

> *It is unlawful for any person to leave a bicycle upon any improved sidewalk within the business district of the City unless such bicycle is standing in a rack or receptacle for the parking of bicycles as provided in this chapter, if such rack or receptacle is available within a distance of one hundred fifty feet.*

Bicycle parking is available at all public elementary and middle schools listed in **Table 3.2** of this addendum. The Riverside County Transportation Commission maintains bicycle parking facilities at the two Riverside Metrolink stations. The Downtown Riverside station has six bike shells and four bike racks and the La Sierra station has six bike lockers and four bike racks. **Table 3-6** lists Riverside's largest employers and the bicycle support facilities offered by each. **Figure 3-2** shows the location of existing end-of-trip facilities in the City.

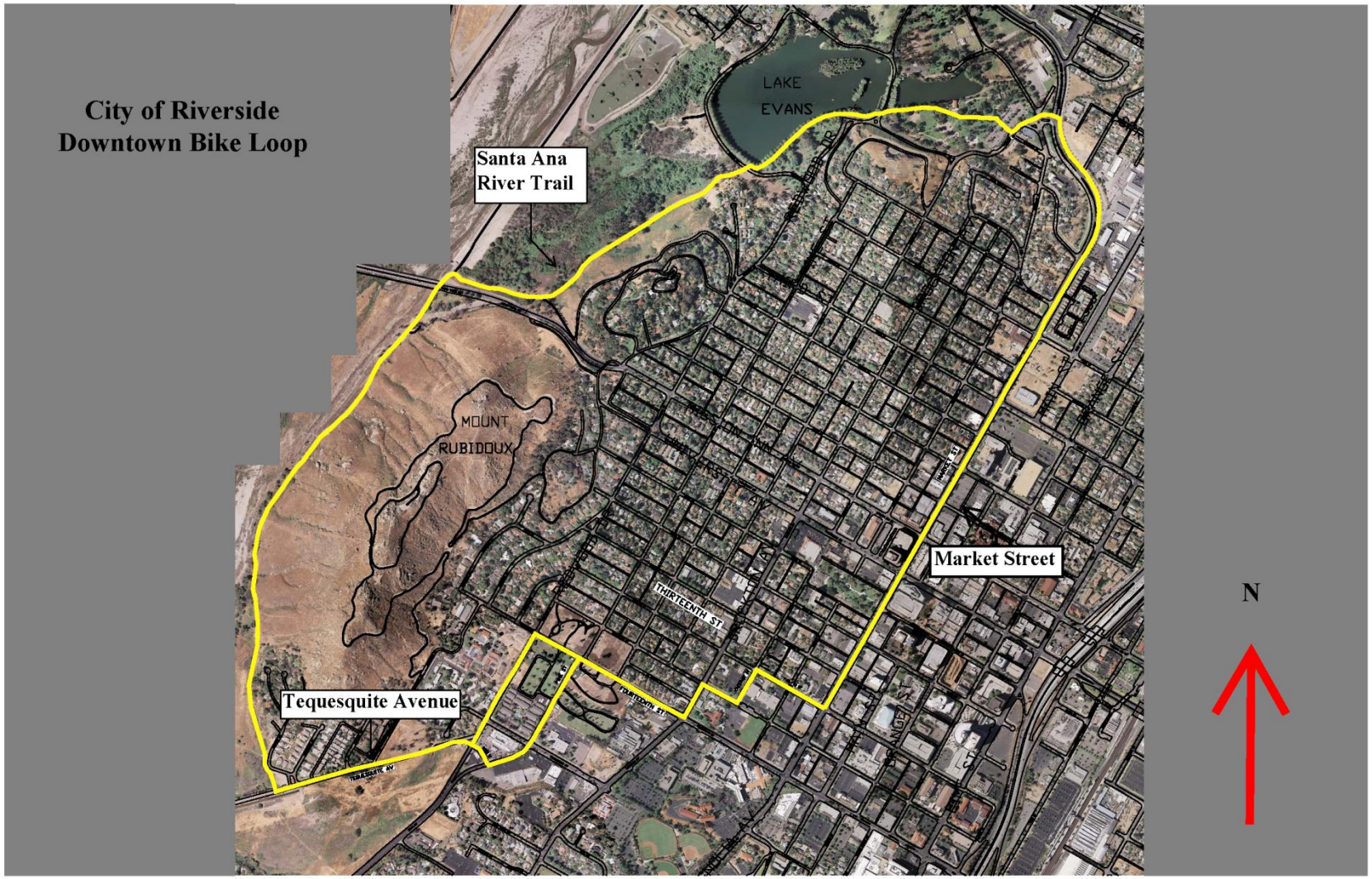
Bicycle Shops

Bicycle shops provide assistance for both commuter and recreational cyclists with bicycle parts, repairs, service or information about bicycling in the city. Riverside has 9 bicycle shops, listed in **Table 3-6.**

Table 3-6: City of Riverside Bicycle Shops

Name	Location	Website
Don's Bicycle Store	384 S. Riverside Avenue	http://donsbikeshop.com
Starklite Cycle	6260 River Crest Dr #F	N/A
Woodcrest Bicycle Center	16960 Van Buren Blvd Ste A	N/A
Riverside Cyclery USA	10000 Magnolia Avenue	http://cycleryusa.com
California Cyclery & Supply	3747 Central Avenue	http://www.calcyclery.com
Pedals Bicycle Shop	3765 Jurupa Avenue Ste. L	http://www.pedalsbikeshop.com
Jenson USA Bicycles	1615 Eastridge Avenue	http://www.jensonusa.com
Southridge Cycling	9199 Jurupa Road	http://southridgeusa.com
Sport Authority	3380 Tyler Street	http://www.sportsauthority.com
Sport Chalet	3700 Tyler Street	http://www.sportchalet.com

Figure 3-4 City of Riverside Downtown Bike Loop



Source: City of Riverside, February 2012

Table 3-7: Bicycle Racks and Support Facilities at Riverside's Largest Employers

Employer	Bike Racks	Bike Lockers	Showers	Notes
City of Riverside	Yes – City Hall, City owned Parking Garages 1, 2, & 3 and the Police Station on Orange Street	Yes	No	Bicycle racks have been installed in visible and user friendly locations. Lockers are located at City Hall and are available for rent by the public and City employees.
County of Riverside	Yes – space for 10 bicycles	Yes – 8 provided, 3 in use	Yes	Also provides clothing lockers.
University of California, Riverside	Yes	Yes – 337 racks (2076 bike parking spaces)	Yes – In the Recreation and Physical Education buildings	Registered bicycle commuters receive limited free car parking, a recreation center pass, locker, lock and towels.
Kaiser Permanente Riverside Medical Center	Yes- 3 in front of building 1 in employee parking garage	Yes – 2 provided in employee parking garage	Yes – In the staff locker rooms	Three racks are "strategically located" in front of the hospital to provide bike parking for employees, visitors and patients.
Riverside Unified School District	Yes- There is usually 1 rack per school	No	Yes- At all middle and high schools	Bicycle racks provided for students. Faculty and staff do not have bicycle parking facilities, but in some cases may store their bicycle in other locations.
Alford Unified School District	Yes	No	Yes – At high schools only	Bicycle racks are provided for students. Faculty does not have separate facilities but may use student racks.
Riverside Community Hospital	Yes– 2 near front entrance	No	No	Lockers were provided formerly, but were damaged and not replaced. The hospital allows employees to lock bicycles near their departments or bring the bicycles inside.

Source: Alta Planning + Design phone and online research, February 2012

3.3 Bicycle Facility Maintenance

Bike lanes are swept twice a month except for the Victoria Avenue trail which is swept every Friday due to the high volume of weekend riders. All other maintenance is completed by the Public Works Department on an as needed basis.

3.4 Past Bicycle Program Expenditures

Bicycle lanes are added to all capital improvement projects where applicable. Work zone accommodation plans are included in all projects that will affect the regular use of any bicycle lanes or trails.

In 2008, the City of Riverside applied for Bicycle Transportation Account (BTA) funding from the California Department of Transportation (Caltrans) and was awarded $104,000, with $120,000 of City funds, to design and construct 4 miles of Class II bicycle lanes along Jefferson Avenue between Arlington Avenue and Victoria Avenue.

The City has also been awarded grant funding to revamp the bike lanes on Third Street from Mulberry Street to Watkins.

3.5 Existing Bicycle Programs

Educational Programs

Traffic Safety Classes

The Riverside Police Department has a full time Traffic Education Coordinator who oversees all traffic education programming, which covers all aspects of traffic safety.

Traffic Safety classes are geared towards children ages 6 to 18 and are offered in February, March, August and November. Classes run for up to 2 hours, and require that the parents accompany their children. Bicycle safety classes can be scheduled for a neighborhood, community group, or club. These classes are customized to meet the needs of the group.

Safe Routes to School

The County and the City of Riverside have received Safe Routes to School funding for education and encouragement programs at the elementary school level. The County and City have worked together to conduct walk and bicycle audits at select elementary schools. The City also installed pedestrian count heads at all signalized intersections throughout the city with Safe Route to School and City funding.

Encouragement Programs

Share the Road Educational Campaign

The City of Riverside, through its Department of Public Works, established a "Share the Road" educational campaign to educate both cyclists and motorists about their legal rights and responsibilities of the road, and general rules on how to share the road safely with each other.

Bicycle Clubs

The Riverside Bicycle Club provides community members with resources to learn about local opportunities for bicycling via their public website (www.riversidebicycleclub.com). The Riverside Bicycle Club (RBC) organizes weekly rides for different levels and abilities around the city. The club also has a mountain bike division called Team Dirty Work which has its own website and caters to all levels of mountain bike riding.

Bike Tours

There are three major bike rides that are promoted and conducted for the general public in the City of Riverside including:

- *The Tour de Riverside* — 30 mile and 15 mile rides through scenic downtown Riverside and Victoria Avenue.
- *Riverside Citrus Classic Bike Ride* — Offers 100 mile, 50 mile, 28 mile, and 7 mile to promote cycling for all ages through Redlands, Moreno Valley and Riverside.

Riverside's bicycle clubs and rotary clubs promote these rides by posting information on their websites and distributing flyers to the public.

Riverside Police Department

The Riverside Police Department provides educational materials providing safety information to the public. These are available at any of the City of Riverside Police Stations. The Riverside Police Department also has a Safety Cite Program. Safety Cite is a positive reinforcement plan to promote the use of traffic safety equipment and safety rules. Juveniles that are properly wearing their helmets, obeying the law, and/or practicing proper safety skills will be "cited" by police department employees, by sending letters to their parents and rewarding "cited" children with a prize. Each child cited will be entered into a drawing for a new bike.

National Bike Month, Bicycle Safety Month/Day, and Bicycle Awareness Week are also promoted by the Riverside Police Department and other partners.

Bicycle Maps

To encourage and educate the community about bicycling opportunities in Riverside, the City has added a bicycle page to the Public Works Department Website (http://www.riversideca.gov/traffic/bike.asp). The webpage contains an interactive bicycle map (http://maps.riversideca.gov/BikewaysFxApp/index.html), link to the Bicycle Master Plan, bicycle safety tips, and links to different bicycle websites.

Evaluation and Planning Programs

Bicycle Advisory Committee

In September of 2009, the City of Riverside established a Bicycle Advisory Committee (BAC) whose role is to assist in the implementation of the Bicycle Master Plan by prioritizing its projects. The BAC is made up of resident cyclists, City employees, representatives from bicycle clubs, local colleges, and nonprofit organizations, and other key representatives from the community. It serves as an opportunity for dialogue linking these various groups with a common interest in the City's bicycle community and infrastructure. The BAC has established short term goals to increase public awareness about bicycling, maintain the City's existing bicycle infrastructure, and increase secure bicycle parking.

Bicycle Friendly Community Award

On October 20, 2009 the City of Riverside was recognized by the League of American Bicyclists as a Bronze Level Bicycle Friendly Community. The award recognizes Riverside's commitment to maintaining and connecting the City's existing bicycle infrastructure.

The Bicycle Friendly Community designation is a four year designation and will be up for renewal in October, 2013. The renewal process and four levels of the award – platinum, gold, silver, and bronze – provide a clear incentive for communities to continuously improve. This recognition will enhance the City's image as a destination for bicyclists, inspire the community to continue to improve conditions for bicycling, and improve the City's ability to attract grant funds.

City Bicycle Coordinator

Since the adoption of the Plan on May 22, 2007, the City of Riverside appointed a city employee as the part- time Bicycle Coordinator located in the Public Works Department to handle day-to-day concerns of Riverside's cyclists.

In the fall of 2011, the City hired a Bicycle Coordinator consultant who will work with City Staff, the BAC and the bicycling community of Riverside to expand and enhance the existing bikeway network, advance the City's standing as a Bicycle Friendly Community, train City staff, evaluate existing facilities, provide recommendations and identify funding opportunities for bicycle projects.

Complete Streets

The Governor of the State of California has signed into law AB 1358, The Complete Streets Act. In summary, the Complete Streets Act will ensure that the transportation plans of California communities meet the needs of all users of the roadway including pedestrians, bicyclists, users of public transit, motorists, children, the elderly, and the disabled.

Also signed into law by the Governor of the State of California is SB 375, Regional planning for greenhouse gas reduction, travel demand models, which "seeks to reduce vehicle miles traveled through land use and planning incentives." These laws are critically important to achieving improved accommodation of cyclists in all new road construction, reconstruction, and resurfacing projects in the City of Riverside.

5 Needs Analysis

This chapter provides an update of the needs analysis from the adopted 2007 Riverside Bicycle Master Plan.

5. 2 Aggregate Demand Model

Journey-to-work information collected by the US Census Bureau's *American Communities Survey* (ACS) is the foundation of this analysis. The ACS "Commuting to Work" data provide an indication of current bicycle system usage. A major objective of any bicycle facility enhancement or encouragement program is to increase the "bicycle mode split" or percentage of people who choose to bike rather than drive alone. The most recent ACS data available for the City of Riverside is the 2008-2010 three-year estimates. Model variables from the ACS for the City of Riverside include: total population (302,333 people), employed population (125,143 people), school enrollment (56,619 students grade K-12; 31,188 college students), and travel-to-work mode split shown in **Table 5-1.**

Table 5-1: Walking and Bicycling Commute Mode Share in Riverside

Population Type	Bicycling	Walking	Source
Employed	0.9%	3.10%	ACS, 2008-2010
K-12	0.67%	10.57%	NHTS 2009
College	0.9%	3.10%	ACS, 2008-2010

The 2009 NHTS provides a substantial national dataset of travel characteristics, particularly for trip characteristics of bicycling and walking trips. Data used from this survey include:

- Student mode split, grades K-12
- Trip distance by mode by trip purpose
- Ratio of walking/bicycling work trips to utilitarian trips
- Ratio of work trips to social/recreational trips
- Average trip length by trip purpose and mode

Several of these variables are trip type multipliers that provide an indirect method of estimating the number of walking and bicycling trips made for other reasons, such as shopping and running errands. NHTS 2009 data indicates that for every bicycle work trip, there are slightly more than two utilitarian bicycle trips made. Although these trips cannot be directly attached to a certain group of people (not all of the utilitarian bicycling trips are made by people who bicycle to work) these multipliers allow a high percentage of the community's walking and bicycling activity to be captured in an annual estimate.

The *Safe Routes to School Baseline Data Report* (2010) was used to determine the percent of students who walk or bicycle by the parents' estimate of distance as well as the frequency of carpooling for trip replacement. As with any modeling projection, the accuracy of the result is dependent on the accuracy of

the input data and other assumptions. Effort was made to collect the best data possible for input to the model, but in many cases national data was used where local data points were unavailable. Examples of information that could improve the accuracy of this exercise include the detailed results of local Safe Routes to Schools parent and student surveys, a regional household travel survey, and a student travel survey of college students.

Existing Walking and Bicycling Trips

Table 5-2 shows the results of the model, which estimates that almost 8,000 bicycle trips and almost 56,000 walking trips occur in Riverside each day. Based on the model assumptions, the majority of trips are non-work utilitarian trips, which include medical/dental services, shopping/errands, family personal business, obligations, transporting someone, meals, and other trips.

Table 5-2: Current Walking and Bicycling Trips

	Bicycling	Walking	Source
Commute Trips			
Bicycle/ walking commuters	1,126	3,879	Employed population multiplied by mode split
Weekday bicycle/ walking trips	2,253	7,758	Number of commuters multiplied by two for return trips
School Trips			
K-12 bicycle/ walking commuters	381	5,986	School children population multiplied by mode split
Weekday K-12 bicycle/ walking trips	761	11,972	Number of student bicyclists multiplied by two for return trips
College Trips			
College bicycle/ walking commuters	281	967	Employed population multiplied by mode split
Weekday bicycle/ walking college trips	561	1,933	Number of college student bicyclists multiplied by two for return trips
Utilitarian Trips			
Daily adult bicycle/walking commute trips	2,814	9,691	Number of bicycle/walking trips plus number of bicycle/walking college trips
Daily bicycle/walking utilitarian trips	4,407	34,068	Utilitarian bicycle/walking trips multiplied by ratio of utilitarian to work trips (NHTS). Distributes weekly trips over entire week (vs. commute trips over 5 days)
Total Current Daily Trips	**7,983**	**55,732**	

Trip Replacement

To estimate the total distance Riverside residents travel to work or school by walking and bicycling, the model isolates different walking and bicycling user groups and applies trip distance information for walking or bicycling trips by mode based on the NHTS 2009 national dataset of travel characteristics. As shown in **Table 5-3**, this analysis estimates that there are currently 17 million bicycling and walking trip each year, which reduces 6 million annual vehicle trips and reduces nearly 7 million vehicle miles traveled as a result of bicycling and walking in the City of Riverside.

Table 5-3: Current Walking and Bicycling Trip Replacement

	Bicycling	Walking	Source
Commute Trips			
Weekday vehicle trips replaced	1,739	5,989	Trips multiplied by drive alone trips to determine automobile trips replaced by bicycle trips
Weekday miles bicycled/walked	6,156	4,013	Number of vehicle trips reduced multiplied by average bicycle/walking work trip length (NHTS 2009)
School Trips			
Weekday vehicle trips reduced	220	3,466	Trips multiplied by drive alone trips to determine automobile trips replaced by bicycle/walking trips
Weekday miles bicycled/walked	169	2,662	Number of vehicle trips reduced multiplied by average trip length to/from school (SRTS 2010)
College Trips			
Weekday vehicle trips reduced	433	1,493	Trips multiplied by drive alone trips to determine automobile trips replaced by bicycle/walking trips
Weekday miles bicycled/walked	641	836	Number of vehicle trips reduced multiplied by average bicycle school/daycare/religious trip length (NHTS 2009)
Utilitarian Trips			
Daily vehicle trips reduced	2,172	7,482	Number of daily utilitarian trips multiplied by drive alone trips
Daily miles bicycled/walked	4,113	4,988	Number of vehicle trips reduced multiplied by average utilitarian trip length (NHTS 2009; does not include work or home trips)
Yearly Results	**Bicycling**	**Walking**	**Total**
Yearly bicycle/walking trips	1,868,635	15,164,277	17,032,912
Yearly vehicle trips reduced from bicycling/walking trips	921,400	5,265,515	6,186,914
Yearly vehicle miles reduced from bicycling/walking trips	3,266,999	3,553,106	6,820,105

5.2.1 Current Benefits

To the extent that bicycling and walking trips replace single-occupancy vehicle trips, they reduce emissions and have tangible economic impacts by reducing traffic congestion, crashes, and maintenance costs. In addition, the reduced need to own and operate a vehicle saves families money. These benefits are shown in Table 5-4.

Table 5-4: Benefits of Current Bicycling and Walking Trips in Riverside

	Bicycling	Walking	Total	Source
Yearly vehicle miles reduced	3,266,999	3,553,106	6,820,105	
Air Quality Benefits				
Reduced Hydrocarbons (pounds/year)	9,795	10,653	20,449	EPA, 2005
Reduced Particulate Matter (pounds/year)	73	79	152	EPA, 2005

Reduced Nitrous Oxides (pounds/year)	6,842	7,442	14,284	EPA, 2005
Reduced Carbon Monoxide (pounds/year)	89,311	97,132	186,443	EPA, 2005
Reduced Carbon Dioxide (pounds/year)	2,657,722	2,890,472	5,548,194	EPA, 2005
Economic Benefits of Air Quality				
Particulate Matter	$6,111	$6,646	$12,756	NHTSA
Nitrous Oxides	$13,685	$14,883	$28,568	NHTSA
Carbon Dioxide	$45,567	$49,558	$95,125	NHTSA
Reduced External Costs of Vehicle Travel				
Crashes/Traffic Congestion	$1,339,469	$1,456,774	$2,796,243	From "Crashes vs. Congestion – What's the Cost to Society?", by size of city
Roadway Maintenance Costs	$457,380	$497,435	$954,815	From Kitamura, R., Zhao, H., and Gubby, A. R. (1989). Development of a Pavement
Household Transportation Savings				
Reduction in HH transportation spending	$1,633,499	$1,776,553	$3,410,052	IRS operational standard mileage rates for 2010 (http://www.irs.gov/newsroom/article/0,,id=216048,00.html). Used to estimate benefit of transportation costs by reduced VMT.
Total	**$3,495,711**	**$3,801,848**	**$7,297,560**	

[1] From EPA report 420-F-05-022 "*Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks.*" 2005.

[1] NHTSA Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Table VIII-5 (http://www.nhtsa.dot.gov/portal/site/nhtsa/ menuitem.d0b5a45b55bfbe582f57529 cdba046a0/).

[1] "Crashes vs. Congestion – What's the Cost to Society?" http://www.aaanewsroom.net/Assets/Files/20083591910.CrashesVsCongestionFullRe

[1] Kitamura, R., Zhao, H., and Gubby, A. R. (1989). *Development of a Pavement Maintenance Cost Allocation Model.* Institute of Transportation Studies – University of California, Davis (http://pubs.its.ucdavis.edu/publication_detail.php?id=19). $0.08/mile (1989), adjusted to 2010 dollars using the Bureau of Labor Statistics Inflation Calculator (http://www.bls.gov/data/inflation_calculator.htm).

[1] http://www.irs.gov/newsroom/article/0,,id=216048,00.html

5.2.2 Potential Future Walking and Bicycling Trips

Estimating future benefits requires additional assumptions regarding Riverside's future population and anticipated commuting patterns in 2030. Future population predictions determined by the Riverside County Center for Demographic Research were used in this model. **Table 5-5** shows the projected future demographics used in the future analysis.

Table 5-5: Projected Future (2030) Demographics

	Projected Year 2030	Percent of 2010 Population	Source
Population	369,024	122.06%	*Riverside County Center for Demographic Research- 2010 Projections Report*
Employed population	206,653	68.35%	*Riverside County Center for Demographic Research- 2010 Projections Report*
School population, K-12	69,108	18.73%	Assumes same percent as from ACS 2008-2010 estimate
College student population	38,068	10.32%	Assumes same as ACS 2008-2010 estimate

Bicycling mode share was increased to address the higher use potentially generated by the addition of new facilities and enhancements to the existing system. The analysis predicts the bicycle mode split increase caused by development of the proposed bicycle network and education/encouragement programs. The "network completion factor" used in this analysis is the ratio of roadways with bikeway facilities. While many factors affect people's choice to bicycle in a community, development of a network of bicycle lanes and other facilities is a key component of encouraging bicycling. The predicted bicycle mode split is 3.6% in 2030. The results of the model are shown in **Table 5-6.**

Table 5-6: Future (2030) Bicycling and Walking Trips

	Bicycling	Walking	Source
Commute Trips			
Bicycle/walking commuters	7,488	7,593	Employed population multiplied by mode split
Weekday bicycle/ walking trips	14,975	15,185	Number of bicycle/walking commuters multiplied by two for return trips
School Trips			
K-12 bicycle/ walking commuters	2,504	12,942	School children population multiplied by mode split
Weekday K-12 bicycle/ walking trips	5,008	25,884	Number of student bicyclists multiplied by two for return trips
College Trips			
College bicycle/ walking commuters	1,130	1,146	Employed population multiplied by mode split
Weekday bicycle/ walking college trips	2,260	2,292	Number of college student bicyclists multiplied by two for return trips
Utilitarian Trips			
Daily adult bicycle/ walking commute trips	17,235	17,477	Number of bicycle/walking trips plus number of bicycle/walking college trips
Daily bicycle/walking utilitarian trips	26,994	61,437	Number of utilitarian bicycle/walking trips multiplied by bicycle/walking utilitarian trip multiplier, spread over entire week (vs. commute trips over 5 days)
Total Future Daily Trips	49,238	104,798	
Annual Results	**Bicycling**	**Walking**	**Total**
Yearly bicycle/walking trips	15,188,755	31,914,822	47,103,577
Yearly vehicle trips reduced from bicycling/walking trips	11,252,884	22,194,460	33,447,343
Yearly vehicle miles reduced from bicycling/walking trips	25,811,621	14,918,122	40,729,743

Future Benefits

The trip replacement factors remain the same as in the model of current trips. This analysis projects that the number of annual walking and bicycling trips in 2030 will be approximately 47 million, which will reduce 33 million annual vehicle trips and reduce nearly 41 million vehicle miles traveled as a result of bicycling and walking in the City of Riverside.

Table 8 shows the air quality benefits of the future projected walking and bicycling trips in Riverside.

Table 5-7: Benefits of Future Bicycling and Walking Trips in Riverside

	Bicycling	Walking	Total	Source
Yearly vehicle miles reduced	25,811,621	14,918,122	40,729,743	
Air Quality Benefits				
Reduced Hydrocarbons (pounds/year)	77,391	44,729	122,119	EPA, 2005
Reduced Particulate Matter (pounds/year)	575	332	907	EPA, 2005
Reduced Nitrous Oxides (pounds/year)	54,060	31,244	85,304	EPA, 2005
Reduced Carbon Monoxide (pounds/year)	705,621	407,821	1,113,442	EPA, 2005
Reduced Carbon Dioxide (pounds/year)	20,997,902	12,135,978	33,133,880	EPA, 2005
Economic Benefits of Air Quality				
Particulate Matter	$6,111	$27,903	$34,013	NHTSA
Nitrous Oxides	$108,119	$62,489	$170,608	NHTSA
Carbon Dioxide	$360,015	$208,075	$568,089	NHTSA
Reduced External Costs of Vehicle Travel				
Crashes/Traffic Congestion	$10,582,765	$6,116,430	$16,699,195	From "Crashes vs. Congestion – What's the Cost to Society?", by size of city
Roadway Maintenance Costs	$3,613,627	$497,435	$4,111,062	From Kitamura, R., Zhao, H., and Gubby, A. R. (1989). Development of a Pavement
Household Transportation Savings				
Reduction in HH transportation spending	$12,905,810	$7,459,061	$20,364,872	IRS operational standard mileage rates for 2010 (http://www.irs.gov/newsroom/article/0,,id=216048,00.html). Used to estimate benefit of transportation costs by reduced VMT.
Total	**$27,576,447**	**$14,371,392**	**$41,947,839**	

[1] From EPA report 420-F-05-022 "*Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks.*" 2005.

6 Recommended Improvements

This chapter provides an update of the recommended infrastructure and non-infrastructure projects from the adopted 2007 Riverside Bicycle Master Plan.

6.1 Recommended Bikeway Network

The recommended bikeway network for Riverside is shown in **Figure 6-1.** The bikeways are classified into the standard Caltrans Class I, II, and III bikeway categories identified in Chapter 1000 of the California Highway Design Manual. **Tables 6-1** to **6-3** provide a list of all proposed facilities, including segment extents and lengths. The Plan update proposes 15.8 miles of Class I Bike Paths, 59.2 miles of Class II Bike Lanes and 39.3 miles of Class III Bike Routes.

Additionally, the City is working on a proposed realignment of the Santa Ana River Trail between Martha McLean Park and Rubidoux Street. The realignment would adjust the trail to make it more direct and reduce elevation changes caused by the surrounding hills. The City would also like to fill in the shoulders along the trail with dirt or decomposed granite, and repave most of the trail upon the completion of the City's sewer project.

Table 6-1: Recommended Class I Bike Paths

Name	Extents	Miles
Gage Canal Trail	Central Avenue to Arlington Avenue, University Avenue to Central Avenue, and Spruce Street to Northern City Limits	5.1
Le Conte Drive	Chicago Avenue to Gage Canal Trail	0.6
Pierce Street	Collett Avenue to State Hwy 91 and Magnolia Avenue to Indiana Avenue	0.9
Tequesquite Connector Trail	Santa Ana River Trail to Palm Avenue	1.0
St Laurence St Bike Path	Adams Street to Van Buren Blvd	3.8
Springbrook Wash Arroyo Trail	Market Street and Columbia Avenue	1.0
Woodcrest Reservoir Bike Path	Washington Street to Dauchy Avenue	3.4
	Total	15.8

Table 6-2: Recommended Class II Bike Lanes

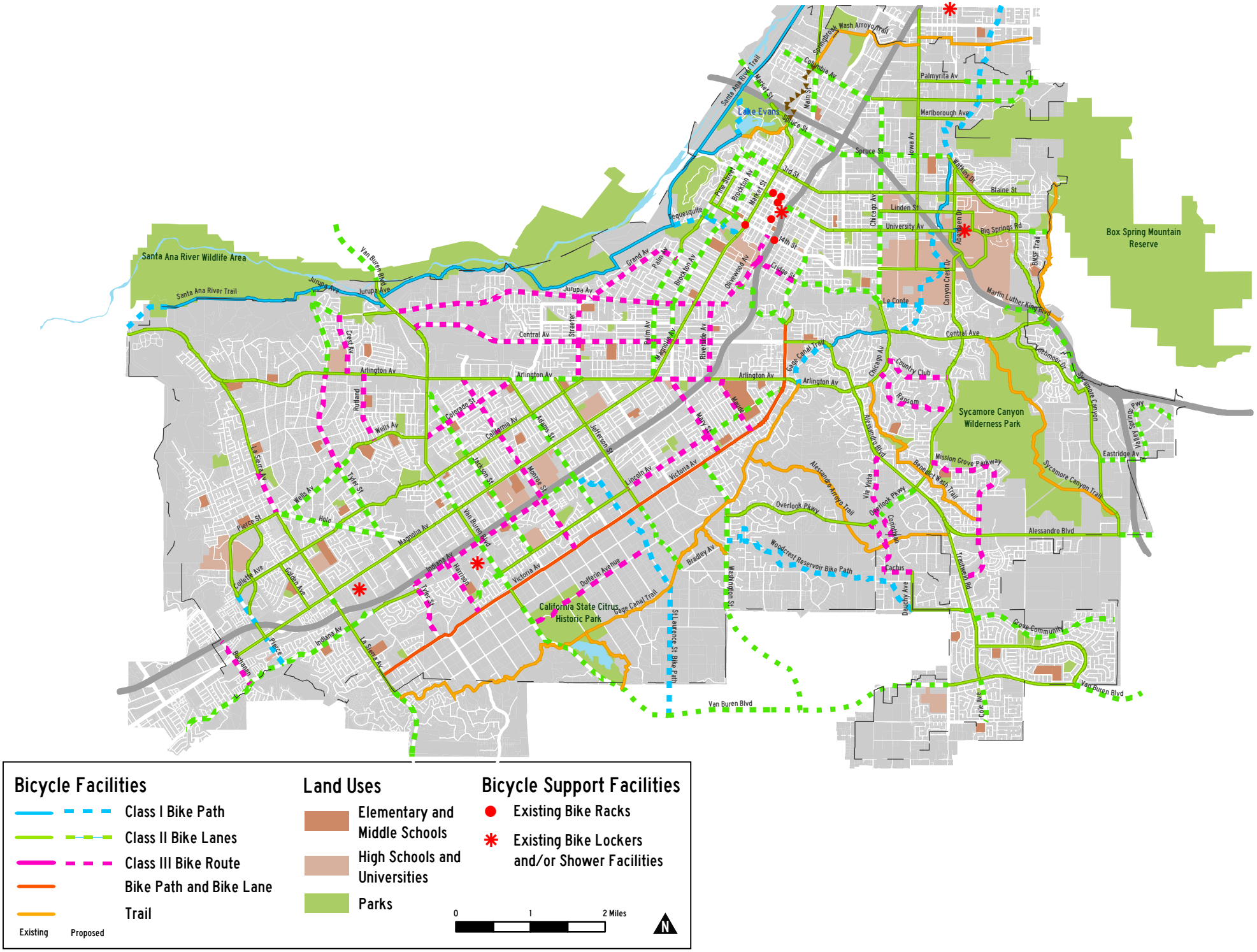
Name	Extents	Miles
14th Street	Brockton Avenue to Market Street	0.8
3rd Street	Redwood Avenue to Market Street	0.5
Adams Street	California Avenue to Lincoln Avenue	1.6
Alessandro Boulevard	Sycamore Canyon Boulevard to Eastern City Limits	0.4
Arlington Avenue	Adams Avenue to Streeter Avenue	1.0
Big Springs Road	Mount Vernon Avenue to Eastern City Limits	0.2
Brockton Avenue	Central Avenue to 3rd Street	2.8
Canyon Springs Parkway	Valley Springs Pkwy to Day Street	0.5

Name	Extents	Miles
Chicago Avenue	Le Conte Drive to Columbia Avenue	2.8
Cole Avenue	Van Buren Avenue to Krameria Avenue	0.6
Columbia Avenue	Santa Ana River Trail to I- 215	1.4
Cridge Street	Victoria Avenue to Chicago Avenue	1.3
Eastridge Avenue	Sycamore Canyon to Valley Springs Pkwy	0.6
Grove Community	Trautwein Road to Eastern City Limits	2.0
Hole Avenue	Wells Avenue to Tyler Street	1.3
Indiana Avenue	McKinley Street to Valle Road and Monroe Street to Adams Street	3.6
Jackson Street	Van Buren Boulevard to Victoria Avenue	2.6
Jefferson Street	Victoria Avenue to Bradley Street	1.1
John F Kennedy Drive	Branding Iron Road to Trautwein Road	0.1
Jurupa Avenue	Santa Ana River Trail to Crest Avenue	0.4
La Sierra Avenue	Magnolia Avenue to Montlake Drive and Cleveland Avenue to Lake Knoll Parkway	1.1
Lincoln Avenue	Harrison Street to Van Buren Boulevard and Mary Street to Victoria Avenue	1.7
Main Street	State Hwy 60 Ramps to Columbia Avenue	0.7
Market Street	State Hwy 60 to Northern City Limits	0.8
Overlook Parkway	Crystal Avenue to Trautwein Road	0.8
Palm Avenue	Arlington Avenue to Bandini Avenue	2.0
Palmyrita Avenue	Northgate Street to Mount Vernon Avenue	1.0
Panorama/Ivy/Myrtle	Olivewood Avenue to Victoria Avenue	1.0
Pine Street	Tequesquite Avenue to 14th Street and University Avenue to 3rd Street	0.6
Redwood Drive	University Avenue to 3rd Street	0.4
Serpentine Drive	Michigan Avenue to Northern City Limits	0.8
Spruce Street	Market Street to Watkins Drive	2.3
Sycamore Canyon Boulevard	Lochmoor Drive to El Cerrito Drive	1.1
Tyler Street	Jurupa Avenue to Arlington Avenue and Wells Avenue to Hole Avenue	2.2
University Avenue	Market Street to Park Avenue	0.7
Van Buren Boulevard	California Avenueto Magnolia Avenue, Indiana Avenue to Victoria Avenue, Cleveland to Wood Avenue, and Orange Terrace Parkway to Clark Street	9.6
Valley Springs Parkway	Eastridge Avenue to Canyon Springs Pkwy	0.7
Victoria Avenue	Arroyo Drive to 14th Street	0.8
Washington Street	Victoria Avenue to Van Buren Boulevard	3.9
Wells Avenue	La Sierra Avenue to Crest Avenue	1.4
	Total	59.2

Table 6-3: Recommended Class III Bike Routes

Name	Extents	Miles
Arlington Avenue	Magnolia Avenue to Indiana Avenue	1.1
Berry Road	Crystal View Terrace to Corinthian Way	0.1
Buchanan Street	Corona Fwy to Indiana Avenue	0.7
Cactus Avenue	Crystal View Terrace to Dauchy Avenue	0.4
Central Avenue	Van Buren Boulevard to Riverside Avenue	4.0
Colorado Street	Van Buren Boulevard to Arlington Avenue	1.4
Corinthian Way	Overlook Parkway to Berry Road	0.2
Country Club Drive	Chicago Avenue To Canyon Crest Drive	0.9
Crest Avenue	Jurupa Avenue to Arlington Avenue	0.8
Cridge Street	Olivewood Avenue to Victoria Avenue	0.5
Crystal View Terrace	Overlook Parkway to Cactus Avenue	0.8
Dufferin Avenue	Van Buren Blvd to St. Lawrence	1.9
Grand Avenue	Jurupa Avenue to Bandini Avenue	1.4
Harrison Street	Indiana Avenue to Victoria Avenue	0.8
Indiana Avenue	Tyler Street to Monroe Street	2.1
Jurupa Avenue	Van Buren Boulevard to Olivewood Avenue	4.5
La Sierra Avenue	Gramercy Street to Hole Avenue	0.6
Lincoln Avenue	Jefferson Street to Mary Street	1.3
Mary Street	Arlington Avenue to Victoria Avenue	1.2
Maude Street	Arlington Avenue to Victoria Avenue	0.8
Mission Grove Parkway	Canyon Crest Drive to Trautwein Road	2.6
Monroe Street	Arlington Avenue to Victoria Avenue	2.7
Olivewood Avenue	Jurupa Avenue to 14th Street	1.1
Ransom Road	Chicago Avenue to Canyon Crest Drive	1.2
Riverside Avenue	Jurupa Avenue to Arlington Avenue	1.0
Rutland Avenue	Arlington Avenue to Wells Avenue	0.9
Streeter Avenue	Jurupa Avenue to Arlington Avenue	1.1
Tyler Street	Arlington Avenue to Wells Avenue	2.2
Via Vista Drive	Corinthian Way to Alessandro Boulevard	1.0
	Total	39.3

Figure 6-1: City of Riverside Existing and Proposed Bikeways



Source: City of Riverside GIS Data February 2012

Shared Lane Markings (Sharrows)

On bike route segments where on-street parking is present and the speed limits are appropriate, this plan recommends using "Shared Lane Marking" stencils (commonly referred to as "sharrows"). Sharrows have been introduced for use in California as an additional treatment for Class III facilities. Section 9C-07 of the California MUTCD states that the shared roadway bicycle marking is intended to:

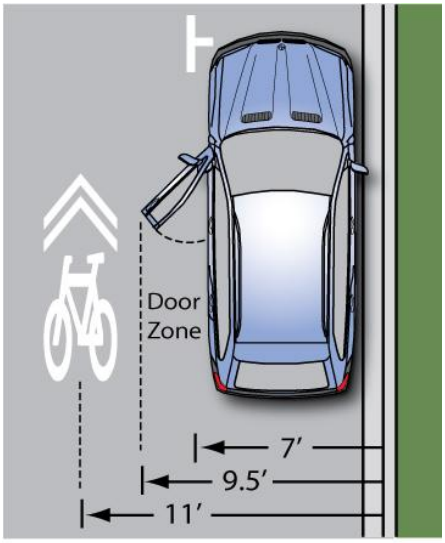
- Reduce the chance of collisions between open doors of parked vehicles and bicyclists on a roadway with on-street parallel parking.
- Alert road users within a narrow traveled way of the lateral location where bicyclists ride.
- Encourage safe passing of bicyclists by motorists, and reduce the incidence of wrong way bicycling.

Design considerations for shared lane markings include:

- Use " Bike Route" sign (D11-1) as specified for shared roadways in the California-MUTCD.
- Share lane markings should not be placed on roadways with speed limit at or above 35MPH (California MUTCD).
- Marking should be placed immediately after an intersection and spaced at intervals no greater than 250 feet hereafter.
- Use only on a roadway Class III Bikeway (bike route) or shared roadway (no bikeway designation) which has on-street parallel parking. If used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the centers of the Shared Lane Markings should be at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb.

Figure 6-2 shows the shared lane marking placement guidance for streets with on-street parking.

Figure 6-2: Share Lanes Marking Placement Guidance



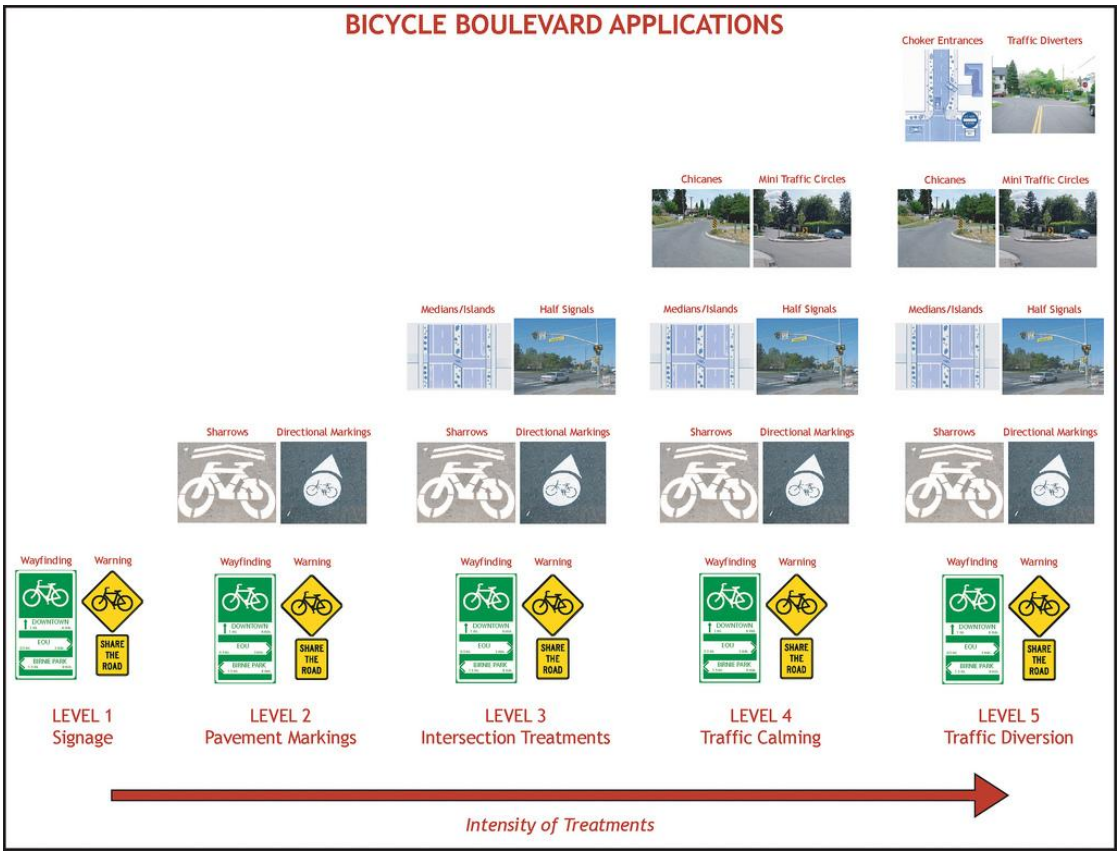
Shared Lane Marking should be placed 11 feet minimum from curb.

Bicycle Boulevards

The City is considering implementing bicycle boulevards to connect to popular destinations in the City, such as the University of California, Riverside campus. Bicycle Boulevards are local roads or residential streets that are enhanced with traffic calming and other treatments to facilitate safe and convenient bicycle travel. Bicycle boulevards accommodate bicyclists and motorists in the same travel lanes, without specific vehicle or bicycle lane delineation. These roadway designations prioritize bicycle travel above vehicular travel. The treatments which create a Bicycle Boulevard heighten motorists' awareness of bicyclists and slow vehicle traffic, making the boulevard more conducive to safe bicycle and pedestrian activity.

Bicycle boulevard treatments fall within five basic "application levels" based on their level of physical intensity, with Level 1 representing the least physically-intensive treatments that could be implemented at relatively low costs. Identifying appropriate application levels for individual Bicycle Boulevard corridors provides a starting point for selecting appropriate site-specific improvements. The five Bicycle Boulevard application levels are shown in **Figure 6-3.** It should be noted that corridors targeted for higher-level applications would also receive appropriate lower-level treatments. For instance, a street targeted for Level 3 applications should also include Level 1 and 2 applications, as necessary. Also, it may not be necessary to apply all treatments for a specific level.

Figure 6-3: Bicycle Boulevard Application Levels



Signed Shared Bikeway *Intensity of Treatments (varies based on roadway)* *Bicycle Boulevard*

6.2 Recommended Support Facilities and Programs

On Street Bike Parking Corral

Bike Parking Corrals provide high-volume on-street bicycle parking and is a relatively inexpensive solution. Bike racks are installed in the street and are protected from motor vehicles with removable curbs and bollards. These facilities move bicycles off the sidewalks leaving space for pedestrians, local business, or residents to use. Bike Corrals can be accommodated by converting vehicle parking spaces or placing them in no-parking zones. Bicycle parking does not block sightlines like motor vehicles do so it may be beneficial to place them on streets where visibility of oncoming vehicle traffic is a concern. Bike Corrals are recommended at Riverside Plaza, Brockton Arcade, and Downtown.

Bike Parking Corral in Portland, Oregon

Bike Share Program

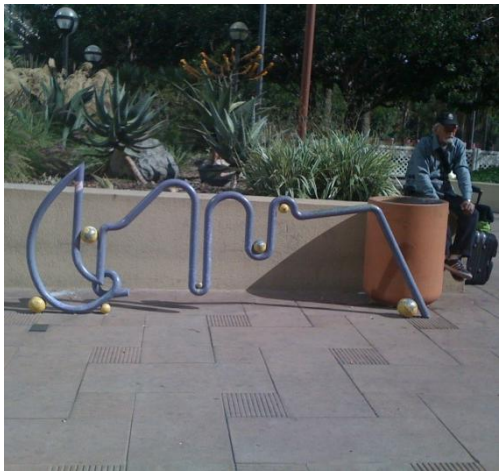
Bike Share programs can provide safe and convenient access to bicycles for short trips, such as running errands during lunch, and transit-work trips. The international community has experimented with Bike Share programs for nearly 40 years. Bike Share programs, such as systems in Washington, DC and Boston, Massachusetts, help increase cycling mode share, serve as an extension to the public transit system, reduce a city's travel-related carbon footprint and provide additional 'green' jobs related to system management and maintenance. The City of Riverside should consider implementing a Bike Share Program in the downtown core or near bus stops and Metrolink Stations.

Nice Ride – Bikeshare System in Minneapolis

Bicycle Rack Design Contest

Artistic bicycle racks create a signature public art presence that also fulfills a necessary urban function of providing bicycle parking spaces. A design competition is one way to stimulate creativity and create a unique design that enhances Riverside's reputation as an outstanding bicycle-friendly community.

The City should manage a design competition to identify a new City art rack that will be installed throughout the city. The competition should:



Art Rack in Downtown Los Angeles, CA

- Clearly identify the goal of the competition and the use case for which the rack is intended (e.g. "Racks will be placed outdoors in the public right-of-way for short term use by the public for the purposes of locking bicycles").
- Clearly identify the functional specifications of the rack desired (e.g. "must provide two points of contact for the bicycle").
- Clearly identify the process for participants to ask questions, register, and submit designs, as well as the judging process.
- Identify the exact deliverable expected (e.g. drawing/graphics, CAD files, scale prototype, fabricated prototype, etc.).
- Clarify the intellectual property assumptions for entrants and winners.

A prize should be offered for the winner, preferably cash. (If no prize is offered, reputable designers may not participate, and the City may experience community backlash for asking designers to work for free.) A jury should be selected by the City that represents the range of practical and aesthetic experience desired in the final rack.

In 2008, New York City held a public design competition for a new city standard bike rack design. Their process is widely considered a successful model to be emulated by other communities. Full information, including details entrant instructions, can be found here: http://nycityracks.wordpress.com/.

Create Bicycle-Friendly Business Districts

There are many actions the City of Riverside can take to foster a bicycle-friendly business environment, including:

- Encourage businesses to apply for the "Bicycle Friendly Businesses" program run by the League of American Bicyclists, and acknowledge Riverside businesses that receive designation.
- Regularly update bicycle parking standards and code enforcement efforts to ensure adequate long-term bicycle parking in office buildings. In addition, the City should consider a 'bicycle access to buildings' ordinance that compels building owners to either offer on-site bicycle storage, or permit bicycles to be brought into office space.
- Offer a City program to install bike racks in the public right-of-way at no cost, upon request by the public and/or business owners.
- Create a cost-sharing or technical assistance program to help employers install bike parking on their private property. This could consist of selling racks at cost to business owners and/or allowing business owners to purchase installed racks from the City for a fee. Alternately, the City could offer technical assistance with purchasing, sitting, permitting, and installing racks.
- Host an annual Bike to Work Day event and invite City businesses to participate.

- Create a municipal bike sharing program, and invite other employers the opportunity to pay to participate in the same system on their worksite.
- Offer Bike Commute 101 clinics regularly. Ideally, these would be offered at workplaces to employees, and would offer advice about commuting, distribute maps and other information, and answer questions.

In 2010, the City of Long Beach created the nation's first Bike-Friendly Business District (BFBD) program, which has enhanced the popularity of Long Beach's bicycle friendly community. This program encourages residents and tourists to dine and shop locally. More information about this program can be found here: http://www.bikelongbeach.org/Planning/Read.aspx?ArticleId=20

Adopt-a-Trail Program

The challenges of maintenance and operations of current and future trails can be easily met through an Adopt-a-Trail Program. This program helps coordinate volunteers and events to assist jurisdictions in monitoring trail use and conditions. Volunteers can be trained to report back to cities on maintenance, needs, improvements, environmental issues and other concerns as well as provide details on trail conditions after each walk, provide trail information to other users, help prioritize maintenance needs requiring immediate versus long-term attention, and organize periodic maintenance days to improve the trail environment. Adopt-a-Trail is a cost efficient solution to keeping existing trails clean, accessible, and safe and may serve as an effective tool for enabling the development of new trails.

Keep Riverside Clean and Beautiful (KRCB) is a nonprofit community program sponsored by the City of Riverside's Public Works Department and the Greater Riverside Chamber of Commerce that runs an existing Adopt-a- Street Program. The City is working with KRCB to implement a similar program for its trails.