Appendix U16

Active Transportation Implementation Strategy

Appendix U16 Contents

Attachments:

Active Transportation Implementation Strategy

The Active Transportation Implementation Strategy outlines a program for broad, regionwide implementation of active transportation that includes walking, biking, Safe Routes to Transit, and Safe Routes to School improvements. The Strategy is focused on incorporating active transportation into San Diego Forward: The Regional Plan (Regional Plan), in addition to further defining SANDAG active transportation planning and implementation work in the region.

Background

On October 28, 2011, the SANDAG Board of Directors approved the 2050 Regional Transportation Plan/Sustainable Communities (2050 RTP/SCS) for the San Diego region. In response to public comment on its final action on the 2050 RTP/SCS, the SANDAG Board of Directors committed to undertaking six specific actions prior to approval of the next RTP/SCS, including preparation of an Active Transportation Implementation Strategy, and development of a Regional Bike Plan Early Action Program. These commitments were an integral part of the work program for the Regional Plan.

The Active Transportation Implementation Strategy builds on *Riding to 2050: The San Diego Regional Bicycle Plan* (Bike Plan), adopted by the SANDAG Board of Directors in 2010, and the Regional Bicycle Plan Early Action Program (Bike Plan EAP), adopted by the SANDAG Board of Directors in 2013.

Riding to 2050: The San Diego Regional Bicycle Plan

In 2010, the SANDAG Board of Directors approved *Riding to 2050: The San Diego Regional Bicycle Plan*. The Bike Plan was developed to support implementation of both the Regional Comprehensive Plan and the 2050 RTP/SCS, both of which call for more transportation options and a balanced regional transportation system that supports smart growth and a more sustainable region. In 2011, the SANDAG Board of Directors approved a set of actions for initial implementation of the Bike Plan, including implementation of the highest priority projects identified in the plan, and development of programs to support the plan, such as Safe Routes to Transit, data collection and modeling, development of regional wayfinding signage guidelines, and development of an approach to address bike parking needs. This was followed by adoption of the Regional Bike Plan Early Action Program in 2013, as described below. The Bike Plan is included as Attachment 1.

The Regional Bike Plan Early Action Program

On September 27, 2013, the SANDAG Board of Directors approved the Regional Bike Plan Early Action Program – a $200 million initiative to expand the Regional Bike Network regionwide and finish high-priority projects within a decade. The adopted Bike Plan EAP comprises 38 projects, totaling roughly 77 miles of new bikeways that will make it much easier for people to ride their bikes to school, work, transit stations, and other major destinations. The Bike Plan EAP is funded by *TransNet*, the regional half-cent sales tax for transportation approved by San Diego County voters. *TransNet* funding will be leveraged to bring in state and federal dollars so the region can complete more bike projects and reap even greater economic, health, and mobility benefits. In presenting the Bike Plan EAP to the Board for consideration, a second set of high priority projects (also with an approximate cost of $200 million) was identified. These projects are included in the Revenue Constrained network of San Diego Forward: The Regional Plan.

Goals and Objectives

The Sustainable Communities Strategy included in the Regional Plan outlines five strategies around which it is organized. One of these strategies serves as an overarching goal for the Active Transportation Implementation Strategy: *Invest in a transportation network that gives people transportation choices and reduces greenhouse gas emissions.*

Four primary objectives for the Strategy were outlined in a framework set by the SANDAG Transportation Committee on April 19, 2013, focused on incorporating active transportation into the Regional Plan:

1. Implement the Bike Plan and EAP
2. Enhance bike and pedestrian access to public transit
3. Improve bike and pedestrian safety at highway interchanges
4. Connect regional transportation investments to schools

SANDAG identified active transportation components associated with transit and freeway corridor projects for consideration in the Regional Plan. This approach will help to maximize investments in transit and highway infrastructure, by enhancing safety, and improving bike and pedestrian access to transit.

Accordingly, the Strategy includes the following specific approaches that have been incorporated into the Regional Plan:

- *San Diego Regional Bike Plan*: Inclusion of all Regional Bike Plan projects in the regional transportation network
- *Safe Routes to Transit*: New transit projects include bike and pedestrian access improvements at stations and the station area, including improved access to nearby schools and commercial and residential areas.
- *Safety at Highway Interchanges*: New highway interchange projects include bike and pedestrian improvements.
- *Safe Routes to School*: As Safe Routes to Transit, Safety at Highway Interchanges, and Regional Bike Plan projects are implemented, Safe Routes to School improvements will also be considered in the project planning when the project area includes schools.
- *Retrofits*: Identification of bike and pedestrian improvement needs at existing transit station areas and highway interchanges.

Finally, the Strategy outlines steps toward implementation, including Regional Bike Plan EAP implementation, Safe Routes to Transit project planning and implementation, development of a matrix that identifies implementation and coordination opportunities, and programs that support implementation of the San Diego Regional Bike Plan: education and outreach programs such as GoByBike, development of regional bike wayfinding signage guidelines, and data-related activities such as project evaluation, modeling, and monitoring.

Incorporating Active Transportation into San Diego Forward: The Regional Plan

Developing an Active Transportation Network and Measuring Performance

The Regional Plan represents the first time that an Active Transportation Network has been included in the Regional Transportation Plan. The Network includes two major components: (1) The Regional Bike Network included in *Riding to 2050: The San Diego Regional Bicycle Plan;* and (2) active transportation improvements that are integrated into transit and highway projects from the Transit Network and Highway Network. The resulting Revenue Constrained Active Transportation Network is shown in Figure U16.1, and the Revenue Unconstrained Active Transportation Network is shown in Figure U16.2.

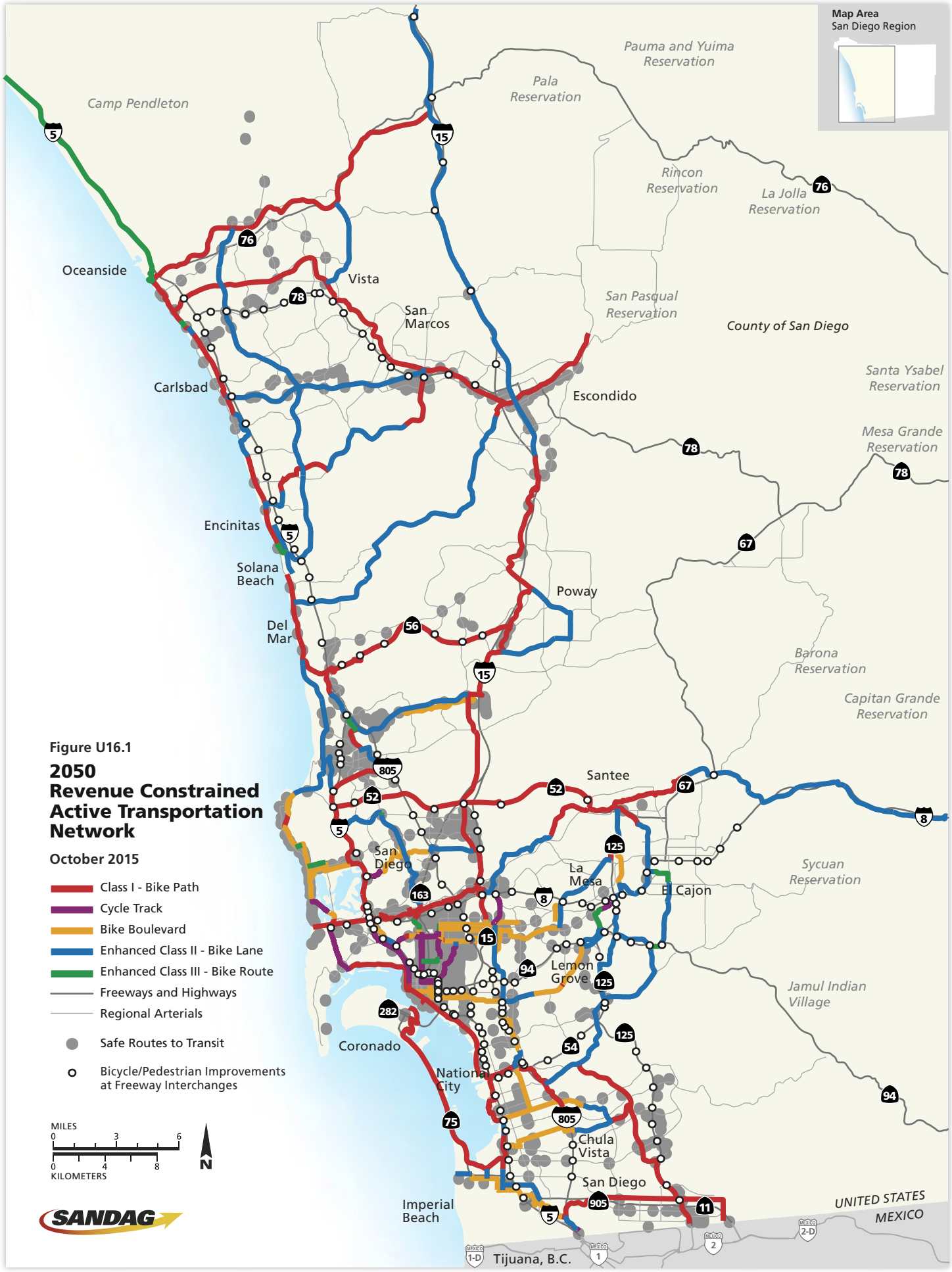
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Figure U16.1
2050 Revenue Constrained Active Transportation Network
October 2015
Class I - Bike Path
Cycle Track
Bike Boulevard
Enhanced Class II - Bike Lane
Enhanced Class III - Bike Route
Freeways and Highways
Regional Arterials
Safe Routes to Transit
Bicycle/Pedestrian Improvements at Freeway Interchanges
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Map Area
San Diego Region
Camp Pendleton
Pauma and Yuima Reservation
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UNITED STATES
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Tijuana, B.C.
Figure U16.2
2050 Unconstrained Active Transportation Network
October 2015
Class I - Bike Path
Cycle Track
Bike Boulevard
Enhanced Class II - Bike Lane
Enhanced Class III - Bike Route
Freeways and Highways
Regional Arterials
Safe Routes to Transit
Bicycle/Pedestrian Improvements at Freeway Interchanges
Safe Routes to Transit Retrofits
Bicycle/Pedestrian Improvements/Retrofits
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The Regional Bike Network

Riding to 2050: The San Diego Regional Bicycle Plan identified a connected network of bike facilities to provide access throughout the region. This network built upon existing regional Class I facilities and was expanded to improve access in the most urbanized transportation corridors of the region. These Bike Plan projects form the basis for the Active Transportation Network in the Regional Plan. The Bike Plan projects included in the Regional Plan fall into three categories and are phased accordingly in the Regional Plan:

1. Adopted Bike Plan EAP projects: *phased through 2025 (included in the 2020 and 2035 Regional Plan phased years)*

   These represent the 38 projects approved by the Board in 2013 for implementation over the next ten years. Cost estimates for these projects were completed in preparation of the EAP.

2. Other Bike Plan EAP projects: *phased through 2035*

   These represent the next 38 projects presented to the Board in 2013 for consideration as part of the EAP, but not included as part of the original $200 million EAP adoption. Cost estimates for these projects were completed in preparation of the Bike Plan EAP.

3. Regional Bike Plan projects not included in the Bike Plan EAP: *phased to 2050*

   These represent the projects that were identified in *Riding to 2050: The Regional Bicycle Plan* as part of the Regional Bike Network, but were not included in the EAP. Cost estimates for these projects were developed using the EAP per-mile cost assumptions based on facility type.

Figure U16.3 and Figure U16.4 show the 2012 Regional Bike Network (Figure U16.3), compared to full build-out by 2050 (Figure U16.4).

Integration with Transit and Highway Projects

In addition to the corridors identified in the Regional Bike Plan, access to and from transit stations, and safety when traversing highway interchange areas, represent critical areas of need for people who walk or bike. A key step in developing the Strategy was to identify active transportation improvements for the Regional Plan. The identification of these improvements helps to define areas of regional significance with respect to active transportation, and capitalizes on the opportunity to build active transportation improvements into transit and highway projects.

To this end, two types of active transportation projects were identified in developing the Active Transportation Network for the Regional Plan:

(1) *New Safe Routes to Transit and Freeway Interchange Projects: Revenue Constrained*

These consist of active transportation improvements in *new* transit and highway corridor project areas included in the Regional Plan. These projects were identified in conjunction with the Revenue Constrained Transit and Highway Networks – each active transportation improvement project was identified as part of the transit and highway projects. These transit or highway projects were identified as "parent" projects to which the active transportation improvements would be coupled. As such, phasing of the active transportation improvements follows the phasing of the parent transit or highway project. Cost estimates for the Safe Routes to Transit projects are described in the Safe Routes to Transit section that follows. Costs for the bike and pedestrian improvements at freeway interchanges are assumed as part of the parent freeway project cost.[1] Revenue Constrained Safe Routes to Transit projects are shown on Figure U16.5, and Revenue Constrained Freeway Interchange projects are shown on Figure U16.6.

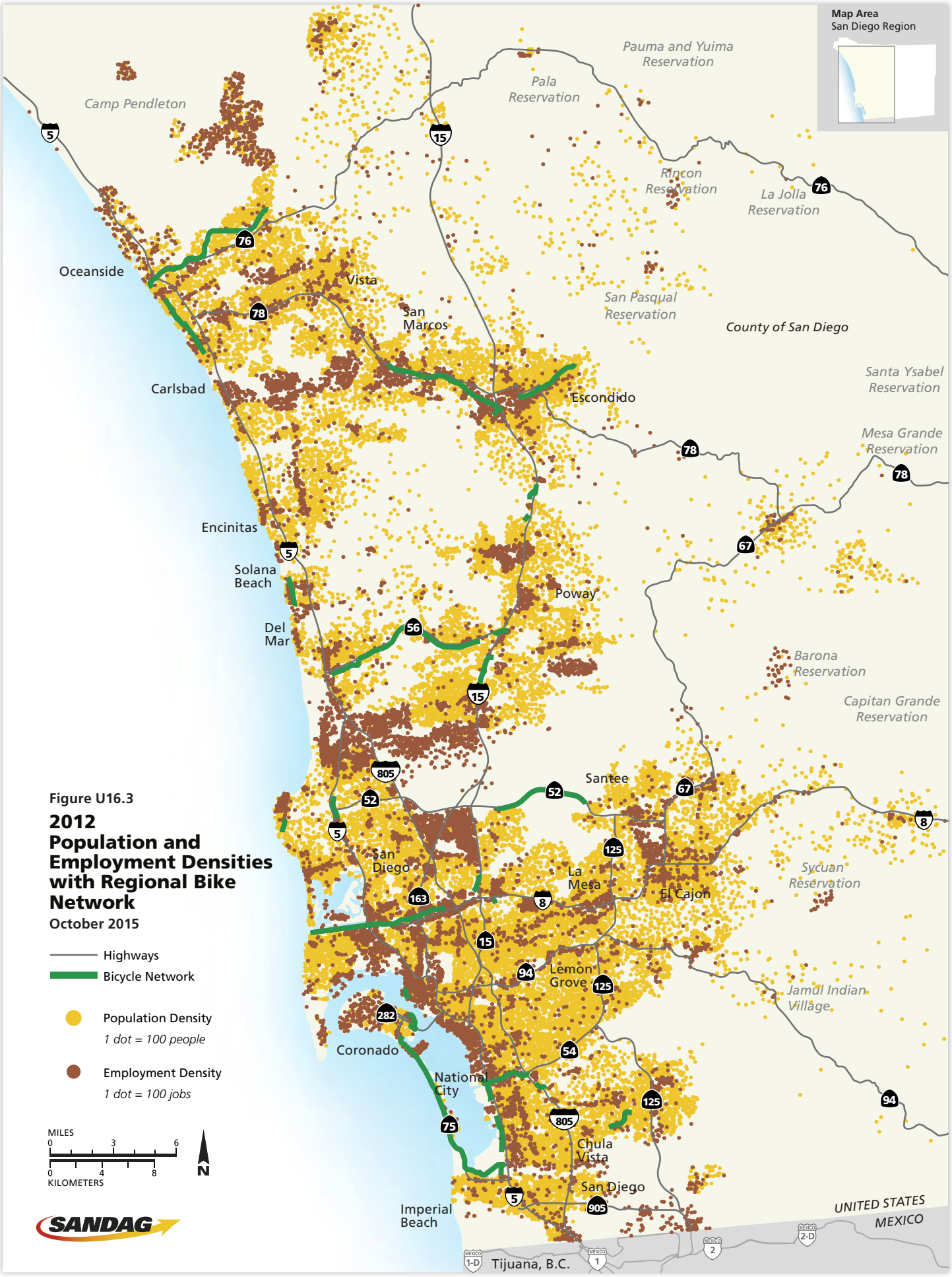
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Figure U16.3
2012 Population and Employment Densities with Regional Bike Network
October 2015
Highways
Bicycle Network
Population Density
1 dot = 100 people
Employment Density
1 dot = 100 jobs
MILES
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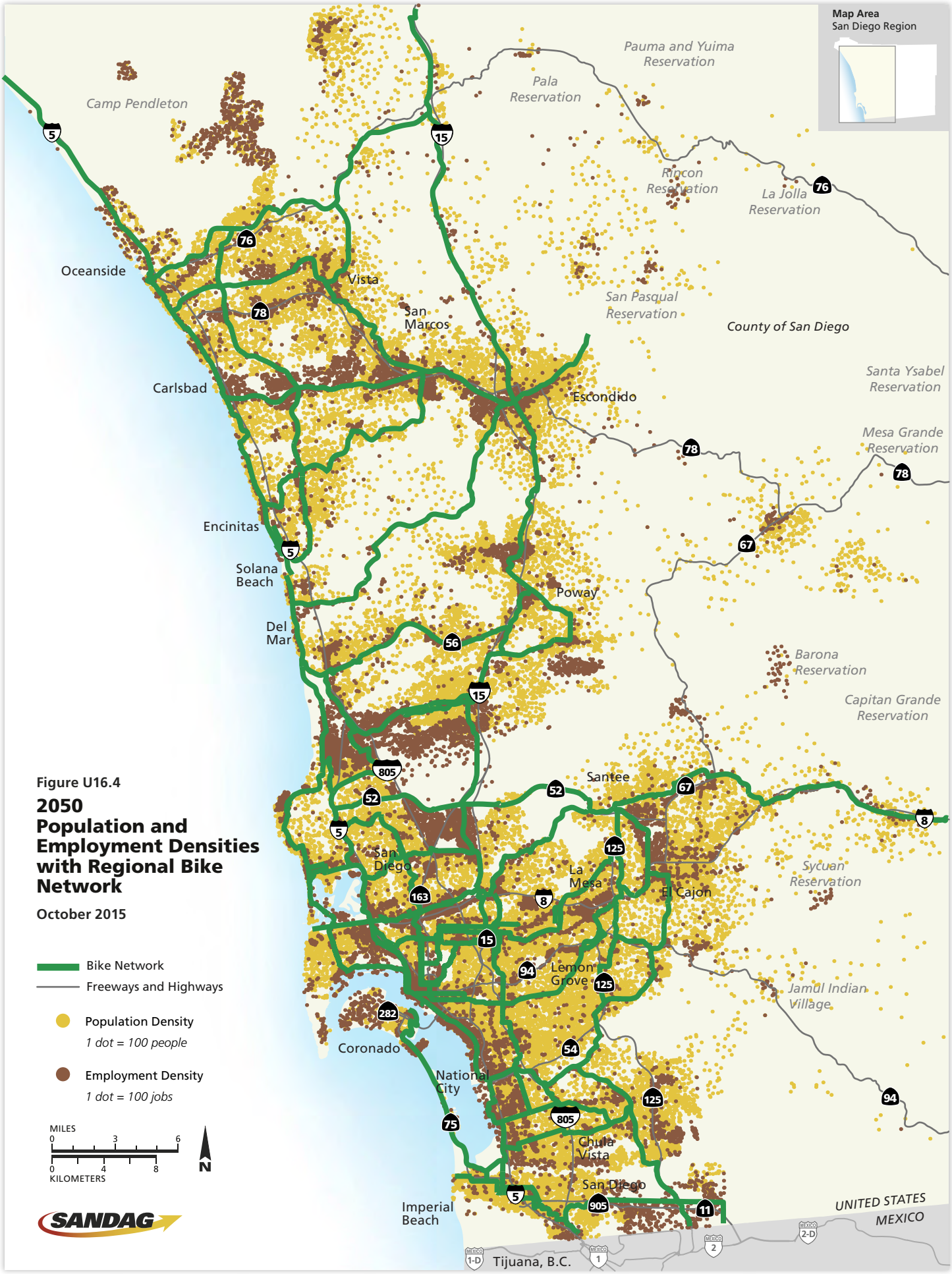
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UNITED STATES
MEXICO
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Figure U16.4
2050 Population and Employment Densities with Regional Bike Network
October 2015
Bike Network
Freeways and Highways
Population Density
1 dot = 100 people
Employment Density
1 dot = 100 jobs
MILES
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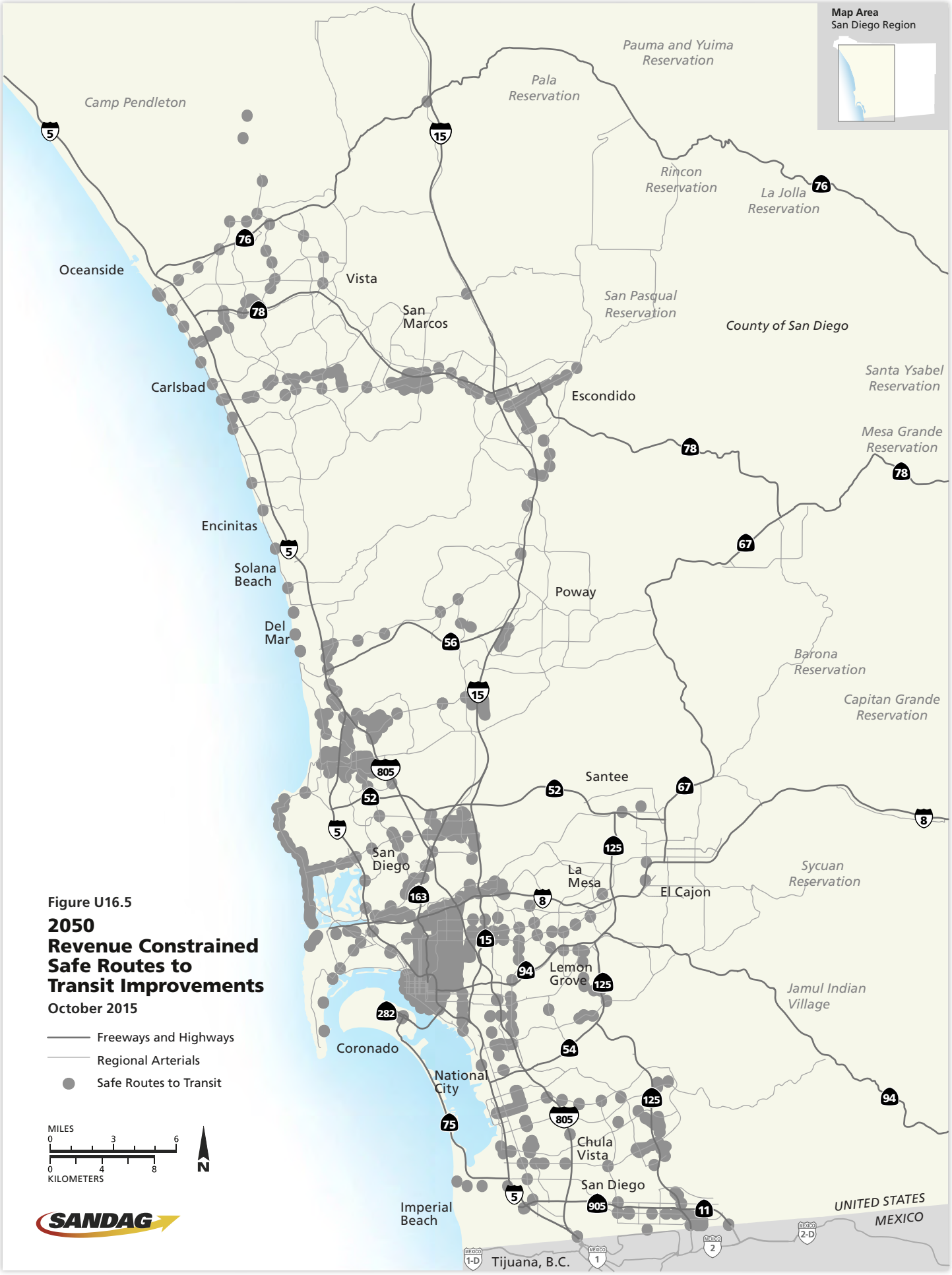
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Figure U16.5
2050
Revenue Constrained Safe Routes to Transit Improvements
October 2015
Freeways and Highways
Regional Arterials
Safe Routes to Transit
MILES
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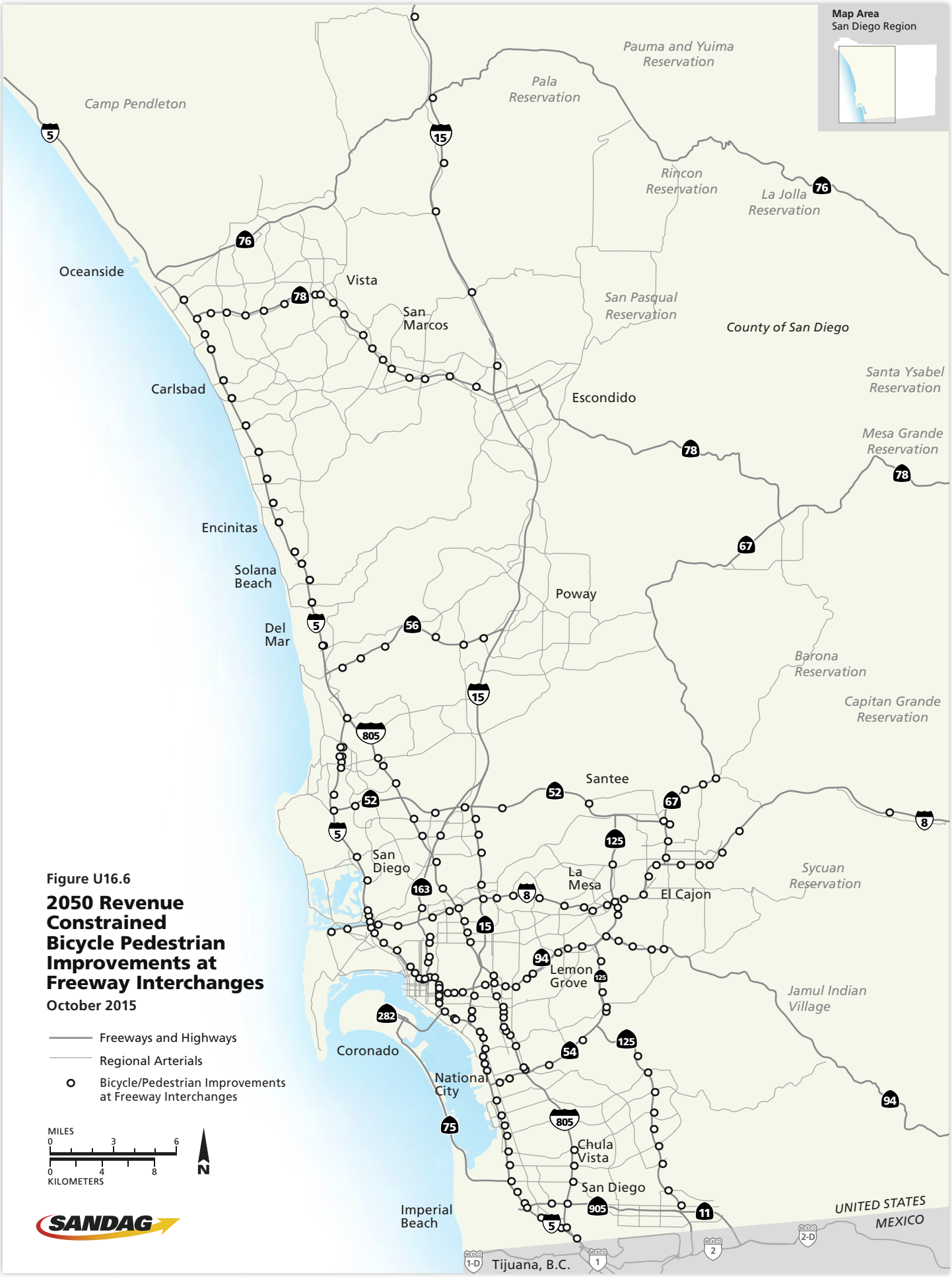
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Tijuana, B.C.
Figure U16.6
2050 Revenue Constrained Bicycle Pedestrian Improvements at Freeway Interchanges
October 2015
Freeways and Highways
Regional Arterials
Bicycle/Pedestrian Improvements at Freeway Interchanges
MILES
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(2) *Retrofit Safe Routes to Transit and Freeway Interchange Projects: Revenue Unconstrained*

These consist of active transportation improvement projects in *existing* regional transit station areas and in areas surrounding existing highway on-/off-ramps. These projects were identified by staff at the Metropolitan Transit System and the North County Transit District in the case of the Safe Routes to Transit projects, and by Caltrans staff in the case of the freeway interchange area projects. Safe Routes to Transit retrofit projects were estimated to range from $186,000 to $7.5 million per stop area or station area, and are shown on Figure U16.7. Freeway interchange retrofit projects were estimated to range from $500,000 to $3 million per interchange area, and are shown on Figure U16.8.

Modeling Enhancements

To more accurately provide information about the Active Transportation Network projects, SANDAG developed active transportation enhancements to the Activity-Based Model (ABM). In the absence of these enhancements, the ABM would not be able to demonstrate any impacts resulting from the investment in bike or pedestrian infrastructure. More information on the active transportation model enhancements can be found in Appendix T: SANDAG Travel Demand Model Documentation.

Development of evaluation criteria and performance measures

Development of an Active Transportation Network for the first time in the Regional Plan required development of criteria and performance measures to evaluate active transportation projects and transportation network scenarios across all modes. SANDAG developed a set of criteria for evaluating Active Transportation Network projects. These criteria can be found in Appendix M. However, the active transportation enhancements to the ABM could not be developed in time for use with the criteria, so the Active Transportation Network project prioritization followed that of *Riding to 2050: The San Diego Regional Bicycle Plan.* The criteria used in the Regional Bike Plan for project prioritization can be found in Attachment 2. Additionally, in developing performance measures for evaluation of network performance across all modes among various scenarios, SANDAG also included active transportation-related measures, which were modeled using the ABM.

Safe Routes to Transit Planning

SANDAG developed a framework for understanding potential Safe Routes to Transit needs, project types, and costs throughout the region. The methodology (included as Attachment 3) describes how this framework was developed to capture the land use and transportation network context surrounding transit stations. These varying contexts help to determine the types of improvements and associated costs that could be included in Safe Routes to Transit projects for such transit station area types. Each transit stop and station area in the region has been classified into a Safe Routes to Transit typology, based on Smart Growth Opportunity Area place type and intersection density. The typology prototypes can be found in Attachment 4.

Each new Safe Routes to Transit project area identified in the Regional Plan was assigned a typology according to the framework described above. Cost estimates for each Safe Routes to Transit project were developed using the cost estimates for the project's respective typology.

Safe Routes to School Implementation

Safe Routes to School refers to a spectrum of programs and built environment improvements used together to foster opportunities for students to walk and bike to school safely and routinely. In 2012, the SANDAG Board of Directors adopted the San Diego Regional Safe Routes to School Strategic Plan (Attachment 5). The Plan identifies a strategy to support local communities in establishing new Safe Routes to School programs, as well as sustaining and enhancing existing efforts.

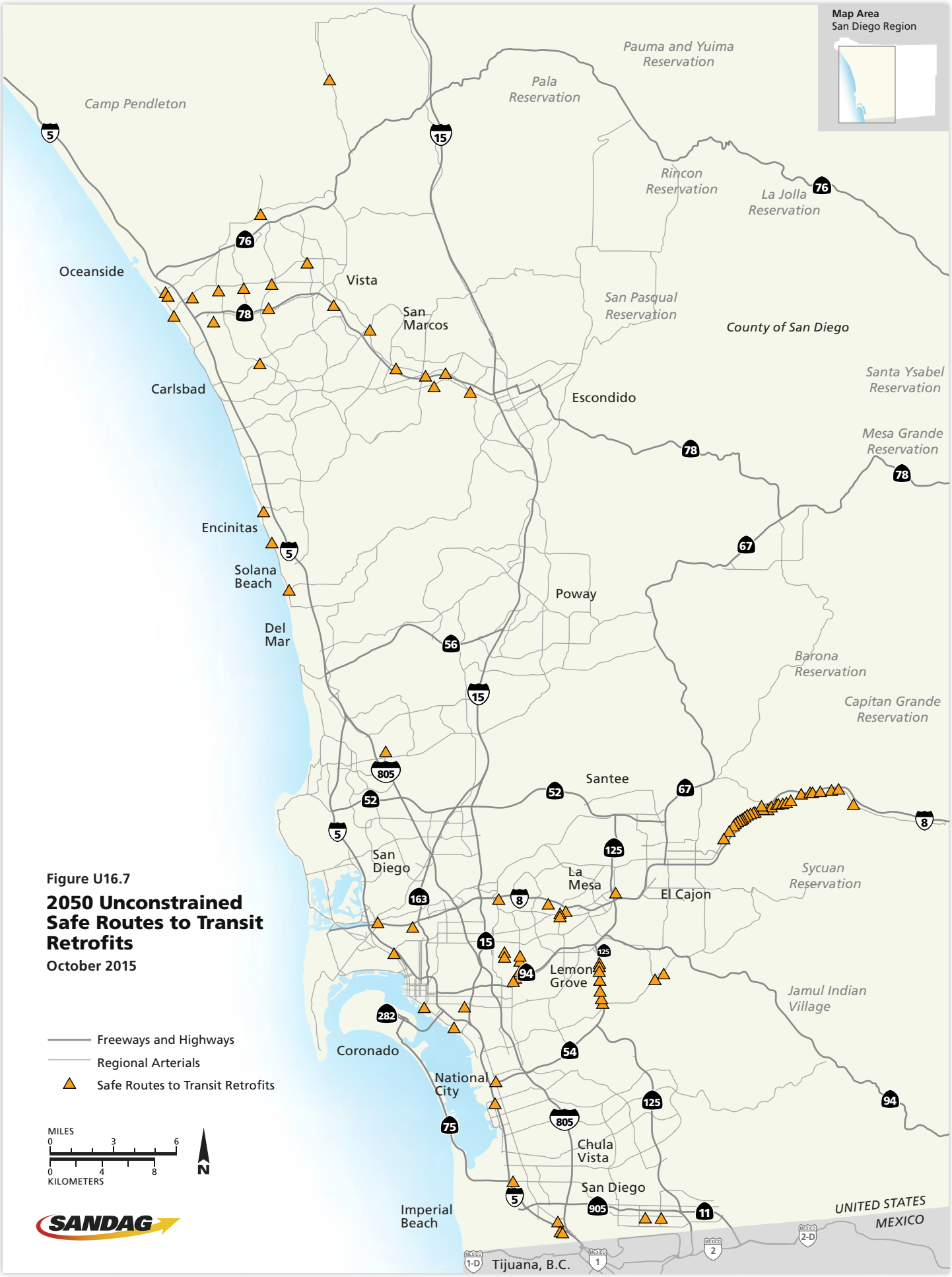

Figure U16.7

2050 Unconstrained Safe Routes to Transit Retrofits

October 2015

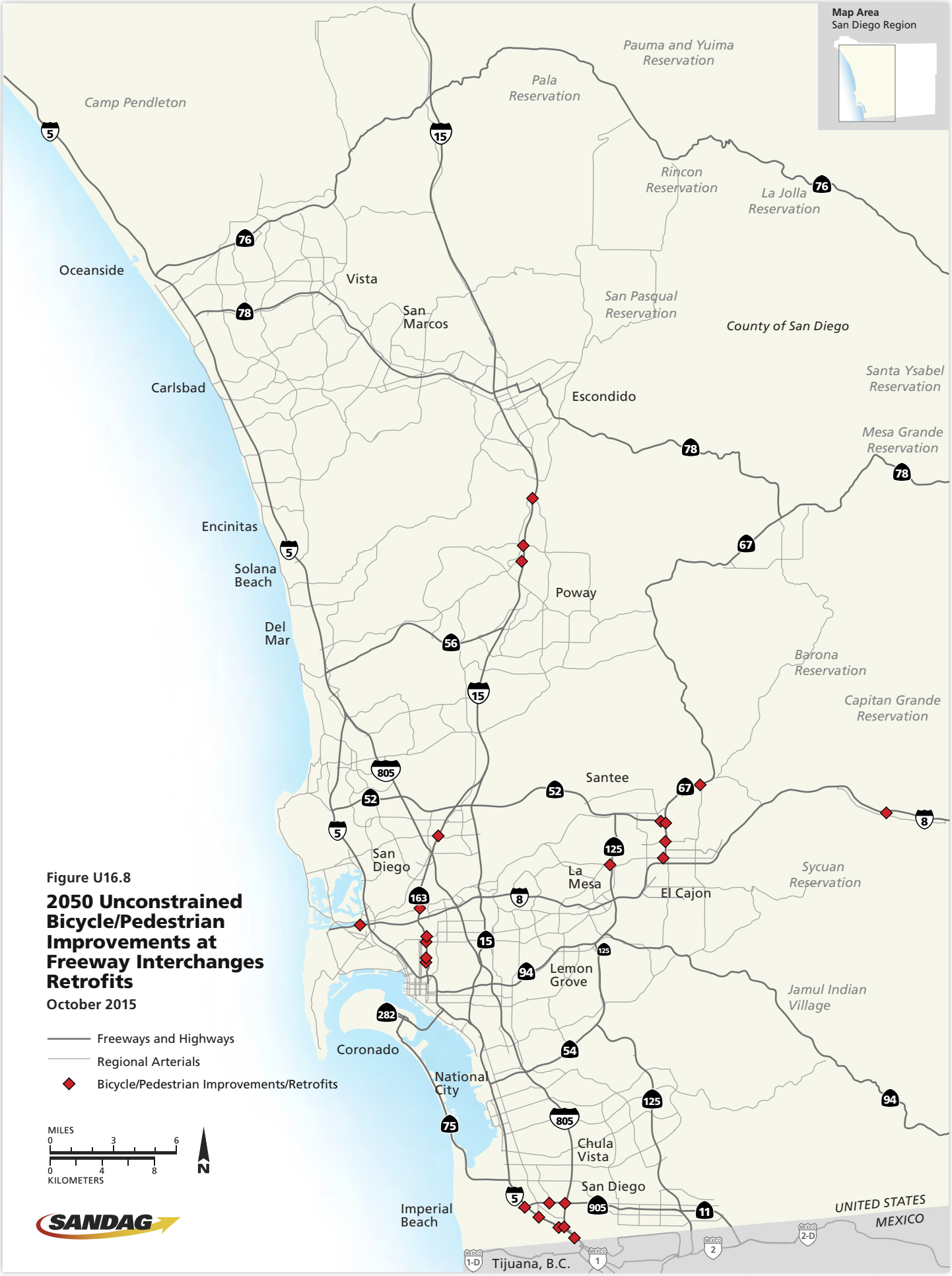
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Figure U16.8
2050 Unconstrained Bicycle/Pedestrian Improvements at Freeway Interchanges Retrofits
October 2015
Freeways and Highways
Regional Arterials
Bicycle/Pedestrian Improvements/Retrofits
MILES
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Additional opportunities for Safe Routes to School implementation can be found in the integration of Safe Routes to School into SANDAG project planning. When Regional Bike Plan, Safe Routes to Transit, and bike/pedestrian improvements at freeway interchange projects include schools in their project areas, plans will include improvements to enhance school access and safety whenever possible.

Endnotes

[1] Caltrans Deputy Directive DD-64-R1 Complete Streets – Integrating the Transportation System requires that bike, pedestrian, and transit user needs are addressed and deficiencies identified during system and corridor planning, project initiation, scoping, and programming.

riding to 2050

SAN DIEGO REGIONAL BIKE PLAN

SANDAG

SAN DIEGO
REGIONAL BICYCLE PLAN

Riding to 2050

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As of April 26, 2010

San Diego Regional Bicycle Plan Acknowledgments

Many individuals aided in the preparation of material contained in this San Diego Regional Bicycle Plan. In Particular, the cooperation and involvement of members of various SANDAG committees and working groups are acknowledged.

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Regional Planning Committee

Bicycle Pedestrian Working Group

Cities/County Transportation Advisory Committee

Regional Planning Technical Working Group

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Executive Summary

The San Diego Regional Bicycle Plan (Plan) proposes a vision for a diverse regional bicycle system of interconnected bicycle corridors, support facilities, and programs to make bicycling more practical and desirable to a broader range of people in our region. This vision is intended to guide the development of the regional bicycle system through the year 2050.

Planning for a more bicycle friendly region helps to resolve multiple complex and interrelated issues, including, traffic congestion, air quality, climate change, public health, and livability. By guiding the region toward the creation of a substantial regional bicycle network, this plan can affect all of these issue areas, thereby improving existing and future quality of life in the San Diego region.

The Plan outlines a range of recommendations to facilitate accomplishing the regional goals of increasing the number of people who bike and frequency of bicycle trips for all purposes, encouraging the development of Complete Streets[1], improving safety for bicyclists, and increasing public awareness and support for bicycling in the San Diego region. The recommendations include bicycle infrastructure improvements, bicycle-related programs, implementation strategies, and policy and design guidelines. Key recommendations are outlined below.

Bicycle Infrastructure Improvements

The Plan presents an interconnected network of bicycle corridors that would enable residents to bicycle with greater safety, directness, and convenience within and between major regional destinations and activity centers. The regional bicycle network consists of a combination of standard bicycle facilities, including Class I bike paths, Class II bike lanes, and Class III bike routes which are described and depicted in greater detail in Table 3.3. The Plan also proposes two facility types that are not defined as bikeways by the California Department of Transportation (Caltrans) – bicycle boulevards and cycle tracks. These two facility types will serve as demonstration projects to study their potential to provide greater safety and comfort to bicyclists.

[1] Complete streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and public transportation users of all ages and abilities are able to safely move along and across a complete street. – www.completestreets.org

The network selection and classification process included a public outreach program, on-going consultation with the SANDAG Bicycle-Pedestrian Working Group (BPWG), which is comprised of staff members from each of the 19 local jurisdictions, as well as mapping and modeling to refine the network and proposed bicycle facilities. To enhance the utility of the regional bicycle network, this Plan also includes provisions for secure and convenient bicycle parking and support facilities that encourage transportation-based bicycle trips, and enhance access to transit.

Recommended Programs

The Plan describes five categories of bicycle-related programs that are essential facets of the overall bicycle system envisioned for the San Diego region: education, marketing/public awareness programs, encouragement, enforcement, and on-going monitoring. A spectrum of programs is recommended for consideration that will require regional coordination to successfully implement. Recommended programs include a Complete Streets education program, Safe Routes to School programs, a Pilot Smart Trips Program, expanded Bike to Work Month activities, a route identification and way-finding signage program, and an annual bicycling evaluation program.

1 Introduction

The San Diego Regional Bicycle Plan (Plan) supports implementation of both the Regional Comprehensive Plan (RCP) and Regional Transportation Plan (RTP),. The RCP calls for more transportation options and a balanced regional transportation system to support smart growth and a more sustainable region. A policy objective of the RCP is to "create more walkable and bicycle-friendly communities consistent with good urban design concepts." The RTP calls for a multimodal regional transportation network that includes a regional bicycle network. According to the RTP, "steps to reduce peak-period travel or change when and how people travel will become increasingly important in the future." To achieve these objectives the Plan sets forth a vision for a distinctive regional bicycle system comprised of interconnected bicycle corridors, support facilities, and programs to make bicycling more practical and desirable to a greater number of the region's residents and visitors. This vision is intended to guide the future development of the regional bicycle system through the year 2050, congruent with the forthcoming 2050 RTP.

The Plan was developed by evaluating the current regional corridor network and programs to identify opportunities and constraints to bicycling in the San Diego region. Policies to improve bicycling and to recommend a system of safe, convenient, regionally significant bicycle facilities, including standard bikeways, innovative facilities such as bicycle boulevards, bicycle parking, and programs such as an annual evaluation program, are included in the Plan. Recent local and regional bicycling questionnaires have found that residents are willing to bicycle more frequently when better bicycle facilities, support facilities and bicycle-related programs are provided[2]. In Portland, Oregon, bicycle commuting doubled between 1990 and 2000, coinciding with a 215 percent increase in the development of its bicycle network.[3]

The Plan outlines the necessary steps for a phased implementation strategy where the prioritization of projects and detailed financing options will be undertaken in a subsequent effort that coincides with the development of the 2050 RTP. Additionally, since bicycle transportation plays a role in public health, reducing vehicle miles traveled (VMT), improving air quality, and lessening the dependence on motor vehicle travel, the results of the Plan will be incorporated into the 2050 RTP.

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[2]San Diego Regional Bicycle Plan Survey Results; City of San Diego Bicycle Master Plan Update Bicycle Survey Results, 2009.

[3] Birk, M. and Geller, R. Bridging the Gaps: How the Quality and Quantity of a Connected Bikeway Network Correlates with Increasing Bicycle Use. TRB Annual Meeting, 2006.

1.1 Setting

The 19 local jurisdictions in the San Diego region encompass approximately 4,300 square miles of varied physical conditions. The region's bays, lagoons, rivers, hills, and mountains help make San Diego a unique and distinctive region but also present challenges for bicycle travel.

In 2009, the San Diego region was home to approximately 3.2 million people, representing a 12.8 percent increase in population since the 2000 Census.[4] The region's population has been characterized by a relatively steady growth rate since the 1990s; it is also becoming more ethnically diverse. The region's population is expected to grow relatively older, with an anticipated growth rate of 128 percent in the population segment over 65 years by the year 2030.

Table 1-1 shows the distribution of land use types across the region, with roughly 12 percent residential and less than 1 percent commercial and industrial. The largest portions of the county are parks and recreation land and undeveloped, and which includes roadway rights-of-way and rail rights-of-way. **Figure 1-1** presents existing land uses across the region.

Table 1.1
Existing Regional Land Uses

Land Use Type	Acreage	Percent of Total
Residential	335,547	12.3%
Commercial & Office	17,538	0.6%
Industrial	14,977	0.5%
Public Facilities & Utilities	188,547	6.9%
Parks & Recreation	1,059,820	38.9%
Agriculture	121,793	4.5%
Undeveloped	984,180	36.1%
Other	4,897	0.2%
TOTALS	**2,727,299**	**100%**

Source: SANDAG Land Use shapefile, 2008; Alta Planning + Design, April 2009

[4] SANDAG, Current Estimates, 2009.

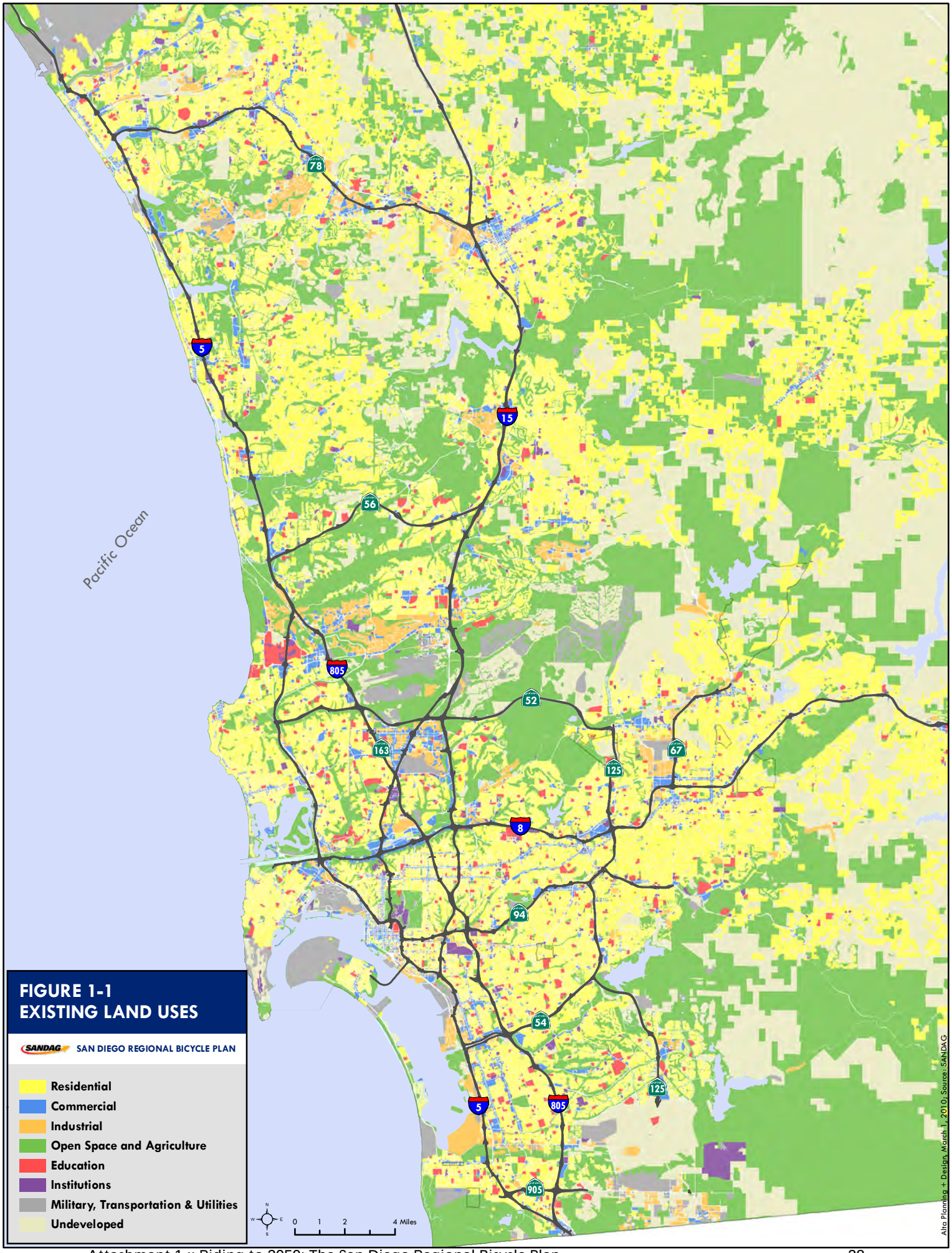

FIGURE 1-1
EXISTING LAND USES

SANDAG SAN DIEGO REGIONAL BICYCLE PLAN

- Residential
- Commercial
- Industrial
- Open Space and Agriculture
- Education
- Institutions
- Military, Transportation & Utilities
- Undeveloped

1.2 Benefits of Being a Bicycle Friendly Region

Planning to create a more bicycle friendly region contributes to resolving several complex and interrelated issues, including, traffic congestion, air quality, climate change, public health, and livability. By guiding the region toward bicycle friendly development, this plan can affect all of these issue areas, which collectively can have a profound influence on the existing and future quality of life in the San Diego region.

1.2.1 Environmental/Climate Change Benefits

Replacing vehicular trips with bicycle trips has a measurable impact on reducing human-generated greenhouse gases (GHGs) in the atmosphere that contribute to climate change. Fewer vehicle trips and vehicle miles traveled (VMT) translates into fewer mobile source pollutants, such as carbon dioxide, nitrogen oxides and hydrocarbons, being released into the air. Ground-level ozone, a byproduct of hydrocarbon emissions, has historically been San Diego County's greatest air pollution problem. San Diego County exceeds the State and Federal eight-hour ozone level limits, which also has implications for the population's respiratory and cardiovascular health[5]. While the region has made progress on reducing ozone and other air pollutants, providing transportation options that reduce VMT is an important component of decreasing greenhouse gas emissions and improving the region's air quality. Chapter five of the Plan presents a quantitative estimate of the potential air quality benefits that will result from increased bicycling activity associated with Plan implementation.

1.2.2 Public Health Benefits

Public health professionals have become increasingly aware that the impacts of automobiles on public health extend far beyond asthma and other respiratory conditions caused by air pollution. There is a much deeper understanding of the connection between the lack of physical activity resulting from auto-oriented community designs and various health-related problems such as obesity and other chronic diseases. Although diet and genetic predisposition contribute to these conditions, physical inactivity is now widely understood to play a significant role in the most common chronic diseases in the US, including heart disease, stroke and diabetes – each of which is a leading cause of death in San Diego County. In 2006, 25 percent of all deaths in San Diego County were caused by heart disease.

[5] Air Quality in San Diego County: 2007 Annual Report. County of San Diego Air Pollution Control District, 2008.

Stroke and diabetes were responsible for an additional nine percent of deaths during that year.[6]

Physical inactivity is a primary contributor to obesity, a health concern that can also lead to other chronic diseases such as heart disease and diabetes. In response to these issues, the public health profession has begun to advocate for the creation of bicycle friendly communities as one of several effective ways to encourage active lifestyles. As the region becomes more conducive to bicycling, the region's population will have more opportunities to exercise, ideally resulting in a higher proportion of the region's residents achieving recommended activity levels.

In addition to individual health benefits, fiscal benefits reward the entire community through a reduction in health care costs and lost days of work. A 2004 study found that every $1 invested in constructing multi-use paths returns $2.94 in direct medical benefits.[7]

1.2.3 Economic Benefits

Bicycling is economically advantageous to individuals and communities. According to some statistics, the annual operating costs for bicycle commuters are 1.5% to 3.5% of those for automobile commuters.[8] Cost savings associated with bicycle travel expenses are also accompanied by potential savings in health care costs. On a community scale, bicycle infrastructure projects are generally far less expensive than automobile-related infrastructure. Further, shifting a greater share of daily trips to bike trips reduces the impact on the region's transportation system, thus reducing the need for improvements and expansion projects. Studies have also shown that the overall contribution of bicycling to the economy is significant. A study conducted by the Wisconsin Department of Transportation and Bicycle Federation of Wisconsin estimates that the bicycle-related sector contributes $556 million to the economy annually. This estimate does not include the economic benefits derived from bicycle tourism, which is reported to constitute a significant portion of the state's $11.7 billion in the tourism sector.[9] The value of the bicycle-related economy in Portland, Oregon is estimated to be $90 million, representing a 38 percent increase since 2006.[10]

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[6] *California Department of Public Health, Center for Health Statistics, Death Statistical Master Files,* 2008.

[7] Wang, Guijing, et al. 2005. Cost-Benefit Analysis of Physical Activity Using Bike/Pedestrian Trails. *Health Promotion Practice*, Vol. 6, No. 2: 174-179.

[8] Active Transportation website: http://www.activetransportation.org/costs.htm

[9] *The Economic Impact of Bicycling in Wisconsin.* Wisconsin DOT and the Bicycle Federation of Wisconsin. 2005.

[10] *The Value of the Bicycle-Related Industry in Portland.* Alta Planning + Design. 2008.

1.2.4 Community/Quality of Life Benefits

Fostering conditions where bicycling is accepted and encouraged increases a city's livability from a number of different perspectives, that are often difficult to measure but nevertheless important. The design, land use patterns and transportation systems that comprise the built environment have a profound impact on quality of life issues. Studies have found that people living in communities with built environments that promote bicycling and walking tend to be more socially active, civically engaged, and are more likely to know their neighbors; whereas urban sprawl has been correlated with social and mental health problems, including stress.[11] [12] Settings where walking and riding bicycles are viable also offer greater independence to elderly people who are unable to drive automobiles. The aesthetic quality of a community also improves when visual and noise pollution caused by automobiles is reduced and when green space is reserved for facilities that enable people of all ages to recreate and commute in pleasant settings.

1.2.5 Safety Benefits

Conflicts between bicyclists and motorists result from poor riding and/or driving behavior as well as insufficient or ineffective facility design. Encouraging development and redevelopment in which bicycle travel is fostered improves the overall safety of the roadway environment for all users. Well-designed bicycle facilities improve security for current cyclists and also encourage more people to bike, which in turn, can further improve bicycling safety. Studies have shown that the frequency of bicycle collisions has an inverse relationship to bicycling rates – more people on bicycles equates to fewer crashes.[13] Providing information and educational opportunities about safe and lawful interactions between bicyclists and other roadway users likewise enhances safety.

1.3 Role of the Regional Bicycle Plan

The Plan is a complementary document to the existing 2030 RTP, the transportation component of the RCP and will be fully integrated into the 2050 RTP currently under development. The RCP establishes a vision for transportation in the region. A part of this vision is a transportation system that makes walking, biking and using transit more convenient and desirable

[11] Frumkin, H. 2002. Urban Sprawl and Public Health. *Public Health Reports* 117: 201–17.

[12] Leyden, K. 2003. Social Capital and the Built Environment: The Importance of Walkable Neighborhoods. *American Journal of Public Health* 93: 1546–51.

[13] Jacobsen, P. Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Bicycling. *Injury Prevention, 9: 205-209*. 2003.

options. The Plan provides a long-range blueprint to advance the bicycling component of this vision.

The Plan contains goals and recommendations that are regional in scope and provides a planning framework to guide decision-making. As a large and complex region where many trips are inter-jurisdictional, the San Diego region requires a complete and integrated network of bikeways and support facilities to increase bicycling trips. While bicycle planning and policy-making is primarily focused on the local level, the development of the Plan provides an opportunity to improve regional coordination and connectivity of bicycle facilities between jurisdictions. The Plan also provides guidance to local decision-makers on the design of bicycle facilities, development of programs, and prioritization of improvement projects.

1.4 Major Recommendations of the Plan

This plan outlines a range of recommendations to facilitate accomplishing the regional goals of increasing the number of people who bike and frequency of bicycle trips for all purposes, encouraging the development of Complete Streets[14], improving safety for bicyclists, and increasing public awareness and support for bicycling in the San Diego region. The recommendations include bicycle infrastructure improvements, bicycle-related programs, implementation strategies, and policy and design guidelines. Key recommendations are outlined below.

1.4.1 Bicycle Infrastructure Improvements

The Plan presents an interconnected network of bicycle corridors that would enable residents to bicycle with greater safety, directness, and convenience within and between major regional destinations and activity centers. The regional network consists of a combination of standard bicycle facilities, including Class I bike paths, Class II bike lanes, and Class III bike routes which are described and depicted in greater detail in Table 3.3. The Plan also proposes two facility types that are not defined as bikeways by the California Department of Transportation (Caltrans) – bicycle boulevards and cycle tracks. These two facility types will serve as demonstration projects to study their potential to provide greater safety and comfort to bicyclists.

The regional bicycle network is one of two bicycle network alternatives developed to reflect varying future funding scenarios. The preferred regional bicycle network is based on region-wide bicycle system need

[14] Complete streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and public transportation users of all ages and abilities are able to safely move along and across a complete street. – www.completestreets.org

without consideration of short-term fiscal constraints. The alternative "revenue constrained network" assumes a funding scenario in which only currently known federal, state, and local transportation revenues are available, supplemented with additional resources that are anticipated to become available through 2030. The network alignments associated with each funding scenario are identical. The difference in cost between the two networks is dependent upon the specific proportion of facility types that comprise a corridor. For example, a particular regional corridor may include Class I bike paths along several segments under the regional bicycle network, and Class II bike lanes along the same segments under the revenue constrained scenario. In summary, the amount of Class I facilities is the single most influential factor in determining the overall cost of each network scenario.

The alternative network unconstrained by 2030 financial conditions was selected as the regional bicycle network for three principal reasons: 1) the regional bicycle network accurately reflects bicycle system needs and is consistent with direction from policy makers and citizen input showing a preference for facilities separate from the roadway, whereas the revenue constrained network underestimates need; 2) the regional bicycle network provides a blueprint for developing a comprehensive regional bikeway system to be complete in 2050 corresponding with the 2050 RTP; and 3) acknowledging the region's actual bicycle system needs broadens the scope of funding opportunities to pursue for system development. The regional bicycle network is described in greater detail in Chapter 3.

The network selection and classification process included a public outreach program, on-going consultation with the SANDAG Bicycle-Pedestrian Working Group (BPWG), which is comprised of staff members from each of the 19 local jurisdictions, as well as mapping and modeling to refine the network and proposed bicycle facilities. To enhance the utility of the regional bicycle network, this Plan also includes provisions for secure and convenient bicycle parking and support facilities that encourage transportation based bicycle trips, and access to transit.

1.4.2 Recommended Programs

The Plan describes five categories of bicycle-related programs that are essential facets of the overall bicycle system envisioned for the San Diego region: education, marketing/public awareness programs, encouragement, enforcement, and on-going monitoring. Chapter 4 provides an overview of these program types as well as synopses of representative programs within each category. These recommended programs were identified through an assessment of the region's program deficiencies and needs determined through extensive public outreach, direction from the BPWG, comparisons

with national model programs, and an analysis of the probable effectiveness of each program within the San Diego context.

1.5 Overview of the Plan Contents

After this introductory chapter, the Plan is organized into the following chapters:

Chapter 2 describes the goals, objectives, and policy actions that provide a vision for future bicycling in the region and serve as the foundation for the Plan recommendations.

Chapter 3 presents a vision of a regional bicycle system, including a classified bicycle network and support facilities.

Chapter 4 summarizes bicycle-related program types recommended for the region.

Chapter 5 provides estimates of the benefits of the proposed regional bicycle network in terms of reduction in GHG.

Chapter 6 addresses an implementation strategy and potential financing options.

Chapter 7 presents bicycle facility design guidelines and a best practices manual to serve as a guide for planners, engineers, and designers.

2 Goals, Objectives, and Policy Actions

This chapter outlines the goals and objectives that will serve as guidelines in the development of the regional bicycle network and programs and that articulate a vision of an ideal future bicycling environment in the San Diego region. The Plan goals and objectives are derived from the RCP and 2030 RTP and were refined based on information garnered over the course of this planning process, including public involvement, and input from the SANDAG Bicycle-Pedestrian Working Group (BPWG) and SANDAG staff.

The RCP seeks to balance regional population, housing, and employment growth with habitat preservation, agriculture, open space, and infrastructure needs. A part of the vision supported by the RCP is a transportation system that makes walking, biking, and transit desirable and reasonable options. A related objective stated in the RCP is to create more bicycle-friendly and walkable communities consistent with good urban design principles. The RCP also recommends enhancing pedestrian and bicycle connections to transit as one action that would help improve the regional transportation system.

2.1 Goals

The goals of the Regional Bicycle Plan describe the guiding principles and long-range vision for the region's bicycling environment.

Goal 1: Significantly Increase Levels of Bicycling throughout the San Diego Region

Increase bicycling by all types of bicycle riders for all trip purposes through consistent support of programs and infrastructure projects that address the five Es: Education, Encouragement, Enforcement, Engineering, and Evaluation.

Goal 2: Improve Bicycling Safety

Improve bicycling safety by increasing education and training opportunities for cyclists, pedestrians, motorists, and professionals whose work impacts the roadway environment, and by promoting enforcement of traffic laws to reduce bicycle related conflicts.

Goal 3: Encourage the Development of Complete Streets

Promote the integration of Complete Streets principles into roadway planning, design, and maintenance policies so that all roadways safely accommodate all users, including bicyclists, pedestrians, transit riders, children, older people, and disabled people, as well as motorists.

Goal 4: Support Reductions in Greenhouse Gas Emissions

Support the integration of bicycle related policies and infrastructure improvements that lead to VMT reduction by converting a higher share of total intra and intercommunity trips to bicycle trips.

Goal 5: Increase Community Support for Bicycling

Increase community support for bicycling by supporting programs that raise public awareness about bicycling and encourage more people to bicycle.

2.2 Objectives and Policy Actions

These objectives are the intermediary steps toward attaining the goals of the Plan. The policy actions describe how policy makers and other decision makers will implement the stated objectives.

Objective 1: Improve the connectivity and quality of the regional bicycle network.

Recommended Policy Actions:

- Support bicycle improvement projects that close gaps in the regional bicycle network either by implementing specific projects recommended in the Plan or through other treatments.
- Encourage local government bicycle projects that connect local facilities to the regional bicycle corridors.
- Promote consistent signage that directs bicyclists to destinations and increases the visibility of the regional bicycle network.

Objective 2: Provide policy direction and funding to assist local jurisdictions with bicycle planning and project implementation.

Recommended Policy Actions:

- Update the Plan as needed and in coordination with Regional Transportation Plan updates to provide continued direction, chart progress, and to respond to changing circumstances.
- Through the SANDAG Bicycle-Pedestrian Working Group, provide continued guidance on the use of bicycle-friendly designs and innovative treatments through updates to the bicycle design guidelines published in conjunction with the Plan and through other means of communication with local jurisdictions.
- Encourage reallocation of roadway rights-of-way where appropriate to accommodate bicycling and bicycle facilities.

- Promote the preservation of bicycle access within all roadway rights-of-way, as well as the development of innovative, safety-enhanced on-street facilities, such as bicycle boulevards.
- Continue the *TransNet* and Transportation Development Act (TDA) funding programs that direct funds to local governments to improve and expand bicycle facilities and programs throughout the San Diego region.
- In support of Board Policy No. 031, TransNet Ordinance and Expenditure Plan Rules, Rule #21: Accommodation of Bicyclists and Pedestrians, continue to mandate bicycle travel accommodations of all projects funded with TransNet revenue. Establish a monitoring program to measure the effectiveness and benefits of the Rule.
- Establish a program and implementation plan for local governments to conduct bicycle counts and assessments when any local land development requires a traffic impact study.

Objective 3: Support bicycle-transit integration to improve access to major employment and other activity centers and to encourage multimodal travel for longer trip distances.

Recommended Policy Actions:

- Develop regional on-demand bike lockers that are accessible using a fare payment card that allows users to access a variety of transit modes administered by multiple agencies.
- Support the development of bicycle facilities that provide access to regional and local public transit services wherever possible.
- Coordinate with transit providers to ensure bicycles can be accommodated on all forms of transit vehicles and that adequate space is devoted to their storage on board whenever possible.
- Coordinate with transit agencies to install and maintain convenient and secure short-term and long-term bike parking facilities – racks, on-demand bike lockers, in-station bike storage, and staffed bicycle parking facilities – at transit stops, stations, and terminals.
- Work with local jurisdictions to facilitate bicycle-friendly development activity and support facilities, such as bicycle rental and repair, around transit stations.
- Provide current and relevant information to cyclists regarding bike parking opportunities located at transit stations through a variety of formats, such as the SANDAG website and regional bike maps.

Objective 4: Ensure the provision of convenient and secure bicycle parking and support facilities region-wide.

Recommended Policy Actions:

- Prepare recommended bicycle parking standards that provide context sensitive solutions for the location and number of spaces that should be provided.
- Encourage local jurisdictions to install and support short-term, long-term, and high capacity bicycle parking within the public right-of-way and on public property.
- Encourage local jurisdictions to adopt bicycle parking ordinances.
- Encourage local jurisdictions to create policies or programs that incentivize building owners and employers to provide showers and clothing lockers along with secure bike parking in areas where employment density warrants.
- Provide current and relevant information to cyclists regarding bike parking opportunities throughout the region through a variety of formats.
- Consider a bike sharing program with distribution stations located in major employment and other activity centers throughout the region.

Objective 5: Institutionalize Complete Streets principles in roadway planning, design, and maintenance policies.

Recommended Policy Actions:

- Provide Complete Streets training to transportation-related professionals.
- Consider development of a region-wide Complete Streets policy and guidelines manual.
- Encourage local jurisdictions to adopt a Complete Streets policy to be included in their General Plans.

Objective 6: Increase education, encouragement, enforcement, and performance monitoring and evaluation programs.

Recommended Policy Actions:

- Support programs that educate the bicycling and general public about bicycle operation, bicyclists' rights and responsibilities, and lawful interactions between motorists and cyclists.

- Support marketing and public awareness campaigns aimed at promoting bicycling and/or improving safety.
- Support enhancements to Bike to Work Month promotional activities and events.
- Monitor and evaluate the San Diego region's bicycling efforts by implementing a regional annual evaluation program that includes: collecting bicycle and pedestrian count data; conducting a regional non-motorized travel survey; and generating an annual report on the state of non-motorized transportation in the region.
- Support programs aimed at increasing bicycle trips by providing incentives, recognition, or services that make bicycling a more convenient transportation mode.
- Encourage enforcement efforts that target unsafe bicyclist and motorist behaviors and enforce laws that reduce bicycle/motor vehicle collisions and conflicts.
- Encourage local jurisdictions to monitor and evaluate progress toward becoming bicycle-friendly by establishing advisory committees, staffing bicycle coordinator positions and by evaluating bicycle master plan implementation.

3 Recommended Regional Bicycle Network

A primary objective of the Plan is to improve the connectivity and quality of the regional bicycle network and bicycle support facilities. Defining and improving a comprehensive regional bicycle network is essential to meeting the 2030 RTP goals of options that help alleviate future traffic demands and congestion. The Plan is regional in focus and provides a framework to promote consistency between and among local jurisdictions and encourage the development of quality facilities region wide. The current regional system requires additional on- and off-street bicycle facilities, safety improvements, improved connections to transit facilities and corridor realignments to enable bicyclists to reach key destinations and encourage more people to bicycle more frequently.

As described in the 2030 RTP,

> *"The goal of the [Regional Bicycle Plan] is to encourage the development of a unified bicycle system throughout the San Diego region that serves the needs of people using their bicycle for transportation and recreational bicyclists with connections to local and regional activity centers and transit facilities and other regional non-motorized systems."*

This chapter describes the infrastructure-related components of the regional bicycle system and is organized into the following sections:

- Existing Bikeways
- Regional Bikeways in the 2030 RTP
- Network Planning Process
- Regional Corridor Classifications
- Regional Bicycle Network
- Regional Bicycle Parking

The regional bicycle network presented in this chapter is a vital component of the overall regional bicycle system vision, which also includes distinctive bicycle programs and support facilities.

3.1 Existing Bikeways

SANDAG publishes a bike map showing existing bicycle facilities in the region, as well as other recommended routes. **Table 3.1** summarizes mileage of bikeways by facility type for the entire region, including those facilities designated as regional corridors. **Figure 3-1** displays all existing local and regional bikeways across the region.

Table 3.1
Existing Bicycle Facilities in the Region

Facility Type	Miles	% of Total
Class I – Path	159.3	11.9%
Class II – Lane	890.2	66.4%
Class III – Route	243.9	18.2%
Freeway Shoulders	47.4	3.5%
TOTALS	**1,340.8**	**100%**

Source: SANDAG Bikes shapefile, 2010; Alta Planning + Design, April, 2010

There are approximately 1,340 miles of existing bikeway facilities in the region. Class II facilities are the predominate type of bikeway at roughly 66 percent of the total, followed by Class III facilities at 18 percent of the regional total. Class I facilities comprise about 12 percent of the regional total. Although bicycles are allowed on a few select freeway shoulders, this Plan does not propose to include those facilities in the regional bicycle network as they are not intended to accommodate users of all types.

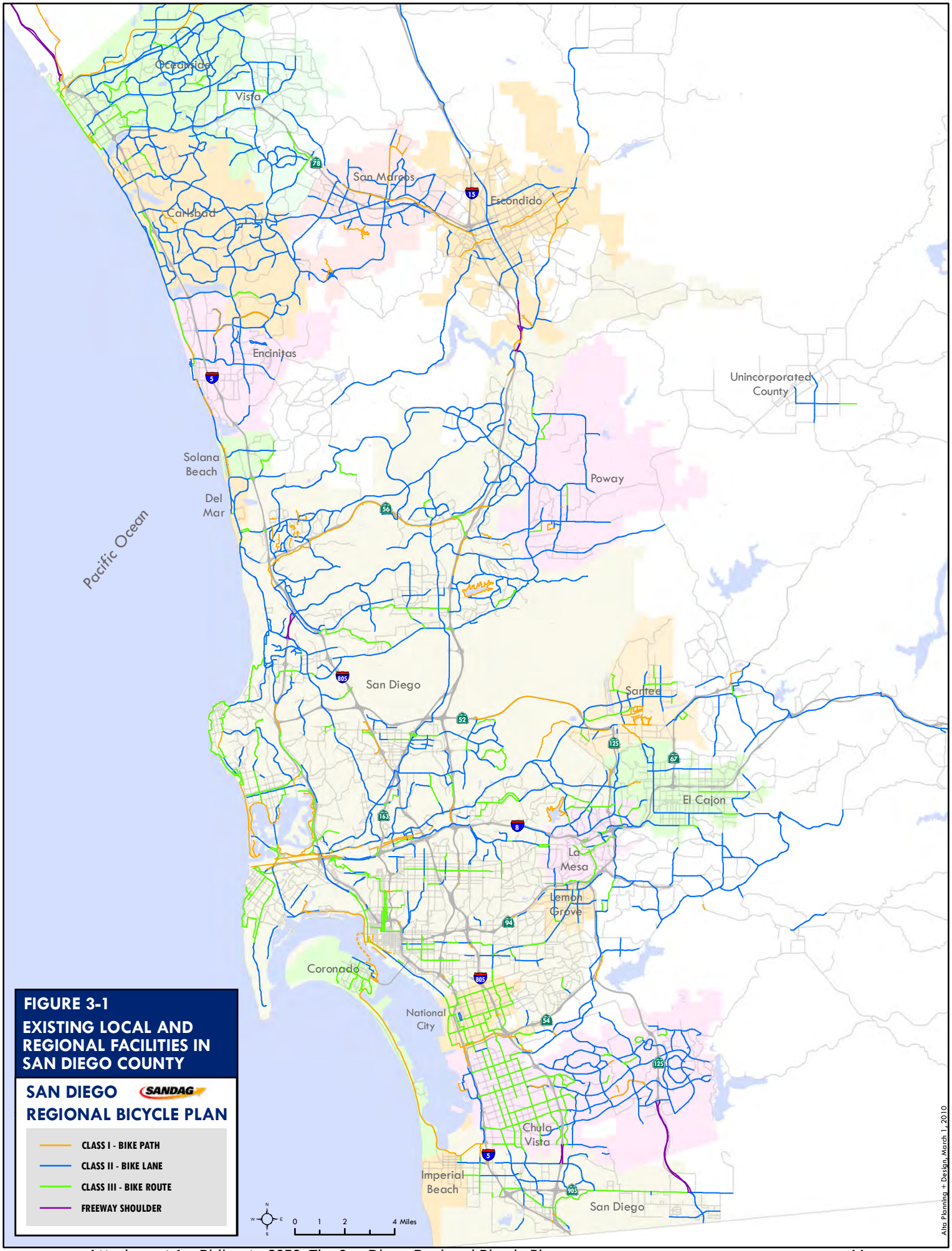

Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Unincorporated County
Solana Beach
Del Mar
Poway
Pacific Ocean
San Diego
Santee
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
San Diego
FIGURE 3-1
EXISTING LOCAL AND REGIONAL FACILITIES IN SAN DIEGO COUNTY
SAN DIEGO REGIONAL BICYCLE PLAN
SANDAG
CLASS I - BIKE PATH
CLASS II - BIKE LANE
CLASS III - BIKE ROUTE
FREEWAY SHOULDER
0 1 2 4 Miles
Alta Planning + Design, March 1, 2010

Table 3.2 presents a summary of existing bikeways by facility type and jurisdiction. Six local jurisdictions – Del Mar, Imperial Beach, La Mesa, Lemon Grove, Poway, and Vista – have one mile or less of Class I facilities; while Imperial Beach and National City are the only jurisdictions with one mile or less of Class II facilities.

Table 3.2
Existing Bicycle Facilities by Jurisdiction

Jurisdiction	Mileage by Facility Type				Total Mileage by Jurisdiction	Percent of Regional Total Mileage	Percent of Regional Population
	Class I	Class II	Class III	Freeway Shoulder			
Carlsbad	4.2	85.6	4.9	0	94.7	7.06%	3.3%
Chula Vista	6.0	67.1	42.6	5.3	121	9.02%	7.4%
Coronado	9.6	1.5	5.0	0	16.1	1.20%	0.7%
Del Mar	0.1	6.0	0.2	0	6.3	0.47%	0.1%
El Cajon	1.3	14.8	3.5	0	19.6	1.46%	3.1%
Encinitas	4.4	21.1	3.0	0	28.5	2.13%	2.0%
Escondido	10.2	33.0	0.1	1.8	45.1	3.36%	4.6%
Imperial Beach	0.6	0.2	0.3	0	1.1	0.08%	0.9%
La Mesa	0.0	13.0	10.5	0	23.5	1.75%	1.8%
Lemon Grove	0.0	7.8	1.0	0	8.8	0.66%	0.8%
National City	2.5	1.0	20.4	0	23.9	1.78%	2.0%
Oceanside	8.8	81.0	16.4	0	106.2	7.92%	5.7%
Poway	0.7	27.0	3.2	0	30.9	2.31%	1.6%
San Diego	71.6	308.4	112.9	16.1	509	37.96%	42.5%
San Marcos	11.8	45.3	0.0	0	57.1	4.26%	2.6%
Santee	7.7	13.7	8.1	0	29.5	2.20%	1.8%
Solana Beach	1.6	3.6	1.4	0	6.6	0.50%	0.4%
Vista	0.0	23.5	4.6	0	28.1	2.10%	3.1%
Unincorporated	18.2	136.6	5.8	24.2	184.8	13.78%	15.5%
TOTALS	**159.3**	**890.2**	**243.9**	**47.4**	**1,340.8**	**100%**	**100%**

Source: SANDAG Bikes shapefile, 2010; Alta Planning + Design, April 2010

As shown in Table 3.2, the City of San Diego has the greatest percentage of facilities that are also part of the regional bicycle network, at roughly 38 percent of the regionwide total, while Imperial Beach, Del Mar, and Solana Beach have the smallest percentage of the regional total, respectively. The overall trends in bikeway facility provision follow trends in population and land area. There are eight jurisdictions whose share of regional bicycle facilities is less than their share of the regional population. These jurisdictions include El Cajon, Escondido, Imperial Beach, Lemon Grove, National City, San Diego, Vista, and the unincorporated county.

3.2 Regional Bikeways in the 2030 RTP

The regional bicycle network as proposed in the 2030 RTP consists of a total of 445 miles of existing and planned facility. The 2030 RTP does not define the classification for each of the segments in the regional corridor system. **Figure 3-2** displays an overview of the adopted regional corridors from the 2030 RTP, which served as the starting point for the development of the regional bicycle network.

3.3 Network Planning Process

Development of the Plan required close examination of the network and alignments in the 2030 RTP. The network planning process included public input, consultation with the SANDAG Bicycle-Pedestrian Working Group (BPWG) comprised of staff members from each of the 19 local jurisdictions, and GIS mapping and modeling to refine the proposed network alignments and facility classifications.

Criteria adopted by the SANDAG Transportation Committee were employed in refining an updated regional bicycle network, including serving the highest relative bicycle demands across the region, providing for the most direct connections, and incorporating existing facilities where feasible (A complete presentation of the existing conditions analysis documenting this background assessment is presented in **Appendix A**.). **Figure 3-3** presents a regionwide overview of the updated regional bicycle network adopted by the Transportation Committee. Proposed changes to the 2030 RTP regional network include the addition of seven new corridors and the adjustment of alignments for eight corridors. **Figure 3-4** displays the changes between the 2030 RTP regional network and the updated network for the Plan.

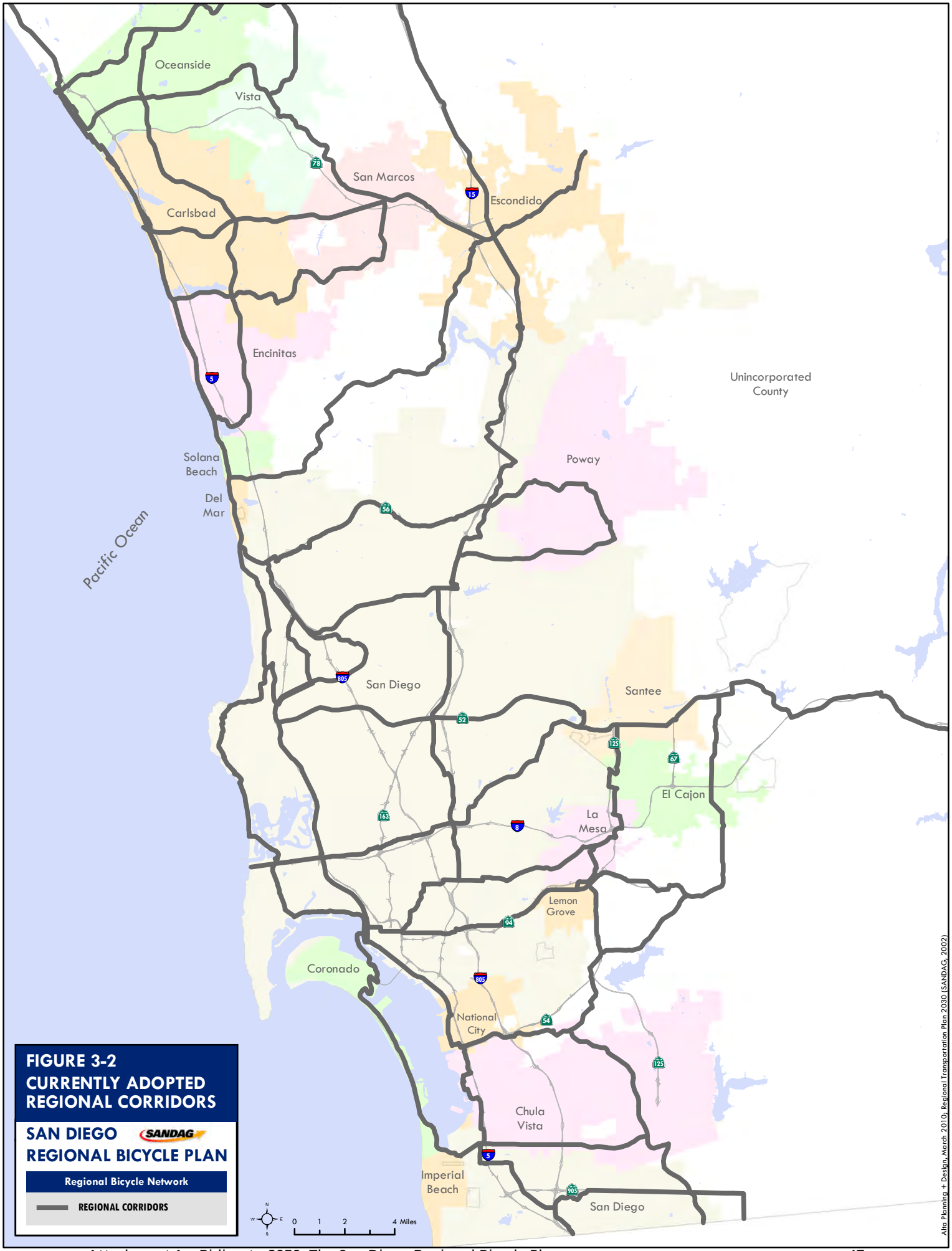


FIGURE 3-2
CURRENTLY ADOPTED REGIONAL CORRIDORS

SAN DIEGO REGIONAL BICYCLE PLAN

Regional Bicycle Network

REGIONAL CORRIDORS

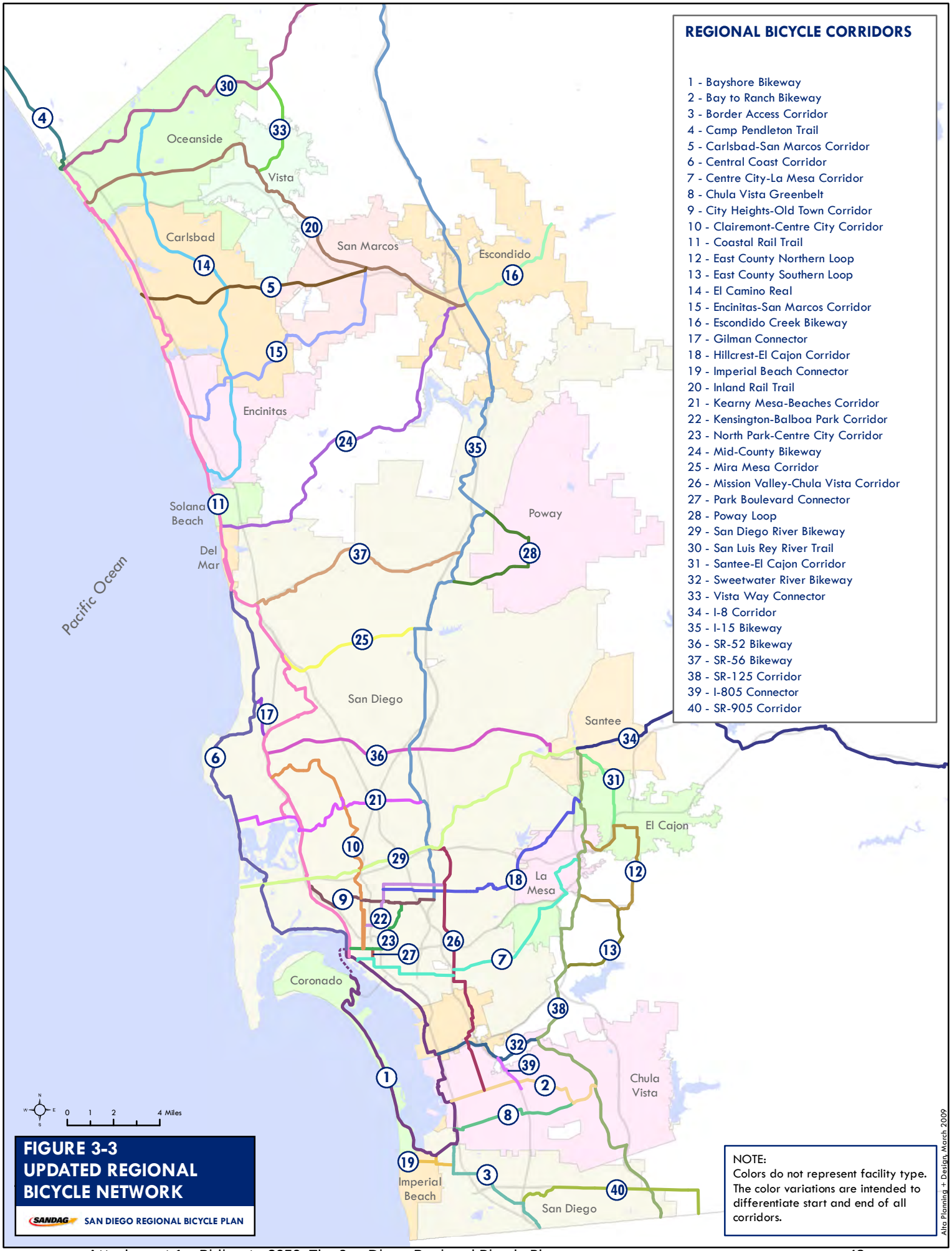
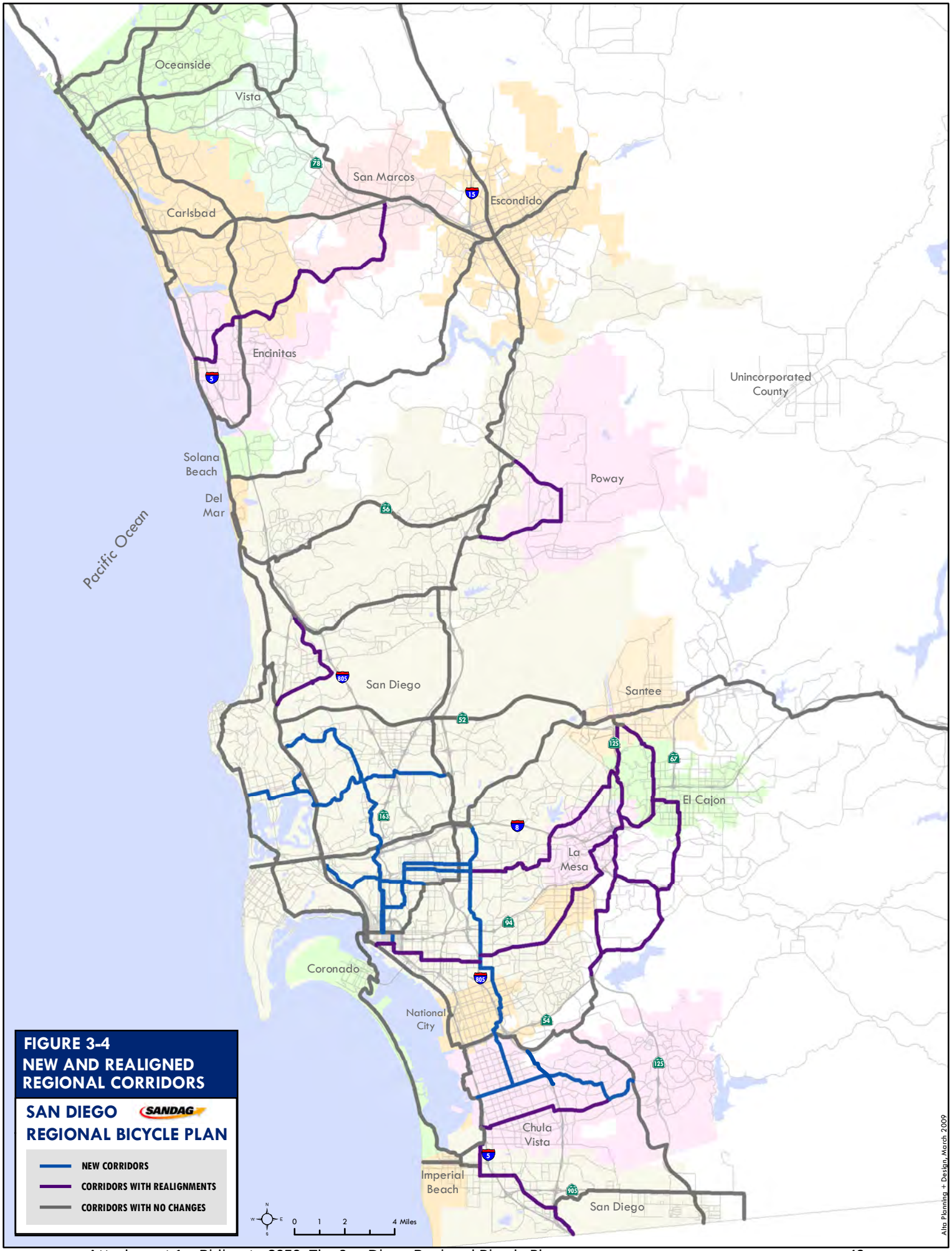


FIGURE 3-3
UPDATED REGIONAL BICYCLE NETWORK

SANDAG SAN DIEGO REGIONAL BICYCLE PLAN


Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Unincorporated County
Solana Beach
Del Mar
Pacific Ocean
Poway
San Diego
Santee
El Cajon
La Mesa
Coronado
National City
Chula Vista
Imperial Beach
San Diego
FIGURE 3-4
NEW AND REALIGNED REGIONAL CORRIDORS
SAN DIEGO REGIONAL BICYCLE PLAN
SANDAG
NEW CORRIDORS
CORRIDORS WITH REALIGNMENTS
CORRIDORS WITH NO CHANGES
0 1 2 4 Miles
Alta Planning + Design, March 2009

3.4 Regional Corridor Classifications

The same method that informed the network alignment process described in Section 3.3 was utilized to establish a bicycle facilities classification system that was applied to the regional corridor alignments to establish a clear vision for future development of the regional bikeway system. The system included five classification types. Three are from the Caltrans Highway Design Manual (referenced in Chapter 7) bikeway classifications enhanced with additional bicycle facility treatments, such as intersection treatments to improve high bicycle/motorist conflict areas. The Plan also proposes the consideration of two classifications not currently defined by the Highway Design Manual – bicycle boulevards and cycle tracks – to provide additional opportunities for regional bikeway connections. Because cycle tracks include non-standard design elements, the cycle track classification is recommended for limited segments to serve as a pilot project. **Table 3-3** displays the classification system employed in planning for the regional bicycle system. Greater detail on the design of standard and non-standard facilities and treatments is provided in **Chapter 7**. All regional corridors should be identifiable via identification and way-finding signage that names each corridor and allows users to easily understand the destinations served by each respective corridor.

Table 3.3
Regional Corridor Classification System

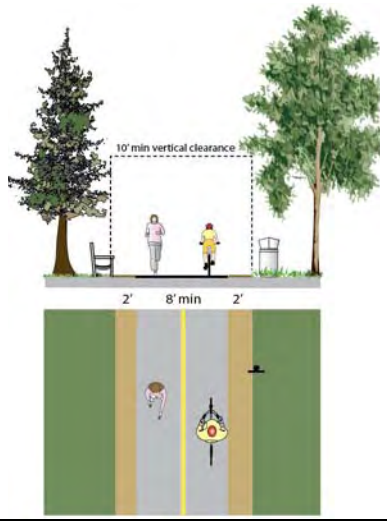
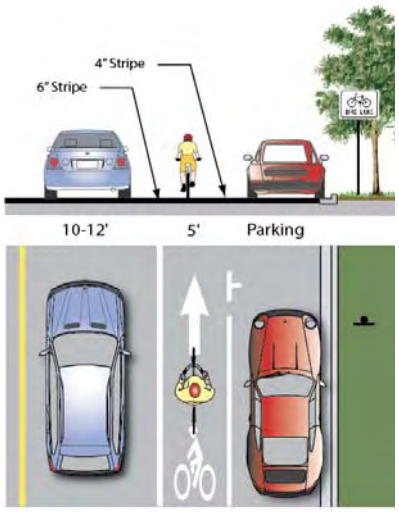
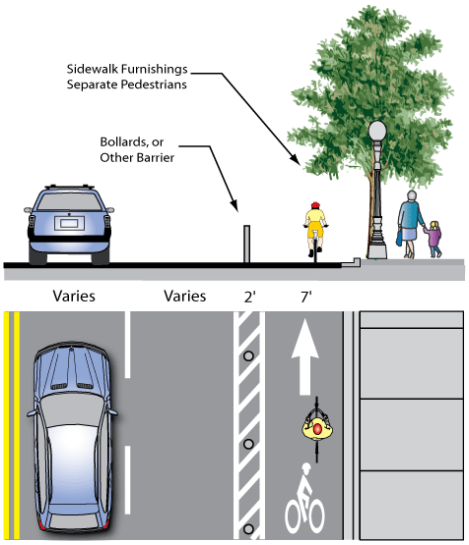
Class I – Bike Path Bike paths are bikeways that are physically separated from vehicular traffic. Also termed shared-use paths, bike paths accommodate bicycle, pedestrian, and other non-motorized travel. Paths can be constructed in roadway right-of-way or independent right-of-way. Bike paths provide critical connections in the region where roadways are absent or are not conducive to bicycle travel.	
Class II - Bike Lanes Bike lanes are defined by pavement markings and signage used to allocate a portion of a roadway for exclusive or preferential bicycle travel. Within the regional corridor system, bike lanes should be enhanced with treatments that improve safety and connectivity by addressing site-specific issues. Such treatments include innovative signage, intersection treatments, and bicycle loop detectors.	
Class III - Bike Routes Bike routes are located on shared roadways that accommodate vehicles and bicycles in the same travel lane. Established by signs, bike routes provide continuity to other bike facilities or designate preferred routes through corridors with high demand. Within the regional corridor system, bike routes should be enhanced with treatments that improve safety and connectivity by addressing site-specific issues.	

Table 3.3, Continued
Regional Corridor Classification System

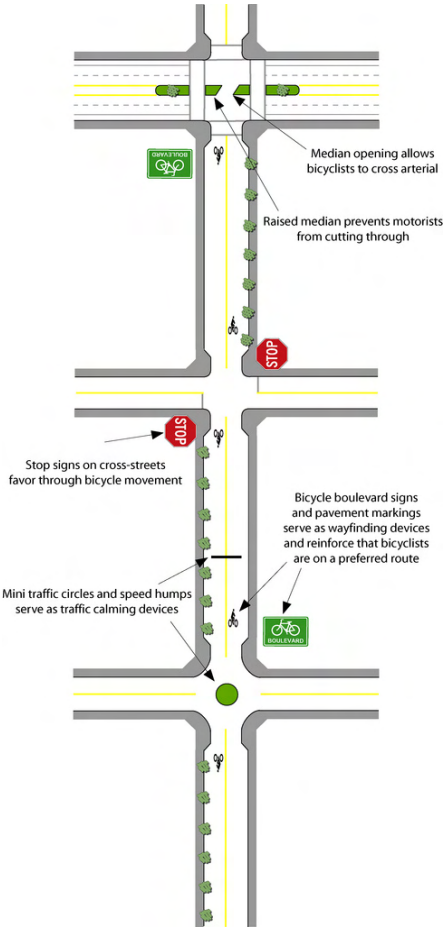
Cycle Tracks

A cycle track is a hybrid type bicycle facility that combines the experience of a separated path with the on-street infrastructure of a conventional bike lane. Cycle tracks are bikeways located in roadway right-of-way but separated from vehicle lanes by physical barriers or buffers. Cycle tracks provide for one-way bicycle travel in each direction adjacent to vehicular travel lanes and are exclusively for bicycle use. **Cycle tracks are not recognized by Caltrans Highway Design Manual as a bikeway facility.** Development of cycle track on segments of the regional corridor system is proposed through experimental, pilot projects.



Bicycle Boulevards

Bicycle boulevards are local roads or residential streets that have been 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, typically without specific vehicle or bicycle lane delineation. These roadway designations prioritize bicycle travel above vehicular travel. The treatments applied to create a bike boulevard heighten motorists' awareness of bicyclists and slow vehicle traffic, making the boulevard more conducive to safe bicycle and pedestrian activity. Bicycle boulevard treatments include signage, pavement markings, intersection treatments, traffic calming measures and can include traffic diversions. **Bicycle boulevards are not defined as bikeways by Caltrans Highway Design Manual; however, the basic design features of bicycle boulevards comply with Caltrans standards.**



3.5 The Regional Bicycle Network

This section presents alignments and classifications for the updated regional bicycle network. The regional bicycle network reflects a comprehensive view of the region's bikeway system needs and represents the vision for a regional network in the year 2050. As part of the planning effort, two bicycle network alternatives were developed, the preferred regional bicycle network and a revenue constrained network. The revenue constrained network is based on a scenario in which only currently known federal, state, and local transportation revenues, supplemented with resources anticipated to become available through 2030, are available for network construction. Whereas, the preferred regional bicycle network accurately reflects the region's bikeway needs unconstrained by shorter-term fiscal conditions. Further details on the different revenue scenarios can be found in Chapter 6.

Section 3.3 of this chapter summarizes the process employed to develop the regional bicycle network. **Figure 3-5** shows the alignments along with the bicycle facility classifications proposed for each corridor. **Figure 3-6** displays existing facilities within the regional corridors along with portions of the regional corridor system that have not been built.

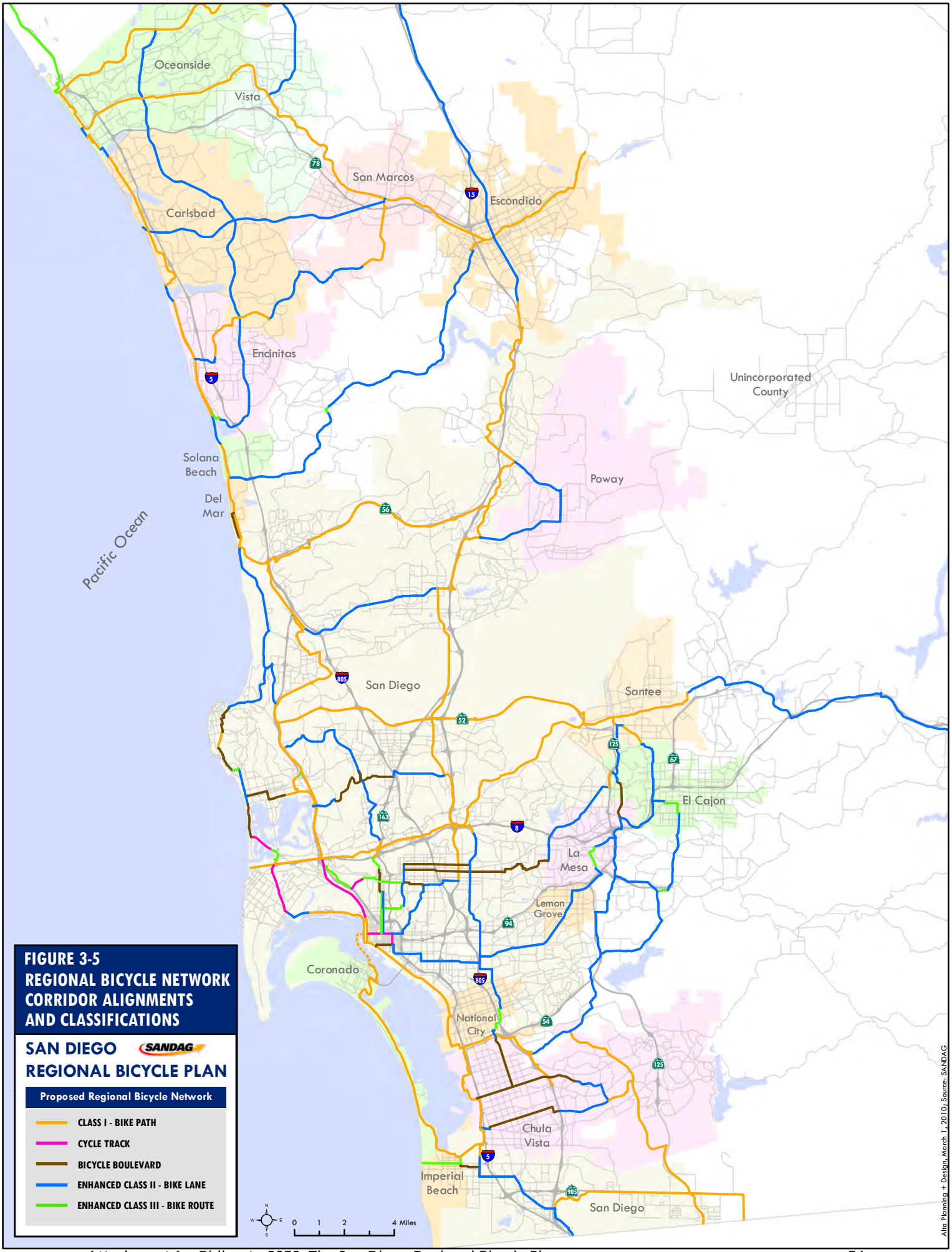
Table 3.4 presents a summary of the regional bicycle network mileage by classification type for each of its 40 corridors. As shown, the network would provide for approximately 515.5 miles of facility, including roughly 227.8 miles of Class I facility, 212.5 miles of enhanced Class II, 33.7 miles of enhanced Class III, 8.3 miles of cycle track, and 34.2 miles of bicycle boulevard.

Table 3.4
Facility Type and Mileage for the Regional Bicycle Network

Facility Type	Mileage	Percent of Total
Class I – Bike Path	227.8	44.2 %
Enhanced Class II – Bike Lane	212.5	41.3 %
Enhanced Class III – Bike Route	32.7	6.3 %
Cycle Track	8.3	1.6 %
Bicycle Boulevard	34.2	6.6 %
TOTALS	**515.5**	**100 %**

Source: Alta Planning + Design, April 2009

The bicycle network map and summary tables for the constrained revenue funding scenario is provided in **Appendix B**.


Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Unincorporated County
Solana Beach
Del Mar
Poway
Pacific Ocean
San Diego
Santee
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
San Diego
FIGURE 3-5
REGIONAL BICYCLE NETWORK CORRIDOR ALIGNMENTS AND CLASSIFICATIONS
SAN DIEGO REGIONAL BICYCLE PLAN
SANDAG
Proposed Regional Bicycle Network
CLASS I - BIKE PATH
CYCLE TRACK
BICYCLE BOULEVARD
ENHANCED CLASS II - BIKE LANE
ENHANCED CLASS III - BIKE ROUTE
0 1 2 4 Miles
Alta Planning + Design, March 1, 2010; Source: SANDAG

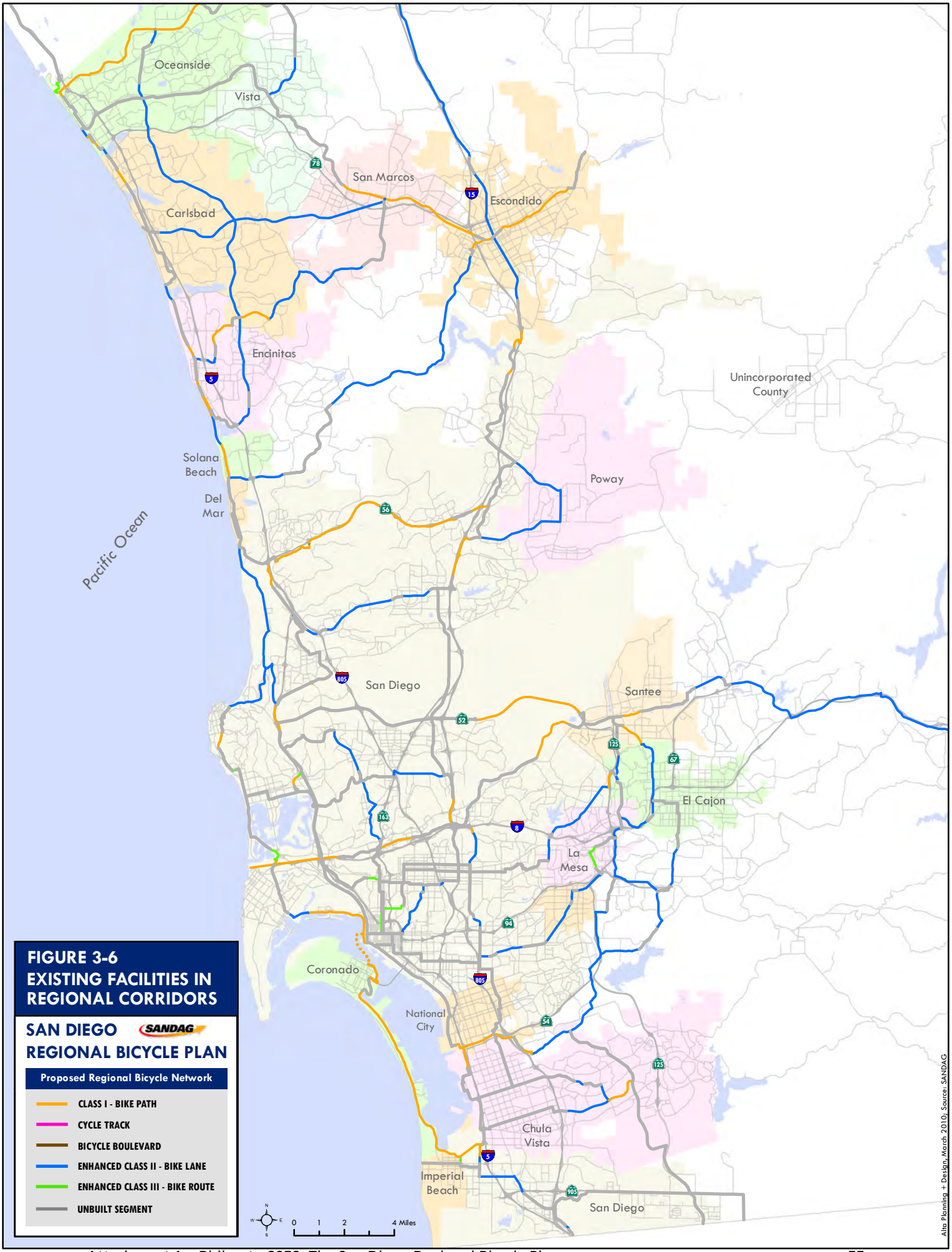


FIGURE 3-6
EXISTING FACILITIES IN REGIONAL CORRIDORS

SAN DIEGO REGIONAL BICYCLE PLAN

Proposed Regional Bicycle Network

- CLASS I - BIKE PATH
- CYCLE TRACK
- BICYCLE BOULEVARD
- ENHANCED CLASS II - BIKE LANE
- ENHANCED CLASS III - BIKE ROUTE
- UNBUILT SEGMENT

3.6 Priority Projects

As part of the implementation of the Plan a project prioritization process using criteria adopted by the SANDAG Transportation Committee will be developed and applied to the regional network to phase implementation.

3.6.1 Project Prioritization Process

The prioritization framework will assess estimated bicycling demands and bicycle facility deficiencies across the region. The bicycle travel demand assessment will employ a gravity model approach where the level of demand on any given segment of the proposed network is assumed to be positively correlated with land use intensities of locations being connected, and inversely correlated with the distances between these locations. The Smart Growth Opportunity Areas (SGOAs), as shown on the SANDAG Board adopted Smart Growth Concept Map (**Appendix C**) will be used to define a set of origins and destinations across the region, with linkages via the proposed regional bicycle network assessed for relative demands. Based upon the gravity model concept, therefore, the higher the land use intensity of a SGOA served by the regional bicycle network, the greater the estimated demand along that particular segment. Likewise, the shorter the distances between any two SGOAs along the regional bicycle network, the higher the estimated demand on that particular segment.

The RCP identifies seven categories of smart growth place types, including the Metropolitan Center, Urban Centers, Town Centers, Community Centers, Rural Villages, Mixed-Use Transit Corridors and Special Use Centers. Each smart growth place type is associated with housing and employment density targets, as well as transit service thresholds. The Smart Growth Concept map was developed in collaboration with the 19 jurisdictions in the San Diego region and includes nearly 200 existing and planned/potential SGOAs. Using SGOAs in the regional bicycle network prioritization process allows the region to emphasize important synergies between its land use, transit, and bicycle planning efforts.

Table 3.5 displays the RCP seven smart growth place types and the respective residential, employment, and transit targets.

Table 3.5
Land Use and Transit Targets for RCP Smart Growth Place Types

Smart Growth Place Type	Minimum Residential Target	Minimum Employment Target	Minimum Transit Service Characteristics
Metropolitan Center	75 du/ac	80 emp/ac	Regional Services
Urban Center	40 du/ac	50 emp/ac	Light Rail/Rapid Bus
Town Center	20 du/ac	30 emp/ac	Light Rail/Rapid Bus
Community Center	20 du/ac	N/A	High Frequency Local Bus within Transit Priority Areas based on the Urban Service Boundary in the 2007-2011 Coordinated Plan
Rural Village	10.9 du/ac	N/A	N/A
Special Use Center	Optional	45 emp/ac	Light Rail/Rapid Bus
Mixed-Use Transit Corridor	25 du/ac	N/A	High Frequency Local Bus

Source: Smart Growth Concept Site Descriptions June 6, 2008 (SANDAG)

Notes:
du/ac = dwelling units per acre
emp/ac = employees per acre

In addition to the demand-based criteria, the prioritization process will also incorporate bicycle network deficiencies and levels of prior facility funding. Specifically, the deficiency assessment will consider bicycle facility gaps, incidence of bicycle crashes, and public comment related to problem areas. Factors such as the presence of a facility gap, high crash locations, more public comment, and prior funding will be given higher priority.

3.7 Regional Bicycle Parking

Secure and convenient bicycle parking is essential to facilitating bicycle transportation, including multimodal trip-chaining where the bicycle is used for a portion of the total trip. The SANDAG iCommute bike locker program continues to advance bicycle-transit integration in the region by managing 872 spaces in bike lockers at 60 transit centers (Trolley, COASTER, SPRINTER, and BRT Stations), and Park and Ride lots throughout San Diego County. iCommute mechanical and electronic lockers can be accessed for a $25 dollar key deposit fee and are available to users on a first-come, first-served basis. **Table 3.6** displays the quantity of iCommute bike lockers and locker spaces by location.

Table 3.6
SANDAG iCommute Bike Lockers in the San Diego Region

Site Name	Total Lockers	Total Spaces
12th and Imperial Trolley Station	2	4
24th Street Trolley Station	2	4
70th Street Trolley Station	6	12
8th Street Trolley Station	4	8
Alvarado Medical Center Trolley	6	12
Amaya Trolley Station	7	14
Bayfront Trolley Station (E Street)	9	18
Beyer Blvd Trolley Station	2	4
Buena Creek (SPRINTER)	9	18
Cal State San Marcos (SPRINTER)	10	20
Carlsbad Village	2	4
Carmel Mtn. Park & Ride #4	4	8
Coast Highway (SPRINTER)	4	8
College Blvd (SPRINTER)	10	20
Crouch St (SPRINTER)	8	16
El Cajon Transit Terminal	8	16
El Camino Real (SPRINTER)	5	10
Encanto Trolley Station	2	4
Encinitas Coaster Station	16	28
Escondido Ave (SPRINTER)	11	22
Escondido Transit Ctr	19	38
Euclid Ave Trolley Station	1	2
Fashion Valley Transit Center	16	16
Fenton Pkwy	2	4
Gillespie Field Trolley (Weld)	6	12
Grantville Trolley Station	6	12
Grossmont Trolley Station	4	8
H St. Trolley Station	11	22
Harborside Trolley Station	1	2
Hazard Center Trolley Station	6	12
Iris Ave Trolley Station	14	28
La Mesa Trolley Station	3	6
Lemon Grove Trolley (Broadway)	4	8
Massachusetts Trolley Station	3	6
Melrose Station (SPRINTER)	7	14
Mission SD Trolley Station	6	12

(Continued on next page)

Table 3.6 (continued)
SANDAG iCommute Bike Lockers in the San Diego Region

Site Name	Total Lockers	Total Spaces
Mission Valley Ctr Trolley	4	8
Morena/Linda Vista Trolley	6	12
Nordahl Road Station (SPRINTER)	8	16
Oceanside Transit Center	10	20
Old Town Transit Center	24	48
Pacific Fleet Trolley Station	2	4
Palm Ave Trolley Station	7	14
Palomar College Station (SPRINTER)	16	32
Palomar Trolley Station	6	12
Poinsettia Coaster Station	6	12
Qualcomm Stadium Trolley	6	12
Rancho Bernardo BRT	8	16
Rancho Carmel Park & Ride #31	2	4
Rancho Del Oro (SPRINTER)	8	16
Sabre Springs BRT	8	16
Sabre Springs Park & Ride #16	2	4
San Marcos Civic Center (SPRINTER)	18	36
Santa Fe Depot	2	4
Santee Trolley Station	20	40
Solana Beach Coaster Station	6	12
Sorrento Valley Coaster	22	44
Spring Street Trolley Station	3	6
Vista Transit Center (SPRINTER)	14	28
Washington Trolley Station	2	4
TOTAL	**446**	**872**

Source: SANDAG, 2008

iCommute also reaches out to the community regarding bicycle locker availability via the San Diego Region Bike Map, the iCommute website, and biking advocacy organizations. This form of encouragement is one facet of iCommute's overall efforts to reduce drive-alone vehicular trips through the promotion of alternative commutes.

Providing long-term bike parking at transit centers increases bike-transit trip potential; however, short- and long-term parking facilities are needed elsewhere throughout the region to encourage local bicycle trips by both transit riders and persons traveling solely by bicycle. Many office buildings, commercial districts, and tourist attractions lack sufficient bicycle parking in terms of design and quantity. This discourages people from cycling

because many bicyclists desire reasonable protection against theft, vandalism, and inclement weather. According to the bicycle user questionnaire distributed for the Regional Bicycle Plan planning process, 43 percent of respondents indicated that they would bicycle more frequently if more bike parking was available. An even greater percentage of public workshop participants expressed strong interest in bike parking. Bicycle parking is most effective when it is located close to trip destinations, visible, and easy to use. If quality bicycle parking facilities are not provided, determined bicyclists lock their bicycles to street signs, parking meters, lampposts, or trees, all of which are undesirable because they are often less secure, may interfere with pedestrian movements, and can create liability issues or damage to street furniture or trees.

In addition to maintaining the iCommute bike locker program, SANDAG has a role in providing policy guidance to local jurisdictions to ensure adequate bicycle parking is available throughout the region. Locally adopted and enforced bike parking ordinances are most critical to ensuring bike parking is provided by private developers, yet few jurisdictions in San Diego County currently have an ordinance that mandates specific bike parking requirements. Bike parking ordinances at a minimum should include parameters for the quantity and type of bike parking facilities that are required by type of development. They should also include provisions for the design options and placement of facilities to ensure they are secure, convenient, visible and maneuverable. Chicago, Illinois; Santa Cruz, California; and Madison, Wisconsin have been successful in implementing ordinances that make bike parking compulsory. **Appendix D** provides a model bike parking ordinance and is intended to assist cities in developing a local bike parking ordinance. **Chapter 7** provides a brief overview of effective bike parking design options.

4 Recommended Programs

The infrastructure projects and system improvements recommended by the Plan are intended to be complemented by programs designed to raise awareness of bicycling; connect current and future cyclists to resources; educate people about safe bicycle operation, bicyclists' rights and responsibilities, and lawful interactions between motorists and cyclists; and encourage residents to bicycle more frequently.

The Plan describes several proposed bicycle programs whose success in the San Diego region would be contingent on cooperation between regional agencies, municipal governments, and non-governmental organizations (NGOs) for funding and implementation. In many cases, these programs can be implemented by NGOs provided they are adequately funded.

The selection of programs proposed in this plan is largely derived from a review of strengths and weakness in the region's existing programs as well as a national-level review of best practices. An overview of existing programmatic conditions can be found in Appendix A.

The proposed programs are intended to provide direction to the San Diego region for developing programs that directly support the goals, objectives, and policies of the Plan. This chapter presents a discussion of each of the following program categories:

- Education Programs
- Public Awareness Programs/Marketing
- Encouragement Programs
- Enforcement Programs
- Monitoring & Evaluation

Each section contains an overview of the program category and synopses of representative programs within each category. The presentation of each proposed program includes identification of the target audience, the primary implementing agency, potential partners, key elements of the program, relative cost, potential funding sources, and exemplary programs. The proposed programs were selected based upon information garnered over the course of this planning process, including public input, direction from the Bicycle-Pedestrian Working Group (BPWG) and SANDAG staff, and from an analysis of the likely effectiveness of each program in the San Diego region.

This chapter is intended to introduce a spectrum of programs that are successful in other locations, but are currently absent or underserved the San Diego region. Their introduction serves as a jumping off point for

further exploration of their application. Local governments can use this chapter as a menu of potential programs, select certain programs for further examination, and include this selected subset of programs in their bicycle master plans with more detailed discussions related to implementation in their respective city.

4.1 Education Programs

Education programs ensure that bicyclists, pedestrians, and motorists understand how to travel safely in the roadway environment and are cognizant of the regulations that govern these modes of transportation. Education programs are available in an array of forums from long-term courses with detailed instruction to single session workshops focusing on a specific topic. Curriculums should be tailored to the target audience with specific content varying by audience group and instruction format. The following education programs are recommended for implementation in the region and described in more detail in the remainder of the section:

- Complete Streets Education
- Driver's Education and Diversion Classes
- Safe Routes to School – Phase 1
- Cycling Skills and Safety Courses (Adult & Youth)

Complete Streets Education	
Target	City planners and engineers, police officers, construction crews and professional drivers
Primary agency	Local governments
Partners	SANDAG, research and education institutions
Key elements	Internal or off-site educational programs for professionals
Cost	$50,000 to $100,000 annually
Potential funding sources	TDA & *TransNet* funds; California Bicycle Coalition; Municipal Planning Organizations (MPOs)
Sample programs	UC Berkeley ITS TE-19 Course: http://www.its.berkeley.edu/education/

Achieving Complete Streets requires shifting the paradigm of roadway planning and design away from preference to motorists and toward an approach that accommodates all forms of travelers, including bicyclists, pedestrians, transit riders, children, older people, disabled people, and motorists. In 2008 California passed the Complete Streets Act, joining several states and local governments who have adopted a variety of policies to achieve complete streets. Implementing Complete Streets legislation

requires educating professionals whose work directly or indirectly impacts the roadway environment. The San Diego region would benefit from a comprehensive Complete Streets training program that could be made available to city planners, engineers, and decision-makers. The American Planning Association (APA) has developed a *Best Practices Manual on Complete Streets* (http://www.planning.org/research/streets/) which is a product of long-term research and collaboration with organizations such as the National Complete Streets Coalition.

Contractors, subcontractors, and city maintenance and utility crews should also receive instruction to ensure they are aware of bicyclists and pedestrians movements and that they follow standard procedures when working on or adjacent to roadways and walkways.

Driver's Education & Diversion Courses	
Target	Learning drivers; traffic violators
Primary agency	Bicycle organizations, traffic courts (i.e. San Diego Superior Court), city transportation departments and police departments
Partners	Driver education schools, court-approved traffic schools
Key elements	Curriculum, testing materials, and training videos
Cost	$50,000 to $100,000 annually
Potential funding sources	TDA & *TransNet* funds; National Highway Traffic Safety Administration
Sample programs	League of American Bicyclists: http://bikeleague.org/programs/education/courses.php League of Illinois Bicyclists: http://www.bikelib.org/video/ The Mobility Education Foundation (Seattle): http://www.mobilityeducation.org Marin County: http://www.marinbike.org/Campaigns/ShareTheRoad/Index.shtml#StreetSkills Portland: http://www.legacyhealth.org/body.cfm?id=1928

Educating beginning drivers on rules related bicycling and how to safely interact with bicyclists provides an opportunity to instill positive attitudes and behaviors when new drivers are developing driving habits. Multiple organizations have created curriculums, instructional videos, and tests to be integrated into driver's education courses that teach new motorists laws and safe practices related to bicycle travel. Programs are frequently initiated through partnerships between city police or transportation

departments and non-profit bicycle organization who conduct the trainings. The Mobility Education Foundation of Seattle has expanded this concept by incorporating mobility related topics, such as health, environmental issues, economics, and multimodal transportation into their curriculum targeting teen driver education students.

Motorist education can also be effectively applied in the form of diversion programs where traffic offenders can elect education in lieu of citations or fines or in exchange for fee reductions. Classes are geared toward motorists, bicyclists, and pedestrians who are violators of bicycle and pedestrian-related traffic violations. Participants receive safety instruction and exposure to laws that impact pedestrian, bicyclist and motorist interaction. In Marin County (CA) the Superior Court refunds a portion of traffic infraction citation fees upon successfully completion of a two-hour bicycle safety class that is taught by Marin County Bicycle Coalition professional instructors.

Throughout San Diego County, the Sheriff's Department offices host periodic bicycle rodeos to teach children riding techniques and bicycle traffic laws. Several city police departments also provide educational information to citizens. Local agencies therefore have some experience with these program types; however there is significant opportunity to build upon existing resources and develop more extensive traffic violation diversion programs presented by both enforcement officers and bicycling organization.

Safe Routes to School – Phase 1	
Target	Parents, schoolchildren, administrators, city planners & engineers
Primary agency	SANDAG, San Diego region school districts
Partners	Parent groups at schools, school neighbors
Key elements	Bicycle and pedestrian audit of infrastructure at elementary schools. Recommended route maps.
Cost	$50,000 to $100,000 (for first phase only)
Potential funding sources	State-legislated Program (SR2S) and the federally-legislated Program (SRTS) Safe Routes to School grant funding; local, state or national health grants (e.g. Robert Wood Johnson Active Living by Design grants)
Sample programs	Marin County Safe Routes to School: http://www.saferoutestoschools.org/index.shtml Portland Safer Routes to School Program: http://www.trans.ci.portland.or.us/saferoutes/

Safe Routes to School refers to a variety of multi-disciplinary programs aimed at promoting walking and bicycling to school, and improving traffic safety around school areas. Robust Safe Routes to School programs address all of the "Five E's" (Engineering, Education, Encouragement, Enforcement, and Evaluation) and typically involve partnerships between municipalities, school districts, community and parent volunteers, and law enforcement agencies. Numerous San Diego communities have utilized Caltrans programs to develop Safe Routes to School projects, including neighborhoods in San Diego's City Heights, East County neighborhoods, and the city of Chula Vista.

For San Diego County school districts that have not implemented a Safe Routes to School Program, an example of a first phase program uses walkabouts (also known as a **bicycle and pedestrian audits**) to assess walking and biking conditions of streets adjacent to elementary schools.

Students participate in a walkabout to evaluate pedestrian conditions

Parents, students, neighbors, city planners, and traffic engineers are invited to join in the walkabout. Safety concerns, issues, and ideas are recorded.

After the bicycle and pedestrian audits are conducted, **maps for each elementary school** showing recommended routes to reach school, along with high-traffic intersections and routes to avoid, are produced and distributed.

As a final step, an **initial infrastructure improvement plan** is produced for each elementary school, including cost estimates and a prioritized project list. This infrastructure improvement plan serves as a blueprint for future investments, and can be used to apply for further grant funding.

Cycling Skills & Safety Courses (Adult & Youth)	
Target	Adult cyclists, school-age children
Primary agency	Bicycle organizations, school districts, cities' public safety, police and planning departments
Partners	Parent groups at schools, community volunteers
Key elements	On-bike skills and safety training
Cost	$50,000 to $100,000
Potential funding sources	State-legislated Program (SR2S) and the federally-legislated Program (SRTS) Safe Routes to School grant funding; local, state or national health grants (e.g. Robert Wood Johnson Active Living by Design grants); TDA & *TransNet* funds
Sample programs	LAB's curriculums: http://www.bikeleague.org/programs/education/index.php BTA's Bike Safety Education Program: http://www.bta4bikes.org/resources/educational.php

Nearly every person in the United States receives in-depth training before receiving a driver's license. Bicycles are also vehicles used on roadways, but most bicyclists do not receive comprehensive training about the rules of the road related to bicyclist-motorist interactions, how bicycles operate, or how to ride a bicycle safely and effectively on the roadway.

Volunteers assist Swiss children through a bicycle skills course

The San Diego County Bicycle Coalition (SDCBC) currently offers adult and youth League of American Bicyclists (LAB) courses taught by League Certified Instructors. Local agencies can partner with the SDCBC and other non-profit organizations to expand course offerings for adults and children and incorporate them into recreation center programs or work with school districts to incorporate bicycle safety into local school curriculums. Courses aimed at children can be taught during school, as a component of a physical education curriculum, or after school.

Common LAB adult courses are Traffic Skills 101, Traffic Skills 102, and Commuting. These courses address topics such as bicycle safety checks and basic maintenance, riding skills, traffic negotiation, and collision avoidance.

An on-bike education curriculum for kids should include:

- Parts of a bicycle
- How a bike works
- Flat fixing
- Rules of the road
- Right of way
- Road positioning
- On-bike skills lessons (braking, turning, steering)
- On-bike community ride

In addition to the LAB curriculums, there are several model programs, such as the Bicycle Transportation Account (BTA) Bike Safety Education Program, available for local adaptation.

4.2 Public Awareness Campaigns & Marketing

Public awareness campaigns are intended to impact the attitudes and behavior of the general public. Public awareness campaigns are high profile efforts that rely on materials, media outreach, and special events to convey a clear message aimed at promoting bicycling and/or improving safety. Share the Road, Street Smarts, Share the Path, and Bike to Work Day/Month are common public awareness campaigns. The following public awareness campaigns and marketing programs are recommended for implementation in the region and described in more detail in the remainder of the section:

- Bike to Work Month
- Share the Road Campaign / Street Smarts
- Share the Path Campaign

Bike to Work Month	
Target	Current and potential cyclists
Primary agency	SANDAG, San Diego County Bicycle Coalition
Partners	Local businesses, other local bicycle clubs and advocacy groups, community volunteers
Key elements	Publicize National Bike Month in May. Offer classes, rides and events.
Cost	$50,000 to $100,000+ (depending on scope)
Potential funding sources	Local businesses and bike shops (in-kind or cash support); hospitals and insurance companies; local government agencies
Sample program	Puget Sound Region Bike to Work Month Activities: http://www.cbcef.org/btw/

SANDAG iCommute coordinates Bike to Work Day in May with the assistance of local bicycle organizations and businesses (http://www.icommutesd.com/Promotions/BikeToWorkDay.aspx). The popularity of this event has grown significantly in recent years. Supporting activities throughout the month of May, in recognition of National Bike Month, could expand the campaign's impact.

Options for expanding Bike to Work activities during the month of May include offering commute classes, weekly rides, presentations on bicycling for employees, raffles, and commuter incentives. The League of American Bicyclists organization's website provides marketing, educational, and organizational materials to help cities promote and support bike to work week (http://www.bikeleague.org/programs/bikemonth/).

Share the Road Campaign/Street Smarts	
Target	All roadway users
Primary agency	Local governments' public safety and police departments, bicycle organizations
Partners	Local bike clubs and organizations
Key elements	Multimedia and printed promotional materials; events
Cost	$50,000 to $100,000+
Potential funding sources	State or national health grants (e.g. Robert Wood Johnson Active Living by Design grants); TDA & *TransNet* funds
Sample programs	Share the Road: http://isharetheroad.com/ City of San Jose Street Smarts: http://www.getstreetsmarts.org/pr_121702.htm

A Share the Road campaign is intended to educate motorists, bicyclists, and pedestrians about their legal rights and responsibilities on the road, and the need to increase safety through courteous and cooperative behavior. The campaign targets all residents and visitors to a community. Developing a Share the Road campaign would require collaboration between local Public Safety Departments (or Police Divisions), San Diego bicycling advocacy groups, and other partners. Establishing Share the Road campaigns generally include:

- Developing **Share the Road** flyers, one targeting bicyclists and one targeting motorists, which outline safe and courteous behavior, collision reporting procedures, and local bicycling resources and hotlines.
- In conjunction with the Police Department, holding **periodic traffic checkpoints** during months with high bicycling rates, where motorists, bicyclists, and pedestrians are stopped, given a Share the Road flyer and have the opportunity to provide feedback to officers regarding the campaign ideas. Checkpoints are typically held along local bikeways and roadways commonly used by bicyclists.
- Producing **public service announcements** on radio and TV to promote the Share the Road campaign, including publicity about the Share the Road checkpoints. Promoting the campaign on involved agencies' websites.
- Creating public PowerPoint **presentations** with the Share the Road message for presentation to the public.
- Developing **adult bicycle safety classes** and holding them at regular intervals.

Similar to a comprehensive Share the Road campaign, Street Smarts, a traffic calming program developed by the City of San Jose, combines an advertising campaign with techniques, such as community events, school presentations, and neighborhood initiatives. Street Smarts aims to provoke fundamental change in the attitudes and behaviors of motorists, pedestrians, and bicyclists.

Share the Path Campaign	
Target	All path users (especially cyclists)
Primary agency	Local governments' planning, police or parks and recreation departments
Partners	Local bicycling clubs and organizations
Key elements	Bell giveaway; maps and information; media outreach.
Cost	$50,000 to $100,000
Potential funding sources	Local bike shops (in-kind donations); volunteer time contributions by local cycling groups; in-kind or time contributions; TDA & *TransNet* funds
Sample programs	Portland Office of Transportation Share the Path brochure: http://www.portlandonline.com/shared/cfm/image.cfm?id=161457

Many cities around the country are implementing "share the path" programs in response to concerns about conflicts between pedestrians and cyclists on shared-use paths. San Diego County is home to numerous popular paths. A Share the Path program will encourage responsible path usage and create community goodwill around bicycling.

Effective Share the Path campaigns generally require the following actions:

- Developing a simple, clear **Share the Path brochure** for distribution through local bike shops and wherever bike maps are distributed.
- Hosting a **bicycle bell giveaway** event on a popular shared-use path. A table is set up with maps and brochures, and knowledgeable staff are present to answer questions.
- Volunteers and agency staff can partner to hand out bells to cyclists. Signs, pavement chalk, and banners are used to explain the event and give cyclists warning so they can stop and receive a bell. Volunteers mount the bells on handlebars (BBB EasyFit bells are recommended because installation requires no tools: http://www.bbbparts.com/products/accessories/others/bbb12.htm)
- Volunteers can also walk along the path and give a thank you and a small gift to bicyclists who use their bells when passing.
- Involved agencies conduct **media outreach** before the event. Bell giveaways provide positive stories about bicycling and good visual opportunities for marketing.

4.3 Encouragement Programs

Encouragement programs are generally characterized by their focus on encouraging people to bicycle more frequently, particularly for transportation. Encouragement programs increase the propensity for bicycle trips by providing incentives, recognition, or services that make bicycling a more convenient transportation mode. The following encouragement programs are recommended for implementation in the region and described in more detail in the remainder of the section:

- Bike Sharing Program
- Pilot Smart Trips Program
- Employer Incentive Programs
- Bicycle Friendly Community Designation
- San Diego Region Bike Map
- Identification and Way-finding Signage
- University-base Bike Orientation

Bike Sharing Program	
Target	Bicyclists and potential bicyclists
Primary agency	SANDAG
Partners	Local governments; MTS
Key elements	Rental bikes available at key locations. Comprehensive outreach.
Cost	$100,000+
Potential funding sources	CMAQ (Congestion Mitigation/Air Quality) funds; SAFETEA-LU; TE, ; public transportation funds; TDA & *TransNet* funds
Sample programs	Paris' Velib: http://www.en.velib.paris.fr/ Germany's Call a Bike: http://www.callabike-interaktiv.de/kundenbuchung/process.php?proc=english&f=500&key=d77b3782346423c9f6ea41d27f412b00...00000 City of Houston: http://www.publicworks.houstontx.gov/bikeways/bikecampaign.htm

Bike sharing is an innovative approach to urban mobility, combining the convenience and flexibility of a private vehicle with the accessibility and reliability of public mass transit. Public bicycles are available on demand, providing fast and easy access for any trip around a community without the hassles presented by parking a private car or waiting on a transit timetable. When used in combination with other transportation systems, a shared bike program can reduce the travel time between transit stop and office and easily overcome the distance between residences and shopping centers. The

flexibility and freedom presented by a public bicycle program are well suited for modern urban commutes. Bike sharing programs generally facilitate biking for shorter trip distances. Within the regional setting, bike sharing nodes ease congestion in dense urban areas and encourage transit use by inter-jurisdictional commuters by providing a convenient transportation option to make local trips throughout the course of the workday.

Public bicycle programs have gained momentum all over Europe with new networks of rental systems rolling out in a variety of cities. Ninety-plus cities in Europe, Australia, and Asia already take advantage of some form of shared bike infrastructure. Italy, France, Germany, and Spain have all enjoyed the success and popularity of a public bicycle rental system. North America has active bike sharing programs in Washington D.C., Chicago, University of California at Irvine, and Montreal with many other cities planning to implement bicycle systems in the coming years. Sophisticated tracking and transaction technology has contributed to the public appeal of these programs by allowing users to see the availability of bicycles and parking stations live through internet and mobile devices, a level of accessibility on par with, and sometimes surpassing, transit and traditional vehicle parking systems. In most cases this technology and infrastructure can be introduced into any city.

Municipal bike fleet programs have proven successful in several U.S. cities including Houston, San Francisco, and Portland. These programs provide bicycles to city employees to use for free for travel between city buildings and meetings or errands.

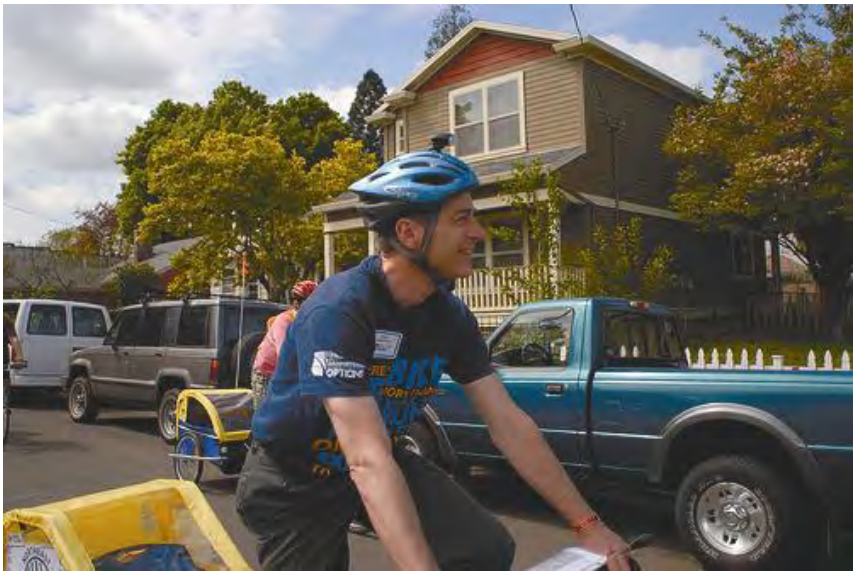
Pilot Smart Trips Program	
Target	San Diego County residents who are interested in biking, walking and transit
Primary agency	Local governments
Partners	SANDAG, transit agencies, community volunteers
Key elements	Outreach to a target geographic area promoting biking, walking and transit usage.
Cost	$100,000+
Potential funding sources	CMAQ (Congestion Mitigation/Air Quality) funds; federal flexible transportation; public transportation funds; hospitals and insurance companies; TDA & *TransNet* funds
Sample programs	Portland Smart Trips program: http://www.portlandonline.com/transportation/index.cfm?c=ediab

Smart Trips programs (also known as social marketing programs) are encouragement programs based on the concept of saturating a geographic area with resources to help residents reduce drive-alone trips and increase biking, walking, transit, and carpool trips. Smart Trips programs have demonstrated a lasting reduction in drive-alone trips. Target areas in Portland, Oregon for example have experienced a 10% reduction in vehicle traffic.[15]

Programs offer residents maps, brochures and other printed materials, classes, guided rides and walks, and other tools and programs that make bicycling, walking, and transit usage a more inviting travel option compared to drive-alone trips.

Measured against infrastructure improvements, these programs are scalable, flexible, inexpensive, and site-independent. Once the program has been established for a specific geographic target area, it can be administered with low start-up costs in other target areas.

This model, however, is unlikely to be successful in areas that have failed to make initial infrastructure investments sufficient to provide a functional bicycling, walking, and transit network. It is most effective as an approach that leverages investments in infrastructure, not one that replaces those investments.



Maps and materials are delivered to interested residents by bike in this Smart Trips program

One of the strengths of the individualized marketing model is that it reaches every resident with an appealing invitation to participate, but then focuses the bulk of resources on those who identify themselves as interested. The

[15] Alta Planning + Design, 2009

many classes, rides, and activities continue to be publicized and open to all, so residents have multiple opportunities to opt into the program. This focus allows for both broad reach and strategic investment.

Implementing a pilot Smart Trips program in a limited geographic area within San Diego County may include any of the following:

- Maps and brochures
- Classes, clinics, workshops
- Guided rides and walks
- Fun social events
- Giveaways (coupons, cyclocomputers, etc.)
- Targeted outreach (e.g. Women on Bikes, Senior Strolls)
- Route planning help (bike, walking, or transit)

Employer Incentive Programs	
Target	Employers in the region
Primary agency	SANDAG, Local governments
Partners	Employers in the region
Key elements	Outreach to employers. Informational materials and possibly monetary awards.
Cost	$0 to $50,000
Potential funding sources	CMAQ (Congestion Mitigation/Air Quality) funds; federal flexible transportation; public transportation funds
Sample programs	City of Boston Green Awards: http://www.cityofboston.gov/environmentalandenergy/greenawards/ Bike Commute Challenge (Oregon): http://www.bikecommutechallenge.com/

Employer incentive programs to encourage employees to bicycle to work include strategies such as providing bicycle lockers and shower facilities, offering more flexible arrival and departure times, and financial incentives such as cash bonuses or in-kind gifts to employees who participate. Cities may offer incentives to employers to institute these improvements through lowered parking requirements, reduced traffic mitigation fees, or other means. Cities may also consider an award or certificate program that publicly recognizes businesses demonstrating commitment to non-motorized transportation options by implementing incentive programs.

SANDAG's iCommute program includes the Diamond Awards, an encouragement program that honors San Diego organizations and

individuals promoting alternative travel options such as vanpooling, carpooling, use of public transit, walking, and biking (http://www.icommutesd.com/Promotions/DiamondAwards.aspx). Companies and organizations are eligible to receive one of the following award categories:

- Program Excellence
- Innovation
- Marketing
- Ongoing Commitment
- Best New Program

Programs that promote biking and bike-transit integration may be eligible for an award under each category. However, iCommute may consider revising these categories to include a bike-friendly category or non-motorized transport category in order to elevate awareness of these program types.

Bicycle Friendly Community Designation	
Target	General public
Primary agency	Local governments
Partners	Bicycle advocacy organizations
Key elements	Bicycle Friendly audit and application.
Cost	$0 to $50,000 (to apply)
Potential funding sources	Funding may not be required.
Sample programs	Bicycle Friendly Community Information: http://www.bikeleague.org/programs/bicyclefriendlyamerica/communities/

The League of American Bicyclists sponsors an awards program that recognizes cities and counties that actively support bicycling. According to the League, a Bicycle Friendly Community is one that "provides safe accommodation for cycling and encourages its residents to bike for transportation and recreation." The league recognizes four tiers of bicycle friendly communities: bronze, silver, gold, and platinum. In 2008 the City of Oceanside was the recipient of a Bronze Level Bicycle Friendly Community designation and is the first jurisdiction to receive the distinction in the San Diego region. Other jurisdictions may choose to develop action plans that fulfill the League of American Cyclist's requirements to become a Bicycle Friendly Community. Bicycle Friendly Community designation promotes bicycling and demonstrates communities' commitment and willingness to be held accountable.

The application process for being considered as a Bicycle Friendly Community involves an audit of the engineering, education, encouragement, enforcement, evaluation, and planning efforts for bicycling. The League reviews the application and solicits feedback from bicyclists in the community to determine if Bicycle Friendly Status should be awarded. The League provides technical assistance and other information for cities working toward Bicycle Friendly Community status at: www.bicyclefriendlycommunity.org.

Logo that can be displayed on street signs and in public areas

San Diego Region Bike Map	
Target	General public, especially cyclists
Primary agency	SANDAG, local governments
Partners	None
Key Elements	Expand the San Diego Region Bike Map.
Cost	$0 to $50,000
Potential funding sources	Additional funding may not be necessary

SANDAG publishes and regularly updates the San Diego Region Bike Map, a free guide that encourages bicycle usage by providing information on bicycle facilities and resources to bicyclists and potential bicyclists. The map displays bikeways and points of interest, including transit centers, bike shop locations, and bike locker stations. It is complimented with iCommute information, rules and safety tips, and bike-transit options in the region.

The San Diego Region Bike Map is an excellent resource that SANDAG should continue to produce. SANDAG should consider expanding distribution to meet the high demand for maps reported by local bicyclists. SANDAG may also consider creating a supplement to the map that provides greater detail on safety, rules of the road, and bike-transit opportunities.

Identification & Way-finding Signage	
Target	General public, especially cyclists
Primary agency	SANDAG
Partners	Local Governments
Key Elements	Signage
Cost	To be determined with implementation
Potential funding sources	Low cost; additional funding may not be necessary

System identification raises awareness of the bicycle network and encourages more bicycle trips by making it easier for people to navigate to destinations. System identification generally consists of identifying a series of bicycle routes, designing a unique logo and facility signage, developing a network map, and publicity. Ideally, the system also includes informational kiosks, directional signage pointing out local and regional destinations, and mileage indicators. The Plan recommends that all facilities within the regional bicycle network be complimented with identification and wayfinding signage. This will require coordination with city governments. As system identification plans are usually implemented and maintained by cities, local governments may choose to build upon the regional system to develop city-based wayfinding and identification systems. Recommendations on wayfinding signage design protocol are provided in Chapter 7.

University-Based Bike Orientation	
Target	University and college students, especially incoming freshmen
Primary agency	Local governments & universities/colleges
Partners	Student bicycle clubs
Key elements	Bicycle safety & promotion orientation for incoming freshmen and returning students. Classes & clinics, materials, social events, and rides.
Cost	$50,000 to $100,000
Potential funding sources	On-campus parking fees, TDM funding sources
Sample programs	Stanford University Bike Program: http://transportation.stanford.edu/alt_transportation/BikingAtStanford.shtml

University students are ideal candidates for bicycling outreach programs; many students live near campus and may not own a car or choose not to

drive. The San Diego region is home to several major universities and colleges, such as San Diego State University (SDSU), University of California–San Diego (UCSD), Cal State University San Marcos (CSUSM), and University of San Diego (USD), however many university campuses and college areas are unaccommodating to bicycle travel. UCSD offers successful biking encouragement programs, including the UCSD Pedal Club and the Triton Bikes Program, a free on-campus bike sharing program. There is also an on-campus UCSD Bike Shop. A bike orientation program is one option for universities to add to or initiate multimodal program strategies. Bike orientation programs encourage bicycling, improve relations between bicyclists and other vehicles, and increase safety for student bicyclists.

Bike orientation programs typically include:

- **Bike maps and information** provided to incoming and returning students at the beginning of the year through school informational packets
- **Flat tire clinics and guided rides**, advertised through flyers, email and bulletin boards, and campus newspapers
- **Information table** hosted at campus events and prominent locations (e.g. campus bookstores, quads) during the first few weeks of school
- A **Bikes at SDSU (for example) web page** with links and more information
- At-cost or low-cost **bike lights** sold at tabling events and through campus bookstores

A "bike buddy" program may also be implemented to match current cycling students with interested students. This can be a simple program where bicyclists wear a sticker that says "I bike to SDSU, ask me how," or a more elaborate program that matches bike buddies with interested students who live in their neighborhood for mentoring. Bike buddy programs increase the cost of university-based programs, but can be an effective tool. SANDAG's iCommute offers the option of setting up a university network through its Ride Matcher program (http://www.icommutesd.com/Commuters/RideMatcher.aspx).

4.4 Enforcement Programs

Enforcement programs target unsafe bicyclist and motorist behaviors and enforce laws that reduce bicycle/motor vehicle collisions and conflicts. Enforcement fosters mutual respect between roadway users and improves safety. These programs generally require coordination between law enforcement, transportation agencies, and bicycling organizations.

Bike Patrol Units & Sting Operations	
Target	General public
Primary agency	Local police departments
Partners	None
Key Elements	On-bike police officers enforcing laws.
Cost	$0 to $50,000
Potential funding sources	Additional funding may not be necessary.

Local police departments enforce applicable laws on roadways, depending on available resources and priorities. Vehicle statutes related to bicycle operations are typically enforced on bikeways as part of a department's normal operations. Police departments may consider proactively enforcing bicycle-related violations at high-crash areas. Spot enforcements are highly visible and publicly advertised. They may take the form of crosswalk stings, handing out informational sheets to motorists, bicyclists and pedestrians, or enforcing speed limits and right of way at shared use path-roadway intersections.

As part of a National Highway Traffic Safety Administration grant awarded to Utah's Departments of Health, Transportation, and Public Safety to develop a Share the Road campaign, the State of Utah has developed an enforcement plan that targets motorists who do not share the road with bicyclists. Plainclothes officers on bicycles will stop motorists and cyclists not following the rules of the road and will provide educational material developed as part of the grant, as well as cite the transgressors. An officer on a bicycle will observe the offense and radio to an officer in a chase car who will make the stop. Multiple municipal police forces in the region include bike patrol units, such as the City of San Diego, Escondido and Carlsbad. Bicycle patrol units are encouraged. Bike officers are often viewed as more approachable and undergo special training in bicycle safety and bicycle-related traffic laws and are therefore especially equipped to enforce laws pertaining to bicycling. Bicycle patrol officers also help educate cyclists and motorists through enforcement.

4.5 Monitoring & Evaluation

Monitoring and evaluating local jurisdictions of the region's progress toward becoming bicycle-friendly is critical to ensuring that programs and facilities are effective and to understanding changing needs. Maintaining consistent count programs, reporting on progress, and convening advisory committees are methods for monitoring efforts and for holding agencies accountable to the public. The following monitoring and evaluation

programs are recommended for implementation in the region and described in more detail in the remainder of the section:

- Annual Evaluation Program
- Bicycle Coordinators & Bicycle Advisory Committees Program

Annual Evaluation Program	
Target	None
Primary agency	SANDAG, local governments
Partners	None
Key Elements	Bike and pedestrian counts. A regional non-motorized travel survey. An annual regional progress report.
Cost	$100,000+
Potential funding sources	None
Sample programs	Copenhagen's City of Cyclists 2006 Report: http://www.vejpark2.kk.dk/publikationer/pdf/464_Cykelregnskab_UK.%202006.pdf City of San Francisco Citywide Bike Count Report: http://www.sfmta.com/cms/rbikes/documents/CitywideBikeCountReport2007.pdf New York City Bicycle Survey: http://www.nyc.gov/html/dcp/pdf/transportation/bike_survey.pdf

The San Diego region is in need of an evaluation program that measures bicycle and pedestrian activity and identifies trends in bicyclists' and pedestrians' behaviors and attitudes. The program should include three major components: 1) collecting bicycle and pedestrian count data; 2) conducting a regional non-motorized travel survey; and 3) generating an annual report which captures changes in bicycling and pedestrian activity and documents the perceptions of residents regarding bicycling and walking in the region. An annual regional progress report should also include progress that has been made toward the implementation of bicycle facilities and programs.

The bicycle and pedestrian count program should be administered annually, geographically representative, and capture all types of bicycle and pedestrian trips including trips for recreation, commuting to work and for other utilitarian purposes. In addition to a regional continuous count program, bicycle and pedestrian counts and assessments should be conducted whenever a local land development project requires a traffic

impact study. A long-term financing source should be identified to guarantee the longevity of the program.

The Seamless Travel Project is a two year Caltrans-funded research effort that investigates correlations between rates of bicycling and walking, and land uses, facility types, and local demographics. The project, in coordination with the National Bicycle & Pedestrian Documentation Project, is one of the larger count and survey efforts in the United States focusing only on bicyclists and pedestrians. Using San Diego County as a case study, this research is the first of its type to develop an extensive database of count and survey data for use in analyzing and identifying factors that influence bicycling and walking. The Seamless Travel Project was initiated in 2007 and concluded in 2009. The final report can be found at http://www.altaplanning.com/App_Content/files/fp_docs/Caltrans-Seamless-Travel-Final-Report.pdf. SANDAG may consider building on the approach of this project to develop an on-going program.

Bicycle Coordinators & Bicycle Advisory Committees (BACs)	
Target	None
Primary agency	Local governments
Partners	SANDAG
Key Elements	Leadership to advise on all bicycle-related issues.
Cost	$0 to $100,000+
Potential funding sources	None
Sample programs	- San Francisco's BAC: http://www.sfgov.org/site/bac_index.asp?id=11483 - Oceanside Bicycle Committee: http://www.ci.oceanside.ca.us/Datarelation.aspx?Content=308

All San Diego jurisdictions should pursue filling a local bicycle coordinator position and establishing a Bicycle Advisory Committee (BAC). The majority of cities in the San Diego region do not have bike coordinator positions or BACs. The bike coordinator and BAC will allow cities to take full advantage of bicycle planning efforts and will ensure that bicycle planning and implementation garner the necessary attention of City staff and elected officials. The job duties for a local government bicycle coordinator may include monitoring the design and construction of on-street bikeways and shared use paths, including those constructed in conjunction with private development projects; ensuring bicycle facilities identified in local plans, and as mitigation measures, are designed appropriately and constructed expediently; coordinating the

implementation of master plan projects and programs; and serving on the regional BPWG.

BACs generally consist of 10 to 15 members appointed by city councils or boards of supervisors to advise the city or county on issues related to bicycling. BACs make recommendations on facility and program improvements and oversee the implementation of long-range plans, such as bicycle master plans. Committee members are citizens with expertise and commitment to bicycle-related issues and typically represent a geographic area of the city or county.

SANDAG's Bicycle-Pedestrian Working Group (BPWG) is a committee formed to advise SANDAG on the bicycle, pedestrian, and non-motorized facilities component of the RTP and to make recommendations about funding priorities for local bicycle and pedestrian projects. The BPWG is composed of staff members from the 19 local jurisdictions, transit agencies, and bicycle and pedestrian advocacy groups. The BPWG has also provided input on all aspects of the Plan content. Individual advocates and non-profit organizations are currently underrepresented on the BPWG. There may be benefits to expanding participation by non-agency stakeholders so that the group strengthens cooperation between public agencies and citizens and reflects the breadth of perspectives in the region.

5 Air Quality Benefits of Regional Bicycle Network Implementation

This chapter discusses the potential air quality benefits associated with increasing bicycle use. Section two of this Plan's introduction summarizes several issue areas that are positively impacted by the Plan's implementation including environmental, public health, economic, community and quality of life, and safety benefits. Collectively these benefits can have a profound influence on the existing and future quality of life in the San Diego region.

One of the primary reasons for developing the Plan is to maximize the number of bicycle commuters in order to help achieve transportation goals such as providing an alternative to driving, and reducing traffic congestion and air pollution. Local and national statistics are used as a basis for estimating the benefits of an improved and expanded regional bicycle network in San Diego. The national statistics are derived from the 2000 U.S. Census and SANDAG forecasts.

5.1 Current System Usage

Understanding how many people bike in the San Diego region is important to developing a baseline against which to measure success and is also vital information for grant applications. This section presents bicycle system usage estimates developed through application of Census data on commuter mode shares to San Diego County.

A primary data source for estimating biking rates is the United States Census and the American Community Survey. Journey to work data was obtained from the 2006 American Community Survey for San Diego County, California, and the United States for comparison. **Table 5.1** displays journey to work data. As shown, approximately 0.6% of San Diego County journey-to-work trips are by bicycle. This is less than the state as a whole.

Table 5.1
Journey to Work Data

Mode	United States	California	San Diego County
Bicycle	0.5%	0.8%	0.6%
Car, Truck or Van – Drive Alone	76.0%	73.0%	80.1%
Car, Truck or Van – Carpool	10.7%	12.4%	11.5%
Public Transit	4.8%	5.0%	3.3%
Walked	2.9%	2.7%	2.9%
Other Means	5.1%	6.1%	1.1%

Source: 2006 American Community Survey

This data is likely an underestimate of the true amount of biking in the county. Census data does not account for the number of people who bicycle for recreation or for utilitarian purposes, students traveling to school, or commuters who travel from outside of the county. Census data also only reflects a person's predominant commute mode and does not count non-motorized trips that are part of a multimodal trip, for example a person who walks or bicycles to a transit station.

5.2 Potential Future Usage and Air Quality Benefits

According to the San Diego County Air Pollution Control District, the monitoring agency of the San Diego Area Basin's air quality, the San Diego region does not currently meet the federal or State eight-hour average ozone standards nor does it meet the stringent State particulate matter (PM10) fine particle standards. In the San Diego region, passenger vehicles are the largest source of air pollution and greenhouse gases (about 41% of the total) that contribute to climate change. By making bicycle travel a safe and functional option for everyday trips to work, school, and shops, the regional bicycle network can help the region improve air quality.

The Climate Action Strategy, SANDAG's guide for addressing climate change, identifies measures that reduce total miles of vehicle travel as one of three potential approaches to reducing greenhouse gas emissions from passenger vehicles. Measures to increase bicycle trips, including implementation of the Plan, are one of several potential policy options to reduce vehicle miles traveled that can help SANDAG reduce greenhouse gas emissions in the 2050 RTP and comply with Senate Bill 375 (Steinberg 2008).

According to Census 2000 trip to work data, the San Diego region's bicycling mode share is 0.6%. This mode share is significantly lower than the actual mode share because it doesn't include people bicycling to school or to transit. By supplementing Census data with estimates of bicycle mode share for students and transit riders, this plan estimates that the actual current number of daily bicycle commuters in San Diego County is closer to 76,037 riders, making 152,075 daily trips and saving an estimated 46,918 VMTs per weekday. The calculations behind this estimate are described below and outlined in **Table 5.2**.

Table 5.2 quantifies the estimated increase in cyclists and resulting reduction in VMTs in the San Diego region by 2030. It is predicted that progress on implementing the Plan could increase the total number of work and school bicycle commuters from the current estimate of 76,037 (2.7% mode share) to 280,031 (7.0% mode share). Table 5.2 shows the assumptions and calculations applied to generate these estimates. The 7.0%

mode share would result in an estimated decrease of 8,410 pounds/year of particulate matter (PM10 and PM2.5), 1,132,456 pounds/year of hydrocarbons, and 307,261,855 pounds/year of carbon dioxide (CO2). Predicted increases in cycling are based on increases in cycling on newly built bikeways in San Francisco, California; Portland, Oregon; and Seattle, Washington.[16]

[16] San Francisco saw 61% corridor increase at 20% network completion, translating to 305% adjusted increase. Portland saw 137% corridor increases at 50% system completion, translating to 274% adjusted increase. Seattle saw 90% corridor increase at 35% system completion, translating to 257% adjusted increase. This translates into an average 279% increase upon system completion. Adjusted increase reflects the projected amount of bicycling that will occur when the system is completed, based on studies of communities with completed or nearly completed bikeway systems. Corridor increases refers to the average increase in bicycling in the corridors in each city, before and after bikeways were installed. System completion refers to the percent completion of the citywide bikeway network in each city.

Table 5.2
Bicycle Commute and Air Quality Projections

Current Commuting Statistics		Source/Calculation
San Diego County Population	2,813,833	*2000 US Census*
Number of Employed Persons	1,299,503	*2000 US Census*
Bicycle-to-Work Mode Share	0.6%	*2000 US Census*
Number of Bicycle Commuters	7,797	*Employed persons multiplied by bike-to-work mode share*
Work-at-Home Mode Share	4.4%	*2000 US Census*
Estimated Work-at-Home Bicycle Commuters	28,589	*Assumes 50% of population working at home makes at least one bicycle trip per day.*
Transit to Work Mode Share	3.3%	*2000 US Census*
Estimated Transit Bicycle Commuters	10,721	*Assumes 25% of transit riders access transit by bicycle.*
School Children Grades K-8	190,814	*2000 US Census*
Estimated School Children Bicycling Mode Share	2.0%	*National Safe Routes to School surveys (2003)*
Estimated School Bicycle Commuters	3,816	*Calculated from above*
Number of College Students in Region	251,140	*2000 US Census*
Estimated College Student Bicycling Mode Share	10.0%	*National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995. Review of bicycle commute share in seven university communities (10%)*
Estimated College Bicycle Commuters	25,114	*Calculated from above*
Adjusted Current Commuting Statistics		**Source/Calculation**
Adjusted Current Estimated Mode Share	2.7%	*Mode share including bike-to-work, school, and college bicycle commuters.*
Adjusted Current Estimated Total Number of Daily Bicycle Commuters	76,037	*Total of bike-to-work, transit, school, and college bicycle commuters. Does not include recreation or utilitarian.*
Adjusted Current Estimated Total Daily Bicycle Trips	152,075	*Total bicycle commuters x 2 (for round trips)*
Reduced Vehicle Trips per Weekday	46,918	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children Based on survey results from 10 California cities conducted by Alta between 1990 and 1999, L.A. Countywide Policy Document survey (1995), and National Bicycling & Walking Study, FHWA, 1995.*
Reduced Vehicle Miles per Weekday	361,183	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*
Reduced Vehicle Miles per Year	94,268,794	*Calculated from above*
Current Air Quality Benefits		**Source/Calculation**
Reduced Hydrocarbons (pounds/year)	282,645	*1.36 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced PM10 (pounds/year)	1,081	*0.0052 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced PM2.5 (pounds/year)	1,018	*0.0049 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced NOX (pounds/year)	197,436	*.95 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced CO (pounds/year)	2,577,056	*12.4 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced CO2 (pounds/year)	76,688,206	*369 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*

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Table 5.2, Continued
Bicycle Commute and Air Quality Projections

Estimated Future Bicycle Commuting Statistics		Source/Calculation
2030 San Diego County Population	3,984,753	*SANDAG 2030 Population Forecast*
Future Employed Population Estimate	1,913,822	*SANDAG 2030 Employment Population Forecast*
Adjusted Future Estimated Mode Share	7.0%	*Estimate of the potential mode share based on other jurisdictions experiences with system development.*
Future Total Number of Bicycle Commuters	280,031	*Total bike-to-work, school, college, and work-at-home biking trips. Does not include recreation.*
Future Total Daily Bicycle Trips	560,062	*Future daily bicycle commuters x 2*
Future Reduced Vehicle Trips per Weekday	189,035	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*
Future Reduced Vehicle Miles per Weekday	1,447,130	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*
Future Reduced Vehicle Miles per Year	377,700,902	*Calculated from above*
Future Air Quality Benefits		**Source/Calculation**
Reduced Hydrocarbons (pounds/year)	1,132,456	*1.36 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced PM10 (pounds/year)	4,330	*0.0052 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced PM2.5 (pounds/year)	4,080	*0.0049 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced NOX (pounds/year)	791,054	*.95 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced CO (pounds/year)	10,325,331	*12.4 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*
Reduced CO2 (pounds/year)	307,261,855	*369 grams per reduced mile (Emissions rates from EPA report 420-F-05-022, 2005.)*

Notes: Sources as noted in the table.

6 Implementation and Financing

This chapter describes the assumptions used to develop the estimated costs of implementing the regional bicycle network and supporting regional programs. It presents alternative strategies for implementing the Plan, identifies the funding sources available to the SANDAG bicycle program, and financing alternatives for implementing the regional network. It concludes with a discussion of recommended strategies for monitoring the effectiveness of the Plan and its implementation, including updating the Plan on a periodic basis.

6.1 Costing Methods and Estimates

The cost to complete the regional corridor network were estimated using unit costs for each facility type that were developed in conjunction with SANDAG staff and a review of unit costs from other jurisdictions.

Table 6.1 displays the unit costs employed for this planning process.

Build out of the regional bicycle network will result in 153.9 miles of new Class I facility, 51.6 miles of new enhanced Class II facility, 27.2 miles of new enhanced Class III, 34.2 miles of bicycle boulevard, and 8.3 miles of cycle track. The estimated cost for build out of the regional bicycle network is $419 million. **Table 6.2** displays these estimated costs by regional corridor and facility type.

Costs for education and encouragement programs, which are discussed in Chapter 4, would result in ongoing annual costs of up to $1.3 million depending on the number and size of the programs operated each year.

Table 6.1
Unit Costs Used for Estimating Costs of Regional Bicycle Network

Facility Type	Unit	Base Cost	Survey / Design (10%)	Contingency (10%)	Admin (5%)	Traffic Control and Mobilization (7%)	Total Cost per Mile*	Source(s)
Bike Path (Class I)	Mile	$2,000,000	$200,000	$200,000	$100,000	$140,000	**$2,640,000**	San Diego Association of Governments (2008)
Bike Boulevard 1	Mile	$84,000	$8,400	$8,400	$4,200	$5,900	**$110,900**	Milpitas (CA) Bikeway Master Plan Update - Public Draft (2008); Lafayette Bikeways Master Plan (2006); Caltrans Approved BTA Projects FY2006/2007, FY2007/2008 and FY2008/2009
Bike Boulevard 2	Mile	$94,000	$9,400	$9,400	$4,700	$6,600	**$124,100**	Milpitas (CA) Bikeway Master Plan Update - Public Draft (2008); Lafayette Bikeways Master Plan (2006); Caltrans Approved BTA Projects FY2006/2007, FY2007/2008 and FY2008/2009
Cycle Track	Mile	$341,800	$34,200	$34,200	$17,100	$23,900	**$451,200**	Milpitas (CA) Bikeway Master Plan Update - Public Draft (2008); Mammoth Lakes (CA) Trail System Master Plan - Public Draft (2008); Columbus (OH) Bicentennial Bikeways Plan (2008); La Grande (OR) Pedestrian and Bicycle Improvement Plan (2007)
Bike Lane (Class II)	Mile	$22,700	$2,300	$2,300	$1,100	$1,600	**$30,000**	Milpitas (CA) Bikeway Master Plan Update - Public Draft (2008); Mammoth Lakes (CA) Trail System Master Plan - Public Draft (2008); Columbus (OH) Bicentennial Bikeways Plan (2008); La Grande (OR) Pedestrian and Bicycle Improvement Plan (2007)
Bike Lane (Class II) w/ Widening	Mile	$206,800	$20,700	$20,700	$10,300	$14,500	**$273,000**	Milpitas (CA) Bikeway Master Plan Update - Public Draft (2008); Mammoth Lakes (CA) Trail System Master Plan - Public Draft (2008); La Grande (OR) Pedestrian and Bicycle Improvement Plan (2007)
Bike Route (Class III)	Mile	$11,200	$1,100	$1,100	$600	$800	**$14,800**	Milpitas (CA) Bikeway Master Plan Update - Public Draft (2008); Mammoth Lakes (CA) Trail System Master Plan - Public Draft (2008); Carlsbad (CA) Bikeway Master Plan (2007)

Source: Alta Planning+Design, April 2009

**Note: Base cost does not include right-of-way acquisition*

Table 6.2
Regional Bicycle Network Cost Estimate

ID	Name	Beginning	End	Total Miles	Miles of Unbuilt Facility							Cost of Unbuilt Portion
					Unbuilt Miles	Class I	Class II[17]	Class II[18]	Class III	Bike Blvd	Cycle Track	
1	Bayshore Bikeway	Central Coast Corridor	Central Coast Corridor	23.8	11.2	11.2	0	0	0	0	0	$29,568,000
2	Bay to Ranch Bikeway	Bayshore Bikeway	Chula Vista Greenbelt Otay River	7.4	4.8	0	0	0.7	0	4.1	0	$502,750
3	Border Access Corridor (Preferred Alternative)	Bayshore Bikeway	San Ysidro Border Crossing, San Diego	6.4	3.1	0	0	3.1	0	0	0	$93,000
4	Camp Pendleton Trail	Northern boundary of County of San Diego	San Luis Rey River Trail, Oceanside	18.9	18.1	0	0	0	18.1	0	0	$267,880
5	Carlsbad – San Marcos Corridor	Coastal Rail Trail, Carlsbad	Inland Rail Trail, San Marcos	10.3	0.7	0	0.7	0	0	0	0	$191,100
6	Central Coast Corridor	Coastal Rail Trail, Del Mar	Bayshore Bikeway, San Diego	22.1	8.5	0	0	1.5	0.1	3.8	3.1	$1,891,700
7	Centre City – La Mesa Corridor	Bayshore Bikeway, San Diego	SR-125 Corridor	13.7	7.5	0	0	6.8	0	0.7	0	$286,250
8	Chula Vista Greenbelt Otay River (Preferred Alternative)	Bayshore Bikeway, San Diego	SR-125 Corridor, Chula Vista	5.7	3.8	0	0	0.8	0	3.0	0	$376,500
9	City Heights – Old Town Corridor	Coastal Rail Trail	I-15 Bikeway	6.2	5.5	0	0	1.3	2.6	0.9	0.7	$499,070
10	Clairemont – Centre City Corridor	Coastal Rail Trail	North Park – Centre City Corridor	13.9	7.7	0.9	0	4.2	1.5	1.1	0	$2,653,450
11	Coastal Rail Trail	San Luis Rey River Trail, Oceanside	Bayshore Bikeway, San Diego	44.3	34.0	29.5	0	0.2	0	1.2	3.1	$79,425,720
12	East County Northern Loop	SR-125 Corridor, La Mesa	SR-125 Corridor, County of San Diego	9.2	3.7	0	2.3	0	1.4	0	0	$648,620

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[17] Class II with constraints.
[18] Class II without constraints.

Table 6.2 (continued)
Regional Bicycle Network Cost Estimate

ID	Name	Beginning	End	Total Miles	Miles of Unbuilt Facility							Cost of Unbuilt Portion
					Unbuilt Miles	Class I	Class II[19]	Class II[20]	Class III	Bike Blvd	Cycle Track	
13	East County Southern Loop	East County Northern Loop, El Cajon	SR-125 Corridor, County of San Diego	4.3	1.1	0	0	1.1	0	0	0	$33,000
14	El Camino Real	San Luis Rey River Trail, Oceanside	Coastal Rail Trail, Encinitas	20.0	3.8	0	3.2	0	0.6	0	0	$882,480
15	Encinitas – San Marcos Corridor	Coastal Rail Trail , Encinitas	Inland Rail Trail, San Marcos	13.3	4.2	4.1	0.1	0	0	0	0	$10,851,300
16	Escondido Creek Bikeway	I-15 Bikeway, Escondido	Valley Centre Rd, Escondido	5.9	2.3	2.3	0	0	0	0	0	$6,072,000
17	Gilman Connector	Central Coast Corridor, San Diego	Coastal Rail Trail	2.0	0	0	0	0	0	0	0	0
18	Hillcrest – El Cajon Corridor	Kensington – Balboa Park Corridor	SR-125 Corridor	11.5	6.8	0	0	0.4	0	6.4	0	$764,000
19	Imperial Beach Connector	Seacoast Drive, Imperial Beach	Border Access	2.6	2.4	0	0	0	1.5	0.9	0	$127,950
20	Inland Rail Trail	Coastal Rail Trail, Oceanside	I-15 Bikeway, Escondido	20.7	14.8	14.8	0	0	0	0	0	$39,072,000
21	Kearny Mesa – Beaches Corridor (Preferred Alternative)	Central Coast Corridor, Pacific Beach	I-15 Bikeway, San Diego	10.4	8.4	1.6	1.0	0	0	5.8	0	$5,178,500
22	Kensington – Balboa Park Corridor	Clairemont – Centre City Corridor	Mission Valley – Chula Vista Corridor	5.3	4.3	0	0	1.7	0	2.6	0	$356,500
23	North Park – Centre City Corridor	City Heights – Old Town Corridor	Coastal Rail Trail	3.7	1.5	0	0	0.5	0	0	1.0	$466,200
24	Mid-County Bikeway Corridor	Coastal Rail Trail, Del Mar	Inland Rail Trail	17.3	4.6	0	0	4.4	0.2	0	0	$134,960

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[19] Class II with constraints.
[20] Class II without constraints.

Table 6.2 (continued)
Regional Bicycle Network Cost Estimate

ID	Name	Beginning	End	Total Miles	Miles of Unbuilt Facility							Cost of Unbuilt Portion
					Unbuilt Miles	Class I	Class II[21]	Class II[22]	Class III	Bike Blvd	Cycle Track	
25	Mira Mesa Corridor	Coastal Rail Trail, San Diego	I-15 Bikeway	6.5	1.8	0.7	1.1	0	0	0	0	$2,148,300
26	Mission Valley – Chula Vista Corridor	San Diego River Bikeway, San Diego	Bay to Ranch Bikeway, Chula Vista	12.5	10.3	0.7	2.1	4.2	1.2	2.1	0	$2,811,810
27	Park Boulevard Connector	North Park – Centre City Corridor	Centre City – La Mesa Corridor	0.4	0.4	0	0	0	0	0	0.4	$180,480
28	Poway Loop	I-15 Bikeway, San Diego	I-15 Bikeway, San Diego	6.9	0	0	0	0	0	0	0	0
29	San Diego River Bikeway	Voltaire St, San Diego	SR-125 Corridor, Santee	17.9	10.7	10.7	0	0	0	0	0	$28,248,000
30	San Luis Rey River Trail	Coastal Rail Trail, Oceanside	I-15 Bikeway, County of San Diego	18.4	10.7	10.7	0	0	0	0	0	$28,248,000
31	Santee – El Cajon Corridor	El Cajon Northern Loop, El Cajon	I-8 Corridor, Santee	3.9	0.2	0	0	0.2	0	0	0	$6,000
32	Sweetwater River Bikeway	Bayshore Bikeway, National City	SR-125 Corridor, Chula Vista	5.2	0.6	0.6	0	0	0	0	0	$1,584,000
33	Vista Way Connector	San Luis River Rey Trail	Inland Rail Trail	4.6	2.5	0	2.5	0	0	0	0	$682,500
34	I-8 Corridor	SR-125 Corridor	Japatul Valley Rd, County of San Diego	25.0	9.9	6.0	0	3.9	0	0	0	$15,957,000
35	I-15 Bikeway	Northern boundary of County of San Diego	City Heights – Old Town Corridor	55.1	24.2	23.5	0.7	0	0	0	0	$62,061,000
36	SR-52 Bikeway	Coastal Rail Trail, San Diego	San Diego River Bikeway, San Diego	13.5	13.5	13.5	0	0	0	0	0	$35,640,000
37	SR-56 Bikeway	Coastal Rail Trail, San Diego	I-15 Bikeway, San Diego	10.7	1.2	1.2	0	0	0	0	0	$3,168,000

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[21] Class II with constraints.
[22] Class II without constraints.

Table 6.2 (continued)
Regional Bicycle Network Cost Estimate

ID	Name	Beginning	End	Total Miles	Miles of Unbuilt Facility							Cost of Unbuilt Portion
					Unbuilt Miles	Class I	Class II[23]	Class II[24]	Class III	Bike Blvd	Cycle Track	
38	SR-125 Corridor	San Diego River Bikeway, Santee	Otay Mesa Border Crossing, San Diego	25.1	15.6	11.1	0	2.9	0	1.6	0	$29,579,000
39	I-805 Connector	Sweetwater River Bikeway	Telegraph Canyon Road, Chula Vista	1.8	1.8	1.8	0	0	0	0	0	$4,752,000
40	SR-905 Corridor	Border Access Corridor, San Diego	Future SR-11 Border Crossing, County of San Diego	9.0	9.0	9.0	0	0	0	0	0	$23,760,000
			TOTALS	*515.5*	*275.2*	*153.9*	*13.0*	*38.6*	*27.2*	*34.2*	*8.3*	*$419,169,020*

Source: Alta Planning+Design, March, 2010

6.2 Funding Sources

Historically, the primary sources of revenue for developing bicycle programs and projects in the region have been the *TransNet* Active Transportation Program, which funds bicycle, pedestrian, and neighborhood safety (traffic calming) projects and programs, and the Transportation Development Act (TDA) Article 3 Non-motorized funds. Eligible support programs include those that help to encourage walking and the use of bicycles, such as secure bicycle parking facilities and bicycle and pedestrian promotion and safety education programs. Regional projects have also benefited from the availability of federal transportation funds, and to a lesser extent, state funds. In fact, the *TransNet* Extension Ordinance states that the *TransNet* Active Transportation funds should be used to match federal, state, local, and private funding to maximize the number of improvements to be implemented. Each of these funding sources, and the level of funding available, is discussed below.

6.2.1 Regional Funding Sources

TransNet Active Transportation Program. The *TransNet* 1/2-cent transportation sales tax program has provided approximately $31.4 million in sales tax revenues and interest earnings for active transportation projects since it was first began in FY 1988. For the first 20 years, $1 million was designated for bicycle facilities and programs each year. With the passage of the *TransNet*

[23] Class II with constraints.
[24] Class II without constraints.

Extension Ordinance, which began in FY 2009, the funding increased to two percent of the annual revenues, and the purposes for which the funds could be expended were broadened to include pedestrian and neighborhood safety (traffic calming) projects. Over the years, these *TransNet* funds supported regional bikeway development primarily by serving as the local match for federal funds. The overwhelming majority of the funds have gone to local projects through an annual competitive grant process. The *TransNet* program will end in 2048. Projected revenues for the Active Transportation Program between FY 2011 and the end of the program are estimated to be $232 million in current dollars as shown in **Table 6.3**.

Transportation Development Act (TDA) Article 3. The TDA program is funded by 1/4-cent of the statewide sales tax based on sales taxes collected within San Diego County. Of that amount, two percent is set aside for bicycle and pedestrian programs and projects. Annual revenues currently are about $1.8 million. SANDAG administers these funds in the San Diego region as part of its Active Transportation Program. The funds are distributed to cities and the County through the same competitive grant process used to award *TransNet* active transportation grants. Revenues for TDA funds are also shown in Table 6.3.

Table 6.3
Active Transportation Program Funds

Fiscal Years	TransNet	TDA	Total
2011	$3,874,000	$1,787,000	$5,661,000
2012	3,918,000	1,840,000	$5,758,000
2013	4,028,000	1,890,000	$5,918,000
2014	4,244,000	1,994,000	$6,238,000
2015	4,418,000	2,076,000	$6,494,000
2011-2015	$20,482,000	9,587,000	$30,069,000
2016-2020	23,719,000	11,143,000	$34,862,000
2021-2048	187,581,000	88,124,000	275,705,000
Total	**$231,782,000**	**$108,854,000**	**$340,636,000**

6.2.2 Federal Funding Sources

The current federal transportation funding authorization is known as *Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU)*. It is the third iteration of the transportation vision established by Congress in 1991 with the Intermodal Surface Transportation Efficiency Act (ISTEA) that takes a multimodal approach to transportation

planning. It allows flexibility in the use of funds under the various funding programs, which makes bicycle projects eligible in most funding categories. SAFETEA-LU expired in October 2009, so the federal transportation program has been continuing under a series of extensions enacted by Congress. In light of the uncertainty about the form and funding levels of the next federal authorization, this plan assumes a continuation of the existing federal programs with funding levels consistent with recent authorizations and with funding estimates provided by the California Transportation Commission (CTC).

While bicycle projects are eligible under most federal funding programs, current SANDAG policy dedicates 94 percent of all discretionary funding to the *TransNet* Early Action Projects (EAP). These are the major corridor projects that support highway and transit corridor project development. Regional bikeway projects could be built with the funds dedicated to the EAP if they are identified as mitigation for those projects, but for the most part, the bikeway projects will need to compete for the remaining six percent of federal funds where there already is significant demand from other eligible project types. There are, however, several federal programs that restrict funds to specific categories of projects, and some of these could be used to support development of regional bikeway projects.

Transportation Enhancement Funds. The most common source of federal funds for bicycle projects is the Transportation Enhancements (TE) Program. Based on the assumption that the TE program will be included in the next federal transportation authorization, the state has estimated funding levels for the program through FY 2015 as shown in **Table 6.4**.

Table 6.4
Federal Transportation Enhancement Program Revenue Estimates*

FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total
$1,356,000	$3,624,000	$4,311,000	$5,326,000	$5,327,000	$19,944,000

**Based on revenue estimates provided by the California Transportation Commission*

TE funds may be used to fund 12 specified types of projects, including bicycle and pedestrian facilities. Using the discretion over these funds granted to regional agencies by state law, SANDAG has in the past chosen to focus the use of TE funds on projects that support specific regional priorities. Most recently, the funds were used for a pilot program to demonstrate how transportation funding can be used to develop projects that support and provide incentives for smart growth. That discretion could be used to dedicate future TE funds to regional bikeway implementation. While local agencies may want the opportunity to compete for these funds

as they have in the past, focusing TE funds on regional bikeways would reduce the amount of local *TransNet* and TDA funds necessary for the regional network, leaving more of those funds for local projects. In addition, it would consolidate the administrative burden that comes with federal funds on a few larger projects.

Safe Routes to School. SAFTEA-LU established a federal Safe Routes to School program to support projects that encourage more children to walk or ride a bike to school. Metropolitan planning organizations (MPOs) like SANDAG are eligible to receive grants under this program, which is administered in California through Caltrans. The last cycle of projects provided $46 million for 106 projects. Eligible projects must be within two miles of a school. Projects on the regional network that directly serve schools could potentially benefit from this funding source.

Congestion Mitigation and Air Quality Funds (CMAQ). Projects that help meet national goals for improved air quality and congestion relief, including bicycle projects, are eligible for CMAQ funds. Several regional bikeway projects, including the Coastal Rail Trail, Inland Rail Trail and the Bayshore Bikeway have been developed in part with CMAQ funds. However, because these funds are subject to SANDAG policy to dedicate 94 percent of discretionary funds to the EAP, this cannot be considered a viable source of funding for regional bikeway implementation in the near term.

Land and Water Conservation Fund. This program, administered by the National Parks Service, allocates money to state and local governments to acquire new land for recreational purposes, including bicycle paths and support facilities such as bike racks. Funding allocated to California is administered by the State Department of Parks and Recreation. Eligible applicants include cities, counties and districts authorized to acquire, develop, operate and maintain park and recreation areas. For local agencies, funds are provided through a competitive selection process. There is a 50% local match requirement. The Land and Water Conservation Fund has not been used to date in the San Diego region to develop the regional bikeway network.

Recreational Trails Program. This program provides funds for developing and maintaining recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, and other non-motorized as well as motorized uses. While bikeway projects have been developed through this program, the urban location and transportation emphasis of the regional bike network suggests this will not be a major source of revenue for project implementation. There are, however, recreational trails in the region that do serve a transportation function. Even

if this program did not fund the regional network, it is available as a potential source of funds for local bikeway projects that qualify and would compete well under the program. The Recreational Trails Program is administered in California by California State Parks. Approximately $6 million was available statewide for this program in the last funding cycle.

6.2.3 State Funding Sources

Bicycle Transportation Account (BTA). The BTA is an annual statewide discretionary program that is available through Caltrans for funding bicycle projects. The grants to cities and counties provide $7.2 million each year with an emphasis on funding projects that benefit bicycling for commuting purposes. The local match must be a minimum of ten percent of the total project cost. BTA funds have been used to develop regional bikeways like the Inland Rail Trail, but should SANDAG be responsible for regional project development, it would only be available through a cooperative agreement with a local agency that agreed to apply for the funds on SANDAG's behalf.

Safe Routes to School. The state of California was a pioneer in establishing a state Safe Routes to School program ten years ago using funds from the Hazard Elimination Safety program. Like the federal program, its purpose is to encourage walking and bicycling to school by eliminating barriers to bicycle and pedestrian travel, and by implementing education and encouragement campaigns. The most recent funding cycle provided $24 million statewide. Like the BTA, only cities and counties are eligible under the state program, and a ten percent local match is required. Projects on the regional network that directly serve schools could potentially benefit from this funding source.

Other Potential Funding Sources. There are a variety of other sources of funds that have or could be used to support bikeway development in the region. These sources include:

- Federal demonstration grants been awarded through the San Diego congressional delegation
- Federal economic stimulus funds
- State bond funds such as Proposition 84 park bonds
- Local gas tax or *TransNet* Local Systems funds
- Development impact fees or other developer assessments

Finally, federal, state and local complete streets policies establish the responsibility to provide for all modes of travel when developing transportation projects. Following complete streets guidelines, wherever a regional network project coincides with other highway, local streets and

roads or transit projects, the projects should be developed concurrently to take advantage of the costs and time savings that could be realized through economies of scale and coordinated implementation.

6.3 Implementation

The key implementation steps that will follow adoption of the Plan and will include employing the Plan's project prioritization criteria to develop a list of priority regional corridor projects, developing an implementation strategy for how the regional network will be completed and programmatic components of the Plan implemented, and developing a financial plan for implementing the projects and programs. These follow-up steps will be completed through the summer of 2010 so the Plan recommendations can be incorporated into the 2050 RTP.

The Plan represents a significant step forward in bicycle planning for the region. It includes more comprehensive and detailed recommendations for the regional bicycle network and supporting programs that were previously developed through the regional transportation plan process, and it establishes ambitious goals to make bicycling a significant contributor to the region's transportation system. With this new and ambitious plan comes the opportunity to re-evaluate the region's approach to project development and financing.

6.3.1 Project Development

SANDAG's current role in developing the regional bicycle network has been to identify and administer funding sources, encourage local agencies to take on regional projects, and provide guidance and oversight as projects are developed. This approach is a reflection of SANDAG's role as the administrator of transportation funding in the region, but it has its limitations. Implementation of corridor projects that have a high priority at the regional level have had to compete against local priorities for resources. At times this has led to long project development timelines. Different priorities for regional projects between jurisdictions have resulted in the development of discontinuous segments for multi-jurisdictional bicycle facilities. In addition, educational and promotional programs that could have been deployed regionwide have been restricted to the single jurisdiction that is awarded funding for the project, reducing the program's impact. Two alternative approaches to implementation are suggested for further consideration: 1) provide increased incentives in the Active Transportation funding program to encourage local agencies to implement regional projects; and 2) establish agreements between SANDAG and local agencies that enables SANDAG to be the lead agency for project implementation.

SANDAG awards funds to local jurisdictions under its Active Transportation program through a competitive grant process. Projects are selected based on established criteria that are designed to select projects with high potential demand that increase safety, and that are cost effective and ready for development. These criteria could be revised to place a premium on funding regional projects. With this approach, SANDAG also may want to increase its oversight role to help ensure timely project development and a consistent approach to design and operation for regional bikeways. This approach would be consistent with the implementation framework established in the RCP adopted in 2004 that focuses on collaborative planning and incentives to achieve regional goals.

The current approach to developing regional bikeways was developed before the consolidation of regional transportation implementation responsibilities at SANDAG. Taking advantage of this new capacity, a second approach would be to implement the regional bicycle program in a manner more akin to how regional transit projects are developed with SANDAG taking lead in planning, design and construction, and the local agency assuming responsibility for on-going operation and maintenance. Investing SANDAG with the responsibility to implement regional projects would require cooperative agreements between SANDAG and local agencies that addressed how construction, operation, and maintenance would occur. It also would require changes in the way regional funds are allocated since current active transportation funding decisions are made through a process designed to dispense funds to local agencies.

Maintenance. Maintenance and funding for maintenance is a significant issue for all public rights of way whether it is for general roadways or separate bicycle and pedestrian facilities. Historically, the funding that has been administered by SANDAG for bicycle and pedestrian projects has not been available for maintenance, and the Plan does not include specific provisions for maintenance of the facilities proposed in the Plan. This issue will be addressed as part of the first phase of the Plan implementation where it can be evaluated in conjunction with the project prioritization and financing discussion.

6.3.2 Environmental Review

Proposed projects are required to comply with the California Environmental Quality Act (CEQA). It is not the intent of this Plan to make recommendations for regional network improvements that would result in significant impacts to traffic, biological resources, or other environmental factors. During design and environmental review of individual planned segments, project proponents may elect to modify alignment of corridor

segments to avoid and minimize impacts. Any changes to the regional network will be documented during the Plan update, which is proposed at intervals of every four years.

6.3.3 Project Financing

The Plan identifies a cost of $419 million to implement the regional bicycle network, and $246 million for the constrained revenue network. The revenue estimate for the *TransNet* and TDA Active Transportation Program through the end of the *TransNet* program in FY 2048 is $340.6 million, which means a significant portion of the regional network could be funded with the *TransNet* and TDA funds dedicated for active transportation provided completing the regional network were made the first priority for the use of these funds. However, considerable additional funding sources will be required to augment *TransNet* and TDA funds.

A simple comparison of projected annual *TransNet* and TDA Active Transportation Program revenues to total estimated network project costs suggests that the regional bicycle network could be completed in approximately 40 years if **all** these revenues were dedicated to constructing the network and if all available Transportation Enhancement (TE) funds are added to the funding plan as a revenue source for regional network development, with a three percent growth in TE funds assumed for each new federal authorization. How to prioritize funding the regional network and programs in comparison to local bicycle, pedestrian and neighborhood safety projects will be a policy decision to be addressed in the initial implementation phase of the Plan.

An alternative funding scenario that would enable an accelerated schedule for project development would be to utilize the *TransNet* program's financing capacity to borrow against future Active Transportation Program revenues. The regional projects could be financed as part of SANDAG's periodic bond sales or other financing mechanisms. This approach could reduce the impact of developing the regional network on the Active Transportation Program funds to the debt service obligations spread out over the remaining years of the *TransNet* program, leaving more funds for local projects in the early years. A debt financing strategy will be evaluated as an early implementation item once a priority list of projects and associated project costs has been established.

6.4 Program Monitoring

The Plan provides a long-term vision for the development of a regionwide bicycle network that can be used by all residents for all types of trips. Implementation of the Plan will take place incrementally over many years.

The following actions and measures of effectiveness are provided to guide SANDAG toward the vision identified in the Plan.

6.4.1 Regularly Revisit Project Prioritization

Projects will be prioritized based on bicycling demand, facility deficiencies, public comment, and a host of other criteria. This list should be reviewed every fiscal year, with new projects added, completed projects removed, and the priorities revised as conditions change.

6.4.2 Update the Plan

While the Plan is intended to guide the SANDAG's bicycle planning for the next 40 years, it should be reviewed and updated on a regular basis. The Plan should be updated on a four year cycle consistent with the requirement for updating the RTP.

6.4.3 Establish Measures of Effectiveness

Measures of effectiveness are used as a quantitative way to measure the region's progress toward implementing the Plan. Well-crafted measures of effectiveness will allow the region to determine the degree of progress toward meeting the Plan's goals, and include time-sensitive targets for SANDAG to meet. Chapter 4 includes a discussion of a monitoring and evaluation program.

Table 6.5 describes several measures that SANDAG may consider. These measures were developed based on known baseline conditions. Goal targets, when given, are developed based on reasonable expectations within the time frame. As new baseline information is made available, and SANDAG implements more of the Plan, the measures of effectiveness should be reevaluated, revised, and updated. SANDAG should regularly review the progress made toward these goals, preferably on an annual or biennial basis.

Table 6.5
Potential Measures of Effectiveness

Measure	Existing Benchmark (if available)	Target
Bicycle mode share	Benchmark data to be established.	By 2012 increase the percentage of people who bike for utilitarian purposes by 50%.
Public attitudes about biking in San Diego	The survey conducted as part of the Regional Bicycle Plan public input process provides some information, but a survey specifically geared toward attitudes of bikers, non-bikers, walkers and non-walkers should be developed.	Increase in positive attitudes about biking and about bicycle facilities.
Number of miles of bike paths, lanes and routes	106.9 miles of bike paths 784.6 miles of bike lanes 250.4 miles of bike routes	Increase in bicycle facilities
Proportion of Arterial Streets with Bike Lanes	Benchmark data to be established.	Increase in the proportion of arterial streets with bicycle facilities. Suggested target of 25% by 2017 to spur greater bicycle commuting.
Percentage of Elementary Schools with Safe Routes to Schools Programs	Benchmark data to be established.	100% of elementary schools participating in Safe Routes to Schools Program by 2015
Independent recognition of Non-Motorized Transportation Planning Efforts	No Bicycle Awards to Date	Independent recognition of efforts to promote biking by 2012. League of American Cyclist's Bronze Award by 2017 and Silver or Gold Award by 2027.
Number of collisions involving bicyclists and drivers	2005: 834 bike 2006: 853 bike 2007: 704 bike *Source: SWITRS*	Annual reduction in bicycle collision rate per capita

Source: Alta Planning + Design, April 2009

7 Bicycle Design Guidelines

This chapter provides design guidelines gathered from local, state and national best practices. It is intended to serve as a guide for city planners, engineers, and designers when designing and constructing bicycle facilities in the San Diego region. The design guidelines presented in this chapter are a combination of minimum standards outlined by the *California Highway Design Manual*'s Chapter 1000, recommended standards prescribed by the American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities* and the *California Manual of Uniform Traffic Control Devices (California MUTCD)*. The minimum standards and guidelines presented by Chapter 1000 and AASHTO provide basic information about the design of bicycle facilities, such as bicycle lane dimensions, striping requirements and recommended signage and pavement markings. These guidelines also include recommendations for optional design treatments that are not intended to represent a minimum or maximum accommodation or to replace any existing adopted roadway design guidelines. Also included in these guidelines are experimental or nonstandard best practices with information about optional innovative bikeways and support facilities that have not been adopted by the *California MUTCD* or by the State of California for use in California and do not currently meet *Highway Design Manual, Chapter 1000* design requirements.

Final design of any bikeway should be conducted by a licensed engineer using sound engineering judgment and applicable standards and guidelines.

7.1 **Design References** lists the documents used to develop the San Diego region bicycle facility guidelines.

7.2 **Design Principles** describes the principles that should be used in implementing the San Diego region design guidelines.

7.3 **Standard Designs of Bicycle Facilities** provides general descriptions of California bikeway classifications, standard treatments, and standard signage.

7.4 **Innovative Treatments and Signage** presents treatments and signage that are intended to enhance safety but are not standard in California according to the *California MUTCD* or *Caltrans Highway Design Manual, Chapter 1000*.

7.5 **Bicycle Parking** describes guidelines for placing bicycle parking, and design guidelines for bicycle racks, bicycle lockers, and high-volume bicycle parking options such as bicycle corrals and bike stations.

7.1 Design References

The bikeway design principals outlined in this chapter are derived from the regional, state, and national documents listed below. Many of these documents are available online and provide a wealth of information and resources to the public.

- Highway Design Manual, Chapter 1000: Bikeway Planning and Design (California Department of Transportation, 2006). http://www.dot.ca.gov/hq/oppd/hdm/pdf/chp1000.pdf
- California Manual of Uniform Traffic Control Devices for Streets and Highways, Part 9: Traffic Controls for Bicycle Facilities (California Department of Transportation, 2006). http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd/CAMUTCD-Part9.pdf
- Guidelines for the Development of Bicycle Facilities (American Association of State Highway and Transportation Officials, 1999). http://www.transportation.org/
- Federal Highway Administration Best Practices Design Guide Part 2, Designing Sidewalks and Trails for Access (FHWA Pub# FHWA-EP-01-027, 1001)
- AASHTO Green Book: Policy on Geometric Design of Streets and Highways (American Association of State Highway and Transportation Officials, 2001). www.transportation.org
- Bike Lane Design Guide (City of Chicago and Pedestrian and Bicycle Information Center, 2002). http://www.bicyclinginfo.org/pdf/bike_lane.pdf
- Bicycle Parking Design Guidelines (Association of Pedestrian and Bicycle Professionals, 2002). http://www.bicyclinginfo.org/pdf/bikepark.pdf
- Pedestrian and Bicycle Facilities in California: A Technical Reference and Technology Transfer Synthesis for Caltrans Planners and Engineers (California Department of Transportation, 2005)
- Innovative Bicycle Treatments (Institute of Transportation Engineers, 2003)
- Bicycle Boulevard Design Tools and Guidelines (City of Berkeley, 2000)
- Bicycle Boulevards Technical Memorandum (Alta Planning + Design, 2007)

- Cycle Tracks: Lessons Learned (Alta Planning + Design; Burchfield, Robert, 2008)

All bikeway facilities are required at a minimum to meet the design guidelines outlined in the **Highway Design Manual, Chapter 1000** and in the **California MUTCD**. Jurisdictions in the San Diego region are encouraged to consider application of the innovative design treatments where appropriate. When using design treatments not approved by the **California MUTCD** and the **Highway Design Manual, Chapter 1000**, agencies in the San Diego region must follow the protocol for testing innovative treatments specified by the State.

7.2 Design Principles

The following key principles were followed in developing the San Diego regional bicycle network as proposed in this plan:

- The San Diego region will have a complete and interconnected network of on-street bicycling facilities and shared-use paths that will provide bicycle access across the region to a broad range of bicycle users.
- All roads in the San Diego region are legal for the use of bicyclists, (except those roads designated as limited access facilities which prohibit bicyclists). This means that most streets are bicycle facilities, and will be designed and maintained accordingly.
- The San Diego region should strive for 'complete streets' as called for by the California Complete Streets Act of 2008. Complete streets are designed to safely accommodate all users, including bicyclists, pedestrians, transit riders, children, older people, and disabled people, as well as motorists.

Design guidelines are intended to be flexible and should be applied with professional judgment by licensed engineers. In this manual, design guidelines approved by the *California MUTCD* and the *Highway Design Manual, Chapter 1000* are differentiated from innovative design treatments that are not yet approved. When using design treatments not approved by the standard regulatory documents, agencies in the San Diego region must follow the protocol for testing innovative treatments specified by the State.

7.3 Standard Designs of Bicycle Facilities

According to Caltrans, the term "bikeway" encompasses all facilities that provide primarily for bicycle travel. Caltrans has defined three types of bikeways in the *Highway Design Manual, Chapter 1000*: Class I, Class II, and Class III. For each type of bikeway facility both "Design Requirements" and "Additional Design Recommendations" are provided. "Design

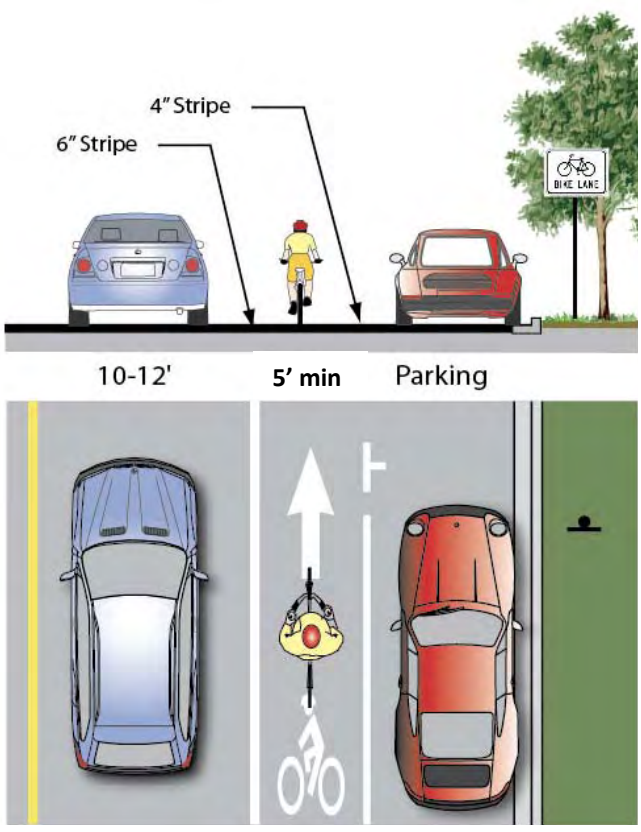
Requirements" contain requirements established by *Highway Design Manual, Chapter 1000*, including minimum dimensions, proper pavement markings, signage and other design treatments for bicycle facilities. "Additional Design Recommendations" are provided as guidelines to assist with design and implementation of facilities and include alternate treatments approved or recommended but not required by Caltrans. This section provides an overview of these standard bicycle facilities.

Class II Bike Lanes

Description

A bike lane or Class II bikeway is defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for one-way bicycle travel on either side of a street or highway. The following graphics show examples of typical bike lane configurations, including standard signage and required lane striping.

Graphics

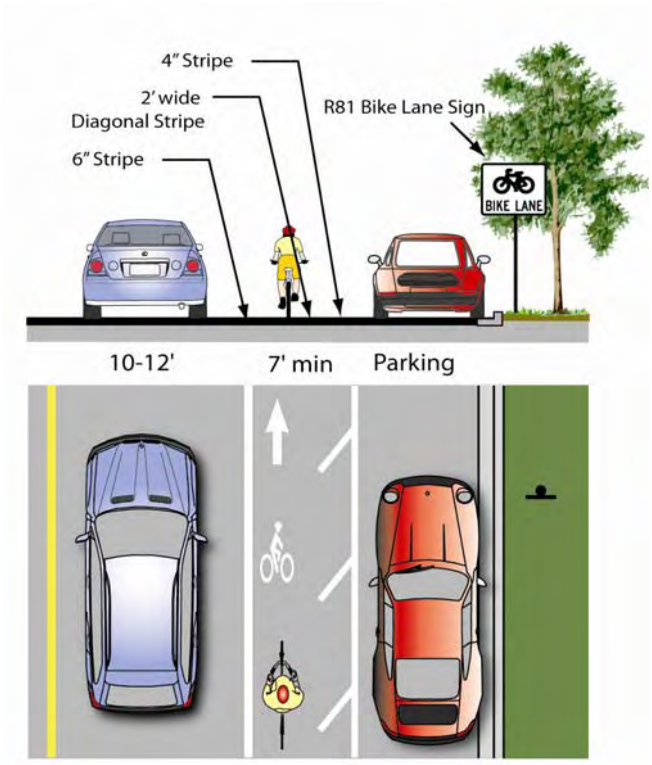


Bike Lane with On-Street Parallel Parking

Source: Alta Planning + Design, 2009

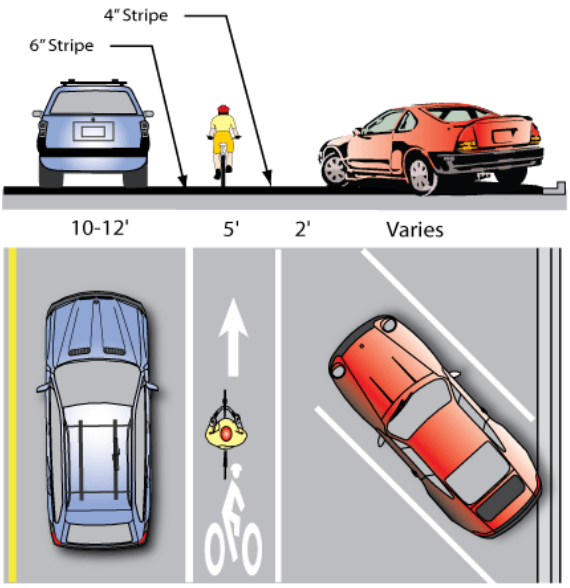
Bike Lane with No On-Street Parking

Source: Alta Planning + Design, 2009



Bike Lane with Buffer and On-Street Parallel Parking

Source: Alta Planning + Design, 2009



Bike Lane with Back-in Diagonal Parking

Source: Alta Planning + Design, 2009

General Guidelines

The width of the bike lanes vary according to parking and street conditions. Note that these dimensions are for reference only, and are subject to engineering design review.

- 4 feet (1.2 m) minimum width if no gutter exists, measured from edge of pavement;
- 5 feet (1.5 m) minimum width with normal gutter, measured from curb face; or 3' (0.9 m) measured from the gutter pan seam;
- 5 feet (1.5 m) minimum width when parking stalls are marked; and
- 11 feet (3.4 m) minimum width for a shared bike/parking lane where parking is permitted but not marked on streets without curbs; or 12 feet (3.7 m) for a shared lane adjacent to a curb face.
- Bicycle lanes shall be comprised of a 6 inch solid white stripe on the outside of the lane, and a 4 inch solid white stripe on the inside of the lane.
- Where on-street parking is allowed, bicycle lanes must be striped between the parking area and the travel lanes.
- In cases where there is insufficient space for a bike lane, cities may recommend removing a traffic lane, narrowing traffic lanes, or prohibiting parking.
- The R81 (CA) bicycle lane sign shall be placed at the beginning of all bicycle lanes, on the far side of arterial street intersections, at all changes in direction and at a maximum of 0.6 mile intervals. All standard signage is shown in Chapter 9 of the 2006 *California MUTCD*.

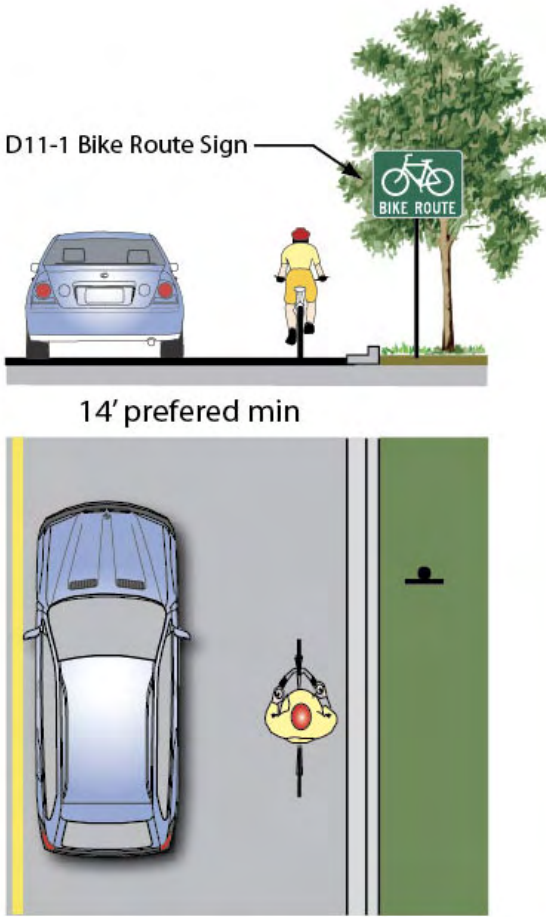
Additional Discussion
Intersections represent a primary collision point for bicyclists. Small intersections with few lanes are relatively easy to manage. Large, multi-lane intersections are more difficult for bicyclists to travel through than smaller, two-lane intersections. Road striping and signage can be used to accommodate bicyclists at critical locations. Figures 9C1 and 9C3 of the California MUTCD provide standard treatment options for intersections with right-turn only and left-turn only lanes. Design solutions for bicyclists at large signalized intersections include: • Signals should be timed to allow slower-moving bicyclists to travel across the intersection per the recommendations in the California Manual for Uniform Traffic Control Devices; • Loop detectors or video detection that is used to actuate the signal should be calibrated to detect bicyclists; • Loop detector stencils should be used to show bicyclists where to position themselves to actuate signals using properly calibrated loop detectors; • Bike boxes and/or warning signage may be used to assist bicyclists who wish to turn left and are required to travel across several motor vehicle lanes to reach the left hand turn lane; • Warning signage may be used to assist bicyclists who are traveling straight and have to merge across motor vehicle traffic that is turning right from a right-turn lane; • Design treatments can help bicyclists travel through intersections and alert motorists of bicyclists' presence. Good intersection design alerts motorist to bicyclists, indicates to motorists and bicyclists where bicyclists may ride, and guides bicyclists through intersections.

Typical Class III Bike Routes

Description

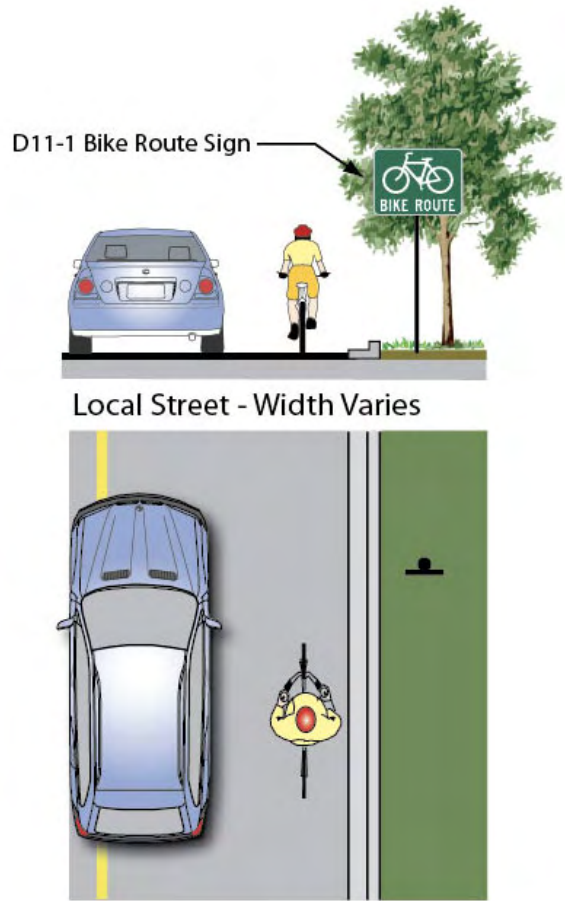
A bike route or Class III bikeway provides routes through areas not served by Class I or II facilities or to connect discontinuous segments of a bikeway. Class III facilities can be shared with either motorists on roadways or pedestrians on a sidewalk (strongly discouraged) and is identified only by signing. There are no recommended minimum widths for Class III facilities, but when encouraging bicyclists to travel along selected routes, traffic speed and volume, parking, traffic control devices, and surface quality should be acceptable for bicycle travel. Although it is not a requirement, a wide outside traffic lane (14 feet) is typically preferable to enable cars to safely pass bicyclists without crossing the centerline. *Highway Design Manual, Chapter 1000* provides details regarding the design requirements for placement and spacing of bicycle route signage.

Graphics



Bike Route with Wide Outside Lane

Source: Alta Planning + Design, 2009



Bike Route on Minor Roadway

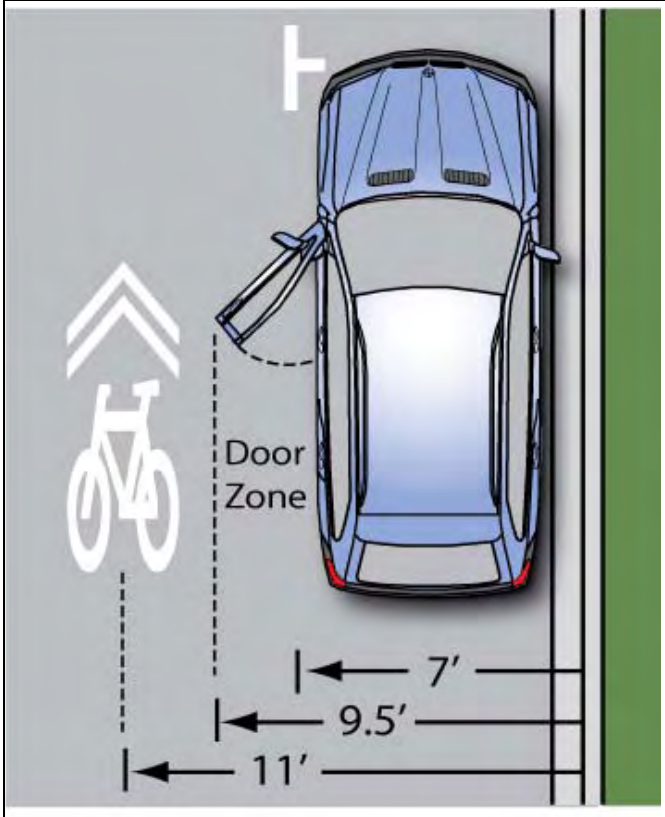
Source: Alta Planning + Design, 2009

Enhanced Class III - Shared Lane Arrow Markings (SLMs)

Description

In September 2005, the "shared lane marking" was approved by the California Traffic Control Devices committee for use by California jurisdictions.[25] The primary purpose of the shared lane marking (sometimes referred to as "sharrows") is to provide positional guidance to bicyclists on roadways that are too narrow to be striped with bicycle lanes and to alert motorists of the location a cyclist may occupy on the roadway. Shared lane markings are intended to reduce the chance of a cyclist colliding with an open car door of a vehicle parked on-street, parallel to the roadway. The *California MUTCD* only allows shared lane markings to be used on urban roadways with on-street parallel parking. The next version of the national *MUTCD* will include shared lane markings, and will allow them to be included at all locations, not just next to parked cars.

Graphics



Recommended Sharrow Placement

Source: Alta Planning + Design, 2009

Sharrow on a residential street

[25] Policy Directive 05-10 "Shared Roadway Bicycle Marking", passed on September 12, 2005, outlines implementation guidelines for placing Shared Lane Markings. <http://www.dot.ca.gov/hq/traffops/signtech/signdel/policy.htm>

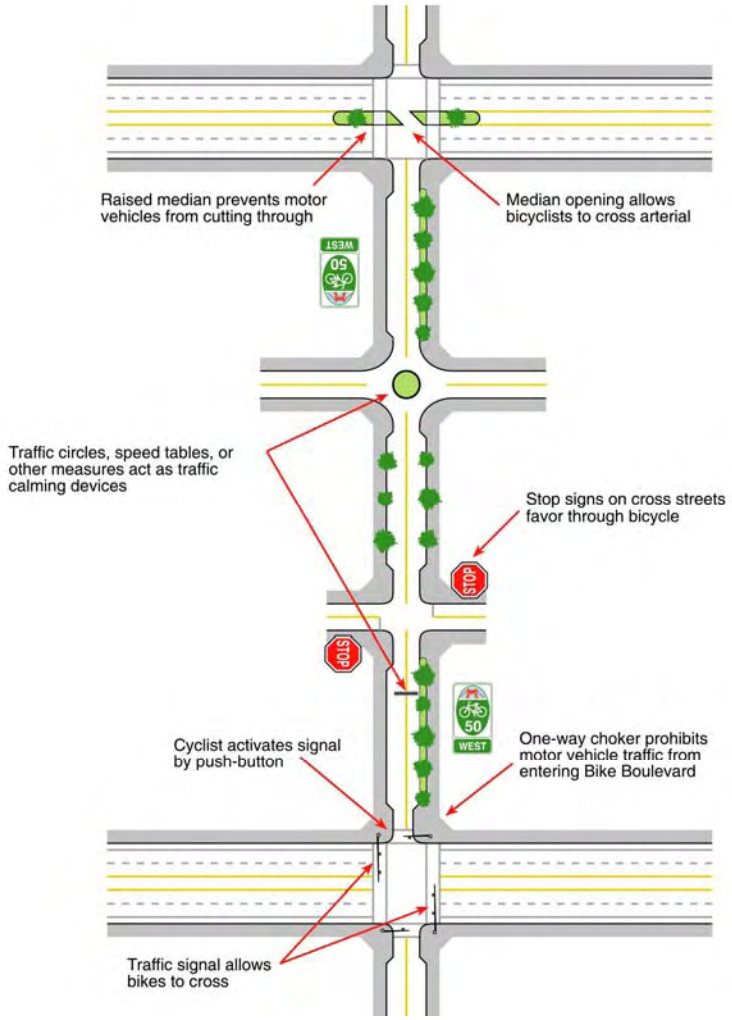
General Guidelines
Shared lane markings are appropriate on bicycle network streets that are: • Too narrow for standard striped bicycle lanes; • Areas that experience a high level of "wrong-way" riding; or • Streets that have moderate to high parking turnover, typically in commercial areas. • There is increasing interest in applying sharrows in conjunction with bike lanes on steeper slope roadways. Bike lanes are placed on the uphill side of the roadway and sharrows are placed on the downhill side of the roadway to encourage fast moving bicyclists to position themselves away from parked cars. • Shared lane arrow markings should be installed in conjunction with "share the road" signs • Arrows should be spaced approximately 200' center to center, with the first arrow on each block or roadway segment placed no further than 100' from the nearest intersection.

Bicycle Boulevards

Description

Bicycle boulevards are local roads or residential streets that have been enhanced with treatments to facilitate safe and convenient bicycle travel. These facilities accommodate bicyclists and motorists in the same travel lanes, typically without specific vehicle or bicycle lane delineation. Bicycle boulevards prioritize bicycle travel above vehicular travel. The treatments applied to create a bike boulevard heighten motorists' awareness of bicyclists and slow vehicle traffic, making the boulevard more conducive to safe bicycle and pedestrian activity. Bicycle boulevards have been implemented in a variety of locations including Berkeley, Palo Alto and Davis California, and Portland, Oregon.

Graphic



Bicycle Boulevard Lane Configuration

Note: The installation of traffic calming measures requires local government agency approval. *Source: Alta Planning + Design, 2009*

General Guidelines

Bicycle boulevards typically include the following design features:

- Traffic calming devices such as traffic circles and curb bulbouts;
- Bicycle destination signage;
- Pavement stencils indicating status as a bicycle boulevard;
- Crossing improvements at major arterials such as traffic signals with bicycle-detection, four-way stops and high-visibility crosswalks;
- Bicycle-friendly signal preemption at high-volume signalized intersections;
- Stop signs on streets crossing the bicycle boulevard; and
- Some jurisdictions have implemented bicycle boulevards by removing on-street parking in select locations.

Bicycle boulevards can be designed to accommodate the particular needs of the residents and businesses along the routes, and may be as simple as pavement markings with wayfinding signs or as complex as a street with traffic diverters and bicycle signals. Bike boulevards with signage only typically require extensive public education to be effective.

To further identify a street as a preferred bicycle route, lower volume roadways may be modified to function as a through street for bicycles, while maintaining only local access for automobiles. Traffic calming devices can lower traffic speeds and through trips, limiting conflicts between motorists and bicyclists and providing priority to through bicycle movement.

For more information, see:

- City of Berkeley Bicycle Boulevard Design Tools and Guidelines: http://www.ci.berkeley.ca.us/transportation/Bicycling/BB/Guidelines/linkpag.htm;
- Bicycle Transportation Alliance Bicycle Boulevards Campaign: http://www.bta4bikes.org/at_work/bikeboulevards.php
- Draft 2009 AASHTO Guide for the Development of Bicycle Facilities
- Bicycle Boulevard Design Guidebook (forthcoming publication of the Portland State University Initiative for Bicycle and Pedestrian Innovation (IBPI) and Alta Planning + Design.

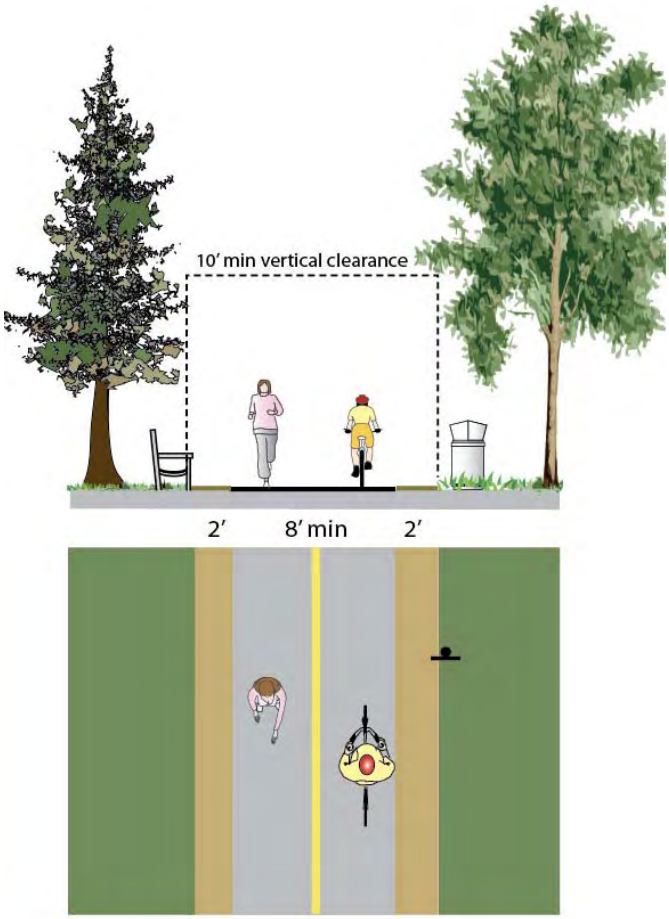
Traffic calming on bicycle boulevards

Class I Bike Path (Shared-Use Path)

Description

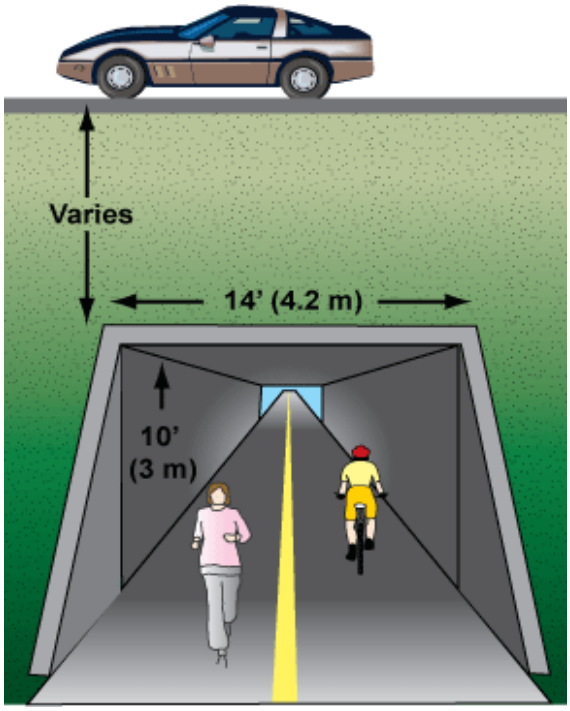
Typically called a "bike path" or "shared-use path," a Class I bikeway provides bicycle travel on a paved right-of-way completely separated from any street or highway. In locations with high use, or on curves with limited sight distance, a yellow centerline should be used to separate travel in opposite directions. High use areas of the trail should also provide additional width of up to 12 feet. Lighting should be provided in locations where evening use is anticipated or where paths cross below structures.

Graphics



Shared-Use Path Example

Source: Alta Planning + Design, 2009



Shared-Use Path Undercrossing

Source: Alta Planning + Design, 2009

General Guidelines

The recommended width of a shared-use path is dependent upon anticipated usage:

- 8 feet (2.4 m) is the minimum width for Class I facilities.
- 8 feet (2.4 m) may be used for short neighborhood connector paths (generally less than one mile in length) due to low anticipated volumes of use.
- 10 feet (3.0 m) is the recommended minimum width for a typical two-way shared-use path.
- 12 feet (3.7 m) is the preferred minimum width if more than 300 users per peak hour are anticipated, and/or if there is heavy mixed bicycle and pedestrian use.
- A minimum 2' (0.6 m) wide graded area must be provided adjacent to the path to provide clearance from trees, poles, walls, guardrails, etc.
- Paths should be constructed with adequate sub grade compaction to minimize cracking and sinking, and should be designed to accommodate appropriate loadings, including emergency vehicles.
- A 2% cross slope shall be provided to ensure proper drainage.
- 8 feet (2.4 m) is the required minimum clearance from overhead obstructions, with 10 feet (3.0 m) recommended.

GRADE INTERSECTION:

When shared-use paths cross streets, proper design should be developed on the pathway as well as on the roadway to alert bicyclists and motorists of the crossing. Sometimes on larger streets, at mid-block pathway crossing locations, an actuated signal is necessary. A signal allows bicyclists a clear crossing of a multi-lane roadway. If a signal is or is not needed, appropriate signage and pavement markings should be installed, including stop signs and bike crossing pavement markings.

OVERCROSSINGS:

Overcrossings are also an important component of bikeway design. Barriers to bicycling often include freeways, complex interchanges, and rivers. When a route is not available to cross these barriers a bicycle overcrossing is necessary.

Some design considerations for overcrossings include:

- Pathways must be a minimum 6 feet (1.8 m) wide, with a preferred width of 8 feet (2.4 m) or 10 feet (3.0 m) wide;
- Slope of any ramps must comply with ADA Guidelines; and
- Screens are often a necessary buffer between vehicle traffic and the bicycle overcrossing.

UNDERCROSSINGS:

Undercrossings are an important component of Class I bikeway design. Some considerations for undercrossings include:

- Must have adequate lighting and sight distance for safety;
- Must have adequate over-head clearance of at least 10 feet (3.0 m);
- Tunnels should be a minimum width of 14 feet (4.3 m) for several users to pass one another safely; a 10 feet x 20 feet (3.0 m x 6.1 m) arch is the recommended standard;
- "Channeling" with fences and walls into the tunnel should be avoided for safety reasons; and
- May require drainage if the sag point is lower than the surrounding terrain.

Bicycle Signals & Adaptive Signal Timing

Description

Making intersections more "friendly" to bicyclists, involves modifying how they operate. Improved signal timing, calibrating loop detectors to detect bicyclists, and camera detection makes intersections easier for bicyclists to cross intersections.

Bicycle loop detectors activate traffic signals at intersections, similar to standard loop detectors used for auto traffic. Where bicycle loop detectors are not present, bicyclists are forced to wait for a motor vehicle to trigger a signal; where motor vehicle traffic is infrequent, they may cross against a red signal. Bicycle loop detectors should be identified with pavement markings that show cyclists where to position themselves to trigger the traffic signal.

A bicycle signal provides an exclusive signal phase for bicyclists traveling through an intersection. This takes the form of a new signal head installed with red, amber, and green bicycle indications. Bicycle signals can be actuated with bicycle sensitive loop detectors, video detection, or push buttons. Bicycle signals became an approved traffic control device in the state of California after the technology was studied after years of service in the City of Davis. Part 4 of the *California MUTCD* covers bicycle signals.

Graphics

Bicycle signal

Bicycle loop detector stencil

General Guidelines
Bicycle signals are typically considered in locations with heavy bicycle traffic combined with significant conflicts with motor vehicles, at intersections with unique geometry or at the interface between busy roads and off-street bicycle facilities. Specific situations where bicycle signals have had a demonstrated positive effect include: • Locations with high volume of bicyclists at peak hours; • Locations with high numbers of bicycle/motor vehicle crashes, especially those caused by crossing paths; • At T-intersections with major bicycle movement along the top of the T; • At the confluence of an off-street bike path and a roadway intersection; and • Where separated bike paths run parallel to arterial streets. While bicycle signals are approved for use in California, local municipal code should be checked or modified to clarify that at intersections with bicycle signals, bicycles should only obey the bicycle signal heads.

On-Street Bikeway Signage

Description

Standard signage for on-street bikeways includes standard BIKE LANE and BIKE ROUTE signage, as well as supplemental signage such as SHARE THE ROAD and warning signage for constrained bike lane conditions. Engineers should consult the *California MUTCD* for the full spectrum and applicability of signage options.

Graphics

Potential Signage Options for Bike Routes/Bicycle Boulevards

(not comprehensive)

Source: California MUTCD

Berkeley, CA bike boulevard signage

San Francisco, CA route identification signage

Additional Discussion
Wayfinding signage is an important part of the bicycle network. Implementing a well-planned and attractive system of signage can greatly enhance bikeway facilities, making their presence aware to motorists, as well as existing and potential bicyclists. By leading people to city bikeways that offer safe and efficient transportation, effective signage can encourage residents and visitors to bicycle. Way-finding can include mile-markers, route identification, and informational kiosks. Destination signage helps bicyclists use the bikeway network as an effective transportation system. These signs typically display distance, direction and in some cases, estimated travel time information to various destinations and activity centers. In the San Diego region, destination signage would be helpful for destinations such as downtown, Balboa Park, UCSD, and beaches. Signage can also assist users to navigate towards major bikeways, transit hubs, or greenway trails. Finally, way-finding can help bicyclists avoid difficult and potentially hazardous road scenarios, like steep terrain, dangerous intersections, highway and river crossings, or deteriorating road conditions. Wayfinding and bike route network signage is recommended for the San Diego region. *California MUTCD* defines standards for these route network signs. Most commonly, they show the route number and the corresponding direction. Route naming and numbering should be coordinated between neighboring jurisdictions where bikeways cross cities' boundaries so that the regional signage system is seamless. For bike route signs, *California MUTCD* requires a green background and white lettering. The top third portion of the sign is customizable for the city or region where it is located. For example, the City of San Francisco shows the Golden Gate Bridge on its bike route signs. The multi-use path network should be integrated with on-street bike facility signage to encourage use of paths for recreational as well as utilitarian bicycling; helping bicyclists of all ages and abilities reach destinations more easily. Informational kiosks, complete with maps of the surrounding area, can help provide initial orientation and bearings for bicyclists beginning their journeys at major transit hubs, or transitioning from off-street to on-street facilities.

7.4 Innovative Treatments and Signage

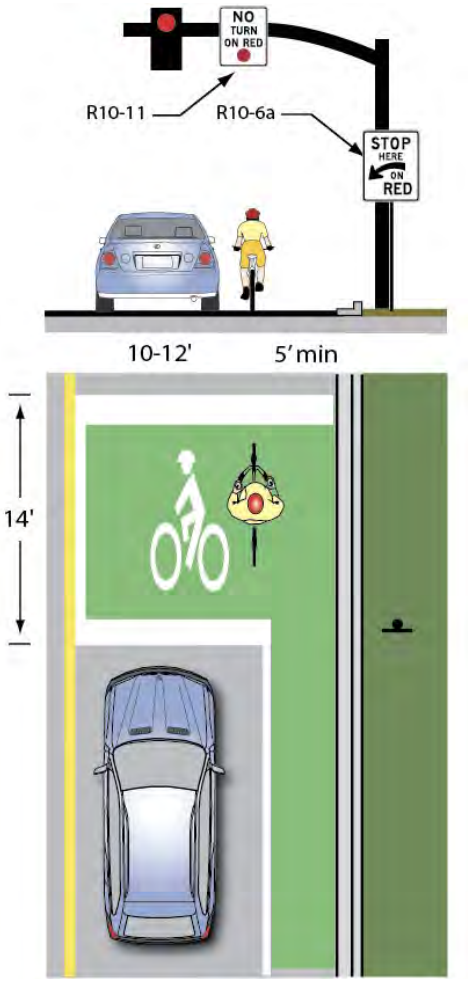
The following section describes facilities and treatments that are intended to enhance safety but are not adopted as standard treatments by the *California MUTCD* or *Caltrans Highway Design Manual*.

Bike Boxes

Description

A bike box is a relatively simple innovation to improve turning movements for bicyclists without requiring cyclists to merge into traffic to reach the turn lane or use crosswalks as a pedestrian. The bike box is formed by pulling the stop line for vehicles back from the intersection, and adding a stop line for bicyclists immediately behind the crosswalk. When a traffic signal is red, bicyclists can move into this "box" ahead of the cars to make themselves more visible, or to move into a more comfortable position to make a turn. **Bike Boxes are not included in the *California MUTCD*.**

Graphic



Possible Bike Box Configuration

Source: Alta Planning + Design, 2009

Examples of bike boxes

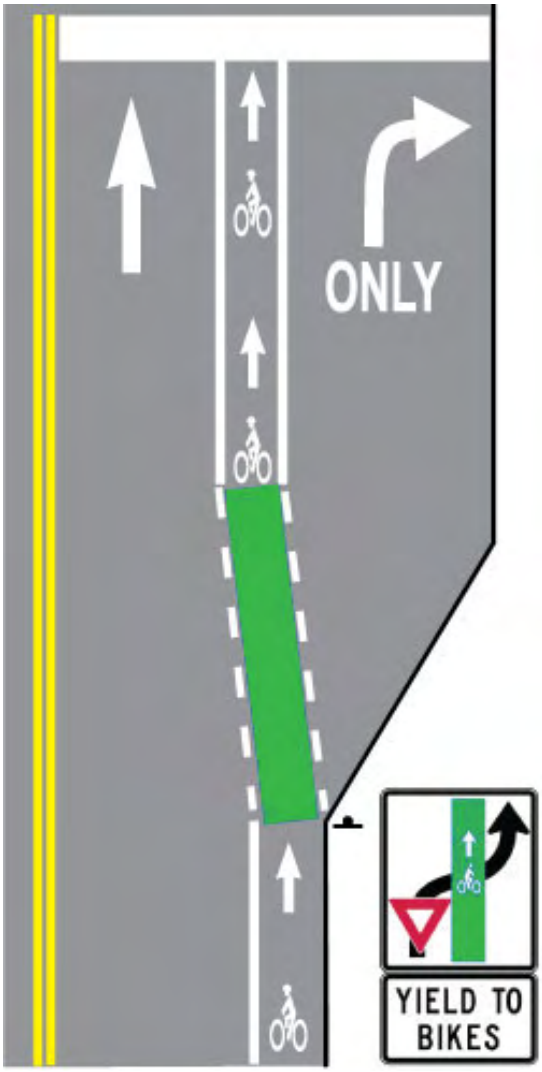
General Guidelines
• Apply at intersections with a high volume of bicycles and motor vehicles. • Apply where there are frequent turning conflicts and/or intersections with a high percentage of turning movements by both bicyclists and motorists. • California MUTCD signage should be present to prevent 'right turn on red' and to indicate where the motorist must stop. • In the US, bicycle boxes have been used in Cambridge, MA, Portland, OR and Eugene, OR. They have been used in a variety of locations throughout Europe.

Colored Bike Lanes in Conflict Areas

Description

European countries have used colored pavement – red, blue, yellow, and green—for bike lanes where this is a higher probability of vehicle conflicts. Examples of such locations are freeway on- and off-ramps where motorists move into a right turn pocket. In the United States cities such as Portland and Seattle have experimented with colored bike lanes and supportive signage with favorable results. Studies conducted in Portland showed that more motorists were using their turn signals and slowing or stopping at the blue lanes. **Colored Bike Lanes are not included in the *California MUTCD*.**

Graphics



Colored Bike Lane Configuration

Source: Alta Planning + Design, 2009

Examples of colored bike lanes in U.S. cities

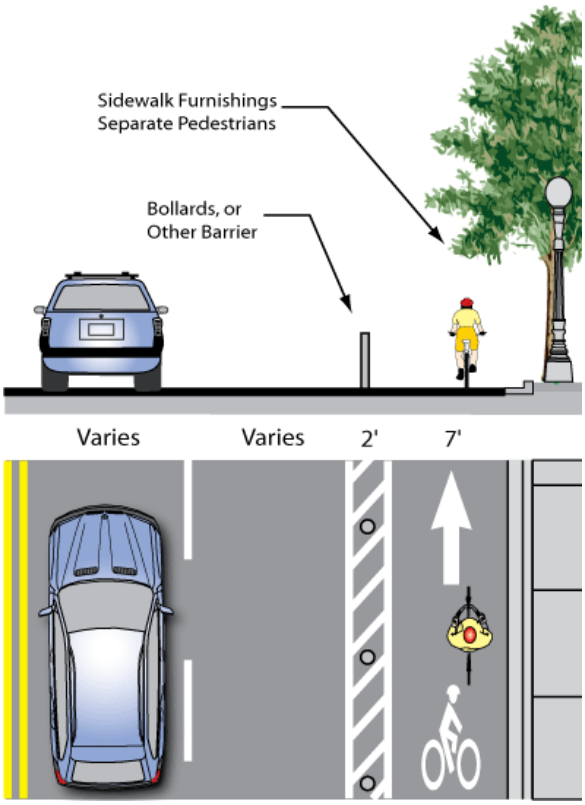
General Guidelines
• This treatment is not currently present in any State or Federal design standards. • Colored bike lanes are used to guide bicyclists through major vehicle/bicycle conflict points, especially at locations where the volume of conflicting vehicle traffic is high, and where the vehicle/bicycle conflict area is long. • Colored bike lanes typically extend through the entire bicycle/vehicle conflict zone (e.g., through the entire intersection, or through the transition zone where motorists cross a bike lane to enter a dedicated right-turn lane. • Portland's Blue Bike Lanes: http://www.portlandonline.com/shared/cfm/image.cfm?id=58842

Cycle Tracks

Description

Cycle tracks are receiving increasing levels of interest and attention from planners and engineers in the United States, although they are not currently considered a standard facility type. **The *Highway Design Manual, Chapter 1000* does not define cycle tracks as a bikeway or include provisions for cycle track designs.** Cycle tracks are physically separated one-way (or two-way) bike lanes in the roadway right-of-way. These bikeways are located between sidewalks and vehicle travel lanes or parking lanes and are a delineated area specifically for through bicycle traffic. Cycle tracks can be at the same plane as sidewalks but are usually separated by a low curb or barrier. There should be sidewalks adjacent to cycle tracks to prevent pedestrians from confusing cycle tracks with multi-use paths. When crossing cycle tracks, pedestrians should have the right-of-way. On the motor vehicle side of cycle tracks, if there is an on-street vehicle parking lane then there is normally a two to three foot buffer preventing car doors from entering the bikeway. If there is no on-street parking, a larger barrier is put in place to separate bicycles and automobile traffic.

Graphics



Cycle Track with No On-Street Parking

Source: Alta Planning + Design, 2008

Cycle track in New York City, NY

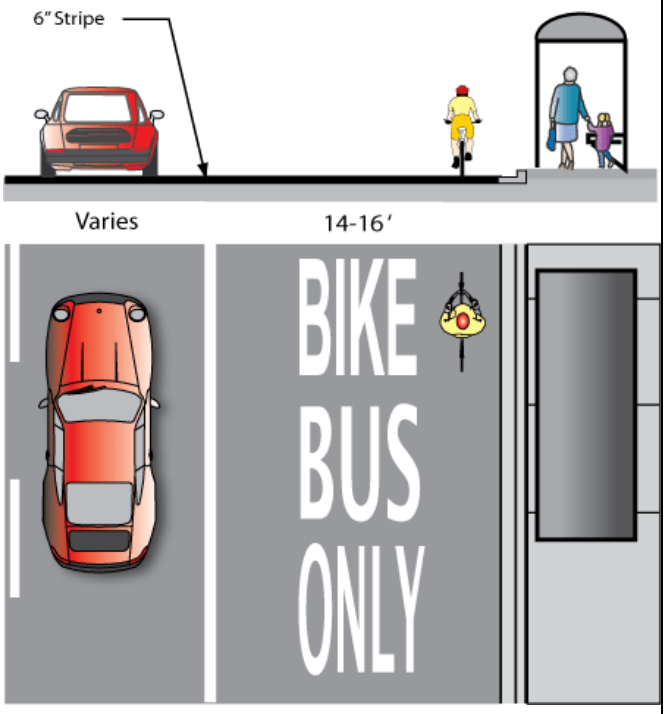
General Guidelines
• Cycle tracks are useful along streets with minimal crossings. • Intersections should be designed to include signage that alerts motorists of bicyclists crossing from the cycle track, and vegetation and parking should be limited near intersections so that bicyclists and motorists can see each other. • If cycle tracks are two-way, motorists should be alerted to the fact that bicyclists will be approaching from both directions. • To help decrease the number of wrong-way riding bicyclists on one-way cycle tracks, complimentary facilities should be provided on the opposite side of the street. • While cycle tracks increase bicyclists' comfort on urban and suburban streets, intersection treatments are needed to mitigate turn movement conflicts. Protective measures include retrofitting signalized intersections to provide separate left and right turn movements, adding bicycle-only signals, requiring no right-turn-on-red, and warning signage and special markings at unsignalized intersections. Other innovative treatments, such as colored pavement, can complement these facilities and improve warnings to motorists. • For additional discussion of cycle track designs, see the white paper on cycle tracks provided in **Appendix I**.

Shared Bike-Bus Lane

Description

Travel time for bikes and buses can be improved with a dedicated shared bicycle/bus lane, so that neither is hindered or endangered by congestion from other auto traffic. Shared bicycle/bus lanes are commonly used in central business districts where room for dedicated bicycle lanes is limited, and where motor vehicle congestion warrants a separate facility for buses.

Graphic



Shared Bike-Bus Configuration

Source: Alta Planning + Design, 2009

Shared Bike-Bus Signage

General Guidelines

- Potential locations for bicycle/bus lane implementation include congested streets with moderate or long bus headways, streets with moderate bus headways during peak hours, or places that provide no reasonable alternative routing alignment.
- Shared bicycle/bus lanes should be paved with colored asphalt and stenciled as a diamond lane with supporting signage and pavement legends to emphasize their designation.
- Lanes should be wide enough to allow bicyclists to comfortably pass stopped buses on the left. Twelve feet is the recommended minimum width of shared bicycle/bus lanes.
- Potential disadvantages of shared lanes include a leapfrogging between buses and bikes (when buses and bikes are continually passing one another in the lane). Leapfrogging creates a greater potential for conflicts. The second disadvantage is when vehicles are allowed to use the lane at intersections as a right turn lane. This slows and creates potential conflict points between bicycles and vehicles and slows buses and bicycles significantly.

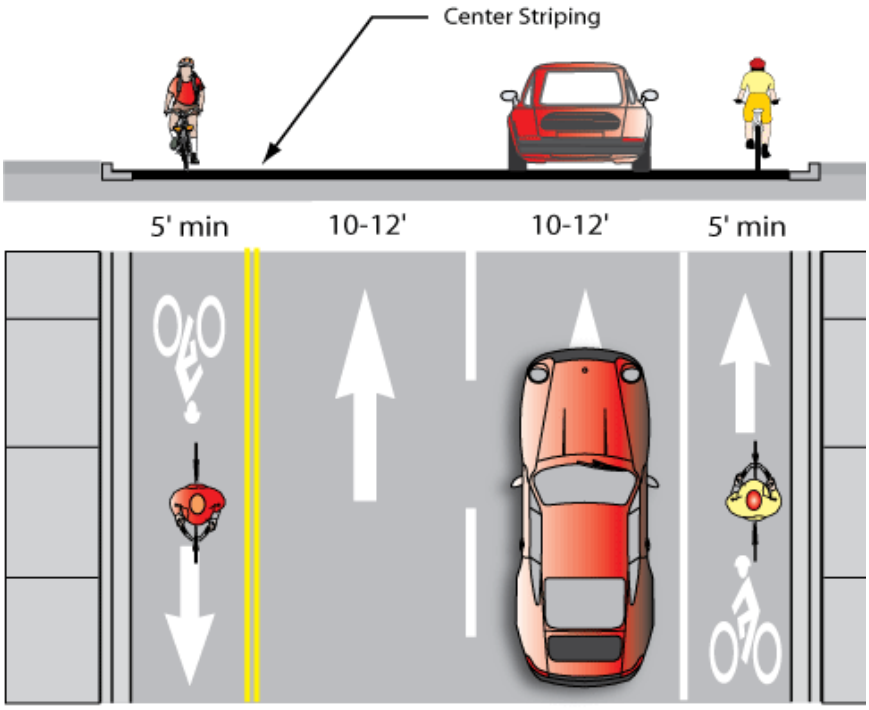
Contra-Flow Bicycle Lanes

Description

Contra-flow bicycle lanes entail a striped lane for bicycles going against the flow of automobile travel. The lanes should be separated by a double-yellow line. **Contra-flow bike lanes are not included in the *Highway Design Manual, Chapter 1000*.**

Contra-flow bike lanes are designated lanes that allow bicycles to move in the opposite direction of traffic on a one-way street. Functionally, streets with contra-flow bicycle lanes are set up so that motor vehicles can only move one way on the road, while bikes can move in both directions – with traffic or opposite traffic in the contra-flow lane.

Graphic



General Guidelines
Their implementation is controversial primarily because, contrary to standard road rules, they encourage cyclists to ride against motor-vehicle right of way, which can lead to increased bicycle/motor-vehicle crashes. However, in some circumstances, they may offer substantial savings in out-of-direction travel, by providing more direct routes. For popular destinations and high-use bikeways, a contra-flow lane can increase safety by reducing the number of bicyclists, and the number of conflicts, along the longer indirect route. Potential Applications: • Provides direct access to key destination; • Improves safety; • Infrequent driveways on bike lane side; • Bicyclists can safely and conveniently re-enter traffic at either end; • Sufficient width to provide bike lane; • No parking on side of street with bike lane; • Existing high bicycle usage of street; • Less than three blocks in length; or No other reasonable route for bicyclist. Contra-flow lanes are most successful on streets with few intersecting driveways, alleys or streets on the side of the lane; on streets where bicyclists can safely and conveniently re-enter the traffic stream at either end of the lane; on streets where a substantial number of bicyclists are already using the street; and on streets with sufficient width to accommodate a bike lane. Special features to incorporate into contra-flow bike lane design include the following. • The contra-flow bike lane must be placed on the right side of the street (to motorists' left) and must be separated from oncoming traffic by at least a double yellow line; vertical separation or grade separation is encouraged. This indicates that the bicyclists are riding on the street legally, in a dedicated travel lane. • Any intersecting alleys, major driveways, and streets must have signs indicating to motorists that they should expect two-way bicycle traffic. • Existing traffic signals should be fitted with actuators for bicyclists (i.e. loop detectors, video cameras, infrared or push buttons). • Existing traffic signals should be modified (if necessary) so that bicyclists traveling in the contra-flow direction can see the signal head, and any conflicting turn phasing shall be eliminated.

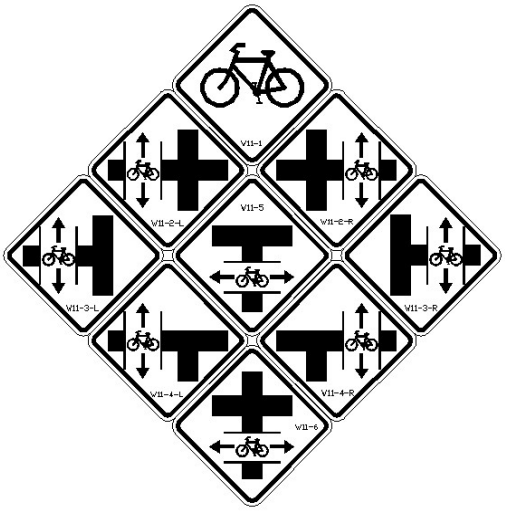
Innovative Signage

Description

Innovative signage can be developed for a number of reasons – as a standardized warning system, to assist with unique way-finding, or to help lend a sense of place to a community. Some innovative signage is developed to increase awareness that bicyclists may use the full travel lane and to alert motorists to the proper response. Any signs to be installed on public roadways in California must be approved by Caltrans.

New experimental designs can be utilized after approval. This continuing process of developing better way-finding or safety-warning signs is important for designing safer and more enjoyable bicycling facilities, as well as improving the overall transportation system.

Graphics



Experimental parallel path warning signage in Denver, CO

Experimental parallel path warning signage in Denver, CO

San Carlos, CA innovative sign

Innovative signage in Santa Cruz, CA

7.5 Bicycle Parking

As more bikeways are constructed and bicycle usage grows, the need for bike parking will increase. Short-term parking at shopping centers and similar land uses can support bicycling as well as long-term bicycle parking at transit stations, work sites and schools.

Bicycle parking should be installed on public property, or available to private entities on an at-cost basis. Bicycle parking facilities should be provided at other public destinations, including government buildings, community centers, parks, schools and shopping centers.

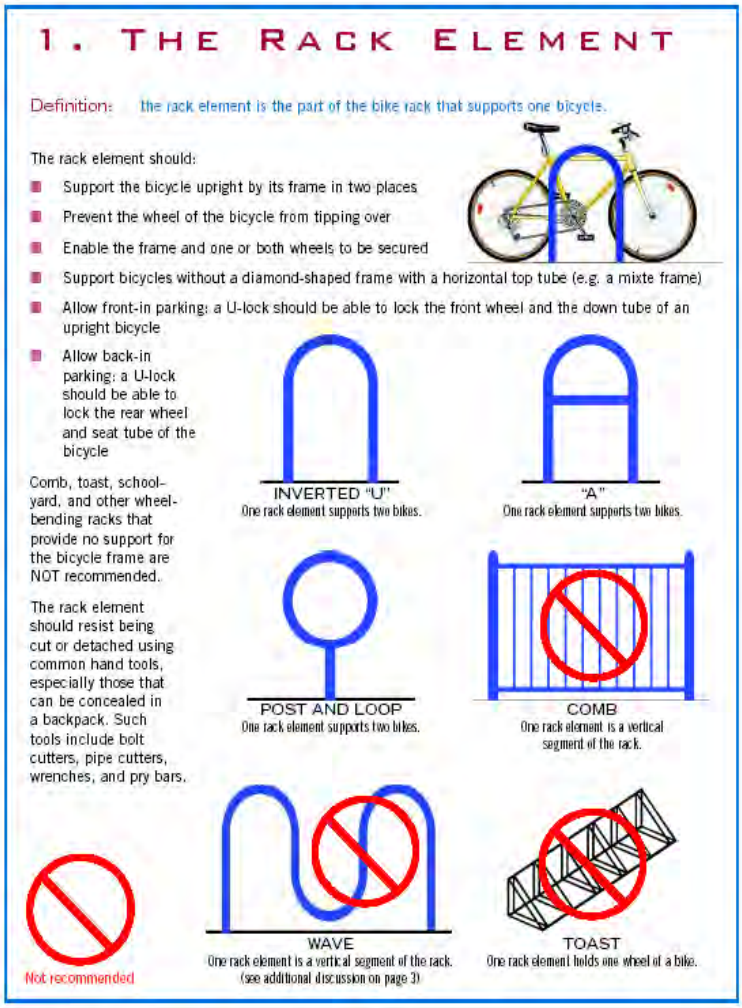
All bicycle parking should be in a safe, secure area visible to passersby. Commuter locations should provide secure indoor parking, covered bicycle corrals, or bicycle lockers. Bicycle parking on sidewalks in commercial areas should be provided according to specific design criteria, reviewed by merchants and the public, and installed as demand warrants.

Short Term Bicycle Parking

Description

Short term bicycle parking facilities are best used to accommodate visitors, customers, messengers and others expected to depart within two hours. Bicycle racks provide support for the bicycle but do not have locking mechanisms. Racks are relatively low-cost devices that typically hold between two and eight bicycles, allow bicyclists to securely lock their frames and wheels, are secured to the ground, and are located in highly visible areas. They are usually located at schools, commercial locations, and activity centers such as parks, libraries, retail locations, and civic centers.

Graphics



Bike Rack Recommendations

Source: Association of Pedestrian and Bicycle Professionals, 2002

Custom artistic racks

Inverted U rack

General Guidelines

Bicycle racks should be installed with the following guidelines in mind.

- The rack element (part of the rack that supports the bike) should keep the bike upright, supporting the frame in two places and allowing one or both wheels to be secured.
- Install racks so there is enough room between adjacent parked bicycles. If it becomes too difficult for a bicyclist to easily lock their bicycle, they may park elsewhere. A row of inverted "U" racks should be installed in parallel with 15 inches minimum between racks.
- Empty racks should not pose a tripping hazard for visually impaired pedestrians. Position racks out of the walkway's clear zone.

When possible, racks should be in a covered area protected from the elements. Long-term parking should always be protected.

Generally, 'U' type racks bolted into the sidewalk are preferred and should be located intermittently or in front of key destinations. Bicycle racks should be installed to meet ADA standards and not block pedestrian through traffic.

On-Street Bike Parking with Inverted U Racks

The City may want to consider custom racks that can serve not only as bicycle parking racks, but also as public artwork or as advertising for a specific business. The "post and ring" style rack is an attractive alternative to the standard inverted-U, which requires only a single mounting point and can be customized to have the city name or emblem stamped into the rings. These racks can also be easily retrofitted onto existing street posts, such as parking meter posts. While custom racks can add a decorative element and relate to a neighborhood theme, the rack function should not be overlooked: All racks should adhere to the basic functional requirement of supporting the bicycle by the frame (not only the wheel) and accepting a U-lock.

Long Term Bicycle Parking

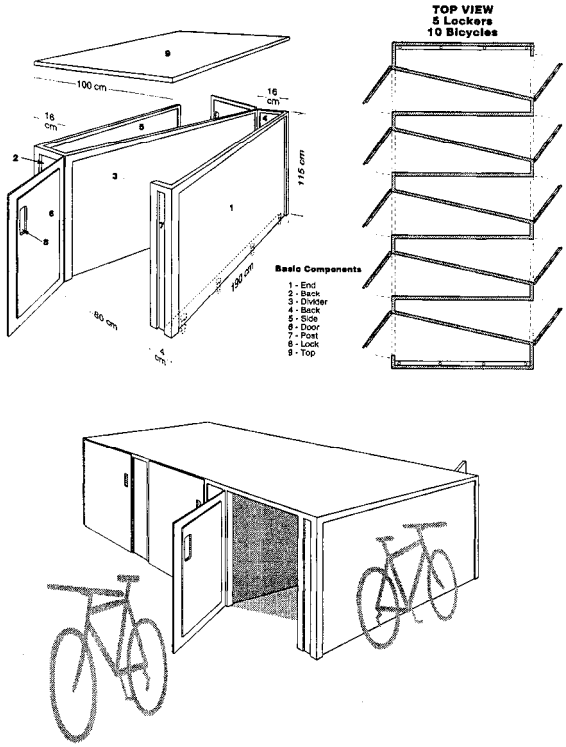
Description

For long-term parking, the cities may want to consider bicycle lockers. Bicyclists are usually more comfortable storing their bicycles in lockers for long periods because they offer increased security and protection from natural elements. Although they may be more expensive to install, they can make the difference for commuters deciding whether or not to bicycle.

Lockers can be controlled with traditional key systems or through more elaborate subscription systems. Subscription locker programs, like e-lockers, or park-by-phone systems allow even more flexibility within locker use. Instead of restricting access for each patron to a single locker, subscribers can gain access to all lockers within a system, controlled by magnetic access cards, or caller ID. These programs typically have fewer administrative costs because they simplify or eliminate key management and locker assignment.

Long-term bicycle parking facilities accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking should be provided in a secure, weather-protected manner and location. Long-term bicycle parking will either be a bicycle locker, or a secure area like a 'bike corral' that may be accessed only by bicyclists.

Graphic



Bike Locker Configuration

Source: Alta Planning + Design, 2000

Innovative High Volume Bicycle Parking

Description

In many locations, individual U-racks located on the sidewalk can be sufficient to meet bicycle parking demand. Where bicycle parking demand is higher, more formal structures and larger facilities need to be provided. Several options for high-volume bicycle parking are outlined below.

Graphic

Bike Oasis

Bike Corral in Portland, OR

Bike Station in Chicago, IL

General Guidelines

On-Street Bike Parking Corral:

A relatively inexpensive solution to providing high-volume bicycle parking is to convert one or two on-street motor vehicle parking spaces into on-street bicycle parking. Bike racks are installed in the street and protected from motor vehicles with removable curbs and bollards. These Bike Parking Corrals move bicycles off the sidewalks, and leave space for sidewalk café tables or pedestrians. Bicycle parking does not block sightlines like motor vehicles do, so it may be possible to locate bicycle parking in no-parking zones near intersections and crosswalks.

Bike Oasis:

In 2008, the City of Portland, Oregon began installation of several "Bike Oases" in commercial districts. These signature bicycle parking facilities are installed on curb extensions and consist of attractive covered bike parking and an information panel. Portland's Bike Oases provide parking space for ten bikes. Bike and walking maps are installed on the information panel.

Bike Stations:

Bike stations serve as one-stop bicycle service centers for bicycle commuters. They include 24-hour secure bicycle parking and may provide additional amenities such as a store to purchase items (helmets, raingear, tubes, patch kits, bike lights, and locks), bicycle repair facilities, showers and changing facilities, bicycle rentals, and information about biking. Some bike stations provide free bike parking, while others charge a fee or require membership.

Bike stations have been installed in several cities in California, including Long Beach, San Francisco, Los Angeles and Berkeley, as well as Chicago, and Seattle.

Valet Bike Parking:

The San Diego Padres currently provides bike parking in a pavilion at Sunday afternoon Padres games as does the San Diego County Bicycle Coalition (SDCBC) during other community events. To expand bike parking options, indoor locations for storing bicycles should be designed into future venues that host sporting events, festivals, and other events where large numbers of people gather.

In San Francisco, attended bicycle parking is provided at the AT&T Stadium, home of the San Francisco Giants. The bicycle valet sees between 100 and 180 bicycles per game on average (The stadium's capacity is 41,503). In addition to providing bicycle valet parking, the City and stadium heavily promote using alternative modes to get to the stadium, emphasizing that "if you drive you will get stuck in traffic."

Their valet parking system works much like a coat check: the bicyclist gives their bicycle to the attendant, who tags the bicycle with a number and gives the bicyclist a claim stub. The valet also will take non-motorized devices such as rollerblades, baby strollers and push scooters. When the bicyclist returns to get the bicycle, they present the claim stub and the attendant retrieves the bicycle for them. Locks are not needed. The valet is open from two hours before the game to thirty minutes after.

Riding To 2050: The San Diego Regional Bicycle Plan Evaluation Criteria Summary

The following is a summary of the evaluation criteria used to prioritize projects for inclusion in the Regional Bicycle Network identified in *Riding to 2050*. The criteria include three components:

1. Demand-based Criteria
2. Facilities-based Criteria
3. Cost-to-Nee d Ratio

Demand-based Criteria

Location in Metropolitan Center/Urban Center/Town Center Smart Growth Opportunity Areas

Facilities-based Criteria

1. Fills in facility gaps
2. Existence of funding for unbuilt segment
3. Crash density in project area
4. Number of public comments received regarding segment

Cost-to-Need Ratio

Cost-to-Need Ratio = (Demand-based score + Facilities-based score)/Cost weighted by facility type

MEMORANDUM

Date: 20 September 2013

To: Christine Eary, SANDAG

From: Matt Benjamin, Jeremy Klop & Michael Kennedy, Fehr & Peers

Subject: ***SR2T Station Typologies***

Ref: SD13-0086

This memorandum summarizes our recommended station context typological categories to be used to inform the development of contextually appropriate safe routes to transit (SR2T) enhancements.

SANDAG PLACE TYPOLOGIES

The SANDAG *Regional Comprehensive Plan* (RCP) identifies seven smart growth place types, and identifies existing and potential/planned locations of these place types in the region. These place types are identified both by minimum land use thresholds in terms of residential and employment densities (dwelling units per acre, employees per acre), as well as minimum levels of transit service in terms of transit type (commuter rail, bus rapid transit, local bus, etc.). The following table details the minimum residential and employment targets, and the minimum transit service characteristics of the seven smart growth place types:

Regional Comprehensive Plan Smart Growth Place Type Targets

Smart Growth Place Type	Minimum Residential Target	Minimum Employment Target	Minimum Transit Service Characteristics
Metropolitan Center	75 du/ac	80 emp/ac	Commuter Rail, Express Light Rail Transit (LRT), or Bus Rapid Transit (BRT)
Urban Center	40 du/ac	50 emp/ac	LRT or Rapid Bus
Town Center	20 du/ac	30 emp/ac	LRT, Rapid Bus, or Streetcar/Shuttle*
Community Center	20 du/ac	N/A	High-Frequency Peak-Period Local Bus or Streetcar/Shuttle within Urban Area Transit Strategy Boundary
Rural Village	10.9 du/ac	N/A	N/A
Special Use Center	Optional	45 emp/ac	LRT, Rapid Bus, or Peak BRT
Mixed-Use Transit Corridor	25 du/ac	N/A	High-Frequency Peak-Period Local Bus or Streetcar/Shuttle

Source: SANDAG Smart Growth Concept Map Site Descriptions, January 27, 2013

PROPOSED SR2T TYPOLOGIES

Because the need for pedestrian and bicycle access facilities varies from station to station based on the numbers and types of destinations around stations, the densities of the land uses around stations, as well as the density of the street network (concentrated or dispersed), the purpose of identifying station typologies in the context of the Safe Routes to Transit Regional Plan is to develop and target a set of access enhancements appropriate to the location, land use, and transit service context of a station for all of the Regional Transportation Plan (RTP) transit projects. We have identified three land use categories that consolidate the Smart Growth Place Type Categories, and two categories related to the density of the street network that inform the development of SR2T enhancements.

Land Use/Urban Context Categories

Land Use Intensity
Land use intensity is an important variable that affects the propensity for transit usage, as well as pedestrian and bicycle activity.

Centers
The presence of destinations (employment centers, special use centers like Universities) in a particular area will affect transit, pedestrian, and bicycle usage

Based on these variables, we propose grouping the following Smart Growth Place Type Targets as follows:

1. Metropolitan Center
2. Centers & Corridors
    a. Urban Center
    b. Town Center
    c. Community Center
    d. Special Use Center
    e. Mixed-Use Transit Corridor
3. Outside Centers
    a. Rural Village
    b. No designated Smart Growth Place Type

Street Network Density Categories

The density of the street network has a pronounced effect on the walkability and bikability of a station area. Stations located in areas with a dense street network with short blocks and frequent intersections, such as Downtown San Diego are typically much easier to get around on foot or by bicycle. In these areas, pedestrians and cyclists have choice in the direction they want to travel in, there are frequent signalized crossings, and there are few impediments in their route to and from a transit stop.

In suburban areas, the street network is less dense. Block lengths are much longer, there are far fewer signalized crossings, and the street network is often designed in a hierarchical fashion such that local streets within the residential subdivision are often windy, they feed into a collector road that all of the local streets load onto, and the collector connects with the arterial at one or two locations. Transit stops are typically located on the arterials, which may be close to a person's home geographically, but walking to the transit stop may require a much longer walk to navigate the hierarchical suburban street network.

This concentrated versus dispersed nature of the street networks in urban and suburban areas affects the types of SR2T access improvements needed. For example in a Downtown area with frequent signalized crossings, there are few locations that need additional signals. In contrast, in suburban areas where there are few signalized crossings, mid-block pedestrian crossings with signals or flashing beacons are one of the most important access improvements. We have therefore further classified the Land Use/Urban Context categories by the concentrated versus dispersed nature of the street network.

To determine the break point, Chen Ryan Associates conducted a GIS buffer analysis around each of the RTP project stations, to quantify the number of nodes (intersections), street miles, and area contained within a ½ mile walking distance from each station. We used the street miles variable to classify the street network density, because we found it to be the most reliable indicator of density of the three using GIS processes on the regional street center line shape file. We selected the median value for street miles in the Centers and Corridors category (median value of 8.6 street miles located within a ½ mile walking distance of a station) as the break point between the concentrated and dispersed categories

Recommended Classification

Based on the GIS analysis, the four proposed typologies include:

1. *Metropolitan Center*—The urban context for this typology is Downtown San Diego, with the highest density residential and employment in the region (minimum residential density of 75 dwelling units per acre; minimum employment density of 80 employees per acre). Street network densities are high, with frequent intersections, short blocks, and a grid street network. The following station is an example of this typology:

    - City College Trolley Station—The primary destination at this station is San Diego City College. The predominant land use around the station is mid to high density residential, as well as retail and office.

2. Centers & Corridors (Concentrated)—The urban context for this typology is community centers and corridors outside the Metropolitan Center that have a higher concentration of residential and/or employment than surrounding areas, as well more sub regional destinations. These include are universities, town centers, and other community centers.

Minimum residential densities range from 20 to 40 dwelling units per acre, and minimum employment densities range from 30 to 50 employees per acre, for centers that are employment focused. The street network density is still relatively high. Examples of this typology include existing and proposed station areas in North Park, Uptown, and La Jolla. The following station is an example of this typology:

- Encinitas Coaster Station—The context of this station is Downtown Encinitas with low to mid density retail and residential. The high density street network is characterized by short blocks in a grid-pattern with frequent intersections.

3. Centers & Corridors (Dispersed)—The urban context for this typology is described above, but the street network density is below 8.6 street miles within the ½ mile station area. The following station is an example of this typology:

    - Planned Mid-Coast Trolley Executive Drive Station at Genesee Avenue & Executive Drive—The context of this station located in the University Town Center area is mid and high density office and residential, as well as the UTC regional shopping center. Most of the developments are located on long blocks with limited pedestrian crossings.

1. Outside Centers—The urban context for this typology includes much of the San Diego region. These are areas with lower density (well less than 20 dwelling units per acre) with limited or no employment. Most of these areas have not been categorized as a Smart Growth Opportunity Area, though select locations have been classified as the Rural Village place type. The street network is predominantly low density in these areas. The following station is an example of this typology:

    - Planned Bus Rapid Transit Route 688 Stop at Lusk Boulevard & Barnes Canyon Road—The context of this station located in the University Town Center area is low to mid density office park development, with limited retail services and extensive surface parking. There are few signalized crossings, and very long arterial blocks.

Table 1 summarizes the distribution of the SANDAG region station and stops by land use center and regional versus local transit service. Of the 528 stations in the RTP transit projects network, 10% of them are the Metropolitan Center typology, 28% are Centers & Corridors Concentrated, 26% are Centers & Corridors Dispersed, and 36% are Outside Centers.

TABLE 1 STATION/STOP TYPOLOGY DISTRIBUTION

	Combined Smart Growth Place Type					
	Metropolitan Center		***Centers & Corridors***		***Outside Centers***	
Transit Service Type	**Stops/ Stations**	**%**	**Stops/ Stations**	**%**	**Stops/ Stations**	**%**
Concentrated	55	10%	147	28%	188	36%
Dispersed			138	26%		

Sources: SANDAG shapefiles; analysis by Chen Ryan Associates and Fehr & Peers

Special Cases

Transit Centers

There are several transit centers in the San Diego region, most notably Santa Fe Depot, where a variety of local and regional services come together. These centers may have high levels of transfer activity, but lower levels of pedestrian and bicycle access, or may have levels of both transfer activity and pedestrian and bicycle access. They may draw from a large catchment area than other stations and stops, due to the number of available transit service choices.

Due to the unique transit service context of transit centers, their access needs may draw from strategies for both Local Access and Regional Access typologies. The special characteristics will be accounted for as access concepts are developed.

End of Line Stations

End of line rail and Express Bus/BRT stations/stops, such as the San Ysidro Trolley Station have the potential for drawing from a longer catchment area than interim stations, drawing from areas where riders may travel longer distances to ride higher quality transit. Access modes may include park and ride, but could potentially include longer distance bicycle access as well. Special characteristics will be accounted for as access concepts are developed.

Image via Flickr.com/THE Holy Hand Grenade!

STATION AREA TYPOLOGY

METROPOLITAN CENTER // CONCENTRATED ACCESS

CITY COLLEGE TROLLEY STATION

* PROJECT ID: #### // PARK BLVD AND BROADWAY

SRTT Typology: Metropolitan Center - Concentrated Access

Jurisdiction: City of San Diego (Civic San Diego)

2050 RTP/SCS Transit Project: SDSU to Downtown Trolley via El Cajon Boulevard/Park Avenue, Downtown Tunnel

Smart Growth Opportunity Areas: Metropolitan Center, SD-CC-1; San Diego Downtown (Centre City)

SRTS: San Diego High School, San Diego Early Middle College

DESCRIPTION

As a regional center, downtown San Diego contains the administrative, legal, government, business, entertainment, and cultural center, with the largest centralized, high-density housing in the region. The Downtown Community Plan contains designated land uses that will allow people to live and work near transit in pedestrian-friendly neighborhoods and will support up to 165,000 jobs and a residential population of 90,000 people. Many destinations are located within downtown San Diego, including San Diego City College, adjacent to the City College Trolley Station. The predominant land use around the station, aside from City College, is mid- to high-density residential, as well as retail and office. Street network densities are high, with frequent intersections, short blocks, and a grid street network.

Transit service at the station is provided by the Orange and Blue Trolley lines, which connect the station as far as El Cajon and San Ysidro, as well as Santa Fe Depot in downtown San Diego. Peak period service frequency on the Orange Line is generally 15 minutes, and it is eight minutes on the Blue Line. City College Station is also an important bus transfer station, with local and express bus service that connects the station to close destinations like North Park, and farther destinations like Mira Mesa.

Because of the proximity of most destinations to the stations, the short, walkable nature of the City College Station vicinity, most station access is likely to be on foot, so most of the proposed access improvements focus on enhancing pedestrian safety, amenity, and wayfinding. However, many of downtown's key destinations, such as Petco Park or the Gaslamp Quarter, are a long walk, but convenient bike ride, so select bicycle access enhancements are also proposed.

Schools in thie station vicinity include San Diego High School and San Diego Early Middle College. The recommendations that follow could serve as SRTS improvements for these schools.

AROUND THE STATION

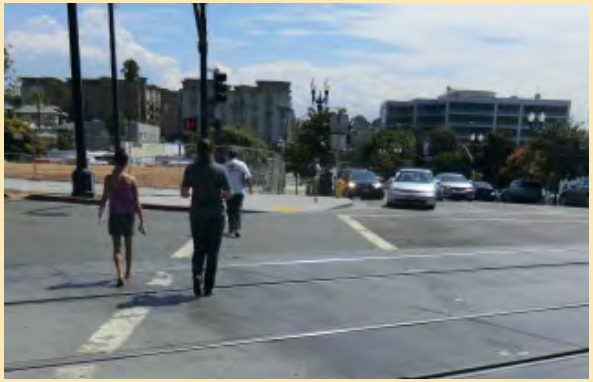
The area immediately surrounding the City College Trolley Station contains a variety of pedestrian and bicycle amenities that connect the urban fabric of the neighborhood with San Diego Blue/Orange Line Trolley.

The majority of intersections within a quarter-mile distance of the station platform are signalized (85%), providing pedestrians with protected crossing opportunities. Some stop-controlled intersections exist, and no uncontrolled intersections are within the station area. Many intersections—both signalized and stop-controlled—do not provide marked pedestrian crosswalks.

OBSERVED PEDESTRIAN & BICYCLIST NEEDS & OPPORTUNITIES

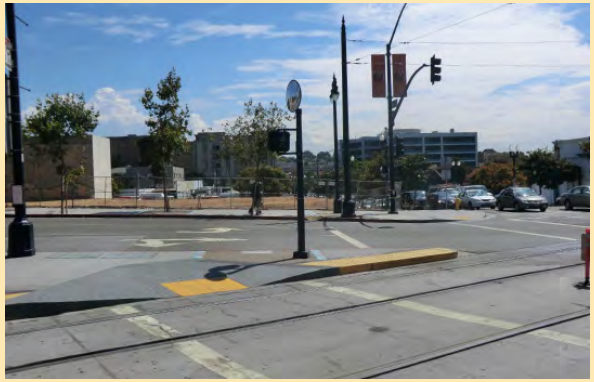
1 Crosswalks are unmarked or striped with white parallel crosswalks; opportunity to provide high visibility crosswalk markings.

2 Visible signage for nearby bus stops would help trolley passengers find connections more easily. Pedestrian and biycle wayfinding signage for area destinations could be enhanced.



3 Visual differentiation of locations where Trolley routes intersect pedestrian crossings would enhance pedestrian safety.

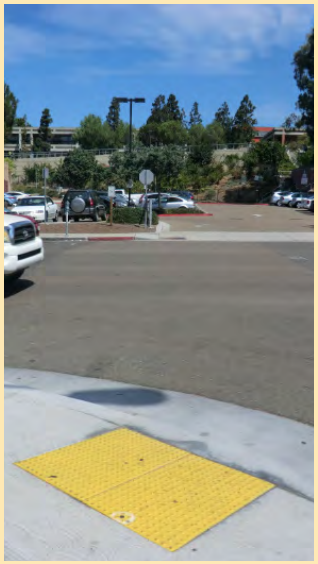
4 Covered, secure bicycle parking at the station would help encourage bike access to transit.



5 Pedestrian crossings could be reduced to single stage crossings, to optimize convenience for pedestrians.

6 Placement of street furnishings, street lights, and bus stops could be reconsidered to maximize sidewalk space for pedestrians, particularly those with disabilities.

7 Directional curb ramps would enhance safety for pedestrians by keeping them further from the path of vehicles in the intersection.



8 Wide intersection crossings at Park Boulevard & B Street could be reconsidered to include traffic calming and higher visibility for pedestrians.

Transit Service and Demographics

Existing Trolley Riders	Existing Bus Riders (1/4 mi)	Population (1/4 mi)	Employment (1/4 mi)
14,790	6,946	34,233	15,489

Places to Walk to

- San Diego City College
- San Diego High School
- San Diego Early Middle College

Existing Pedestrian Facilities

- 46 Total Intersections
- 39 Signalized Intersections (85%)
- 7 Stop-Controlled Intersections (15%)
- 0 Uncontrolled Intersections (0%)

Places to Bike to

- Petco Park
- Gaslamp Quarter
- Balboa Park
- Westfield Horton Plaza

Regional Transit Connections

- Orange & Blue Line Trolley
- Routes 2, 5, 7, 15, 20, 210, 510, 520, 929, and 992

Bicycle Facilities

- Existing Bicycle Lanes: None
- Planned Bicycle Lanes: 8th Ave, B St, C St, and Park St North of B St
- Existing Bike Paths: None
- Planned Bike Paths: None
- Existing Bicycle Parking: Two circular racks on the east side of Park Boulevard across from the station. Two triangular racks on Broadway along the southern end of the station

Sidewalks are generally accommodating of pedestrians, although occasionally "pinch points" exist where the usable pedestrian throughway becomes cluttered with street furniture, street trees, utility poles, and other items. A few notable areas lack street trees and the shaded canopy they provide walkers.

Some bicycle infrastructure exists in the form of a bike route along B Street, and other bikeways are planned as part of the City of San Diego's July 2013 Final Draft Bicycle Master Plan, which includes future bike lanes on 8th Avenue, B Street, C Street, and Park Street North of B Street, as well as bike routes on parts of 14th St and Park Street.

Nearby desinations (the Gaslamp Quarter, Petco Park, Westfield Horton Plaza, and the San Diego Convention Center) are accessible to the south and west. Interstate 5, which abuts the north and eastern sides of the station area, inhibits through pedestrian and bicycle travel in these directions, although Balboa Park to the north is accessible via Park Boulevard, where a bike lane is planned and sidewalks exist.

STATION AREA EXISTING CONDITIONS MAP

RECOMMENDED IMPROVEMENTS

- Add crosswalks for all intersections within the quarter-mile station area
- Add curb extensions to the corners of eight intersections immediately adjacent to the station, within the designated focus area (see map)
- Introduce north/south and east/west bikeways for increased connection to destinations in these directions.
- Locate additional bike parking at the City College station
- Install wayfinding signage at the City College station, and continue appropriate signage along pathways to key destinations
- Consider cycle tracks on Park Boulevard, Broadway, B Street, C Street, or 8th Street

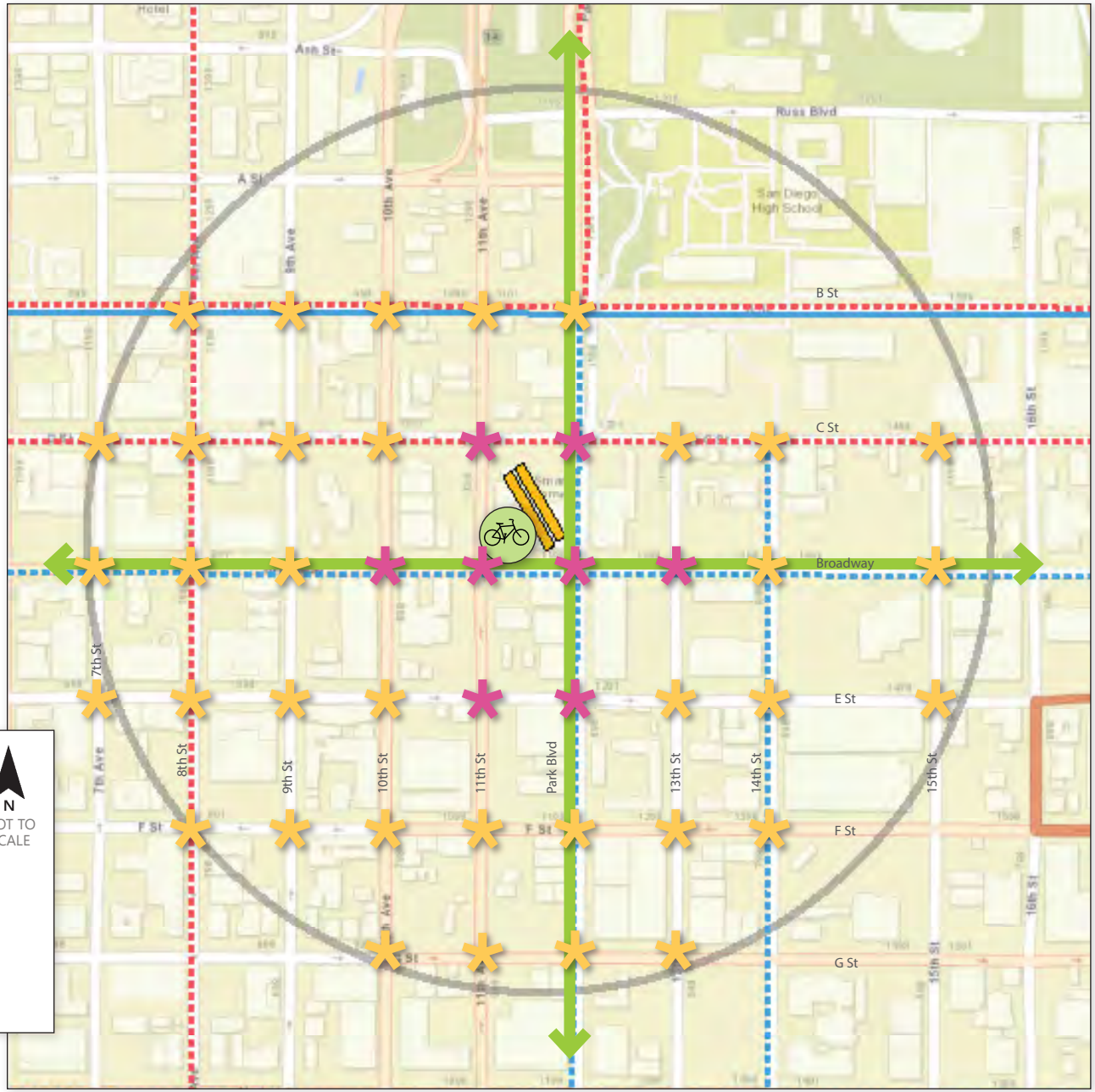
OTHER OPPORTUNITIES

- Downtown San Diego Complete Streets Mobility Plan
- City of San Diego Bikeshare program

Improvement Cost Breakdown

Measure	Quantity	Total Cost Low	Total Cost Medium	Total Cost High
Pedestrian				
Signal Modification (Protected Lefts)	4 Locations	$168,000	$168,000	$168,000
Ped Scramble Phase	4 Locations	$20,000	$20,000	$20,000
Countdown Pedestrian Signalhead	10 Intersections	$64,000	$72,000	$88,000
High-Visibility Crosswalk	40 Intersections	$96,000	$128,000	$160,000
Directional Curb Ramps (including truncated domes)	8 Intersections	$256,000	$288,000	$320,000
Sidewalk Reconstruction	20,000 SF	$180,000	$240,000	$300,000
Curb/Gutter Reconstruction	2,000 LF	$70,000	$80,000	$90,000
Street Trees	8 Blocks	$192,000	$320,000	$512,000
Pedestrian Street Lighting	8 Blocks	$320,000	$480,000	$544,000
Pedestrian Wayfinding Signs	16 Signs	$12,000	$14,400	$16,000
Subtotal Pedestrian		**$1,378,000**	**$1,810,400**	**$2,218,000**
Bicycle				
Bike Parking	32 Spaces	$8,000	$16,000	$32,000
Bike Destination Wayfinding Signs	16 Signs	$12,000	$14,400	$16,000
One-Way Cycle Track (Striped Buffer)	1.5 Miles	$1,243,440	$1,702,800	$2,316,600
One-Way Cycle Track (Raised Median)	0.5 Miles	$447,163	$817,740	$1,111,440
Class II Bike Lanes (including signing & striping)	2 Miles	$26,667	$37,594	$49,421
Class III Sharrows (including signing & striping)	2 Miles	$11,827	$18,586	$24,077
Bike Signal (added to existing signalized intersection)	4 Bike Signals	$200,000	$300,000	$400,000
Subtotal Bicycle		**$1,950,098**	**$2,907,119**	**$3,949,538**
Traffic Calming				
Curb Extensions (w/ directional curb ramps)	8 Intersections	$240,000	$300,000	$360,000
Neighborhood Traffic Circles	2 Traffic Circles	$14,200	$26,000	$36,470
Diverters (Use similar assumption to Median Refuge)	1 Diverter	$3,600	$5,000	$6,000
Subtotal Traffic Calming		**$257,800**	**$331,000**	**$402,470**
Construction Cost Subtotal		$3,585,898	$5,048,519	$6,570,008
Contingencies				
Construction Contingency		$717,180	$1,009,704	$1,314,002
Planning/Design/Environmental		$537,885	$757,278	$985,501
Construction Engineering		$358,590	$504,852	$657,001
Total Including Contingencies (Rounded to Nearest $1,000)		**$5,200,000**	**$7,320,000**	**$9,527,000**

RECOMMENDATION MAP*



LEGEND

- Station Area
- Existing/Planned Bike Route
- Planned Bike Lane
- Key Station Bicycle Connection
- Candidate Location for High-Visibility Crosswalk
- Candidate Location for Curb Extensions, Pedestrian Scramble Phases, or Other Enhanced Pedestrian Measures
- Additional Bicycle Parking

N
NOT TO SCALE

Wide-ranging recommendations or those that are not location-specific are not shown

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Image via Flickr.com/THE Holy Hand Grenade!

STATION AREA TYPOLOGY

CENTERS & CORRIDORS // CONCENTRATED ACCESS

BOULEVARD TRANSIT PLAZA

* PROJECT ID: #### // EL CAJON BLVD & I-15

SRTT Typology: Centers & Corridors - Concentrated Access

Jurisdiction: City of San Diego

2050 RTP/SCS Transit Project: SDSU to Downtown Trolley via El Cajon Boulevard/Park Avenue

Smart Growth Opportunity Areas: Town Center, SD-CH-1, San Diego City Heights; Mixed-Use Transit Corridor, SD-NP-2 El Cajon Boulevard from Park Boulevard to 79th Street

SRTS: Wilson Middle School, Arroyo Paseo Charter High School, Central Elementary, Our Lady of Sacred Heart School, America's Finest Charter School

DESCRIPTION

This town center area, which also spans the southern portions of Normal Heights and Kensington, includes El Cajon Boulevard and University Avenue, which are existing commercial and mixed-use corridors that provide east-west transit access across Mid-City. The predominant land use is one and two story single and multi-family residential, and one and two story commercial uses on El Cajon Boulevard.

This transit corridor area spans from greater North Park, the Mid-City communities of City Heights, Normal Heights, Kensington-Tallmadge, and the eastern area to the City's boundary line in College area. It is designated for commercial and mixed-use from 55 (and up to 110) dwelling units per acre in the greater North Park Plan and commercial and mixed-use at 29 (and up to 73) dwelling units per acre at major nodes in the Mid-City Communities Plan. Several infill, mixed-use developments along the corridor are in the development pipeline. El Cajon Boulevard serves as a major east-west transit corridor for all of the communities along the corridor.

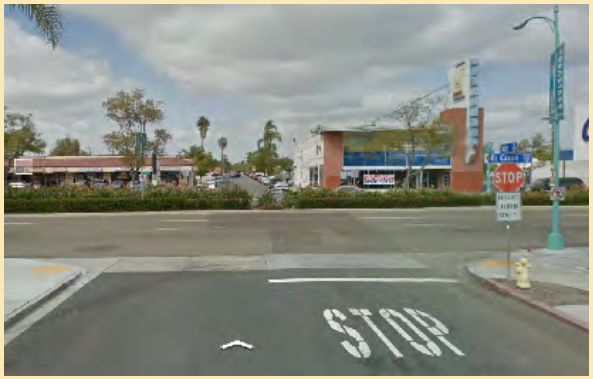
Existing transit service in the area includes routes 210 and 960, which operate commuter services on the 15 freeway and provide express service to/from Downtown, Kearny Mesa, Scripps Ranch, and other points north (Route 210), and UTC, Kearney Mesa, and the Euclid Avenue Orange Line Trolley Station (Route 960). Routes that operate on arterial streets include Route 1, which runs on El Cajon Boulevard between Hillcrest and La Mesa; Route 7, which operates on University Avenue through City Heights, North Park, Balboa Park and Downtown; Route 10 which operates on University Avenue, with service to the Old Town Transit Center; Route 11, which runs on Adams Avenue in the vicinity of the station, connects to the SDSU Transit Center, Hillcrest, Downtown, and out to the east to Logan Heights and Paradise Hills.

Station area schools include Wilson Middle School, Arroyo Paseo Charter High School, Central Elementary School, Our Lady of Sacred Heart School, and America's Finest Charter School. The recommendations that follow could serve as SRTS improvements for these schools.

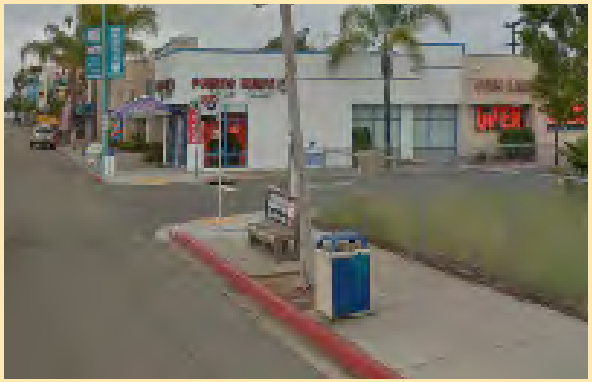
OBSERVED PEDESTRIAN & BICYCLIST NEEDS & OPPORTUNITIES

1 Protected mid-block crossing opportunities could help mitigate the long spacing between signalized intersections across El Cajon Blvd.

2 Pedestrian access to the Boulevard Transit Plaza requires crossing several lanes of traffic, including freeway ramps; improvements could minimize crossing distances and enhance safety.



3 Medians on El Cajon Blvd. provide opportunities to add mid-block pedestrian refuge if new crossings are added.



4 Sidewalks could be widened to eliminate pinch points at several locations, including at bus stops. Bus stops could be enhanced with amenities at most locations.

5 Uncontrolled pedestrian crossings near schools could be upgraded with more visible striping, better signage, and other pedestrian enhancements like RRFBs. Opportunity to leverage access improvements that will serve both the station and area schools.

6 Crosswalks could be provided at stop-controlled intersections, which make up the majority the intersections in the station area.

7 Orange Ave is a designated bike route, and could benefit from facilities (such as sharrows, enhanced signage, etc.) to indicate that it is an active bike route.

8 A limited number of inverted U-racks are provided for bike parking at the Transit Plaza. Visibility of the bike parking from the street is limited.

Transit Service and Demographics

Existing Trolley Riders	Existing Bus Riders (1/4 mi)	Population (1/4 mi)	Employment (1/4 mi)
N/A	1,079	42,071	6,087

Places to Walk to

- Boulevard Transit Plaza
- Wilson Middle School
- Arroyo Paseo Charter High School
- Central Elementary School
- Our Lady of Sacred Heart School
- America's Finest Charter School

Existing Pedestrian Facilities

- 25 Total Intersections
- 5 Signalized Intersections (20%)
- 20 Stop-Controlled Intersections (80%)
- 0 Uncontrolled Intersections (0%)

Places to Bike to

- Ward Canyon Neighborhood Park
- Balboa Park
- San Diego State University
- City Heights Community Recreation Center

Regional Transit Connections

- Routes 1, 15, 210, and 960

Bicycle Facilities

- Existing Bicycle Lanes: None
- Planned Bicycle Lanes: El Cajon Blvd
- Existing Bike Path: None
- Existing Bicycle Parking: Inverted U-Racks at Boulevard Transit Plaza

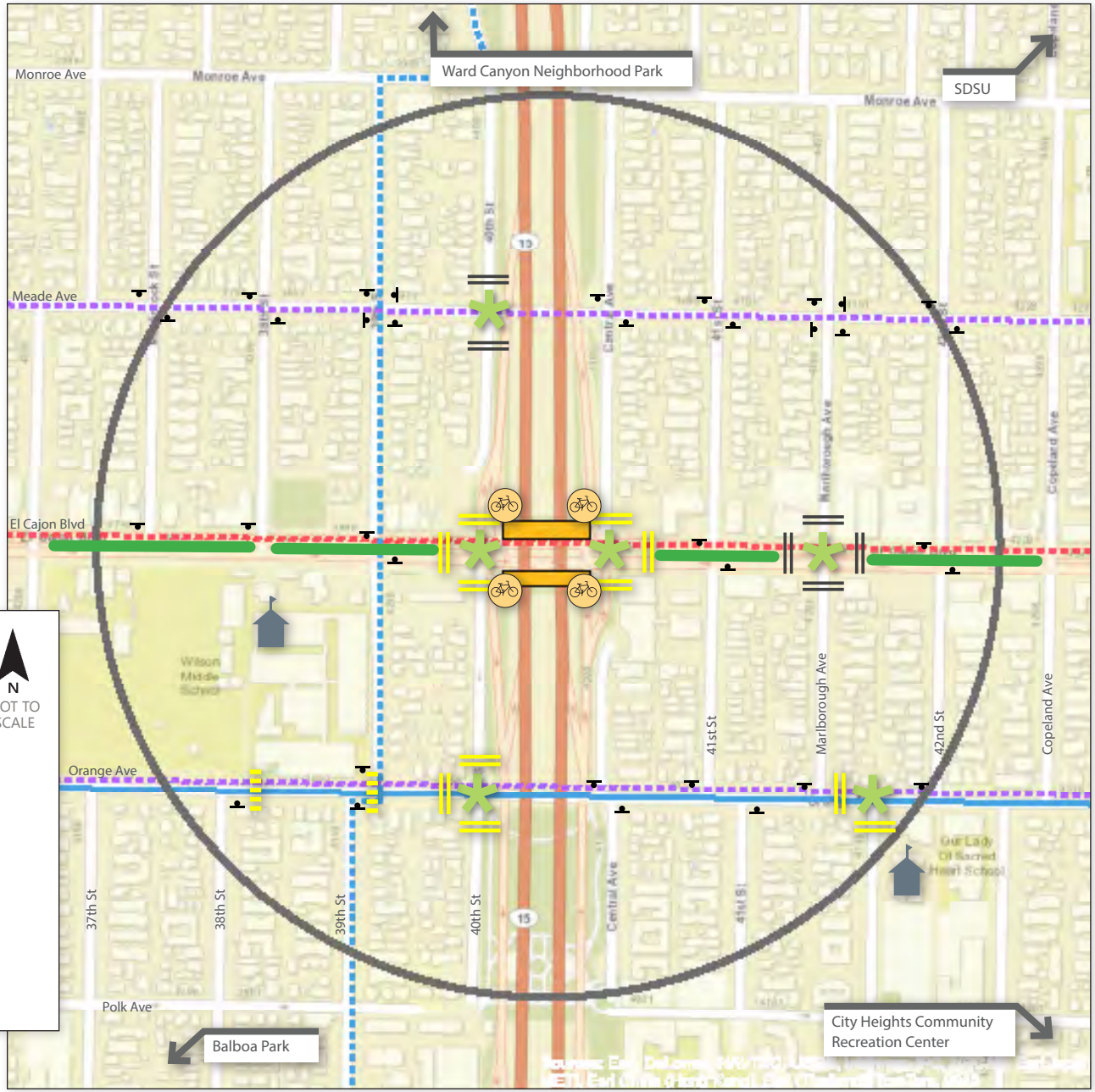
AROUND THE STATION

The area immediately around the Boulevard Transit Plaza provides relatively short block lengths, but only 20% of the intersections are signalized, so protected pedestrian crossing opportunities are spaced out relatively far given the number of intersections in this station area. All signalized crossings have striped crosswalks, most of which are striped yellow, because of their proximity to several schools in the station area. There are a few additional crosswalks at uncontrolled locations striped with high-visibility yellow ladder striping adjacent to station area schools.

Sidewalks are generally accommodating of pedestrians, although "pinch points" exist where the usable pedestrian space is hindered by street furnishings, bus stop benches, street trees, utility poles, and other items. A few notable areas lack street trees and the shaded canopy they provide walkers.

Orange Avenue through the station area is a designated bicycle route. It is planned to be upgraded to a bicycle boulevard per the City of San Diego Bicycle Master Plan Update and was identified as a high-priority regional bike corridor by SANDAG. A bicycle lane is planned on El Cajon Boulevard per the City's bike plan, and it was identified as a candidate location for cycle track in SANDAG's North Park/ Mid-City Regional Bike Corridors Study. A bicycle boulevard is planned on Meade Avenue, and a bicycle route is planned on 39th Street. The proposed Safe Routes to Transit improvements that follow would connect directly with the Regional Bike Network projects that will be built in the area.

STATION AREA EXISTING CONDITIONS MAP



*Limited tree canopy throughout site

RECOMMENDED IMPROVEMENTS

- Add crosswalks for 16 intersections located closest to the station that currently lack them
- Install a new traffic signal, rectangular rapid flashing beacons, and curb extensions, for key unsignalized intersections that will be used for pedestrian access
- Improve the street tree canopy and lighting on the blocks closest to the station
- Locate additional bike parking at the station
- Install wayfinding signage at the City College station, and continue appropriate signage along pathways to key destinations
- Upgrade planned bike lanes on El Cajon Boulevard to a separated cycle track

OTHER OPPORTUNITIES

- City of San Diego Bicycle Master Plan
- City of San Diego Bikeshare program
- North Park Mid-City Regional Bike Corridor project

Improvement Cost Breakdown

		Total Cost		
Measure	Quantity	Low	Medium	High
Pedestrian				
New Traffic Signal	1 Intersection	$175,000	$200,000	$250,000
RRFB Flashing Beacon (Solar)	2 Locations	$20,000	$24,000	$28,000
High-Visibility Crosswalk	16 Intersections	$38,400	$51,200	$64,000
Directional Curb Ramps (including truncated domes)	4 Intersections	$128,000	$144,000	$160,000
Sidewalk Reconstruction	20,000 SF	$180,000	$240,000	$300,000
Curb/Gutter Reconstruction	2,000 LF	$70,000	$80,000	$90,000
Street Trees	4 Blocks	$96,000	$160,000	$256,000
Pedestrian Street Lighting	4 Blocks	$160,000	$240,000	$272,000
Pedestrian Wayfinding Signs	16 Signs	$12,000	$14,400	$16,000
Subtotal Pedestrian		**$879,000**	**$1,153,600**	**$1,436,000**
Bicycle				
Bike Parking	16 Spaces	$4,000	$8,000	$16,000
Bike Destination Wayfinding Signs	8 Signs	$6,000	$7,200	$8,000
One-Way Cycle Track (Striped Buffer)	1.5 Miles	$1,657,920	$2,270,400	$3,088,800
Class II Bike Lanes (including signing & striping)	3 Miles	$41,501	$56,390	$74,131
Class III Sharrows (including signing & striping)	2 Miles	$11,827	$18,586	$24,077
Bike Signal (added to existing signalized intersection)	1 Bike Signal	$50,000	$75,000	$100,000
Subtotal Bicycle		**$1,771,248**	**$2,435,576**	**$3,311,008**
Traffic Calming				
Median Refuge Islands	2 Locations	$14,400	$20,000	$24,000
Curb Extensions (w/ directional curb ramps)	8 Intersections	$240,000	$300,000	$360,000
Neighborhood Traffic Circles	1 Traffic Circle	$7,100	$13,000	$18,235
Diverters (Use similar assumption to Median Refuge)	1 Diverter	$3,600	$5,000	$6,000
Subtotal Traffic Calming		**$265,000**	**$338,000**	**$408,235**
Construction Cost Subtotal		$2,915,748	$3,927,176	$5,155,243
Contingencies				
Construction Contingency		$583,150	$785,435	$1,031,049
Planning/Design/Environmental		$437,362	$589,076	$773,286
Construction Engineering		$291,575	$392,718	$515,524
Total Including Contingencies (Rounded to Nearest $1,000)		**$4,228,000**	**$5,694,000**	**$7,475,000**

RECOMMENDATION MAP*

**Wide-ranging recommendations or those that are not location-specific are not shown*

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Image via Flickr.com/THE Holy Hand Grenade!

STATION AREA TYPOLOGY

CENTERS & CORRIDORS // DISPERSED ACCESS

GENESSEE / EXECUTIVE STATION

* PROJECT ID: #### // EXECUTIVE DR & GENESEE AVE

SRTT Typology: Centers & Corridors - Dispersed Access

Jurisdiction: City of San Diego

2050 RTP/SCS Transit Project: Mid-Coast LRT Extension

Smart Growth Opportunity Areas: Urban Center, SD-UN-2, San Diego University City

SRTS: La Jolla Country Day School, Nierman Preschool

DESCRIPTION

Adjacent to the University of California at San Diego and its related facilities and associated institutions, San Diego University City is home to the highest density and intensity of office, commercial, and residential uses and medium-high and mid- to high-rise office towers. As of 2012, numerous development projects have been approved for the area, including 750,000 square feet of neighborhood and community-serving commercial and 800 residential units in high- and mid-rise towers. Street network densities are lower than in some other urban areas, with long blocks, somewhat infrequent intersections, and a meandering street network. Nearby destinations include University of California-affiliated centers and institutions, the university itself, and the popular Westfield University Towne Center shopping mall.

Current transit operations in the area include bus routes 31, 960, and 979, as well as a number of local shuttles operated by UCSD and nearby private businesses. Some of these shuttles connect to the Sorrento Valley Coaster Station to the north of the station area. Commuter rail trains leaving this station reach as far north as Oceanside, where a connection to Metrolink trains is available, and as far south as Santa Fe Depot in Downtown San Diego.

The Mid-Coast LRT Extension, an extension of SDMTS's San Diego Trolley, is planned to serve the area in the future, with service slated to start in 2018. The SANDAG Board approved the Locally Preferred Alternative (LPA) for the route in July 2010, which calls for a median-running section on Genesee Avenue terminating at the Westfield University Towne Center transit center.

Schools in the station vicinity include La Jolla Country Day School and Nierman Preschool. The recommendations that follow could serve as SRTS improvements for these schools.

AROUND THE STATION

Currently, the area immediately around the intersection of Genessee Avenue and Executive Drive displays some pedestrian and bicycle amenities. Genessee Drive contains both northbound and southbound bike lanes that connect to other nearby bicycle facilities, including existing lanes on Eastgate Mall and Regents Road. Other connecting bikeways are planned, including a bike path originating on the north side of Eastgate Mall.

The majority of intersections within a quarter-mile distance of the station are signalized (73%), providing pedestrians with protected crossing opportunities at the limited number of intersections in the station area.

OBSERVED PEDESTRIAN & BICYCLIST NEEDS & OPPORTUNITIES

1 Improvements could include shortening long crossing distances for pedestrians crossing Genessee Avenue and La Jolla Village Drive.

2 Protected mid-block crossings could mitigate long blocks to present more street crossing opportunities.

3 Crosswalk striping paint is thinly worn and difficult to see in places, and could be refreshed to provide better visibility for pedestrians crossing.

4 Elevated pedestrian bridges provide pedestrian crossing opportunities, but convenience could be improved by at-grade crosswalks at intersections and mid-block locations.

5 Protection could be provided for bike lanes on Genessee Ave, Eastgate Mall, and Regents Road, since high traffic volumes create conflicts.

6 Pedestrian access is limited to driveways, presenting a conflict area.

7 Transit stops need amenities such as shade and bicycle parking, and the bus bench could be placed so as not to intrude into pedestrian travel space.

8 A buffer between pedestrians and moving traffic could help mitigate the lack of on-street parking and attached sidewalks.

Transit Service and Demographics

Existing Trolley Riders	Existing Bus Riders (1/4 mi)	Population (1/4 mi)	Employment (1/4 mi)
N/A	709	23,505	9,767

Places to Walk to

- Mandell-Weiss Eastgate City Park
- Friedenberg Olympic Pool
- Westfield University Towne Center
- La Jolla Country Day School
- Nierman Preschool

Existing Pedestrian Facilities

- 11 Total Intersections
- 8 Signalized Intersections (73%)
- 2 Stop-Controlled Intersections (18%)
- 1 Uncontrolled Intersection (9%)

Places to Bike to

- University of California San Diego
- Westfield University Towne Center

Regional Transit Connections

- Routes 31, 201, 202, 960, 979
- UTC Transit Center
- Sorrento Valley Coaster Station – 2.5 miles northwest. Accessible via UCSD Coaster East Shuttle
- Planned Mid-Coast LRT Extension

Bicycle Facilities

- Existing Bicycle Lanes: Genesee Avenue; Regents Road south of Eastgate Mall; Eastgate Mall
- Planned Bike Lane: La Jolla Village Drive
- Planned Bike Path: Extending North of Eastgate Mall
- Existing Bicycle Parking: None

Some intersections lack crosswalks, however. The intersection of Genessee Avenue and Executive Drive itself has a single crossing on the eastern leg. However, east-west pedestrian travel is made possible by an overhead pedestrian bridge connecting the two sides of the street. Such bridges exist in two other locations within the quarter-mile station area. While these bridges provide separation of pedestrian and auto travel, they require more time and effort to use than traditional crosswalks.

Sidewalks are generally accommodating of pedestrians, although they are in places narrow, and bus stops generally occupy sidewalk space. Wider, higher traffic streets largely lack a defined street canopy that provides shade to the sidewalk and pedestrians passing by. In places, trees on private parcels abut the sidewalk, but many of these trees do not provide direct shade to pedestrians on the public right-of-way.

STATION AREA EXISTING CONDITIONS MAP

RECOMMENDED IMPROVEMENTS

- Add crosswalks for all intersections within the quarter-mile station area
- Install rectangular rapid flashing beacons, curb extensions, and median refuge islands at key mid-block locations close to the proposed station
- Locate bike parking at the proposed station
- Enhance bicycle facilities at key north/south and east/west connections, including consideration for cycle tracks on Genessee Avenue, La Jolla Village Drive, or other station area corridors
- Install wayfinding signage at the Executive station, and continue appropriate signage along pathways to key destinations

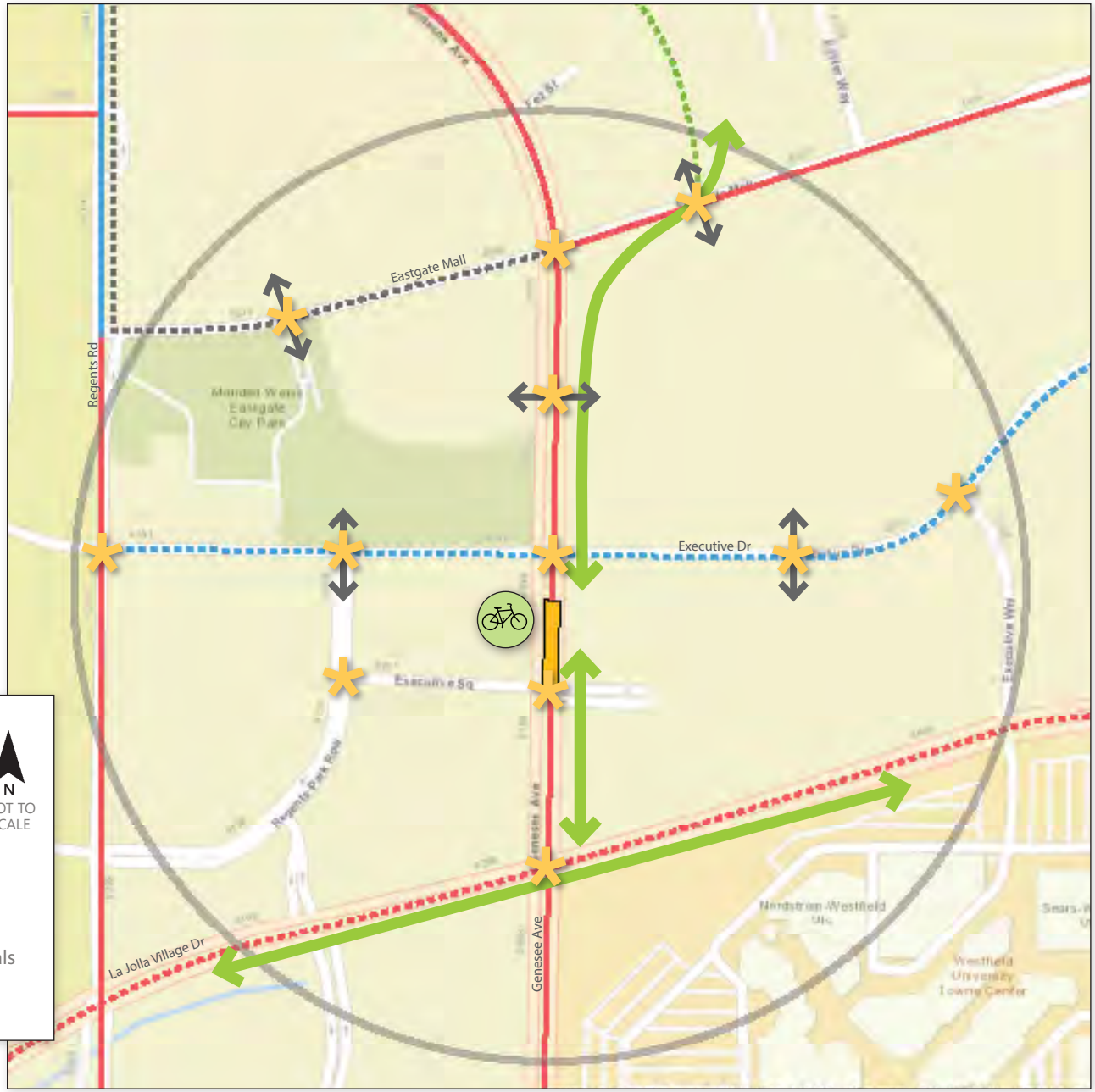
OTHER OPPORTUNITIES

- City of San Diego Bikeshare program

Improvement Cost Breakdown

Measure	Quantity	Total Cost Low	Total Cost Medium	Total Cost High
Pedestrian				
RRFB Flashing Beacon (Solar)	4 Locations	$40,000	$48,000	$56,000
High Visibility Crosswalk	16 Intersections	$19,200	$25,600	$32,000
Sidewalk Reconstruction	10,000 SF	$90,000	$120,000	$150,000
Curb/Gutter Reconstruction	1,000 LF	$35,000	$40,000	$45,000
Pedestrian Street Lighting	2 Blocks	$80,000	$120,000	$136,000
Pedestrian Wayfinding Signs	8 Signs	$6,000	$7,200	$8,000
Subtotal Pedestrian		**$270,200**	**$360,800**	**$427,000**
Bicycle				
Bike Parking	8 Spaces	$2,000	$4,000	$8,000
Bike Destination Wayfinding Signs	4 Signs	$3,000	$3,600	$4,000
One-Way Cycle Track (Striped Buffer)	2 Miles	$1,657,920	$2,270,400	$3,088,800
Class II Bike Lanes (including signing & striping)	4 Miles	$55,334	$75,187	$98,842
Class III Sharrows (including signing & striping)	2 Miles	$11,827	$18,586	$24,077
Bike Signal (added to existing signalized intersection)	4 Intersections	$200,000	$300,000	$400,000
Subtotal Bicycle		**$1,930,082**	**$2,671,773**	**$3,623,718**
Traffic Calming				
Median Refuge Islands	4 Locations	$28,800	$40,000	$48,000
Curb Extensions (w/ directional curb ramps)	2 Intersections	$60,000	$75,000	$90,000
Subtotal Traffic Calming		**$88,800**	**$115,000**	**$138,000**
Construction Cost Subtotal		**$2,289,082**	**$3,147,573**	**$4,188,718**
Contingencies				
Construction Contingency		$457,816	$629,515	$837,744
Planning/Design/Environmental		$343,362	$472,136	$628,308
Construction Engineering		$228,908	$314,757	$418,872
Total Including Contingencies (Rounded to Nearest $1,000)		**$3,319,000**	**$4,564,000**	**$6,074,000**

RECOMMENDATION MAP*



LEGEND

- Station Area
- Existing/Planned Bike Route
- Existing/Planned Bike Lane
- Planned Bike Path
- Other Planned Bikeway
- Key Station Bicycle Connection
- Candidate Location for High-Visibility Crosswalk
- Candidate Location for Protected Crossing (Signals or Beacons, Curb Extensions or Median Refuge)
- Add Bicycle Parking

N
NOT TO SCALE

**Wide-ranging recommendations or those that are not location-specific are not shown*

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Image via Flickr.com/THE Holy Hand Grenade!

STATION AREA TYPOLOGY

OUTSIDE CENTERS // DISPERSED ACCESS

LUSK BOULEVARD AT BARNES CANYON ROAD

* PROJECT ID: #### // LUSK BLVD & BARNES CANYON RD

SRTT Typology: Outside Centers - Dispersed Access

Jurisdiction: City of San Diego

2050 RTP/SCS Transit Project: Otay Mesa to Sorrento Mesa via I-805 BRT

Smart Growth Opportunity Areas: N/A

SRTS: None

DESCRIPTION

The Sorrento Mesa Area is a primary suburban employment center characterized by low to moderate density office parks surrounded by surface parking, limited strip commercial retail and restaurant, and a low density street network with long intersection spacing, few signalized pedestrian crossings, and relatively wide arterial streets. Existing transit service is primarily commuter-serving, with infrequent service, and limited service hours that are focused on peak weekday commute periods. Route 880 provides connections to the UTC Transit Center, Mira Mesa, and the 4S Ranch. Route 921 connects to University City, Miramar, and Mira Mesa. Route 972 is a Sorrento Mesa circulator, which provides connections from the Sorrento Valley Coaster Station through the employment areas.

The Qualcomm campus represents the major employment destination in this area. Qualcomm provides a shuttle, but many employees walk between Qualcomm buildings.

AROUND THE STOP

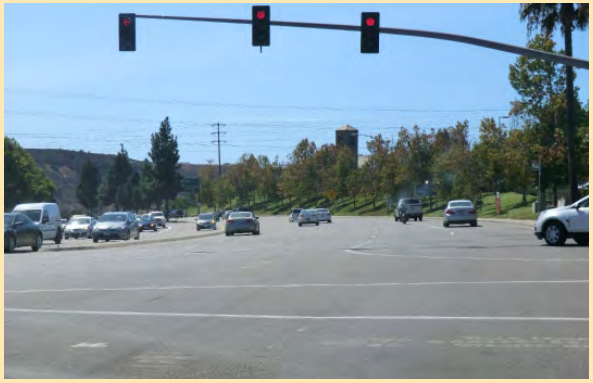
Pedestrian and bicycle facilities surrounding Lusk Boulevard at Barnes Canyon Road are limited. The only existing bicycle facilities are bike lanes on Mira Mesa Boulevard a short distance away (outside the quarter-mile station area). Other connecting bikeways are planned for the area, including a bike route on Pacific Heights Boulevard between Barnes Canyon Road and Mira Mesa Boulevard and on Barnes Canyon Road between Pacific Heights Boulevard and Lusk Boulevard. Another, as-yet-undetermined Class II or Class III bikeway is planned for this stretch of Lusk Boulevard.

All intersections within a quarter-mile distance of the stop are signalized, providing pedestrians with designated crossing opportunities at the limited city intersections in the station area. Some intersections lack crosswalks: the convergences of Pacific Center Boulevard and Lusk Boulevard, Barnes Canyon Road and Pacific Heights Boulevard, and Pacific Mesa Boulevard and Pacific Heights Boulevard are all missing one leg.

Sidewalks are generally accommodating of pedestrians, although they are in places narrow, and bus stops generally lack pedestrian amenities such as shade and benches. In places, trees on private parcels abut the sidewalk, but many of these trees do not provide direct shade to pedestrians on the public right-of-way. This is particularly evident on Lusk Boulevard just north and south of Barnes Canyon Road.

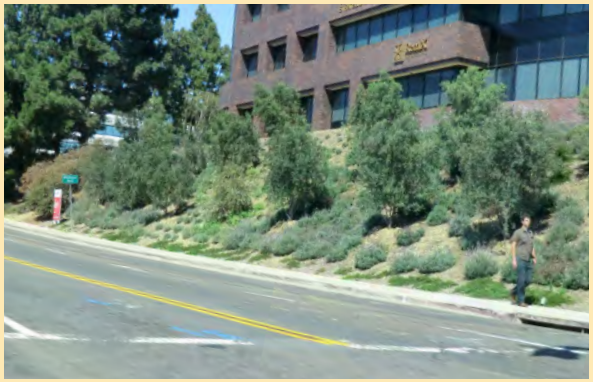
OBSERVED PEDESTRIAN & BICYCLIST NEEDS & OPPORTUNITIES

1 The number of signalized intersections are limited, and spaced far apart, so there are few controlled locations for pedestrians to cross. There are regular unprotected mid-block crossings as a result.



2 Intersection improvements could shorten crossing distances for pedestrians.

3 Crosswalk striping exists at most intersections, although paint is thinly worn and difficult to see in places.



4 Sidewalks are generally provided on all public roadways, but sidewalks are narrow.

5 Pedestrian access to office parks are primarily at vehicle driveways, presenting a conflict area.

6 Transit stops could include amenities such as shade, benches, bicycle parking, etc.

7 Lack of on-street parking and attached sidewalks means there is no buffer between pedestrians and moving traffic.

8 Limited bicycle infrastructure

Transit Service and Demographics

Existing Trolley Riders	Existing Bus Riders (1/4 mi)	Population (1/4 mi)	Employment (1/4 mi)
N/A	545	21	8,246

Places to Walk to

- Qualcomm Offices
- Commercial strip retail

Existing Pedestrian Facilities

- 5 Total Intersections
- 5 Signalized Intersections (100%)
- 0 Stop-Controlled Intersections (0%)
- 0 Uncontrolled Intersections (0%)

Places to Bike to

- Qualcomm Offices
- Commercial strip retail
- Sorrento Valley Coaster Station

Regional Transit Connections

- Routes 880, 921, 972
- Sorrento Valley Coaster Station – 2.5 miles west. Accessible via Route 972
- UTC Transit Center—3.5 miles to the south. Accessible via Route 880.

Bicycle Facilities

- Existing Bicycle Lanes: Mira Mesa Boulevard
- Planned Bikeways: Lusk Boulevard, Pacific Heights Boulevard between Barnes Canyon Road and Mira Mesa Boulevard, Barnes Canyon Road between Pacific Heights Boulevard and Lusk Boulevard

STATION AREA EXISTING CONDITIONS MAP

RECOMMENDED IMPROVEMENTS

- Add high-visibility crosswalks for all legs of key intersections within the quarter-mile stop area
- Install rectangular rapid flashing beacons at midblock locations far from existing crossing locations
- Locate bike parking at stop
- Implement planned bikeways
- Install wayfinding signage

OTHER OPPORTUNITIES

- City of San Diego Bikeshare program

Improvement Cost Breakdown

Measure	Quantity	Total Cost Low	Total Cost Medium	Total Cost High
Pedestrian				
RRFB Flashing Beacon (Solar)	4 Locations	$40,000	$48,000	$56,000
High Visibility Crosswalk	4 Intersections	$9,600	$12,800	$16,000
Sidewalk Reconstruction	5,000 SF	$45,000	$60,000	$75,000
Curb/Gutter Reconstruction	500 LF	$17,500	$20,000	$22,500
Pedestrian Wayfinding Signs	4 Signs	$3,000	$3,600	$4,000
Subtotal Pedestrian		**$115,100**	**$144,400**	**$173,500**
Bicycle				
Bike Parking	4 Spaces	$1,000	$2,000	$4,000
Bike Destination Wayfinding Signs	2 Signs	$1,500	$1,800	$2,000
Class II Bike Lanes (including signing & striping)	2 Miles	$27,667	$37,594	$49,421
Subtotal Bicycle		**$30,167**	**$41,394**	**$55,421**
Construction Cost Subtotal		**$125,267**	**$161,794**	**$200,921**
Contingencies				
Construction Contingency		$29,053	$37,159	$45,784
Planning/Design/Environmental		$21,790	$27,869	$34,338
Construction Engineering		$14,527	$18,579	$22,592
Total Including Contingencies (Rounded to Nearest $1,000)		**$211,000**	**$269,000**	**$332,000**

RECOMMENDATION MAP*

Wide-ranging recommendations or those that are not location-specific are not shown

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Image via Flickr.com/THE Holy Hand Grenade!

STATION AREA TYPOLOGY

LOCAL BUS STOP AMENITIES

PROTOTYPICAL LOCAL BUS STOP

* PROJECT ID: ####

SRTT Typology: Local Bus Stops

Jurisdiction: Varies

2050 RTP/SCS Transit Project: N/A

Smart Growth Opportunity Areas: : Varies. Some may fall within a SGOA, but most fall outside.

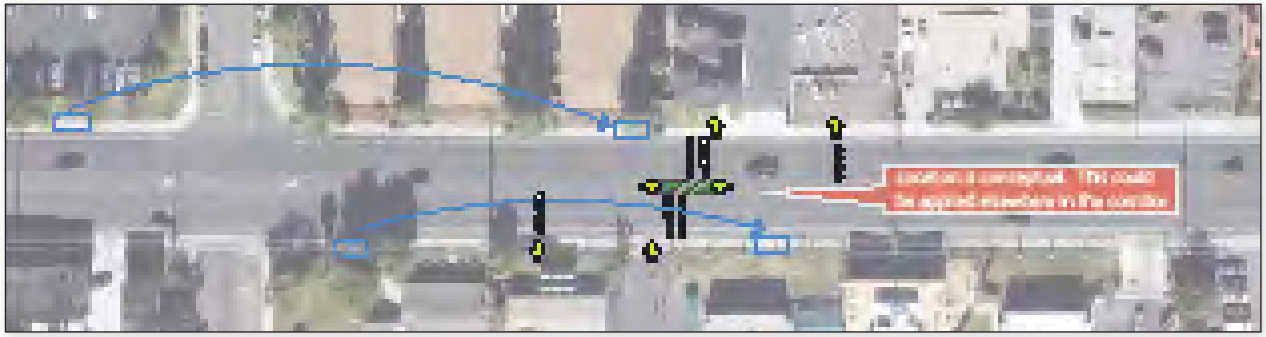
SRTS: Varies. Some may be located near schools.

DESCRIPTION

Local bus stops are the predominant stop typology in the San Diego region. Most are located along arterials and collectors in residential and neighborhood commercial areas. This type of transit service, operated primarily by San Diego Metropolitan Transit System in the southern and central areas of the county, and the North Coast Transit District in the northern part of the county provides service to local destinations, and in some cases to regional transit services like the Coaster commuter rail. Bus service frequencies vary by line and location. On some lines, service can be quite limited, and on other local lines that serve some larger residential areas, service can be more frequent.

The level of bus stop amenity varies by location, line, and service provider, but is generally limited to a bus stop sign, and in some locations a bus stop bench, and trash receptacle.

Pedestrian and bicycle access opportunities can be quite limited in areas with few signalized pedestrian crossing opportunities. Bicycle infrastructure varies by location and jurisdiction, but is often quite limited. However, because local bus stop spacing is generally close together (typically less than a mile), the emphasis on these recommendations is addressing pedestrian access constraints at bus stops.



RECOMMENDATION IMPLEMENTATION EXAMPLE

RECOMMENDED IMPROVEMENTS

The primary impediment at many local bus stops is the lack of protected pedestrian crossings. Generally, signalized intersections are spaced far apart, so pedestrians walking to access a bus will often need to cross at an uncontrolled intersection, or will cross mid-block. Local bus stops in suburban areas may also lack continuous sidewalk coverage. To address these impediments, the following enhancements are proposed:

- Install a mid-block high visibility crosswalk with a median refuge island and a rectangular rapid flashing beacon.
- Relocate bus stops so that they are adjacent to the protected crossing.
- Improve sidewalk coverage to ensure that sidewalks are provided on the block where the local bus stop is located.
- Add bicycle parking for up to two spaces in locations where bike parking may be desirable.

Improvement Cost Breakdown

Measure	Quantity	Total Cost Low	Total Cost Medium	Total Cost High
Pedestrian				
RRFB Flashing Beacon (Solar)	1 Location	$10,000	$12,000	$14,000
High Visibility Crosswalk	1 Location	$600	$800	$1,000
Sidewalk Reconstruction	4,000 SF	$36,000	$48,000	$60,000
Subtotal Pedestrian		**$46.600**	**$60,800**	**$75,000**
Bicycle				
Bike Parking	2 Spaces	$500	$1,000	$2,000
Subtotal Bicycle		**$500**	**$1,000**	**$2,000**
Traffic Calming				
Median Refuge Island	200 SF	$3,600	$5,000	$6,000
Subtotal Traffic Calming		$3,600	$5,000	$6,000
Construction Cost Subtotal		**$50,700**	**$66,800**	**$83,000**
Contingencies				
Construction Contingency		$29,053	$37,159	$45,784
Planning/Design/Environmental		$21,790	$27,869	$34,338
Construction Engineering		$14,527	$18,579	$22,592
Total Including Contingencies (Rounded to Nearest $1,000)		**$116,000**	**$150,000**	**$186,000**

BUS STOP AMENITY GUIDELINES

In addition to access enhancements, the American Public Transportation Association (APTA) has developed a recommended practice that provides stop amenity guidelines for local bus stops, The following is an excerpt from APTA Recommended Practice:[a]

1. Prohibit parking along any curb or platform where the transit vehicle will stop so that passengers have a clear path to the vehicle. The area where parking needs to be prohibited needs to be clearly designated to avoid any confusion as to where parking is legal or not. Never assume that a driver knows where not to park. Designating the no-parking zone should be by a means separate from the transit stop sign. The preferred method is painting the curb in the appropriate no-parking color. An alternate is separate no parking signs clearly delineating the length of the zone.

2. Construct a landing pad for passengers to board or alight the vehicle, based on the vehicle design and location of doors. A typical bus stop pad to allow the operation of a wheelchair lift or ramp requires:

   - a firm, stable surface (concrete, asphalt or pavers, depending on surrounding materials);
   - a minimum clear length of 96 in. (measured from the curb or vehicle roadway edge);
   - a minimum clear width of 60 in. (measured parallel to the vehicle roadway) to the maximum extent allowed by legal or site constraints; and
   - a cross slope not to exceed 2 percent.

   These guidelines should be verified with local and national accessibility requirements and with vehicle specifications.

3. Connect pad to streets, sidewalks or pedestrian paths by an accessible route.

   The slope of the pad must meet accessibility requirements but should be the same as the parallel roadway to the extent practicable.

   For water drainage, a maximum slope of 1:50 (2 percent) perpendicular to the roadway is allowed.

4. Provide benches for passenger to wait.

   Locate the benches so that passengers seated on them can see approaching vehicles. Ensure that benches do not intrude into the landing pad or the pedestrian clear zone.

5. Provide shelters to protect waiting passengers from the elements.

   Do not place shelters in the pedestrian clear zone. Locate shelters so that they do not impair operation of wheelchair lifts.

   A minimum distance of 2 ft should be maintained between the back-face of the curb and the roof or panels of the shelter. Greater distances are preferred to separate waiting passengers from nearby vehicular traffic.

   Shelters should be located at the end of the transit stop zone so they are highly visible to approaching buses and passing traffic and to reduce walking distance from the shelter to the bus. Locate shelters so that passengers in the shelter can see approaching vehicles.

   Shelters should not be located directly in front of store windows. When shelters are directly adjacent to a building, a 12 in. clear space should be preserved to permit trash removal or cleaning of the shelter.

   A minimum clear entrance (doorway) of 32 in. is recommended. The entrance may be constructed as part of the "path of travel," but then it must be 36 in. wide minimum

   A minimum clear floor area measuring 30 in. wide by 48 in. long, completely within the perimeter of the shelter, must be provided. A rider using a wheelchair or other mobility aid must be able to enter the shelter from the public way and reach the 30 in. by 48 in. clear floor area.

[a] *Design of On-street Transit Stops and Access from Surrounding Areas,* APTA, March 2012.

EXAMPLES

Good: Parking clearly prohibited at bus stop. (Las Vegas, NV). Photo: Christof Spieler

Good: Wheelchair user being let off on landing pad. (Dallas, TX). Photo: DART

Bad: No landing pad, no ramp, no connecting sidewalk. (Houston, TX). Photo: Christof Spieler

Good: Passenger using bench. (Houston, TX). Photo: Christof Spieler

A minimum 7.5 ft clearance between underside of roof and sidewalk surface is desired.

Light shelters when existing streetlights do not provide adequate lighting. Proper lighting is important for the safety and security of transit patrons.

Shelters should be designed to protect from wind, rain, wind-driven rain and harsh sun. Local climactic conditions will influence shelter design. Most shelters require both a roof and side panels to be effective. A good shelter is both practical and attractive.

Bus stops and their surroundings should be designed according to the principles of Crime Prevention Through Environmental Design, paying particular attention to sight lines and visibility. For example, the materials used to construct shelters should be as transparent as possible so that a rider waiting at the stop can see his/her surround-ings.

Reference:

Crime Prevention Through Environmental Design says that bus shelters should be well lit with vandal resistant lighting and located with unobstructed sightlines to the foot-path, street and any nearby buildings. Bus shelters should be designed to permit peo-ple to observe inside the shelter as they approach e.g. by constructing shelters with one or 2 transparent or semi-transparent walls.

Good: Shelter protects passengers from rain. (Portland, OR). Photo: Christof Spieler.

6 Use pedestrian-scale landscaping, pavement color and texture, street furniture components, plazas and kiosks to increase the visual variety and attractiveness of the station facilities.

Good: Light fixtures, banners, shelter, paving, and plantings establish pedestrian scale at transit center waiting areas. (Tempe, AZ). Photo: Christof Spieler

7 Provide trash receptacles at boarding areas. These may be required even when boardings are low because of surrounding uses (e.g., a transit stop near a fast food restaurant). Guidelines for placement of a trash receptacle are as follows:

- Anchor the receptacle securely to the ground to reduce unauthorized movement.
- Locate the receptacle away from wheelchair landing pad areas, and allow for at least a 3 ft separation from other street furniture.
- Locate the receptacle at least 2 ft from the back of the curb.
- Ensure that the receptacle, when adjacent to the roadway, does not visually obstruct nearby driveways or land uses.
- Avoid installing receptacles that have ledges or other design features that permit liquids to pool or remain near the receptacle (this may attract insects).
- If possible, attempt to locate the receptacle away from direct sunlight; heat may cause foul odors to develop).

Good: Trash can at stop. (Austin, TX). Photo: Capital Metro

Good: Local bus stop adjacent to off-street bike path with bike racks. (Seattle, WA). Photo: Christof Spieler.

8 At stops with high bicycle use, such as stops near universities or adjacent to bike paths, provide bicycle storage. Bicycle storage is useful even where bikes are permitted on transit vehicles, since the number of bikes than can fit on one vehicle is generally limited.

Locate bicycle storage outside of the landing pad and pedestrian clear zone and such that it does not intrude on waiting passengers. Use defensible spaces that are physically and visually accessible, while avoiding areas with low visibility.

All bike racks must be positioned to provide 2 ft by 6 ft of space per bicycle. Racks should provide 48 in. aisles measured from tip to tip of bike tires across the space between racks to accommodate one person being able to walk one bike through the aisle. 72 in. of depth should be allowed for each row of parked bikes. The rack should be located no less than 24 in. from walls. Inverted U racks should be at a minimum of 36 in. apart.

Rental lockers for regular users may be provided in addition to racks where the demand exists and space permits.

Good: Bike lockers for regular bike commuters. (Seattle, WA). Photo: Christof Spieler

9 At sites where high levels of cyclists are currently using, or will use, the station, provide or support other entities to provide amenities such as changing rooms, lockers and shower facilities in office buildings for employees to encourage cycling and transit use.

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San Diego Regional Safe Routes to School Strategic Plan

March 2012

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www.sandag.org/srts

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Safe Routes to School Strategic Plan

Made possible by funding from the Centers for Disease Control and Prevention,
through the County of San Diego and the San Diego Association of Governments

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Executive Summary

"Safe Routes to School" efforts create streets that safely accommodate bicyclists and pedestrians, coupling infrastructure improvements with education, encouragement, and other programs designed to make walking and biking safer and more desirable.

With the overarching goals of improving safety and encouraging active transportation, Safe Routes to School efforts improve health, reduce transportation costs, and decrease school-related vehicle trips, thus improving air quality and reducing traffic congestion near schools. Safe Routes to School efforts also teach children healthy lifestyle skills and heighten public awareness about the benefits of active transportation.

To further realize these benefits, the Regional Safe Routes to School Strategic Plan (Strategic Plan) proposes a blueprint for a regional strategy to make walking and bicycling to and from school safer and facilitate the development of more attractive travel choices for families throughout the region.

Safe Routes to School initiatives support the regional objectives of the Regional Comprehensive Plan (RCP) and 2050 Regional Transportation Plan and Sustainable Communities Strategy (2050 RTP and SCS) by creating walkable and bicycle-friendly communities, encouraging active transportation to reduce vehicle trips and improve public health.

THE CHARGE FOR A REGIONAL STRATEGY

Safe Routes to School efforts support the regional objectives of the Regional Comprehensive Plan (RCP) and 2050 Regional Transportation Plan and Sustainable Communities Strategy (2050 RTP and SCS) by creating walkable and bicycle-friendly communities, encouraging active transportation to reduce vehicle trips and improve public health.

To enhance the region's existing efforts, the Strategic Plan identifies a strategy to support local communities in establishing new Safe Routes to School programs as well as sustaining and enhancing existing efforts. A regional strategy will ensure that the tools provided are germane and that resources are focused in areas across the region with the greatest need for assistance.

A REGIONAL SAFE ROUTES TO SCHOOL STRATEGY

SANDAG began developing the Strategic Plan in September 2010 with funding through the County of San Diego Health and Human Services Agency (HHSA) Healthy Works program, a multi-faceted initiative addressing rising obesity rates in the region by increasing access to healthy foods and promoting physical activity.

Photo Source: SANDAG

The planning process has engaged key stakeholders and the region's residents in the development of the Strategic Plan through a variety of venues. The strategy proposed in the plan reflects input received as well as reviews of best practices and existing conditions.

The recommended strategy consists of the following elements:

Regional Planning and Evaluation – Integrating Safe Routes to School into regional planning efforts establishes a vision for Safe Routes to School throughout the region and advances the regional goals of monitoring, projecting, and promoting active transportation. Within this category, recommendations include establishing an ongoing Safe Routes to School data collection and evaluation program, and activities to underscore the importance of Safe Routes to School in promoting active transportation, complete streets, and smart growth.

Collaboration and Coordination – The ultimate success and reach of this strategy is largely contingent on engaging in partnerships and collaborating with agencies and organizations that are intimately connected to school communities and knowledgeable about school issues. Two actions are recommended to improve regional coordination and information sharing: establish a regional Safe Routes to School coordinator position; and sustain the San Diego Regional Safe Routes to School Coalition assembled in conjunction with the development of the Strategic Plan. Beginning in April 2011, multiple agencies have partnered to establish the Regional Safe Routes to School Coalition that serves as a forum to connect agencies and organizations involved in implementing Safe Routes to School.

Technical Assistance – Providing trainings and other forms of technical assistance helps ensure that programs are comprehensive, effective, and sustainable. Recommended programs in the area of technical assistance include Safe Routes to School planning workshops, seminars and trainings, and professional Safe Routes to School planning services.

Education and Encouragement – Identifying and administering select education and encouragement programs, such as the iCommute SchoolPool program, provides communities beneficial tools that might otherwise be too costly or burdensome for local administration. Also, serving as an information clearinghouse to local jurisdictions, schools districts, and schools facilitates local Safe Routes to School program development and maintenance. Proposed education and encouragement actions involve enhancing Web-based tools and information to encourage walking and biking to school, conducting outreach and promotional campaigns, and providing education programs.

The Strategic Plan addresses several of the region's significant and interrelated issues including escalating childhood obesity rates, safety concerns, transportation costs, traffic congestion, and clean air. By promoting effective and coordinated Safe Routes to School programs, this strategy responds to these challenges, thus improving the overall quality of life in the San Diego region.

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CHAPTER 1:
INTRODUCTION

"Safe Routes to School" refers to a spectrum of programs and built environment improvements used together to foster opportunities for students to walk and bike to school safely and routinely.

In addition to the overarching goals of improving safety and increasing physical activity, Safe Routes to School efforts improve health, reduce transportation costs, and decrease school-related vehicle trips thus improving air quality and reducing traffic congestion near our schools. Safe Routes to School efforts also teach children healthy lifestyle skills and heighten public awareness about the built environment, air quality, health, and quality of life benefits associated with these programs.

Photo Source: Walk San Diego

Safe Routes to School efforts improve health, reduce transportation costs, and decrease school-related vehicle trips thus improving air quality and reducing traffic congestion near our schools.

This chapter of the Strategic Plan introduces the concept of Safe Routes to School, how the concept has evolved over time, and it describes how the plan was developed and highlights the specific goals of the strategy.

THE "FIVE E'S" OF SAFE ROUTES TO SCHOOL

Safe Routes to School programs utilize five strategies: planning and evaluation, infrastructure improvements, enforcement of safe motorist, pedestrian, and bicyclist behaviors, education, and activities that encourage children to walk and bicycle to school. Comprehensive Safe Routes to School programs encompass all of these components commonly referred to as the 5 E's (engineering, education, enforcement, encouragement, and evaluation).

Engineering

The engineering element of Safe Routes to School refers to the design, construction, and maintenance of traffic control devices, pedestrian and bicycle facilities, traffic calming measures, and other modifications to the built environment aimed at enhancing safety around school areas. Common improvements include installing school area signage, high visibility crosswalks, flashing yellow beacons, and traffic calming measures such as landscaped roundabouts, curb extensions, and chicanes. Use of school area infrastructure improvements is guided by engineering analysis and several design guidelines and manuals including *Planning and Designing for Pedestrians, Model Guidelines for the San Diego Region* and the *California Manual on Uniform Traffic Control Devices*, particularly Part 7, Traffic Controls for School Areas.

Education

Education is a cornerstone of Safe Routes to School. It involves teaching students traffic safety skills and laws, personal security measures, as well as health and environmental lessons. Material is presented in a variety of formats including skills practice in a simulated streetscape setting, school assemblies, and ongoing classroom coursework. Integrating Safe Routes to School education into physical education, health, and science curriculums exposes students to the health and environmental benefits of active transportation. Public awareness campaigns can also educate the general public about the benefits associated with Safe Routes to School and the critical importance of operating motor vehicles more safely, especially in school zones. Providing the educational information in alternative languages for those with limited English skills can help ensure all members of the community have the opportunity to learn about Safe Routes to School. Educating neighbors and parents on the goals and benefits of Safe Routes to School is essential to program success.

Photo Source: SANDAG

Integrating Safe Routes to School education into physical education, health, and science curriculums exposes students to the health and environmental benefits of active transportation.

Encouragement

Closely related to education, encouragement efforts are designed to increase walking and biking to school by generating enthusiasm, highlighting the benefits of active transportation, and increasing the convenience of using alternatives to driving students to school. Encouragement activities include special events, such as "Walk and Bike to School Day", coordinated walking and biking groups, promotional campaigns, student competitions and incentives. Many of these initiatives incorporate an educational component. For example, "Walk Across America" can integrate geography, math, and science lessons into this classroom-based competition by calculating and

tracking classes' weekly walking miles across a map, studying destinations they travel through, and learning about the air quality benefits derived from their walk trips.

Enforcement

Enforcing compliance with traffic and parking laws is another aspect of Safe Routes to School. Enforcement activities target unsafe driving behavior, such as speeding, failing to yield to pedestrians and bicyclists, as well as illegal parking and turns in school areas. In addition to motorists' behaviors, enforcement includes ensuring that pedestrians and bicyclists comply with traffic laws. While authority to enforce traffic laws resides with local police departments, crossing guards, school officials, parents, and volunteers can play a vital role in reinforcing safe behaviors surrounding schools.

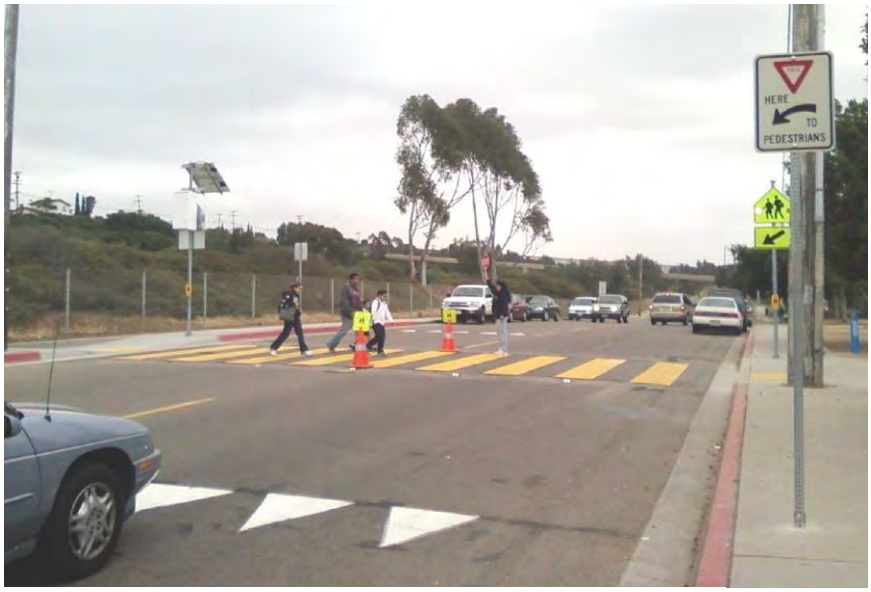


Photo Source: City of National City

Evaluation

Evaluation is crucial to gauging the efficacy of a Safe Routes to School program and identifying needed improvements.

Evaluation is crucial to gauging the efficacy of a Safe Routes to School program and identifying needed improvements. Factors to measure include program participation levels and awareness of the program, school travel mode shift, changes in attitudes toward active transportation to school, infrastructure completed, and dollars leveraged to support the longevity of the program. Evaluation efforts begin with collecting baseline data and establishing performance measures and obtainable benchmarks.

Ideally, identifying each community's respective infrastructure and programmatic strategies begins with a planning process that includes a

thorough assessment of the school area's existing facilities, travel patterns, issues, and community input. Many jurisdictions fold assessment into comprehensive Safe Routes to School plans that include the following key components:

- Existing conditions and needs assessments;
- Needed infrastructure improvements to facilitate safe walking and biking to school routes;
- Education, encouragement, and enforcement strategies; and
- Monitoring and evaluation strategies.

Comprehensive planning helps ensure each communities' infrastructure and programmatic priorities are germane and competitive for funding.

THE SAFE ROUTES TO SCHOOL MOVEMENT

In the United States, Safe Routes to School programs initially emerged during the mid-1990s to address child pedestrian safety issues in school areas, and then proliferated in response to escalating childhood obesity rates, of which physical inactivity is a key contributor.

Photo Source: SANDAG

…approximately 13 percent of students aged five to 14 years old walk or bike to school regularly compared to 48 percent in 1969.

Early Safe Routes to School efforts in New York, Florida, and Chicago were recognized as mechanisms for integrating physical activity into children's and adolescents' daily routines, which is critical in the United States where

an estimated 32 percent of children and adolescents are considered overweight or obese and only one-third meet the Surgeon General's daily physical activity recommendations (Center for Disease Control and Prevention [CDC], 2005). Correspondingly, approximately 13 percent of students aged five to 14 years old walk or bike to school regularly compared to 48 percent in 1969 (National Center for Safe Routes to School [NCSRTS], 2010).

Recognition of the safety and health implications of this trend ultimately led to state and federal Safe Routes to School grant programs established through legislation in 1999 and 2005, respectively.

California's Safe Routes to School Grant Program

California's pioneering Safe Routes to School program was established in October 1999 with the passage of California Assembly Bill 1475 (AB 1475). AB 1475 allocated one-third of California's federal Surface Transportation Program (STP) safety funds toward Safe Routes to School, thus creating the first statewide Safe Routes to School construction program in the United States. A coalition of urban planning, engineering, public health, education, law enforcement, active transportation advocacy groups, and other professional organizations were instrumental in advancing the bill.

Photo Source: SANDAG

The initial two-year program administered by the California Department of Transportation (Caltrans) restricted funding to infrastructure projects. However, succeeding program cycles have authorized funds to be used for education and encouragement programs at the schools that the infrastructure projects serve. Under the current grant program guidelines (Cycle 9), incorporated cities and counties are eligible to apply for up to $450,000 toward construction projects that target grades K–12 schools and

may apply ten percent of project funding toward education, enforcement, and encouragement activities and/or school grounds improvements. A ten percent match of funds is required for the California state program. The non-infrastructure program allowance is sometimes underutilized; however, in many communities this component of the program is a pivotal part of the strategy to support travel behavior change.

In September 2011 California Assembly Bill 516 was adopted, requiring state and federal Safe Routes to School grant program applicants to identify community priorities, a public participation process, and potential benefits of the project to low income communities.

Federal Safe Routes to School Grant Program

At the federal level, Safe Routes to School commenced in 2000 when the National Highway Traffic Safety Administration (NHTSA) awarded $50,000 each to launch pilot programs in Marin County, California and Arlington, Massachusetts geared toward increasing rates of walking and biking to school. The successes of these and other programs, particularly in Marin County, ultimately led to federal Safe Routes to School legislation. In 2005, the federal surface transportation bill, Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), authorized $612 million in funding under Section 1404 to state departments of transportation for Safe Routes to School programs through September 2009. The funding is allotted to states based on their relative proportions of total enrollment in primary and middle schools. The federal surface transportation bill has been operating under a series of short-term extensions until a new transportation authorization is passed.

Photo Source: SANDAG

Under the federal Safe Routes to School grant program guidelines released on April 15, 2011, tribal governments and regional and local planning

agencies are eligible to apply for funding toward infrastructure and non-infrastructure projects aimed at influencing behavior and improving safety for children in Kindergarten through 8th grade. Although local or regional planning agencies must serve as the lead agency, they may partner with a 'Project Sponsor' such as a public health agency, school district, or non-profit organization.

One million dollars is the maximum amount that may be requested for capital projects and $500,000 for programmatic projects. In addition to applying for projects that are exclusively programmatic, agencies seeking capital project funding may allocate up to 10 percent of their budget toward complementary education, encouragement, and enforcement activities. California's approximate allocation of funds for the current (2011 – 2012) cycle is $42 million, with a target of 70 percent of those funds devoted to infrastructure projects and 30 percent toward education, encouragement and enforcement activities.

Local and Regional Implementation

While funding for Safe Routes to School programs primarily derives from the state and federal programs, the planning and implementation of Safe Routes to School programs is inherently local, relying on collaboration between local jurisdictions, school districts, schools, and community-based and nonprofit organizations. Although state and federal grants are vital funding sources, many Safe Routes to School activities occur outside of grant funded projects. Several of these effective local programs exist throughout the San Diego region and are described in greater detail in Chapter 3 of this plan.

Photo Source: SANDAG

Within the regional planning context, Safe Routes to School is gaining prominence as an effective Transportation Demand Management (TDM), air quality, and greenhouse gas reduction strategy in addition to an essential component to regional active transportation planning. It also plays a developing role in addressing transportation equity by targeting public health impacts and serving low-income communities.

PURPOSE AND RELATIONSHIP TO OTHER PLANS AND POLICIES

The emerging role of Safe Routes to School in regional planning has significant implications for the San Diego region. Safe Routes to School efforts support the regional objectives of creating walkable and bicycle-friendly communities, encouraging complete streets and smart growth place-making, and helping to reduce vehicle trips during peak periods of demand. Chapter two of this plan summarizes these and several related benefits derived from implementing Safe Routes to School programs.

To achieve these benefits, this Strategic Plan identifies a strategy to support the region's local communities in establishing new programs as well as sustaining and expanding upon the many existing Safe Routes to School initiatives. Planning a regional strategy ensures that tools and resources are strategically distributed to realize the greatest benefit.

Planning a regional strategy ensures that tools and resources are strategically distributed to realize the greatest benefit.

The specific goals of the regional strategy are to:

- Increase physical activity rates of children and adolescents by increasing the number who walk and bike to school.
- Improve safety conditions for pedestrians and bicyclists, thereby reducing child and adolescent injuries and fatalities.
- Continue to expand current Safe Routes to School programs by encouraging comprehensive planning, fostering collaboration and partnerships, boosting public support, and initiating institutional change.
- Reduce barriers to participation in Safe Routes to School, whether founded on race, ethnicity, national origin, disability, income level, or some other basis.
- Promote and document the health, vehicle miles traveled (VMT) and greenhouse gas emission reduction, traffic management, and community benefits derived from Safe Routes to School through systematic monitoring, evaluation, and planning.

- Promote standardization of data collection where possible throughout the region.

- Promote land use planning and design decisions that support active transportation, complete streets, and smart growth place-making.

The regional strategy consists of methods for integrating Safe Routes to School into regional planning activities; strengthening collaboration; providing technical assistance; and education and encouragement programs offered region-wide.

Several of the region's transportation plans underpin the development of the Strategic Plan to support active transportation to school. The 2050 Regional Transportation Plan (2050 RTP) outlines the regional Safe Routes to School strategy and provides a framework to guide the development of this Strategic Plan. The 2050 RTP proposes completion of the Strategic Plan as one action toward expanding the region's travel choices by helping to make walking and biking to school a viable transportation option.

Photo Source: SANDAG

The Safe Routes to School strategy also contributes to a new element of the RTP, the Sustainable Communities Strategy (SCS). The SCS proposes coordinating land use, housing, and transportation planning to foster more sustainable, compact, walkable, and transit-oriented communities. The SCS accounts for this strategy's potential to increase school walk and bike trips and thus contribute to meeting the regional greenhouse gas reduction targets.

Consistent with Safe Routes to School objectives, the Regional Comprehensive Plan (RCP), adopted in 2004, seeks to advance more walkable and bicycle-friendly communities based on sound urban design and planning principles. The RCP also acknowledges the significant role of school siting and

design in using land more efficiently and supporting smart growth development.

Safe Routes to School is also identified as a priority in *Riding to 2050: San Diego Regional Bicycle Plan* (Regional Bicycle Plan) adopted in April 2010. The Regional Bicycle Plan provides a blueprint for making bicycling more practical and desirable to a broad spectrum of people in the San Diego region. It includes Safe Routes to School as a priority program to encourage children and adolescents to bicycle safely and more frequently to school.

STRATEGY PLANNING PROCESS

SANDAG began developing the Strategic Plan in September 2010 with funding through the County of San Diego Health and Human Services Agency (HHSA) Healthy Works program, a multi-faceted initiative intended to address rising obesity rates in the region by increasing access to healthy foods and promoting physical activity.

The planning process has engaged key stakeholders and the general public in the development of the Strategic Plan through a variety of formats.

Beginning in October 2010, SANDAG has convened a Safe Routes to School Strategy Coordination Team comprised of school district officials, planners, engineers, and public health professionals. The specific purpose of the team was to provide guidance on the contents of the Strategic Plan including existing conditions, issues to address, and actions identified in the plan.

Early in the planning process, SANDAG staff also drafted a white paper entitled "Overview of Safe Routes to School and the 2050 Regional Transportation Plan" that introduced the concept of a regional Safe Routes to School strategy and proposed preliminary strategic actions for potential inclusion in the 2050 RTP and as a possible framework for developing the Strategic Plan.

In November 2010 through January 2011, this 2050 RTP white paper was presented to the following eight SANDAG working groups and policy committees to solicit input on the strategy: Bicycle-Pedestrian Working Group, Public Health Stakeholder Group, Regional Planning Technical Working Group, San Diego Regional Traffic Engineers Council, Regional Planning Committee, Transportation Committee, and Cities/County Transportation Advisory Committee. The same eight working groups and committees were presented the draft of this plan and provided valuable input to shape the final Strategic Plan.

Developing and administering a Healthy Works pass-through grant program was also instrumental in shaping this strategy. The Healthy Works Safe

Routes to School grant programs are funding twelve comprehensive Safe Routes to School planning projects and education, encouragement, and enforcement related projects.

SANDAG staff also garnered feedback on the strategy through public presentations and forums, such as to the Regional Safe Routes to School Coalition (discussed in Chapter 4 of this plan) and various school-based meetings. School stakeholders and the general public also had the opportunity to review and provide comment on the draft version of the Strategic Plan available online on the SANDAG website (www.sandag.org/healthyworks) and distributed via email to key stakeholders and agencies.

CONTENTS OF THE STRATEGIC PLAN

After this introduction, the Strategic Plan is organized into the following chapters:

Chapter 2: Existing Issues and Opportunities discusses the role of Safe Routes to School in addressing certain transportation, built environment, air quality, and public health issues currently impacting the region.

Chapter 3: Existing Safe Routes to School Efforts describes the region's existing Safe Routes to School resources and programs implemented at the local as well as regional level.

Chapter 4: Moving Forward – a Regional Safe Routes to School Strategy presents the draft regional strategy to support the creation and maintenance of Safe Routes to School efforts. It also proposes a process for implementing the strategy and updating the strategy to address future needs.

CHAPTER 2:
EXISTING ISSUES AND OPPORTUNITIES

This chapter of the Strategic Plan highlights opportunities for Safe Routes to School programs to impact several of the region's significant and interrelated challenges including escalating childhood obesity rates, safety concerns, transportation costs, traffic congestion, and cleaner air. By promoting effective Safe Routes to School programs, this strategy can substantially affect all of these challenges, thus improving the overall quality of life in the San Diego region.

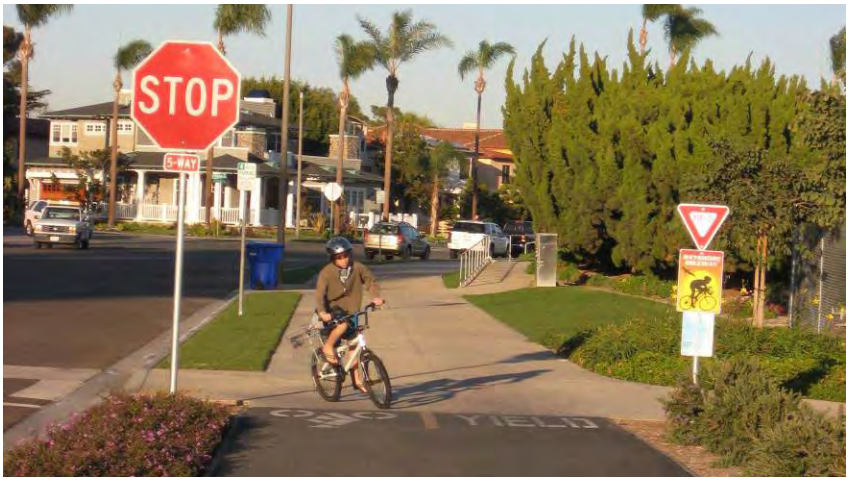


Photo Source: SANDAG

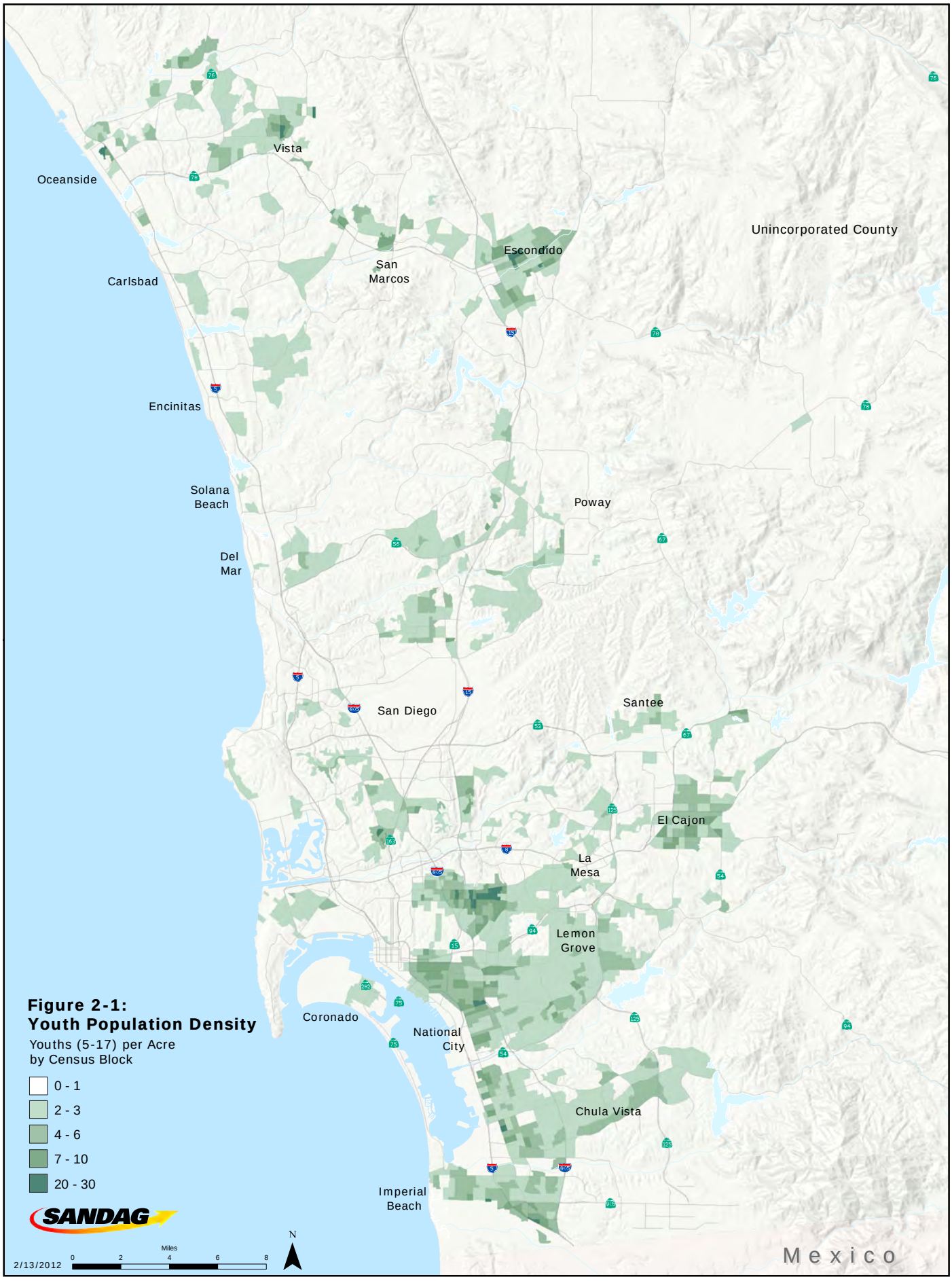
The chapter opens with walking and bicycling to school trends and an overview of the region's school system.

SNAPSHOT OF THE REGION'S SCHOOL SYSTEM AND WALKING AND BIKING TRENDS

As of 2011, an estimated 21 percent of students walk to and/or from school, and 1 percent bike to and/or from school. In comparison, 2.7 percent of all daily trips are taken by walking, and 0.5 percent by bike. Single occupancy vehicle trips constitute 52.7 percent of all trips, 42.8 percent are high-occupancy vehicle trips, and the remaining 1.3 percent of trips are taken via transit. While the percentage of students taking active modes to school is

relatively significant, there is opportunity to grow these numbers through Safe Routes to School, particularly as the average distance between home and school in the region is 3.25 miles. **Figure 2-1** shows the distribution of youths across the region.

The San Diego region's public school system currently consists of 42 school districts and 761 schools serving 498,243 students. An additional 38,431 students attend the region's 251 private elementary and secondary schools (California Department of Education, 2011). **Figure 2-2** displays the schools and school district boundaries within the region. Of the 42 districts, 24 are elementary, six are high school, and 12 are unified districts, which consolidate primary and high school administration into a single district.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San Diego
Santee
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Mexico
Figure 2-1:
Youth Population Density
Youths (5-17) per Acre
by Census Block
0 - 1
2 - 3
4 - 6
7 - 10
20 - 30
SANDAG
Miles
0 2 4 6 8
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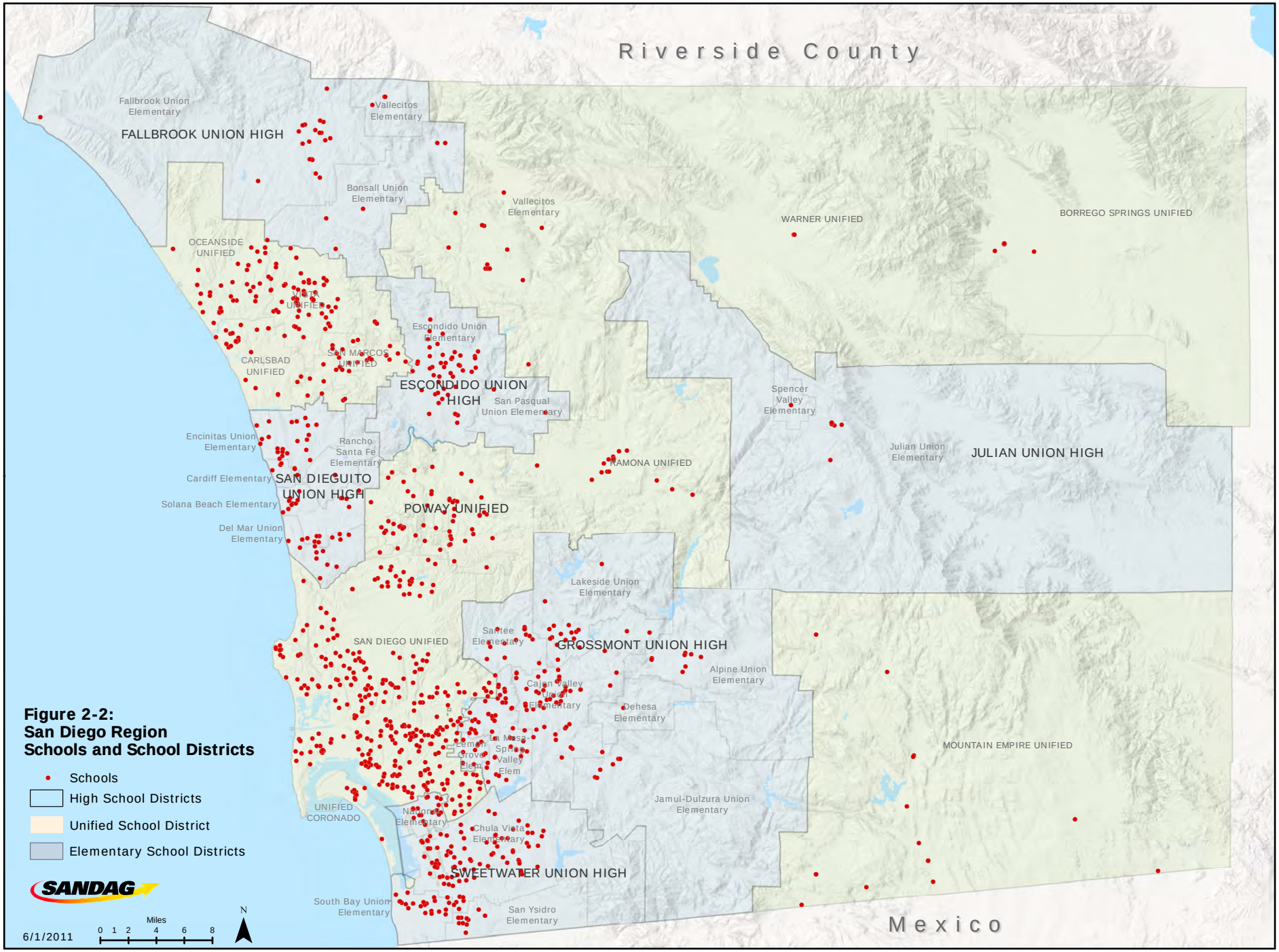
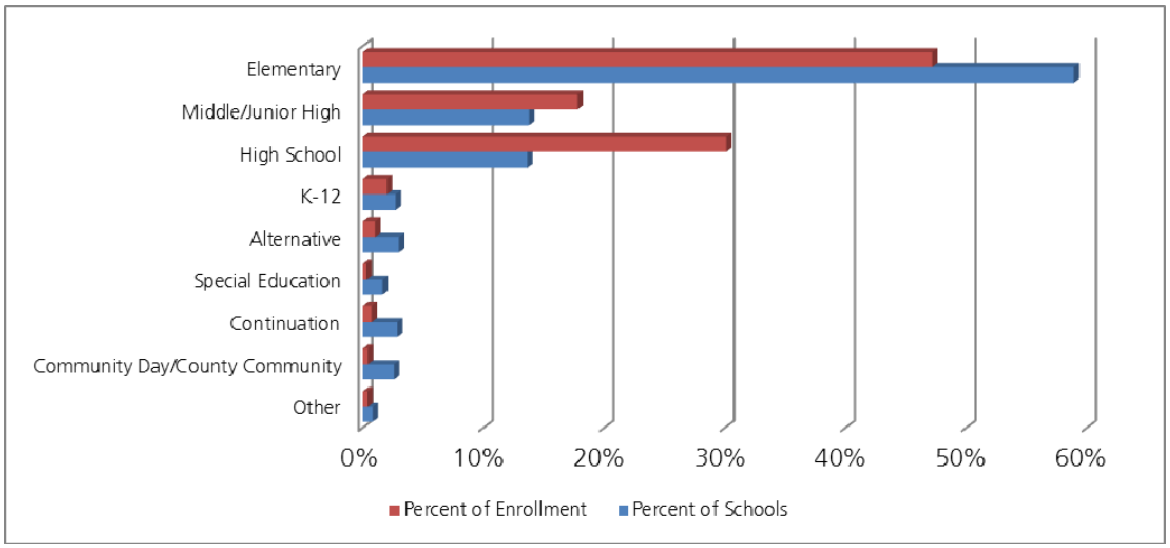

Riverside County
Fallbrook Union Elementary
FALLBROOK UNION HIGH
Vallecitos Elementary
Bonsall Union Elementary
Vallecitos Elementary
WARNER UNIFIED
BORREGO SPRINGS UNIFIED
OCEANSIDE UNIFIED
VISTA UNIFIED
Escondido Union Elementary
CARLSBAD UNIFIED
SAN MARCOS UNIFIED
ESCONDIDO UNION HIGH
San Pasqual Union Elementary
Spencer Valley Elementary
Encinitas Union Elementary
Rancho Santa Fe Elementary
Julian Union Elementary
JULIAN UNION HIGH
RAMONA UNIFIED
Cardiff Elementary
SAN DIEGUITO UNION HIGH
Solana Beach Elementary
POWAY UNIFIED
Del Mar Union Elementary
Lakeside Union Elementary
Santee Elementary
SAN DIEGO UNIFIED
GROSSMONT UNION HIGH
Alpine Union Elementary
Cajon Valley Union Elementary
Dehesa Elementary
La Mesa-Spring Valley Elem
MOUNTAIN EMPIRE UNIFIED
Jamul-Dulzura Union Elementary
UNIFIED CORONADO
National Elementary
Chula Vista Elementary
SWEETWATER UNION HIGH
South Bay Union Elementary
San Ysidro Elementary
Mexico
Figure 2-2:
San Diego Region
Schools and School Districts
Schools
High School Districts
Unified School District
Elementary School Districts
SANDAG
6/1/2011
Miles
0 1 2 4 6 8
N

Correspondingly, elementary school students comprise the greatest share of school enrollment. **Figure 2-3** displays the portion of schools and student enrollment figures by school type within the region. As shown, elementary schools account for approximately 59 percent of the region's schools and 47 percent of total student enrollment.

Figure 2-3: Percentage of Schools and Enrollment by Type



Source: Education Data Partnership, May 2011

The proportions of middle and high school students are both greater than their relative share of schools in the region. Specifically, 14 percent of the region's schools are middle schools constituting 18 percent of enrollment and 13 percent of schools are high schools contributing 30 percent of total student enrollment in the region (Education Data Partnership, 2011).

PHYSICAL ACTIVITY AND HEALTH AMONG YOUTHS

Childhood and adolescent obesity rates have risen exponentially over the last few decades and currently persist at critical levels, with approximately 32 percent of United States youths ages two to 19 classified as overweight and 17 percent considered obese (Ogden et al., 2010). This trend is equally severe in the San Diego region, where more than one in four children are categorized as obese (California Department of Education, 2010). As with adults, lack of physical activity is a principal contributor to the childhood obesity epidemic and the associated health risks, including diabetes, high blood pressure, and heart disease.

Safe Routes to School programs provide opportunities to incorporate physical activity into children and adolescents daily lives; thus counteracting

Childhood and adolescent obesity rates have risen exponentially over the last few decades and currently persist at critical levels, with approximately 32 percent of United States youths ages two to 19 classified as overweight and 17 percent considered obese.

the prevalence of obesity and its associated health risks for all segments of the population.

Numerous studies have examined the impact of school travel mode choice on physical activity levels, finding that children who walk or bike to school tend to meet recommended physical activity levels and have a greater propensity to be active throughout the day. For example, a study of 332 children found that students who walked to school were significantly more active than those who were driven to school. Among male students, biking to school was also correlated with higher overall physical activity levels (Cooper et al., 2005). A similar study found that walking to school was associated with greater overall activity levels and that, among males, walking to school was also linked to greater activity levels after school and throughout the evening (Cooper et al., 2003).

Photo Source: SANDAG

By increasing physical activity, Safe Routes to School programs promote healthy weight and cardiovascular and respiratory functioning. Body Mass Index (BMI) and skin-fold measurements, two indicators of obesity, are lower among boys who walk or bike to school than those who do not, according to a two-year study of fourth-grade to fifth-grade students (Rosenberg et al., 2006). Bicycling to school has also been correlated with higher levels of cardiovascular and respiratory fitness among children and adolescents (Cooper et al., 2006).

Physical activity not only has a significant impact on physiological health, research indicates that physical activity contributes to cognitive functioning (Buck et al., 2008) and academic achievement among children (Stevens et al., 2008) and adolescents (Nelson & Gordon-Larsen, 2006) despite variance in personal backgrounds and demographic characteristics. Better grades, standardized test scores, and other measures of academic performance have been linked to physical activity in copious research studies (Robert Wood Johnson Foundation, 2011).

In addition to these immediate health benefits, walking and biking to school can engender lasting behavior change – children who are consistently physically active as youths are more likely to become physically active adults (Telama et al., 2005).

The role of Safe Routes to School in increasing physical activity makes it a key school-based public health strategy that, in conjunction with physical education, nutrition, and wellness programs, can have a monumental impact on child and adolescent health.

TRAFFIC SAFETY AND PERSONAL SECURITY

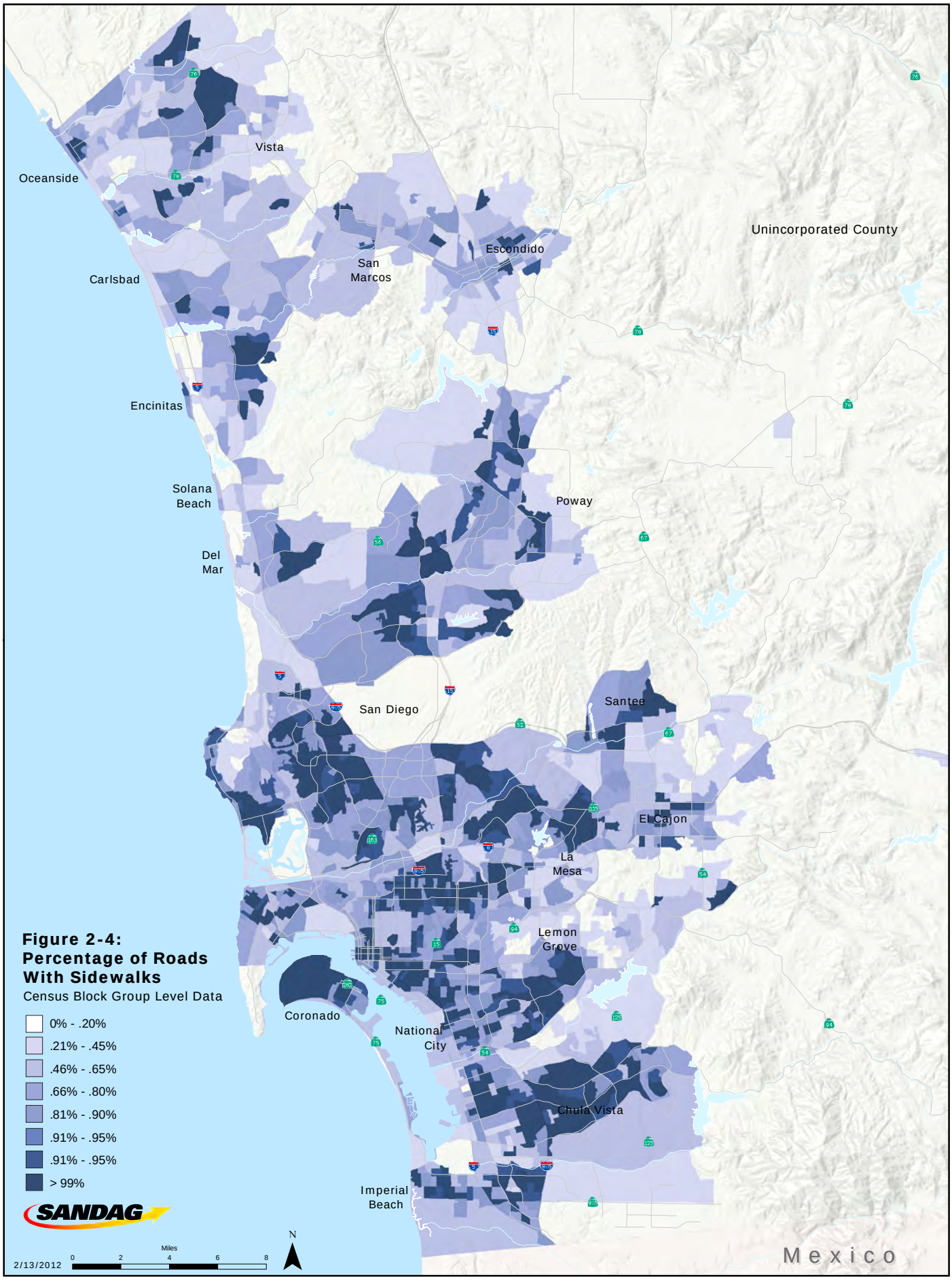
Concerns for child safety are among the strongest impediments to children walking or biking to school, but for some, walking or bicycling to school is a necessity due to financial or other circumstances. In fact, walking or biking to school is more than twice as common among students from low-income households than students from higher-income households. Studies also show that low-income communities tend to report more infrastructure deficiencies within their communities compared to higher-income communities (McDonald, 2008). For these reasons, creating safe routes is one key mechanism to achieve social equity goals by providing safe opportunities to walk and bike regardless of a community's socio-economic composition.

…creating safe routes is one key mechanism to achieve social equity goals by providing safe opportunities to walk and bike regardless of a community's socio-economic composition.

Traffic safety conditions vary substantially across the region, based on characteristics such as traffic volumes and speeds, roadway widths, intersection density, and presence of pedestrian and bicycle facilities. **Figure 2-4** displays the percentage of roadways with sidewalks by census block group across the region. **Figure 2-5** shows existing bicycle facilities in the region. Although facilities exist across the region, gaps are also present in some areas.

Frequent vehicle collisions involving pedestrians or bicyclists indicate that there are opportunities to improve safe walking or biking. **Figures 2-6** and **2-7** show average pedestrian crash rates and bicycle crash rates by census block group over a ten-year period normalized by day time population.

Improving safety conditions is a central goal of Safe Routes to School programs, which can be accomplished through improvements to the built environment, educating students, engaging community members, enforcing traffic laws, and instituting programs designed to address personal security concerns.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Imperial Beach
Mexico
Figure 2-4:
Percentage of Roads With Sidewalks
Census Block Group Level Data
0% - .20%
.21% - .45%
.46% - .65%
.66% - .80%
.81% - .90%
.91% - .95%
.91% - .95%
> 99%
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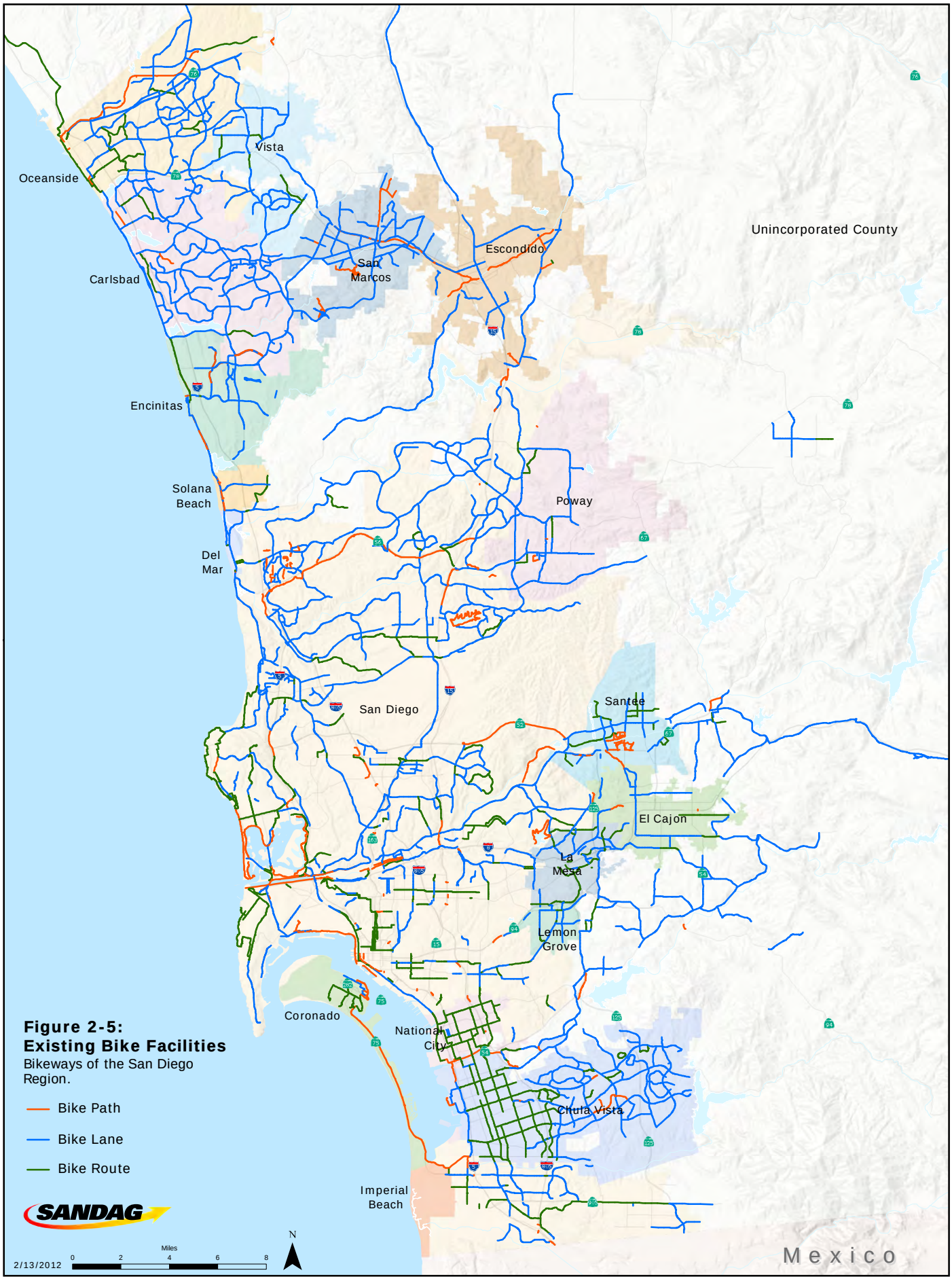
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Mexico
Figure 2-5:
Existing Bike Facilities
Bikeways of the San Diego Region.
Bike Path
Bike Lane
Bike Route
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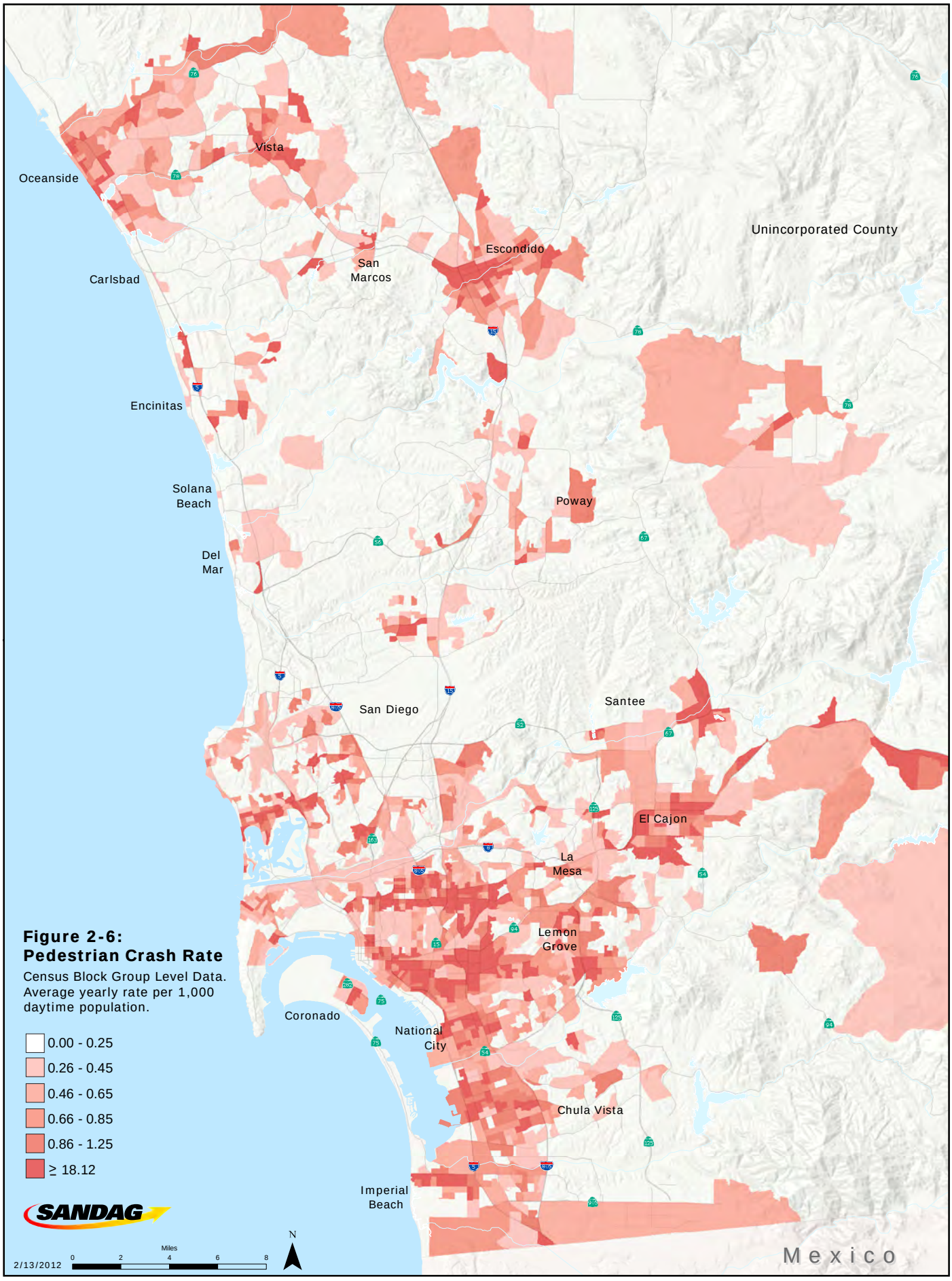
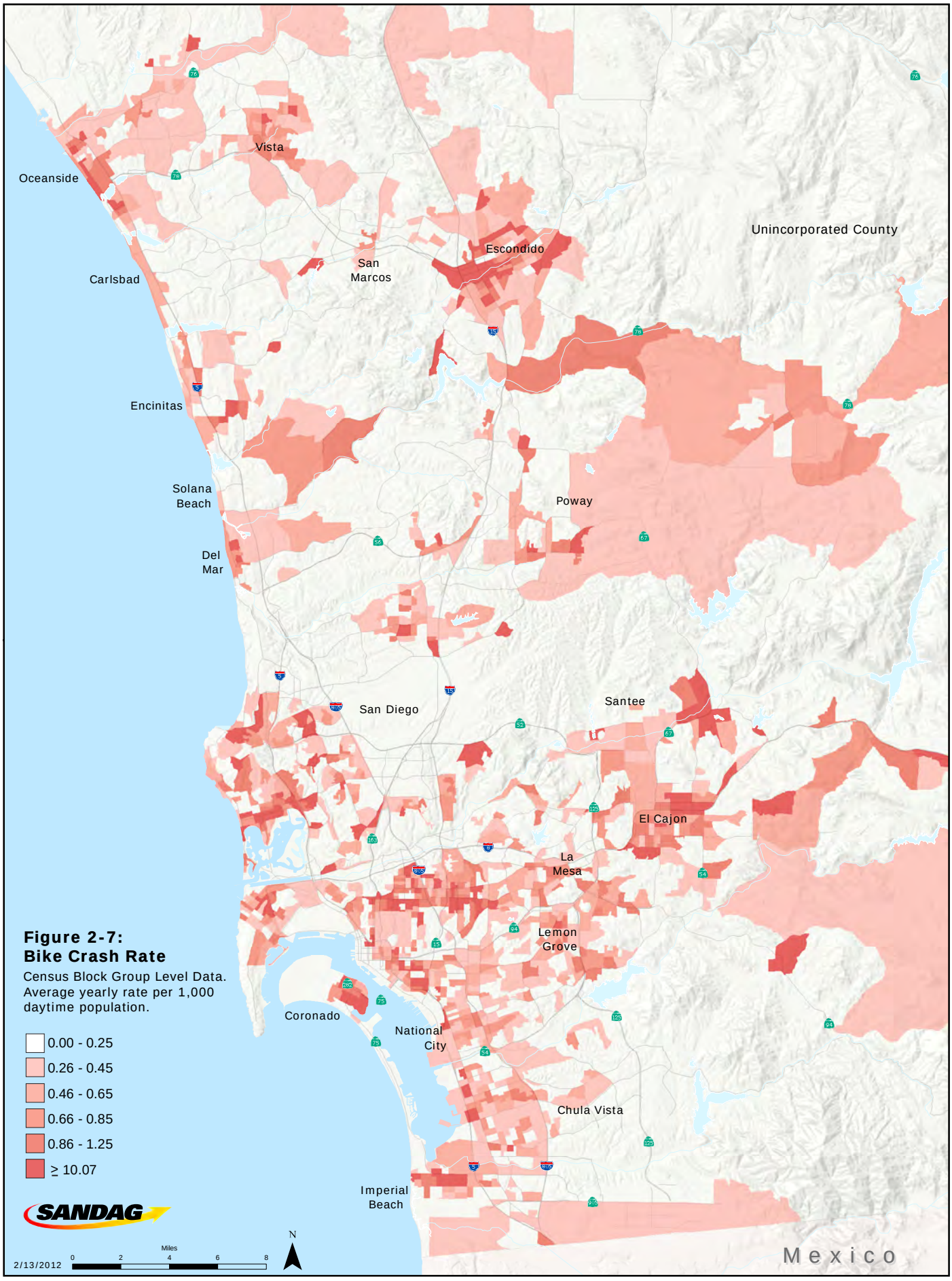


Figure 2-6:
Pedestrian Crash Rate

Census Block Group Level Data.
Average yearly rate per 1,000 daytime population.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National City
Chula Vista
Imperial Beach
Mexico
Figure 2-7:
Bike Crash Rate
Census Block Group Level Data.
Average yearly rate per 1,000
daytime population.
0.00 - 0.25
0.26 - 0.45
0.46 - 0.65
0.66 - 0.85
0.86 - 1.25
≥ 10.07
SANDAG
Miles
0
2
4
6
8
N
2/13/2012

Photo Source: SANDAG

Studies focused on assessing the impacts of the California-legislated program demonstrate that Safe Routes to School infrastructure improvements can be effective tools for improving safety and increasing the proportion of students walking and biking to school. Traffic signal enhancements and sidewalk gap closures, especially, have been shown to influence safety and mode choice. (Boarnet et al., 2005a; Boarnet et al., 2005b). In addition to addressing school travel issues, investing in safety improvements and traffic calming measures benefits the broader community particularly in urban areas where school and population density is higher (Watson & Dannenberg, 2008).

Photo Source: City of National City

Schools in the San Diego region that have participated in the National Center for Safe Routes to School evaluation program show that, combined, traffic safety and infrastructure deficiencies are by far the most significant barriers to parents allowing their children to walk and bike to school. In addition to physical barriers, forty percent of parents surveyed also indicate that fear of violence or crime influences their decisions regarding active transportation to school. This was the strongest individual factor among the approximately forty schools from five jurisdictions that participated in the program by January 2011 (NCSRTS, December 2010). Although this only reflects parents' attitudes from a small subset of the population, it illustrates that in many communities personal security is a significant determinant of school travel behavior.

Several Safe Routes to School strategies are designed to address personal security concerns by engaging parents, school officials, and community members in supervising students as they walk or bike to school and by training children how to respond to potentially dangerous encounters on the trip to school. Walking schools buses, for example, have proven effective in urban, socio-economically disadvantaged neighborhoods where concern with criminal activity can be paramount (Mendoza, et al., 2009).

TRANSPORTATION COSTS

Congestion in school zones degrades air quality and can be a significant community-level transportation issue that is further exacerbated by changes in San Diego school districts' transportation policies. Over the last several years, the cost of busing, coupled with budgetary constraints, have caused several districts to reduce, eliminate, or institute a fee-based system for school-busing services.

Photo Source: SANDAG

By 2009, at least three of the region's school districts had eliminated regular school-to-home transportation and 12 charged a fee for student busing although fee policies typically exclude students enrolled in special education programs or whose household income qualifies them as low-income or certified to receive free or reduced lunch. In June 2011 the San Diego Unified School District Board of Education, overseeing the largest district in the region, approved a plan to eliminate all non-mandatory bus services. This action will eliminate bus service for approximately 6,000 students and is projected to produce substantial overcapacity at 11 schools resulting in a need of $56 million in capital improvements to accommodate a surge of students returning to their neighborhood schools (San Diego Unified School District, June 7, 2011).

Photo Source: SANDAG

The cost to schools and individual families due to busing reductions can be mitigated, in part, by expanding transportation options including carpooling, walking, biking, and taking other active modes to school.

COMPLETE STREETS AND SMART GROWTH

Safe Routes to School programs support the vision established in the Regional Comprehensive Plan and Draft 2050 Regional Transportation Plan of more sustainable, compact, well-designed communities interconnected by a transportation system that expands travel choices and reduces greenhouse gas emissions. Safe Routes to School programs help achieve this vision by reducing peak period vehicle trips and making active transportation to school more viable and attractive options. Addressing school safety and accessibility improves the overall walkability of affected neighborhoods.

Some of the region's most exemplary 'complete streets' are a result of Safe Routes to School infrastructure projects, exhibiting a mix of traffic calming measures, road diet, pedestrian and bicycle facilities, and amenities.

Some of the region's most exemplary 'complete streets' are a result of Safe Routes to School infrastructure projects, exhibiting a mix of traffic calming measures, road diet, pedestrian and bicycle facilities, and amenities. The County of San Diego and cities of National City, Chula Vista, Lemon Grove, San Diego, and Encinitas have all completed Safe Routes to School projects featuring traffic calming elements. For example, the City of Encinitas used a federal Safe Routes to School grant to fund first phase implementation of a neighborhood traffic calming project surrounding Cardiff Elementary School, and the City of National City received a state grant to improve access to Central Elementary School with a road diet, traffic calming, and amenities along East 8th Street. In San Diego, the City Heights neighborhood Urban Village is a mixed-use public space that provides recreational and educational opportunities to adults and youths including enhanced pedestrian access to Rosa Parks Elementary School.

Photo Source: SANDAG

Yet the efficacy of Safe Routes to School projects and programs is limited by school siting and design decisions. National studies cite distance to school as the single strongest deterrent to parents allowing their children to walk or bike to school (National Center for Safe Routes to School, 2010). Additionally, distance to school has increased over the last few decades which may be responsible for as much as half of the reduction in active transportation to school over the same period (McDonald, 2007). Therefore, school siting must be addressed to broaden the impact of Safe Routes to School programs.

Not only does school siting have an unparalleled influence over school travel patterns; the more expansive implications are that these land use decisions affect the region's progress toward advancing smart growth objectives. Smart growth proponents advocate for investing in community-oriented schools that are interwoven into the social fabric of the neighborhoods they serve. This requires investment in existing urban and suburban schools. However, acreage and square-footage guidelines established by state policies have historically favored new school construction in suburban areas over reinvestment in existing schools.

State case law is beginning to help shift financing toward a more balanced approach to school construction and renovation. However, more collaboration is needed between policymakers, education, and planning experts to identify urban and suburban strategies to support community-oriented schools.

Over the last ten years, San Diego Unified School District has made significant progress in restoring urban schools based on community priorities. In 2002, the San Diego Chapter of the American Planning Association honored the district for applying collaborative site identification and community-based planning strategies to its school facility master plan process. Opportunities

exist to strengthen the relationship between Safe Routes to School, school siting, and the advancement of smart growth goals.

TRANSPORTATION DEMAND MANAGEMENT, AIR QUALITY, AND GREENHOUSE GAS EMISSIONS

Safe Routes to School programs are mechanisms for reducing private vehicle trips and traffic congestion which improves traffic safety and air quality in school zones, and has a measurable impact on human-generated greenhouse gas (GHG) emissions. These programs can also help counteract the adverse effect on air quality experienced in communities that are already overburdened by pollution.

For this reason, planning and transportation agencies across the U.S. utilize Safe Routes to School as TDM measures. In 2009, the San Francisco Bay Area Metropolitan Transportation Commission (MTC) invested $80 million over three years toward its Climate Initiatives Program, which includes $17 million allocated toward emission-reducing Safe Routes to School programs.

Marin County's nationally-recognized Safe Routes to School initiative has proven effective at shifting school travel modes from single-student vehicle trips to alternative modes. During the 2007/2008 school year, 90 percent of students living within a half-mile of school walked or bicycled to school. The Transportation Authority of Marin (TAM) attributes the program with more than 15 percent mode shift since its inception (TAM, 2009). This is significant in Marin County where school-related trips constitute 21 percent of morning peak period trips compared to 11 percent in most U.S. geographic areas (U.S. Department of Transportation, 2007).

In the San Diego region, 41 percent of the region's GHG emissions derive from light-duty truck and passenger car trips. Much of these emissions occur during the morning and afternoon commute hours – approximately 50 percent of daily travel occurs during the morning and afternoon peak-periods. School trips contribute over eight percent of peak-period traffic congestion. These figures are likely underestimations because the data does not distinguish between work commute trips and combined work and school commute trips. Combination trips are generally captured as work commute whereas school-only trips are reflected as school commutes. Thus, there is also no measure of additional miles traveled resulting from these extended trips.

Shifting a greater percentage of these school-related trips to walking and biking trips would contribute to meeting our region's GHG reduction goals. The SCS developed in conjunction with the 2050 RTP includes implementation of this Safe Routes to School Strategy as one measure to help reduce future GHG emissions from private vehicles and light trucks. Specifically, implementing this Safe Routes to School strategy is anticipated to increase school walk and bike trips by 10 percent in 2020 and 20 percent by 2035, resulting in tens-of-thousands fewer pounds of GHG.

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CHAPTER 3:
EXISTING SAFE ROUTES TO SCHOOL EFFORTS

The potential benefits described in Chapter 2 are already evident in many communities throughout the region who participate in Safe Routes to School activities. This chapter of the Strategic Plan provides an overview of the region's existing Safe Routes to School efforts underway, including individual programs as well as regionally-available resources.

FEDERAL AND STATE GRANT FUNDED PROGRAMS

Through the collaborative efforts of city officials, schools, school districts, community-based organizations, parent organizations, and parents, at least a quarter of the region's schools engage in Safe Routes to School activities or benefit from Safe Routes to School infrastructure improvements funded by the federal or state-legislated grant programs.

Photo Source: SANDAG

Although not inclusive of all of the region's existing Safe Routes to School efforts, as primary sources of funding for Safe Routes to School programs,

the state-legislated and federal Safe Routes to School grant awards provides an indication of the number, distribution, and diversity of these Safe Routes to School efforts.

Table 3.1 summarizes state-legislated Safe Routes to School grant awards by jurisdiction in the San Diego region over the nine funding cycles since the program commenced.

Table 3.1
State-Legislated Safe Routes to School Program
Funded Projects in the San Diego Region (All Program Cycles)

Jurisdiction	Schools	Grants	Grant Funds	Total Funds
Chula Vista	4	4	$ 745,505	$846,250
County of San Diego	12	9	$3,087,508	$3,430,564
El Cajon	2	1	$ 105,750	$117,500
Encinitas	5	4	$ 1,127,833	$1,253,353
Escondido	5	1	$337,500	$375,000
Imperial Beach	2	1	$225,720	$250,800
La Mesa	4	4	$825,172	$916,869
Lemon Grove	3	3	$735,930	$817,700
National City	14	4	$2,283,800	$3,207,000
Oceanside	1	1	$241,200	$268,000
Poway	4	3	$427,500	$562,800
San Diego	12	9	$4,352,160	$4,869,100
San Marcos	6	5	$1,634,830	$1,860,230
Santee	2	1	$225,720	$250,800
Vista	4	4	$1,585,260	$2,411,400
Totals	80	54	$17,941,388	$21,437,366

Source: Caltrans, http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/sr2s.htm
(downloaded on December 4, 2010)

As shown, the state-legislated program has provided nearly $18 million toward projects and programs impacting 80 schools throughout the region. Some schools have benefited from more than one grant. By design, the vast majority of these funds were devoted to infrastructure improvements. The state-legislated program enables jurisdictions to apportion up to 10 percent of grant funds toward education and encouragement activities. However, according to Caltrans' approved projects lists, only three of the 54 funded projects incorporated non-infrastructure program elements, specifically, projects of the County of San Diego and cities of National City and San Diego.

Table 3.2 presents the number of grants, funds, and schools in the region impacted by the federal Safe Routes to School grant program.

Table 3.2
Federal Safe Routes to School Program
Funded Projects in the San Diego Region
(Program Cycles 1 & 2)

Agency	Schools	Grants	Grant Funds
Chula Vista	2	1	$621,115
Chula Vista Elementary School District	17	1	$499,025
Encinitas	1	1	$651,390
La Mesa	9	2	$975,390
Lemon Grove	2	1	$743,510
National City	1	1	$730,000
Oceanside	2	1	$63,320
Rady Children's Hospital Center for Healthier Communities	27	1	$499,816
San Diego County	1	1	$517,000
San Marcos	14	2	$1,034,000
Santee	1	1	$228,800
Totals	77	13	$6,563,366

Source: Caltrans, http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/sr2s.htm
(downloaded on December 4, 2010)

Over the first two federal program cycles, 13 grants with a combined total of about $6.6 million have been awarded to cities, school districts, and non-profit organizations. Ten of the 13 grants were infrastructure based and three were provided to support non-infrastructure programs conducted by the Chula Vista Elementary School District, Rady Children's Hospital Center for Healthier Communities, and City of La Mesa.

Some of the non-infrastructure funded programs include coordinating Walk to School Day events, parent safety patrols, taskforces, incentive programs, outreach campaigns, and traffic safety courses.

To help reduce the disparity between the numbers of infrastructure and non-infrastructure funded projects (an imbalance that is not exclusive to the San Diego region), Caltrans sets funding distribution goals. The federal Call for Projects released on April 15, 2011 aimed to allocate 70 percent of available funds to infrastructure projects and 30 percent to support education, encouragement and enforcement activities.

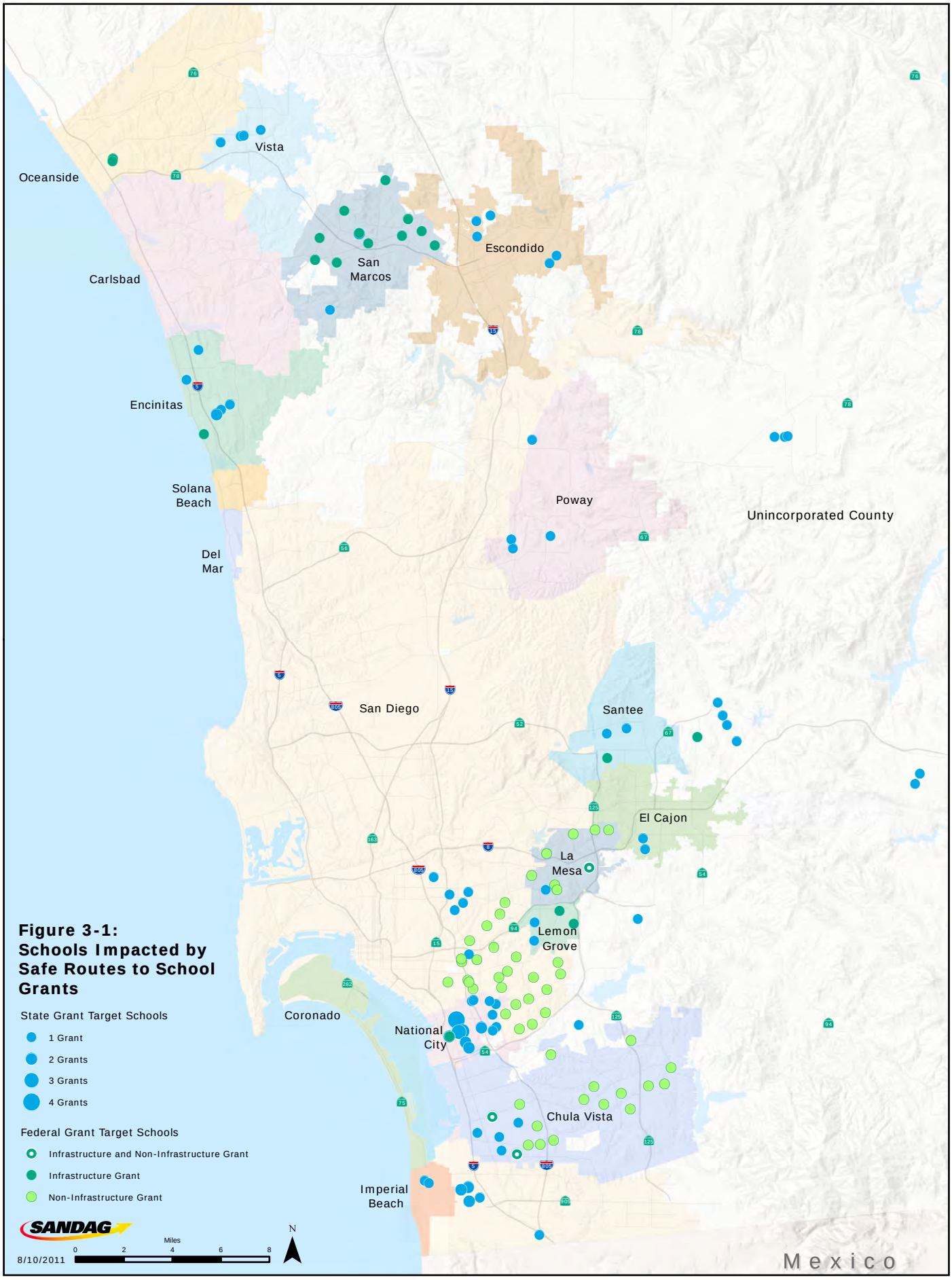
The majority of federal and state Safe Routes to School infrastructure projects involve sidewalk and curb ramp installation. Traffic controls and crossing improvements such as enhanced crosswalks, in-pavement lighted crosswalks, flashing beacons, pavement markings, and signage, are also common construction types. Additionally, several jurisdictions have used

funds for traffic calming measures including curb extensions, bulb-outs, raised pedestrian refuges, and speed humps. Fewer projects involve bicycle facilities.

Photo Source: City of National City

Figure 3-1 displays the geographic distribution of schools impacted by the federal and state-legislated Safe Routes to School grant awards in the San Diego region. As shown, several jurisdictions have implemented Safe Routes to School projects. While the majority of funds have been used to support capital projects, the three non-infrastructure grants have benefited about 50 schools because programmatic activities are relatively inexpensive compared to infrastructure improvements. Federally-funded non-infrastructure programs are concentrated in the southwestern portion of the region, in southeastern San Diego, La Mesa, and Chula Vista.

In addition to those already impacting the region, eleven new Safe Routes to School grants are anticipated through the federal 2011/2012 program cycle. On October 17, 2011, Caltrans announced the list of projects approved for Cycle 3 grants, which will contribute an additional $5.4 million in federal Safe Routes to School funds to the San Diego region, including $1.9 million to support non-infrastructure projects. Cycle 3 grant recipients include the cities of San Diego, Santee, El Cajon, Encinitas, La Mesa, Lemon Grove, National City, San Marcos, and County of San Diego.


Vista
Oceanside
Carlsbad
San Marcos
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Unincorporated County
San Diego
Santee
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Mexico
Figure 3-1: Schools Impacted by Safe Routes to School Grants
State Grant Target Schools
1 Grant
2 Grants
3 Grants
4 Grants
Federal Grant Target Schools
Infrastructure and Non-Infrastructure Grant
Infrastructure Grant
Non-Infrastructure Grant
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SUPPORTIVE LOCAL AND SCHOOL DISTRICT POLICIES

School boards can play a vital role in encouraging active transportation to school by establishing policies that promote programs and encourage coordination with local city departments to implement Safe Routes to School projects.

Most local jurisdictions in the region have a current bicycle master plan and several have a pedestrian master plan, or similar document, that includes a discussion of Safe Routes to School as a key element to improving pedestrian and bicycle mobility. Fewer school districts have adopted complementary policies. Of the region's 42 school districts, the following eight have adopted Safe Routes to School-supportive policies:

- Alpine Union School District
- Encinitas Union School District
- Escondido Union School District
- Escondido Union High School District
- Grossmont Union High School District
- La Mesa – Spring Valley School District
- San Pasqual Union School District
- Solana Beach School District

School boards can play a vital role in encouraging active transportation to school by establishing policies that promote programs and encourage coordination with local city departments to implement Safe Routes to School projects. Policy development can also be key to assessing and minimizing liability risks. Concern over liability is a common barrier to instituting Safe Routes to School programs. Some local jurisdictions are addressing these issues by developing Safe Routes to School plans that identify need and establish policies, programs, and procedures to implement Safe Routes to School.

PUBLIC HEALTH PARTNERSHIPS

The public health field plays an integral role in advancing Safe Routes to School programs both state-wide and within the region.

California Department of Public Health

To complement the support provided by the state grant program, the California Safe Routes to School Technical Assistance Resource Center (TARC) assists local communities in coordinating non-infrastructure Safe Routes to School programs. TARC is a project of California Active Communities, which is a joint program of the University of California, San Francisco, Institute for Health and Aging and the California Department of Public Health. TARC is funded by Caltrans to support non-infrastructure

Safe Routes to School projects and represents a successful partnership between the state departments of transportation and public health. Four TARC coordinators provide training and resources to communities throughout the state.

California Project LEAN (Leaders Encouraging Activity and Nutrition) works with school and community stakeholders to prevent obesity and its associated health risks by promoting physical activity and nutrition policy, particularly in high-need, low-income communities. The program is a collaborative effort of the California Department of Public Health and the Public Health Institute.

County of San Diego Healthy Works

As noted in the introductory chapter of this plan, in March 2010 SANDAG partnered with the County of San Diego Health and Human Services Agency (HHSA) to develop this Strategic Plan and provide implementation resources to encourage exemplary, comprehensive local Safe Routes to School programs throughout the region. This effort is one of six Healthy Works initiatives HHSA has contracted with SANDAG to implement as part of HHSA's broader effort to reduce chronic disease by combating rising obesity rates in the San Diego region with improved access to physical activity, nutritious foods, and healthy school environments. Healthy Works is funded by Communities Putting Prevention to Work, a program of the federal Centers for Disease Control and Prevention established by the American Recovery and Reinvestment Act.

Photo Source: SANDAG

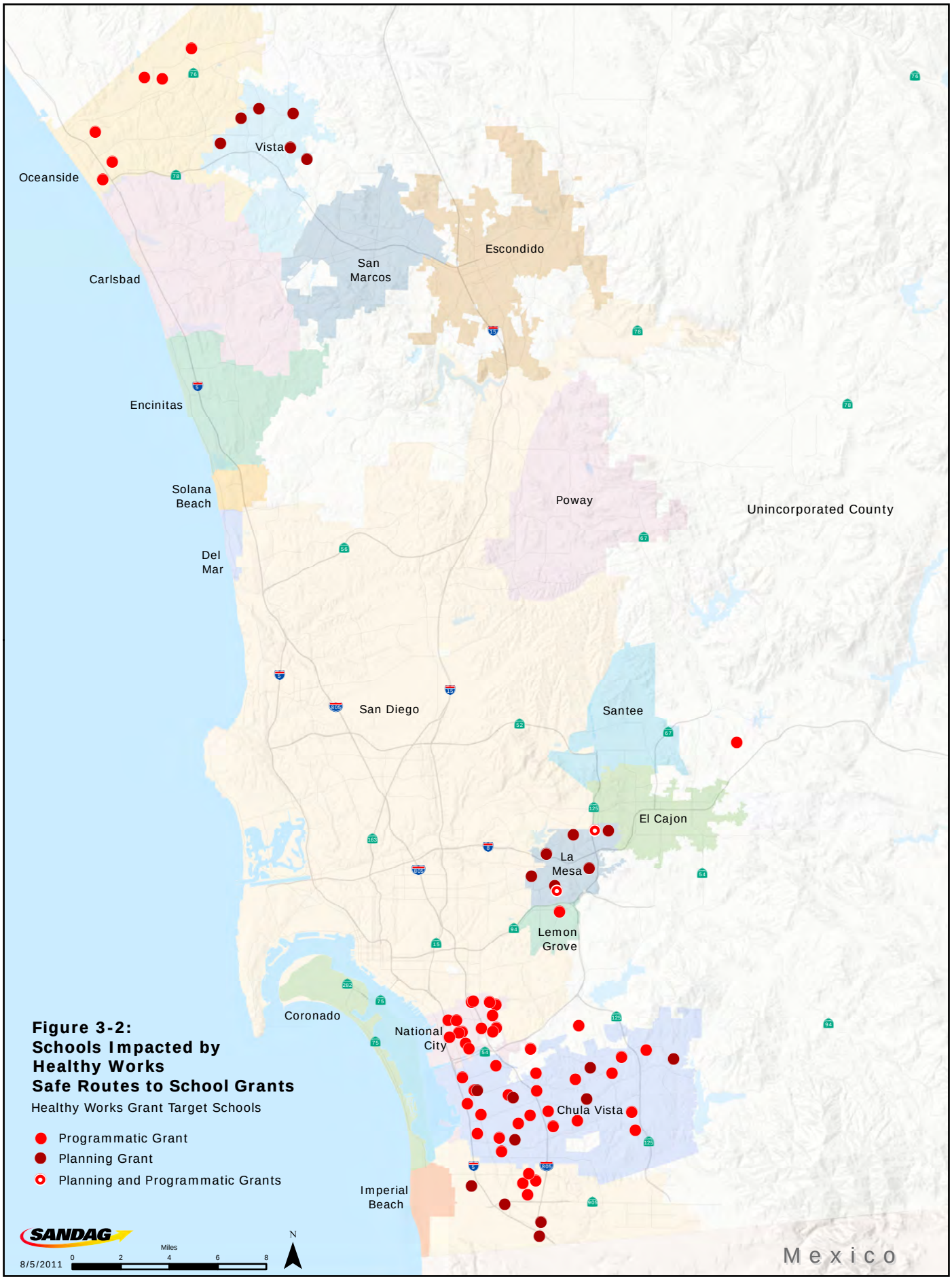
A major component to SANDAG's Healthy Works Safe Routes to School initiative involved developing and administering two pass-through grant programs: the Safe Routes to School Capacity Building and Planning

Grant Program, and Safe Routes to School Education, Encouragement, and Enforcement Grant Program.

Twelve cities, non-profit organizations, and school districts were awarded grants totaling about $340,000. Approximately $280,000 was provided to develop comprehensive Safe Routes to School plans that include existing conditions analysis; identification of infrastructure needs and non-infrastructure program strategies; and define an ongoing monitoring and evaluation strategy. These plans are intended to serve as a blueprint for future Safe Routes to School investments and make jurisdictions more competitive for state and federal funding. In addition to planning grants, about $60,000 was awarded to advance education, encouragement, and enforcement activities, such as bicycle rodeos, a speed reduction campaign, pedestrian safety courses, and student encouragement competitions.

Photo Source: SANDAG

Figure 3-2 displays schools impacted by the Healthy Works grant programs. As demonstrated, the Healthy Works program was most commonly utilized in jurisdictions where Safe Routes to School initiatives already exist. In some cases, the Healthy Works funds are contributing to expanding Safe Routes to School into schools not currently participating, such as in Chula Vista. In other jurisdictions, funds are being used to incorporate other program components, such as the City of National City pursuing education and encouragement activities to support their existing capital investments.


Oceanside
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Encinitas
Solana Beach
Poway
Unincorporated County
Del Mar
San Diego
Santee
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Mexico
Figure 3-2:
Schools Impacted by Healthy Works
Safe Routes to School Grants
Healthy Works Grant Target Schools
Programmatic Grant
Planning Grant
Planning and Programmatic Grants
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Miles
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N

Table 3.3 lists the Healthy Works project titles, lead agency, and project partners.

Table 3.3
SANDAG Healthy Works Grant Projects

Project Title	Lead Agency	Project Partners
La Mesa Kids Walk & Roll to School Safe Routes Program Planning Project	City of La Mesa	La Mesa-Spring Valley School District, Boys and Girls Club of East County, WalkSanDiego
San Ysidro Walks and Wheels to School	WalkSanDiego	San Ysidro School District
South San Diego: Let's Move Together	WalkSanDiego	South Bay Union School District
Students Taking Active Routes to School (STARTS) Program	City of Chula Vista	Sweetwater Union High School District, San Diego County Bicycle Coalition, Chula Vista Community Collaborative
Vista Safe Routes to School Strategic Plan	City of Vista	Vista Unified School District
Golden Avenue Elementary Safe Routes to School (GAE-SRTS)	Lemon Grove Elementary School District	San Diego County Sheriff's Department, District Health and Wellness Council, WalkSanDiego, Parent Teacher Association of Golden Avenue Elementary
La Mesa and Parkway Middle School Student Engagement Initiative	City of La Mesa	WalkSanDiego
Lakeside Gets Moving	WalkSanDiego	Lakeview Elementary School, Lakeside Union School District
National City Safe Routes to School Education and Encouragement Initiative	City of National City	National School District, Sweetwater Union High School District, South Bay Community Services, National City Collaborative Family Resource Center
Neighborhood Pace Car Program- Safe Routes to School	Chula Vista Elementary School District	Chula Vista Community Collaborative, WalkSanDiego
Oceanside Bicycle Rodeo Program	City of Oceanside	Oceanside Unified School District, Oceanside Bicycle Committee, San Diego County Bicycle Coalition
Walk This Way: Pedestrian Training for Elementary School Students	WalkSanDiego	

Five Healthy Works grantees, who were awarded a combined $160,000, leveraged those dollars to secure nearly $2.5 million in federal Safe Routes to School grant funds through the program's third application cycle (see Table 3.3).

Healthy Works helps fulfill HHSA's broader goals which include promoting Safe Routes to School as a strategy to improve childhood health. In July 2010, the County of San Diego adopted *Live Well, San Diego!,* the County's 10-year plan to build a healthy, safe and thriving community, which identifies encouraging Safe Routes to School programs as a goal to increase physical activity. The San Diego County Childhood Obesity Initiative's 2010 *Call to Action: Childhood Obesity Action Plan* also identifies Safe Routes to School strategies including implementation of a countywide Safe Routes to School strategic plan. By funding the development of this Strategic Plan and complementary grant program, the Healthy Works program helps achieve the County's Safe Routes to School related public health goals.

SANDAG'S ACTIVE TRANSPORTATION PROGRAM

The Healthy Works program builds on SANDAG's growing active transportation and the iCommute SchoolPool program.

Photo Source: SANDAG

To support local projects and planning, the regional Active Transportation Program funds bicycle, pedestrian, and neighborhood safety (traffic calming) projects and programs including projects that improve access and safety in school areas. Funding for the Active Transportation Program local competitive grant program derives from the *TransNet* ½-cent transportation sales tax program and the Transportation Development Act (TDA) Article 3

To support local projects and planning, the regional Active Transportation Program funds bicycle, pedestrian, and neighborhood safety (traffic calming) projects and programs including projects that improve access and safety in school areas.

Non-motorized funds. Since the *TransNet* program's inception in FY 1988, SANDAG has provided approximately $28 million in *TransNet* revenues and $37 million TDA funds to active transportation projects throughout the region.

The competitive grant program's current guidelines and criteria give preference to planning and infrastructure projects that comprehensively address active transportation and complete streets considerations, including bicycle, pedestrian, and transit access and Safe Routes to School. Approximately $8.8 million is available for the FY 2011 local call for projects.

Implementation of the Regional Bicycle Plan is also central to the development of a robust active transportation system and is now a key component to the regional Active Transportation Program. In April 2011 SANDAG assumed responsibility as the lead agency in implementing regional bicycle projects and programs identified in the Regional Bicycle Plan. These projects and programs are funded by *TransNet* and Transportation Enhancement (TE) funds. Initial implementation will begin in 2012 and is supported by $8.3 million in *TransNet* and TE funds.

As noted in Chapter 1, the Regional Bicycle Plan identifies Safe Routes to School as a priority regional program. This Strategic Plan strengthens the region's Active Transportation Program by contributing a strategy to support Safe Routes to School planning and programming.

SANDAG iCOMMUTE SCHOOLPOOL

SANDAG's SchoolPool program is managed by iCommute, the regional TDM program. SchoolPool is designed to reduce peak-period trips and traffic congestion in and around school zones. The program is a free, convenient, and secure online system used to help parents of children who attend the same school to find partners to walk, bike, or carpool for school commute trips. As of January 2012, 68 schools from 14 school districts participate in the SchoolPool program.

Carpooling is a vital element to many Safe Routes to School programs, particularly for schools where a significant portion of the student population live further from school than is a reasonable distance to walk or bike. Carpooling reduces vehicle congestion in school zones, which promotes cleaner air and safety around the school.

With Healthy Works funding, iCommute launched the "Walk, Ride and Roll to School" campaign in 2011 to expand school and parent participation in SchoolPool. The campaign introduced the "Walking School Bus" and "Bike Buddies" elements to the program. These program elements encourage students to walk or bike to school as a group, supported by adult-

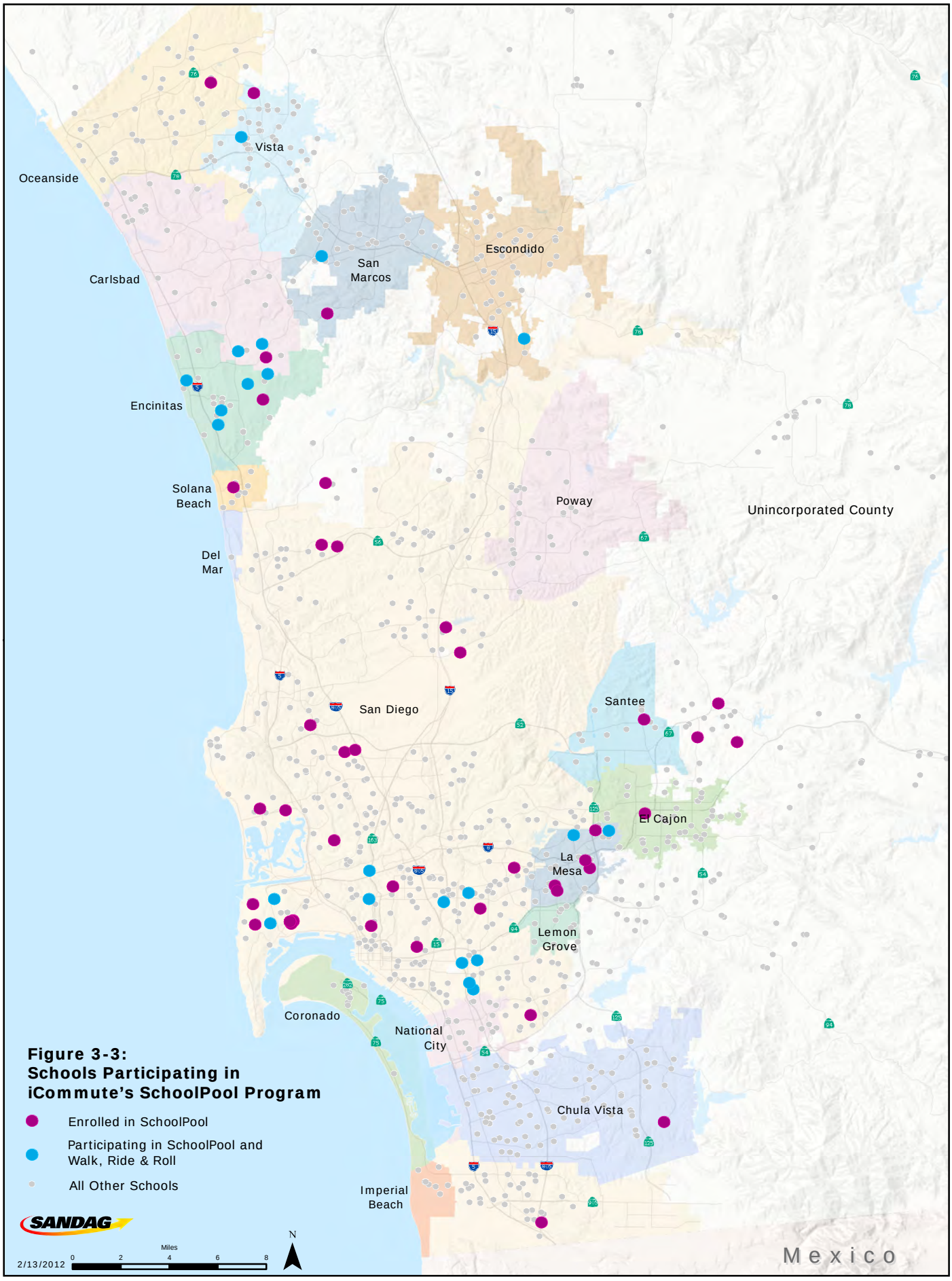
supervision and safety education. Bike Buddies and Walking School Buses can also be used in combination with carpooling.

Walk, Ride, and Roll to School 2011 provided free marketing materials, student incentives, and safety equipment, such as bike helmets and reflective vests, for Walking School Bus and Bike Buddies formed through SchoolPool. These Bike Buddies and Walking School Bus starter kits were available while supplies lasted to all SchoolPool registrants, regardless of participation in Walk, Ride, and Roll. The campaign featured a competition where schools could win up to $1,000 toward school supplies for logging the most walking or biking trips throughout the month of October 2011. Registered schools also received pedestrian or bicycle safety training courses and safety trading cards.

Walk, Ride, and Roll to School 2011 provided free marketing materials, student incentives, and safety equipment, such as bike helmets and reflective vests, for Walking School Bus and Bike Buddies formed through SchoolPool…
Twenty-two schools, representing approximately 15,000 students, registered to participate in Walk, Ride, and Roll to School.

Photo Source: Walk San Diego

Twenty-two schools, representing approximately 15,000 students, registered to participate in Walk, Ride, and Roll to School in 2011. As shown in **Figure 3-3**, schools across the region participate in SchoolPool as well as Walk, Ride, and Roll. Also beginning in 2011, iCommute is holding annual Walk and Bike to School Day events in conjunction with International Walk to School Day.


Vista
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Poway
Unincorporated County
Del Mar
San Diego
Santee
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Mexico
Figure 3-3:
Schools Participating in iCommute's SchoolPool Program
Enrolled in SchoolPool
Participating in SchoolPool and Walk, Ride & Roll
All Other Schools
SANDAG
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ADVOCACY AND COMMUNITY-BASED ORGANIZATIONS

As illustrated in the previous sections, non-profit and community-based organizations in the San Diego region play a vital role in Safe Routes to School implementation within the region. The San Diego County Bicycle Coalition, for example, provides bicycle skills and safety training to children in communities throughout the region. This includes conducting bicycle and pedestrian safety trainings as a facet of the iCommute "Walk, Ride, and Roll" campaign.

WalkSanDiego is another non-profit organization in the region focused on education, outreach, and advocacy to promote walkable communities. Their work includes contracting with several communities within the region to assess school travel needs and deliver Safe Routes to School education and encouragement programs. Additionally, the City Heights Community Development Corporation, Oceanside Bicycle Committee, Bayside Community Center and Linda Vista Collaborative, and Chula Vista Community Collaborative are among the numerous community-based organizations that collaborate with schools, school districts, and city agencies to advance Safe Routes to School.

Photo Source: SANDAG

State and national organizations also serve as essential resources to Safe Routes to School programs. The National Center for Safe Routes to School, administered by the University of North Carolina Highway Safety Research Center with funding from the U.S. Department of Transportation Federal Highway Administration, maintains a website containing the largest U.S. based collection of Safe Routes to School related information, including a guide to developing and sustaining programs, case studies, news,

publications, information on funding sources, and instructions on collecting and submitting data to the National Center's database.

The National Center's data collection program is a tool for local communities to evaluate the effectiveness of their programs and also contributes to national research and evaluation conducted by the institute. Currently, the National Center also provides mini-grants of $1,000 to communities throughout the country on a bi-annual basis to support mainly community-driven education and encouragement activities.

Other online resources include California Walk to School Day Headquarters and iWalk International Walk to School in the USA, which enables schools to register their Walk to School events and provides access to materials and tools for organizing successful events. Appendix A of this plan lists Web links to resources provided at the regional, state, and national level.

Photo Source: SANDAG

The programs summarized in this chapter reflect only a large subset of Safe Routes to School activities within the region. Many activities are maintained with volunteer support, such as bicycle rodeos conducted in Oceanside and Lakeside. School and parent involvement can be key to the success of these programs due to limited staff resources. Private businesses, organizations, and other governmental agencies also regularly fund Safe Routes to School related efforts. For example, in 2005, Imperial Beach launched a pedestrian and bicycle safety campaign involving bicycle and pedestrian rodeos and school assemblies with funding from the California Office of Traffic Safety. Imperial Beach is now expanding their Safe Routes to School program activities with a Caltrans Environmental Justice grant award.

CHAPTER 4:
MOVING FORWARD A REGIONAL STRATEGY

Based on a review of best practices, existing efforts, and extensive input from stakeholders, the following strategy is proposed as a means to support local communities and schools in developing effective Safe Routes to School programs and to better integrate Safe Routes to School with regional objectives.

The strategy consists of the following major components: regional planning and evaluation; technical assistance; collaboration and coordination; and education and encouragement. Within each of these categories, actions are recommended as well as the agencies responsible for implementing the action.

Integrating Safe Routes to School into regional planning efforts establishes a vision for Safe Routes to School throughout the region and advances the regional goals of monitoring, projecting, and promoting active transportation.

REGIONAL PLANNING AND EVALUATION

Integrating Safe Routes to School into regional planning efforts establishes a vision for Safe Routes to School throughout the region and advances the regional goals of monitoring, projecting, and promoting active transportation.

The following actions are recommended to strengthen the role of Safe Routes to School in local and regional transportation and land use planning.

Data Collection and Evaluation

Key Elements	➢ Data collection and analysis focused on school travel
Lead Agency	➢ SANDAG
Partners	➢ School districts, schools, parent volunteers, and local governments

Data collection and analysis of school travel behavior is essential to measuring progress, identifying and prioritizing needs, and generating evidence to support future investment in Safe Routes to School efforts. Accordingly, the Strategic Plan recommends establishing a process to evaluate Safe Routes to School program participation levels, changes in

perceptions and attitudes toward active transportation to school, future needs, and Safe Routes to School impacts on mode share, health, and safety.

This Safe Routes to School monitoring program should complement the Active Transportation Program data collection, evaluation, and modeling effort planned for initial implementation in 2012. This broader Active Transportation Program effort will capture active transportation trip data to incorporate into future activity-based transportation models and to inform future regional planning efforts with more robust data on active transportation activity levels and behaviors.

Photo Source: SANDAG

To measure journey to school trends, the Safe Routes to School data collection effort may consist of three major components:

- Conducting biannual school traffic counts throughout the region that capture a diverse sample of school sites in terms of Safe Routes to School program elements and land use, transportation, and population characteristics, as well as encouraging schools to routinely collect in-classroom student arrival and departure tallies, consistent with the National Center for Safe Routes to School evaluation program.

- Surveying parents or guardians and students to identify behavioral and attitudinal trends as well as input on the effectiveness of Safe Routes to School infrastructure and non-infrastructure programs. Survey instruments should be based upon and compatible with the National Center for Safe Routes to School evaluation program but enhanced with input from local practitioners.

- Surveying government agencies and school administrators to gain an accurate picture of the types and distribution of the Safe Routes to School activities in existence, programs they are interested in learning more about, and existing institutional barriers to participating in Safe Routes to School activities.

The data compiled through this effort should be incorporated into a Regional Safe Routes to School Evaluation and Action Plan that includes: 1) performance measures and benchmarks; 2) a mode shift and GHG reduction analysis; 3) an assessment of Safe Routes to School program participation levels, including utilization of SANDAG resources such as SchoolPool; 4) a health and safety benefits analysis; and 5) actions and programs recommended to implement the Strategic Plan over the subsequent years.

The Evaluation and Action Plan should be published bi-annually and incorporated into regional Active Transportation Program monitoring reports. It should help inform future regional transportation and comprehensive planning, and also serve as a strong public awareness tool to communicate the health and environmental benefits of active transportation.

Community-oriented schools located in close proximity to the neighborhoods they serve encourage walking and biking to school and provide social and recreational opportunities for students and community residents.

Smart Growth and Complete Streets Integration

Key Elements	➢	Engaging planners, school district officials, and policymakers to improve synthesis between school facility and community planning goals.
Lead Agency	➢	SANDAG
Partners	➢	Local jurisdictions, school district officials, and school facility planners

Community-oriented schools located in close proximity to the neighborhoods they serve encourage walking and biking to school and provide social and recreational opportunities for students and community residents. If well-designed, they reflect community character, can hold historical significance, and enhance the aesthetic quality of a neighborhood. For these reasons, community schools support smart growth development, and in many communities, school access has become the focal point of complete streets initiatives.

However, a spectrum of factors discourages investment in community-oriented schools. These include regulatory barriers, such as historical funding biases that favor new construction over renovation and minimum acreage regulations for new facilities, as well as social factors that must be balanced, such as the need for large athletic fields and cultural diversity goals. Lack of coordination between comprehensive planning and school facility planning is also a challenge to designing schools that are interwoven into the community fabric.

Despite these challenges, communities are moving toward collaboration and innovative design solutions to retain community-centered schools.

Photo Source: SANDAG

To underscore the connection between school planning, smart growth, and complete streets, the Strategic Plan recommends the following actions:

- Discuss the role of schools in place-making in relevant, future regional plans such as the Regional Comprehensive Plan and Regional Transportation Plan.

- Address school design and access issues in any of the region's future smart growth, complete streets, or healthy and active design guidelines.

- In SANDAG's existing Smart Growth and Active Transportation grant programs, consider incorporating criteria that encourages jurisdictions to consider school access and collaborative school facility planning approaches.

- Provide workshops, presentations, or other forums on topics such as joint-use policies, green school building renovation, complete streets, and model inter-agency review agreements between school facility planning and city planning agencies.

COLLABORATION AND COORDINATION

The success and reach of this strategy is largely contingent on engaging with partners and collaborating with agencies and organizations that are intimately connected to school communities and knowledgeable about school issues.

There is growing interest among Safe Routes to School implementers in coordinating regionally and collaborating on Safe Routes to School efforts. The following actions are intended to strengthen relationships and the exchange of information amongst schools, organizations, SANDAG, and other agencies involved in advancing Safe Routes to School. Another key objective is to engage related, non-participating organizations in Safe Routes to School efforts through collaboration and disseminating information.

Photo Source: SANDAG

The success and reach of this strategy is largely contingent on engaging in partners and collaborating with agencies and organizations that are intimately connected to school communities and knowledgeable about school issues.

Safe Routes to School Coordination

Key Elements	➢ Regional coordination of Safe Routes to School efforts
Lead Agency	➢ Regional public health or planning organization
Partners	➢ Local jurisdictions, school districts, County of San Diego HHSA, and other regional organizations and agencies involved in Safe Routes to School

The Strategic Plan recommends creating a structure to manage on-going implementation of the regional strategy, coordinate local Safe Routes to School program activities, and ensure that local jurisdictions and school communities have access to technical assistance that supports effective program implementation. A key component to this process is bringing school districts and local jurisdictions together to promote collaboration and jointly address barriers to Safe Routes to School implementation.

Photo Source: SANDAG

Safe Routes to School funding apportioned for non-infrastructure projects is often underutilized because applicants lack the staff resources to implement these types of projects. Although city traffic engineers and planners may not have the time or expertise to devote toward programmatic activities, most recognize the high rate of return provided by these efforts. As shown in Chapter 2, non-infrastructure projects can reach a considerable number of schools at relatively low cost.

Coordinating access to resources and information could help address this gap and expand program activities in the San Diego region. Throughout the U.S., county- or region-wide Safe Routes to School coordination supports programmatic activities by providing individualized support to jurisdictions, schools, and community volunteers. This includes connecting schools with available resources and providing information on model programs and strategies for establishing programs tailored to their communities' needs, sustaining activities, and overcoming program challenges. One way to accomplish this is by maintaining a clearinghouse of case studies to illustrate best practices.

Regional coordination could also result in tools to address common barriers to walking and biking to school, such as liability concerns, prohibitive school policies and other institutional barriers, as well as tools to support instituting curriculums, school transportation policies, and school wellness policies that facilitate walking and biking to school. Regional coordination could also help to ensure resources are available, in appropriate formats and languages, to underserved communities.

Participating in existing regional, state, and national Safe Routes to School networks, in addition to seeking new opportunities to collaborate among

agencies and institutions, is key to coordinating Safe Routes to School regionally.

Safe Routes to School Coalition

Key Elements	➢ On-going forum to exchange information and promote collaboration
Lead Agencies	➢ California Department of Public Health, Safe Routes to School Technical Assistance Resource Center ➢ County of San Diego HHSA ➢ Rady Children's Hospital, Center for Healthier Communities ➢ SANDAG
Partners	➢ School district officials, parent organizations, non-profit organizations, local government staff including engineers and planners.

Beginning in April 2011, the County of San Diego HHSA, SANDAG, the California Department of Public Health's Safe Routes to School Technical Assistance Resource Center (TARC), and Rady Children's Hospital, Center for Healthier Communities, have partnered to establish a Regional Safe Routes to School Coalition that serves as a forum to connect agencies and organizations involved in implementing Safe Routes to School. The Coalition, currently chaired by TARC, meets on a bi-monthly basis to coordinate efforts and to share relevant information about local program activities as well as available resources and technical expertise.

Photo Source: SANDAG

The Strategic Plan recommends regional and local partners, including SANDAG, continue to participate and work to expand participation and the scope of the Coalition.

TECHNICAL ASSISTANCE

Providing trainings and other forms of technical assistance helps ensure that programs are comprehensive, effective, and sustainable.

Seminars and Trainings

Key Elements	➢ Professional trainings on a variety of technical topics related to Safe Routes to School
Lead Agencies	➢ Regional public health or planning organization
Partners	➢ Local governments, school districts, County of San Diego HHSA, State of California agencies, and professional organizations.

In order to promote comprehensive citywide and school-district wide Safe Routes to School planning, the Strategic Plan recommends providing professional planning services to up to three high-need communities per year beginning with this program's first year of implementation.

The plan recommends providing periodic trainings and seminars for professionals to support Safe Routes to School program and project development and overcome obstacles to implementing Safe Routes to School. Training topics may include: addressing liability issues, local and school district policy development, prioritizing investments, crime prevention by design, school-siting and design issues, and obligating funds in a timely manner.

Additionally, the highly competitive nature of Safe Routes to School funding has produced significant demand for grant-writing assistance. In response, the plan recommends offering periodic grant-writing seminars geared toward writing successful state-legislated and federal grant applications, as well as identifying and applying for alternative sources for Safe Routes to School funding.

One to three trainings or seminars could be offered within the first five years of strategy implementation, contingent on local demand.

Safe Routes to School Planning Workshops

Key Elements	➢ Safe Routes to School planning workshops
Lead Agency	➢ SANDAG
Partners	➢ Local jurisdictions, school districts, schools, parent volunteers, and professional trainers

The San Diego region is home to 251 private and 747 public primary and secondary schools as distinct as the 19 jurisdictions they reside within. With schools located in varied rural, suburban, and urban settings and with diverse built environment and population characteristics, each school's combination of transportation issues and solutions are unique.

Photo Source: Walk San Diego

The plan recommends offering Safe Routes to School planning workshops to engage school communities and jurisdictions in launching comprehensive Safe Routes to School programs that address each school's distinctive mix of issues and opportunities.

The workshops should be modeled after the National Center for Safe Routes to School National Course, designed to engage local planners, engineers, policy-makers, law enforcement, school district and school administrators, teachers, parent organizations, and other community members in a highly interactive process to identify school travel issues and potential solutions.

The workshops should be approximately three-hour sessions, taught by a team of at least two instructors, and conducted at a school or nearby facility. The format includes an introduction to the five elements of Safe Routes to School, observation of school travel behaviors, and charettes resulting in potential design solutions, as well as non-infrastructure programs to pursue, for the target schools.

Prior to the workshop, the instructors should conduct field work to observe travel behaviors and identify deficiencies and issues in the vicinity of each target school. They should also review traffic count and collision data and interview enforcement, engineering, and school officials prior to the workshop. All of this information should be integrated into the workshop content.

Photo Source: SANDAG

Workshops could either focus on an individual school or a small group of schools located within the same area or similar settings. Scheduling workshops would require collaborating with school districts and local jurisdictions to prioritize implementation and coordinate with schools.

The results of the workshop, along with the data collected prior to the workshop, should be summarized into a report for the host agencies. The results can be used to initiate broader planning efforts, such as those described in the subsequent section (Safe Routes to School Planning Services), and to help launch the development of a comprehensive Safe Routes to School program. The workshop facilitators should also offer post-workshop de-briefs to the lead implementing agencies to provide technical assistance in moving forward with the development of the program.

Once the program is established, approximately five workshops could be held per year in high need communities.

Safe Routes to School Planning Services

Key Elements	➢ Comprehensive Safe Routes to School planning services
Lead Agency	➢ SANDAG
Partners	➢ Local governments, partnering organizations, and professional planning agencies

In order to promote comprehensive citywide and school-district wide Safe Routes to School planning, the Strategic Plan recommends providing professional planning services to three to five high-need communities per year beginning with this program's first year of implementation. Cities and districts will be selected on a competitive basis based on criteria such as safety, health, existing and latent demand, and community support. The selection process will be developed as part of early implementation of the Strategic Plan.

Photo Source: Walk San Diego

Similar to the plans funded through the Healthy Works Safe Routes to School grant program, the planning services will result in community-level, district-wide, or city-wide safe routes to school plans that include all of the following elements:

- Existing conditions analysis and needs assessment (including walk/bike audits);
- Community and stakeholder input;

- Suggested routes and/or deficiency maps;
- Infrastructure improvement plans and concepts;
- Education, encouragement, and enforcement program strategies;
- Summary of funding sources; and
- Evaluation and monitoring plan.

In addition, planning services to provide guidance on school-siting, new school design, or renovations may be available through this program.

EDUCATION AND ENCOURAGEMENT STRATEGIES

Identifying and administering select education and encouragement programs provides communities beneficial tools, such as SchoolPool, that might otherwise be too costly or burdensome for local administration. Also, serving as an information clearinghouse to local jurisdictions, schools districts, and schools facilitates local Safe Routes to School program development and maintenance.

Safe Routes to School Web Enhancements

Key Elements	➢ A Safe Routes to School page and upgrades to iCommute Trip-Tracker
Lead Agency	➢ SANDAG
Partners	➢ Local governments, school districts, schools, non-profit organizations, and other Safe Routes to School implementers

Knowledge about and access to existing resources is an initial hurdle to initiating Safe Routes to School efforts. One recommended approach to raising awareness about Safe Routes to School resources is by creating a Safe Routes to School Web page that incorporates the following possible elements:

- A summary or listing of Safe Routes to School programs and resources offered throughout the San Diego region;
- Announcements of Safe Routes to School events or related activities in the region; and
- Links to Safe Routes to School resources and publications available throughout the United States including the National Center for Safe Routes to School, iWalk International Walk to School Day, and California Active Communities Safe Routes to School Technical Assistance Resource Center Web sites.

The Strategic Plan also recommends developing a system to automatically log children's trips to school or enable children to track their trips in Trip-Tracker, the iCommute program function that allows users to log their trips and review the estimated economic and air quality benefits derived from using alternative modes of travel. Currently this web tool is only accessible to parents, school officials, or other guardians. Thus, for households without computers, or when adults in the home do not use computers, the tool is underutilized. Auto-log technology or a child-accessible Trip-Tracker available through the school [i.e. supervised] could be accompanied by a children-oriented fun, interactive, and educational Web page.

Photo Source: SANDAG

Another recommended Web tool to consider includes updating the ride-matching interface of Trip-Tracker to accommodate multi-modal trips. This could facilitate the formation of "Bus Buddies," a mechanism to connect families that use transit for at least one segment of their school trip. The popularity of transit for school-based trips is increasing steadily across the region in response to school-bus service reductions and is a viable option for students who live farther than walkable or bikeable distance from school. A "Bus Buddies" tool could help enable safe and active trips on the first and last leg of children's school trips.

These additions are proposed to complement SchoolPool's existing carpool, Bike Buddies, and Walking School Bus ride-matching system.

Outreach and Promotional Campaigns

Key Elements	Coordinate campaigns, activities, and events that promote walking and biking to school.
Lead Agency	SANDAG
Partners	Local governments, non-profit organizations, and school communities

Raising awareness through public outreach efforts and regional campaigns can increase school and parent participation in Safe Routes to School initiatives.

As described in Chapter 3, iCommute launched a Walk, Ride and Roll to School campaign in 2011 to expand school and parent participation in SchoolPool and to introduce "Walking School Bus" and "Bike Buddies" elements to the program. These program elements encourage students to walk or bike to school as a group, supported by adult-supervision and safety education.

Photo Source: SANDAG

With adult-supervision as an essential element, Walking School Bus and Bike Buddies programs address personal security concerns, which is a significant barrier to walking and biking to school. Older adults within the community can be trained to supervise groups, which would benefit the older community as well as students and their families. Evaluations of Walking School Bus initiatives have shown them to be effective in low-income, urban neighborhoods where concern with criminal activity can

be paramount (Mendoza, et al., 2009). Adding and promoting a "Bus Buddies" component also holds potential to increase personal safety.

Building on the momentum of Healthy Works, the plan recommends SANDAG continue to coordinate with school officials and parent organizations to promote and administer the iCommute SchoolPool program through regular communication and through robust incentive-based campaigns similar to Walk, Ride, and Roll to School.

In addition, SANDAG should continue to conduct outreach, provide incentives, and coordinate campaigns, activities, and events that promote walking and biking to school. This includes annual coordination of a regional Walk and Bike to School Day in conjunction with International Walk to School Day.

Education Courses

Key Elements	Education courses for students
Lead Agencies	SANDAG Non-profit organizations
Partners	Schools, parent volunteers, school districts and local public safety personnel

Education is a vital element to any Safe Routes to School program. The content and format of educational activities should be designed to address known barriers to walking and biking to school, and therefore, can vary substantially between communities. Programs commonly involve teaching students traffic safety skills and can also incorporate lessons about personal security measures and health, science, and math topics. Material can be presented in a variety of formats including skills practice in a simulated streetscape setting, school assemblies, and ongoing classroom coursework.

Photo Source: SANDAG

Because there is a spectrum of possible programs, the Strategic Plan recommends conducting a 'best practices' and needs analysis to identify education programs that will have the broadest benefit to the region. The study should include a strategy for offering education programs so that they reach communities with the greatest need for assistance. The results of this assessment can be both shared with and informed by the Regional Safe Routes to School Coalition and planning efforts described in this chapter. After initial implementation, the effectiveness of the courses offered should be regularly assessed as a part of the evaluation program described on pages 53 and 54 of this Strategic Plan.

IMPLEMENTATION PROCESS

Following adoption of the Strategic Plan, the recommendations will be prioritized. A phasing and financing strategy will be developed and incorporated into an Active Transportation Early Action Program. The 2050 RTP calls for an Active Transportation Early Action Program by 2014 to accelerate implementation of the regional Active Transportation Program.

Following adoption of the Strategic Plan, the recommendations will be prioritized. A phasing and financing strategy will be developed and incorporated into an Active Transportation Early Action Program.

Implementing the Strategic Plan also requires a needs analysis to define areas that will receive priority for some of the resources recommended in the strategy. This analysis will consider demographic and land use patterns with emphasis on safety, health impacts and social equity considerations. Using the results of the analysis to prioritize implementation will help meet a major social equity objective identified in the 2050 RTP, "to create equitable transportation opportunities for all populations regardless of age, ability, race, ethnicity, or income."

In future years, this assessment will be addressed within Evaluation and Action Plans (p. 53) that will provide recommendations based on analysis of data and public input collected through the ongoing Safe Routes to School Data Collection and Evaluation program (p. 53 - 55). This approach allows the strategy to evolve and respond to the changing needs of the regions' local communities and schools.

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Appendix A:
RESOURCE LIST

Schools and community members interested in Safe Routes to School are encouraged to contact their local government to learn about opportunities within their jurisdiction. There is also a multitude of resources available to assist communities in developing individualized Safe Routes to School programs. This reference list can be used as a starting point for collecting more information on active transportation and how to initiate and sustain Safe Routes to School programs.

SAN DIEGO REGION

Caltrans District 11 – San Diego & Imperial Counties
Division of Local Assistance
Luis Z. Medina, Safe Routes to School District Coordinator
(619) 278-3735
luis_z_medina@dot.ca.gov
http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm

Division of Transportation Planning
Seth Cutter, District 11 Bicycle and Pedestrian Coordinator
(619) 688-2597
Seth.Cutter@dot.ca.gov
(619) 688-6699 (general number for District 11)
http://www.dot.ca.gov/dist11/

County of San Diego Health and Human Services Agency
Katherine Judd, Health Promotion Specialist
(619) 668-3758
Katherine.Judd@sdcounty.ca.gov
http://www.healthyworks.org/

Rady Children's Hospital Center for Healthier Communities
Dane Lotspeich, Safe Routes to School Project Coordinator
(858) 573-1700, ext. 3656
dlotspeich@rchsd.org
http://www.rchsd.org/ourcare/programsservices/c-d/centerforhealthiercommunities/injuryprevention/saferoutestoschool/index.htm

Safe Routes to School Technical Assistance Resource Center
California Active Communities, CA Department of Public Health
Kristin Haukom, Safe Routes to School Project Coordinator,
San Diego Region
(916) 208-1885
Kristin.Haukom@cdph.ca.gov
http://www.casaferoutestoschool.org/

SANDAG
Regional Active Transportation Program
Chris Kluth, Program Manager
(619) 699-1952
ckl@sandag.org
Bridget Enderle, Active Transportation Planner
(Safe Routes to School contact)
(619) 595-5612
ben@sandag.org
http://www.sandag.org/index.asp?subclassid=98&fuseaction=home.subclashome

iCommute SchoolPool
Kim Weinstein, Senior Transportation Planner
(619) 699-0725
kwe@sandag.org
Call 511 (say "SchoolPool" when prompted)
schoolpool@sandag.org
http://www.icommutesd.com/Schoolpool.aspx

San Diego County Bicycle Coalition
Maria Olivas, Education Program Coordinator
(858) 472-6025
education@sdcbc.org
http://www.sdcbc.org/

San Diego Regional Safe Routes to School Coalition
Kristin Haukom, Chair
(916) 208-1885
Kristin.Haukom@cdph.ca.gov

Bridget Enderle, Advisory Member
(619) 595-5612
ben@sandag.org

WalkSanDiego
Leah Stender, Program Manager
(619) 544-9255
lstender@walksandiego,org
http://www.walksandiego.org/

CALIFORNIA

California Project LEAN
(916) 552-9907
http://www.californiaprojectlean.org/

California Safe Routes to School (Caltrans)
Caltrans Division of Local Assistance
Dawn Foster, California Safe Routes to School Coordinator
(916) 653-6920
dawn_foster@dot.ca.gov
http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm

California Safe Routes to School Technical Assistance Resource Center
California Active Communities, CA Department of Public Health
(916) 552-9874
CAactivecommunities.org
http://www.casaferoutestoschool.org/

California Walks
Wendy Alfsen, Director
(510) 684-5705
wendy@californiawalks.org
https://californiawalks.org/

California Walk to School Day Headquarters
California Active Communities
(916) 552-9874
walktoschool@cdph.ca.gov
http://www.cawalktoschool.com

Safe Routes to School California: A Project of the Safe Routes to School National Partnership
http://saferoutescalifornia.wordpress.com/

NATIONAL

America Walks
(703) 738-4889
http://americawalks.org/

iWalk International Walk to School in the USA
(866) 610-SRTS
http://www.walktoschool-usa.org

Center for Disease Control and Prevention of the Department of Health and Human Services
Kids Walk-to-School
http://www.cdc.gov/nccdphp/dnpa/kidswalk/resources.htm

League of American Bicyclists
(202) 822-1333
bikeleague@bikeleague.org
http://www.bikeleague.org/

National Center for Safe Routes to School
University of North Carolina Highway Safety Research Center
(866) 610-SRTS
http://www.saferoutesinfo.org

National Complete Streets Coalition
http://www.completestreets.org/

National Policy & Legal Analysis Network to Prevent Childhood Obesity
Public Health Law & Policy
http://www.nplanonline.org/

Pedestrian and Bicycle Information Center
University of North Carolina Highway Safety Research Center
http://www.pedbikeinfo.org/

Safe Routes to School National Partnership
Jessica Meaney, California Policy Manager
(213) 221-7179
jessica@saferoutespartnership.org
http://www.saferoutespartnership.org/home

United States Federal Highway Administration Safe Routes to School Program
http://safety.fhwa.dot.gov/saferoutes/

The National Center for Bicycling and Walking
http://www.bikewalk.org/

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