METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT

Active Transportation Projects Grant Application

Submitted by:

SANBAG (San Bernardino Associated Governments), acting in its role as the

San Bernardino County Transportation Commission

May 16, 2014

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Link to Reports

Non-Motorized Transportation Plan (NMTP Revised 2014)

http://www.sanbag.ca.gov/planning2/plan_non-motor.html

Improvement to Transit Access for Cyclists and Pedestrians (Access to Transit Report 2012)

http://www.sanbag.ca.gov/planning2/study_bike-improvmnts.html

Community Vital Signs (CVS Report)

http://communityvitalsigns.org/Portals/41/OurCommunityVitalSigns2013FinalReport.pdf

ACTIVE TRANSPORTATION PROGRAM

CYCLE 1

APPLICATION
Part 1
(Includes Sections I, V, VI, VII, VIII & XI)

Please read the Application Instructions at
http://www.dot.ca.gov/hq/LocalPrograms/atp/index.html
prior to filling out this application

Project name:	SANBAG Metrolink Station Accessibility Improvement Project

For Caltrans use only: ____TAP _____STP_____RTP ____SRTS ____SRTS-NI ____SHA
____DAC ____Non-DAC ____Plan

Project name:	SANBAG Metrolink Station Accessibility Improvement Project

I. GENERAL INFORMATION-continued

Sub-Project Type (Select all that apply)

21. ☐ Develop a Plan in a Disadvantaged Community (select the type(s) of plan(s) to be developed)
    ☐ Bicycle Plan ☐ Safe Routes to School Plan ☐ Pedestrian Plan
    ☐ Active Transportation Plan

    (If applying for an Active Transportation Plan- check any of the following plans that your agency already has):
    ☐ Bike plan ☐ Pedestrian plan ☐ Safe Routes to School plan ☒ ATP plan

22. ☒ Bicycle and/or Pedestrian infrastructure
    Bicycle only: ☒ Class I ☒ Class II ☒ Class III
    Ped/Other: ☒ Sidewalk ☒ Crossing Improvement ☒ Multi-use facility

    Other:

23. ☐ Non-Infrastructure (Non SRTS)

24. ☐ Recreational Trails*- ☐ Trail ☐ Acquisition

    ***Please see additional Recreational Trails instructions before proceeding**

25. ☐ Safe routes to school- ☐ Infrastructure ☐ Non-Infrastructure

If SRTS is selected, provide the following information

26. SCHOOL NAME & ADDRESS:
N/A
27. SCHOOL DISTRICT NAME & ADDRESS:
N/A

28. County-District-School Code (CDS)	29. Total Student Enrollment	30. Percentage of students eligible for free or reduced meal programs **
N/A		
31. Percentage of students that currently walk or bike to school	32. Approximate # of students living along school route proposed for improvement	33. Project distance from primary or middle school
N/A		N/A

**Refer to the California Department of Education website: http://www.cde.ca.gov/ds/sh/cw/filesafdc.asp

☐ Click here if the project involves more than one school; attach the remaining school information including school official signature and person to contact, if different, on a separate page

I. GENERAL INFORMATION

Project name:	SANBAG Metrolink Station Accessibility Improvement Project

(fill out all of the fields below)

1. APPLICANT (Agency name, address and zip code) San Bernardino Associated Governments (SANBAG), 1170 W. 3rd Street, 2nd Floor San Bernardino, CA 92410-1715	2. PROJECT FUNDING ATP funds Requested $ 4,678,729.00 Matching Funds (If Applicable) $ Other Project funds $ TOTAL PROJECT COST $ 4,678,729.00
3. APPLICANT CONTACT (Name, title, e-mail, phone #) Josh (Kyu-Sang) Lee Transportation Planning Analyst Email: jlee@sanbag.ca.gov, Phone#: 909-884-8276 x 166	
4. APPLICANT CONTACT (Address & zip code) 1170 W. 3rd Street, 2nd Floor San Bernardino, CA 92410	5. PROJECT COUNTY(IES): San Bernardino
6. CALTRANS DISTRICT #- Click Drop down menu below District 8	7. Application # 1 of 3 (in order of agency priority)

Area Description:

8. Large Metropolitan Planning Organization (MPO)- Select your" MPO" or "Other" from the drop down menu>	SCAG Southern California Association of Governn
9. If "Other" was selected for #8- select your MPO or RTPA from the drop down menu>	
10. Urbanized Area (UZA) population (pop.)- Select your UZA pop. from drop down menu>	Within a Large MPO (Pop > 200,000)

Master Agreements (MAs):

11. ☒ Yes, the applicant has a FEDERAL MA with Caltrans. 08-6053R
12. ☒ Yes, the applicant has a STATE MA with Caltrans. 00335S

13. If the applicant does not have an MA. Do you meet the Master Agreement requirements? Yes ☐ No ☐
The Applicant MUST be able to enter into MAs with Caltrans

Partner Information:

14. Partner Name*: N/A	15. Partner Type
16. Contact Information (Name, phone # & e-mail)	17. Contact Address & zip code

☐ Click here if the project has more than one partner; attach the remaining partner information on a separate page

*If another entity agrees to assume responsibility for the ongoing operations and maintenance of the facility, documentation of the agreement must be submitted with the application, and a copy of the Memorandum of Understanding or Interagency Agreement between the parties must be submitted with the request for allocation.

Project Type: (Select only one)

18. Infrastructure (IF) ☒ 19. Non-Infrastructure (NI) ☐ 20. Combined (IF & NI) ☐

II. PROJECT INFORMATION

Project Location: The Metrolink Station Accessibility Improvement Project (the Project) included in this grant application is located along six existing Metrolink transit stations in the cities of: 1) Montclair; 2) Upland; 3) Rancho Cucamonga; 4) Fontana; 5) Rialto; and 6) San Bernardino in San Bernardino County along most heavily traveled Metrolink line. The projects are situated within the 0.5 -mile radius for pedestrian access and 1 ½ - mile radius for bicycle access along existing San Bernardino Line Metrolink stations, a passenger rail service to Los Angeles. Appendix A includes detailed maps of the project sites.

Figure 1: Project Area Locations

Project coordinates: The projects will be located within 0.5 – 1.5 miles of the stations.

Table 1: Station Area GPS Coordinates

Station	Longitude / Latitude Location (Decimal Degrees)
Montclair Metrolink Station	-117.695576 / 34.094085
Upland Metrolink Station	-117.647448 / 34.094505
Rancho Cucamonga Metrolink Station	-117.559894 / 34.091814
Fontana Metrolink Station	-117.438092 / 34.095131
Rialto Metrolink Station	-117.371897 / 34.096752
San Bernardino Metrolink Station	-117.309797 / 34.103969

Project Description: SANBAG, acting in its role as the San Bernardino County Transportation Commission, is proposing the Project to improve bicycle and pedestrian access to the regional transit network and extend the catchment areas of each station. The individual projects were thoughtfully and collaboratively pulled into a logical, achievable package for consideration in the Active Transportation Program (ATP) process based on the improvement to transit/bicycle/pedestrian connectivity and safety. Improvements focus on providing safe pedestrian/bicycle access, gates at the railroad tracks, wayfinding signage to direct users to the transit centers, sidewalk improvements, high-visibility crosswalks, bicycle parking, and the implementation of key corridors of the regional bicycle network designed to directly connect to the stations. Station projects are shown in the Preliminary Plans, Appendix A. The San Bernardino Line is the most heavily traveled commuter rail line on the Southern California System, and most of the stations are located adjacent to the downtowns of the respective cities. The foundation for this package of projects began in 2011 with the initiation of the study *Improvement to Transit Access for Cyclists and Pedestrians (Access to Transit Report)* included in Appendix D http://www.sanbag.ca.gov/planning2/study_bike-improvmnts.html. Because the projects span six jurisdictions, it was determined that SANBAG would be an appropriate lead agency for Project development and construction resulting in more efficient management of grant funds. SANBAG and our partner cities believe that our application is worthy of consideration for the following reasons:

- The package of projects will directly benefit those using the passenger rail infrastructure in the County as well as individuals frequenting the surrounding activity centers.
- The projects were identified through a multi-jurisdictional, collaborative, bottom-up process founded on sound planning and engineering principles.

- The projects have been selected out of the larger pool of projects as having the most potential for cost-effective access, safety improvement and deliverability.
- The projects are deliverable within the ATP timeframe. They are currently in the process of being environmentally cleared under state and federal categorical exclusions/exemptions (CE).
- All six cities in which the transit stations are located are economically disadvantaged communities. An ATP investment will promote economic growth in these station areas with both direct and indirect benefit to the disadvantaged communities.
- As lead agency SANBAG has the experience and commitment to successfully develop and construct the Project.

Project Status: Based on a preliminary review of the project and its component activities, it is anticipated that the project will qualify for the National Environmental Policy Act (NEPA) Categorical Exclusions for activities that include construction of bicycle and pedestrian lanes, paths, and facilities. The project will also qualify for the California Environmental Act (CEQA) Categorical Exemptions. SANBAG is anticipated to be the CEQA lead and will prepare a Notice of Exemption for the project. Caltrans will be the NEPA lead for the project. The environmental process has begun using local resources. The ATP grant request is for funding for the PS&E and construction phases of the Project.

III. SCREENING CRITERIA

A. Demonstrated Needs of the Applicant

Poor pedestrian access, narrow sidewalks, lack of maintenance and shade trees, disconnected bicycle networks and other barriers isolate neighborhoods from the existing multi-modal transit centers and make access to the transit stations unsafe and undesirable. The Project will not only improve the level of day-to-day maintenance of the accessibility services but also make the much-needed repairs and new construction of pedestrian and bike amenities. The station area accessibility and livability

improvements will provide convenient access to employment and housing opportunities. The significant improvements translate to greater mobility for visitors, shoppers, recreational users, and workers either passing through or accessing the area as a job destination. The Project also eases poverty impacts by directly providing a higher degree of mobility to lower income and disadvantaged communities. Per the CalEnvironScreening (CES) Tool, five stations are in the top 10% of disadvantaged communities, with the surrounding areas of all six stations within the top 10% category. The Project supports economic competitiveness by integrating transit coupled with substantial bicycle and pedestrian improvements. The Project will significantly enhance user mobility through the creation of more convenient, economic, and healthy transportation options for travelers and provide for additional modes of transportation that currently are under-provided. The Project will directly connect active transportation users to the larger Metrolink system and the Omnitrans local and bus rapid transit network.

B. Consistency with Regional Transportation Plan

The Project is key to implementing the goals of the *San Bernardino County Non-Motorized Transportation Plan* (NMTP), which serves as the comprehensive countywide plan for bicycle and pedestrian infrastructure. A major update to the NMTP was approved by SANBAG in April 2011 with the most recent amendment approved on May 7, 2014. The NMTP (refer to Appendix E http://www.sanbag.ca.gov/planning2/plan_non-motor.html) contains an extensive amount of information on non-motorized needs for each individual jurisdiction. The network of projects in the County NMTP has been incorporated into the Southern California Association of Governments' (SCAG's) 2012 – 2035 *Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS). The RTP/SCS has a major emphasis on active transportation, with a projected Southern California investment of $6 billion in regional bicycle, walking, and related infrastructure through 2035. The projects proposed in this application are an integral part of that broader regional system.

The proposed improvements are also included in the *Access to Transit Report* which is includes station-area reviews and recommendations, photos and graphical illustrations, best practices, conceptual drawings, and funding opportunities. This report received the American Planning Association (APA) 2014 National Planning Achievement Award for Transportation. For consistency purposes, the recommended improvements from the studies have been fully integrated into the NMTP through the SANBAG Board action on November 6, 2013.

On March 5, 2014 SANBAG approved the County Regional Greenhouse Gas Reduction (GHG) Plan and certified the Environmental Impact Report (EIR). A key reduction measure included in the Regional GHG Plan is the reduction of transportation emissions through the promotion of transit-oriented development, transit, bicycle and pedestrian connections and other strategies designed to reduce the reliance on single-occupancy vehicles. These strategies are consistent and build upon the RTP/SCS at the regional level to reduce GHG emissions. The Project would assist local jurisdictions satisfy strategies identified in the Regional GHG Plan.

IV. NARRATIVE QUESTIONS

1. Potential for increased walking and Bicycling, especially among students, including the identification of walking and bicycling routes to and from schools, transit facilities, community centers, employment centers and other destinations; and including increasing and improving connectivity and mobility of non-motorized users.

A. Describe how your project encourages increased walking and bicycling.

San Bernardino County has long been an auto-dominated environment. The existing active transportation network typically consists of a number of disconnected bicycle and pedestrian facilities. Despite these challenges, walking, bicycling, and transit usage throughout the study area remains high. As such, connecting the non-motorized facilities to one another, extending them to six existing stations and ultimately to the people that use them is the key objective of this Project. The Project elements are specific and detailed (refer to maps in Appendix A). The proposed

improvements include new bike lanes, new sidewalks, wayfinding signs, enhanced pedestrian crossings, additional bicycle parking, pavement repairs, as well as general recommendations designed to help create a safe "sense of place" in and around the six station area. The Project encourages increased walking and bicycling by identifying and proposing the following improvements in partnership with planning and engineering staff in the jurisdictions:

- High priority bicycle corridors providing safer and more direct access to stations
- New or improved pedestrian crosswalks for commuters and residents
- New or improved ADA-compliant sidewalks for commuters and residents
- A comprehensive wayfinding elements
- Additional bicycle parking at the stations and nearby destinations
- Providing connection to employment and activity center in the region

B. Describe the number and type of possible users and their destinations, and the anticipated percentage increase in users upon completion of your project. Data collection methods should be described.

Users of the improvements to the walking and biking facilities of this Project will be commuting to jobs, taking leisure trips and traveling for social services and medical purposes. They will be able to increase their mobility throughout the adjacent San Bernardino cities from Montclair to San Bernardino. Access to Metrolink opens up user access to all five Southern California Metrolink system counties as well as to connecting transit services throughout Southern California. Access to various activity centers is described in the response to Section C below.

Although walking and biking trips data has not been collected yet for the six Metrolink station areas, using Metrolink bicycle data as well as surveys at the six Metrolink stations, SANBAG will document the existing walking and biking trips. SANBAG will then develop a monitoring and reporting system to track the actual increase in biking and walking due to the Project by conducting pre and post construction surveys of the communities and using subsequent Metrolink bicycle data.

As part of the SANBAG NMTP, data was collected from the American Community Survey[1] regarding existing bike and walking trips, as shown below.

Table 2: Percent of Trips to Work by Bicycle and Walking for Southern California Counties (excerpt for San Bernardino County) (Source: American Community Survey, 2006-2009)

County	Total Trips to Work	No. of Bike Trips	No. of Walk Trips	% Bike Trips	% Walk Trips
San Bernadino	658,710	2,475	10,070	0.38%	1.53%

Table 3: City-level Percentage of Daily Commuter Trips by Bicycle and Walking (excerpt for Project Cities) (Source: American Community Survey, 2006-2009)

City	Total Commute Trips	% Trips by Bicycle	Trips by Bicycle	% Trips by Walking	Trips by Walking
Fontana	46,235	0.21%	97	0.60%	277
Montclair	12,250	0.65%	80	1.20%	147
Rancho Cucamonga	60,635	0.21%	127	0.60%	364
Rialto	31,540	0.17%	54	0.90%	284
San Bernardino	60,600	0.50%	303	1.40%	848
Upland	31,570	0.25%	79	1.00%	316
Totals	242,830	0.30%	740	0.92%	2,236

Through the benefit costs analysis (see response to Question 4 and Appendix K), the increase in biking due to this Project is shown in Table 4. Cyclists are the total number of adults using the facility for all purposes. Commuters are those that use the facility as part of their commute.

Table 4: Increase in Cyclists due to the Project

	Average Annual	30 years
Total New Commuters	246	7,366
Total New Cyclists	982	29,463

C. Describe how this project improves walking and bicycling routes to and from, connects to, or is part of a school or school facility, transit facility, community center, employment center, state or national trail system, points of interest, and/or park.

The Project includes a package of pedestrian and bicycle infrastructure improvements designed to substantially improve access and safety to and from the six transit stations on the San Bernardino Metrolink line. It is known from past experience that better access to the transit network enhances overall access to regional activity centers. The Metrolink service not only serves the communities in

[1] American Community Survey, 2006-2009

their core downtown areas but allows them to connect to the entire Southern California commuter rail and transit network. Activity centers accessible from stations within the region include shopping and entertainment venues (Montclair Plaza, Ontario Mills, Victoria Gardens and Inland Center), medical facilities (Kaiser Permanente and Arrowhead Regional Medical Center), government services (county, state, and federal government services located in downtown San Bernardino), as well as access to the Ontario International Airport which is located 4-miles from the Rancho Cucamonga Station. Expanding bicycle and pedestrian access to Metrolink transit stations significantly expands connectivity opportunities for accessing the metropolitan region, which translates to greater mobility for individuals to access a variety of activities centers for employment, recreation, shopping and entertainment. The maps showing activity centers in and around the Project area are located in the Appendix A.

D. Describe how this project increases and/or improves connectivity, removes a barrier to mobility and/or closes a gap in a non-motorized facility.

The existing non-motorized network consists of a number of disconnected facilities. Barriers include highway/railroad crossings, Interstate 10, high roadway medians, a BNSF rail yard, the Santa Ana river channel, disconnected bike lanes, lack of wayfinding signs, substandard sidewalks and pedestrian crossings, etc. The Project eliminates these gaps by providing an interconnected network of bike lanes, walking trails, sidewalks, crossings, and improving existing highway railroad crossings and other related infrastructure which are safe, easy to navigate, convenient, and attractive. The Project plans to implement a well-connected network of active transportation facilities that foster a positive transit experience. It aims to build successful bicycle facilities with well-signed route-finding along the facility itself, and regional wayfinding to nearby destinations. The stations are surrounded by commercial, residential and industrial uses, and serve as commuter stations and local bus transfer center for a large amount of users.

2. Potential for reducing the number and/ or rate of pedestrian and bicyclists fatalities and injuries, including the identification of safety hazards for pedestrians and bicyclists.

A. Describe the potential of the project to reduce pedestrian and/or bicycle injuries or fatalities.

During the development of the *Access to Transit Report* SANBAG engaged the public and the stakeholders in soliciting ideas, alternatives, and options that would address the needs and safety of those accessing the stations via walking and cycling. Surveys and walk audits were conducted at each station to understand the unique challenges and safety hazards of accessing each station. Four public workshops were held to educate the public about the proposed Project improvements.

The Project goal is to implement safe pedestrian and bicycle improvements that will reduce the number, rate and consequences of surface transportation-related crashes, and injuries and fatalities along the corridor. The Project will improve safety in the following ways:

- The sidewalks and bicycle lanes designed will reduce the potential for crime by attracting additional pedestrians, transit users, and Metrolink patrons, thereby having more "eyes on the street" making criminal activity much less likely around the six stations and vicinity.
- The reduction in Vehicles Miles Traveled (VMT) creates further safety benefits in terms of accidents avoided. As per the Benefit-Cost Analysis (BCA) the reduction in VMT reduces safety incidents and the amount to $47.6 million savings at 7% discount rate and $94.1 million savings at 3% discount rate. The non-fatal safety incidents are reduced by 1,497.

Striping crosswalks and controlling pedestrian crossings with enhanced safety mechanisms will further address the auto, pedestrian and bicycle conflicts. These improvements are aimed at eliminating accidents such as the bicyclist fatality at an at-grade rail crossing in Fontana in 2011.

B. Describe if/how your project will achieve any or all of the following:

Improvements included as part of this Project will help address the following issues:

- Reduces speed or volume of motor vehicles: Near the Montclair transit center, by removing one lane of northbound traffic on Monte Vista Avenue between Arrow Highway and Richton Street, and replacing that travel lane with a protected bike lane and sidewalk, vehicle volume will be reduced, and bicyclists and pedestrians can access the station more safely.
- Improves sight distance and visibility: Installation of high-visibility crosswalks at key intersections within Montclair, Upland, Fontana, Rialto and San Bernardino to improve visibility, and increase driver awareness at pedestrian crossing zones.
- Eliminates behaviors that lead to collisions: High-visibility crosswalks and designated bike lane striping increase bike and pedestrian safety by making motorists more aware of the presence of bicyclists and pedestrians within the environment.
- Addresses inadequate traffic control devices: Traffic control devices are not included.
- Addresses inadequate bicycle facilities, crosswalks or sidewalks: Installation of designated bike lanes along key travel corridors. The Project will address inadequate crosswalks and sidewalks by adding missing sidewalk segments and by providing high visibility crosswalks at key intersections to address pedestrian safety and visibility. In Upland, the Project includes automated pedestrian rail crossing gates at Euclid Avenue and A Street for increased pedestrian safety in the downtown pedestrian zone.

C. Describe the location's history of events and the source(s) of data used (e.g. collision reports, community observation, surveys, audits) if data is not available include a description of safety hazard(s) and photos.

Using data from the Transportation Injury Mapping System (TIMS) (http://tims.berkeley.edu/index.php), vehicle accidents involving bicycles and pedestrians were collected for the station areas. See Appendix H for accident summaries (pedestrian and bicycle collisions) per year per station location over a five year period (January 2008 through December 2012). A total of 32 bicycle and 33 pedestrian accidents have occurred within that five year period in

and around each of the six station areas. These accidents resulted in a total of 64 injuries and 2 fatalities as a result of collisions with cars.

Proposed Countermeasures: Some of the improvements proposed in the Project that specifically address bike/pedestrian-related accidents in the immediate vicinity of the transit stations include:

- Protected, enhanced, buffered and new bike lanes and sidewalks
- Safe pedestrian access
- Installation of high visibility cross walks with enhanced wayfinding signage;
- Installation of a mid-block crosswalk with lights

The results of these countermeasures will be compared with TIMS data to determine the safety effectiveness of the Project.

3. Public Participation and Planning

A. Describe the community based public participation process that culminated in the project proposal or plan, such as noticed meetings/public hearings, consultation with stakeholders, etc.

Since the 2001 development of the NMTP the combined total of centerline miles of bicycle infrastructure for all jurisdictions has increased eight-fold to about 500 miles, from 53 miles. The development of the 2011 NMTP (Appendix E) update included a strong partnership among local governments, transportation agencies, and the citizens, with policy oversight by the SANBAG Board of Directors. Public involvement opportunities were available through the open meetings of the SANBAG Plans and Programs Committee.

As part of the public outreach process for the 2012 *Access to Transit Report* (refer to Appendix D), SANBAG conducted intercept surveys with the community at each of the six Metrolink stations to identify bicycling and walking improvements that commuters would like to see implemented and four public workshops over the course of the Project. . Chapter 3 of the *Access to Transit Report*

summarizes the Public Outreach effort, and a complete documentation of public comments compiled as part of the Project are available in its appendix.

B. Describe the local participation process that resulted in the identification and prioritization of the project:

The NMTP evolved into the *Access to Transit Report* when SANBAG examined the ability of non-motorized users to access the regional transit network stations listed in this application, extensive stakeholder consultation and public outreach efforts led to the identification of improvements which were further refined through existing conditions documentation, including fieldwork and Geographic Information Systems (GIS) analysis, industry research, and financial feasibility analysis. SANBAG conducted number of events and exercises such as community surveys, workshops, and walking audits designed to engage the public and solicit their opinions.

The development of the NMTP and the *Access to Transit Report* was a collaborative effort between SANBAG and local jurisdictions. Each year the Transportation Technical Advisory Committee (TTAC) and SANBAG staff review the list of projects, and its readiness of each project to be proposed for funding, and consider the project sequencing.

On a separate effort, the County Department of Public Health (DPH) implemented the Community Vital Signs (CVS) Initiative, which addresses the Wellness element of the Countywide vision. It sets evidence-based goals and priorities that align and use the County resources to improve the overall health and well-being of the county's residents. CVS is a one of a kind community driven initiative that brings together leaders and stakeholders from business, education, safety, faith and community organizations, housing, government, health and human services, and planning and transportation to establish a community health improvement framework. A theme emerging from Countywide Wellness vision public meetings is that residents place high value on cycling and walking features within their communities. Cycling and walking trails have been listed in the County's "Countywide

Vision Project" meetings as a part of the infrastructure needing improvement. The Countywide Vision can be accessed at http://cms.sbcounty.gov/cao-vision/Home.aspx. Throughout the engagement process, the community leaders were able to shape the future of the county wellness. A result of the engagement process was an in-depth analysis on how agencies can develop or enhance active transportation programs and policies to better meet the needs of residents and improve the overall County wellness from the built-environment perspective. The proposed Project is one of the implementation projects of SANBAG in achieving the community's Wellness Element Vision of the County.

Consequently, in an effort to expand active transportation and to reach out to the local communities, SANBAG joined with community based organizations and the DPH to establish the San Bernardino County Active Transportation Network (SBCATN). The SBCATN brings together county agencies, community organizations, residents and cities interested in improving the experience of and increasing facilities for walking and bicycling in the County. Some of the stakeholders include SANBAG, Omnitrans, DPH, MoveIE, Safe Routes to School National Partnership, American Lung Association and the Inland Empire Biking Alliance. As the Project progresses, the SBCATN is intended to serve as a venue for cities, agencies, organizations and communities to collaborate as partners through the design and construction phases of the project.

C. Is the project cost over $1 Million? Yes

If Yes- is the project Prioritized in an adopted city or county bicycle transportation plan, pedestrian plan, safe routes to school plan, active transportation plan, trail plan, circulation element of a general plan, or other publicly approved plan that incorporated elements of an active transportation plan?

Yes, the Project is prioritized in the SANBAG NMTP which has been regularly updated and included in the RTP/SCS.

4. Cost Effectiveness

A. Describe the alternatives that were considered. Discuss the relative costs and benefits of all the alternatives and explain why the nominated one was chosen.

The details regarding the development of the Project alternatives are found in the *Access to Transit Report* (Appendix D) and the grouping of projects around the stations for this ATP grant was the best combination of projects to significantly increase access to transit.

A benefit-cost analysis (BCA) was conducted for the resulting project for submission to the Caltrans ATP. Two analyses were done: one using the PRISM™ (http://prism.pbworld.net/), a benefit cost analysis tool that uses a methodology consistent with the most recent guidelines developed by U.S. DOT and the other using the Cal-B/C model. The overall cost of the Project is expected to be $4.7 million in undiscounted 2013 dollars through 2018. At a 7 percent discount rate, the total costs are $3.9 million, while at a 3 percent discount rate the total costs are $4.3 million.

Prism Analysis: In real 2013 dollars, the Project creates $58.6 million in present value benefits when discounted at 7% or $116.4 million when discounted at 3% (Appendix K). The Project creates these benefits by attracting new cyclists. All of the cyclists receive health benefits associated with cycling. In addition to those benefits cyclist commuters will also receive mobility benefits. Further benefits created by this Project derive from a reduction in Vehicle Miles Traveled (VMT) as commuters switch from autos to bikes. These benefits include reductions in emission, reduced pavement damage, lower fuel costs and lower non-fuel related vehicle O&M costs.

The overall Project impacts can be seen in Table 5, which shows the magnitude of change and direction of the various impact categories while Table 6 below shows the overall results of the BCA.

Table 5: Project Impacts

Category	Quantity
Average Annual Commuters	▲ 246
Average Annual Cyclists	▲982
Vehicle Miles Traveled	▼49,650,154
Gallons of Fuel Consumed	▼1,570,240
Non-Fatal Safety Incidents	▼1,497
CO2 Emissions (tons)	▼17,401

Source: Parsons Brinckerhoff, 2014

Table 6: Benefit Cost Analysis Summary Results

Scenario	Net Present Value ((2013 $ millions disc.)	Benefit Cost Ratio
Case A (7 percent discount rate)	$54,709,166	15.13
Case B (3 percent discount rate)	$112,047,478	26.94

Source: Parsons Brinckerhoff, 2014

Prism™ Methodology: The analysis was performed using PRISM™[2] with assumptions listed in Appendix K. The following benefits are included: mobility, vehicle operating costs fuel and non-fuel, oil imports, safety incidents, emissions, noise pollution, pavement damage and health.

Caltrans Cal B/C Model Analysis: The Cal-B/C tool was used to analyze the Project in addition to PRISM™. However as the CAL B/C tool is not designed to consider projects focused on non-motorized traffic the analysis omits benefit related to bicycle mobility and health. There are several other differences between the Cal-B/C tool and PRISM™ which are outlined in Appendix K. The funds requested are the same as the total costs. The results of the Cal-B/C analysis are reported in Table 7 and Table 8.

Table 7: Cal-B/C Benefits and Costs (2013 $) Discounted at 4% over 20 Years

Benefits	Without Safety Benefits	With Safety Benefits
Travel Time Savings	-	-
Vehicle Operating Cost Savings	$21,046,913	$21,046,913
Accident Cost Savings	-	$5,756,646
Emission Cost Savings	$2,511,041	$2,511,041
TOTAL BENEFITS	$26,020,116	$29,314,600
Costs		
TOTAL COSTS	$4,390,069	$4,390,069

Source: Cal-Trans B/C

Table 8: Cal-B/C NPV (2013 $ millions) and B/C Ratio, Discounted at 4%, over 20 years

	Without Safety Benefits	With Safety Benefits
B/C-Ratio	5.93	6.68
Net Present Value	$21,630,047	$24,924,531

Source: Cal-Trans B/C

B. Calculate the ratio of the benefits of the projects relative to both the total project cost and funds requested.

[2]PRISM™ Benefit-Cost Tool developed by Parsons Brinckerhoff http://prism.pbworld.net/

Since the total cost and the requested funding is the same amount, the results are the same.

5. Improved Public Health

A. Describe how the project will improve public health, i.e. through the targeting of populations who have a high risk factor for obesity, physical inactivity, asthma, or other health issues.

To address the growing health concerns, the County's DPH led a community-driven effort to establish a health improvement framework known as *Community Vital Signs* (CVS), a concept developed in line with the State's "Health in All Policies" initiative to address the Wellness element of the Countywide Vision. As a result of the initiative, SANBAG partnered with the DPH to address the public health issues related to the built-environment, especially from the perspective of providing active transportation alternatives to the communities. The active transportation projects highlighted in this grant application are the first step in creating a well-connected and expanded network of bikes lanes and pedestrian walkways with a goal of promoting active health behaviors and healthy lifestyles and targeting the disadvantaged communities to address the following:

1) 30% of adults in the County are obese and another 34% are overweight; "percentage in obesity for low-income adults is going up." (CVS Report, 2013, p72);
2) According to the County Health Ranking by the Robert Wood Johnson Foundation, there were over 6,500 premature deaths in the County in 2013, putting the county above the state average;
3) "Overall heart disease has been recently declining in the County, but high blood pressure is going up, especially for Latinos. African Americans have much higher rates of hospitalization for heart disease than any other ethnicity." (CVS Report 2013, p76);
4) "Fewer adults in the County walked than in California as a whole. Less than 20% of teens (ages 12-17) in the County met the CDC recommendation of 60 minutes of physical activity every day, greater than in California at 15% in 2009." (CVS Report 2013, p91);

5) According to the CES, San Bernardino ranks in the 98th percentile for ozone concentration, 83th percentile for PM 2.5, 90th percentile for asthma and 87th percentile for low birth weight.

According to the American Lung Association State of the Air 2013, San Bernardino County ranks first as the most ozone and smog polluted County in the US (refer to Appendix I). The projects identified in the grant application will:

1) Provide safe and convenient alternatives to driving: The active transportation elements of the Project will facilitate incorporating physical activity into daily life and help individuals achieve their recommended levels of daily activity.
2) Offer sustainable communities designed around transit: Walking and cycling have shown to reduce lung and heart disease, obesity, diabetes and other health conditions. Research showed that individuals who live in more walkable communities have a 35% lower risk of obesity. Other studies have shown that people who live in walkable neighborhoods are more than twice as likely to get the recommended amount of physical activity.
3) Encourage shifting trips from private automobiles to bicycling, walking and public transportation; which will reduce greenhouse gas emissions, reduce vehicle per miles traveled and help the region satisfy statewide goals under AB 32 and SB 375.

With future data collection efforts, SANBAG can project more detailed health benefits. In the interim, Prism™ model (see Q4) was used to calculate the health benefits of biking and found the annual benefits value for cycling to be $128 which is shown in Table 7 (see details in Appendix K).

Table 9: Annual Health Benefits (2013 $)

Category	Low	Likely	High
Cycling Health Benefits	$115	$128	$141

Source: Victoria Transportation Policy Institute, 2011, Parsons Brinckerhoff, 2014

6. Benefit to Disadvantaged Communities

I. Is the project located in a disadvantaged community? Yes

II. Does the project significantly benefit a disadvantaged community? Yes

a) Which criteria does the project meet? (Answer all that apply)

- California Communities Environmental Health Screen Tool (CalEnvironScreen) score for the community benefited by the project:

Table 10 includes the CalEnvironScreen (CES) scores and score groups for the communities benefited by the Project.

Table 10: CalEnvironScreen Scores and Groups

Metrolink Station Location	CES Score	CES Score Group
Montclair	42.84	6-10%
Upland	41.3	6-10%
Rancho Cucamonga	35.77	16-20%
Fontana	57.75	1-5%
Rialto	46.8	1-5%
San Bernardino	48.16	1-5%

b) Should the community benefitting from the project be considered disadvantaged based on criteria not specified in the program guidelines? If so, provide data for all criteria above and a quantitative assessment of why the community should be considered disadvantaged.

Per the CES tool, all of the Metrolink station areas are in the top 10% of disadvantaged communities except for Rancho Cucamonga. Although the Rancho Cucamonga station area happens to fall under the ZIP code within the top 20% disadvantaged communities, the surrounding zip code areas are within the 10% top disadvantaged communities and majority of the users of the stations reside in the disadvantaged communities as identified in CES (refer to Appendix I).

c) Describe how the project demonstrates a clear benefit to a disadvantaged community and what percentage of the project funding will benefit that community, for projects using the school based criteria describe specifically the school students and community will benefit.

The County has been met with unprecedented growth over the last few decades resulting in irregular development patterns away from infill development to new suburban developments. The social issues arising from lack of infill development can be seen in multiple layers that are tied to the health

of the community at large. Version 1.1 of the CES lists most of the San Bernardino County's valley cities in the top 10% of disadvantaged communities as defined by the tool for evaluating multiple pollutants and stressors in California communities. Please see Q6.b for the details on qualifying stations and map references. The recent CVS Report ranks the region as the fourth most obese region in US with two out of three residents considered overweight or obese. The region also has third highest heart disease rate and has the worst healthy food access within the state, with six times as many unhealthy food retail outlets as healthy ones.

The most recent Quarterly Economic Report prepared by John E. Husing PhD for the Inland Empire Economic Partnership (IEEP) states that "public health research has shown that poverty far outranks other determinants like access to medical care or the environment in impacting a community's health". San Bernardino County has seen annual household income fall from $57,942 in 1989 to $51,756 in 2012. This represents a 10.7% decrease. This results in a poverty rate increase from 11.8% in 1990 to 19.0% in 2012.

The Project focuses on this spatial mismatch of jobs and residences for low income population due to inefficient land use patterns and community designs. Walking and bicycling are often the main modes of transport for lower-income persons. The Project eases poverty impacts by directly providing a higher degree of mobility to lower income and disadvantaged communities. Where active transportation is the main transportation mode for the work journeys of lower-income persons there is a higher the likelihood that those workers can afford to live near their jobs. Bicycle commuting and walking save on parking fees, parking tickets, fuel costs, auto maintenance costs and transit fares. On a round-trip commute of 10 miles, bicyclists save approximately $10 daily. Bicycle-derived modes play an essential role in urban transport for most low- and middle income population. All the new facilities will be ADA accessible. Fixing sidewalks and adding and repairing

missing sidewalk segments will provide excellent bicycle and pedestrian continuity thus enhancing transportation choices for the economically disadvantaged population.

Hence the Project will improve accessibility and transport services overall for the economically disadvantaged populations throughout the San Bernardino Valley for non-drivers, senior citizens, and persons with disabilities. Should the Project be selected for ATP funding, SANBAG commits 100% of the funds to serving the disadvantaged community of the County.

7. Use of California Conservation Corps (CCC) or a Certified Community Conservation Corps

A. The applicant has coordinated with the CCC to identify how a state conservation corps can be a partner of the project. Yes

a. Name, e-mail, and phone # of the person contacted and the date the information was submitted to them: Virginia Clark, virgina.clark@ccc.ca.gov, 916-341-3147.

The requested project information was sent via email on May 5, 2014.

B. The applicant has coordinated with a representative from the California Association of Local Conservation Corps (CALCC) to identify how a certified community conservation corps can be a partner of the project. Yes

b. Name, e-mail, and phone # of the person contacted and the date the information was submitted to them: Cynthia Vitale, calocalcorps@gmail.com, 916-558-1516. The requested Project information was sent via email on May 5, 2014.

C. The applicant intends to utilize the CCC or a certified community conservation corps on all items where participation is indicated? No – based on the response.
I have coordinated with a representative of the CCC; and the following are project items that they are qualified to partner on: Per a May 12, 2014 email from Virginia Clark, CCC Region Deputy, Region 1, the CCC is opting not to participate in the Project.

I have coordinated with a representative of the CALCC; and the following are project items that they are qualified to partner on: Per a May 14, 2014 email from Cynthia Vitale, Conservation Strategy Group, CALCC is opting not to participate in the Project.

8. Applicants Performance on Past Grants
Describe any of your agency's ATP type grant failures during the past 5 years, and what changes your agency will take in order to deliver this project.
SANBAG is in good standing with all the past grants.

Project name:	SANBAG Metrolink Station Accessibility Improvement Project

V. PROJECT PROGRAMMING REQUEST

Applicant must complete a Project Programming Request (PPR) and attach it as part of this application. The PPR and can be found at http://www.dot.ca.gov/hq/transprog/allocation/ppr_new_projects_9-12-13.xls

PPR Instructions can be found at http://www.dot.ca.gov/hq/transprog/ocip/2012stip.htm

Notes:

- Fund No. 1 must represent ATP funding being requested for program years 2014/2015 and 2015/2016 only.
- Non-infrastructure project funding must be identified as Con and indicated as "Non-infrastructure" in the Notes box of the Proposed Cost and Proposed Funding tables.
- Match funds must be identified as such in the Proposed Funding tables.

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised July 2013)

General Instructions

■ New Project					Date:	5/16/14
District	**EA**	**Project ID**	**PPNO**	**MPO ID**		**TCRP No.**
08						

County	Route/Corridor	PM Bk	PM Ahd	Project Sponsor/Lead Agency	
SB				SANBAG	
				MPO	**Element**
				SCAG	

Project Manager/Contact	Phone	E-mail Address
Josh (Kyu-Sang) Lee	9098848276 x166	jlee@sanbag.ca.gov

Project Title

SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT

Location, Project Limits, Description, Scope of Work ■ See page 2

The active transportation projects included in this grant application are located along six existing Metrolink transit stations in the cities of: 1) Montclair; 2) Upland; 3) Rancho Cucamonga; 4) Fontana; 5) Rialto; and 6) San Bernardino in San Bernardino County. The projects are situated within the half-mile radius for pedestrian access and 1½ -mile radius for bicycle access (known as the project catchment area) along existing Metrolink Stations on the San Bernardino Line, a passenger rail service operated by Metrolink. The project goal is to improve access to transit for cyclists and pedestrians.

■ Includes ADA Improvements ■ Includes Bike/Ped Improvements

Component	Implementing Agency
PA&ED	SANBAG
PS&E	SANBAG
Right of Way	SANBAG
Construction	SANBAG

Purpose and Need ■ See page 2

A safe and interconnected biking and pedestrian network can be a major asset to both individual communities and to urban areas of San Bernardino County if: 1) it enhances, connects and extends existing or planned transit service; 2) it is implemented in close proximity to transit-oriented subpopulations such as students or employees; 3) it improves accessibility to Metrolink transit stations for the economically disadvantaged population such as non-drivers, senior citizens and persons with disabilities and other low income groups; 4) it promotes biking and walking resulting in health benefits to the users; and finally 5) it reduces GHG emission as more people switch from driving to biking and walking to access

Project Benefits ■ See page 2

1) Enhance, connect and extend existing Metrolink transit service to non-motorized users; 2) Increase bicyclist and pedestrian access to/from neighborhoods, employment centers, shopping areas, recreational sites to Metrolink transit stations; 3) Improve bicycle and pedestrian safety by improving safety infrastructure such as railroad and highway grade-crossings; 4) Ensure routine accommodation of bicyclists

■ Supports Sustainable Communities Strategy (SCS) Goals ■ Reduces Greenhouse Gas Emissions

Project Milestone			Proposed
Project Study Report Approved			**NA**
Begin Environmental (PA&ED) Phase			04/01/14
Circulate Draft Environmental Document	**Document Type**	CE	NA
Draft Project Report			NA
End Environmental Phase (PA&ED Milestone)			10/01/14
Begin Design (PS&E) Phase			04/15/15
End Design Phase (Ready to List for Advertisement Milestone)			03/15/16
Begin Right of Way Phase			01/01/16
End Right of Way Phase (Right of Way Certification Milestone)			03/01/16
Begin Construction Phase (Contract Award Milestone)			06/30/16
End Construction Phase (Construction Contract Acceptance Milestone)			12/01/17
Begin Closeout Phase			01/01/18
End Closeout Phase (Closeout Report)			07/01/18

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☒ New Project					Date:	5/16/14
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	**TCRP No.**	
08						

Project Title

SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT

Additional Information

Location, Project limit, Description, Scope of work: (Continued from Page 1): Scope of work includes the general improvement to transit/bicycle/pedestrian connectivity such as railroad grade crossing improvements, adding class I, II and III bike lanes, providing wayfinding signage, improving sidewalks, crosswalks, lighting enhancements, adding bicycle parking, curb improvements, etc. The project's priority is to improve access to and from existing transit stations by creating a well connected network of non-motorized transportation modes which promotes and encourages walking, biking, and transit usage. In effect, the project improvements will extend the catchment areas of each of the aforementioned Metrolink commuter rail stations, increasing the effectiveness of transit investments.

Purpose and Need (Continued from Page 1): The project will address all of the above goals and provide much needed access to the regional transit network. Among the challenges facing San Bernardino County, such as population growth, physical barriers and lack of direct transit services, the continued growth in travel demand that for many years has outpaced the region’s capacity to expand transportation facilities. It is imperative to develop cohesive, integrated non-motorized transportation solution with collaboration between SANBAG and local jurisdictions. The Improvement to Transit Access for Cyclists and Pedestrians study identified several critical projects to address safety and promote active transportation and the next step is implementation of those strategies.

Project Benefits (Continued from Page 1): and pedestrians in transportation and land use planning; 5) Reducing the number of vehicle trips and saving energy by encouraging walking and bicycling. This will promote air quality and reduce greenhouse gas emissions by promoting improved accessibility to transit stations, reducing some of the need for single occupancy vehicles, while facilitating a more environmentally friendly option. 6) Reduce the use of fossil fuels, saving significant amounts of gasoline over the life of the infrastructure. 7) Improve public health by creating more attractive options resulting in daily physical exercise. The daily physical exercise, both for practical travel and for recreation, promotes healthy lifestyle and in turn reduces medical costs and extends life expectancy of general public.

SCS goals supported by the project (Continued from Page 1): The project is consistent with the sustainability goals of the SCAG RTP/SCS and the State of California. SANBAG has been heavily engaged in sustainability initiatives, and the project is another step forward in implementation of the adopted RTP/SCS initiatives, especially in the area of linking transit with active transportation options. The main focus of the project is to maximize the existing transit station areas' potential for development and planning of transportation strategies that enhance non-auto mobility, reduce energy consumption, reduce greenhouse gases, and benefit the environment. To achieve the sustainability goals, SANBAG and its local partners have established the San Bernardino County Active Transportation Network (SBCATN) in 2012 as an informal collaboration of public agencies and advocacy groups with an interest in active transportation to help coordinate and collaborate on bicycle and pedestrian facility planning and implementation. This body will serve as the forum for monitoring the project progress and implementation.

Greenhouse Gas reduction (Continued from Page 1): The project is consistent with the GHG reduction goals set in the San Bernardino County Regional GHG Reduction Plan and its EIR by promoting transit, bicycle and pedestrian connections, transit-oriented development and other strategies designed to reduce the reliance on single-occupancy vehicles. The project promotes and encorages people to switch from driving to biking and walking to access transit service while simultaneously reducing the GHG emission. These strategies are consistent and build upon the RTP/SCS at the regional level to reduce GHG emissions as well.

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STATE OF CALIFORNIA ● DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised July 2013)

Date: 5/16/14

District	County	Route	EA	Project ID	PPNO	TCRP No.
08	SB					
Project Title:	SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT					

Proposed Total Project Cost ($1,000s)									Notes
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	
E&P (PA&ED)									
PS&E		576						576	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON			4,103					4,103	
TOTAL		576	4,103					4,679	

Fund No. 1:	ATP Funding								Program Code
Proposed Funding ($1,000s)									ATP
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	Funding Agency
E&P (PA&ED)									CALTRANS
PS&E		576						576	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON			4,103					4,103	
TOTAL		576	4,103					4,679	

Fund No. 2:									Program Code
Proposed Funding ($1,000s)									
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 3:									Program Code
Proposed Funding ($1,000s)									
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Project name:	SANBAG Metrolink Station Accessibility Improvement Project

VI. ADDITIONAL INFORMATION

Only fill in those fields that are applicable to your project

FUNDING SUMMARY

ATP Funds being requested by Phase (to the nearest $1000)	**Amount**
PE Phase (includes PA&ED and PS&E)	$ 416
Right-of-Way Phase	$
Construction Phase-Infrastructure	$ 4,263
Construction Phase-Non-infrastructure	$
Total for ALL Phases	**$** 4,679

All Non-ATP fund types on this project* (to the nearest $1000)	**Amount**
NA	$
	$
	$
	$
	$
	$

*Must indicate which funds are matching

Total Project Cost	$ 4,679
Project is Fully Funded	Yes

ATP Work Specific Funding Breakdown (to the nearest $1000)	**Amount**
Request for funding a Plan	$
Request for Safe Routes to Schools Infrastructure work	$
Request for Safe Routes to Schools Non-Infrastructure work	$
Request for other Non-Infrastructure work (non-SRTS)	$
Request for Recreational Trails work	$

ALLOCATION/AUTHORIZATION REQUESTS SCHEDULE

	Proposed Allocation Date	**Proposed Authorization (E-76) Date**
PA&ED or E&P		
PS&E	01/01/2015	03/01/2015
Right-of-Way		
Construction	05/01/2016	06/30/2016

All project costs MUST be accounted for on this form, including elements of the overall project that will be, or have been funded by other sources.

Project name:	SANBAG Metrolink Station Accessibility Improvement Project

VII. NON-INFRASTRUCTURE SCHEDULE INFORMATION

Start Date	End Date	Task/Deliverables
		N/A

Project name: SANBAG Metrolink Station Accessibity Improvement Project

VIII. APPLICATION SIGNATURES

Applicant: The undersigned affirms that the statements contained in the application package are true and complete to the best of their knowledge.

Signature: _____ Date: 05/13/2014
Name: Josh (Kyu-Sang) Lee Phone: 909-884-8276
Title: Transportation Planning Analyst e-mail: jlee@sanbag.ca.gov

Local Agency Official (City Engineer or Public Works Director): The undersigned affirms that the statements contained in the application package are true and complete to the best of their knowledge.

Signature: _____ Date: 5/12/14
Name: Raymond W. Wolfe Phone: 909-884-8276
Title: Executive Director e-mail: rwolfe@sanbag.ca.gov

School Official: The undersigned affirms that the school(s) benefited by this application is not on a school closure list.

Signature: _____ Date: _____
Name: _____ Phone: _____
Title: _____ e-mail: _____

Person to contact for questions:

Name: Phone: _____
Title: e-mail: _____

Caltrans District Traffic Operations Office Approval*
If the application's project proposes improvements on a freeway or state highway that affects the safety or operations of the facility, it is required that the proposed improvements be reviewed by the district traffic operations office and either a letter of support or acknowledgement from the traffic operations office be attached (_) or the signature of the traffic personnel be secured below.

Signature: _____ Date: _____
Name: _____ Phone: _____
Title: _____ e-mail: _____

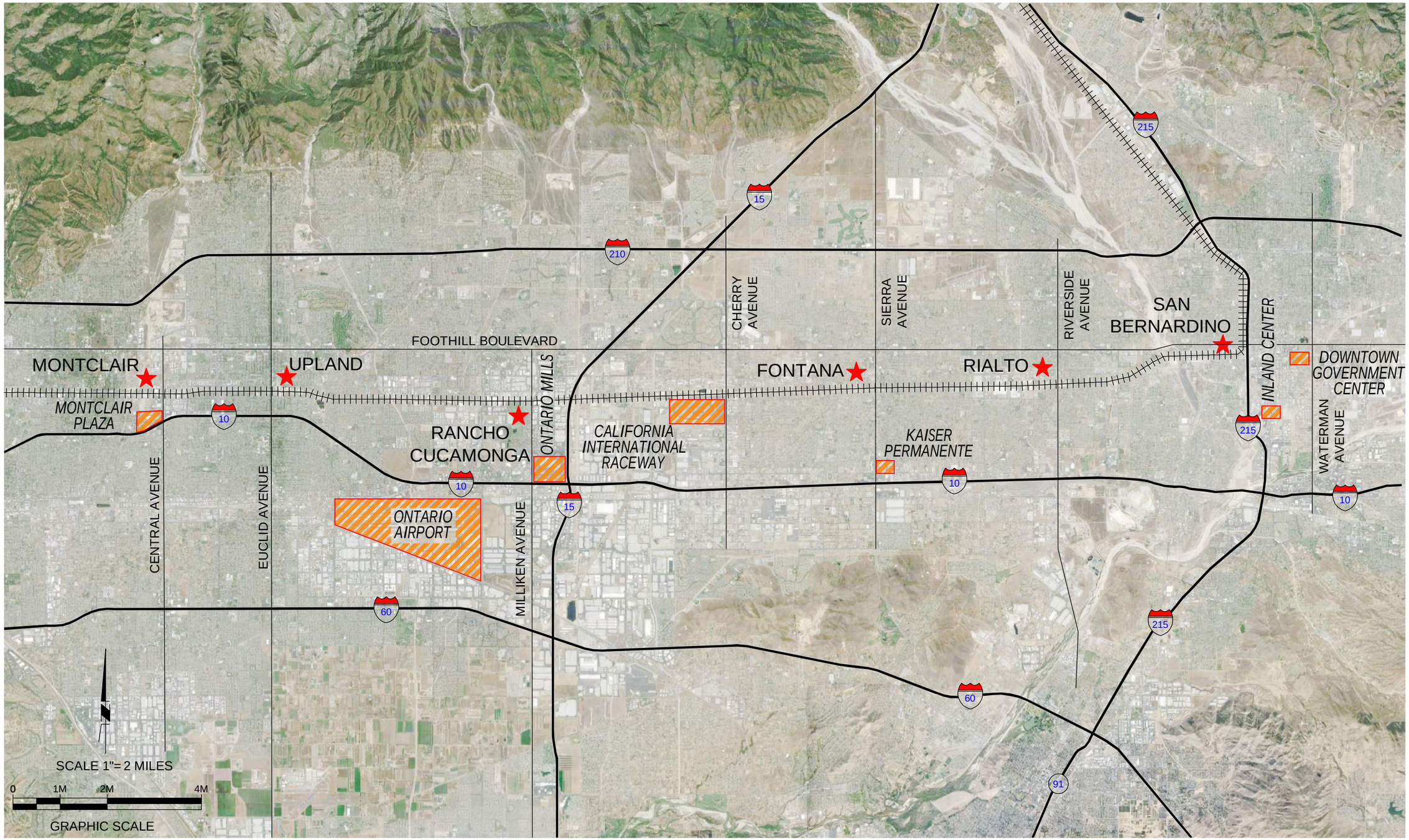
*Contact the District Local Assistance Engineer (DLAE) for the project to get Caltrans Traffic Ops contact information. DLAE contact information can be found at http://www.dot.ca.gov/hq/LocalPrograms/dlae.htm

Project name: SANBAG Metrolink Station Accessibility Improvement Project

VIII. ADDITIONAL APPLICATION ATTACHMENTS

Check all attachments included with this application.

- ☒ Vicinity/Location Map- **REQUIRED for all IF Projects**
  - ☒ North Arrow
  - ☒ Label street names and highway route numbers
  - ☒ Scale
- ☒ Photos and/or Video of Existing Location- **REQUIRED for all IF Projects**
  - ☒ Minimum of one labeled color photo of the existing project location
  - ☒ Minimum photo size 3 x 5 inches
  - ☐ Optional video and/or time-lapse
- ☒ Preliminary Plans- **REQUIRED for Construction phase only**
  - ☒ Must include a north arrow
  - ☒ Label the scale of the drawing
  - ☐ Typical Cross sections where applicable with property or right-of-way lines
  - ☒ Label street names, highway route numbers and easements
- ☒ Detailed Engineer's Estimate- **REQUIRED for Construction phase only**
  - ☒ Estimate must be true and accurate. Applicant is responsible for verifying costs prior to submittal
  - ☒ Must show a breakdown of all bid items by unit and cost. Lump Sum may only be used per industry standards
  - ☒ Must identify all items that ATP will be funding
  - ☒ Contingency is limited to 10% of funds being requested
  - ☒ Evaluation required under the ATP guidelines is not a reimbursable item
- ☐ Documentation of the partnering maintenance agreement- Required with the application if an entity, other than the applicant, is going to assume responsibility for the operation and maintenance of the facility
- ☐ Documentation of the partnering implementation agreement-Required with the application if an entity, other than the applicant, is going to implement the project.
- ☐ Letters of Support from Caltrans (Required for projects on the State Highway System(SHS))
- ☒ Digital copy of or an online link to an approved plan (bicycle, pedestrian, safe routes to school, active transportation, general, recreation, trails, city/county or regional master plan(s), technical studies, and/or environmental studies (with environmental commitment record or list of mitigation measures), if applicable. Include/highlight portions that are applicable to the proposed project.
- ☒ Documentation of the public participation process (required)
- ☐ Letter of Support from impacted school- when the school isn't the applicant or partner on the application (required)
- ☒ Additional documentation, letters of support, etc (optional)



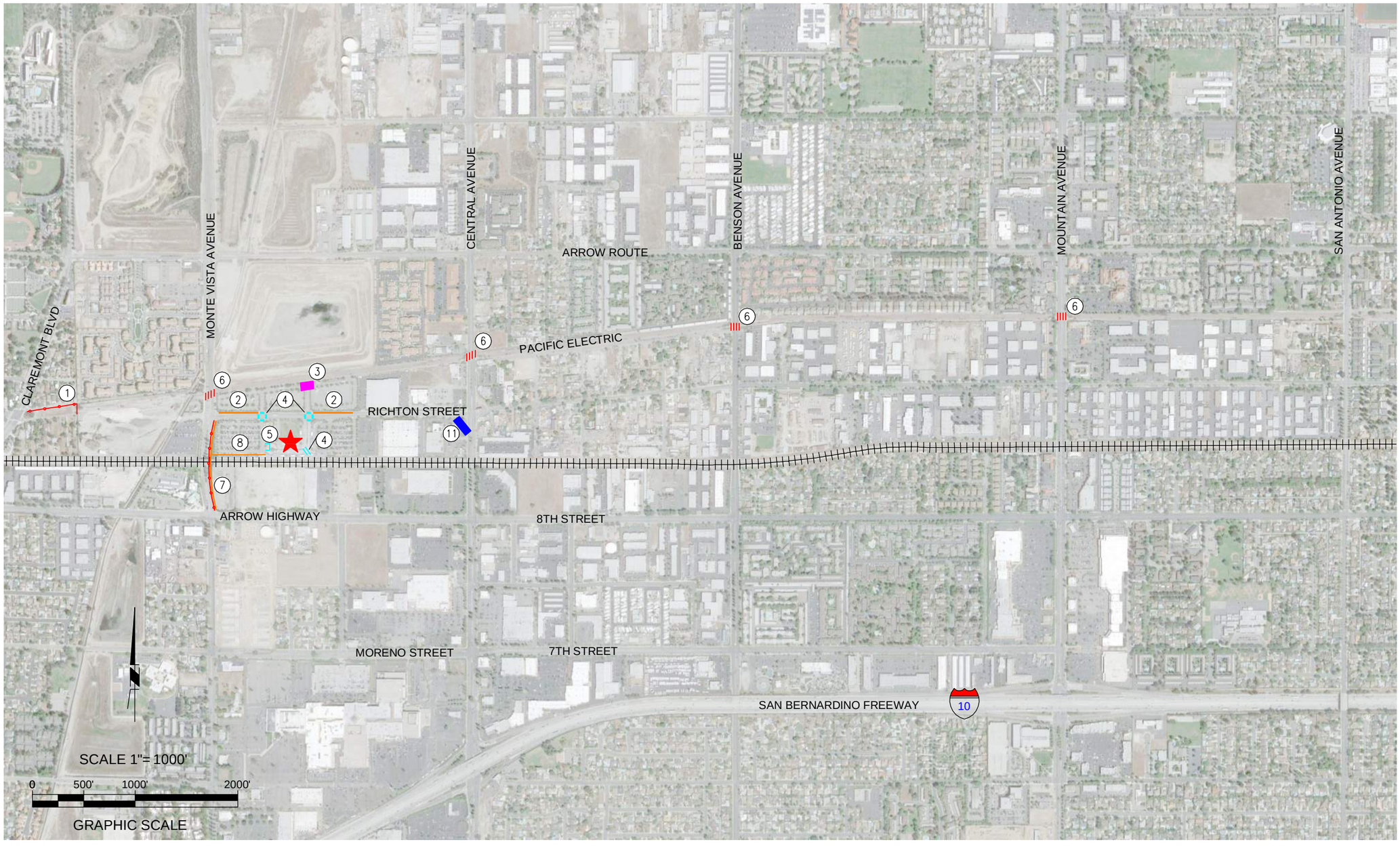
SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT-STUDY AREA LOCATIONS

LEGEND

STATION

RAILROAD TRACK

PARSONS BRINCKERHOFF
451 E. Vanderbilt Way Suite 200, San Bernardino CA
TEL: 909.888.1106 FAX: 909.889.1884



PROJECT DEFINITION-MONTCLAIR

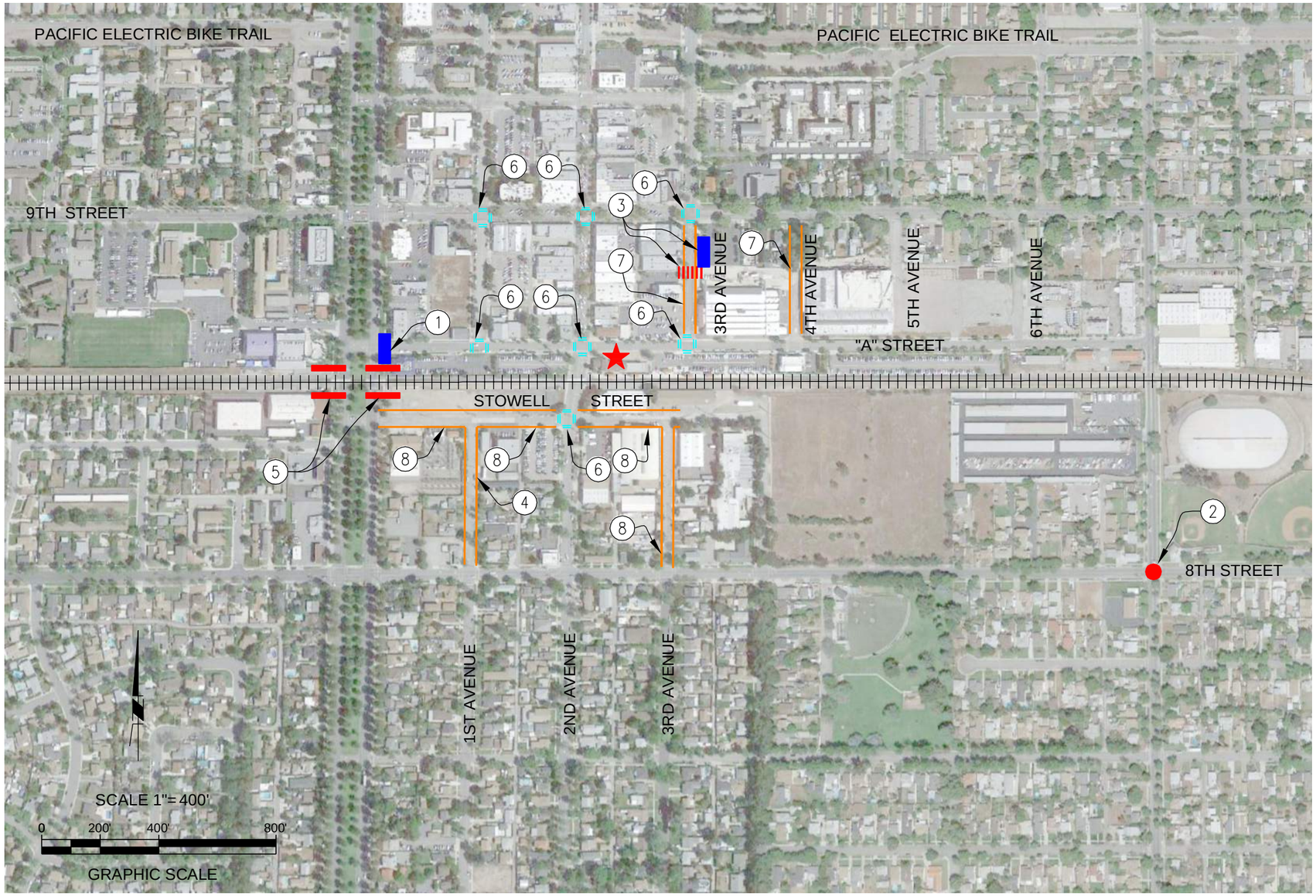
1. EXTEND PACIFIC ELECTRIC TRAIL TO CLAREMONT BOULEVARD
2. PROVIDE SIDEWALK TO NORTH SIDE OF RICHTON STREET
3. PROVIDE BIKE/PED ACCESS FROM PACIFIC ELECTRIC TRAIL TO METROLINK PARKING LOT
4. PROVIDE ENHANCED PED CROSSING ON RICHTON STREET AND ACROSS BUS ACCESS
5. INSTALL BIKE RACKS
6. PROVIDE HIGH VISIBILITY CROSSWALKS AND SIGNALIZATION ALONG THE PACIFIC ELECTRIC TRAIL CORRIDOR
7. REMOVE ONE LANE OF TRAFFIC AND REPLACE WITH BIKE LANE AND SIDEWALK ON MONTE VISTA AVENUE NORTH OF ARROW HIGHWAY
8. PROVIDE PED ACCESS FROM MONTE VISTA AVENUE TO PLATFORM NORTH OF RAILROAD TRACKS

SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT-MONTCLAIR STATION

SIDEWALK
STATION
CALL OUT
RAILROAD TRACK
CROSSWALK
HIGH VISIBILITY CROSSWALK
BICYCLE RACKS
BIKE/PED ACCESS
BIKE LANE

LENGTH OF BIKE LANES TO BE INSTALLED: 0.29 MILES

PARSONS BRINCKERHOFF
451 E. Vanderbilt Way Suite 200, San Bernardino CA
TEL: 909.888.1106 FAX: 909.889.1884



PROJECT DEFINITION- UPLAND

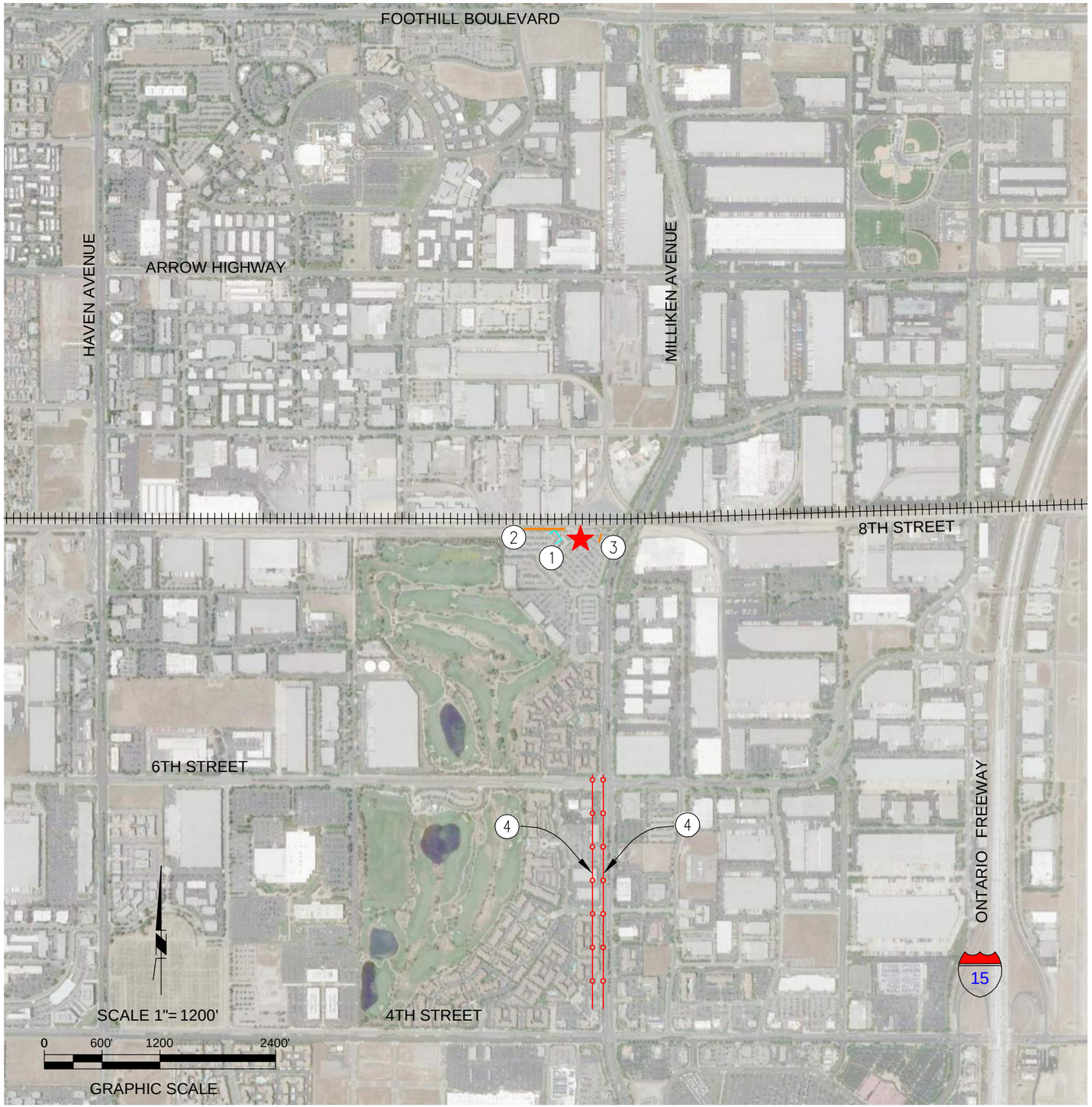
1. PROVIDE WAYFINDING SIGNAGE AT EUCLID AVENUE AND "A" STREET
2. PROVIDE SHARED BIKE LANE MARKINGS ON CLASS III BIKE LANES AT 8TH STREET AND CAMPUS AVENUE
3. PROVIDE CROSSWALK AND WAYFINDING SIGNAGE ON 3RD AVENUE NORTH OF METROLINK STATION
4. PROVIDE SIDEWALK ON 1ST AVENUE SOUTH OF RAILROAD TRACKS
5. PROVIDE PEDESTRIAN AUTOMATED CROSSING GATES AT RAILROAD TRACKS AT EUCLID AVENUE AND "A" STREET
6. PROVIDE ENHANCED CROSSWALKS AT 4 INTERSECTIONS ALONG 1ST AVENUE, 2ND AVENUE, AND 3RD AVENUE
7. PROVIDE SIDEWALK ON BOTH SIDES OF STREETS ON 3RD AVENUE AND 4TH AVENUE, NORTH OF THE RAILROAD TRACKS.
8. PROVIDE SIDEWALK ALONG 3RD AVENUE, 1ST AVENUE AND STOWELL AVENUE SOUTH OF THE RAILROAD TRACKS

LEGEND

- SIDEWALK
- STATION
- CALL OUT
- CROSSWALK
- WAYFINDING SIGNAGE
- RAILROAD TRACK
- AUTOMATIC GATE

SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT- UPLAND STATION

PARSONS BRINCKERHOFF
451 E. Vanderbilt Way Suite 200, San Bernardino CA
TEL: 909.888.1106 FAX: 909.889.1884



PROJECT DEFINITION- RANCHO CUCAMONGA

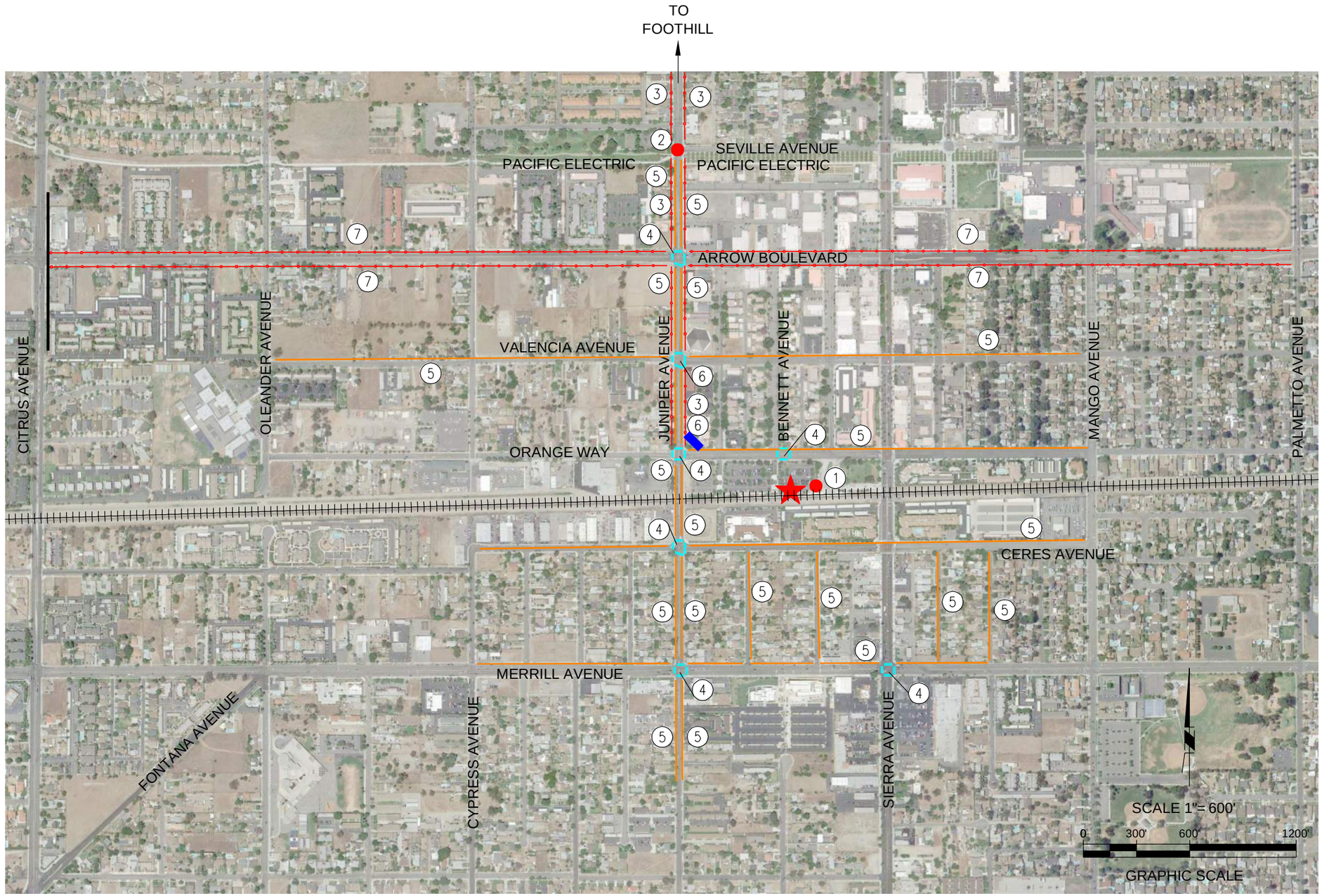
1. PROVIDE BIKE LOCKERS
2. REPAIR/REPLACE SIDEWALK AT METROLINK STATION SOUTH OF THE RAILROAD TRACKS
3. PROVIDE PED/BIKE ACCESS TO MILLIKEN AVENUE
4. PROVIDE BIKE LANE ALONG MILLIKEN AVENUE BETWEEN 4TH STREET AND 6TH STREET

LEGEND

- SIDEWALK
- STATION
- CALL OUT
- BICYCLE LOCKERS
- BIKE LANE
- LENGTH OF BIKE LANES TO BE INSTALLED: 1.0 MILES
- RAILROAD TRACK

SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT- RANCHO CUCAMONGA STATION

PARSONS BRINCKERHOFF
451 E. Vanderbilt Way Suite 200, San Bernardino CA
TEL: 909.888.1106 FAX: 909.889.1884



PROJECT DEFINITION- FONTANA

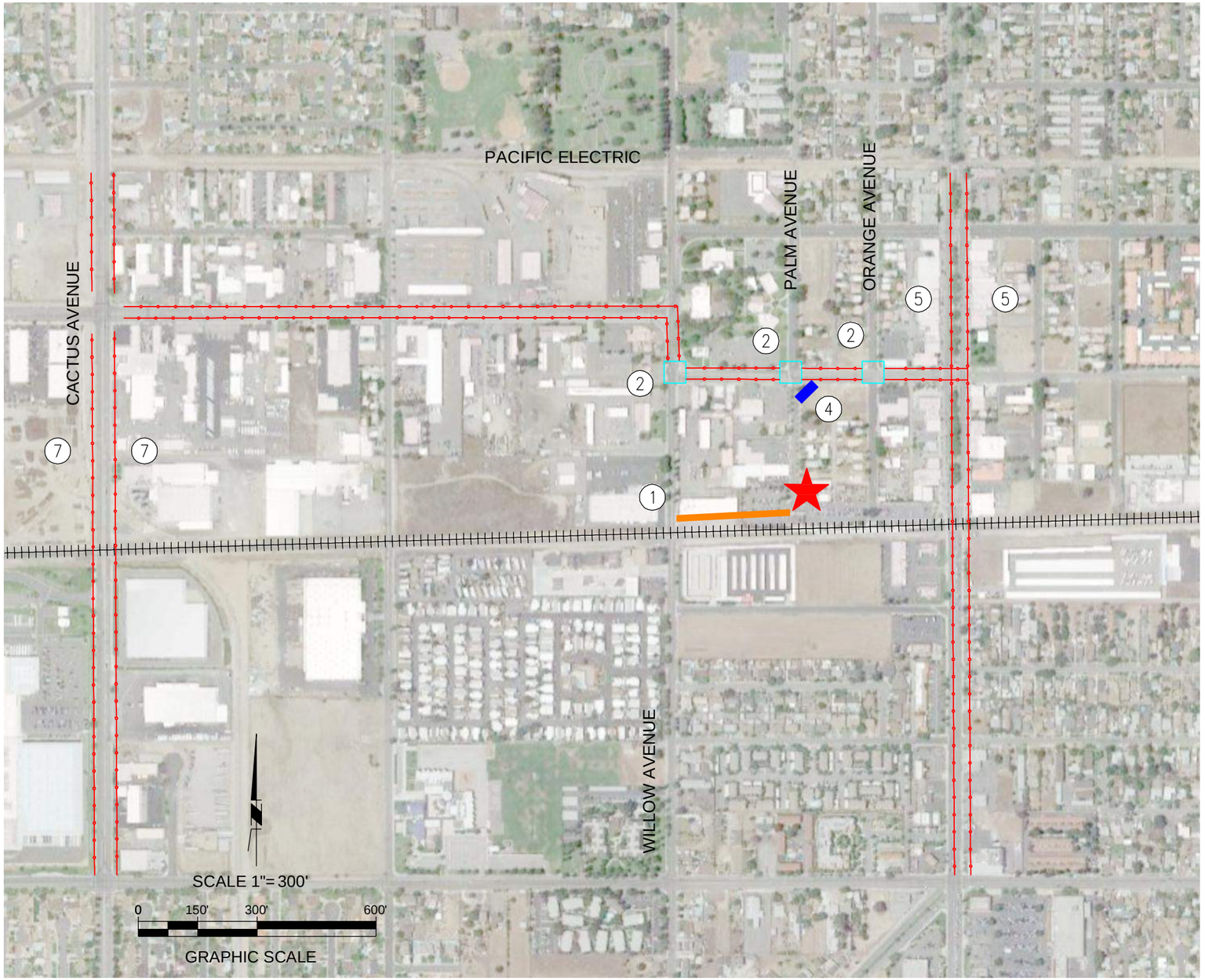
1. INSTALL SHORT AND LONG–TERM BICYCLE PARKING
2. RECONFIGURE CROSSING AND POST SIGNS ON JUNIPER AVENUE AT PACIFIC ELECTRIC TRAIL
3. PROVIDE BIKE ROUTE, WAYFINDING SIGNAGE, "COLOR" BIKE TRAIL AT CONFLICT ZONES ON JUNIPER AVENUE FROM ORANGE WAY TO BASE LINE
4. PROVIDE HIGH VISIBILITY CROSSWALKS AT 7 INTERSECTIONS
5. PROVIDE MISSING SIDEWALKS ALONG VARIOUS STREETS
6. PROVIDE WAYFINDING SIGNAGE ALONG JUNIPER
7. PROVIDE BUFFERED BIKE LANES, WAYFINDING SIGNAGE, "COLOR" BIKE TRAIL AT CONFLICT ZONES ON ARROW BOULEVARD BETWEEN PALMETTO AVENUE AND CITRUS AVENUE

SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT- FONTANA STATION

LEGEND

- SIDEWALK
- STATION
- CALL OUT
- BIKE LANE
- LENGTH OF BIKE LANES TO BE INSTALLED: 4.54 MILES
- CROSSWALK
- WAYFINDING SIGNAGE
- RAILROAD TRACK

PARSONS BRINCKERHOFF
451 E. Vanderbilt Way Suite 200, San Bernardino CA
TEL: 909.888.1106 FAX: 909.889.1884



PROJECT DEFINITION- RIALTO

1. PROVIDE SIDEWALK PED ACCESS FROM WILLOW AVENUE TO THE METROLINK STATION.
2. PROVIDE ENHANCED PED CROSSWALKS ON RIALTO AVENUE
3. PROVIDE SHORT AND LONG-TERM BIKE PARKING
4. PROVIDE WAYFINDING SIGNAGE AT RIALTO AVENUE AND PALM AVENUE
5. PROVIDE BIKE LANES ON RIVERSIDE AVENUE
6. PROVIDE BIKE LANES ON RIALTO BOULEVARD/ARROW BOULEVARD BETWEEN CACTUS AVENUE AND RIVERSIDE DRIVE
7. PROVIDE BIKE LANES ON CACTUS AVENUE FROM MERRILL AVENUE TO THE PACIFIC ELECTRIC TRAIL

LEGEND

- STATION
- CALL OUT
- BICYCLE LOCKERS
- RAILROAD TRACK
- ENHANCED CROSSWALK
- WAYFINDING SIGNAGE
- SIDEWALK
- BIKE LANE

LENGTH OF BIKE LANES TO BE INSTALLED: 2.89 MILES

SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT- RIALTO STATION

PARSONS BRINCKERHOFF
451 E. Vanderbilt Way Suite 200, San Bernardino CA
TEL: 909.888.1106 FAX: 909.889.1884

PROJECT DEFINITION-
SAN BERNARDINO

1. REPAIR EXISTING UNEVEN PAVEMENT ALONG MT. VERNON AVENUE
2. PROVIDE HIGH VISIBILITY PED CROSSWALKS AT MT. VERNON AVENUE AND 2ND STREET.
3. PROVIDE MID-BLOCK CROSSWALK ON 3RD STREET WITH LIGHTS AND SIGNAGE
4. INSTALL WAYFINDING SIGNAGE FOR LOCAL BUS STOPS ON 3RD STREET
5. PROVIDE ENHANCED CROSSWALK STRIPING IN PARKING LOT
6. PROVIDE SIDEWALK
7. INSTALL SHORT AND LONG-TERM BICYCLE PARKING
8. PROVIDE HIGH VISIBILITY CROSSWALKS AT GIOVANOLA AVENUE AND 2ND STREET
9. PROVIDE WAYFINDING SIGNAGE AT "L" STREET AND 2ND STREET

LEGEND

- SIDEWALK
- STATION
- CALL OUT
- BICYCLE LOCKERS
- WAYFINDING SIGNAGE
- HIGH VISIBILITY CROSSWALK
- CROSSWALK
- RAILROAD TRACK

SANBAG METROLINK STATION ACCESSIBILITY IMPROVEMENT PROJECT-
SAN BERNARDINO STATION

PARSONS BRINCKERHOFF
451 E. Vanderbilt Way Suite 200, San Bernardino CA
TEL: 909.888.1106 FAX: 909.889.1884

SANBAG Metrolink Station Accessibility Improvement Project

SITE DESCRIPTION	SUBTOTAL
SITE 1: MONTCLAIR METROLINK STATION	$ 1,032,885
SITE 2: UPLAND METROLINK STATION	$ 976,084
SITE 3: RANCHO CUCAMONGA METROLINK STATION	$ 551,475
SITE 4: FONTANA METROLINK STATION	$ 1,108,958
SITE 5: RIALTO METROLINK STATION	$ 823,635
SITE 6: SAN BERNARDINO METROLINK STATION	$ 185,693
	$ -
GRAND TOTAL	**$ 4,678,729**
Total Program Cost	**$ 4,678,729**

SANBAG Metrolink Station Accessibility Improvement Project

SITE 1: MONTCLAIR METROLINK STATION

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL COST
1	EXTEND PACIFIC ELECTRIC TRAIL TO CLAREMONT BOULEVARD	LF	590	$ 300.00	$ 177,000.00
2	PROVIDE SIDEWALK TO NORTH SIDE OF RICHTON STREET	LF	880	$ 30.00	$ 26,400.00
3	PROVIDE BIKE/PED ACCESS FROM PACIFIC ELECTRIC TRAIL TO METROLINK PARKING LOT	EA	1	$ 5,000.00	$ 5,000.00
4	PROVIDE ENHANCED PED CROSSING ON RICHTON STREET AND ACROSS BUS ACCESS	LF	90	$ 80.00	$ 7,200.00
5	INSTALL BIKE RACKS	LS	1	$ 6,000.00	$ 6,000.00
6	PROVIDE TWO HIGH VISBILITY CROSSWALKS AND SIGNALIZATION ALONG THE PACIFIC ELECTRIC TRAIL CORRIDOR	EA	4	$ 50,000.00	$ 200,000.00
7	REMOVE ONE LANE OF TRAFFIC AND REPLACE WITH BIKE LANE AND SIDEWALK ON MONTE VISTA AVENUE NORTH OF ARROW HIGHWAY	LF	930	$ 300.00	$ 279,000.00
8	PROVIDE PED ACCESS FROM MONTE VISTA AVENUE TO PLATFORM NORTH OF RAILROAD TRACKS	LF	430	$ 150.00	$ 64,500.00
	SUBTOTAL				**$ 765,100.00**

Design and Construction Management (25%)	$ 191,275.00
Contingency (10%)	$ 76,510.00
TOTAL	**$ 1,032,885.00**

SANBAG Metrolink Station Accessibility Improvement Project

SITE 2: UPLAND METROLINK STATION

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL COST
1	PROVIDE WAYFINDING SIGNAGE AT EUCLID AVENUE AND "A" STREET	EA	2	$ 10,000.00	$ 20,000.00
2	PROVIDE SHARED BIKE LANE MARKINGS ON CLASS III BIKE LANES AT 8TH STREET AND CAMPUS AVENUE	LS	1	$ 2,500.00	$ 2,500.00
3	PROVIDE CROSSWALK AND WAYFINDING SIGNAGE ON 3RD AVENUE NORTH OF METROLINK STATION	LS	1	$ 10,000.00	$ 10,000.00
4	PROVIDE SIDEWALK ON 1ST AVENUE SOUTH OF RAILROAD TRACKS	LF	1,100	$ 30.00	$ 33,000.00
5	PROVIDE PEDESTRIAN AUTOMATED CROSSING GATES AT RAILROAD TRACKS AT EUCLID AVENUE AND "A" STREET	EA	4	$ 100,000.00	$ 400,000.00
6	PROVIDE ENHANCED CROSSWALKS AT SEVEN INTERSECTIONS ALONG 1ST AVENUE, 2ND AVENUE, AND 3RD AVENUE	LF	1,925	$ 25.00	$ 48,125.00
7	PROVIDE SIDEWALK ALONG 3RD & 4TH AVENUES NORTH OF THE RAILROAD TRACKS	LF	1,760	$ 30.00	$ 52,800.00
8	PROVIDE SIDEWALK ALONG 3RD AVENUE, 1ST AVENUE AND STOWELL AVENUE SOUTH OF THE RAILROAD TRACKS	LF	5,220	$ 30.00	$ 156,600.00
					$ -
	SUBTOTAL				**$ 723,025.00**

Design and Construction Management (25%)	$ 180,756.25
Contingency (10%)	$ 72,302.50
TOTAL	**$ 976,083.75**

SANBAG Metrolink Station Accessibility Improvement Project

SITE 3: RANCHO CUCAMONGA METROLINK STATION

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL COST
1	PROVIDE BIKE LOCKERS	LS	1	$ 25,000.00	$ 25,000.00
2	REPAIR/REPLACE SIDEWALK AT METROLINK STATION SOUTH OF THE RAILROAD TRACKS	SF	4,000	$ 6.00	$ 24,000.00
3	PROVIDE PED/BIKE ACCESS TO MILLIKEN AVENUE	LS	1	$ 15,000.00	$ 15,000.00
4	PROVIDE BIKE LANE ALONG MILLIKEN AVENUE BETWEEN 4TH STREET AND 6TH STREET	LF	5,300	$ 65.00	$ 344,500.00
				$ -	$ -
				$ -	$ -
	SUBTOTAL				**$ 408,500.00**

Design and Construction Management (25%)	$ 102,125.00
Contingency (10%)	$ 40,850.00
TOTAL	**$ 551,475.00**

SANBAG Metrolink Station Accessibility Improvement Project

SITE 4: FONTANA METROLINK STATION

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL COST
1	INSTALL SHORT AND LONG-TERM BIKE PARKING	LS	1	$ 25,000.00	$ 25,000.00
2	RECONFIGURE CROSSING AND POST SIGNS ON JUNIPER AVENUE AT PACIFIC ELECTRIC TRAIL	LS	1	$ 5,000.00	$ 5,000.00
3	PROVIDE BIKE ROUTE, WAYFINDING SIGNAGE, “COLOR” BIKE TRAIL AT CONFLICT ZONES ON JUNIPER AVENUE FROM ORANGE WAY TO FOOTHILL	LF	7,840	$ 25.00	$ 196,000.00
4	PROVIDE HIGH VISIBILITY CROSSWALKS AT SEVEN INTERSECTIONS	LF	1,410	$ 25.00	$ 35,250.00
5	PROVIDE MISSING SIDEWALKS ALONG VARIOUS STREETS	LF	4,890	$ 30.00	$ 146,700.00
6	PROVIDE WAYFINDING SIGNAGE ALONG JUNIPER AVENUE	LS	1	$ 10,000.00	$ 10,000.00
7	PROVIDE BUFFERED BIKE LANES, WAYFINDING SIGNAGE, “COLOR” BIKE TRAIL AT CONFLICT ZONES ON ARROW BOULEVARD BETWEEN Palmetto Avenue and Citrus Avenue	LF	16,140	$ 25.00	$ 403,500.00
				$ -	$ -
	SUBTOTAL				**$ 821,450.00**

Design and Construction Management (25%)	$ 205,362.50
Contingency (10%)	$ 82,145.00
TOTAL	**$ 1,108,957.50**

SANBAG Metrolink Station Accessibility Improvement Project

SITE 5: RIALTO METROLINK STATION

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL COST
1	PROVIDE SIDEWALK PED ACCESS FROM WILLOW AVENUE TO THE METROLINK STATION.	LF	320	$ 30.00	$ 9,600.00
2	PROVIDE ENHANCED PED CROSSWALKS ON RIALTO AVENUE	LF	720	$ 25.00	$ 18,000.00
3	INSTALL SHORT AND LONG-TERM BIKE PARKING	LS	1	$ 25,000.00	$ 25,000.00
4	PROVIDE WAYFINDING SIGNAGE AT RIALTO AVENUE AND PALM AVENUE	LS	1	$ 10,000.00	$ 10,000.00
5	PROVIDE BIKE LANES ON RIVERSIDE AVENUE between Merrill Avenue and PE Trail	LF	6,650	$ 25.00	$ 166,250.00
6	Add Bike Lanes on Rialto Avenue/Arrow Boulevard between Cactus Avenue and Riverside Drive	LF	8,600	$ 25.00	$ 215,000.00
7	Add Bike Lanes on Cactus Avenue from Merrill Avenue to PE Trail	LF	6,650	$ 25.00	$ 166,250.00
				$ -	$ -
				$ -	$ -
	SUBTOTAL				**$ 610,100.00**

Design and Construction Management (25%)	$ 152,525.00
Contingency (10%)	$ 61,010.00
TOTAL	**$ 823,635.00**

SANBAG Metrolink Station Accessibility Improvement Project

SITE 6: SAN BERNARDINO DEPOT

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL COST
1	REPAIR EXISTING UNEVEN PAVEMENT ALONG MT. VERNON AVENUE.	LS	1	$ 50,000.00	$ 50,000.00
2	PROVIDE HIGH VISIBILITY PED CROSSWALKS AT MT. VERNON AVENUE AND 2ND STREET.	LF	336	$ 50.00	$ 16,800.00
3	PROVIDE MID-BLOCK CROSSWALK ON 3RD STREET WITH LIGHTS AND SIGNAGE	LF	70	$ 200.00	$ 14,000.00
4	PROVIDE WAYFINDING SIGNAGE FOR LOCAL BUS STOPS LOCATED ON 3RD STREET	LS	1	$ 10,000.00	$ 10,000.00
5	PROVIDE ENHANCED CROSSWALK STRIPING IN PARKING LOT	LF	105	$ 50.00	$ 5,250.00
6	PROVIDE SIDEWALK	LF	10	$ 50.00	$ 500.00
7	INSTALL SHORT AND LONG-TERM BIKE PARKING	LS	1	$ 25,000.00	$ 25,000.00
8	PROVIDE HIGH VISIBILITY CROSSWALKS AT GIOVANOLA AVENUE AND 2ND STREET	LF	240	$ 25.00	$ 6,000.00
9	PROVIDE WAYFINDING SIGNAGE AT "L" STREET AND 2ND STREET	LS	1	$ 10,000.00	$ 10,000.00
					$ -
	SUBTOTAL				**$ 137,550.00**

Design and Construction Management (25%)	$ 34,387.50
Contingency (10%)	$ 13,755.00
TOTAL	**$ 185,692.50**

Current Photos of Project Locations at Metrolink Stations

Current Photos are included in the attached pages.

More information and photos are found in SANBAG's Improvements to Transit Access for Cyclists and Pedestrians, Final Report, November 2012, as listed below. The Report is included in the appendices.

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Rancho Cucamonga	37
Fontana	49
Rialto	57
San Bernardino	65

[1] SANBAG's Improvements to Transit Access for Cyclists and Pedestrians, Final Report, November 2012

Current Montclair Metrolink Station Photo

Current Montclair Metrolink Station Photo

Current Montclair Metrolink Station Photo

Current Montclair Metrolink Station Photo

Current Upland Metrolink Station Photo

Current Upland Metrolink Station Photo

Current Upland Metrolink Station Photo

Current Upland Metrolink Station Photo

Current Rancho Cucamonga Metrolink Station Photo

Current Rancho Cucamonga Metrolink Station Photo

Current Rancho Cucamonga Metrolink Station Photo

Current Rancho Cucamonga Metrolink Station Photo

Current Fontana Metrolink Station Photo

Current Fontana Metrolink Station Photo

Current Rialto Metrolink Station Photo

Current Rialto Metrolink Station Photo

Current San Bernardino Metrolink Station Photo

Current San Bernardino Metrolink Station Photo

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SANBAG Improvement to Transit Access for Cyclists and Pedestrians
County of San Bernardino, California

W. Paul Farmer, FAICP
Chief Executive Officer

William Anderson, FAICP
APA President

Improvement to Transit Access for Cyclists and Pedestrians

Final Report

Submitted to the San Bernardino Associated Governments

by Alta Planning+Design
with Gruen Associates

November 2012

Governments SANBAG Working Together

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

COMPASS BLUEPRINT

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GRUENASSOCIATES

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Executive Summary

Plan Process

San Bernardino Associated Governments (SANBAG) undertook an effort to examine the ability of non-motorized users to access its regional transit network, including the six existing Metrolink Commuter Rail stations along the San Bernardino Line, and four under construction sbX Bus Rapid Transit (BRT) Stations in the cities of San Bernardino and Loma Linda. This year-long project sought to identify existing barriers to access, inform stakeholders of industry best practices relating to improving non-motorized circulation, and propose planning-level improvements in and around the selected stations. These improvements were based on existing conditions documentation, including fieldwork and Geographic Information Systems (GIS) analysis, industry research, extensive stakeholder consultation, public outreach efforts, and financial feasibility.

The project is designed to serve as a guiding document for cities looking to secure funding for transit station area improvements, implement the goals of the SANBAG Non-Motorized Transportation Plan, and improve access to and from these stations for local residents and commuters, thereby reducing parking demand and increasing transit ridership. A Project Development Team (PDT) was convened at the beginning of the project, and consisted of over three dozen members, ranging from City staff, SANBAG and SCAG representatives, local cycling advocates, community members, representatives from Metrolink and Omnitrans, and major employers in the region such as Cal State San Bernardino. The PDT met every two months for the duration of the project, and members were kept abreast of project progress via regular e-mail and phone communication.

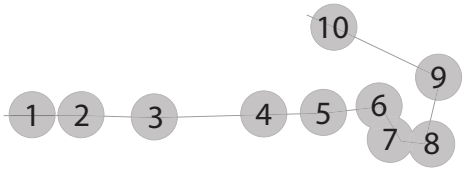
Existing Conditions

San Bernardino County has long been an auto-dominated environment. Roadways are typically laid out in a grid network, topography permitting, with a standard hierarchy of classifications. The Cities in the study area vary widely in their approach to implementing bicycle and pedestrian facilities, owing to a number of factors relating to circulation priorities, land use patterns, and transit station built environments. SANBAG completed its countywide Non-Motorized Transportation Plan, updated in Spring of 2011, which quantified the existing non-motorized network in the region. While it is difficult to generalize, the existing non-motorized network typically consists of a number of disconnected facilities for both cyclists and pedestrians. On-street facilities face challenges from vehicle speeds and volumes, substandard infrastructure, while off-street facilities (such as walking trails and bike paths) face challenges of a lack of funding for creating amenities and providing maintenance.

Despite these challenges, walking, bicycling, and transit usage throughout the study area remains high, and connecting non-motorized facilities to one another and to the people that use them is a key objective of this project.

Best Practices

Chapter Three presents a number of industry best practices from throughout the country designed to improve access to and from transit stations. These examples served to inform the public and the PWG, and formed the basis of a series of recommendations in and around the transit station areas under study, including use of innovative new traffic control devices, bicycle facilities, wayfinding concepts, and other hardscape improvements.



Public Outreach

This project featured a number of events and exercises designed to engage the public and solicit their opinions. An initial survey effort was conducted at each of the ten stations under study, designed to identify transit users' issues, challenges, and preferences relating to accessing their respective transit stations. These surveys took place over the course of two weeks, and resulted in over 200 completed surveys.

In addition, a total of four public workshops were held over the course of the project, which helped to solicit additional comments and educate the public about the proposed improvements found in Chapter Four.

Lastly, SANBAG maintained a project webpage on its website, which featured project materials such as deliverables and public notices for review and comment by the public. In addition, the webpage featured a project-specific e-mail address for community members to provide their comments on the project. This e-mail address was checked daily, and resulted in a number of unique suggestions which have been taken into consideration in the recommended improvements.

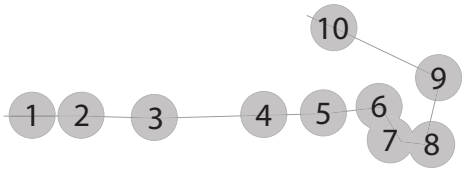
Recommended Improvements

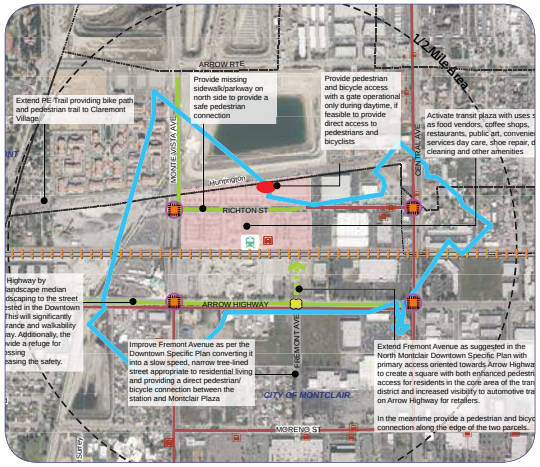
The project study area includes approximately 140 square miles of project catchment area, and recommends an "outside-in" approach, whereby the scale and scope of the proposed improvements become more specific and more detailed as they approach the respective station areas.

This methodology allows participating cities to use this project to identify priority non-motorized transit access corridors within their jurisdictions, helping them to implement the regional bicycle network in a manner that simultaneously improves direct, logical connections to transit facilities, closes gaps in the regional bicycle network, and improves cyclist safety and mobility.

Closer to the station, the recommendations become more specific and detailed, proposing improvements such as new sidewalks, enhanced pedestrian crossings, additional bicycle parking, street trees, or lighting elements, as well as general recommendations designed to help to create a "sense of place" in and around the station area. Highlights of the recommendations include:

- Over 70 miles of high-priority bicycle corridors providing safer, more direct access to transit stations
- Nearly 50 new or improved pedestrian crosswalks for commuters and residents
- Over 23 miles of new, ADA-compliant sidewalks





- Over 2,300 new pedestrian-scale lighting elements in and around station areas
- Over 1,700 new trees for shade and improved aesthetics

In addition to these specific improvements, the following general recommendations are proposed:

- Develop comprehensive wayfinding plan(s) for local residents, commuters, and visitors
- Prioritize roadway resurfacing on designated bikeways
- Increase the quality and amount of bicycle parking at stations and surrounding destinations

Phasing of the improvements identified will be site-specific and dependent on the goals and objectives of each of the participating cities, however, it is recommended that implementation measures occur in concert with not only one another, but with those of neighboring cities to maximize cost effectiveness, non-motorized network activity, and public enjoyment of the facilities.

Funding and Implementation

The consultant team understands the financial challenges currently facing the cities that participated in this project. Despite the difficult funding and implementation for non-motorized improvements, federal, state, local, and private grant funds are available from a number of targeted accounts. In addition to transportation funds, public health, air quality, and various grant sources allow for the design and construction of facilities like those identified in this report.

Chapter Five presents a listing of these sources and identifies the application process for cities and other governmental agencies to follow in order to secure monies for implementation.

Lessons Learned

Over the course of the project, the effort was informed by a diverse stakeholder group, which was an invaluable resource in project development and overall knowledge of the various land use and transportation planning efforts underway throughout the study area cities and among transit operators. Future projects of this nature should make every effort to include as many agency and City stakeholders as possible, and should not exclude cycling and pedestrian advocates and organizations, such as the Friends of the Pacific Electric Trail.

From a technical standpoint, when confronted with applying the 3-mile bicycle travel shed guideline developed by the FTA, municipalities should explore using FTA funds to implement their proposed bicycle network, particularly high-demand corridors and segments which directly serve transit facilities.

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1 Introduction and Existing Conditions

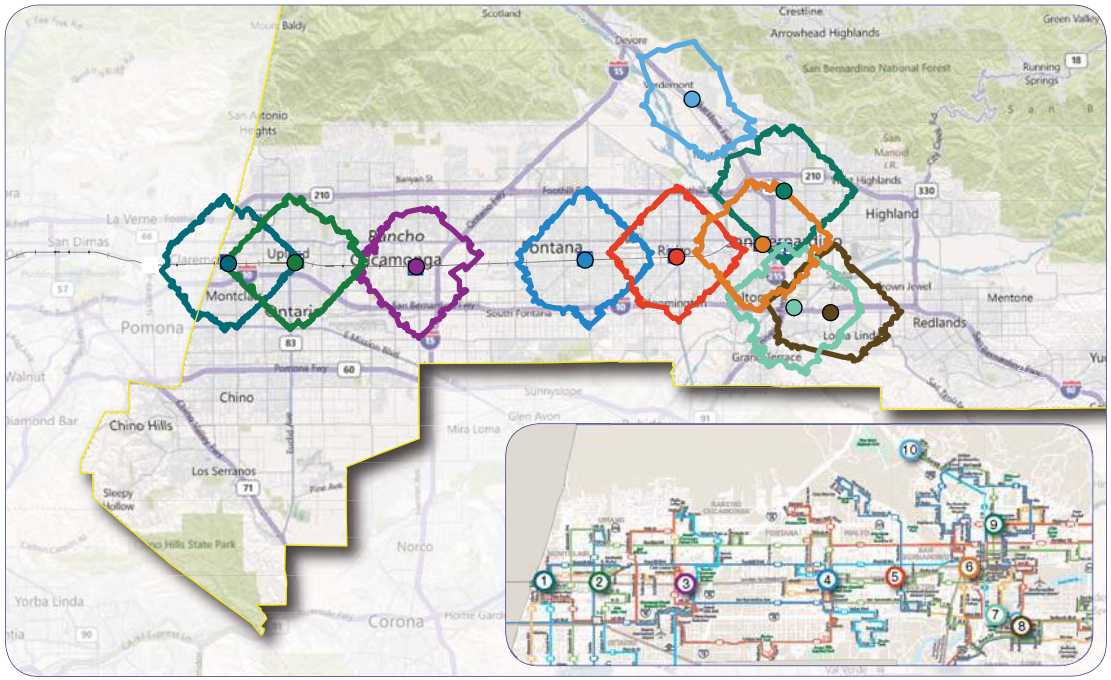
Study Area Description

The project study area is located in the southwestern corner of San Bernardino County, primarily along the Metrolink Commuter Rail network and the Interstate 10 corridor, with a small number of stations along the Interstate 215 corridor. Fixed-route bus transit service is provided by Omnitrans, and as mentioned, Metrolink provides commuter rail service within the study area. San Bernardino County cities participating in the study include Montclair, Upland, Rancho Cucamonga, Fontana, Rialto, San Bernardino, and Loma Linda.

Stations Selected for Analysis

The Project Development Team (PDT) developed ten stations for analysis. The locations were selected for a number of reasons, including high levels of existing or planned transit service, proximity to transit-oriented subpopulations such as students or employees, and for some smaller stations, the opportunity to serve as a model for how to implement infrastructure improvements designed to best serve the needs of bicyclists and pedestrians at transit stations throughout the Inland Empire.

FIGURE 1.1 **STUDY AREA LOCATIONS AND PROXIMITY BUFFERS**


Pomona
Chino
Chino Hills
Los Serranos
Norco
Corona
Yorba Linda
Highland
Redlands
Mentone
Crestline
Arrowhead Highlands
San Bernardino National Forest
Devore
Scotland
Running Springs
Green Valley
San Dimas
La Verne
Walnut
Diamond Bar
Sleepy Hollow
Mira Loma
Glen Avon
Sunnyslope
Grand Terrace
Loma Linda
Brown Jewel
South Fontana
Foothill
Sierra Madre
Euclid Ave
Fine Ave
Pomona Fwy
Mission Blvd
Home Garden
Rancho Cucamonga
Fontana
Rialto
San Bernardino
Upland
Montclair
Ontario
Redlands
Highland
Loma Linda
Yucaipa
Chino Hills State Park
Mount Baldy
San Antonio Heights
Vineyard
Cucamonga
Bernardino
Ontario
Colton
Rialto
Fontana
Upland
Montclair
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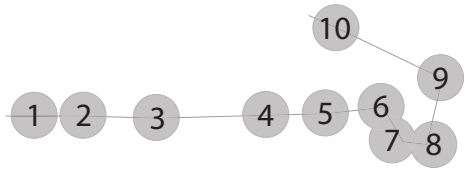


2009 SCAG General Plan Land Use Category

- Agriculture
- College or Universities
- General Commercial
- General Industrial
- Golf Course
- Heavy Industrial
- Hotel
- Institutions / Government
- K-12 Schools
- Light Industrial
- Military
- Misc. Commercial
- Misc. Industrial
- Office
- Open Space / Parks
- Other Retail
- Regional Commercial
- Residential
- Transportation
- Urban / Mixed Use
- Utilities

The land uses in each study vary greatly, and affect the nature of pedestrian and bicyle travel around each station

Population per Acre (2010)

- None
- 0.1 - 5
- 5.1 - 10
- 10.1 - 25
- Over 25

The more dense the population, the more potential for pedestrian and bicyclist access

Project Catchment Areas and Distances

Frequently in transit access analyses, simple distance-based buffers are applied around the station location to comply with the Federal Transit Administration (FTA) guidelines of one-half mile for pedestrian access, and three miles for bicycle access. These distances are used to identify which projects within a city may be eligible for FTA transit access funding and fit the description found in the FTA *Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law.*

Increasingly, however, distance-based buffers are making use of sophisticated route finding software algorithms to better reflect the true travel distance from a station as reflected by the local street network. This method allows for planners to account for barriers and delays built into travel routing to develop a catchment area that is more reflective of the conditions on the ground than an area that is simply radial in nature.

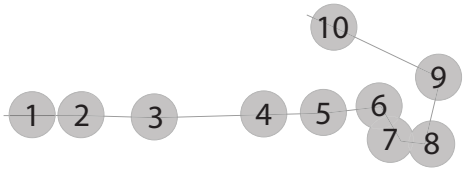
These barriers to travel may include having to alter one's route to access freeway, rail corridor, or river channel crossing points, cul-de-sacs, private drives, or other non-connected features of the built environment. Based on feedback from the Project Development Team, each station catchment area under study was refined to reflect this "true" travel distance, and complies with FTA guidelines.

This chapter is broken into ten sections, one for each transit station under study. Each station is assessed generally and specifically with regards to the pedestrian and bicycle environment present in each respective catchment area.

General assessment criteria include:

- Opportunities and Constraints bullet points as observed by the Project Working Group through fieldwork and other professional judgement criteria
- Nearby and adjacent land uses and their observed effects on transit access (see general legend at left)
- Population density figures as reported by the 2010 Census (see general legend at left)
- Overall level of existing and planned transit connectivity based on Omnitrans' route network (local Omnitrans Routes are shown in ORANGE, the E Street sbX BRT route is shown in BLUE)

In addition to these general observations, each station catchment area was specifically assessed for the level of its pedestrian and bicycle infrastructure networks. SANBAG and SCAG provided Geographic Information System (GIS) infrastructure data to the consultant team from their databases, and coordinated the data collection efforts between the participating cities. Alta Planning + Design and



Example of GIS-based distance buffer compared to radial distanced-based buffer

Unmaintained bike lane and non-ADA compliant sidewalk

Residential uses often do not connect to adjacent bikeway facilities

Gruen Associates used this data to confirm existing conditions as part of their fieldwork efforts in 2011.

These findings are reported in a series of matrices following the general assessments of each respective station. Specific assessment criteria include:

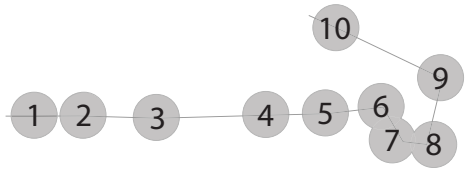
Bicycle Network

The bikeways recommended in this plan correspond to California Department of Transportation (Caltrans) standard designations. They include:

- **Class I Bikeway: Typically called a "bike path", a Class I Bikeway provides bicycle travel on a paved right-of-way completely separated from the street where vehicles travel.**
- **Class II Bikeway: Often referred to as a "bike lane", a Class II Bikeway provides a striped, signed, and stenciled lane for one-way travel on a street or highway.**
- **Class III Bikeway: Generally referred to as a "bike route"' a Class III Bikeway provides for shared use with bicycle or motor vehicle traffic and uses only signage identification.**

The following are indictors of a supportive environment that fosters high bicycle accessability and volumes:

- **Speed and Condition of Vehicular Traffic** - Class II and III bikeway facilities share the road right-of-way with automobiles, and their usage is often correlated with the speed and congestion of automobile traffic. Bicyclists who feel adjacent traffic is too congested or moving too fast may be unwilling to use these facilities.
- **Pavement Condition** - Roadway shoulders or bike lanes that are neglected, unmaintained, or in poor condition can be hazardous, and can discourage bicyclists from using the facility.
- **"Door Zone" and Driveway Conflicts** - Vehicles entering or exiting driveways frequently pose challenges to on-road cyclists, as do drivers exiting their vehicles from the driver's side of a parallel parking space. The more parallel parking and driveways in a corridor, the greater possibility of these types of conflicts.
- **Transit Service and Waiting Environment Within Corridor** - Transit must be accessible and inviting to encourage use. Ample transit service with adequate waiting environments are key components of a well-used transit network for all users.
- **Amount of Trip Generators and Attractors** - The more attractions in an area, the greater the potential for bicycle traffic in and around the study area.



- **Amount of Bike Facility Striping or Signage** - Successful bicycle facilities should be well-signed for routefinding along the facility itself, and regional wayfinding to nearby destinations.

Pedestrian Network

Providing safe, convenient and attractive sidewalks, pedestrian crossings and transit stops are imperative to ensuring transit riders have a positive experience. A safe, comfortable, and pleasant pedestrian environment encompasses the following:

- **Sidewalk/Parkway Width** - Sidewalk and Parkway width includes the landscape/furniture zone and the pedestrian zone. The Landscape/Furniture Zone is defined as the area between the roadway curb face and the front edge of the walkway. The recommended minimum width of this zone is 5 feet wide; six feet is better. This zone buffers pedestrians from the adjacent roadway. It is the appropriate location for street trees and landscaping and also the preferred location for street furniture, art, pedestrian lighting and other elements. The pedestrian zone is the area of the sidewalk that is specifically reserved for pedestrian travel.
- **Sidewalk Width** - Residential sidewalks are often four feet wide, but that should be considered an absolute minimum. In commercial areas, sidewalks should be a minimum five feet wide. Six feet or more is better, as it allows people travelling opposite direction to pass comfortably, and allows two people to walk abreast. Sidewalks that are too narrow encourage people to walk in the street, which is unsafe. Sidewalks widths should accommodate people in wheelchairs, parents with toddlers or pushing baby strollers, and a variety of other pedestrians.
- **Sidewalk Condition** - Sidewalks that are neglected, unmaintained, or in poor condition can be hazardous, and can discourage pedestrians from using the facility. Sidewalks with holes deeper than 1", loose gravel and high cracks with missing pieces are considered extremely unsafe.
- **Sidewalk and/or Parkway Location** - Trees in tree well/planting strips provide a buffer between pedestrians on the sidewalk and motor vehicle traffic. Planting strips require a minimum of five feet, although six feet or wider is more desirable, especially for larger trees.
- **Crosswalks** - Pedestrian crossings generally fall into two categories: controlled and uncontrolled. Controlled crossings include signalized locations and stop-controlled crossings. Uncontrolled crossings include both intersection and mid-block locations. Well-marked pedestrian crossings serve two purposes - 1.) they prepare drivers for the likelihood of encountering a pedestrian, and 2.) they create an atmosphere of walkability and accessibility for pedestrians. Marked crossings reinforce the location and legitimacy of a crossing.

Caption

Unmaintained facilities discourage use and create hazards

Interactions with interstate-bound traffic are frequent and challenging in the study area

Accessing transit on foot or by bicycle often involves negotiating difficult street environments

Transit waiting environments can affect ridership

- **Curb Ramp** - Curb ramps provide critical access between the sidewalk and the street for people with mobility impairments. Without curb ramps, people who use wheelchairs cannot access the sidewalk. Curb ramps are most commonly found at intersections but also are required at midblock crossings and crossings of medians.
- **Street Tree Locations** - A row of trees on either side of the street, spaced 30 to 35 ft. apart, is considered ideal. In most situations shade trees located in parkway or tree wells next to the curb are recommended.
- **Raised Median** - A landscaped median reduces the perceived width of a wide street and makes it seem pedestrian-friendly and reduces motor vehicle crashes between opposing lanes of traffic.
- **Utility Poles** - Utility poles located within a sidewalk can obstruct pedestrian mobility and block views.
- **Lighting** - Pedestrian-scale lighting improves accessibility by illuminating sidewalks, crosswalks, curbs, curb ramps, and signs as well as barriers and potential hazards. On wide streets, pedestrian-scale lighting and motor vehicle-scale lighting should be provided to complement each other ensuring that both sidewalks and travel lanes are effectively illuminated.
- **Street Furniture** - Street furnishings, public art and other pedestrian and bicycle amenities are important elements that can create a comfortable, safe and attractive public realm. Examples of street furnishings include benches, litter and recycling receptacles, bike racks, multiple publication newsstands, water fountains, pedestrian scaled lighting and planters.
- **Wayfinding Signage** - An enhancement to the sidewalk network for pedestrians is wayfinding signage. The signs should consist of a distinctive logo and directional guidance to neighborhood destinations. The signs can be attached to separate poles or lampposts and located at decision points along the route network.

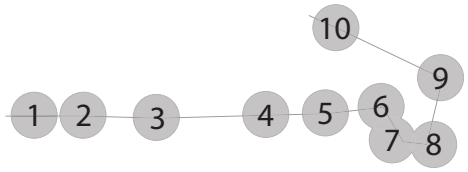


TABLE 1.2 **BICYCLE AND PEDESTRIAN SCORING CRITERIA**

Matrix Item	Rating ○	◔	◑	◕	●
Bicycle Environment					
Speed and Conditions of Vehicular Traffic	Low speeds, free flow	Moderate speeds, free flow	Moderate speeds, some constrained flow	Moderately high or low speeds, constrained flow	Low speeds, failing flow, or excessively high speeds
Pavement Condition	Excellent pavement conditions	Good pavement conditions	Average pavement conditions	Below average pavement conditions	Poor pavement conditions
"Door Zone" and Driveway Conflicts	No conflicts	Few conflicts	Some conflicts	Many conflicts	Dangerous amount of conflicts
Transit service and waiting environment within Corridor	Several bus routes, mostly enhanced or standard stop types	Several bus routes, mix of standard and sub-standard stop types	Some routes, mix of standard and sub-standard stop types	Few routes, mostly basic stop types	No routes, no stops
Amount of Key Attractions Served	Several key attractions	Some key attractions	Few key attractions	Very few key attractions	No key attractions
Amount of Bike Facility Striping or Signage	Ample signage and striping, good condition	Some signage and striping, good condition	Some signage and striping, fair condition	Little signage and striping, fair condition	No signage or striping
Pedestrian Environment					
Sidewalk/Parkway Width	> 12 ft	10 ft	8 to 10 ft	5 to 10 ft	0 to 4 ft
Sidewalk Width	> 6 ft	5 ft	4 to 5 ft	4 ft	0 to 3 ft
Sidewalk Condition	Excellent sidewalk conditions	Good sidewalk conditions	Average sidewalk conditions	Below average sidewalk conditions	Poor sidewalk conditions
Sidewalk and/or Parkway Location	Parkway planted with shade trees located next to the curb with sidewalk behind	Landscaped parkway planted with some trees located next to the curb with sidewalk behind	Landscaped parkway planted with no trees located next to the curb with sidewalk behind	Sidewalk next to the curb	No sidewalks
Crosswalks	Continental markings /Decorative/Colored Concrete/Stamped crosswalks and curb extensions	Continental markings crosswalks	Crosswalks with parallel markings	Crosswalks with parallel markings in fair condition	No crosswalks
Curb Ramp	ADA complaint with truncated dome; good condition	Curb ramp without truncated dome; good condition	ADA complaint without truncated dome; fair condition	ADA non-compliance	No curb ramp
Street Trees Location	Double row of trees spaced 30 to 35 ft apart	Single row of trees spaced 30 to 35ft apart in parkway/tree wells located next to the curb	Shade trees spaced more than 40ft apart in parkway/tree wells located next to the curb	No trees in public right-of-way; adjoining trees on private property shading sidewalks	No trees
Raised Median	14 ft or greater median with landscaping and large mature trees	10 ft to14ft median with landscaping and large mature trees	10 to 14ft landscaped median with a few trees	Concrete median with no trees and/or landscaping	No raised median
Utility Poles and wires	Underground	Located within Parkway allowing for street trees	Located within sidewalk with enough room for pedestrians and trees in parkway	Located within parkway with no room for trees	Located within sidewalk restricting pedestrian mobility
Lighting	Street lights and pedestrian-scaled lights	Street lights and/or pedestrian-scaled lights	Street lights with double arms	Street lights with single arm	No lights
Street Furniture	Benches/Bicycle Racks/Trash Receptacle/Public Art	Benches/Bicycle Racks/Trash Receptacle	Benches and Trash Receptacle	Benches or Trash Receptacle	None
Wayfinding Signage in public realm	Ample pedestrian-scaled wayfinding signage; good condition	Some pedestrian-scaled wayfinding signage; good condition	Some pedestrian-scaled wayfinding signage, fair condition	Little pedestrian-scaled wayfinding signage, fair condition	No wayfinding signage

San Bernardino County Non-Motorized Transportation Plan

March 2011

Revised November 16, 2013

Governments SANBAG Working Together

Prepared by San Bernardino Associated Governments ~
In collaboration with Local Jurisdictions in San Bernardino County

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Executive Summary

ES.1.0 Introduction

A safe, interconnected cycling and walking system can be a major asset to both individual communities and to an urban area, particularly one as well suited to these activities as San Bernardino County. The climate and topography are highly conducive for these and other outdoor pursuits. Both natural and man-made corridors provide ideal opportunities for development of a comprehensive system of cycling facilities, pathways, and trails. Even though San Bernardino County is known for its recreational opportunities, such a system is not well developed in many areas of the County.

However, progress is being made. In 2001, the combined total of centerline miles of bicycle infrastructure for all jurisdictions was 53 miles. As of 2011, the combined total of centerline miles of bicycle infrastructure for all jurisdictions is 468 miles. This represents an eight-fold growth in the County's bicycle infrastructure.

The challenge ahead involves developing a cohesive, integrated plan and identifying sources of funds to implement that plan. This is the goal of the San Bernardino County Non-Motorized Transportation Plan (NMTP). The NMTP of 2001 and the 2006 update have taken us part way there. This 2011 Plan hopes to take the development of such systems to another level. It identifies a comprehensive network, with a focus on the bicycle system. It is also a response, in part, to the initiatives to reduce vehicle travel and greenhouse gas emissions embedded in California Senate Bill 375 (SB 375). The Plan satisfies the State of California requirements of a Bicycle Transportation Plan (BTP) for purposes of Caltrans Bicycle Transportation Account (BTA) funding.

Implementation of the Plan will be a win-win on multiple fronts, and a strong partnership among local governments, transportation agencies, and the citizens of San Bernardino County can make it happen. The 2011 San Bernardino County NMTP will serve as a vehicle for communicating the non-motorized vision for the County, which is represented by the collective visions of each jurisdiction. Although the jurisdictions will be responsible for implementation of the Plan, it is important to have a Plan that cuts across subareas and jurisdictions so that coordination can occur on a physical facility level as well as in scheduling and funding.

ES.1.1 Overview of NMTP Development Process

The development of the 2011 NMTP was a collaborative effort between SANBAG and local jurisdictions in San Bernardino County, with policy oversight by the SANBAG Board of Directors. The existing 2006 update of the NMTP and the associated local jurisdiction plans provided the starting point, but the 2011 Plan represents a wholesale upgrade of the entire document, focusing principally on the bicycle system, but on the walking environment as well.

SANBAG staff conducted an initial inventory of all existing Class I, II and III bicycle facilities in the County and rode most of the facilities personally. This was supplemented by local jurisdiction inventory data. Existing facilities were then mapped, and proposed facilities from the

prior plan were superimposed. This served as the starting point for network development, representing an interactive process between SANBAG and local jurisdiction staff.

Basic criteria were applied to gauge the need and feasibility for additional bicycle facilities, including:

- Connections to major destination points and trip generators
- Connectivity within and across jurisdictional boundaries
- Potential for usage of exclusive rights-of-way (i.e. for Class I facilities)
- Physical characteristics of roadways and suitability for accommodation of bicycle facilities (i.e. for Class II and III facilities)
- Closing gaps between existing facilities
- Constructability and cost issues

Accident data were tabulated from the Statewide Integrated Traffic Records System (SWITRS), both by jurisdiction and for the County as a whole. A comprehensive countywide map of existing and proposed facilities was then prepared, and a draft subarea map was prepared for each jurisdiction. Each map was accompanied by tables of existing and proposed facilities, and a narrative was prepared describing both existing conditions and the bikeway plan for each. Construction costs were estimated for each improvement type and segment based on current unit cost factors (in 2010 dollars). The relevant sections were provided to each jurisdiction for review.

Typically two to three review cycles were undertaken before the city-level maps, tables, and text were finalized. These represented the “core” of the bicycle portion of the plan and were incorporated into Chapter 4. The Transportation Technical Advisory Committee (TTAC) served as a focal point for discussion of technical issues related to the NMTP. Periodic reviews of NMTP status were provided to the TTAC beginning in 2009.

The body of the report was completed and provided for local jurisdiction review in mid-February 2011. The report was reviewed by the TTAC and by individual jurisdictions, and comments were reflected in the text, as appropriate.

The SANBAG Plans and Programs Committee served as the committee with policy oversight throughout the process. The committee approved the proposed NMTP policies in October 2009 and received reports on the Plan in February and March, 2011. Following approval of the NMTP by the Committee on March 16 (action yet to come), the SANBAG Board approved the Plan on April 6 (action yet to come). Individual jurisdictions were responsible for approval of the Plan with their own city councils and the Board of Supervisors.

Public involvement opportunities have been available through the open meetings of the Plans and Programs Committee. Agendas have been posted and are available to all through the SANBAG website. However, direct outreach to the public and advocacy groups was limited during the course of the development of this Plan, due to the compressed timeline in which the Plan had to be prepared once the dates were set by the State for local jurisdiction applications for Bicycle Transportation Account funds. Nevertheless, one of the implementation actions listed in Chapter 7 is to take this significantly upgraded NMTP to both bicycle and pedestrian advocates and the general public. Comments and suggestions from these groups will be incorporated into the Plan, with another update of the NMTP anticipated by the end of 2012.

ES.1.2 NMTP Structure

The Non-motorized Transportation Plan is organized into the following chapters:

Executive Summary

1. Introduction
2. Regional System Overview and Goals, Objectives, and Policies
3. Bicycle Planning
4. Pedestrian Planning
5. Local Jurisdiction Bicycle Plans
6. Design Guidelines
7. Plan Implementation

Chapter 5 is the key chapter showing the NMTP for bikeways at the jurisdiction level. It includes an inventory of existing and proposed facilities, mileage statistics, accident data, and a narrative that ties each plan together. SANBAG acknowledges several Non-Motorized Transportation Plans prepared for other California jurisdictions from which information, graphics, and examples were drawn for inclusion in the San Bernardino County NMTP, specifically, bicycle plans for Stanislaus County, San Francisco Bay Area, and City of Portland. Additional information was extracted from the *Caltrans Design Manual, Chapter 1000 – Bikeway Planning and Design*, American Association of State Highway and Transportation Officials (AASHTO) *Guidelines for the Development of Bicycle Facilities*, and the Federal Highway Administration's *Manual on Uniform Traffic Control Devices* (MUTCD).

ES.2.0 Local Jurisdiction Plans

For purposes of the Non-Motorized Transportation Plan, the study uses the following study areas:

- East Valley
- West Valley
- Victor Valley
- Mountains
- Barstow Area
- Morongo Basin
- Needles Area

The subareas are generally consistent with the San Bernardino County Measure I subareas, with the exception of the San Bernardino Valley. The Valley Measure I Subarea was further disaggregated into the East Valley and West Valley to provide additional granularity when mapping the NMTP facilities. Each of these subareas has unique aspects and demographics relevant to establishing an effective NMTP. Chapter 2 further identifies and comments on the unique geographic and demographic elements for each subarea.

ES.2.1 Goals

The infrastructure improvements and programs recommended in San Bernardino County for the NMTP will be shaped by the Plan's goals and policies. Goals provide the context for the specific policies discussed in the NMTP. The goals provide the long-term vision and serve as the foundation of the Plan. Goals are broad statements of purpose, while policies identify specific initiatives and provide implementation direction on elements of the Plan.

The following represent the goals of the NMTP:

1. Increased bicycle and pedestrian access - Expand bicycle and pedestrian facilities and access within and between neighborhoods, to employment centers, shopping areas, schools, and recreational sites.

2. Increased travel by cycling and walking - Make the bicycle and walking an integral part of daily life in San Bernardino County, particularly (for bicycle) for trips of less than five miles, by implementing and maintaining a bikeway network, providing end-of-trip facilities, improving bicycle/transit integration, encouraging bicycle use, and making bicycling safer and more convenient.

3. Routine accommodation in transportation and land use planning - Routinely consider bicyclists and pedestrians in the planning and design of land development, roadway, transit, and other transportation facilities, as appropriate to the context of each facility and its surroundings.

4. Improved bicycle and pedestrian safety - Encourage local and statewide policies and practices that improve bicycle and pedestrian safety.

ES.2.2 Policies

A set of policy recommendations was approved the SANBAG Plans and Programs Committee in October 2009 and reconfirmed in February 2011. The policies are as follows:

1. Local jurisdictions are the agencies responsible for the identification of non-motorized transportation projects within their jurisdiction for inclusion into the Plan. SANBAG shall only serve in an advisory capacity with respect to the identification of projects on the regional network. SANBAG shall provide advice on the inclusion of projects that may serve to better establish connectivity between jurisdictions, intermodal facilities and regional activity centers. However, local jurisdictions have sole authority over all projects included in the Plan

2. Local jurisdictions are also responsible for implementation of the projects included in the NMTP. SANBAG may provide advisory support to jurisdictions in the project development process on request. Should SANBAG be requested to provide assistance delivering a project in the Plan, such instances should be limited to development of regional non-motorized transportation facilities that provide connectivity to more than one jurisdiction or complete gaps within the regional non-motorized transportation network or serve to provide better access to transit facilities.

3. SANBAG shall, when feasible, support local education and safety efforts currently being implemented through local law enforcement, highway patrol, Caltrans and schools to better educate children and adults on the safe use of bicycles and to promote the non-motorized transportation system.

4. SANBAG shall prepare and update the comprehensive map identifying the County's non-motorized transportation system using its in-house GIS capabilities. Maintenance of the maps is also an important element of SANBAG's proposed 511 Traveler Information System.

5. SANBAG shall work with its member agencies to develop a regional way-finding system to assist travelers to identify the non-motorized transportation system. Any such system developed shall be developed in collaboration with local jurisdictions, will afford an opportunity for member agency customization, and promote connectivity to transit facilities, park and ride lots, and other regional activity centers.

6. SANBAG shall work with and encourage member agencies to incorporate non-motorized transportation facilities into general and specific plans as well as provide assistance in identifying design standards that provide for pedestrian- and bicycle-friendly access to transit facilities.

7. SANBAG shall use the NMTP as one component of the overall strategy to reduce greenhouse gas emissions pursuant to SB 375.

8. SANBAG shall work with and encourage transit operators to provide end-of-trip pedestrian and bicycle-serving facilities, such as bike lockers, racks, and capacity on transit vehicles to carry bicycles and better facilitate the integration and use of non-motorized transportation within the regional transportation system.

9. SANBAG shall use this plan as the basis to allocate state, federal, and local funds for delivery of non-motorized transportation improvements. Fund types may include, but are not limited to, federal Transportation Enhancement (TE), Congestion Mitigation and Air Quality (CMAQ), state Bicycle Transportation Account (BTA), and Transportation Development Act (TDA) Article 3 funds.

10. SANBAG shall work with member agencies to coordinate delivery of the NMTP and projects contained in the Nexus Study.

11. SANBAG shall work with member agencies to identify state/federal bicycle and pedestrian infrastructure or planning grant opportunities. When funding opportunities arise, SANBAG shall work to support local jurisdiction grant applications or collaborate with local jurisdictions to directly submit grant applications for projects in the Plan.

12. SANBAG and member agencies shall conduct regular bicycle and pedestrian counts to monitor the effects of implementation of the NMTP. SANBAG shall work to identify funding for the monitoring of Class I, separated shared-use facilities, so that no financial impact is borne by the local jurisdictions for collection of count information. Counts conducted on Class II and Class III, on-street bicycle facilities, shall correspond with counting for intersections that are both on the non-motorized network and require CMP Monitoring as outlined in the Congestion Management Program. When counts for non-

CMP intersections are desired, SANBAG shall be responsible for identifying funding for such counts.

These policies constitute a modest expansion of SANBAG's role in implementing the NMTP. Most of the policy recommendations are incorporated into SANBAG's current activities, although they may not be explicitly stated. All of the proposed policies are consistent with the agency's role as a County Transportation Commission and a Council of Governments. Moreover, SANBAG programs significant state, federal and local funding sources to implement the components of the NMTP, and needs to play an active role in providing for regional non-motorized transportation from that perspective as well.

ES.3.0 Bicycle Planning

Chapter 3 provides an overview of bicycle planning as it relates to the San Bernardino County Non-Motorized Transportation Plan. The chapter begins by outlining the classes of bicycle facilities. For the purposes of the NMTP, there are three classes of bicycle facilities and are as follows:

- Class I (Share Use or Bike Path): A bikeway physically separated from any street or highway. Shared Use Paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users.
- Class II (Bike Lane): A portion of roadway that has been designated by striping, signaling, and pavement markings for the preferential or exclusive use of bicyclists.
- Class III (Bike Route): A generic term for any road, street, path, or way that in some manner is specifically designated for bicycle travel regardless of whether such facilities are designated for the exclusive use of bicycles, or are to be shared with other transportation modes.

ES.3.1 Types of Riders

Despite the advances various cities have made in facilitating bicycling, many individuals still have concerns about the safety of bicycle transportation. Other bikeway plans have used a typology to categorize riders based on their approach to bicycling. A more thorough description of the four classes of bike riders identified by Alta Planning in collaboration with the City of Portland include:

- Strong and Fearless
- Enthused and Confident
- Interested but Concerned
- Not Interested

Of course there are limitations to any model that categorizes individuals; however, there is still some utility to considering these four generalizations, namely that it forces SANBAG to better think about who the plan is intended to serve. A major premise of this plan is that the residents who are described as 'interested but concerned' will not be attracted to bicycle for transportation by the provision of more bike lanes, but may be more willing to ride if a network of low-stress bikeways is provided.

ES.3.2 Existing Bicycle Network

ES.3.2.1 Overview

San Bernardino County has some excellent non-motorized facilities already in place for both recreation and commuting. The following describes these assets in detail and their relationship to the NMTP.

The growth of the non-motorized system has been substantial during the past decade. In 2001, the combined total of centerline miles of bicycle infrastructure for all jurisdictions was 53 miles. As of 2011, the combined total of centerline miles of bicycle infrastructure for all jurisdictions is 468 miles. This represents an increase of 415 centerline miles and a 780% growth in the County's bicycle infrastructure.

Subarea maps of existing and proposed bicycle facilities are provided in Figures ES.1 through ES.7. The full set of maps may be referenced at the end of the Executive Summary. Additional information and tabular summaries of existing and proposed route mileage are provided for each individual jurisdiction in Chapter 5.

ES.3.2.2 Existing Regional Non-Motorized Assets

San Bernardino County has some excellent non-motorized facilities already in place for both recreation and commuting. Chapter 3 more thoroughly describes the assets, but the NMTP recognizes the following as assets within the context of the Plan.

- Pacific Electric Trail
- Santa Ana River Trail
- Flood Control Channels
- Power Line Corridors
- Cajon Pass Connector – Route 66 Heritage Trail
- Orange Blossom Trail

ES.3.3 Future Bicycle Network

In addition to the above-mentioned existing regional assets that span across cities, many jurisdictions have developed their own Class I, Class II, and/or Class III bikeways. Collectively, these represent the bikeways portion of the NMTP. Figures ES.1 through ES.7 showcase these future facilities at the subarea level. Table ES.1 summarizes the total centerline mileage of existing and planned bicycle network by class. These mileage totals represent a summation of those in the individual jurisdiction plans. Because some of the planned facilities represent conversions from one class to another, the total existing plus planned is a slight over-counting of the actual mileage expected when the plan is complete.

Table ES.1. Summary of Existing and Planned Bicycle Network Centerline Mileage
(Note: Total existing plus planned represents a slight over-representation of the future network totals – see text.)

	Class I	Class II	Class III	Total
Existing	78.1	270.1	116.3	464.5
Planned	277.9	756.6	247.6	1282.1
Total	356.0	1026.7	363.9	1746.6

The local jurisdiction plans in Chapter 5 are drawn from the subarea maps and provide a more detailed discussion on specific bikeway facilities, end-of-trip facilities, and project priorities, where appropriate. Chapter 6 addresses design considerations when implementing bicycle facilities. Chapter 7 presents an overall implementation strategy and priorities.

ES.3.4 Recommendations for the Regional Bikeway System

Specific project lists, recommendations, and priorities are contained in the individual jurisdiction bicycle plans in Chapter 5. This section provides recommendations that are regional in nature, with emphasis on the physical infrastructure in San Bernardino County. Chapter 7 presents an implementation strategy that takes these a step further, and provides regional priorities.

1. Deliver the Class I, II and III identified in the subarea maps referenced in Chapter 3. Although the Class I facilities can be considered a backbone bicycle system, there is much more to the network than just Class I facilities. Other types of facilities can also be delivered more quickly and less expensively, improving regional connectivity.
2. Develop better bicycle connectivity between cities and subareas of the County by coordinating the location and staging of network improvements. This must include improved collaboration with Caltrans, given the number of State highways connecting the subareas. Connectivity on Class II and Class III bicycle facilities can be increased by prioritizing the “low-hanging fruit” – parts of the regional system that are low-cost, close gaps in the system, and provide connections to key destinations.
3. Develop a better “sense of a system” through improved signage, markings, and way-finding for both cyclists and pedestrians.
4. Develop an improved inventory of end-of-trip facilities, particularly at transit stations, schools, other public buildings, and major employment centers.
5. Proactively coordinate integration of cycling and walking accommodations with the State’s Complete Streets requirements, once guidelines are finalized by the State.
6. Proactively coordinate integration of cycling and walking access accommodations to and from transit stations.
7. Continue safety education and promotion of cycling through schools, newsletters, and public websites.

ES.4.0 Pedestrian Planning

It is often perceived that pedestrian transportation is essentially a local concern, given the length of most pedestrian trips and the manner in which these trips are usually contained within a given area, whether that area is a schoolyard, a shopping center, a college campus or a downtown business district. At the same time, federal legislation and funding programs remind us that regional, state and federal levels of government all have a stake in designing the multi-modal transportation system to serve the needs of all travelers. It is often said that pedestrian planning is a part of "alternative transportation planning," yet there is no more basic mode of transportation than getting around on foot. Indeed, no trip involving a car, bus, train, airplane or other mode can even begin without a pedestrian journey taking place. Regional transportation facilities such as airports and transit stations must be designed around the needs of the pedestrian if they are to fulfill their mission.

For purposes of this plan, the following activities are considered regional priorities for pedestrian planning and project development:

1. Improving pedestrian access to transit;

2. Removing existing barriers to pedestrian travel;

3. Development of regional trails and pathways which provide improved pedestrian access to destinations;

4. Improvement of the pedestrian environment on major regional arterials and at regional activity centers.

Chapter 4 describes potential elements of a regionally based pedestrian transportation effort. The core focus of pedestrian planning, as it relate to this plan, include the following:

- Improving transit access
- Preventing and eliminating barriers to pedestrian travel
- Developing regional trails and pathways
- Better providing for pedestrian travel on major regional arterials and at activity centers

ES.5.0 Overview of Local Jurisdiction Plans

Chapter 5 represents the heart of the Non-Motorized Plan for bicycle facilities. The chapter contains individualized plans for each of the 25 jurisdictions in San Bernardino County, with emphasis on the bicycle system. The plans all contain the same structure, including the following elements:

- The population of the jurisdiction
- An overview of the jurisdiction, including uniquely tailored commentary about its geography or historical elements.
- A summary of the jurisdiction's existing and proposed land use.
- A map of the jurisdiction's General Plan land use coverage, including information on schools, parks, residential, commercial and industrial land uses.

- A map of the jurisdiction's existing and proposed bicycle facility networks.
- A textual description of the existing non-motorized condition.
- A textual description of the jurisdiction's past investment in non-motorized infrastructure
- A textual description of the jurisdiction's non-motorized priorities, if any.
- Tables that document existing, future and priority bicycle facility projects with class, mileage, and estimated costs.
- A summary table of multi-modal connections.
- Documentation of municipal code pertaining to the provision of non-motorized serving infrastructure, if available.
- A summary of non-motorized serving infrastructure, including bike racks, bike lockers and shower facilities where identified.
- A table with collision information and an analysis as to how the number of collisions relates to the state average.
- Information on jurisdiction safety and education programs related to non-motorized transportation.

ES.6.0 Design Guidelines

Chapter 6 provides details on the recommended design and operating standards for the San Bernardino County Bikeway System.

The Caltrans Design Manual, Chapter 1000 – Bikeway Planning and Design establishes the standards for bicycle facility design within the state of California. These standards are, for the most part, consistent with the American Association of State Highway and Transportation Officials (AASHTO) Guidelines for the Development of Bicycle Facilities. The Caltrans standards provide the primary basis for the design recommendations that follow.

ES.7.0 Implementation

Chapter 7 provides an implementation strategy for the NMTP and a description of funding opportunities for the proposed bicycle and pedestrian improvements. The implementation strategy consists of the following elements:

- Identification of implementation priorities (both infrastructure and institutional)
- Coordination of responsibilities for project delivery
- Identification and pursuit of funding opportunities

Each of these elements is described below.

ES.7.1 Implementation Priorities

The setting of priorities for the NMTP involves more than just the identification of priority projects, although it does include that. Priorities must also consider institutional initiatives that pave the way for the delivery of priority projects. Thus, the priorities for the NMTP include a

restatement of some of the recommendations for system improvement identified in Chapter 3, plus several institutional initiatives to foster program and project delivery. The following represent NMTP priorities (not in order of importance):

1. Deliver the Class I backbone bicycle system. Although the Class I facilities can be considered a backbone bicycle system, there is much more to the network than just Class I facilities. Other types of facilities can also be delivered more quickly and less expensively, improving regional connectivity.
2. Develop better bicycle connectivity between cities and subareas of the County. This must include improved collaboration with Caltrans, given the number of State highways connecting the subareas.
3. Increase connectivity on Class II and Class III bicycle facilities by prioritizing the "low-hanging fruit" – parts of the regional system that are low-cost, close gaps in the system, and provide connections to key destinations.
4. Develop a better "sense of a system" through improved signage, markings, and way-finding for both cyclists and pedestrians
5. Proactively coordinate integration of cycling and walking accommodations with the State's Complete Streets requirements
6. Proactively coordinate integration of cycling and walking access accommodations to and from transit stations
7. Aggressively pursue grant funding and devote additional programmatic funding to non-motorized facilities
8. Identify individuals within SANBAG, local jurisdictions, Caltrans, and transit agencies to be points of contact on non-motorized facility implementation and ensure communication on non-motorized topics among the agencies.

The full identification of Class I bicycle facilities is contained in the subarea maps in Chapter 3 and in the individual jurisdiction plans in Chapter 5. Several key Class I projects listed in the 2001 NMTP and the 2006 update that would be considered as part of the Class I backbone system include:

- Santa Ana River Trail
- Pacific Electric Trail
- Orange Blossom Trail
- San Timoteo Canyon Trail
- Riverwalk Trail
- Cajon Pass Connector – Route 66 Heritage Trail

ES.7.2 Coordination of Responsibilities for Project Delivery

The policies listed in Chapter 2 provide guidance as to how implementation is to occur. Local jurisdictions are responsible for the identification, prioritization, and implementation of non-motorized transportation projects within their jurisdiction, with SANBAG serving in an advisory capacity and coordinating activity where necessary. SANBAG is also to work with local jurisdictions to develop a regional way-finding system.

The policies also identify a role for SANBAG to pursue grant opportunities for State/federal bicycle and pedestrian infrastructure or planning. SANBAG will support local jurisdiction grant applications or collaborate with local jurisdictions to directly submit grant applications for

projects in the Plan. The pursuit of grant application opportunities is one of the areas identified in the Plan where substantial improvement is possible, as San Bernardino County has been under-represented in the share of non-motorized grant funds that have been awarded in the past.

This Plan recognizes that regional cooperation among local agencies is critical in the selection and promotion of priority projects and the allocation of local funding to ensure an orderly implementation of an effective bicycle system.

The schedule for implementation on a year-to-year basis can be better coordinated and should be determined by:

- Relationship to the regional system
- Readiness of each project in terms of local support;
- CEQA approvals;
- Right-of-way requirements;
- Timing with other related improvements; and/or
- Success in obtaining competitive funding.

SANBAG staff should monitor the short- and mid-term projects identified in this Plan and subsequent updates, and maintain a comprehensive list of projects and funding allocations. A rolling five-year schedule of short-term projects should be identified so that resources can be focused and coordinated to ensure attention to priority projects over time. This is not to the exclusion of other local projects, but regional connectivity to support commuting and other longer-distance trips is an emphasis of this Plan. Each year the TTAC and SANBAG staff will review the list of projects slated for priority that year, review the readiness of each project to be proposed for funding, and consider the sequencing of the projects. This process does not preclude cities and local agencies from continuing to submit other local projects for funding consideration.

ES.7.3 Funding Opportunities

There are a variety of potential funding sources - including local, state, regional, and federal programs - that can be used to construct the proposed bicycle and pedestrian improvements. Most of the federal, state, and regional programs are competitive, and involve the completion of extensive applications with clear documentation of the project need, costs, and benefits. In addition, the majority of the programs require a local match, usually 10-15% of the total project cost.

The recipients of grant funds for many of these programs are then required to monitor the projects for compliance with the program guidelines. Although the pursuit and administration of grant moneys can require a significant amount of staff time, grant funding allows for the construction of more miles of facilities.

The key to receiving funds will be to tailor grant requests to meet specific requirements and criteria, leverage grants with matching funds, and demonstrate a commitment by the jurisdiction to implement and maintain the system. Serious intent would include adoption of the NMTP, development of an additional local plan, inclusion of bikeway improvements into the Capital

Improvements Plan, adoption of recognized design and operating standards, and public/political support.

A detailed breakdown of available funding programs is provided in Chapter 7. Tracking program specifics can be difficult as program guidelines are modified regularly. Thus it is important to verify program dates and deadlines with the program administrator since specific amounts and deadlines can change from year to year. In general, however, the known broad groups of funding sources are broken into three broad categories—federal, state and local—with further documentation of the know fund sources pertinent to each of the broad groups called out as bullet points. For more detailed information on any of the funding sources, see the more detailed discussion in Chapter 7.

SAN BERNARDINO COUNTY:

Our Community Vital Signs

2013 final report

SAN BERNARDINO COUNTYWIDE VISION IT'S UP TO US!

COMMUNITY VITAL SIGNS INITIATIVE
County of San Bernardino

ASR

SAN BERNARDINO COUNTYWIDE VISION

IT'S UP TO US!

WE ENVISION a *complete county* that capitalizes on the diversity of its people, its geography, and its economy to *create a board range of choices* for its residents in how they live, work, and play.

WE ENVISION a vibrant economy with a skilled workforce that attracts employers who seize the opportunities presented by the county's *unique advantages* and provide the *jobs that create countywide prosperity*.

WE ENVISION a *sustainable system* of high-quality education, community health, public safety, housing, retail, recreation, arts and culture, and infrastructure, in which development complements our natural resources and environment.

WE ENVISION a *model community* which is governed in an open and ethical manner, where *great ideas are replicated and brought to scale*, and *all sectors work collaboratively* to reach standard goals.

From our valleys, across our mountains, and into our deserts, we envision a county that is a destination for visitors and a home for anyone seeking a sense of community and the best life has to offer.

Adopted by San Bernardino County Board of Supervisors and San Bernardino Assoicated Governments Board of Directors

June 30, 2011

GREGORY C. DEVEREAUX
Chief Executive Officer

COUNTY OF
SAN BERNARDINO

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Dear Community Partner:

Wellness is a key element of the Countywide Vision because it directly links to the quality of life, productivity and prosperity of our communities. Students do better in school when they enter the classroom healthy and ready learn, and healthy employees are more productive and miss fewer workdays.

But the Countywide Vision's wellness goals cannot be achieved alone. We need to work together to create environments in our neighborhoods, schools, and workplaces that promote and support the health and well-being of our residents.

This summer as part of the Community Vital Signs Initiative more than 1,000 stakeholders, including business professionals, healthcare workers, educators, public safety officers, nonprofit leaders, and others, came together to analyze county health trends and to establish priorities we must take on to achieve our shared wellness goals.

The following report expounds on those wellness priorities and serves as a call to action for businesses, local governments, community organizations, faith-based groups and others who care about the future of our great county.

My colleagues and I on the San Bernardino County Board of Supervisors extend our sincere appreciation to everyone participating in this effort, and we look forward to continuing our partnership with you as we strive to create a healthy and prosperous county.

Sincerely,

Janice Rutherford

JANICE RUTHERFORD
Board of Supervisors Chair
Second District Supervisor
County of San Bernardino

The mission of the government of the County of San Bernardino is to satisfy its customers by providing service that promotes the health, safety, well being, and quality of life of its residents according to the County Charter, general laws, and the will of the people it serves.

OUR COMMUNITY VITAL SIGNS REPORT

Our Community Vital Signs 2013 Final Report is intended to drive discussion at the community level, and future alignment of strategies and resources in order to achieve Wellness in our County.

The information contained in this report is intended for use by residents, all sectors, networks, and partnerships committed to taking action to address the priority health-related issues together. We understand that every aspect of the health and well-being of our communities is a part of an interrelated system.

Our Community Vital Signs 2013 Final Report and executive summary are available online at: www.communityvitalsigns.org.

For further information please contact Community Vital Signs at: CommunityVitalSigns.SanBernardinoCounty@dph.sbcounty.gov

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A very special thank you to all of those who contributed and helped locate secondary data for this report. Agencies and organizations are cited as sources, but the assistance of individuals has been critical.

ABOUT THE RESEARCHER

Applied Survey Research (ASR) is a nonprofit, social research firm dedicated to helping people build better communities by collecting meaningful data, facilitating information-based planning, and developing custom strategies. The firm was founded on the principle that community improvement, initiative sustainability, and program success are closely tied to assessment of needs, evaluation of community goals, and development of appropriate responses.

The Community Assessment Project is a prime example of a comprehensive evaluation of the needs of the community. Its goal is to stimulate dialogue about trends and to encourage informed strategies for shaping future policies and effective actions.

Applied Survey Research

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COMMUNITY VITAL SIGNS INITIATIVE

The Community Vital Signs Initiative is a community-driven effort in partnership with San Bernardino County to establish a health improvement framework by using data to help set goals and priorities for action to improve the quality of life in the county. This report provides a snapshot in a wide range of areas including education, employment, the environment, public safety, and a strong focus on health. Data are provided for the county with city and state comparisons, as well as the desired goals for population health as outlined by Healthy People 2020. The data presented in this report is valid for five years.

History

This project was started by the San Bernardino County Departments of Public and Behavioral Health as well as Arrowhead Regional Medical Center, and has become transformed into a community-wide initiative. The first community workshop was held in September 2011 with more than 80 community stakeholders representing local nonprofit hospitals, universities, government agencies, businesses, faith, and community-based organizations. These groups gathered to discuss the purpose of the Community Vital Signs Initiative and to develop a shared vision. A working group of ten participants was selected by this larger body to create the purpose, value, and vision statements of the Community Vital Signs Initiative, which were then discussed and adopted by a cross sector of community members at a summit meeting in March 2012. They include:

Purpose

Community Vital Signs is a community health improvement framework jointly developed by San Bernardino County residents, organizations, and government. It builds upon the Countywide Vision by setting evidence-based goals and priorities for action that encompass policy, education, environment, and systems change in addition to quality, affordable and accessible health care and prevention services. It provides the basis for aligning and leveraging resources and efforts by diverse agencies, organizations, and institutions to empower the community to make healthy choices.

Vision

We envision a county where a commitment to optimizing health and wellness is embedded in all decisions by residents, organizations, and government.

Values

Community Vital Signs is guided by the following values:

- **Community-driven:** Shared leadership by and for residents, engaging, and empowering all voices
- **Cultural competency:** Respecting and valuing diverse communities and perspectives
- **Inclusion:** Actively reaching out, engaging, and sharing power with diverse constituencies
- **Equity:** Access to participation, resources and service, addressing historical inequities and disparities
- **Integrity and Accountability:** Transparent and cost-effective use of resources
- **Collaboration:** Shared ownership and responsibility
- **Systemic change:** Transform structures, processes, and paradigms to promote sustained individual and community health and well-being.

COLLECTIVE IMPACT

The Community Vital Signs Initiative has adopted Collective Impact, a systemic approach to social impact for needle-moving change by aligning organizations and resources through the following five conditions:[1]

1. **Common Agenda:** All participants have a shared vision for change including a common understanding of the problem and a joint approach to solving it through agreed upon actions
2. **Shared Measurement:** Collecting data and measuring results consistently across all participants ensures efforts remain aligned and participants hold each other accountable
3. **Mutually Reinforcing Activities:** Participant activities must be differentiated while still being coordinated through a mutually reinforcing plan of action
4. **Continuous Communication:** Consistent and open communication is needed across the many players to build trust, assure mutual objectives, and appreciate common motivation
5. **Backbone Organization:** Creating and managing collective impact requires a separate organization(s) with staff and a specific set of skills to serve as the backbone for the entire initiative and coordinate participating organizations and agencies[2]

Collective Impact initiatives are currently being employed around the world to address a wide variety of issues including education, healthcare, homelessness, the environment, and community development. Many of these other initiatives are already showing concrete results, reinforcing the promise of Collective Impact in solving complex social problems.[3]

San Bernardino County Healthy Communities – An Example of Collective Impact in Action

Recognizing that improving health requires engaging diverse partners, San Bernardino County organized and funded the Healthy Communities initiative as a cross-sectorial partnership in 2006. The charge of the initiative is to create healthy environments and promote healthful lifestyle choices through policy, environment, and systems change. The San Bernardino County Healthy Communities Program serves as the infrastructure to support partners in their efforts to improve health by educating and facilitating, providing health statistics and technical assistance, and sustaining and connecting the vast partner network. Partners include municipalities, healthcare providers, hospitals, universities, school districts, businesses, and community based organizations.

Baseline data compiled by San Bernardino County Department of Public Health (SBC DPH) helped partners make the case for the need for health improvement among their stakeholders and constituents, and helped to identify and prioritize specific health issues and solutions. San Bernardino County's ranking as having the third worst heart disease mortality in California drove the selection of heart disease as an obvious high priority health issue. In December 2012, San Bernardino County non-profit hospitals' Community Benefits Collaborative adopted the goal: "Displace heart disease as the

[1] Kania, J. & Kramer, M. (2011). Collective impact. Stanford Social Innovation Review, Winter 2011, pp. 35-41. Stanford, CA.

[2] Foundation Strategy Group, Inc. (2013). What is collective impact? San Francisco, CA.

[3] Ibid.

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leading cause of death in San Bernardino County." In January 2013, Healthy Communities partners also agreed to adopt this common goal and to work with the hospitals collaborative towards achieving it.

As a first step towards defining common actions, data was collected from Healthy Communities partners regarding existing activities that contribute towards achieving the heart disease goal. Data collection was structured around the Mayo Clinic's five strategies to help prevent heart disease.[4] Facilitated and recorded by SBC DPH staff, Healthy Communities partners described projects and activities already in place in their agencies that align with the five prevention strategies. The information that was collected is summarized in the following table and included in full in Appendix 4. This information will inform selection of countywide approaches and implementation of heart disease prevention actions. The Community Vital Signs initiative will ensure that metrics for effectiveness of the collective actions and progress towards achieving the goal are tracked and reported.

[4] www.mayoclinic.com/health/heart-disease-prevention/WO00041

Inventory of Cities' Activities that Support Heart Disease Prevention Strategies

STRATEGIES *(from* **Mayo Clinic's "5 Medication-free strategies to help prevent heart disease"***)*			
Don't smoke or use tobacco	Get 30 minutes of physical activity on most days of the week	Eat a heart-healthy diet and Maintain a healthy weight	Get regular health screenings
SAN BERNARDINO COUNTY HEALTHY CITIES' ACTIVITIES			
» Smoke free campus » Community lecture program	Active Transportation » Integrate transportation modes » Multi-jurisdictional trails connections » Master plans » Walking and bicycling infrastructure » Livable communities » Safe Routes to School » Complete streets policies Parks » Safe and maintained parks » Joint use policies » Park, playground expansion » Activity parks (e.g. dog, BMX, fitness) Programming » Subsidies; incentives; free/low cost » Partnerships (e.g. youth sports, health care) » After school programs » Corporate fitness challenges » Mobile recreation	» Cal-Fresh utilization » Baby friendly hospitals » Breastfeeding workplace policy, support » Education programs » Healthy "dining out" » Healthy vending policies » Improve retail food environment index » Community supported agriculture; subsidies » Food Policy Council » Harvest of the Month » Rethink Your Drink » Gardens at summer camps, teen centers, preschools, etc.	» Collective outreach for Covered California » Screenings at work sites » Health career pipelines » Community education: "know your numbers"

Activities that Support Multiple Strategies

- Policy, advocacy, civic engagement
- Policy/Action Briefs
- Healthy City culture, branding
- Neighborhood “Health Hubs” throughout communities
- Events (e.g. fitness, fairs)
- College, high school internships
- Let’s Move! Cities; California HEAL Cities Campaign
- Healthy Cities network
- Worksite wellness programs

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Overall Snapshot

of SAN BERNARDINO COUNTY:

	HP 2020	CALIFORNIA	SAN BERNARDINO COUNTY	COUNTY TREND
Population Estimates • Total population	NA	NA	2,065,377	↑
Age Distribution • Percentage of population 60 years and older	NA	16.8%	13.7%	↑
High School Graduation Rate	82.4%	78.5%	77.1%	↑
Poverty • Percentage of individuals living in poverty	NA	16.6%	19.3%	↑
Unemployment Rate	NA	9.7%	10.8%	↓
Health Insurance Coverage • Percentage of residents with health insurance	100%	81.9%	79.2%	↔
Delays in Access to Health Care • Percentage of residents who delayed or did not get medical care in the past year	4.2%	12.5%	16.4%	↑
Cardiovascular Disease • Percentage of adults ever diagnosed with high blood pressure	NA	26.2%	26.1%	↑
Causes of Death • Death rate for all cancers per 100,000 population	160.6	156.4	170.0	↓
Physical Activity • Percentage of teens (12-17 years) who met CDC recommendation of 1 hour or more of daily physical activity	20.2%	15.2%	19.0%	NA
Preterm Births • Percentage of preterm births	11.4%	10.0%	11.2%	↔
Access to Healthy Foods • Retail Food Environment Index	NA	4.18	5.72	NA

↑ Increasing (Upward) trend; ↓ Declining (Downward) trend; ↔ Inconclusive; variable; no clear trend; NA Not applicable or data unavailable.

Note: Data presented in the table are the most recent data available.

A note on geography: Most data in this report is county level. For detailed city level data reports (available 8/19/2013), please visit the Community Vital Signs website, http://www.communityvitalsigns.org.

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Number of Deaths for Selected Causes of Death, 2009

City	Motor Vehicle Accidents	Pedal Cyclists and Pedestrian Accidents
Adelanto	8	1
Apple Valley	3	1
Barstow	3	2
Big Bear Valley	3	2
Chino	4	1
Chino Hills	3	1
Colton	6	1
Fontana	19	3
Grand Terrace	2	1
Hesperia	9	4
Highland	12	2
Loma Linda	0	0
Montclair	3	2
Needles	0	0
Ontario	11	4
Rancho Cucamonga	5	3
Redlands	7	1
Rialto	32	4
San Bernardino City	18	5
Twentynine Palms	8	3
Upland	7	0
Victorville	11	0
Yucaipa	6	0
Yucca Valley	2	2
San Bernardino County	**186**	**51**

Source: San Bernardino County Department of Public Health. (2013). Deaths and death rates for selected causes of death by race/ethnicity, Residents of San Bernardino County, Cities/towns/communities, and California, 2009.
Note: Number of cases are less than 20 and too small to calculate a rate, as small numbers are unstable and can be misinterpreted.
Note: Rates were calculated by the San Bernardino County Department of Public Health using 2010 U.S. Census population data.
Note: Data are most recent available.

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Health Behaviors Snapshot

of SAN BERNARDINO COUNTY:

	HP 2020	CALIFORNIA	SAN BERNARDINO COUNTY	COUNTY TREND
Physical Activity • Percentage of teens (12-17 years) who met CDC recommendation of 1 hour or more of daily physical activity	20.2%	15.2%	19.0%	NA
Nutrition • Percentage of 7th grade students who ate breakfast in the past day	NA	67%	62%	↑
Alcohol, Tobacco, and Other Drug Use • Percentage of 11th grade students who reported any alcohol or drug use in the past 30 days	NA	39%	42%	NA

↑ Increasing (Upward) trend; ↓ Declining (Downward) trend; ↔ Inconclusive; variable; no clear trend; NA Not applicable or data unavailable.

Note: Data presented in the table are the most recent data available.

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Physical Activity

According to the Centers for Disease Control and Prevention (CDC), regular physical activity largely reduces the risk of coronary heart disease - the nation's leading cause of death - and decreases the risk of stroke, colon cancer, diabetes, and high blood pressure.[40] It also helps control weight, improves bone health, strengthens muscles and joints, reduces falls among older adults, helps relieve the pain of arthritis, reduces symptoms of anxiety and depression, and is linked with fewer hospitalizations, physician visits, and prescribed medications. The CDC recommends 30 minutes of moderate-intensity physical activity five or more times a week for adults and 60 minutes or more each day for children.

***San Bernardino County students** and adults are exercising less than their peers in California.*

Data regarding physical activity among adults is limited and therefore adults who walked for transportation, fun, or exercise in the past seven days is used as a proxy measure. Fewer adults in San Bernardino County walked than in California as a whole. In San Bernardino County, African American adults had the highest percentages of those who walked (83%), followed by Latinos (75%) and Whites (74%) in 2009. Further, African Americans had the highest increase in walking, from 66% of adults in 2003 to 83% in 2009.

Less than 20% of teens (ages 12-17) in San Bernardino County met the CDC recommendation of 60 minutes of physical activity every day, greater than in California at 15% in 2009.

California students are assessed for whether they achieve six physical fitness standards in 5th, 7th and 9th grades. Students in San Bernardino County had slightly lower levels of achievement of at least five of the six- physical fitness standards as compared to students in California, in the school years 2010-11 and 2011-12. For example, 47% of county 5th graders achieved at least five of the six standards, as compared to 49% of California 5th graders in 2011/12.

There was a wide range of differences in student fitness achievement depending on the school district in the county. For example, the top three schools for 9th grade achievement of five of six fitness standards were Yucaipa-Calimesa Joint Unified (78%), Bear Valley Unified (72%), and Chino Valley Unified (69%), while the lowest three districts were San Bernardino County Office of Education (28%), Colton Joint Unified (39%), and San Bernardino City Unified (39%).

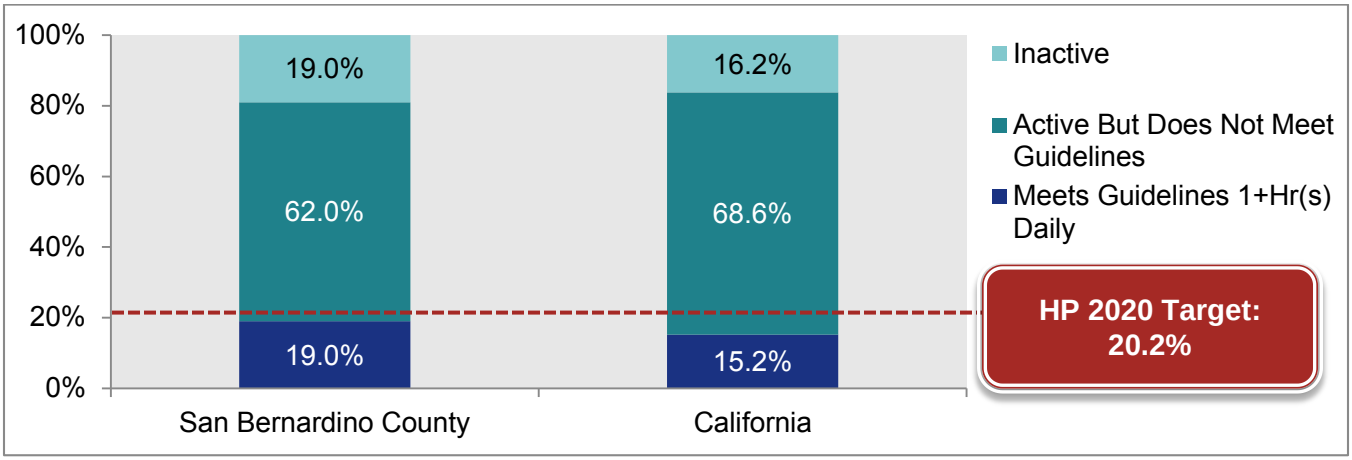
[40] Centers for Disease Control and Prevention. (2011). Physical activity and health: The benefits of physical activity. Atlanta, GA.

Percentage of Adults (18 Years and Older) Who Walked for Transportation, Fun, or Exercise in the Past Seven Days, by Ethnicity

Ethnicity/Region	2003	2005	2009	03-09[1] Net Change
African American				
San Bernardino County	**65.9%**	**67.0%**	**83.4%**	**17.5**
California	67.8%	74.9%	74.6%	6.8
Latino				
San Bernardino County	**65.2%**	**79.3%**	**74.5%**	**9.3**
California	74.5%	79.0%	79.1%	4.6
White				
San Bernardino County	**65.7%**	**70.2%**	**73.9%**	**8.2**
California	72.8%	76.8%	76.4%	3.6
All Ethnic Groups				
San Bernardino County	**65.7%**	**73.8%**	**74.7%**	**9.0**
California	73.0%	77.9%	77.2%	4.2

Source: California Health Interview Survey, UCLA Center for Health Policy Research. (2012). Walked for transportation, fun, or exercise, 2003-2009.
Note: Data for American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Asian, and Two or More Races were not presented because data were statistically unstable due to small number of respondents.
Note: Data presented are the most recent available.
[1] Question was not asked in 2007.

Percentage of Teens (12-17 Years) Who Were Physically Active in a Typical Week, 2009



Source: California Health Interview Survey, UCLA Center for Health Policy Research. (2012). Number of days physically active at least one hour in a typical week. 2003-2009.
Note: Data presented are the most recent available.

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Percentage of Students Achieving at Least 5 Out of 6 Physical Fitness Standards, by Grade

Grade	2010-11	2011-12
5th Grade		
San Bernardino County	**46.3%**	**46.6%**
California	48.4%	48.6%
7th Grade		
San Bernardino County	**52.1%**	**52.8%**
California	54.9%	55.0%
9th Grade		
San Bernardino County	**53.8%**	**53.5%**
California	59.4%	59.4%

Source: California Department of Education, Statewide Assessment Division. (2013). Physical fitness testing results, 2010–2012. .

Note: The Fitness Areas include Aerobic Capacity, Body Composition, Abdominal Strength, Trunk Extensor Strength, Upper Body Strength, and Flexibility.

Percentage of Students Achieving at Least 5 Out of 6 Physical Fitness Standards, 2011-12

School District[1]	5th Grade	7th Grade	9th Grade
Adelanto Elementary	40.7%	52.3%	NA
Alta Loma Elementary	61.8%	61.9%	NA
Apple Valley Unified	53.6%	48.6%	51.8%
Barstow Unified	39.2%	58.4%	67.4%
Bear Valley Unified	51.4%	56.0%	72.1%
Central Elementary	61.5%	73.5%	NA
Chaffey Joint Union High	NA	NA	61.1%
Chino Valley Unified	54.8%	63.9%	69.4%
Colton Joint Unified	35.6%	45.6%	38.6%
Cucamonga Elementary	55.9%	71.6%	NA
Etiwanda Elementary	61.9%	68.5%	NA
Fontana Unified	38.5%	44.5%	50.2%
Hesperia Unified	47.1%	56.6%	48.0%
Lucerne Valley Unified	33.8%	35.5%	43.2%
Morongo Unified	48.5%	50.6%	66.7%
Mountain View Elementary	63.6%	61.6%	NA
Ontario-Montclair Elementary	40.6%	42.9%	NA
Oro Grande Elementary	63.3%	55.0%	59.4%
Redlands Unified	49.3%	58.0%	56.6%
Rialto Unified	40.2%	45.5%	52.7%
Rim of the World Unified	65.6%	67.5%	56.9%
San Bernardino City Unified	40.9%	42.9%	39.0%
San Bernardino County Office of Education	9.1%	25.3%	27.7%
Silver Valley Unified	64.6%	59.7%	47.7%
Snowline Joint Unified	41.6%	61.6%	64.6%
Upland Unified	52.7%	67.5%	60.2%
Victor Elementary	42.8%	NA	NA
Victor Valley Union High	NA	45.3%	49.3%
Yucaipa-Calimesa Joint Unified	65.6%	64.4%	77.5%

Source: California Department of Education, Statewide Assessment Division. (2013). Physical fitness testing results, 2008-2010.

Note: The Fitness Areas include Aerobic Capacity, Body Composition, Abdominal Strength, Trunk Extensor Strength, Upper Body Strength, and Flexibility.

[1] Only school districts with more than 1,000 students are presented.

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Nutrition

Eating breakfast is important for weight control and to provide focus and energy for the day.[41] Children who eat breakfast are better able to pay attention, perform problem-solving tasks, have fewer school absences, and have better behavior in school.[42]

> ***ONLY ABOUT HALF OF** San Bernardino County students in 9th and 11th grades ate breakfast the day before the survey.*

Only slightly more than half of 9th and 11th graders (54%) in the county had eaten breakfast in the past day in 2009-2011. Further, a smaller percentage of San Bernardino County students in 7th, 9th, and 11th grades ate breakfast as compared to students in California overall between 2007 and 2011. For example, 62% of county 7th graders ate breakfast in the day prior to the survey, as compared to 67% of 7th graders overall in California in 2009-2011. However, there were slight increases (about 3 to 4 percentage points) in county students from 7th, 9th and 11th grades eating breakfast between 2007 and 2011.

There were large differences in the percentage of children eating breakfast based on their school district. For example, 62% of 11th graders ate breakfast the day prior to the survey in Redlands Unified School District compared to 45% in Barstow Unified School District in 2008-2010.

PERCENTAGE OF STUDENTS WHO ATE BREAKFAST IN THE PAST DAY

Grade	2007-2009	2008-2010	2009-2011	07-11 Net Change
7th Grade				
San Bernardino County	**59%**	**62%**	**62%**	**3.0**
California	65%	67%	67%	2.0
9th Grade				
San Bernardino County	**50%**	**54%**	**54%**	**4.0**
California	58%	60%	60%	2.0
11th Grade				
San Bernardino County	**50%**	**54%**	**54%**	**4.0**
California	57%	59%	59%	2.0

Source: California Department of Education, California Healthy Kids Survey (WestEd). (2013). Eating of breakfast, Table A7.1, 2007 – 2009, 2008 – 2010, and 2009 – 2011.
Note: Each three-year period represents two academic years. For example, the 2009 – 2011 data represent the 2009 – 2010 and 2010 – 2011 academic years.

[41] United States Department of Agriculture. (2010). *Start Smart. Eat Breakfast.* Retrieved from www.fns.usda.gov.

[42] USDA School Breakfast Toolkit (http://www.fns.usda.gov/cnd/breakfast/expansion/default.htm); Food Research and Action Center (http://frac.org/federal-foodnutrition-programs/school-breakfast-and-lunch/school-breakfast-program/); Nutrition Explorations (www.nutritionexplorations.org); 2010 Family Nutrition and Physical Activity Survey, Academy of Nutrition and Dietetics Foundation. Retrieved 2013 from http://www.eatright.org/search.aspx?search=children+and+breakfast&type=Site

Percentage of Students Who Ate Breakfast in the Past Day, 2008-2010

School District[1]	7th Grade	9th Grade	11th Grade
Adelanto Elementary	59%	NA	NA
Alta Loma Elementary	69%	NA	NA
Apple Valley Unified	54%	57%	55%
Barstow Unified	53%	47%	45%
Bear Valley Unified	61%	67%	58%
Central Elementary	65%	NA	NA
Chaffey Joint Union High	NA	55%	57%
Chino Valley Unified	65%	63%	60%
Colton Joint Unified	58%	55%	49%
Cucamonga Elementary	65%	NA	NA
Etiwanda Elementary	68%	NA	NA
Fontana Unified	56%	52%	52%
Hesperia Unified	64%	45%	46%
Morongo Unified	62%	50%	50%
Mountain View Elementary	64%	NA	NA
Ontario-Montclair Elementary	57%	NA	NA
Redlands Unified	74%	65%	62%
Rialto Unified	61%	54%	50%
San Bernardino City Unified	54%	45%	47%
Silver Valley Unified	60%	48%	57%
Snowline Joint Unified	69%	57%	61%
Upland Unified	72%	60%	58%
Victor Valley Union High	65%	54%	57%
Yucaipa-Calimesa Joint Unified	67%	60%	58%

Source: California Department of Education, California Healthy Kids Survey (WestEd). (2013). Eating of breakfast, Table A7.1, 2007 – 2009, 2008 – 2010, and 2009 – 2011.

Note: Each three-year period represents two academic years. For example, the 2009 – 2011 data represent the 2009 – 2010 and 2010 – 2011 academic years.

[1] Only school districts with more than 1,000 students are presented.

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Alcohol, Tobacco, and Other Drug Use

In the United States, binge drinking is usually defined as having five or more drinks on one occasion in about two hours. This behavior greatly increases the chances of getting hurt or hurting others due to car crashes, violence, and suicide. One-fourth of the alcohol consumed by adults in the United States is in the form of binge drinking. Binge drinking is commonly associated with college students, and the age group with the greatest number of binge drinkers is 18-34 years old. However, the age group that binge drinks most frequently is 65 years and over. Excessive alcohol consumption, including binge drinking, causes 80,000 deaths in the U.S. each year.[43]

Forty-two percent of San Bernardino County 11th graders reported using alcohol or any other drug in the past 30 days prior to a survey taken in 2009-2011. The rates were highest in Bear Valley Unified where about half (51%) of 11th graders reported using alcohol or another drug in 2009-2010. More than one third (36%) of county 11th graders reported drinking alcohol in the last month, according to the 2009-2011 survey. One in four 11th graders (24%) reported binge drinking in the last month in the county, similar to California at 22%.

> ***ONE IN FOUR 11TH GRADERS*** *reported binge drinking in the last month and more than one in four adults reported binging in the last year in San Bernardino County. Tobacco use is going down for adults in the county.*

More than one out of four county adults (31%) reported binge drinking in the past year, similar to California, according to 2009 data.

Lung cancer is the number one cause of cancer deaths in the United States. Smoking increases a person's risk of developing lung cancer and chronic lung diseases such as emphysema, heart disease, and stroke. People exposed to secondhand smoke or environmental smoke are also put at greater risk for developing these diseases. Additionally, children exposed to secondhand smoke are at greater risk for Sudden Infant Death Syndrome (SIDS), acute respiratory infections, ear problems, asthma, and have slower lung growth.[44]

Individuals who quit smoking lessen their risk for disease. Tobacco dependence is a chronic condition that often requires repeated interventions. Effective treatments and resources do exist and the CDC reports that there are now more ex-smokers than smokers.

Fourteen percent of county 11th graders reported smoking cigarettes in the last 30 days, similar to the state at 13%, according to 2009-2011 data. Fifteen percent of county adults reported being current tobacco smokers in 2009, down from 20% in 2001. White adults had the highest rates of current smoking at 18% in 2009, followed by African Americans at 15% and Latinos at 8%.

[43] Center for Disease Control and Prevention. (2012). Vital signs: Binge drinking. Retrieved from http://www.cdc.gov/alcohol/fact-sheets/binge-drinking.htm

[44] U.S. Department of Health & Human Services. (2007). The health consequences of involuntary exposure to tobacco smoke: A report of the Surgeon General, U.S. Department of Health & Human Services. Washington, DC.

Percentage of Students Who Reported Any Alcohol or Other Drug Use in the Past 30 Days, by School District and Grade, 2009-2010

School District[1]	7th Grade	9th Grade	11th Grade	Healthy People Objective 2020 Target
Apple Valley Unified	29%	32%	39%	16.6%
Barstow Unified	21%	38%	35%	
Bear Valley Unified	15%	36%	51%	
Chino Valley Unified	16%	29%	39%	
Colton Joint Unified	24%	41%	44%	
Fontana Unified	26%	38%	41%	
Hesperia Unified	21%	33%	44%	
Morongo Unified	21%	33%	39%	
Redlands Unified	9%	23%	38%	
Rialto Unified	20%	37%	36%	
San Bernardino City Unified	29%	37%	42%	
Silver Valley Unified	20%	36%	38%	
Snowline Joint Unified	20%	32%	35%	
Upland Unified	13%	30%	34%	
Victor Valley Union High	23%	35%	42%	
Yucaipa-Calimesa Joint Unified	14%	36%	42%	
San Bernardino County[2]	**21%**	**34%**	**42%**	
California[2]	16%	29%	39%	

Source: California Department of Education, California Healthy Kids Survey (WestEd). (2013)., Current alcohol and other drug use, Past 30 days, Table A4.3, By school district, 2009-2010, By county and statewide, 2009-2011.

[1] Only school districts with more than 1,000 students are presented.

[2] County and state data are 2009-2011.

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Percentage of Students Who Reported Drinking Alcohol in the Past 30 Days, by School District and Grade, 2009-2010

School District[1]	7th Grade	9th Grade	11th Grade
Apple Valley Unified	25%	26%	32%
Barstow Unified	18%	31%	29%
Bear Valley Unified	15%	32%	45%
Chino Valley Unified	12%	25%	35%
Colton Joint Unified	20%	32%	39%
Fontana Unified	19%	31%	35%
Hesperia Unified	17%	27%	37%
Morongo Unified	17%	26%	35%
Redlands Unified	8%	19%	33%
Rialto Unified	16%	31%	31%
San Bernardino City Unified	23%	30%	36%
Silver Valley Unified	16%	32%	32%
Snowline Joint Unified	15%	25%	31%
Upland Unified	11%	22%	23%
Victor Valley Union High	18%	27%	34%
Yucaipa-Calimesa Joint Unified	13%	30%	36%
San Bernardino County[2]	**16%**	**28%**	**36%**
California[2]	13%	24%	33%

Source: California Department of Education, California Healthy Kids Survey (WestEd). (2013). Current alcohol and other drug use, Past 30 days, Table A4.3, By school district, 2009-2010, By county and statewide, 2009-2011.

[1] Only school districts with more than 1,000 students are presented.

[2] County and state data are 2009-2011.

Percentage of Students Who Reported Binge Drinking in the Past 30 Days, by School District and Grade, 2009-2010

School District[1]	7th Grade	9th Grade	11th Grade	Healthy People Objective 2020 Target
Apple Valley Unified	17%	16%	22%	8.6%
Barstow Unified	9%	20%	20%	
Bear Valley Unified	6%	21%	36%	
Chino Valley Unified	6%	15%	22%	
Colton Joint Unified	11%	21%	28%	
Fontana Unified	9%	18%	23%	
Hesperia Unified	8%	17%	28%	
Morongo Unified	9%	16%	24%	
Redlands Unified	3%	12%	21%	
Rialto Unified	6%	18%	18%	
San Bernardino City Unified	12%	17%	23%	
Silver Valley Unified	9%	19%	24%	
Snowline Joint Unified	7%	16%	22%	
Upland Unified	4%	13%	16%	
Victor Valley Union High	8%	16%	20%	
Yucaipa-Calimesa Joint Unified	7%	21%	24%	
San Bernardino County[2]	**8%**	**17%**	**24%**	
California[2]	5%	15%	22%	

Source: California Department of Education, California Healthy Kids Survey (WestEd). (2013).Current binge (episodic heavy) drinking, Past 30 days, Table A4.7, By school district, 2009-2010, By county and statewide, 2009-2011
Note: Binge drinking is considered five or more drinks of alcohol in a row within a two-hour period
[1] Only school districts with more than 1,000 students are presented.
[2] County and state data are 2009-2011.

© Applied Survey Research, 2013

Percentage of Adults (18 Years and Older) Who Reported Binge Drinking in the Past Year, by Ethnicity

Ethnicity/Region	2007	2009	Healthy People Objective 2020 Target
Latino			24.4%
San Bernardino County	**33.5%**	**30.0%**	
California	32.4%	33.1%	
White			
San Bernardino County	**30.4%**	**36.2%**	
California	32.0%	34.3%	
Other Ethnicity			
San Bernardino County	**18.6%**	**19.2%**	
California	20.2%	22.0%	
All Ethnicities			
San Bernardino County	**29.7%**	**30.6%**	
California	29.7%	31.3%	

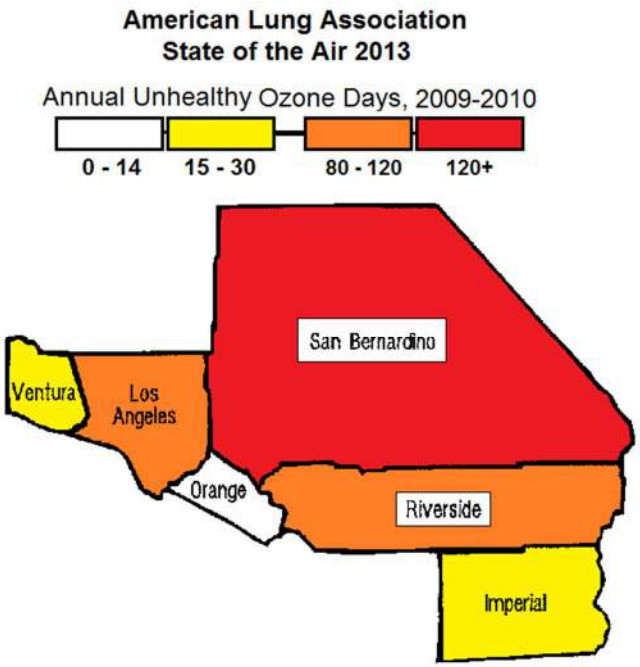
Source: California Health Interview Survey, UCLA Center for Health Policy Research. (2013). Binge drinking in the past year by race/ethnicity, 2007 and 2009.
Note: Other Ethnicity includes African American, American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, and Two or More Races because individual data were statistically unstable.

AMERICAN LUNG ASSOCIATION®
IN CALIFORNIA

State of the Air 2013: Southern CA Association of Governments region

Five of the six counties that comprise the SCAG region rank among the twenty-five most ozone – or smog – polluted counties in the entire United States, including three of the top five. Vehicle emissions are a leading source of pollution in our region, and it has significant impacts on our residents, particularly those living with chronic cardiovascular and respiratory illnesses, the elderly and our children. Reducing motor vehicle emissions through smart growth land use and transportation planning is a key measure to relieve our air pollution crisis.

SCAG Counties Among Smoggiest in America	
County	US Rank, 2013
San Bernardino	1
Riverside	2
Los Angeles	4
Imperial	17
Ventura	20



Populations Vulnerable to Dirty Air

County	Total Pop	Under 18 Years Old	65 and Older	Pediatric Asthma	Adult Asthma	COPD	Heart Disease	Poverty
Los Angeles	9,889,056	2,378,370	1,099,904	170,275	631,724	328,847	2,187,906	1,788,681
Orange	3,055,745	737,120	363,752	52,773	195,151	104,466	698,405	391,460
Riverside	2,239,620	623,094	268,723	44,609	136,046	73,244	488,747	371,930
San Bernardino	2,065,377	593,206	188,958	42,470	123,780	62,735	416,898	391,911
Ventura	831,771	210,361	100,114	15,060	52,329	28,516	191,413	94,625
Imperial	177,057	50,986	18,749	3,650	10,603	5,513	36,633	43,259
SCAG Total	18,258,626	4,593,137	2,040,200	328,838	1,149,633	603,321	4,020,002	3,081,866

All sources: American Lung Association, State of the Air 2013

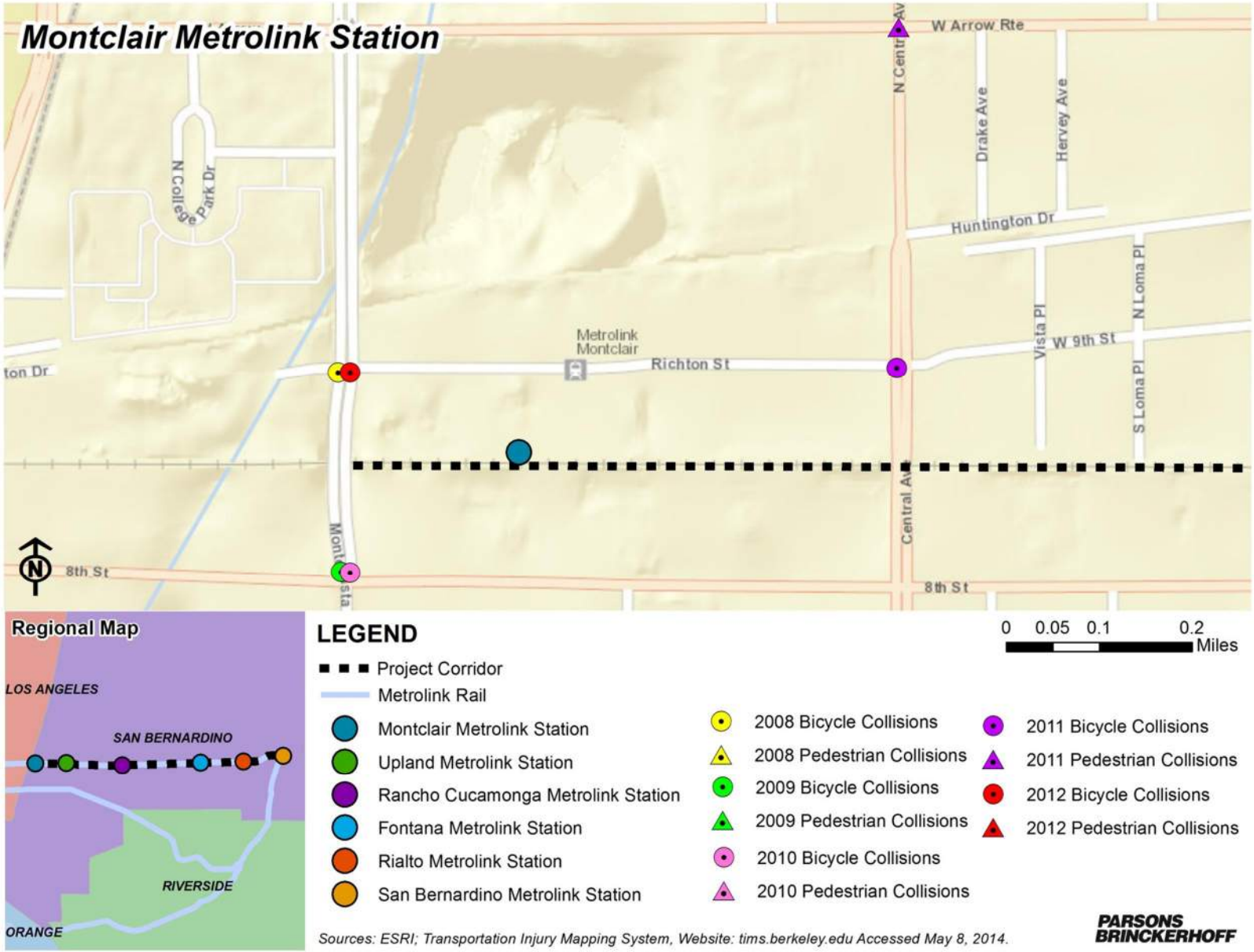
Contact: Katherine Lee, katherine.lee@lung.org

TIMS SUMMARY TABLE

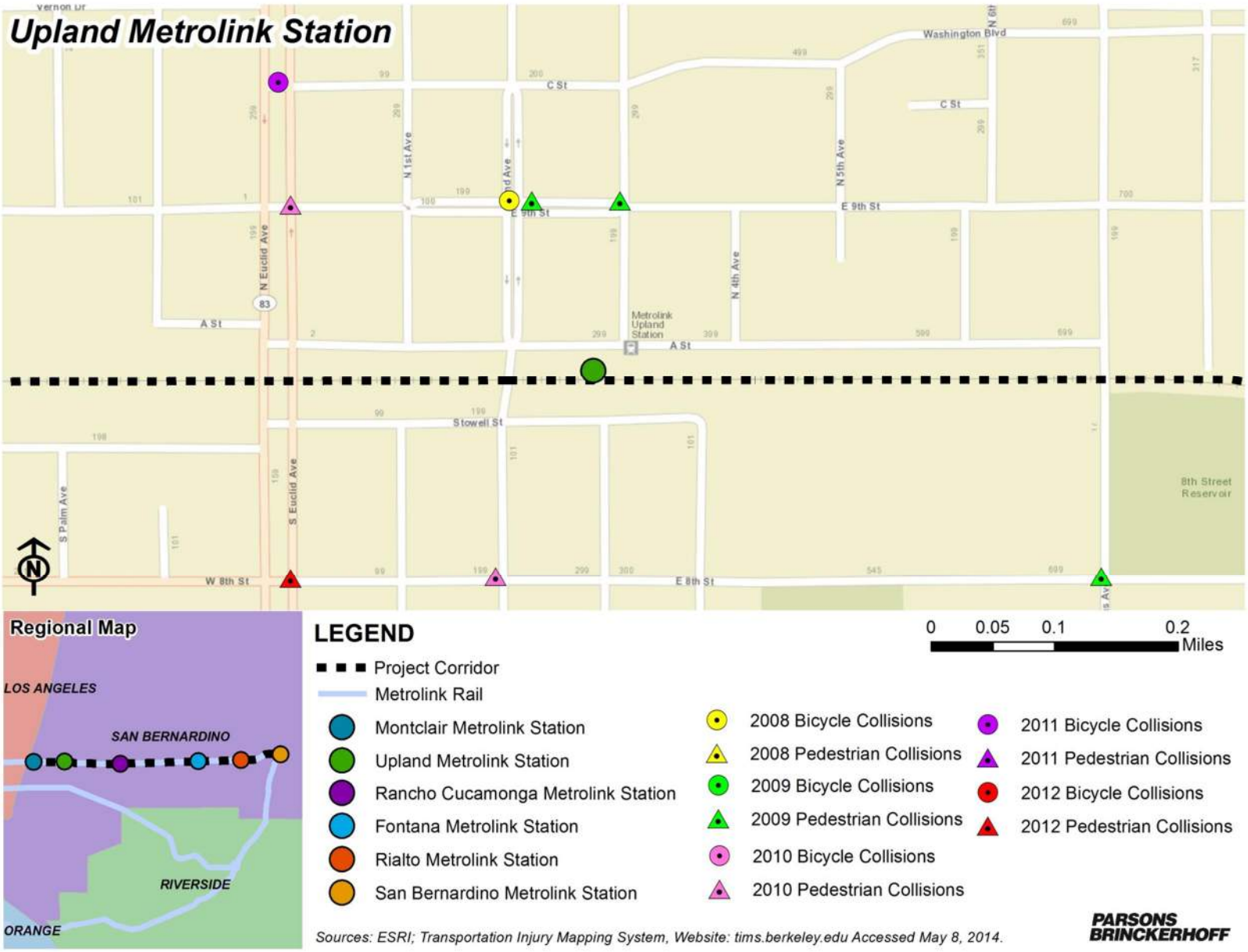
Summary of Bicycle/Pedestrian-Involved Motor Vehicle Accidents

City	Type of Collision	Number of Accidents Per Year						Injury / Fatality
		2008	2009	2010	2011	2012	Total	
Montclair	Bicycle	1	1	1	1	1	5	5/0
	Pedestrian	0	0	0	1	0	1	1/0
Upland	Bicycle	1	0	0	1	0	2	2/0
	Pedestrian	0	3	3	0	1	6	5/1
Rancho Cucamonga	Bicycle	0	0	0	2	0	2	2/0
	Pedestrian	0	1	0	0	0	1	1/0
Fontana	Bicycle	4	1	2	4	8	19	18/1
	Pedestrian	2	3	4	5	1	15	15/0
Rialto	Bicycle	0	0	1	1	2	4	4/0
	Pedestrian	0	1	2	1	3	7	7/0
San Bernardino	Bicycle	0	0	1	0	0	0	1/0
	Pedestrian	0	1	0	1	1	3	3/0

Source: TIMS database for 2008, 2009, 2010, 2011, and 2012

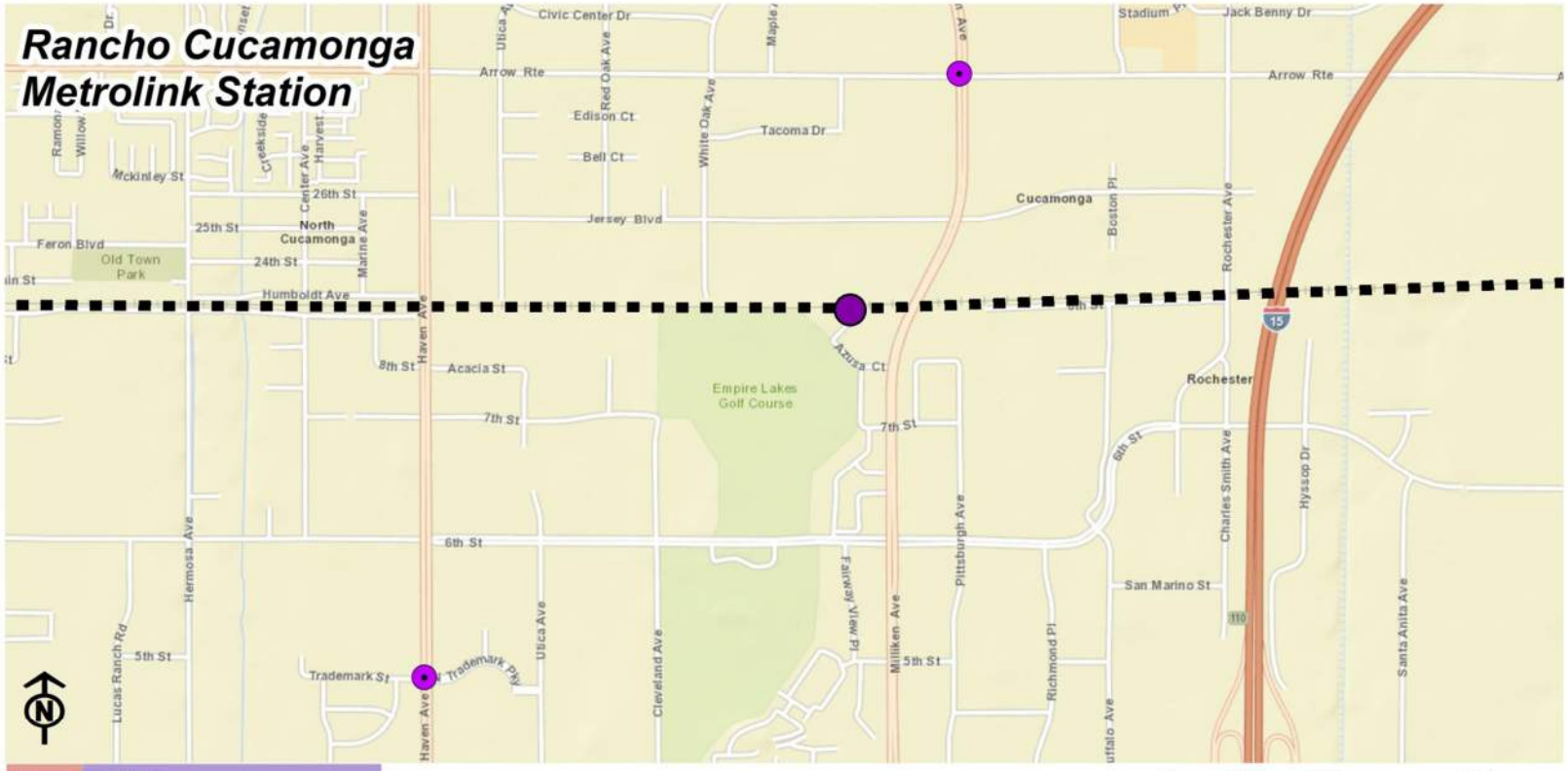

Montclair Metrolink Station
W Arrow Rte
N Central Ave
Drake Ave
Hervey Ave
N College Park Dr
Huntington Dr
N Loma Pl
Vista Pl
W 9th St
Metrolink
Montclair
Richton St
S Loma Pl
Central Ave
Montclair
8th St
8th St
Regional Map
LOS ANGELES
SAN BERNARDINO
RIVERSIDE
ORANGE
LEGEND
Project Corridor
Metrolink Rail
Montclair Metrolink Station
Upland Metrolink Station
Rancho Cucamonga Metrolink Station
Fontana Metrolink Station
Rialto Metrolink Station
San Bernardino Metrolink Station
2008 Bicycle Collisions
2008 Pedestrian Collisions
2009 Bicycle Collisions
2009 Pedestrian Collisions
2010 Bicycle Collisions
2010 Pedestrian Collisions
2011 Bicycle Collisions
2011 Pedestrian Collisions
2012 Bicycle Collisions
2012 Pedestrian Collisions
0 0.05 0.1 0.2
Miles
Sources: ESRI; Transportation Injury Mapping System, Website: tims.berkeley.edu Accessed May 8, 2014.
PARSONS BRINCKERHOFF

Upland Metrolink Station



Sources: ESRI; Transportation Injury Mapping System, Website: tims.berkeley.edu Accessed May 8, 2014.

Rancho Cucamonga Metrolink Station



LEGEND

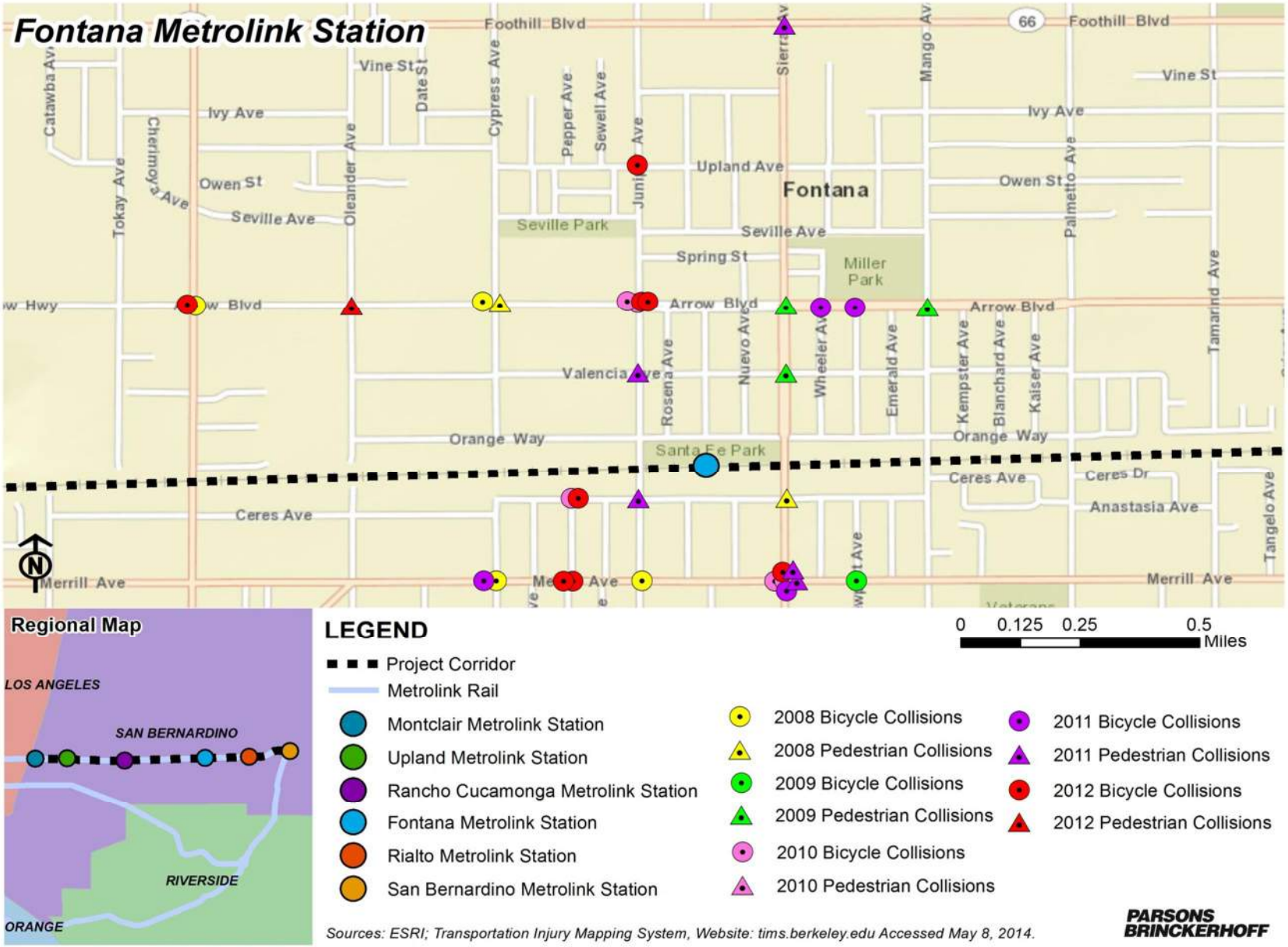
- Project Corridor
- Metrolink Rail
- Montclair Metrolink Station
- Upland Metrolink Station
- Rancho Cucamonga Metrolink Station
- Fontana Metrolink Station
- Rialto Metrolink Station
- San Bernardino Metrolink Station
- 2008 Bicycle Collisions
- 2008 Pedestrian Collisions
- 2009 Bicycle Collisions
- 2009 Pedestrian Collisions
- 2010 Bicycle Collisions
- 2010 Pedestrian Collisions
- 2011 Bicycle Collisions
- 2011 Pedestrian Collisions
- 2012 Bicycle Collisions
- 2012 Pedestrian Collisions

0 0.2 0.4 0.8 Miles

Sources: ESRI; Transportation Injury Mapping System, Website: tims.berkeley.edu Accessed May 8, 2014.

PARSONS BRINCKERHOFF

Fontana Metrolink Station



Sources: ESRI; Transportation Injury Mapping System, Website: tims.berkeley.edu Accessed May 8, 2014.

PARSONS BRINCKERHOFF

Rialto Metrolink Station

LEGEND

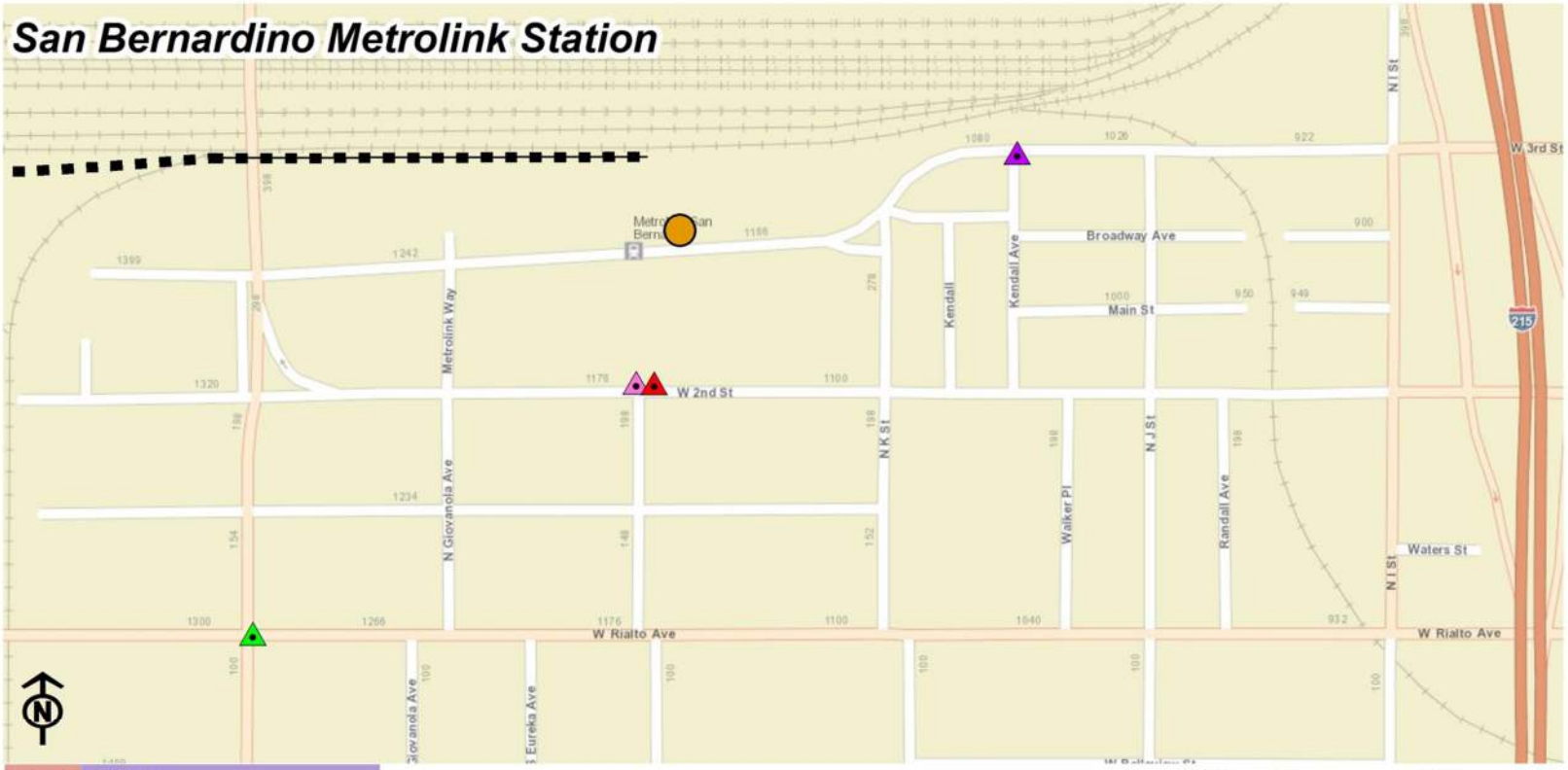
- Project Corridor
- Metrolink Rail
- Montclair Metrolink Station
- Upland Metrolink Station
- Rancho Cucamonga Metrolink Station
- Fontana Metrolink Station
- Rialto Metrolink Station
- San Bernardino Metrolink Station
- 2008 Bicycle Collisions
- 2008 Pedestrian Collisions
- 2009 Bicycle Collisions
- 2009 Pedestrian Collisions
- 2010 Bicycle Collisions
- 2010 Pedestrian Collisions
- 2011 Bicycle Collisions
- 2011 Pedestrian Collisions
- 2012 Bicycle Collisions
- 2012 Pedestrian Collisions

0 0.1 0.2 0.4 Miles

Sources: ESRI; Transportation Injury Mapping System, Website: tims.berkeley.edu Accessed May 8, 2014.

PARSONS BRINCKERHOFF

San Bernardino Metrolink Station



LEGEND

- Project Corridor
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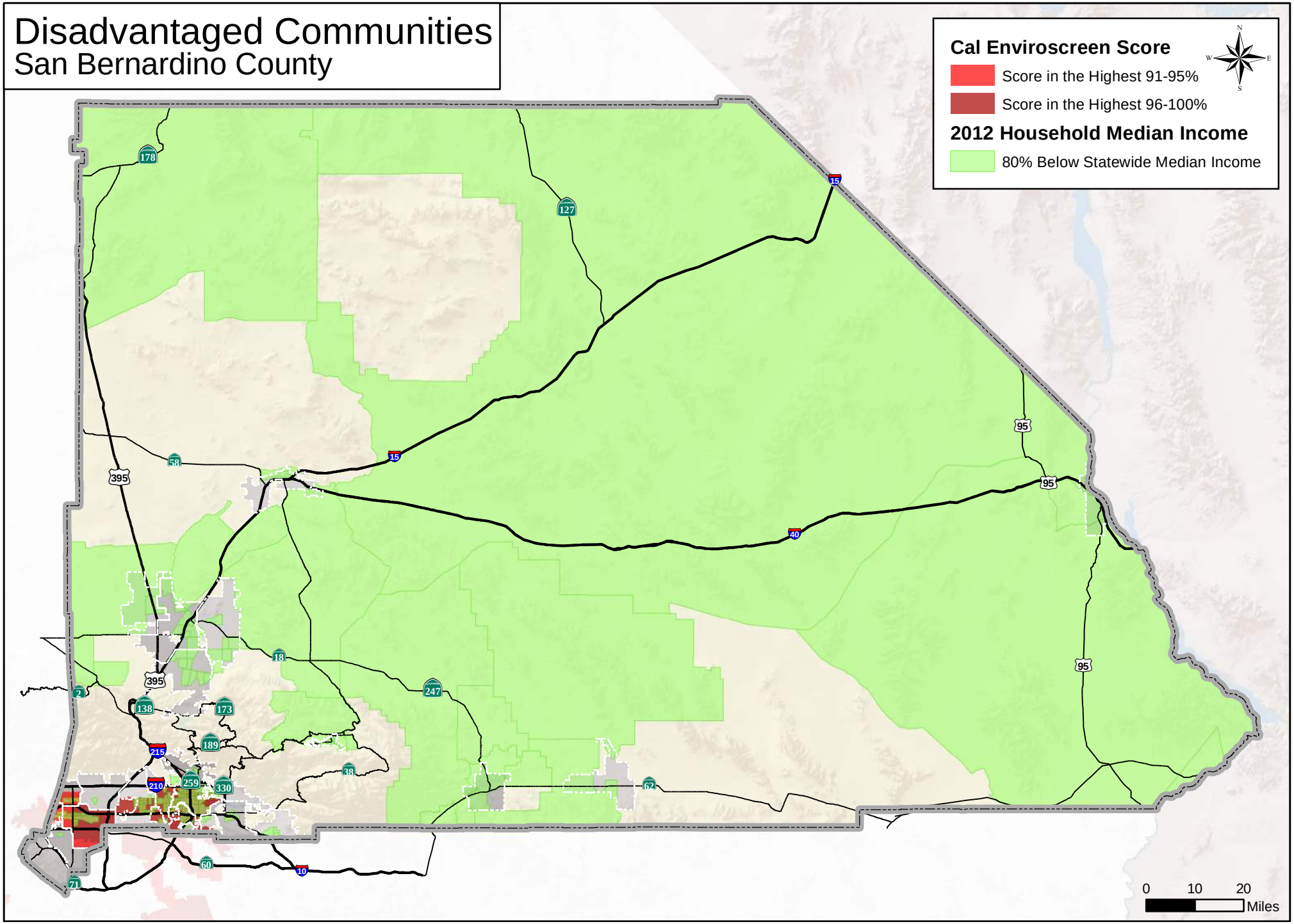
- 2009 Pedestrian Collisions
- 2010 Bicycle Collisions
- 2010 Pedestrian Collisions
- 2011 Bicycle Collisions
- 2011 Pedestrian Collisions
- 2012 Bicycle Collisions
- 2012 Pedestrian Collisions

0 0.05 0.1 0.2 Miles

Sources: ESRI; Transportation Injury Mapping System, Website: tims.berkeley.edu Accessed May 8, 2014.

PARSONS BRINCKERHOFF

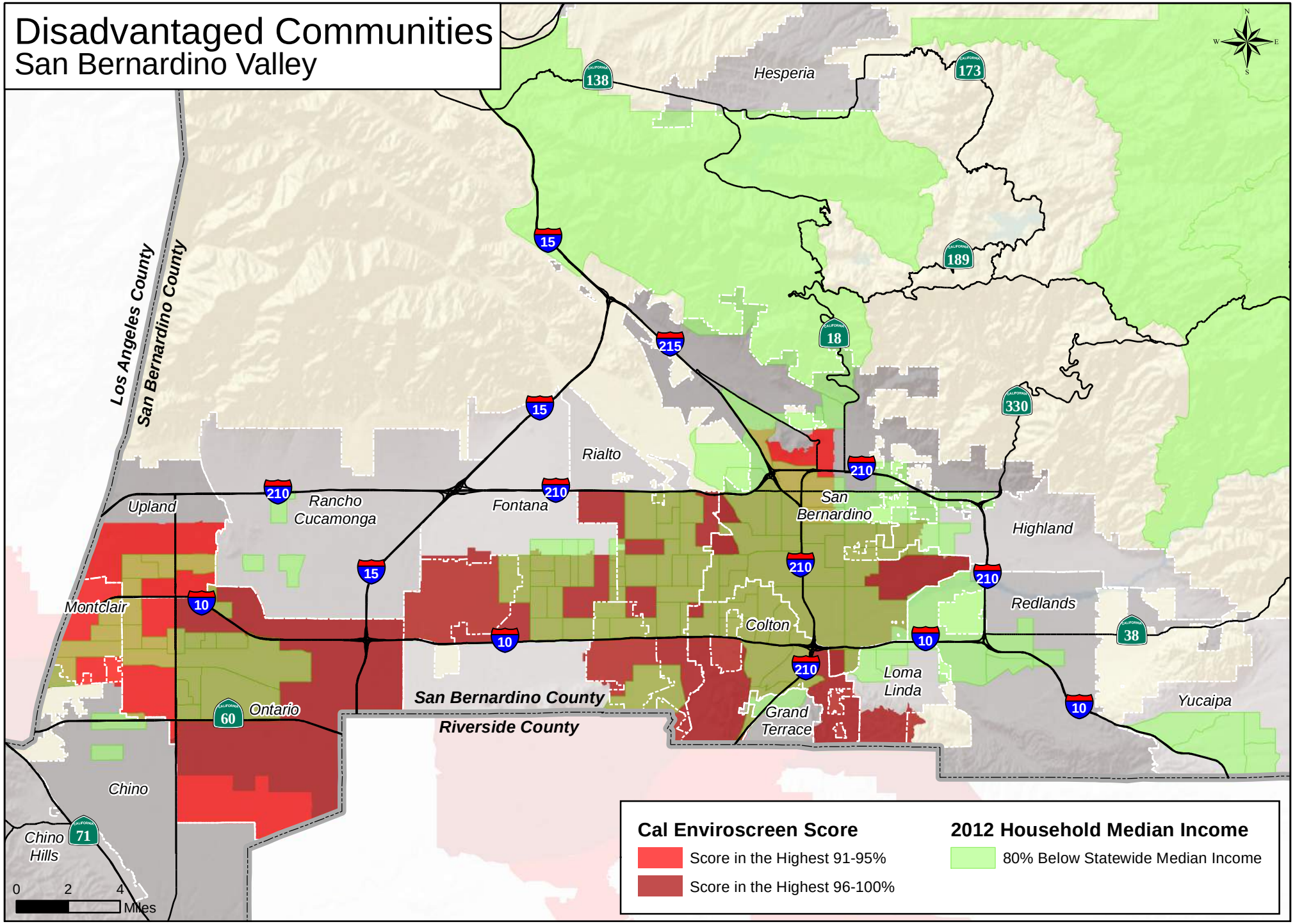
Disadvantaged Communities
San Bernardino County



G. Koblasz (4/28/2014)
C:/Rqsts/Josh/CalEnviroScreen.mxd
Source: California Communities Evnironmental Health Screening Tool & American Community Survey

Governments SANBAG Working Together

Disadvantaged Communities
San Bernardino Valley



G. Koblasz (5/1/2014)
C:/Rqsts/ATP/DisadvantagedCom_Valley
Source: California Communities Evnironmental Health Screening Tool & American Community Survey

Governments SANBAG Working Together

SANBAG Metrolink Station Accessibility Improvement Project

APPENDIX J

National Bike Month Celebration at SANBAG Board Meeting
May 7, 2014

- SANBAG Board Agenda Item No. 11: National Bike Month and Status Report on SANBAG Active Transportation Activities

- Photos of staff and Board members mixing smoothies on a stationary bicycle.

Photos of staff and Board members mixing smoothies on a stationary bicycle
May 7, 2014

Board Member Gary Ovitt

SCAG staff member Arnold San Miguel

SANBAG Director of Planning, Steve Smith

Photos of staff and Board members mixing smoothies on a stationary bicycle
May 7, 2014

SANBAG staff member Josh Lee

SANBAG Metrolink Station Accessibility Improvement Project Benefit-Cost Analysis

Prepared for the San Bernardino Association of Governments

May 14, 2014

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Executive Summary

A benefit-cost analysis (BCA) was conducted for the SANBAG Metrolink Station Accessibility Improvement Project for submission to the California Department of Transportation (Caltrans) Active Transportation Program (ATP). The analysis was conducted in accordance with the benefit-cost methodology as recommended by the U.S. DOT in the Federal Register (79 FR 11854) and conducted for a 30 year analysis period after operations begin in 2019.

In 2012, San Bernardino Associated Governments (SANBAG) undertook an effort to examine the ability of non-motorized users to access its regional transit network, including the six existing Metrolink Commuter Rail stations along the San Bernardino Line. The purpose of that project was to identify existing barriers to access, and proposed planning-level improvements in and around the stations. *Improvement to Transit Access for Cyclists and Pedestrians* report, dated November 2012, informed this project. The project encompasses a variety of improvements including a total of 49.23 miles of bicycle facilities stretching from Montclair to San Bernardino Depot.

The overall cost of the Project is expected to be $4.7 million in undiscounted 2013 dollars through 2018(Table 1). At a 7 percent discount rate, the total costs are $3.9 million, while at a 3 percent discount rate the total costs are $4.3 million. The total cost and the ATP funding request are the same.

Table 1: Capital Costs

Costs (2013 $)	Costs (2013 $ discounted at 7 %)	Costs (2013 $ discounted at 3 %)
$4,678,729	$3,871,207	$4,318,931

Source: SANBAG

Operations and maintenance costs for this project would be negligible and are thus not included in this analysis.

In real 2013 dollars, the Project creates $58.6 million in present value benefits when discounted at 7 percent or $116.4 million when discounted at 3 percent. The project creates these benefits by attracting new cyclists. All of the cyclists receive health benefits associated with cycling. In addition to those benefits cyclist commuters will also receive mobility benefits. Further benefits created by this project derive from a reduction in Vehicle Miles Traveled (VMT) as commuters switch from autos to bikes. These benefits include reductions in emission, reduced pavement damage, lower fuel costs and lower non-fuel related vehicle O&M costs

The overall project benefit matrix can be seen in Table 2. The section Titled Benefit Cost Model Detail Tables, lists the detailed benefits and costs by year.

Table 2: Impact and Benefits Matrix

Type of Impact	Population Affected by Impact	Economic Benefit	Summary of Results (at 7% discount rate)	Summary of Results (at 3% discount rate)
Increase in Commuters Using Bicycles to Access the Stations	Commuting Cyclists	Increased Mobility	$5.7 million savings	$11.6 million savings
Increase in all (Recreation and Commuting) Cycling Activity in the Corridor	All Cyclists	Improved Health	$1.2 million savings	$2.1 million Savings
Reduction in VMT as Commuters Shift from Autos to Bicycles	Commuting Cyclists	Reduction in Fuel Consumption	$1.6 million savings	$3.1 million savings
Reduction in VMT as Commuters Shift from Autos to Bicycles	Society	Reduction in Oil Imports	$159,000 savings	$298,000 savings
Reduction in VMT as Commuters Shift from Autos to Bicycles	Commuting Cyclists	Non-Fuel O&M Cost Reduction	$2.2 million savings	$4.3 million savings
Reduction in VMT as Commuters Shift from Autos to Bicycles	Society	Reduction in Emissions	$359,000 savings	$727,000 savings
Reduction in VMT as Commuters Shift from Autos to Bicycles	Society	Reduction in Safety Incidents	$47.6 million savings	$94.1 million savings
Reduction in VMT as Commuters Shift from Autos to Bicycles	Surrounding Community	Reduction in Noise	$17,000 savings	$34,000 savings
Reduction in VMT as Commuters Shift from Autos to Bicycles	Government	Reduction in Pavement Damage	$17,000 savings	$34,000 savings

Source: Parsons Brinckerhoff, 2014

The overall Project impacts can be seen in Table 3, which shows the magnitude of change and direction of the various impact categories.

Table 3: Project Impacts

Category	Quantity
Average Annual Commuters	▲ 246
Average Annual Cyclists	▲982
Vehicle Miles Traveled	▼49,650,154
Gallons of Fuel Consumed	▼1,570,240
Non Fatal Safety Incidents	▼1,497
CO2 Emissions (tons)	▼17,401

Source: Parsons Brinckerhoff, 2014

Table 4 below shows the overall results of the BCA. At a 7 percent discount rate, the Project yields a benefit-cost ratio of 15.13 over a 30 year analysis period and using a 3 percent discount rate a benefit-cost ratio of 26.94.

Table 4: Benefit Cost Analysis Summary Results

Scenario	Net Present Value (2013 $ millions disc.)	Benefit Cost Ratio
Case A (7 percent discount rate)	$54,709,166	15.13
Case B (3 percent discount rate)	$112,047,478	26.94

Source: Parsons Brinckerhoff, 2014

Sensitivity tests were conducted utilizing a range of valuations for benefit categories and impacts (described later in this analysis). While the results displayed in Table 4 are the baseline and most likely numbers, further statistical analysis was conducted to create a thorough sensitivity analysis. In addition to PRISM an analysis was also performed using the Caltrans Benefit Cost Analysis tool (Cal-B/C), the results can be found in APPENDIX B – Caltrans BC Model.

Introduction

A benefit-cost analysis (BCA) was conducted for the SANBAG Metrolink Station Accessibility Improvement Project for submission to the California Department of Transportation (Caltrans) Active Transportation Program (ATP). The analysis was conducted in accordance with the benefit-cost methodology as recommended by the U.S. DOT in the Federal Register (79 FR 11854).

Analytical Assumptions

Discount Rates

For project investments, dollar figures in this analysis are expressed in constant 2013 dollars. In instances where certain cost estimates or benefit valuations were expressed in dollar values in other (historical) years, the U.S. Bureau of Labor Statistics' Consumer Price Index for Urban Consumers (CPI-U) was used to adjust them.[1]

The real discount rates used for this analysis were 3.0 and 7.0 percent, consistent with U.S. DOT guidance for TIGER VI grants[2] and OMB Circular A-4.[3].

Evaluation Period

For the Accessibility Project, the evaluation period includes the relevant (post-design) construction period during which capital expenditures are undertaken, plus 30 years of operations beyond the Project completion within which to accrue benefits.

For the purposes of this study, it has been assumed that construction of the project begins in 2015 and continues through 2018; operations begin in 2019. The analysis period, therefore, begins with the first expenditures in 2015 and continues through 30-years of operations, or through 2048.

All benefits and costs are assumed to occur at the end of each year, and benefits begin in the calendar year immediately following the final construction year.

Annualizing Factor Assumptions

Travel demand models produce outputs on daily or sub-daily basis. An annualization factor is thus necessary to convert the travel demand outputs into to yearly values. The annualization factor used for commuters was 260, 5 days a week 52 weeks in a year. It was also assumed that each commuter makes

---

[1] U.S. Bureau of Labor Statistics. Consumer Price Index, All Urban Consumers, U.S. City Average, Series CUSR0000SA0. 1982-1984=100

[2] TIGER 2014 NOFA: Benefit-Cost Analysis Guidance, Updated March 14, 2014; http://www.dot.gov/tiger/guidance

[3] White House Office of Management and Budget, Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (October 29, 1992). (http://www.whitehouse.gov/omb/circulars_a094).

2 trips a day, one to the station and one back home. The annualization factor used for non-commuters is 300. This reflects the 260 work days used for commuters and includes some but not all weekends.

Project Region

The bicycle facilities included in the SANBAG accessibility project run from Montclair to Rialto and cover a total of 8.72 miles.

Travel Demand Sources and Forecast Years for Highway Benefits

This analysis uses a method developed as part of an NCHRP report on the analysis of investments in bicycle facilities to estimate the increased demand for bicycle facilities[4]. This method uses facility length, the population density surrounding the facility and empirically determined likelihood of use factors. The method estimates both commuters and recreational users.

<u>Step 1: Calculating Daily Existing Bicycle Commuters:</u>

First the number of daily existing bicycle commuters is calculated using the number of residents within three distance bands around the facility: within 400 meters, between 400 and 799 meters, and between 800 and 1,600 meters. The number of residents within each band is based off of population density estimates for 2008 provided by SANBAG staff (See Table 5). This information, in conjunction with the facility length, is used to determine the population within each distance band (See Table 6). The commuting rate used in this analysis is the California statewide estimate from the NCHRP report which is 0.82%

Equation 1: Daily Existing Bicycle Commuters

$$DEBC_{rg,S} = P_{rg,S} \cdot C \cdot 0.4$$

$where$
$DEBC = Daily\ Existing\ Bicycle\ Commuters$
$rg = Distance\ Range: within\ 400\ mters, between\ 400\ and\ 799\ meters,$
$and\ between\ 800\ and\ 1{,}600\ meters$
$P = population\ within\ the\ specifed\ distance\ from\ the\ facilty$
$S = Scenario: Build\ or\ No\ Build$
$C = California's\ bicycle\ commute\ \ share\ 0.82\%$
$0.4 = Assumption - 80\%\ of\ residents\ are\ adults * 50\%\ of\ Adults\ are\ commuters$

[4] NCHRP Report 552 Guidelines for Analysis of Investments in Bicycle Facilities, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf

Table 5: Population Densities around Project Stations

Station	Population Density 2008	Population Density 2035
Monclair		
Density w/in less than 400 meters (0-1/4 mi)	1,914	4,550
Density btwn 400 and 799 meters (1/4 - 1/2 mi)	4,397	7,267
Density btwn 800 and 1,599 meters (1/2 - 1 mi)	4,397	7,267
Upland		
Density w/in less than 400 meters (0-1/4 mi)	7,925	9,628
Density btwn 400 and 799 meters (1/4 - 1/2 mi)	6,022	6,663
Density btwn 800 and 1,599 meters (1/2 - 1 mi)	6,022	6,663
Rancho		
Density w/in less than 400 meters (0-1/4 mi)	1,168	1,605
Density btwn 400 and 799 meters (1/4 - 1/2 mi)	3,196	3,332
Density btwn 800 and 1,599 meters (1/2 - 1 mi)	3,196	3,332
Fontana		
Density w/in less than 400 meters (0-1/4 mi)	9,410	10,182
Density btwn 400 and 799 meters (1/4 - 1/2 mi)	5,100	5,883
Density btwn 800 and 1,599 meters (1/2 - 1 mi)	5,100	5,883
Rialto		
Density w/in less than 400 meters (0-1/4 mi)	7,288	11,510
Density btwn 400 and 799 meters (1/4 - 1/2 mi)	5,023	5,949
Density btwn 800 and 1,599 meters (1/2 - 1 mi)	5,023	5,949
San Bernardino Depot		
Density w/in less than 400 meters (0-1/4 mi)	4,707	6,511
Density btwn 400 and 799 meters (1/4 - 1/2 mi)	4,673	5,783
Density btwn 800 and 1,599 meters (1/2 - 1 mi)	4,673	5,783

Source: SANBAG

Table 6: Length of Facilities

Portion of Project	Length in Miles
Montclair	0.29
Rancho	1.00
Fontana	4.54
Rialto	2.89

Source: SANBAG

Step 2: Calculating Total Existing Adult Bicyclists:

Adult commuters only make up a portion of all cyclists. According to US Census and National Household Transportation Survey data, the adult cycling rate in the US falls somewhere between the commuting

rate and 0.6 percent plus three times the commuting rate. To create a more conservative estimate this analysis uses twice the commuting rate only or 1.66%.

Equation 2: Adult Bicycling Rate

$$TBR = 2C$$

$$where$$
$$TBR = Total\ Adult\ Bicycling\ Rate$$

The number of total daily adult cyclists is calculated as follows:

Equation 3: Total Daily Adult Cyclists

$$TDAB_{rg} = P_{rg} \cdot TBR \cdot 0.4$$

$$where$$
$$TDAB = Total\ Daily\ Adult\ Bicyclists$$

<u>Step 3: Calculating the Number of New Bicyclists</u>
To determine the number of new cyclists a facility attracts, the currently existing groups are multiplied by empirically determined likelihood multipliers for each distance. Then these are summed across all the distance bands to determine the totals.

Equation 4: New Cyclists

$$NBC = \sum_{rg} NBC_{rg} = L_{rg} \cdot TBR_{rg}$$

$$NB = \sum_{rg} NB_{rg} = L_{rg} \cdot TDAB$$

$where$
$NBC = New\ Bicyclist\ Commuters$
$NB = New\ Bicyclists\ Adult$
$L = Likelihood\ Multiplier$: $> 800\ meters = 0.51;\ 800 - 1{,}600\ meters = 0.44;$
$1{,}600 - meters = 0.15$

<u>Step 4: Repeat Steps 1 through 3 using 2035 Densities</u>
These steps where then repeated using the 2035 densities. (See

)

Step5: Interpolation and Extrapolation

Using the 2008 and 2035 figures The Compound Annual Growth Rates (CAGRs) were calculated and used to interpolate and extrapolate the number of cyclists in each year. The figures for elected Years are shown below in Table 7.

Table 7: Additional Cyclists each year due to the Project

	2020	2025	2030	2035	2040	2045
New Commuters	227	233	240	247	255	236
All New Adult Cyclists	908	933	960	988	1,018	1,051

Source: Parsons Brinckerhoff

Average Vehicle Occupancy

Because vehicle mile savings are accrued by vehicles and not individuals, it is necessary to identify the number of automobiles removed from the system as a result of the increase in cycling commuters.

In order to do this, this analysis assumes an average vehicle occupancy (AVO) rate of 1.35 persons per vehicle for all trips as supplied by SANBAG. The number of commuters using bicycles is then divided by the AVO to arrive at the number of vehicles removed from the system.

Average Commute Trip

To calculate the VMT saved by individuals commuting to transit by bicycle the average length of commute in the corridor was used. SANBAG reported that the average commute in the region is between 10 and 25 miles, the average of this range, 17.5 miles was the length used in this analysis

Table 8: Automobile Vehicle Miles (VMT) Saved

	2020	2025	2030	2035	2040	2045
Reduction in VMT	1,530,379	1,572,347	1,617,113	1,664,894	1,715,929	1,770,475

Source: Parsons Brinckerhoff

PRISM™

This benefit cost analysis was done using PRISM™ (http://prism.pbworld.net/), a benefit cost analysis tool that uses a methodology consistent with the most recent guidelines developed by U.S. DOT. The tool determined benefits according to the following five categories: State of Good Repair; Economic Competitiveness; Livability; Sustainability; and Safety. PRISM™ is designed to take into account the difficulty in determining the "true value" of a given impact by allowing for a range of per unit values: low likely and high.

Economic Benefits Included

The following identifies and groups the benefits that are included in the BCA for the project. While this section discusses the valuations used for each benefit category specifically, a model output summary of all valuations as used in PRISM™ sensitivity analysis, with statistical details, are available in Appendix A.

Economic Competitiveness

Mobility

Bicycle commuters derive a mobility benefit from being able to travel to work using via their bicycle

The NCHRP paper on assessing the benefits of bicycle facilities determined the willingness to pay by commuters for various cycling facilities. This calculation was done based on the value of time and average time spent commuting. As previously noted USDOT guidance allows the value of time to grow 1.6% annually, thus the values in Table 9 are examples for 2013 only.

Table 9: 2013 Annual Mobility Value of Bicycle Facilities High, Likely, and Low (2013 $)

	Annual Value 2013
High	$1,786
Likely	$2,033
Low	$2,299

Reductions in Vehicle Operating Costs

Vehicles have operating costs beyond fuel costs that will be addressed later in this report. These costs include maintenance and repair, replacement of tires, and the depreciation of the vehicle over time. These costs are reported as per VMT factors and have been estimated by a Minnesota DOT study, [5] and used in this analysis (see the table below). Since the original study estimated the likely range for these

[5] Minnesota Department of Transportation. (2003). *The Per-mile Costs of Operating Automobiles and Trucks.* (MN/RC 2003-19), p.22, Table 4.2. (http://www.lrrb.org/pdf/200319.pdf).

values in 2003 dollars, the values for this analysis have been updated to 2013 dollars using a CPI adjustment.[6]

Table 10: Non-Fuel Vehicle O&M Costs Automobile

Cost Category	Automobile (2013 $ / VMT) Low	Automobile (2013 $ / VMT) Likely	Automobile (2013 $ / VMT) High
Maintenance / Repair	0.0405	0.0481	0.0506
Tires	0.0114	0.0114	0.0139
Depreciation	0.0785	0.0937	0.0988
Total	0.1304	0.1532	0.1633

Source: Minnesota Department of Transportation, 2003; Parsons Brinckerhoff, 2014

Vehicle Operating Costs – Fuel

Fuel Prices

Fuel efficiency values were derived from the U.S. Energy Information Administration (EIA), which provides estimates for the of fuel efficiency through 2040. The values used to calculate fuel efficiency can be found in the table published by EIA titled "Transportation Sector Key Indicators and Delivered Energy Consumption."[7] The following fuel efficiency values were used for the different vehicle classes:

- "Light Duty Stock" energy efficiency (mpg) for passenger vehicles.

The EIA provides estimates low likely and high fuel price estimates through 2040; however the analysis period relevant for this project stretches beyond this timeframe and thus estimated fuel prices in those future years are also necessary. In order to do estimate fuel prices and fuel efficiency ratings beyond 2040, the compound annual growth rate (CAGR) for 2011-2040 was calculated and then used to continue the series through the end of the analysis period.

Table 11: Fuel Efficiency (miles per gallon) EIA reference Case

Fuel Type	2012	2020	2030	2040	2050
Automobiles (Light Duty Stock)	20.89	24.08	31.33	36.10	36.82

Source: U.S. Energy Information Administration, 2013; Parsons Brinckerhoff, 2014

Because fuel taxes are considered a pecuniary benefit, or transfer payment, they cannot be accurately included in benefit calculations of a BCA. Thus, the federal and state taxes estimated by the EIA are subtracted out of the end user fuel prices.

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[6] Bureau of Labor Statistics, Consumer Price Index, All Urban Consumers, US City Average, All Items, Series CUSR0000SA0.

[7] Energy Information Administration. (2012). Annual Energy Outlook 2013. *Components of Selected Petroleum Product Prices, United States, Reference case.* [Microsoft Excel] (http://www.eia.gov/oiaf/aeo/tablebrowser/)

All dollars were reported in real 2011 dollars by the EIA. These dollar amounts were subsequently converted to real 2013 dollars using the U.S. Bureau of Labor Statistics Consumer Price Index adjustment for "motor fuel" between 2011 and 2013.[8]

The following table provides the range of fuel prices, in real 2013 dollars, and a breakdown of values used for PRISM™ sensitivity analysis, for selected years.

Table 12: Fuel Prices (real 2013 $ / gallon)

Fuel Type	2013	2020	2030	2040	2050
Motor Gasoline Low	$2.83	$2.23	$2.23	$2.31	$2.11
Motor Gasoline Likely	$2.83	$2.93	$3.30	$3.97	$4.30
Motor Gasoline High	$2.83	$3.90	$4.53	$5.50	$6.64

Source: U.S. Energy Information Administration, 2013; Parsons Brinckerhoff, 2014

Oil Import Costs

Fuel consumption has a cost beyond the actual operating costs and environmental costs of the consumption, and this additional cost is expressed as the economic cost of oil imports. This concept reflects two ideas: a monopsony component and a price shock component.

The monopsony component derives from the following logic; because the U.S. is such a large consumer of oil an increase in U.S. demand for oil will lead to higher fuel prices (based on supply and demand relationships). The price shock component comes from the fact that when there is a reduction in oil supplies this leads to higher oil prices which in turn reduce the level of U.S. economic output. As a consequence, reducing oil imports by consuming less fuel reduces the impact of these costs on the U.S. economy.

The National Highway Traffic and Safety Administration discusses this concept, and estimates that each gallon of fuel saved reduces total U.S. imports of refined fuel or crude oil by 0.95 gallons. [9]

The likely value for NHTSA's estimate of the per-gallon cost of oil imports (both the monopsony and price shock components combined) is $0.285 per gallon (2005 $). When converted to 2013 dollars using the CPI adjustment,[10] this value is $0.340 per gallon (2013 $). For the range of values estimated by NHTSA as adjusted to 2013 dollars, see Table 13.

[8] U.S. Bureau of Labor Statistics. Consumer Price Index, All Urban Consumers, U.S. City Average, Motor Fuel. Series CUUR0000SETB. 1982-1984=100, 2010=240.724; 2011=301.448

[9] National Highway Traffic and Safety Administration. (2009). Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Final Regulatory Impact Analysis, p.viii-22 – viii-27.

[10] Bureau of Labor Statistics, Consumer Price Index, All Urban Consumers, US City Average, All Items, Series CUSR0000SA0.

Table 13: Cost of Oil Imports

	Low	Likely	High
Cost of Oil Imports (2013 $)	$0.138	$0.340	$0.582

Source: NHSTA 2009, Parsons Brinckerhoff 2014

Safety

Accident Cost Savings

The BCA assumes constant accident rates for the "build" and "no build" scenarios. As a result, any changes in the number of accidents will be a result of changes in VMT, not of structural changes to the safety conditions on the roadway network.

The cost savings that arise from a reduction in the number of accidents include direct savings (e.g., reduced personal medical expenses, lost wages, and lower individual insurance premiums), as well as significant avoided costs to society (e.g., second party medical and litigation fees, emergency response costs, incident congestion costs, and litigation costs). The value of all such benefits – both direct and societal – could also be approximated by the cost of service disruptions to other travelers, emergency response costs to the region, medical costs, litigation costs, vehicle damages, and economic productivity loss due to workers' inactivity.

Accident rates for this analysis were derived from SANBAG, provided the most recent available data. Data was provided based on fatalities, injuries, and property damage only (PDO) rates.

In order to convert these accident rates into the appropriate AIS scale for calculating benefits, national statistics from the National Highway Traffic and Safety Administration were used. [11] By using the national statistics, it was possible to derive the distribution of total injuries into their respective AIS categories, as indicated in the following table which lists each AIS category as a proportion of all possible injuries

Table 14: U.S. AIS Categories as Proportion of All Non-fatal Injuries.

Injury Type	Proportion
AIS 5	0.18%
AIS 4	0.69%
AIS 3	2.39%
AIS 2	8.28%
AIS 1	88.46%
All Injuries	100%

Source: NHTSA, Parsons Brinckerhoff, 2014

[11] National Highway Traffic Safety Administration (2002), The Economic Impact of Motor Vehicle Crashes, 2000, p. 9, Table 3 "Incidence Summary – 2000 Total Reported and Unreported Injuries."

The following table lists all accident rates as reported by SANBAG and subsequently converted into AIS standards:

Table 15: Accident Rates per Million in I-10 Corridor

Accident Type	Accident Rate (per billion VMT)
Fatality	-
AIS 5	0.06
AIS 4	0.21
AIS 3	0.72
AIS 2	2.50
AIS 1	26.65
Property Damage Only	-

Source: SANBAG, Parsons Brinckerhoff, 2014

Monetized values for fatalities, and accidents categorized on the AIS scale are reported in the U.S. DOT's guidance for "Treatment of the Economic value of a Statistical Life"[12] – this includes low and high ranges used for PRISM™ sensitivity analysis. Values pertaining to property damage only accidents were reported by the National Highway Traffic and Safety Administration,[13] and have subsequently been updated to 2012 dollars by the U.S. DOT.[14] Since the likely range for these values were estimated in 2012 dollars, the values for this analysis have been updated to 2013 dollars using a CPI adjustment. The following table lists the range of values used for PRISM™ sensitivity analysis for each accident type:

Table 16: Monetized Accident Values

Accident Type	Unit Value (2013 $) Low	Unit Value (2013 $) Likely	Unit Value (2013 $) High
Fatality	$5,200,000	$9,200,000	$12,900,000
AIS 5	$3,083,600	$5,455,600	$7,649,700
AIS 4	$1,383,200	$2,447,200	$3,431,400
AIS 3	$546,000	$966,000	$1,354,500
AIS 2	$244,400	$432,400	$606,300
AIS 1	$15,600	$27,600	$38,700
Property Damage Only	$3,540	$3,934	$4,327

Source: U.S. DOT, 2008, 2011, 2013 and 2014 update; Parsons Brinckerhoff, 2014

[12] Office of the Secretary of Transportation, *Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses* (2013 update), Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses.

[13] National Highway Traffic Safety Administration (2002*), The Economic Impact of Motor Vehicle Crashes, 2000,* p. 62, Table 3.

[14] U.S. Department of Transportation (2014), *Tiger Benefit-Cost Analysis (BCA) Resource Guide*, p.3. (http://www.dot.gov/tiger/docs/tiger-12_bca-resourceGuide.pdf).

Sustainability

Emissions

The SANBAG ATP will create environmental and sustainability impacts relating to air pollution associated with automobile and commercial truck travel. Five forms of emissions were identified, measured and monetized, including: nitrous oxide, particulate matter, sulfur dioxide, volatile organic compounds, and carbon dioxide.

Emission Rates

Per-mile emissions rates were derived from the California Department of Transportation's California Lifecycle Benefit-Cost Analysis Tool (CAL B/C).[15] This tool provides emissions rates for exactly two different years: 2011 and 2031. In order to develop emissions rates for years within this interval as well as beyond 2031, it was necessary to use certain growth rate assumptions.

Per mile emissions factors differ depending on vehicle, fuel efficiency, average speed, and driving conditions. This BCA used the California Department of Transportation's emissions factors from the California Life-Cycle Benefit-Cost Analysis Model (Cal B/C)[16] which provides emissions factors for automobiles, trucks, and buses at varying speeds, and applies a dynamic model. In general, at slower speeds vehicles emit pollutants at a greater rate.

It is important to note that a unique set of emissions factors exists at each speed. Thus, the emissions data set consists of emissions factors for each emissions type, by year, and by speed.

The CAL B/C documentation[17] indicates that growth rates for CO, NO_X, PM_{10}, and VOC are exponential, so the 2011 to 2031 compound annual growth rate (CAGR) was used to interpolate and extrapolate as necessary.

Growth for SO_X and CO_2 were shown by CAL B/C to exhibit linear growth. Thus, a linear rate is used for these two emissions categories.

Finally, after 2031, emissions rates are assumed "flat-line." The flat-line represents both a leveling out of emissions rates, as well as in consideration for the uncertainty in estimating rates that far into the future.

The following tables show per-mile emissions rates at 35 mph for select years:

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[15] California Department of Transportation (2010) California Life-cycle Benefit/Cost Analysis Model v4.1 [Microsoft Excel]. http://www.dot.ca.gov/hq/tpp/offices/eab/benefit_files/Cal-BCv4-1.xls

[16] California Department of Transportation (2010). *California Life-Cycle Benefit-Cost Analysis Mode.*. Cal-BCv4-1.xls. [Microsoft Excel] (http://www.dot.ca.gov/hq/tpp/offices/ote/benefit_files/Cal-BCv4-1.xls). Tab "Parameters", Cells BG7:CA250.

[17] California Department of Transportation. (2009). California Life-cycle Benefit/Cost Analysis Model, Technical Supplement to User's Guide (Vol. 3). Sacramento: California Department of Transportation.

Table 17: Auto Emissions Rates (grams per vehicle-mile traveled), assuming 35 mph

Emissions Type	2011	2031
NO_X	0.2672	0.0767
PM	0.0481	0.0468
SO_X	0.0037	0.0037
VOC	0.2231	0.0701
CO_2	351.97	344.48

Source: California Department of Transportation, 2011; Parsons Brinckerhoff, 2014

Table 18 below provides the speeds along the corridor as provided by SANBAG.

Table 18: Average Speeds Along the Corridor

Lane Type	AM Peak Speeds	PM Peak Speeds
EB GP lanes	60	53
WB GP Lanes	48	57
EB HOV lane	65	63
WB HOV lane	62	65
AVERAGE	**59**	**60**

Source: SANBAG

Value of Non-CO2 Emissions Costs

The values of PM_{10} emissions are derived from a report published by the National Cooperative Highway Research Program[18].

The likely values for NO_x, SO_x, and VOC were derived from a National Highway Traffic and Safety Administration's CAFE standards for MY2012-MY2016[19]. These are consistent with USDOT guidelines. The remaining low and high values used in PRISM™ sensitivity analysis for non-GHG emissions come from Technical Supplement to the CAL B/C tool[20]. The resulting values are shown in the table below.

[18]NCHRP Project 08-36, Task 61: Monetary Valuation per Dollar of Investment in Different Performance Measures (2007) http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36%2861%29_FR.pdf

[19] National Highway Traffic and Safety Administration (March 2010), *Corporate Average Fuel Economy for MY2012-MY2016 Passenger Cars and Light Trucks*, page 403, Table VIII-8, "Economic Values for Benefits Computations (2007 Dollars)", http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/CAFE_2012-2016_FRIA_04012010.pdf

[20] California Life-Cycle Benefit/Cost Analysis Model (Cal-B/C) Technical Supplement to the User's Guide, Chapter 5. http://www.dot.ca.gov/hq/tpp/offices/eab/benefit_files/tech_supp.pdf

Table 19: Non-CO2 Emissions Costs (2013 $ / metric ton)

Emissions Type	Emissions Costs Low	Emissions Costs Likely	Emissions Costs High
NO_X	$2,463	$7,890	$36,261
PM	$1,659	$3,634	$8,655
SO_X	$14,881	$46,635	$141,110
VOC	$239	$2,002	$2,463

Source: NHTSA, 2010, Cal-B/C, 2013, Parsons Brinckerhoff, 2014

Value CO_2 Emissions Costs

The per-ton costs of carbon emissions were derived from the Interagency Working Group on the Social Cost of Carbon[21] as well as the analysis conducted by the US DOT in the Tiger Benefit –Cost Analysis Resource Guide.[22] The values used for this analysis were discounted at a 3 percent rate as recommended by the U.S. DOT.

Next the social cost of carbon was converted from 2007 dollars to 2013 dollars using a CPI adjustment.[23] Finally, values beyond year 2050 were extrapolated using the compound annual growth rate (CAGR) from 2040 to 2050. The table below shows the low likely and high social costs of carbon for selected years as used for PRISM™ sensitivity analysis. Low and high values are derived from the same Interagency Working Group study, which reports a range for the social cost of carbon.

Table 20: Social Cost of Carbon at 3 percent Discounting (2013 $)

	2013	2020	2030	2040	2050
Social Cost of CO_2 Low	$12.36	$13.48	$17.98	$23.59	$29.21
Social Cost of CO_2 Likely	$38.20	$47.19	$57.30	$67.41	$78.65
Social Cost of CO_2 High	$60.67	$69.66	$82.02	$95.50	$107.86

Source: U.S. EPA, 2010; Parsons Brinckerhoff, 2014

For present value calculations, the social cost of carbon was discounted at a 3 percent discount rate, consistent with the US DOT's guidance.[24]

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[21] U.S. Environmental Protection Agency, Interagency Working Group on Social Cost of Carbon (2010), *Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866,* p.2., Table 19, (http://www.epa.gov/oms/climate/regulations/scc-tsd.pdf).

[22] U.S. Department of Transportation, *Tiger Benefit-Cost Analysis (BCA) Resource Guide*, p.6. (http://www.dot.gov/tiger/docs/tiger-12_bca-resourceGuide.pdf)

[23] U.S. Bureau of Labor Statistics. Consumer Price Index, All Urban Consumers, U.S. City Average, Motor Fuel. Series CUUR0000SETB. 1982-1984=100, 2010=239.178; 2011=302.619.

[24] U.S. Department of Transportation (2011), *Tiger Benefit-Cost Analysis (BCA) Resource Guide*, p.7-9. (http://www.dot.gov/tiger/docs/tiger-12_bca-resourceGuide.pdf)

Noise Pollution

Reducing VMT, creates environmental benefits to society in the form of noise reduction. On a per-VMT basis, these values were estimated based on a Federal Highway Administration cost allocation study report.[25]

The high and low values for the cost of urban automobile noise are calculated as +/- 10 percent of the likely case. As the likely cost of rural automobile noise is so low (one one hundredth of a cent), reducing it to arrive at a low value would not yield a meaningful figure. Therefore, in this case the low and likely values are the same. Similarly a 10 percent increase of such a small number would not be significant and the likely value was doubled to create the high value.

When calculating the impact of truck noise, the 40 kip[26] 4-axle single unit trucks were used for the low value, 60 kip 4-axle single unit trucks for the likely value and 60 kip 5-axle combination units for the high case.

An urban/rural split of 100 percent to 0 percent was used to create a weighted average of the FHWA values for those environments. All values were adjusted from the study's 2000 values to 2013 dollars using a CPI adjustment.[27] See Table 21 for the range of values used in the PRISM™ sensitivity analysis

Table 21: Noise Costs, Auto and Truck, 100-0 Urban-Rural Split, 2013 $

	Noise Costs per VMT Low	Noise Costs per VMT Likely	Noise Costs per VMT High
Auto	0.0012	0.0012	0.0024

Source: FHWA, Parsons Brinckerhoff, 2014

State of Good Repair

As with noise pollution, reductions in VMT lead to societal benefits in the form of reduced costs of pavement damage. Fewer vehicle-miles lead to a lower need of maintenance on roads. The per-mile costs of these values were estimated based on the same Federal Highway Administration cost allocation study report that reported estimations of the cost of noise pollution.[28]

[25] Federal Highway Administration, *Addendum to the 1007 Federal Highway Cost Allocation Study,* Table 13. (http://www.fhwa.dot.gov/policy/hcas/addendum.htm).

[26] A kip is a unit of mass, equal to 1,000 pounds, i.e. one half of a short ton and is used as a unit of deadweight to compute shipping charges.

[27] Bureau of Labor Statistics, Consumer Price Index, All Urban Consumers, US City Average, All Items, Series CUSR0000SA0.

[28] Federal Highway Administration, *Addendum to the 1007 Federal Highway Cost Allocation Study,* Table 13. (http://www.fhwa.dot.gov/policy/hcas/addendum.htm).

When calculating the impact of truck pavement maintenance effects, the 40 kip[29] 4-axle single unit trucks were used for the low value, 60 kip 4-axle single unit trucks for the likely value and 60 kip 5-axle combination units for the high case.

The high and low values for the cost of urban automobile pavement maintenance effects are calculated as +/- 10 percent of the likely case.

As the likely cost of rural automobile pavement damage is so low (one one hundredth of a cent), reducing it to arrive at a low value would not yield a meaningful figure. Therefore, in this case the low and likely values are the same. Similarly a 10 percent increase of such a small number would not be significant and the likely value was doubled to create the high value.

The same urban/rural split used in the noise pollution calculations of 100 percent to 0 percent were used to create a weighted average of the FHWA values. All values were adjusted from the FHWA study's 2000 values to 2013 dollars using a CPI adjustment.[30] See Table 21 for the range of values used in the PRISM™ sensitivity analysis

Table 22: State of Good Repair Values, Auto and Truck, 100-0 Urban-Rural Split, 2013 $

	Pavement Damage Cost per VMT Low	**Pavement Damage Cost per VMT Likely**	**Pavement Damage Cost per VMT High**
Auto	0.0012	0.0012	0.0024

Source: FHWA, Parsons Brinckerhoff, 2014

[29] A kip is a unit of mass, equal to 1,000 pounds, i.e. one half of a short ton and is used as a unit of deadweight to compute shipping charges.

[30] Bureau of Labor Statistics, Consumer Price Index, All Urban Consumers, US City Average, All Items, Series CUSR0000SA0.

Livability

Active Life Style Benefits

Increases in physical activity are linked to improved health. This improved health, in turn, produces societal benefits in two ways. First, the individual experiences private benefits from an extended life expectancy, reductions in certain diseases such as heart disease and type II diabetes, and the medical expenses the individual will pay. Further, there are external benefits from the improved health of the individual because of reduced costs in subsidized medical care, emergency room visits, and marginal reductions group health insurance rates. These benefits are realized by all adult cyclists commuter and recreational.

Using the median value of 10 different studies the NCHRP report on assessing the benefits of bicycle facilities found the annual benefits value for cycling to be $128 (2013 $).[31]

Table 23: Annual Health Benefits (2013 $)

Category	Low	Likely	High
Cycling Health Benefits	$115	$128	$141

Source: Victoria Transportation Policy Institute, 2011, Parsons Brinckerhoff, 2014

[31] The NCHRP study found commuter shares greater than 3 percent to be unusually high. NCHRP Report 552 Guidelines for Analysis of Investments in Bicycle Facilities, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf

Economic Costs Included and Assumptions

In the benefit-cost analysis, the term "cost" refers to the additional resource costs or expenditures required to implement, and maintain the investments associated with the project.

The BCA uses project costs that have been estimated for the project on an annual basis. All costs are reported in real 2013 dollars.

Initial Project Investment Costs

Initial project investment costs include engineering and design, construction, real estate services, vehicles, other capital investments, and contingency factors. The overall cost of the Project is expected to be $4.7 million in undiscounted 2013 dollars through 2018. At a 7 percent discount rate, the total costs are $3.9 million, while at a 3 percent discount rate the total costs are $4.3 million.

These costs were reported by SANBAG and included costs beginning in 2015 and ending in 2018. The facility is expected to be operational in 2019.

Annual Operating and Maintenance Costs

It was determined that O&M costs for this project are negligible and this are not included in this analysis

Key Benefit-Cost Evaluation Measures

The benefit-cost analysis converts potential gains (benefits) and losses (costs) from the Project into monetary units and compares them. The following three common benefit-cost evaluation measures are included in this BCA.

Net Present Value (NPV): NPV compares the net benefits (benefits minus costs) after being discounted to present values using the real discount rate assumption. The NPV provides a perspective on the overall dollar magnitude of cash flows over time in today's dollar terms.

Benefit Cost (B/C) Ratio: The evaluation also estimates the benefit-cost ratio; the present value of incremental benefits is divided by the present value of incremental costs to yield the benefit-cost ratio. The B/C ratio expresses the relation of discounted benefits to discounted costs as a measure of the extent to which a project's benefits either exceed or fall short of their associated costs.

Sensitivity Analysis

To test the robustness of the estimated NPV, and B/C ratio, the economic analysis runs PRISM™ sensitivity analysis simulations using the ranges of valuations already discussed.

Benefit-Cost Analysis Results

Results in Brief

There were two "Cases" conducted for this analysis. Case A assumes a 7.0 percent discount rate, and Case B assumes a 3.0 percent discount rate, as prescribed by the U.S. DOT.

- For the Case A at a 7 percent discount rate, the proposed project investments yield a net present value of $54.7 million, and a benefit-cost ratio of 15.16.
- For the Case B at a 3 percent discount rate, the proposed project investments yield a net present value of $112.0 million, and a benefit-cost ratio of 26.94.

Table 24 presents the evaluation results for the two cases. All benefits and costs were estimated in constant 2013 dollars over an evaluation period extending 30 years beyond system completion in 2019.

Table 24: Benefit Cost Analysis Summary Results

Scenario	Net Present Value (2013 $ millions disc.)	Benefit Cost Ratio
Case A (7 percent discount rate)	$54,709,166	15.13
Case B (3 percent discount rate)	$112,047,478	26.94

Benefits by Category

Table 25 below outlines the changes in the impact categories.

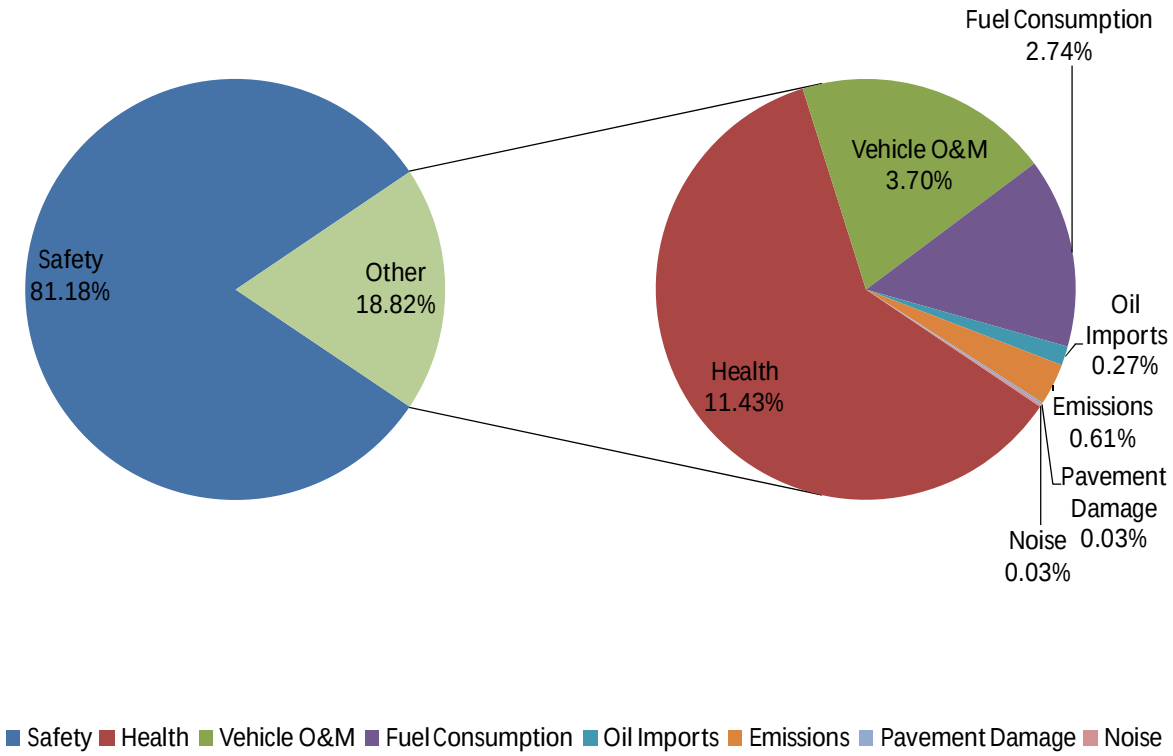
Table 25: Project Impacts

Category	Quantity
Average Annual Commuters	▲ 246
Average Annual Cyclists	▲982
Vehicle Miles Traveled	▼49,650,154
Gallons of Fuel Consumed	▼1,570,240
Non Fatal Safety Incidents	▼1,497
CO2 Emissions (tons)	▼17,401

Source: Parsons Brinckerhoff, 2014

Over the 30-year analysis period, there are $58.6 million in benefits (in 7% discounted 2013 dollars) and $116.4 million in benefits (in 3% discounted 2013 dollars). In present value dollars, safety benefits are $47.6 million, fuel consumption $1.6 million, non-fuel vehicle O&M benefits $2.2 million, mobility benefits constitute approximately $5.7 million and health benefits are $1.2 million both discounted at 7%.

Figure 1: Cumulative Benefits by Category



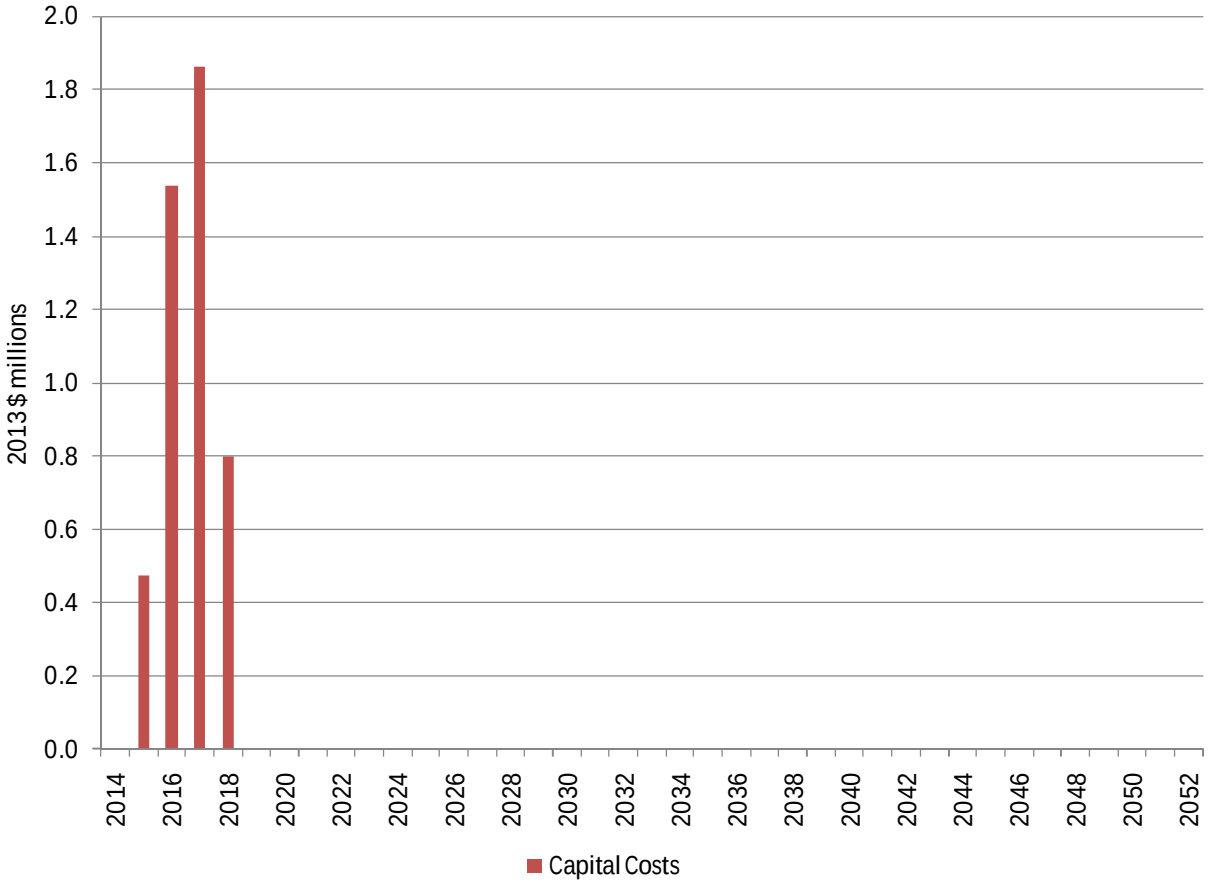
Source: Parsons Brinckerhoff 2014

Costs over Time

Figure 2 presents the capital expenditures over time, expressed in constant 2013 dollars before discounting. The capital investments ($4.7 million) were assumed to begin in 2015 and conclude by the end of 2018. These capital costs translate to $3.9 million when discounted at 7 percent and $4.3 million when discounted at 3 percent

Annual O&M costs over the economic evaluation period were deemed negligible and thus were not included in this analysis.

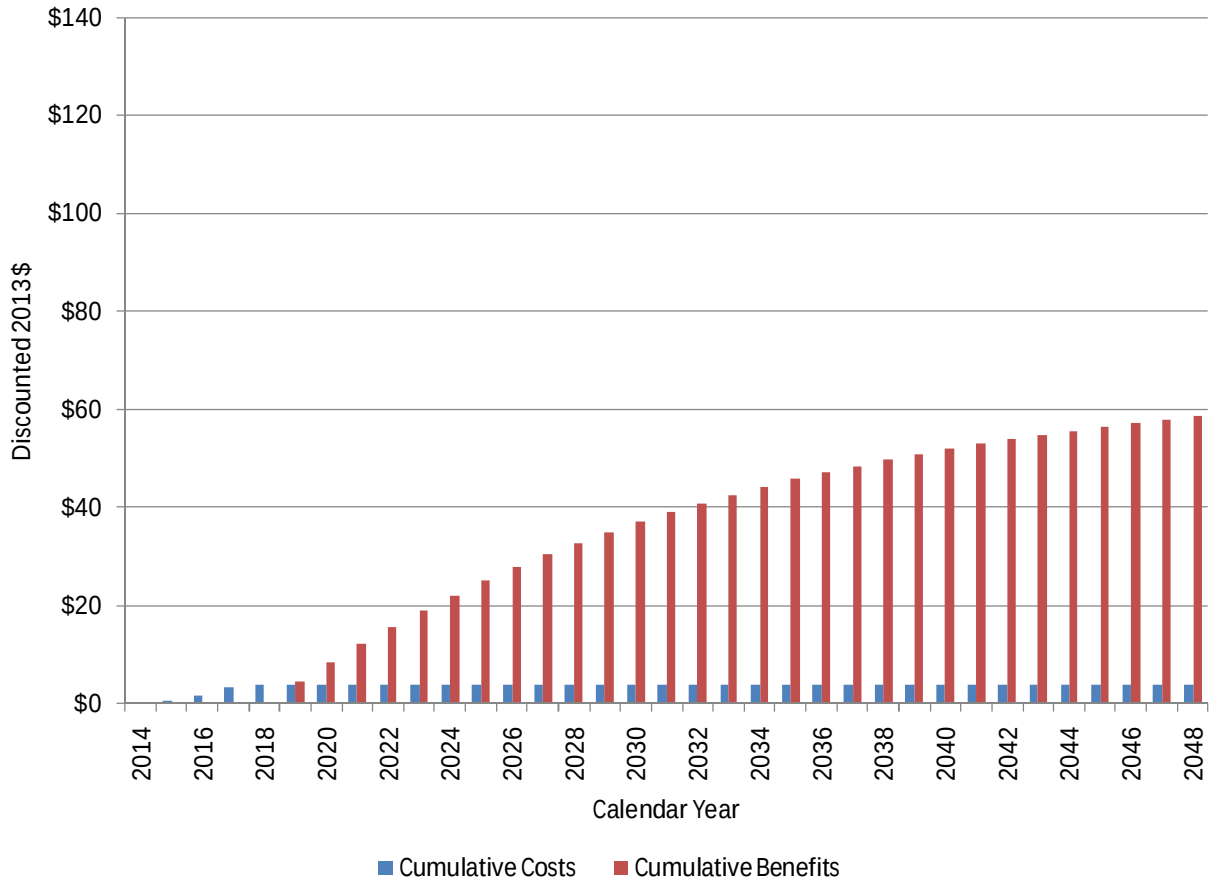
Figure 2: Capital and Rehabilitation Expenditures in 2013 Dollars Before Present Value Discounting



Cumulative Benefits and Costs

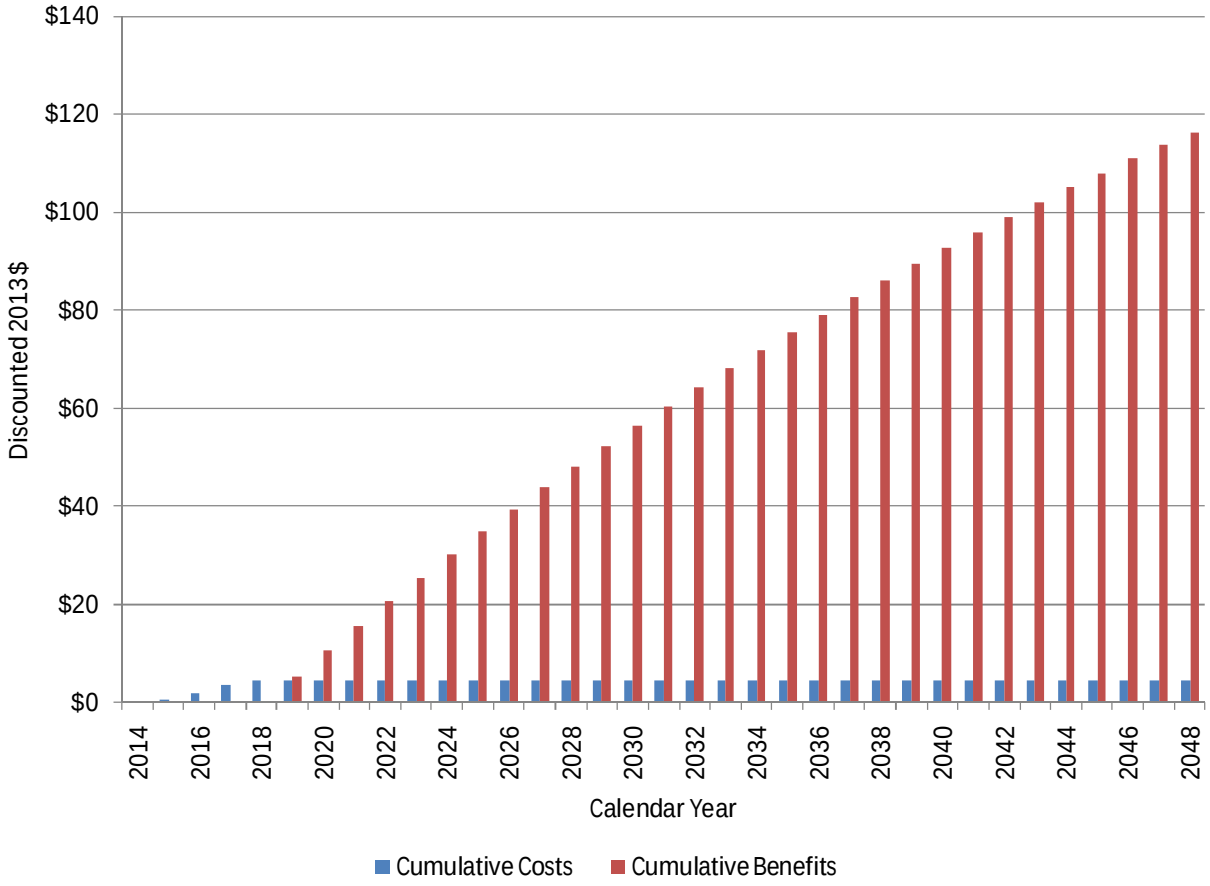
Figure 3 and Figure 4 compare the cumulative present value of benefits with the cumulative present value of costs over time for both cases. The figure shows that the cumulative discounted benefits exceed the cumulative discounted costs by mid 2024 with a 7 percent discount rate, and by mid 2023 with a 3 percent discount rate.

Figure 3: Cumulative Benefits and Costs in 2013 Dollars (Discounted at 7 percent)



Source: Parsons Brinckerhoff, 2014

Figure 4: Cumulative Benefits and Costs in 2013 Dollars (Discounted at 3 percent)



Source: Parsons Brinckerhoff, 2014

Assumption	Source
Analysis Period – 30 years	US DOT Guidance[1]
Discount Rates – 3 and 7 percent	US DOT Guidance[2]
Annualization Factor Commuters 260, Non-Commuters 300	Generally Accepted Practice
Length of facility – 8.72 miles	SANBAG
Number of Induced Cyclists	NCHRP 522[2]
Average Vehicle Occupancy – 1.35	SANBAG
Fuel Efficiency (miles per gallon) and Fuel Cost	EIA[3]
Oil Import Quantity and Cost	NHTSA[4]
Safety Incidents Quantity/Rate	SANBAG and NHTSA[5]
Value of Safety Incidents	Office of the Secretary of Transportation[6]
Emissions Rates and Values	CalTrans B/C[7], NHTSA[8] and EPA[9]
Value of Noise	Federal Highway Administration[10]
Value of Pavement Damage	Federal Highway Administration[11]
Value of Health Impacts	NCHRP 522[12]

[1] OMB Circular A-4
[2] NCHRP Report 552 Guidelines for Analysis of Investments in Bicycle Facilities, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf
[3] Energy Information Administration. (2013). Annual Energy Outlook 2013. *Transportation Sector Key Indicators and Delivered Energy Consumption & Components of Selected Petroleum Product Prices,* (http://www.eia.gov/oiaf/aeo/tablebrowser/)
[4] National Highway Traffic and Safety Administration. (2009). Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Final Regulatory Impact Analysis, p.viii-22 – viii-27.
[5] National Highway Traffic Safety Administration (2002*), The Economic Impact of Motor Vehicle Crashes, 2000,* p. 62, Table 3.
[6] Office of the Secretary of Transportation, *Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses* (2013 update)
[7] California Department of Transportation. (2009). California Life-cycle Benefit/Cost Analysis Model, Technical Supplement to User's Guide (Vol. 3). Sacramento: California Department of Transportation.
[8] National Highway Traffic and Safety Administration (March 2010), *Corporate Average Fuel Economy for MY2012-MY2016 Passenger Cars and Light Trucks*, page 403, Table VIII-8, "Economic Values for Benefits Computations (2007 Dollars)", http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/CAFE_2012-2016_FRIA_04012010.pdf
[9] U.S. Environmental Protection Agency, Interagency Working Group on Social Cost of Carbon (2010), *Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866,* p.2., Table 19, (http://www.epa.gov/oms/climate/regulations/scc-tsd.pdf).
[10] Federal Highway Administration, *Addendum to the 1007 Federal Highway Cost Allocation Study,* Table 13. (http://www.fhwa.dot.gov/policy/hcas/addendum.htm).
[11] Ibid
[12] NCHRP Report 552 Guidelines for Analysis of Investments in Bicycle Facilities, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf

APPENDIX A - PRISM™ Sensitivity Analysis

By using PRISM™ sensitivity analysis simulations on both the valuations and impacts it is able to create a range for both the NPV and B/C ratio. Table 26 reports these ranges at the 7 percent and 3 percent discount rates.

Table 26: NPV (2013 $ millions) and B/C ratio at 7% and 3% discount rates

Case	Low	Likely	High
Case A (7 percent discount rate)			
B/C-Ratio	9.29	15.13	20.63
Net Present Value	$32,075,668	$54,709,166	$75,995,326
Case B (3 percent discount rate)			
B/C Ratio	16.55	26.94	36.72
Net Present Value	$67,147,309	$112,047,478	$154,258,854

APPENDIX B – Caltrans BC Model

The Economic Analysis Branch of the California Department of Transportation (Caltrans) has developed a spreadsheet model called Cal-B/C to facilitate Benefit Cost Analyses. The tool is designed to analyze a variety of highway construction projects and operational improvement projects as well as some Intelligent Transportation System and transit projects.[32]

The Cal-B/C tool was used to analyze the SANBAG ATP project in addition to PRISM™. However as the CAL B/C tool is not designed to consider projects focused on non-motorized traffic the analysis omits benefit related to bicycle mobility and health. There are several other differences between the Cal-B/C tool and PRISM™.

The benefit categories that are calculated by the tool are changes in: travel time, vehicle operating costs, accidents, and emissions. Additional, categories included in PRISM™ but not Cal-B/C are: oil imports, pavement damage and noise.

The values assigned to the benefit categories also differ between the two models. The assumptions in PRISM™ are detailed in the body of this report. For more information on the values and methodology used in Cal-B/C see their Technical Supplements Volumes 1 though 3[33].

Cal-B/C makes internal assumptions concerning the auto/truck split where as PRISM™ assumed that all the VMT removed were automobiles. This is because of the purpose of the relevant trips, i.e. commuting.

Also, Cal-B/C only calculates safety benefits for a specific subset of projects: Freeway Connections, HOV Connections, HOV Drop Offs, Off Ramps and On Ramps. For the tool to calculate a B/C ratio each of those project types requires specific input data that is not relevant the SANBAG ATP project. Thus, in order for the tool to report safety benefits for the project it was necessary to override the project type restrictions. The results with and without the safety benefits are reported below.

Finally Cal-B/C can only perform a 20 year analysis and is set up to use a 4 percent discount rate. PRISM™ assumes a default analysis period of 30 year and to use discount rates of 3 and 7 percent.

The reduction in vehicles, reduction in VMT, accident rates and speeds that were used in the Cal-B/C model are the same as those used in PRISM™.

The results of the Cal-B/C analysis are reported in Table 27 and Table 28.

[32] CalTrans Life-Cycle Benefit-Cost Analysis Model
http://www.dot.ca.gov/hq/tpp/offices/eab/LCBC_Analysis_Model.html
[33] Ibid

Table 27: Cal-B/C Benefits and Costs (2013 $) Discounted at 4% over 20 Years

	Without Safety Benefits	With Safety Benefits
Benefits		
Travel Time Savings	-	-
Vehicle Operating Cost Savings	$21,046,913	$21,046,913
Accident Cost Savings	-	$5,756,646
Emission Cost Savings	$2,511,041	$2,511,041
TOTAL BENEFITS	**$26,020,116**	**$29,314,600**
Costs		
TOTAL COSTS	**$4,390,069**	**$4,390,069**

Source: Cal-Trans B/C

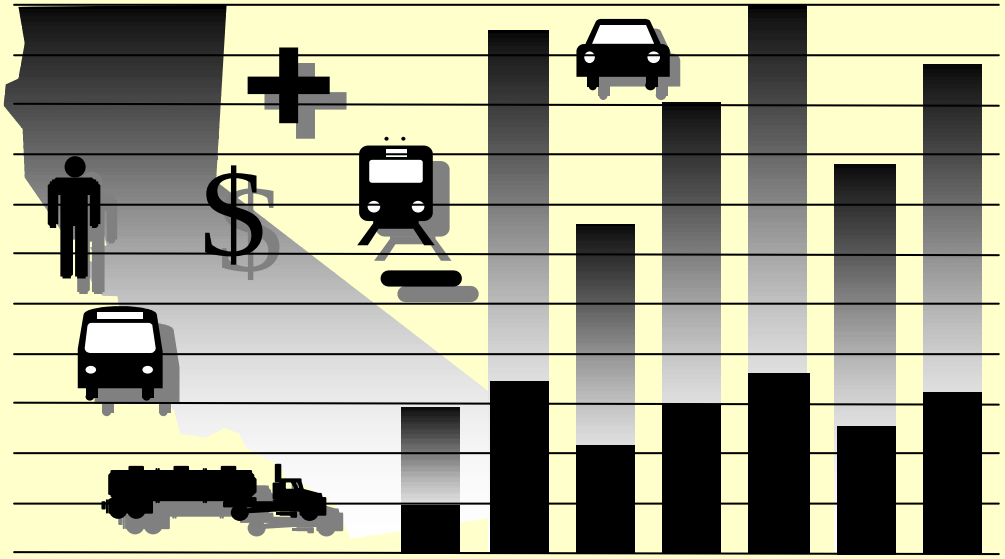
Table 28: Cal-B/C NPV (2013 $ millions) and B/C Ratio, Discounted at 4%, over 20 years

	Without Safety Benefits	With Safety Benefits
B/C-Ratio	5.93	6.68
Net Present Value	$21,630,047	$24,924,531

Source: Cal-Trans B/C

California Department Of Transportation

California Life-Cycle Benefit/Cost Analysis Model (Cal-B/C) Version 5.0



Office of Transportation Economics
Division of Transportation Planning

February 2012

For questions and comments, please contact:

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CALIFORNIA LIFE-CYCLE BENEFIT/COST ANALYSIS MODEL (CAL-B/C)

INTRODUCTION

This spreadsheet model provides a method for preparing a simple economic analysis of both highway and transit projects. Given certain input data for a project, the model calculates its life-cycle costs, life-cycle benefits, net present value, benefit/cost ratio, internal rate of return, and payback period. Annual benefits are also calculated.

The model is arranged by worksheets and contains the following information, data, and results:

Worksheets	Contents
Instructions	General model description and assumptions
1) Project Information	Project input data
2) Model Inputs	Highway speed, volume, accident data, and trips estimated by model
3) Results	Summary results of analysis
Travel Time	Calculation of travel time and induced demand impacts
Vehicle Operating Costs	Calculation of highway vehicle operating cost impacts
Accident Costs	Calculation of accident cost impacts
Emissions	Calculation of emission impacts
Final Calculations	Calculation of net present value, internal rate of return, and payback period
Parameters	Economic assumptions, lookup tables, and other model parameters

The model is designed so that the user generally needs to enter data only in the green boxes on the Project Information worksheet. The model estimates detailed highway speed, volume, and accident data for the user to review on the Model Inputs worksheet. Highway speeds are estimated from volumes using relationships found in the Highway Capacity Manual. Other adjustments are made for weaving and pavement conditions. An option is also available to conduct a simple queuing analysis. Accidents are estimated from statewide averages and recent data for the facility. If available, inputs from regional planning or traffic simulation models can be entered to override model calculations. Summary results are shown in Results worksheet.

The remaining worksheets are provided for the user to see, but model performs calculations automatically. Some projects (i.e., bypasses, interchanges, and connectors) require the user to enter two sets of highway data, since two roads are involved. The model calculates benefits for the first road before the user enters information about the second road. The user clicks a button and the model clears the Project Information worksheet to receive information on the other road.

In the process of economic analysis, some generally accepted economic assumptions are necessary. These assumptions include: the real and nominal discount rates, unit user costs (e.g., value of time), consumption rates (e.g., fuel consumption and vehicle emissions), and accident rates. These assumptions are given in the Parameters worksheet and should not be changed by the user.

After reading the instructions in this worksheet, the user should proceed to the Project Information worksheet and input data for the specific project in the green boxes (light gray when printed). The model provides default values in the red boxes (medium gray when printed). These values can be changed by the user, if information specific to the project is available. The model calculates some values based on relationships or assumptions, with results shown in the blue boxes (dark gray when printed). These values can be changed by the user.

INSTRUCTIONS

The user can analyze most projects simply by entering limited data on the Project Information Sheet and getting results on the Results page. The Model Inputs page allows the user to enter more detailed data adjust estimated speeds, volumes, and accidents rates, and check the number of trips estimated for projects that affect vehicle occupancy.

PROJECT DATA (Box 1A)

This section provides general information about the project and is used for highway, rail, and transit projects. At the top of the sheet, the user can enter information about the project, such as the project name, Caltrans district, and funding information.

Type of Project

1 Please select the appropriate type of highway, rail, or transit project from the pull-down menu. The menu appears if user clicks on the green box next to the project type.

For a bypass or intersection project, model reminds user that information must be entered for both roads impacted by project. After entering information for the first road, the user clicks a button at bottom of the worksheet to prepare model for data on the bypass or intersecting road. The user may also enter information for connector projects involving two roads.

Project Location

2 Insert a 1, 2, or 3 for the appropriate region of California. This information is used to estimate peak traffic and emissions benefits.

Length of Construction Period

3 Insert the number of construction years before benefits begin. This must be a whole number (round to next higher integer).

One- or Two-Way Data

4 Indicate whether Highway Design and Traffic Data to be entered in Box 1B is for a single direction or both directions of highway.

Length of Peak Period(s)

5 Insert the number of peak period hours per typical day. The model provides a default of 5 hours (statewide average). Model estimates total % daily traffic occurring during peak period using a lookup table developed from Traffic Census data. Model does not distinguish between weekdays and weekends.

To model a 24-hour HOV or HOT lane, enter 24 hours so peak is 100% of ADT. To model a ramp metering project, user should enter the number of hours per day that metering is operational.

HIGHWAY DESIGN AND TRAFFIC DATA (Box 1B)

Highway design and traffic data must be entered for highway projects. Enter data consistent with one- or two-way answer in Box 1A. Statewide default values are provided for some inputs.

Highway Design

6 **Roadway Type:** Indicate if the road is a freeway, expressway, or conventional highway in build and no build cases.

7 **Number of General Traffic Lanes:** Insert number of general purpose (not HOV or bus) lanes in both directions for build and no build cases. Enter data consistent with Box 1A.

8 **Number of HOV Lanes:** Insert number of HOV lanes in both directions for the build and no build cases. A value must be provided if an HOV restriction is entered on the next row.

9 **HOV Restriction:** If highway facility has/will have HOV lanes, enter the HOV restriction (e.g., 2 means 2 people per vehicle). Must be entered for an HOV project. Enter for a non-HOV project, if facility has HOV lanes. Changes in HOV restrictions are special project types and handled automatically by model.

10 **Exclusive ROW for Buses:** If bus project, indicate (with "Y" or "N") whether buses have exclusive right-of-way. This information is used to estimate emissions.

11 **Highway Free-Flow Speed:** Insert free-flow speed for build and no build cases. Model assumes build is same as no build, if not entered.

12 **Ramp Design Speed:** If auxiliary lane or off-ramp project, enter the design speed of the appropriate on- or off-ramp. This is used to estimate the speed of traffic affected by weaving.

13 **Highway Segment:** Insert segment length for build and no build cases. Model assumes build is same as no build, if not entered.

14 **Impacted Length:** The model estimates an area affected by the project. In most cases, this equals the segment length. For passing lane projects, the default affected area is 3 miles longer than the project area. For auxiliary lane and off-ramp projects, the default affected area is 1500 feet. For connectors and HOV drop ramps, default affected area is 3250 feet. User can change these lengths.

Average Daily Traffic (ADT)

15 **Current:** For most projects, insert current two-way ADT on facility. For operational improvements, enter only the one-way ADT applicable to the project. Enter data consistent with one-way or two-way answer in Box 1A.

16 **Forecast (Year 20):** Insert projected ADT for 20 years after construction completion for build and no build cases. Model assumes build is same as no build, if not entered.

The model uses the current and forecasted ADT to estimate annual traffic for 20 years after construction, assuming a linear trend. User can change base (Year 1) forecasts.

Average Hourly HOV/HOT Lane Traffic

17 Insert hourly HOV/HOT volumes for build and no build cases in a typical peak hour.

Percent Traffic in Weave

18 For operational improvements, insert % traffic affected by weaving. Model suggests a % based on the type of project (2 right lanes for auxiliary lanes, 3 right lanes for off-ramps, 2.5% of all traffic for freeway connectors, and 4% of HOV traffic for HOV connectors and drop ramps). Users can change values for project conditions.

Percent Trucks

19 Insert estimated % of ADT comprised of trucks in build and no build cases. Model provides a default value (statewide average).

Truck Speed

20 If passing lane project, enter estimated speed (in MPH) for slow vehicles (trucks, recreational vehicles, etc.). Values must be entered for passing lane projects.

On-Ramp Volume

21 **Hourly Ramp Volume:** If auxiliary lane or on-ramp widening project, insert average hourly ramp volume to estimate traffic affected by weaving for auxiliary lanes and metering effectiveness for on-ramp widening. No entry needed for ramp metering projects.

22 **Metering Strategy:** If on-ramp widening project, enter 1, 2, or 3 for vehicles allowed per green signal. Enter "D" for dual metering. No entry should be made for ramp metering projects.

Queue Formation

23 **Arrival Rate:** For queuing and rail grade crossing projects, enter vehicles per hour contributing to queue. Arrival rate should be estimated only for time queue grows. Model estimates queue dissipation automatically.

24 **Departure Rate:** For queuing and rail crossing projects, enter vehicles per hour leaving queue.

Pavement Condition (for Pavement Rehab. Projects)

25 If pavement rehabilitation project, enter base (Year 1) International Roughness Index (IRI) for build and no build. Model will calculate Year 20 values using standard parameters unless entered by user.

Average Vehicle Occupancy (AVO)

26 Model provides default values. The figures change automatically, depending on presence of HOV lanes. Adjust if project-specific data are available.

HIGHWAY ACCIDENT DATA (Box 1C)

Statewide default values are provided for transit projects. The model uses information provided to calculate accident rates for each accident type in the Model Inputs worksheet.

Actual 3-Year Accident Data (from Table B)

27 Insert the total number of fatal, injury, and property damage only accidents on the segment over the 3 most recent years. For rail grade crossing projects, enter 10-year accident data from FRA WBAPS in fatal and injury rows and collision prediction in total accident row.

Statewide Basic Average Accident Rate

28 Insert statewide average accident rates per million vehicle-miles (or million vehicles, as appropriate) for build and no build highway rate groups. Include Base Rate and ADT Factor where applicable.

29 Insert statewide % of accidents that are fatal and injury accidents for road classifications similar to build and no build facilities.

The model uses adjustment factors (the ratio of actual rates to statewide rates for existing facility) to estimate accident rates by accident type for the new road classification. Additional adjustments (accident savings) are made for highway TMS projects. Results are presented in the Model Inputs worksheet and can be changed by the user.

RAIL AND TRANSIT DATA (Box 1D)

This section is used for rail and transit projects only.

Annual Person-Trips

30 **Base (Year 1):** Insert estimated annual transit person-trips for first year after construction completion in build and no build cases. For a transit TMS project, enter only person-trips on routes affected. If the routes are substantially different, the benefits analysis should be split into pieces.

31 **Forecast (Year 20):** Insert forecasted annual transit person-trips for 20 years after construction completion in build and no build cases.

Percent Trips during Peak Period

32 Insert % annual person-trips that occur during peak period.

Percent New Trips from Parallel Highway

33 Insert % new transit person-trips originating on parallel highway.

Annual Vehicle-Miles

34 **Base (Year 1):** Insert estimated annual vehicle-miles for first year after construction completion in build and no build cases. For passenger rail projects, multiply the number of train-miles by the average number of rail cars per train consist.

35 **Forecast (Year 20):** Insert forecasted annual vehicle-miles for 20 years after construction completion in build and no build cases.

Average Vehicles per Train

36 If passenger rail project, insert the average number of rail cars per train consist. This is used to calculate emissions.

Reduction in Transit Accidents

37 If project affects transit/rail safety, insert estimated percent accident reduction due to project. Increases should be entered as negative %.

Average Transit Travel Time

38 **In-Vehicle:** Insert average in-vehicle transit travel time in minutes during peak and non-peak periods in build and no build cases. For TMS Projects, insert the average for all transit routes impacted. Model assumes build is same as no build for most projects. Signal priority and bus rapid transit projects reduce time. User can adjust build travel times.

39 **Out-of-Vehicle:** Insert average out-of-vehicle transit travel time in minutes during peak and non-peak periods. Model monetizes out-of-vehicle travel time at a higher value.

Highway Grade Crossing

40 **Annual Number of Trains:** Insert annual number of passenger and freight trains entering highway-rail crossing.

41 **Average Gate Down Time:** Insert average time per train that crossing gate is down for passenger and freight trains.

Transit Agency Costs (for Transit TMS Projects)

42 **Annual Capital Expenditure:** If transit TMS project, insert annual agency capital expenditures for routes impacted by project. Model calculates cost reductions for expenditures in build case due to transit TMS. Agency cost savings are entered automatically as a negative cost in Box 1E.

43 **Annual Ops. and Maintenance Expenditure:** If transit TMS project, insert the annual average operating and maintenance costs for routes impacted by project. Model calculates cost reductions for expenditures in build case due to transit TMS. Agency cost savings are entered automatically as a negative cost in Box 1E.

PROJECT COSTS (Box 1E)

Net project costs should be entered in the years they are expected to occur. Costs should be entered for construction period and for twenty years after construction completion. Construction Year 1 is the first year that costs are incurred. All costs should be entered in thousands of dollars.

44 Insert project's initial costs in constant (Year 2007) dollars for project development, right-of-way, and construction. The number of construction years with costs should equal the length of the construction period (Box 1A, Input 5).

45 Insert estimated future incremental maintenance/operating and rehabilitation costs in constant (Year 2007) dollars. These figures should be entered in the years after the project opens.

46 Insert estimated mitigation costs (e.g., wetlands, community, and sound walls) in constant (Year 2007) dollars during construction and for 20 years after construction completion.
47 Model adds agency cost savings due to transit TMS automatically.
48 Insert any other costs not already included.

HIGHWAY SPEED AND VOLUME INPUTS (Box 2A)

This section allows user to review detailed speed and volume data estimated by the model. These values are estimated from the inputs provided in the Project Information sheet.

49 User may enter new speed and volume data for the highway in the green boxes to override model calculations, if detailed data are available from a travel demand or micro-simulation model. The model estimates speeds and volumes on highway for HOVs, non-HOVs, weaving vehicles, and trucks during the peak and non-peak periods in Year 1 and Year 20 in build and no build cases. Speeds are estimated using a BPR curve (or queuing analysis). Adjustments are made to speed and volumes to account for weaving, transit mode shifts, pavement condition, and TMS.
50 If TMS project and detailed simulation data are available, the highway results should be inputted in the green cells. Model will use the data in place of figures estimated by the model.

HIGHWAY ACCIDENT RATES (Box 2B)

User may adjust accident rates calculated by the model. User may also enter TASAS highway accident data for rail grade crossing projects in this box.

51 **No Build:** Fatality, injury and PDO accident rates for no build facility are estimated using inputs from Box 1C of the Project Information sheet. User may change these rates in green boxes.
52 **Highway Safety or Weaving Improvement:** Model assumes an overall safety improvement for off-ramp and ramp metering projects. User may adjust this percentage. For safety projects, user should enter collision reduction factor from HSIP Guidelines.
53 **Adjustment Factor:** User may change the ratios of facility accident rates to statewide averages used in calculating rates for the build facility. These factors are also adjusted by the collision reduction factor.
54 **Build Facility:** User may modify the fatality, injury, and PDO accident rates for build facility. Model estimates these accident rates using statewide average rates and the adjustment factors.

RAMP AND ARTERIAL INPUTS (Box 2C)

This section allows users to enter detailed arterial information for an arterial signal management project or detailed ramp and arterial data for a highway TMS project.

55 **Detailed Information Available:** Input "Y" if detailed arterial and/or ramp data are available. Model automatically selects "Y" if other data are inputted. User should enter detailed ramp and arterial data for TMS highway project if detailed highway data are entered in Box 2A.
56 **Aggregate Segment Length:** Input the total segment lengths for the ramps and arterials. These can be estimated from travel demand or micro-simulation model data as VMT/total trips.
57 User may enter speeds and volumes on ramps and arterials during peak and non-peak periods in Year 1 and Year 20 in build and no build cases. If arterial signal management project, user must enter arterial data. Benefits are estimated assuming all vehicles are automobiles.

ANNUAL PERSON-TRIPS (Box 2D)

This section is for information purposes only. It allows user to examine number trips estimated for projects that affect AVO (e.g., HOT lane and HOV conversions).

NEXT STEPS

58 For bypass, interchange, and connector projects, click button on Project Information page after data are verified for the first road. Enter data for the second road in Boxes 1B and 1C. As with the first road, detailed data may be verified on Model Inputs page. Model prompts user to save interim version of analysis before proceeding.
59 Summary results are available immediately in the Results worksheet.

District: 8

PROJECT: SANBAG ATP

EA:
PPNO:

1A PROJECT DATA

Type of Project		
Select project type from list	General Highway	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	1	
Length of Construction Period	4	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	5	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		C	C
Number of General Traffic Lanes		2	2
Number of HOV/HOT Lanes		1	1
HOV Restriction (2 or 3)			
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		70	70
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	35
Length (in miles)	Highway Segment	30.0	30.0
	Impacted Length	30.0	30.0

Average Daily Traffic			
	Current	1,168	
		No Build	Build
	Base (Year 1)	1,168	833
	Forecast (Year 20)	1,300	925
Average Hourly HOV/HOT Lane Traffic			0
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			100%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		9%	9%
Truck Speed		50	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.30	1.30
	Peak	1.35	1.35
High Occupancy Vehicle (if HOV/HOT lanes)		2.15	2.15

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	31	0.81
Fatal Accidents (Fat)	1	0.03
Injury Accidents (Inj)	30	0.78
Property Damage Only (PDO) Accidents	0	0.00

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	1.48	1.48
Percent Fatal Accidents (Pct Fat)	0.6%	0.6%
Percent Injury Accidents (Pct Inj)	47.3%	47.3%

1D RAIL AND TRANSIT DATA

Annual Person-Trips		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Percent Trips during Peak Period		41%	
Percent New Trips from Parallel Highway			100%

Annual Vehicle-Miles		No Build	Build
	Base (Year 1)	5,312,815	3,790,512
	Forecast (Year 20)	5,915,905	4,220,796
Average Vehicles/Train (if rail project)			

Reduction in Transit Accidents	
Percent Reduction (if safety project)	

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

Model should be run for both roads for intersection or bypass highway projects, and may be run twice for connectors. Press button below to prepare model to enter data for second road. After data are entered, results reflect total project benefits.

Prepare Model for Second Road

Enter all project costs (in today's dollars) in columns 1 to 7. Costs during construction should be entered in the first eight rows.
Project costs (including maintenance and operating costs) should be net of costs without project.

1E

PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1			$474					$474,371	$474,371
2			1,540					1,540,082	1,480,848
3			1,865					1,864,993	1,724,291
4			799					799,283	710,560
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1								$0	$0
2								0	0
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
9								0	0
10								0	0
11								0	0
12								0	0
13								0	0
14								0	0
15								0	0
16								0	0
17								0	0
18								0	0
19								0	0
20								0	0
Total	$0	$0	$4,679	$0	$0	$0	$0	$4,678,729	$4,390,069

$$\text{Present Value} = \frac{\text{Future Value (in Constant Dollars)}}{(1 + \text{Real Discount Rate})^{\text{Year}}}$$

2A

HIGHWAY SPEED AND VOLUME INPUTS

	Calculated by Model	Changed by User	Used for Proj. Eval.	Reason for Change
No Build				
Year 1				
Peak Period				
HOV Volume	0		0	
Non-HOV Volume	436		436	
Weaving Volume	0		0	
Truck Volume	43		43	
HOV Speed	64.0		64.0	
Non-HOV Speed	55.0		55.0	
Weaving Speed	55.0		55.0	
Truck Speed	50.0		50.0	
Non-Peak Period				
Non-HOV Volume	627		627	
Weaving Volume	0		0	
Truck Volume	62		62	
Non-HOV Speed	70.0		70.0	
Weaving Speed	55.0		55.0	
Truck Speed	50.0		50.0	
Year 20				
Peak Period				
HOV Volume	0		0	
Non-HOV Volume	485		485	
Weaving Volume	0		0	
Truck Volume	48		48	
HOV Speed	64.0		64.0	
Non-HOV Speed	55.0		55.0	
Weaving Speed	55.0		55.0	
Truck Speed	50.0		50.0	
Non-Peak Period				
Non-HOV Volume	698		698	
Weaving Volume	0		0	
Truck Volume	69		69	
Non-HOV Speed	70.0		70.0	
Weaving Speed	55.0		55.0	
Truck Speed	50.0		50.0	
Build				
Year 1				
Peak Period				
HOV Volume	0		0	
Non-HOV Volume	311		311	
Weaving Volume	0		0	
Truck Volume	31		31	
HOV Speed	64.0		64.0	
Non-HOV Speed	55.0		55.0	
Weaving Speed	55.0		55.0	
Truck Speed	50.0		50.0	
Non-Peak Period				
Non-HOV Volume	447		447	
Weaving Volume	0		0	
Truck Volume	44		44	
Non-HOV Speed	70.0		70.0	
Weaving Speed	55.0		55.0	
Truck Speed	50.0		50.0	
Year 20				
Peak Period				
HOV Volume	0		0	
Non-HOV Volume	345		345	
Weaving Volume	0		0	
Truck Volume	34		34	
HOV Speed	64.0		64.0	
Non-HOV Speed	55.0		55.0	
Weaving Speed	55.0		55.0	
Truck Speed	50.0		50.0	
Non-Peak Period				
Non-HOV Volume	497		497	
Weaving Volume	0		0	
Truck Volume	49		49	
Non-HOV Speed	70.0		70.0	
Weaving Speed	55.0		55.0	
Truck Speed	50.0		50.0	

Model speed estimates based on Highway Capacity Manual, pavement research, and research on weaving impacts

2B

HIGHWAY ACCIDENT RATES

	Calculated by Model	Changed by User	Used for Proj. Eval.	Reason for Change
No Build				
Fatal Accidents	0.026		0.026	
Injury Accidents	0.78		0.78	
PDO Accidents	0.00		0.00	
Total Accidents	0.806			
Hwy Safety or Weaving Improvement		0%	collision reduction factor (per HSIP Guidelines)	
Adjustment Factor (Actual/Statewide Avg. Existing)				
Fatal Accidents	3.1114		3.1114	
Injury Accidents	1.1147		1.1147	
PDO Accidents	0.0000		0.0000	
Build				
Fatal Accidents	0.026		0.026	
Injury Accidents	0.78		0.78	
PDO Accidents	0.00		0.00	
Total Accidents	0.806			

2C

RAMP AND ARTERIAL INPUTS

(if detailed information is available for a TMS or an arterial signal management project)

Detailed Information Available? (y/n)	N	
Aggregate Segment Length (estimate as VMT/total volume)		
All Ramps		miles
Arterials		miles

	Entered by User	Used for Proj. Eval.	Source/Notes
No Build (Peak Period Only)			
Year 1			
Aggregate Ramp Volume		0	
Aggregate Arterial Volume		0	
Average Ramp Speed		5.0	
Average Arterial Speed		5.0	
Year 20			
Aggregate Ramp Volume		0	
Aggregate Arterial Volume		0	
Average Ramp Speed		5.0	
Average Arterial Speed		5.0	
Build (Peak Period Only)			
Year 1			
Aggregate Ramp Volume		0	
Aggregate Arterial Volume		0	
Average Ramp Speed		5.0	
Average Arterial Speed		5.0	
Year 20			
Aggregate Ramp Volume		0	
Aggregate Arterial Volume		0	
Average Ramp Speed		5.0	
Average Arterial Speed		5.0	

2D

ANNUAL PERSON-TRIPS

(for HOV and HOT lane projects that affect average vehicle occupancy)

	No Build	Build	Induced
Year 1			
Peak Period			
HOV Trips	0	0	
Non-HOV Trips	214,667	153,158	(61,509)
Truck Trips	15,727	11,220	(4,506)
Non-Peak Period			
Non-HOV Trips	297,470	212,235	(85,235)
Truck Trips	22,631	16,146	(6,485)
Total Trips	550,494	392,759	(157,735)
Year 20			
Peak Period			
HOV Trips	0	0	
Non-HOV Trips	239,035	170,126	(68,910)
Truck Trips	17,512	12,463	(5,048)
Non-Peak Period			
Non-HOV Trips	331,237	235,748	(95,490)
Truck Trips	25,200	17,935	(7,265)
Total Trips	612,984	436,272	(176,712)

District: 8

PROJECT: SANBAG ATP

EA:
PPNO:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$4.4
Life-Cycle Benefits (mil. $)	$29.3
Net Present Value (mil. $)	$24.9
Benefit / Cost Ratio:	6.68
Rate of Return on Investment:	33.2%
Payback Period:	2 years

ITEMIZED BENEFITS (mil. $)	Average Annual	Total Over 20 Years
Travel Time Savings	$0.0	$0.0
Veh. Op. Cost Savings	$1.1	$21.0
Accident Cost Savings	$0.3	$5.8
Emission Cost Savings	$0.1	$2.5
TOTAL BENEFITS	$1.5	$29.3
Person-Hours of Time Saved	0	0
CO_2 Emissions Saved (tons)	1,693	33,868
CO_2 Emissions Saved (mil. $)	$0.0	$0.6

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

C

SUMMARY OF TRAVEL TIME BENEFITS

Year	HIGHWAY								
	Peak HOV	Peak Non-HOV	Peak Weaving	Peak Truck	Peak Ramp	Peak Arterial	Non-Peak Non-HOV	Non-Peak Weaving	Non-Peak Truck
1	$0	$0	$0	$0	$0	$0	$0	$0	$0
20	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	$0	$0	$0	$0	$0	$0	$0	$0	$0
15	$0	$0	$0	$0	$0	$0	$0	$0	$0
16	$0	$0	$0	$0	$0	$0	$0	$0	$0
17	$0	$0	$0	$0	$0	$0	$0	$0	$0
18	$0	$0	$0	$0	$0	$0	$0	$0	$0
19	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

C

SUMMARY OF TRAVEL TIME BENEFITS (continued)

Year	TRANSIT Peak In-Vehicle	Peak Out-of-Veh	Non-Peak In-Vehicle	Non-Peak Out-of-Veh	Present Value of Travel Time Benefits	Constant Dollars	Total Per-Hrs of Time Saved
1	$0	$0	$0	$0	$0	$0	0
20	$0	$0	$0	$0	$0	$0	0
2	$0	$0	$0	$0	$0	$0	0
3	$0	$0	$0	$0	$0	$0	0
4	$0	$0	$0	$0	$0	$0	0
5	$0	$0	$0	$0	$0	$0	0
6	$0	$0	$0	$0	$0	$0	0
7	$0	$0	$0	$0	$0	$0	0
8	$0	$0	$0	$0	$0	$0	0
9	$0	$0	$0	$0	$0	$0	0
10	$0	$0	$0	$0	$0	$0	0
11	$0	$0	$0	$0	$0	$0	0
12	$0	$0	$0	$0	$0	$0	0
13	$0	$0	$0	$0	$0	$0	0
14	$0	$0	$0	$0	$0	$0	0
15	$0	$0	$0	$0	$0	$0	0
16	$0	$0	$0	$0	$0	$0	0
17	$0	$0	$0	$0	$0	$0	0
18	$0	$0	$0	$0	$0	$0	0
19	$0	$0	$0	$0	$0	$0	0
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**0**

C

SUMMARY OF VEHICLE OPERATING COST BENEFITS

Year	HIGHWAY								TRANSIT		Present Value of Veh Op Cost Benefits	Constant Dollars
	Peak HOV	Peak Non-HOV	Peak Weaving	Peak Truck	Peak Arterial	Non-Peak Non-HOV	Non-Peak Weaving	Non-Peak Truck	Peak Period	Non-Peak Period		
1	$0	$488,560	$0	$69,998	$0	$756,239	$0	$100,728	-	-	$1,415,525	$1,655,964
20	$0	$259,790	$0	$37,221	$0	$402,127	$0	$53,562	-	-	$752,700	$1,855,191
2	$0	$472,743	$0	$67,732	$0	$731,758	$0	$97,467	-	-	$1,369,700	$1,666,449
3	$0	$457,421	$0	$65,536	$0	$708,040	$0	$94,308	-	-	$1,325,306	$1,676,935
4	$0	$442,578	$0	$63,410	$0	$685,065	$0	$91,248	-	-	$1,282,301	$1,687,421
5	$0	$428,200	$0	$61,350	$0	$662,810	$0	$88,284	-	-	$1,240,643	$1,697,906
6	$0	$414,274	$0	$59,354	$0	$641,253	$0	$85,412	-	-	$1,200,294	$1,708,392
7	$0	$400,785	$0	$57,422	$0	$620,374	$0	$82,631	-	-	$1,161,212	$1,718,878
8	$0	$387,721	$0	$55,550	$0	$600,152	$0	$79,938	-	-	$1,123,361	$1,729,363
9	$0	$375,069	$0	$53,737	$0	$580,568	$0	$77,330	-	-	$1,086,704	$1,739,849
10	$0	$362,817	$0	$51,982	$0	$561,603	$0	$74,803	-	-	$1,051,206	$1,750,335
11	$0	$350,952	$0	$50,282	$0	$543,238	$0	$72,357	-	-	$1,016,830	$1,760,820
12	$0	$339,464	$0	$48,636	$0	$525,455	$0	$69,989	-	-	$983,543	$1,771,306
13	$0	$328,340	$0	$47,042	$0	$508,236	$0	$67,695	-	-	$951,313	$1,781,792
14	$0	$317,569	$0	$45,499	$0	$491,564	$0	$65,475	-	-	$920,107	$1,792,277
15	$0	$307,142	$0	$44,005	$0	$475,423	$0	$63,325	-	-	$889,894	$1,802,763
16	$0	$297,046	$0	$42,559	$0	$459,797	$0	$61,243	-	-	$860,645	$1,813,248
17	$0	$287,273	$0	$41,159	$0	$444,669	$0	$59,228	-	-	$832,328	$1,823,734
18	$0	$277,812	$0	$39,803	$0	$430,024	$0	$57,278	-	-	$804,917	$1,834,220
19	$0	$268,654	$0	$38,491	$0	$415,849	$0	$55,389	-	-	$778,383	$1,844,705
Total	**$0**	**$7,264,211**	**$0**	**$1,040,768**	**$0**	**$11,244,243**	**$0**	**$1,497,691**	**-**	**-**	**$21,046,913**	**$35,111,548**

C

SUMMARY OF ACCIDENT REDUCTION BENEFITS

Year	HIGHWAY								TRANSIT	Present Value of Accident Benefits	Constant Dollars
	Peak HOV	Peak Non-HOV	Peak Weaving	Peak Truck	Peak Arterial	Non-Peak Non-HOV	Non-Peak Weaving	Non-Peak Truck	All Periods		
1	$0	$38,947	$0	$20,497	$0	$298,228	$0	$29,495	$0	$387,167	$452,931
20	$0	$20,710	$0	$10,899	$0	$158,582	$0	$15,684	$0	$205,875	$507,423
2	$0	$37,686	$0	$19,833	$0	$288,574	$0	$28,540	$0	$374,633	$455,799
3	$0	$36,465	$0	$19,190	$0	$279,221	$0	$27,615	$0	$362,491	$458,667
4	$0	$35,282	$0	$18,568	$0	$270,160	$0	$26,719	$0	$350,728	$461,535
5	$0	$34,135	$0	$17,964	$0	$261,384	$0	$25,851	$0	$339,335	$464,403
6	$0	$33,025	$0	$17,380	$0	$252,883	$0	$25,010	$0	$328,298	$467,271
7	$0	$31,950	$0	$16,814	$0	$244,649	$0	$24,196	$0	$317,609	$470,139
8	$0	$30,908	$0	$16,266	$0	$236,674	$0	$23,407	$0	$307,256	$473,007
9	$0	$29,900	$0	$15,735	$0	$228,951	$0	$22,644	$0	$297,230	$475,875
10	$0	$28,923	$0	$15,221	$0	$221,472	$0	$21,904	$0	$287,520	$478,743
11	$0	$27,977	$0	$14,724	$0	$214,230	$0	$21,188	$0	$278,118	$481,611
12	$0	$27,061	$0	$14,242	$0	$207,217	$0	$20,494	$0	$269,014	$484,479
13	$0	$26,175	$0	$13,775	$0	$200,426	$0	$19,822	$0	$260,198	$487,347
14	$0	$25,316	$0	$13,323	$0	$193,852	$0	$19,172	$0	$251,663	$490,215
15	$0	$24,485	$0	$12,886	$0	$187,487	$0	$18,543	$0	$243,399	$493,083
16	$0	$23,680	$0	$12,462	$0	$181,324	$0	$17,933	$0	$235,399	$495,951
17	$0	$22,901	$0	$12,052	$0	$175,358	$0	$17,343	$0	$227,654	$498,819
18	$0	$22,147	$0	$11,655	$0	$169,583	$0	$16,772	$0	$220,157	$501,687
19	$0	$21,417	$0	$11,271	$0	$163,993	$0	$16,219	$0	$212,899	$504,555
Total	**$0**	**$579,089**	**$0**	**$304,756**	**$0**	**$4,434,248**	**$0**	**$438,552**	**$0**	**$5,756,646**	**$9,603,533**

C

SUMMARY OF EMISSION REDUCTION BENEFITS

Year	HIGHWAY								
	Peak HOV	Peak Non-HOV	Peak Weaving	Peak Truck	Peak Ramp	Peak Arterial	Non-Peak Non-HOV	Non-Peak Weaving	Non-Peak Truck
1	$0	$63,870	$0	$12,714	$0	$0	$101,754	$0	$18,296
20	$0	$27,398	$0	$4,069	$0	$0	$43,782	$0	$5,856
2	$0	$62,006	$0	$12,333	$0	$0	$98,836	$0	$17,747
3	$0	$60,197	$0	$11,963	$0	$0	$96,004	$0	$17,215
4	$0	$58,442	$0	$11,604	$0	$0	$93,255	$0	$16,698
5	$0	$56,739	$0	$11,256	$0	$0	$90,588	$0	$16,198
6	$0	$55,087	$0	$10,919	$0	$0	$87,998	$0	$15,712
7	$0	$53,484	$0	$10,591	$0	$0	$85,485	$0	$15,241
8	$0	$38,293	$0	$5,688	$0	$0	$60,540	$0	$8,185
9	$0	$37,231	$0	$5,530	$0	$0	$58,911	$0	$7,958
10	$0	$36,200	$0	$5,377	$0	$0	$57,328	$0	$7,737
11	$0	$35,198	$0	$5,228	$0	$0	$55,791	$0	$7,523
12	$0	$34,226	$0	$5,084	$0	$0	$54,297	$0	$7,315
13	$0	$33,282	$0	$4,943	$0	$0	$52,846	$0	$7,114
14	$0	$32,365	$0	$4,807	$0	$0	$51,436	$0	$6,918
15	$0	$31,475	$0	$4,675	$0	$0	$50,067	$0	$6,727
16	$0	$30,611	$0	$4,547	$0	$0	$48,736	$0	$6,543
17	$0	$29,772	$0	$4,422	$0	$0	$47,444	$0	$6,363
18	$0	$28,957	$0	$4,301	$0	$0	$46,188	$0	$6,189
19	$0	$28,166	$0	$4,183	$0	$0	$44,968	$0	$6,020
Total	**$0**	**$832,998**	**$0**	**$144,232**	**$0**	**$0**	**$1,326,257**	**$0**	**$207,554**

C

SUMMARY OF EMISSION REDUCTION BENEFITS (continued)

Year	TRANSIT Peak Bus	Non-Peak Bus	Passenger Rail	Light Rail	Present Value of Emission Benefits	Constant Dollars	CO_2 EMISSIONS SAVED tons/yr	PV $/yr
1	$0	$0	$0	$0	$196,633	$230,033	1,587	$33,780
20	$0	$0	$0	$0	$81,105	$199,901	1,795	$26,416
2	$0	$0	$0	$0	$190,921	$232,285	1,597	$33,341
3	$0	$0	$0	$0	$185,379	$234,563	1,607	$32,905
4	$0	$0	$0	$0	$180,000	$236,868	1,617	$32,474
5	$0	$0	$0	$0	$174,781	$239,200	1,628	$32,048
6	$0	$0	$0	$0	$169,716	$241,559	1,638	$31,625
7	$0	$0	$0	$0	$164,802	$243,948	1,648	$31,208
8	$0	$0	$0	$0	$112,706	$173,506	1,673	$31,086
9	$0	$0	$0	$0	$109,630	$175,521	1,684	$30,673
10	$0	$0	$0	$0	$106,642	$177,567	1,694	$30,264
11	$0	$0	$0	$0	$103,740	$179,644	1,704	$29,860
12	$0	$0	$0	$0	$100,922	$181,755	1,714	$29,460
13	$0	$0	$0	$0	$98,185	$183,898	1,724	$29,065
14	$0	$0	$0	$0	$95,526	$186,075	1,734	$28,674
15	$0	$0	$0	$0	$92,944	$188,288	1,744	$28,287
16	$0	$0	$0	$0	$90,436	$190,535	1,755	$27,904
17	$0	$0	$0	$0	$88,000	$192,820	1,765	$27,526
18	$0	$0	$0	$0	$85,635	$195,142	1,775	$27,152
19	$0	$0	$0	$0	$83,337	$197,502	1,785	$26,782
Total	**$0**	**$0**	**$0**	**$0**	**$2,511,041**	**$4,080,609**	**33,868**	**$600,530**

A

NET PRESENT VALUE CALCULATION

Year	PRESENT VALUE OF USER BENEFITS				PRESENT VALUE OF USER BENEFITS (road 2)			
	Travel Time Savings	Vehicle Op. Cost Savings	Accident Reductions	Vehicle Emission Reductions	Travel Time Savings	Vehicle Op. Cost Savings	Accident Reductions	Vehicle Emission Reductions
Construction Period								
1								
2								
3								
4								
5								
6								
7								
8								
Project Open								
1	$0	$1,415,525	$387,167	$196,633				
2	$0	$1,369,700	$374,633	$190,921				
3	$0	$1,325,306	$362,491	$185,379				
4	$0	$1,282,301	$350,728	$180,000				
5	$0	$1,240,643	$339,335	$174,781				
6	$0	$1,200,294	$328,298	$169,716				
7	$0	$1,161,212	$317,609	$164,802				
8	$0	$1,123,361	$307,256	$112,706				
9	$0	$1,086,704	$297,230	$109,630				
10	$0	$1,051,206	$287,520	$106,642				
11	$0	$1,016,830	$278,118	$103,740				
12	$0	$983,543	$269,014	$100,922				
13	$0	$951,313	$260,198	$98,185				
14	$0	$920,107	$251,663	$95,526				
15	$0	$889,894	$243,399	$92,944				
16	$0	$860,645	$235,399	$90,436				
17	$0	$832,328	$227,654	$88,000				
18	$0	$804,917	$220,157	$85,635				
19	$0	$778,383	$212,899	$83,337				
20	$0	$752,700	$205,875	$81,105				
Total	$0	$21,046,913	$5,756,646	$2,511,041	$0	$0	$0	$0

0	Person-Hours of Time Saved		Person-Hours of Time Saved
33,868	CO_2 Emissions Saved (tons)		CO_2 Emissions Saved (tons)
$600,530	CO_2 Emissions Saved ($ PV)		CO_2 Emissions Saved ($ PV)

PRESENT VALUE OF USER BENEFITS (road 3)				Present Value of Total User Benefits	Present Value of Total Project Costs	NET PRESENT VALUE
Travel Time Savings	Vehicle Op. Cost Savings	Accident Reductions	Vehicle Emission Reductions			
				$0	$474,371	($474,371)
				$0	$1,480,848	($1,480,848)
				$0	$1,724,291	($1,724,291)
				$0	$710,560	($710,560)
				$0	$0	$0
				$0	$0	$0
				$0	$0	$0
				$0	$0	$0
				$1,999,325	$0	$1,999,325
				$1,935,255	$0	$1,935,255
				$1,873,176	$0	$1,873,176
				$1,813,029	$0	$1,813,029
				$1,754,759	$0	$1,754,759
				$1,698,308	$0	$1,698,308
				$1,643,623	$0	$1,643,623
				$1,543,324	$0	$1,543,324
				$1,493,564	$0	$1,493,564
				$1,445,368	$0	$1,445,368
				$1,398,688	$0	$1,398,688
				$1,353,479	$0	$1,353,479
				$1,309,696	$0	$1,309,696
				$1,267,296	$0	$1,267,296
				$1,226,238	$0	$1,226,238
				$1,186,480	$0	$1,186,480
				$1,147,983	$0	$1,147,983
				$1,110,709	$0	$1,110,709
				$1,074,620	$0	$1,074,620
				$1,039,680	$0	$1,039,680
$0	$0	$0	$0	**$29,314,600**	**$4,390,069**	**$24,924,531**

	Person-Hours of Time Saved
	CO_2 Emissions Saved (tons)
	CO_2 Emissions Saved ($ PV)

B

INTERNAL RATE OF RETURN ON INVESTMENT AND PAYBACK PERIOD

Year	USER BENEFITS IN CONSTANT DOLLARS				USER BENEFITS IN CONSTANT DOLLARS (road 2)			
	Travel Time Savings	Vehicle Op. Cost Savings	Accident Reductions	Vehicle Emission Reductions	Travel Time Savings	Vehicle Op. Cost Savings	Accident Reductions	Vehicle Emission Reductions
Construction Period								
1								
2								
3								
4								
5								
6								
7								
8								
Project Open								
1	$0	$1,655,964	$452,931	$230,033				
2	$0	$1,666,449	$455,799	$232,285				
3	$0	$1,676,935	$458,667	$234,563				
4	$0	$1,687,421	$461,535	$236,868				
5	$0	$1,697,906	$464,403	$239,200				
6	$0	$1,708,392	$467,271	$241,559				
7	$0	$1,718,878	$470,139	$243,948				
8	$0	$1,729,363	$473,007	$173,506				
9	$0	$1,739,849	$475,875	$175,521				
10	$0	$1,750,335	$478,743	$177,567				
11	$0	$1,760,820	$481,611	$179,644				
12	$0	$1,771,306	$484,479	$181,755				
13	$0	$1,781,792	$487,347	$183,898				
14	$0	$1,792,277	$490,215	$186,075				
15	$0	$1,802,763	$493,083	$188,288				
16	$0	$1,813,248	$495,951	$190,535				
17	$0	$1,823,734	$498,819	$192,820				
18	$0	$1,834,220	$501,687	$195,142				
19	$0	$1,844,705	$504,555	$197,502				
20	$0	$1,855,191	$507,423	$199,901				
Total	$0	$35,111,548	$9,603,533	$4,080,609	$0	$0	$0	$0

USER BENEFITS IN CONSTANT DOLLARS (road 3)				Total User Benefits in Constant Dollars	Total Project Costs in Constant Dollars	ANNUAL RETURNS ON INVESTMENT	CUMULATIVE RETURNS AFTER PROJ OPENS
Travel Time Savings	Vehicle Op. Cost Savings	Accident Reductions	Vehicle Emission Reductions				
				$0	$474,371	($474,371)	
				$0	$1,540,082	($1,540,082)	
				$0	$1,864,993	($1,864,993)	
				$0	$799,283	($799,283)	
				$0	$0	$0	
				$0	$0	$0	
				$0	$0	$0	
				$0	$0	$0	
				$2,338,928	$0	$2,338,928	$2,338,928
				$2,354,533	$0	$2,354,533	$4,693,461
				$2,370,165	$0	$2,370,165	$7,063,626
				$2,385,823	$0	$2,385,823	$9,449,449
				$2,401,509	$0	$2,401,509	$11,850,957
				$2,417,222	$0	$2,417,222	$14,268,179
				$2,432,964	$0	$2,432,964	$16,701,143
				$2,375,876	$0	$2,375,876	$19,077,019
				$2,391,245	$0	$2,391,245	$21,468,264
				$2,406,644	$0	$2,406,644	$23,874,908
				$2,422,075	$0	$2,422,075	$26,296,983
				$2,437,539	$0	$2,437,539	$28,734,522
				$2,453,036	$0	$2,453,036	$31,187,558
				$2,468,567	$0	$2,468,567	$33,656,125
				$2,484,133	$0	$2,484,133	$36,140,258
				$2,499,735	$0	$2,499,735	$38,639,993
				$2,515,373	$0	$2,515,373	$41,155,365
				$2,531,048	$0	$2,531,048	$43,686,413
				$2,546,762	$0	$2,546,762	$46,233,175
				$2,562,515	$0	$2,562,515	$48,795,690
$0	$0	$0	$0	**$48,795,690**	**$4,678,729**	**$44,116,961**	

Total Construction Costs	**$4,678,729**

Years After Construction Begins	ANNUAL RETURNS ON INVESTMENT
1	($474,371)
2	($1,540,082)
3	($1,864,993)
4	($799,283)
5	$2,338,928
6	$2,354,533
7	$2,370,165
8	$2,385,823
9	$2,401,509
10	$2,417,222
11	$2,432,964
12	$2,375,876
13	$2,391,245
14	$2,406,644
15	$2,422,075
16	$2,437,539
17	$2,453,036
18	$2,468,567
19	$2,484,133
20	$2,499,735
21	$2,515,373
22	$2,531,048
23	$2,546,762
24	$2,562,515
25	$0
26	$0
27	$0
28	$0

Internal Rate of Return **33.18%**

The INTERNAL RATE OF RETURN (IRR) is the discount rate at which benefits and costs break even (are equal). For a project with an IRR greater than the Discount Rate, benefits are greater than costs, and the project has a positive economic value. The IRR allows projects with different costs, different benefit flows, and different time periods to be compared.

Payback Period **2 years**

The PAYBACK PERIOD is the number of years it takes for the net benefits (benefits minus costs) to equal, or payback, the initial construction costs. For a project with a Payback Period longer than the life-cycle of the project, initial construction costs are not recovered. The Payback Period varies inversely with the Benefit-Cost Ratio: shorter Payback Period yields higher Benefit-Cost.

Parameters

This page contains all economic values and rate tables.
To update economic values automatically, change "Economic Update Factor."

General Economic Parameters

Year of Current Dollars for Model	2014	
Economic Update Factor (Using GDP Deflator)	1.00	1
Real Discount Rate	4.0%	2

Travel Time Parameters

	Value	Units	
Statewide Average Hourly Wage	$ 25.05	$/hr	3
Heavy and Light Truck Drivers			
Average Hourly Wage	$ 18.94	$/hr	3
Benefits and Costs	$ 9.78	$/hr	4
Value of Time			
Automobile	$ 12.50	$/hr/per	5
Truck	$ 28.70	$/hr/veh	5
Auto & Truck Composite	$ 17.35	$/hr/veh	6
Transit	$ 12.50	$/hr/per	5
Out-of-Vehicle Travel	2	times	5
Incident-Related Travel	3	times	7
Travel Time Uprater	0.0%	annual incr	

Vehicle Operating Cost Parameters

Average Fuel Price			
Automobile (regular unleaded)	$ 3.50	$/gal	8
Truck (diesel)	$ 3.84	$/gal	8
Sales and Fuel Taxes			
State Sales Tax (gasoline)	2.25%	%	9
State Sales Tax (diesel)	9.12%	%	9
Average Local Sales Tax	0.50%	%	9
Federal Fuel Excise Tax (gasoline)	$ 0.184	$/gal	9
Federal Fuel Excise Tax (diesel)	$ 0.244	$/gal	9
State Fuel Excise Tax (gasoline)	$ 0.353	$/gal	9
State Fuel Excise Tax (diesel)	$ 0.130	$/gal	9
Fuel Cost Per Gallon (Exclude Taxes)			
Automobile	$ 2.85	$/gal	
Truck	$ 3.15	$/gal	
Non-Fuel Cost Per Mile			
Automobile	$ 0.303	$/mi	10
Truck	$ 0.418	$/mi	11
Idling Speed for Op. Costs and Emissions	5	mph	

Accident Cost Parameters

Cost of a Fatality	$ 4,400,000	$/event	12
Cost of an Injury			
Level A (Severe)	$ 221,400	$/event	12
Level B (Moderate)	$ 56,500	$/event	12
Level C (Minor)	$ 26,900	$/event	12
Cost of Property Damage	$ 2,500	$/event	12
Cost of Highway Accident			
Fatal Accident	$ 4,800,000	$/accident	
Injury Accident	$ 67,400	$/accident	
PDO Accident	$ 10,200	$/accident	
Average Cost	$ 52,500	$/accident	
Statewide Highway Accident Rates			
Fatal Accident	0.007	per mil veh-mi	13
Injury Accident	0.27	per mil veh-mi	13
PDO Accident	0.53	per mil veh-mi	13
Non-Freeway	1.05	per mil veh-mi	13

Sources: 1) Office of Management and Budget (OMB), 2) Review of OMB and State Treasurer's Office data, 3) Bureau of Labor Statistics (BLS) OES, 4) BLS Employment Cost Index, 5) USDOT Department Guidance, 6) California Department of Transportation TSI and Traffic Operations, 7) IDAS model, 8) AAA Daily Fuel Gauge Report, 9) California Board of Equalization, 10) AAA Your Driving Costs, 11) American Transportation Research Institute, 12) National Safety Council, 13) TASAS summary 2009

Highway Operations Parameters

	Value	Units	
Maximum V/C Ratio	1.56	-	15
Percent ADT in Peak Period	41.0%	%	
Percent ADT in Average Peak Hour	8.2%	%	
Annualization Factor	365	days/yr	

	Alpha	Beta	Capacity (vphpl)	Dep. Rate (vphpl)	
Freeway	0.20	10	2,000	1,800	15, 16
Expressway	0.20	10	2,000	1,800	15, 16
Conventional Highway	0.05	10	800	1,400	16
HOV Lanes	0.55	8	1,600		17

Non-HOV Lanes	Alpha	Beta	Capacity (vphpl)
No Build	0.05	10	800
Build	0.05	10	800

Sources: 15) Highway Capacity Manual, 16) NCHRP 387, 17) PeMS data

Project Types

Highway Capacity Expansion			Please select a type of highway project
General Highway	TRUE	GenHwy	
HOV Lane Addition	FALSE	HOV	Enter HOV restriction in section 1B
HOT Lane Addition	FALSE	HOT	Include toll payers as HOVs & check AVOs
Passing Lane	FALSE	Passing	Enter a truck speed in section 1B
Intersection	FALSE	Intersect	Remember to run model for both roads
Bypass	FALSE	Bypass	Remember to run model for both roads
Queuing	FALSE	Queuing	Add arrival rate & check departure rate in 1B
Pavement	FALSE	Pavement	Enter pavement condition in section 1B
Rail or Transit Cap Expansion			Please select a type of rail or transit project
Passenger Rail	FALSE	PassRail	Enter data in both sections 1B & 1E
Light-Rail (LRT)	FALSE	LRT	Enter data in both sections 1B & 1E
Bus	FALSE	Bus	Enter data in both sections 1B & 1E
Hwy-Rail Grade Crossing	FALSE	HwyRail	Put hwy design in 1B, safety in 1C & crossing in 1D
Hwy Operational Improvement			Please select a type of op. improvement
Auxiliary Lane	FALSE	AuxLane	Enter ramp design speed & on-ramp volume
Freeway Connector	FALSE	FreeConn	Check percent traffic in weave in section 1B
HOV Connector	FALSE	HOVConn	Check percent traffic in weave in section 1B
HOV Drop Ramp	FALSE	HOVDrop	Check percent traffic in weave in section 1B
Off-Ramp Widening	FALSE	OffRamp	Check percent traffic in weave in section 1B
On-Ramp Widening	FALSE	OnRamp	Enter on-ramp volume & metering strategy
HOV-2 to HOV-3 Conv	FALSE	HOV2to3	Check AVOs & trips in sections 1B & 2D
HOT Lane Conversion	FALSE	HOTConv	Check AVOs & trips in sections 1B & 2D
Transp Mgmt Systems (TMS)			Please select a type of TMS project
Ramp Metering	FALSE	RM	Enter model data, if avail, in sections 2A & 2C
Ramp Metering Signal Coord	FALSE	AM	Enter model data, if avail, in sections 2A & 2C
Incident Management	FALSE	IM	Enter model data, if avail, in sections 2A & 2C
Traveler Information	FALSE	TI	Enter model data, if avail, in sections 2A & 2C
Arterial Signal Management	FALSE	ASM	Complete only sections 1A, 1E & 2C
Transit Vehicle Location (AVL)	FALSE	AVL	Enter transit agency costs in section 1D
Transit Vehicle Signal Priority	FALSE	SigPriority	Check travel time in section 1D
Bus Rapid Transit (BRT)	FALSE	BRT	Enter free-flow bus lane speed in section 1B
TMS Lookup Code	NoAdj	TMSLookup	
User Modified Inputs	FALSE	UserAdjInputs	

Travel Demand Tables

DEMAND FOR TRAVEL IN PEAK PERIOD

(percent of total daily travel)

Number of Hours in Peak Period	Urban				Rural	
	So. California		No. California			
	Fwy/Exp	Other	Fwy/Exp	Other	Fwy/Exp	Other
1	8.6%	8.6%	8.6%	8.6%	8.6%	8.6%
2	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%
3	25.8%	25.8%	25.8%	25.8%	25.8%	25.8%
4	34.1%	34.1%	34.1%	34.1%	34.1%	34.1%
5	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%
6	47.3%	47.3%	47.3%	47.3%	47.3%	47.3%
7	53.5%	53.5%	53.5%	53.5%	53.5%	53.5%
8	59.6%	59.6%	59.6%	59.6%	59.6%	59.6%
9	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%
10	71.1%	71.1%	71.1%	71.1%	71.1%	71.1%
11	76.5%	76.5%	76.5%	76.5%	76.5%	76.5%
12	81.7%	81.7%	81.7%	81.7%	81.7%	81.7%
13	86.9%	86.9%	86.9%	86.9%	86.9%	86.9%
14	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%
15	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%
16	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
17	96.7%	96.7%	96.7%	96.7%	96.7%	96.7%
18	97.9%	97.9%	97.9%	97.9%	97.9%	97.9%
19	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%
20	99.5%	99.5%	99.5%	99.5%	99.5%	99.5%
21	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%
22	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%
23	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%
24	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: California Department of Transportation, 2000-2001 California Statewide Travel Survey
Weekday Travel Report, June 2003

Operating Cost Tables

FUEL CONSUMPTION RATES
(gal/veh-mi)

Speed	Auto*	Truck
5	0.1439	0.2234
6	0.1366	0.2130
7	0.1293	0.2026
8	0.1220	0.1922
9	0.1147	0.1818
10	0.1074	0.1714
11	0.1025	0.1631
12	0.0977	0.1548
13	0.0929	0.1466
14	0.0880	0.1383
15	0.0832	0.1300
16	0.0800	0.1247
17	0.0767	0.1193
18	0.0735	0.1139
19	0.0702	0.1086
20	0.0670	0.1032
21	0.0648	0.0997
22	0.0626	0.0962
23	0.0603	0.0926
24	0.0581	0.0891
25	0.0559	0.0856
26	0.0544	0.0832
27	0.0529	0.0809
28	0.0515	0.0785
29	0.0500	0.0762
30	0.0485	0.0738
31	0.0475	0.0723
32	0.0465	0.0708
33	0.0455	0.0693
34	0.0445	0.0678
35	0.0435	0.0663
36	0.0429	0.0654
37	0.0423	0.0645
38	0.0417	0.0635
39	0.0411	0.0626
40	0.0405	0.0617
41	0.0402	0.0613
42	0.0400	0.0609
43	0.0397	0.0604
44	0.0394	0.0600
45	0.0391	0.0596
46	0.0391	0.0596
47	0.0391	0.0596
48	0.0391	0.0596
49	0.0391	0.0596
50	0.0390	0.0596
51	0.0393	0.0600
52	0.0396	0.0604
53	0.0399	0.0608
54	0.0401	0.0612
55	0.0404	0.0617
56	0.0410	0.0626
57	0.0416	0.0635
58	0.0422	0.0644
59	0.0428	0.0653
60	0.0433	0.0662
61	0.0443	0.0677
62	0.0453	0.0692
63	0.0462	0.0708
64	0.0472	0.0723
65	0.0482	0.0738
66	0.0488	0.0752
67	0.0495	0.0767
68	0.0502	0.0781
69	0.0509	0.0796
70	0.0515	0.0810
71	0.0516	0.0821
72	0.0516	0.0831
73	0.0516	0.0842
74	0.0517	0.0854
75	0.0517	0.0865
76	0.0518	0.0882
77	0.0518	0.0900
78	0.0519	0.0918
79	0.0519	0.0936
80	0.0520	0.0953

** Includes motorcycles & motorhomes*
Note: Five mph is best estimate for idling

Source: California Air Resources Board, EMFAC2011, 2011 & 2031 average

Accident Tables

HIGHWAY INJURY SEVERITY FREQUENCY
(percent of injuries)

Event	Urban	Suburban	Rural	Average
Severe Injury (A)	4.70%	4.70%	4.70%	4.70%
Other Visible Injury (B)	26.28%	26.28%	26.28%	26.28%
Complaint of Pain (C)	69.02%	69.02%	69.02%	69.02%

Source: 2009 SWITRS Annual Report, Table 8C

RATES FOR TRANSIT ACCIDENT EVENTS
(events/million veh-mi)

Event	Pass Train	Light Rail	Bus
Fatality	0.0428	0.1897	0.0351
Injury	0.2517	3.6283	3.8909
All Accidents	0.2519	7.4952	3.8924

Source: USDOT,Transportation Statistics Annual Report, Table 2-33, 2002 to 2008 average

NUMBER OF FATALITIES
(events/accident)

Accident Type	Urban	Suburban	Rural	Average
Fatal Accident	1.09	1.11	1.16	1.13

NUMBER OF INJURIES
(events/accident)

Accident Type	Urban	Suburban	Rural	Average
Fatal Accident	0.84	1.02	1.26	1.06
Injury Accident	1.42	1.43	1.51	1.44

NUMBER OF VEHICLES INVOLVED
(events/accident)

Accident Type	Urban	Suburban	Rural	Average
Fatal Accident	1.69	1.63	1.61	1.65
Injury Accident	2.08	1.97	1.58	1.96
PDO Accident	2.03	1.94	1.62	1.95

DISTRIBUTION OF ACCIDENT TYPES
(percent of accidents)

Accident Type	Urban	Suburban	Rural	Average
Fatal Accident	0.50%	0.74%	2.11%	0.83%
Injury Accident	32.08%	32.90%	37.91%	33.27%
PDO Accident	67.42%	66.37%	59.98%	65.90%

Source: California Department of Transportation,TASAS Unit, 2007 to 2009 average

COST OF TRANSIT ACCIDENT EVENTS
($/event)

Event	Pass Train	Light Rail	Bus
Fatality	$4,400,000	$4,400,000	$4,400,000
Injury	$81,500	$81,500	$81,500
Prop Damage	$82,000	$5,800	$2,800

Source: FTA, Transit Safety & Security Statistics, 2002 to 2007 average

COSTS OF TRANSIT ACCIDENTS
($/million veh-mi)

Value	Pass Train	Light Rail	Bus
Cost	$229,500	$1,173,900	$482,400

Source: Combination of above two tables

HIGHWAY-RAIL GRADE CROSSING INCIDENTS
(units in table)

Value	Incident	Fatality	Injury
Total Events	1,500	332	608
Avg per Incident		0.2213	0.4053
Cost per Event		$4,400,000	$81,500

Source: FRA, Office of Safety Analysis, 5.11 - Hwy/Rail Incidents Summary Tables, California, Jan 2001 to Dec 2010

COST OF HIGHWAY ACCIDENTS
($/accident)

Accident Type	Urban	Suburban	Rural	Average
Fatal Accident	$4,800,000	$4,900,000	$5,200,000	$5,000,000
Injury Accident	$67,400	$67,600	$70,100	$68,000
PDO Accident	$10,200	$9,700	$8,100	$9,800
All Types	$52,500	$64,700	$141,200	$70,500

Source: Combination of above four tables

PASSING LANE ACCIDENT REDUCTION FACTORS
(rate with passing lane/rate without passing lane)

Minimum ADT	Fatality	Injury	PDO
0	25.0%	69.4%	92.6%
5,000	19.2%	80.3%	96.5%
10,000	84.0%	57.7%	97.8%

Source: Taylor and Jain, 1991

Emissions Tables

HIGHWAY EMISSIONS FACTORS (g/mi)

Model Year 2011

Mode	Speed	CO	CO_2	NO_X	PM_{10}	SO_X	VOC
Auto	0	5.2339	79.62	0.3731	0.0044	0.0000	0.7131
	5	5.7109	1200.44	0.4530	0.0640	0.0122	0.6503
	6	5.5208	1138.67	0.4412	0.0627	0.0116	0.6153
	7	5.3308	1076.91	0.4294	0.0614	0.0110	0.5802
	8	5.1407	1015.14	0.4176	0.0601	0.0104	0.5452
	9	4.9507	953.38	0.4058	0.0588	0.0098	0.5102
	10	4.7606	891.61	0.3940	0.0575	0.0091	0.4751
	11	4.6222	850.74	0.3852	0.0567	0.0087	0.4539
	12	4.4838	809.87	0.3764	0.0559	0.0083	0.4326
	13	4.3453	769.00	0.3677	0.0551	0.0079	0.4114
	14	4.2069	728.13	0.3589	0.0543	0.0075	0.3901
	15	4.0685	687.26	0.3502	0.0535	0.0071	0.3689
	16	3.9674	659.79	0.3438	0.0531	0.0068	0.3558
	17	3.8664	632.31	0.3373	0.0526	0.0065	0.3428
	18	3.7653	604.84	0.3309	0.0521	0.0063	0.3298
	19	3.6643	577.36	0.3245	0.0516	0.0060	0.3168
	20	3.5632	549.88	0.3181	0.0512	0.0057	0.3038
	21	3.4877	531.23	0.3134	0.0509	0.0055	0.2958
	22	3.4122	512.58	0.3087	0.0506	0.0053	0.2878
	23	3.3367	493.93	0.3040	0.0503	0.0051	0.2798
	24	3.2612	475.28	0.2993	0.0500	0.0050	0.2718
	25	3.1857	456.63	0.2947	0.0497	0.0048	0.2638
	26	3.1288	444.02	0.2914	0.0495	0.0046	0.2588
	27	3.0718	431.40	0.2881	0.0493	0.0045	0.2538
	28	3.0149	418.78	0.2847	0.0491	0.0044	0.2488
	29	2.9579	406.16	0.2814	0.0489	0.0043	0.2437
	30	2.9010	393.55	0.2781	0.0487	0.0041	0.2387
	31	2.8584	385.23	0.2759	0.0486	0.0040	0.2356
	32	2.8159	376.92	0.2738	0.0485	0.0040	0.2325
	33	2.7734	368.60	0.2716	0.0483	0.0039	0.2294
	34	2.7309	360.29	0.2694	0.0482	0.0038	0.2263
	35	2.6883	351.97	0.2672	0.0481	0.0037	0.2231
	36	2.6580	346.91	0.2659	0.0480	0.0037	0.2214
	37	2.6277	341.84	0.2647	0.0479	0.0036	0.2196
	38	2.5974	336.77	0.2634	0.0479	0.0036	0.2178
	39	2.5671	331.70	0.2622	0.0478	0.0035	0.2160
	40	2.5368	326.63	0.2609	0.0477	0.0034	0.2142
	41	2.5180	324.21	0.2605	0.0477	0.0034	0.2134
	42	2.4992	321.78	0.2601	0.0476	0.0034	0.2127
	43	2.4804	319.36	0.2597	0.0476	0.0034	0.2119
	44	2.4615	316.93	0.2593	0.0475	0.0034	0.2112
	45	2.4427	314.51	0.2589	0.0475	0.0033	0.2104
	46	2.4360	314.44	0.2593	0.0475	0.0033	0.2105
	47	2.4293	314.37	0.2597	0.0475	0.0033	0.2107
	48	2.4227	314.30	0.2601	0.0474	0.0033	0.2108
	49	2.4160	314.23	0.2605	0.0474	0.0033	0.2109
	50	2.4093	314.17	0.2609	0.0474	0.0033	0.2111
	51	2.4171	316.46	0.2621	0.0474	0.0033	0.2121
	52	2.4249	318.75	0.2633	0.0474	0.0034	0.2132
	53	2.4328	321.05	0.2645	0.0474	0.0034	0.2142
	54	2.4406	323.34	0.2657	0.0474	0.0034	0.2153
	55	2.4485	325.64	0.2669	0.0474	0.0034	0.2163
	56	2.4758	330.54	0.2690	0.0475	0.0035	0.2184
	57	2.5031	335.45	0.2711	0.0475	0.0035	0.2206
	58	2.5304	340.36	0.2732	0.0475	0.0036	0.2227
	59	2.5577	345.27	0.2753	0.0476	0.0036	0.2248
	60	2.5851	350.18	0.2774	0.0476	0.0037	0.2270
	61	2.6411	358.30	0.2805	0.0476	0.0038	0.2305
	62	2.6972	366.41	0.2836	0.0477	0.0039	0.2341
	63	2.7533	374.53	0.2868	0.0478	0.0039	0.2377
	64	2.8094	382.64	0.2899	0.0478	0.0040	0.2413
	65	2.8654	390.76	0.2930	0.0479	0.0041	0.2449
	66	2.9386	396.35	0.2952	0.0479	0.0042	0.2489
	67	3.0117	401.95	0.2973	0.0480	0.0042	0.2528
	68	3.0848	407.55	0.2995	0.0480	0.0043	0.2568
	69	3.1580	413.15	0.3016	0.0481	0.0043	0.2608
	70	3.2311	418.75	0.3038	0.0481	0.0044	0.2647
	71	3.3211	418.85	0.3042	0.0481	0.0044	0.2688
	72	3.4111	418.95	0.3045	0.0482	0.0044	0.2729
	73	3.5012	419.04	0.3049	0.0482	0.0044	0.2770
	74	3.5912	419.14	0.3052	0.0482	0.0044	0.2811
	75	3.6812	419.24	0.3056	0.0482	0.0044	0.2852
	76	3.8430	419.40	0.3060	0.0482	0.0044	0.2919
	77	4.0048	419.55	0.3065	0.0482	0.0044	0.2986
	78	4.1666	419.70	0.3070	0.0482	0.0044	0.3053
	79	4.3284	419.86	0.3075	0.0482	0.0044	0.3119
	80	4.4902	420.01	0.3079	0.0482	0.0044	0.3186

HIGHWAY EMISSIONS FACTORS (g/mi)

Model Year 2031

Mode	Speed	CO	CO_2	NO_X	PM_{10}	SO_X	VOC
Auto	0	1.3628	80.38	0.0771	0.0049	0.0000	0.2019
	5	1.3760	1208.90	0.1323	0.0584	0.0122	0.1693
	6	1.3510	1146.73	0.1290	0.0574	0.0116	0.1612
	7	1.3260	1084.55	0.1258	0.0564	0.0110	0.1530
	8	1.3011	1022.37	0.1225	0.0554	0.0104	0.1449
	9	1.2761	960.19	0.1193	0.0544	0.0097	0.1367
	10	1.2511	898.02	0.1160	0.0534	0.0091	0.1286
	11	1.2273	856.86	0.1135	0.0528	0.0087	0.1235
	12	1.2034	815.71	0.1109	0.0523	0.0083	0.1185
	13	1.1796	774.55	0.1084	0.0517	0.0079	0.1135
	14	1.1558	733.40	0.1058	0.0511	0.0075	0.1085
	15	1.1320	692.24	0.1033	0.0505	0.0071	0.1035
	16	1.1120	664.57	0.1014	0.0502	0.0068	0.1005
	17	1.0920	636.90	0.0994	0.0499	0.0065	0.0975
	18	1.0721	609.23	0.0975	0.0495	0.0062	0.0944
	19	1.0521	581.56	0.0955	0.0492	0.0060	0.0914
	20	1.0322	553.89	0.0936	0.0488	0.0057	0.0884
	21	1.0154	535.11	0.0921	0.0486	0.0055	0.0865
	22	0.9985	516.34	0.0906	0.0484	0.0053	0.0847
	23	0.9817	497.56	0.0891	0.0482	0.0051	0.0828
	24	0.9649	478.79	0.0876	0.0480	0.0049	0.0809
	25	0.9481	460.01	0.0862	0.0478	0.0048	0.0791
	26	0.9340	447.31	0.0850	0.0477	0.0046	0.0779
	27	0.9198	434.61	0.0839	0.0475	0.0045	0.0768
	28	0.9057	421.90	0.0828	0.0474	0.0044	0.0757
	29	0.8916	409.20	0.0817	0.0473	0.0042	0.0745
	30	0.8774	396.50	0.0806	0.0472	0.0041	0.0734
	31	0.8657	388.13	0.0798	0.0471	0.0040	0.0727
	32	0.8540	379.77	0.0791	0.0470	0.0039	0.0721
	33	0.8422	371.40	0.0783	0.0469	0.0039	0.0714
	34	0.8305	363.04	0.0775	0.0468	0.0038	0.0708
	35	0.8188	354.67	0.0767	0.0468	0.0037	0.0701
	36	0.8093	349.58	0.0762	0.0467	0.0036	0.0698
	37	0.7999	344.48	0.0756	0.0466	0.0036	0.0695
	38	0.7904	339.39	0.0751	0.0466	0.0035	0.0692
	39	0.7810	334.29	0.0746	0.0465	0.0035	0.0689
	40	0.7716	329.19	0.0740	0.0465	0.0034	0.0686
	41	0.7645	326.76	0.0738	0.0465	0.0034	0.0686
	42	0.7574	324.33	0.0735	0.0464	0.0034	0.0685
	43	0.7504	321.90	0.0732	0.0464	0.0034	0.0685
	44	0.7433	319.47	0.0729	0.0464	0.0033	0.0685
	45	0.7362	317.03	0.0726	0.0464	0.0033	0.0685
	46	0.7319	316.98	0.0726	0.0463	0.0033	0.0688
	47	0.7275	316.94	0.0725	0.0463	0.0033	0.0690
	48	0.7232	316.89	0.0724	0.0463	0.0033	0.0693
	49	0.7188	316.84	0.0724	0.0463	0.0033	0.0696
	50	0.7144	316.79	0.0723	0.0463	0.0033	0.0699
	51	0.7135	319.12	0.0725	0.0463	0.0033	0.0705
	52	0.7126	321.45	0.0726	0.0463	0.0034	0.0711
	53	0.7116	323.78	0.0728	0.0463	0.0034	0.0717
	54	0.7107	326.11	0.0729	0.0463	0.0034	0.0723
	55	0.7098	328.45	0.0731	0.0463	0.0034	0.0729
	56	0.7137	333.43	0.0735	0.0464	0.0035	0.0739
	57	0.7176	338.41	0.0738	0.0464	0.0035	0.0749
	58	0.7215	343.39	0.0742	0.0464	0.0036	0.0760
	59	0.7254	348.37	0.0746	0.0464	0.0036	0.0770
	60	0.7293	353.35	0.0750	0.0464	0.0037	0.0780
	61	0.7407	361.57	0.0756	0.0465	0.0038	0.0797
	62	0.7520	369.78	0.0762	0.0465	0.0038	0.0813
	63	0.7634	378.00	0.0769	0.0466	0.0039	0.0830
	64	0.7747	386.22	0.0775	0.0466	0.0040	0.0847
	65	0.7861	394.44	0.0781	0.0467	0.0041	0.0863
	66	0.8123	400.15	0.0786	0.0467	0.0042	0.0888
	67	0.8386	405.86	0.0791	0.0467	0.0042	0.0912
	68	0.8648	411.57	0.0796	0.0468	0.0043	0.0936
	69	0.8911	417.28	0.0801	0.0468	0.0043	0.0960
	70	0.9173	422.99	0.0806	0.0468	0.0044	0.0984
	71	0.9675	423.21	0.0808	0.0468	0.0044	0.1020
	72	1.0177	423.43	0.0810	0.0468	0.0044	0.1057
	73	1.0679	423.65	0.0812	0.0468	0.0044	0.1093
	74	1.1181	423.87	0.0814	0.0468	0.0044	0.1129
	75	1.1683	424.09	0.0816	0.0468	0.0044	0.1165
	76	1.2588	424.42	0.0818	0.0468	0.0044	0.1224
	77	1.3492	424.76	0.0821	0.0468	0.0044	0.1284
	78	1.4396	425.09	0.0823	0.0468	0.0044	0.1343
	79	1.5300	425.43	0.0826	0.0469	0.0044	0.1403
	80	1.6204	425.77	0.0828	0.0469	0.0044	0.1463

Emissions Tables

Truck	0	7.7807	88.95	0.9968	0.0033	0.0000	0.8010
	5	8.2113	1871.17	1.4852	0.0764	0.0190	0.8648
	6	7.9348	1783.22	1.4539	0.0752	0.0181	0.8200
	7	7.6582	1695.27	1.4225	0.0739	0.0172	0.7751
	8	7.3817	1607.32	1.3912	0.0727	0.0164	0.7303
	9	7.1052	1519.37	1.3599	0.0714	0.0155	0.6854
	10	6.8287	1431.43	1.3286	0.0702	0.0146	0.6406
	11	6.5519	1361.83	1.2955	0.0691	0.0139	0.6068
	12	6.2751	1292.24	1.2625	0.0680	0.0132	0.5731
	13	5.9984	1222.65	1.2294	0.0669	0.0125	0.5394
	14	5.7216	1153.05	1.1964	0.0658	0.0118	0.5056
	15	5.4448	1083.46	1.1633	0.0647	0.0111	0.4719
	16	5.2607	1038.29	1.1404	0.0640	0.0106	0.4514
	17	5.0765	993.12	1.1176	0.0633	0.0102	0.4310
	18	4.8924	947.96	1.0947	0.0626	0.0097	0.4105
	19	4.7082	902.79	1.0719	0.0619	0.0093	0.3901
	20	4.5241	857.62	1.0490	0.0612	0.0088	0.3696
	21	4.3967	827.81	1.0337	0.0607	0.0085	0.3568
	22	4.2692	797.99	1.0184	0.0602	0.0082	0.3440
	23	4.1418	768.18	1.0032	0.0597	0.0079	0.3311
	24	4.0144	738.36	0.9879	0.0592	0.0076	0.3183
	25	3.8870	708.54	0.9726	0.0588	0.0073	0.3055
	26	3.7963	688.82	0.9631	0.0584	0.0071	0.2973
	27	3.7057	669.09	0.9537	0.0581	0.0070	0.2890
	28	3.6150	649.37	0.9442	0.0578	0.0068	0.2808
	29	3.5243	629.64	0.9348	0.0574	0.0066	0.2725
	30	3.4337	609.92	0.9253	0.0571	0.0064	0.2643
	31	3.3683	597.14	0.9207	0.0569	0.0062	0.2589
	32	3.3030	584.37	0.9162	0.0567	0.0061	0.2535
	33	3.2377	571.59	0.9116	0.0565	0.0060	0.2481
	34	3.1723	558.81	0.9070	0.0562	0.0058	0.2427
	35	3.1070	546.04	0.9024	0.0560	0.0057	0.2373
	36	3.0606	538.35	0.9022	0.0559	0.0056	0.2339
	37	3.0141	530.65	0.9020	0.0557	0.0055	0.2304
	38	2.9676	522.96	0.9018	0.0555	0.0054	0.2269
	39	2.9212	515.26	0.9015	0.0553	0.0054	0.2235
	40	2.8747	507.57	0.9013	0.0552	0.0053	0.2200
	41	2.8437	503.97	0.9054	0.0551	0.0052	0.2180
	42	2.8126	500.38	0.9094	0.0549	0.0052	0.2159
	43	2.7815	496.79	0.9135	0.0548	0.0052	0.2139
	44	2.7504	493.20	0.9175	0.0547	0.0051	0.2118
	45	2.7193	489.60	0.9216	0.0546	0.0051	0.2098
	46	2.7023	489.59	0.9303	0.0545	0.0051	0.2087
	47	2.6853	489.58	0.9390	0.0545	0.0051	0.2076
	48	2.6683	489.58	0.9477	0.0544	0.0051	0.2065
	49	2.6513	489.57	0.9564	0.0543	0.0051	0.2055
	50	2.6343	489.56	0.9651	0.0543	0.0051	0.2044
	51	2.6320	493.15	0.9792	0.0542	0.0051	0.2041
	52	2.6296	496.74	0.9934	0.0542	0.0052	0.2039
	53	2.6273	500.34	1.0076	0.0542	0.0052	0.2037
	54	2.6250	503.93	1.0218	0.0542	0.0052	0.2034
	55	2.6226	507.52	1.0360	0.0541	0.0053	0.2032
	56	2.6377	515.24	1.0571	0.0541	0.0053	0.2038
	57	2.6528	522.95	1.0783	0.0541	0.0054	0.2043
	58	2.6679	530.66	1.0995	0.0541	0.0055	0.2049
	59	2.6830	538.37	1.1207	0.0541	0.0056	0.2054
	60	2.6981	546.08	1.1418	0.0541	0.0057	0.2060
	61	2.7365	558.91	1.1726	0.0541	0.0058	0.2075
	62	2.7748	571.73	1.2033	0.0542	0.0059	0.2091
	63	2.8132	584.55	1.2340	0.0542	0.0061	0.2107
	64	2.8516	597.37	1.2647	0.0542	0.0062	0.2122
	65	2.8899	610.19	1.2954	0.0543	0.0064	0.2138
	66	2.9429	622.24	1.3362	0.0543	0.0065	0.2152
	67	2.9958	634.29	1.3770	0.0543	0.0066	0.2167
	68	3.0488	646.34	1.4178	0.0543	0.0067	0.2181
	69	3.1017	658.39	1.4586	0.0544	0.0068	0.2195
	70	3.1547	670.44	1.4994	0.0544	0.0069	0.2210
	71	3.2177	679.52	1.5549	0.0544	0.0070	0.2215
	72	3.2807	688.60	1.6103	0.0545	0.0071	0.2221
	73	3.3436	697.68	1.6658	0.0545	0.0072	0.2226
	74	3.4066	706.77	1.7213	0.0546	0.0073	0.2231
	75	3.4696	715.85	1.7767	0.0546	0.0074	0.2237
	76	3.5719	730.65	1.8592	0.0547	0.0076	0.2245
	77	3.6741	745.45	1.9417	0.0547	0.0077	0.2253
	78	3.7764	760.25	2.0243	0.0547	0.0079	0.2262
	79	3.8787	775.04	2.1068	0.0548	0.0080	0.2270
	80	3.9809	789.84	2.1893	0.0548	0.0082	0.2278

Truck	0	2.4976	90.05	0.4876	0.0028	0.0000	0.2977
	5	2.1294	1891.53	0.3786	0.0651	0.0191	0.2464
	6	2.0765	1802.78	0.3708	0.0642	0.0182	0.2360
	7	2.0236	1714.03	0.3631	0.0633	0.0173	0.2256
	8	1.9707	1625.28	0.3553	0.0625	0.0164	0.2151
	9	1.9178	1536.53	0.3475	0.0616	0.0156	0.2047
	10	1.8650	1447.78	0.3397	0.0608	0.0147	0.1942
	11	1.8056	1377.21	0.3314	0.0601	0.0140	0.1876
	12	1.7462	1306.63	0.3231	0.0595	0.0133	0.1810
	13	1.6868	1236.06	0.3148	0.0589	0.0126	0.1745
	14	1.6275	1165.48	0.3065	0.0582	0.0118	0.1679
	15	1.5681	1094.91	0.2981	0.0576	0.0111	0.1613
	16	1.5259	1049.14	0.2923	0.0572	0.0107	0.1573
	17	1.4836	1003.38	0.2865	0.0568	0.0102	0.1534
	18	1.4414	957.61	0.2806	0.0564	0.0098	0.1494
	19	1.3992	911.84	0.2748	0.0560	0.0093	0.1455
	20	1.3570	866.08	0.2690	0.0556	0.0089	0.1415
	21	1.3255	835.90	0.2650	0.0553	0.0086	0.1391
	22	1.2941	805.73	0.2611	0.0551	0.0083	0.1366
	23	1.2627	775.56	0.2571	0.0548	0.0080	0.1341
	24	1.2312	745.39	0.2531	0.0546	0.0077	0.1317
	25	1.1998	715.21	0.2492	0.0543	0.0074	0.1292
	26	1.1756	695.24	0.2467	0.0541	0.0071	0.1276
	27	1.1513	675.26	0.2442	0.0539	0.0069	0.1260
	28	1.1271	655.29	0.2416	0.0537	0.0067	0.1244
	29	1.1029	635.31	0.2391	0.0536	0.0065	0.1229
	30	1.0786	615.34	0.2366	0.0534	0.0063	0.1213
	31	1.0595	602.42	0.2353	0.0532	0.0062	0.1202
	32	1.0403	589.49	0.2340	0.0531	0.0060	0.1192
	33	1.0211	576.57	0.2327	0.0530	0.0059	0.1181
	34	1.0019	563.65	0.2314	0.0529	0.0058	0.1171
	35	0.9828	550.73	0.2301	0.0528	0.0057	0.1160
	36	0.9674	542.95	0.2299	0.0527	0.0056	0.1153
	37	0.9520	535.17	0.2297	0.0526	0.0055	0.1146
	38	0.9367	527.39	0.2295	0.0525	0.0054	0.1140
	39	0.9213	519.62	0.2292	0.0524	0.0054	0.1133
	40	0.9060	511.84	0.2290	0.0524	0.0053	0.1126
	41	0.8937	508.20	0.2299	0.0523	0.0053	0.1122
	42	0.8814	504.57	0.2307	0.0523	0.0052	0.1118
	43	0.8690	500.94	0.2315	0.0522	0.0052	0.1113
	44	0.8567	497.30	0.2324	0.0522	0.0051	0.1109
	45	0.8444	493.67	0.2332	0.0521	0.0051	0.1105
	46	0.8347	493.67	0.2352	0.0521	0.0051	0.1103
	47	0.8251	493.67	0.2372	0.0520	0.0051	0.1100
	48	0.8154	493.67	0.2393	0.0520	0.0051	0.1098
	49	0.8057	493.67	0.2413	0.0520	0.0051	0.1096
	50	0.7960	493.67	0.2433	0.0520	0.0051	0.1094
	51	0.7888	497.33	0.2466	0.0519	0.0051	0.1093
	52	0.7816	501.00	0.2500	0.0519	0.0052	0.1093
	53	0.7743	504.66	0.2533	0.0519	0.0052	0.1092
	54	0.7671	508.32	0.2567	0.0519	0.0053	0.1091
	55	0.7599	511.99	0.2600	0.0518	0.0053	0.1091
	56	0.7552	519.76	0.2651	0.0518	0.0054	0.1092
	57	0.7505	527.54	0.2702	0.0519	0.0054	0.1093
	58	0.7459	535.32	0.2752	0.0519	0.0055	0.1094
	59	0.7412	543.10	0.2803	0.0519	0.0056	0.1094
	60	0.7365	550.88	0.2854	0.0519	0.0057	0.1095
	61	0.7348	563.87	0.2928	0.0519	0.0058	0.1098
	62	0.7331	576.87	0.3002	0.0519	0.0059	0.1101
	63	0.7313	589.86	0.3076	0.0520	0.0061	0.1104
	64	0.7296	602.86	0.3150	0.0520	0.0062	0.1107
	65	0.7279	615.86	0.3224	0.0520	0.0063	0.1110
	66	0.7328	628.14	0.3324	0.0520	0.0065	0.1112
	67	0.7378	640.43	0.3424	0.0521	0.0066	0.1115
	68	0.7427	652.71	0.3525	0.0521	0.0067	0.1118
	69	0.7476	665.00	0.3625	0.0521	0.0069	0.1120
	70	0.7526	677.28	0.3725	0.0521	0.0070	0.1123
	71	0.7653	686.73	0.3863	0.0521	0.0071	0.1123
	72	0.7779	696.18	0.4001	0.0522	0.0072	0.1124
	73	0.7906	705.64	0.4140	0.0522	0.0073	0.1125
	74	0.8033	715.09	0.4278	0.0522	0.0073	0.1126
	75	0.8160	724.54	0.4416	0.0522	0.0074	0.1126
	76	0.8364	739.92	0.4622	0.0522	0.0076	0.1128
	77	0.8568	755.31	0.4828	0.0522	0.0077	0.1129
	78	0.8772	770.70	0.5034	0.0523	0.0079	0.1130
	79	0.8976	786.08	0.5239	0.0523	0.0080	0.1132
	80	0.9180	801.47	0.5445	0.0523	0.0082	0.1133

Emissions Tables

Bus							
0	16.2307	31.60	1.9169	0.0000	0.0000	1.1480
5	28.2802	2573.44	19.0484	0.9433	0.0248	3.0451
6	27.1830	2530.41	18.5778	0.9295	0.0243	2.9403
7	26.0858	2487.38	18.1073	0.9157	0.0237	2.8355
8	24.9885	2444.35	17.6367	0.9019	0.0232	2.7307
9	23.8913	2401.32	17.1662	0.8882	0.0226	2.6258
10	22.7941	2358.29	16.6956	0.8744	0.0221	2.5210
11	21.3267	2300.37	16.0232	0.8534	0.0215	2.3743
12	19.8593	2242.45	15.3507	0.8324	0.0210	2.2276
13	18.3919	2184.53	14.6782	0.8115	0.0204	2.0808
14	16.9246	2126.60	14.0058	0.7905	0.0199	1.9341
15	15.4572	2068.68	13.3333	0.7695	0.0193	1.7873
16	14.5867	2033.37	12.9075	0.7558	0.0188	1.6952
17	13.7162	1998.07	12.4816	0.7420	0.0182	1.6031
18	12.8457	1962.76	12.0557	0.7282	0.0177	1.5110
19	11.9752	1927.46	11.6298	0.7144	0.0171	1.4188
20	11.1047	1892.15	11.2040	0.7006	0.0165	1.3267
21	10.5723	1870.09	10.9408	0.6918	0.0165	1.2671
22	10.0400	1848.02	10.6777	0.6829	0.0165	1.2076
23	9.5076	1825.95	10.4146	0.6741	0.0165	1.1480
24	8.9753	1803.89	10.1514	0.6653	0.0165	1.0884
25	8.4430	1781.82	9.8883	0.6565	0.0165	1.0288
26	8.1131	1768.58	9.7399	0.6504	0.0165	0.9897
27	7.7832	1755.34	9.5915	0.6443	0.0165	0.9505
28	7.4533	1742.10	9.4431	0.6383	0.0165	0.9113
29	7.1234	1728.86	9.2947	0.6322	0.0165	0.8722
30	6.7935	1715.62	9.1463	0.6261	0.0165	0.8330
31	6.5905	1707.35	9.0884	0.6217	0.0165	0.8071
32	6.3875	1699.08	9.0305	0.6173	0.0165	0.7811
33	6.1845	1690.80	8.9726	0.6129	0.0165	0.7552
34	5.9815	1682.53	8.9146	0.6085	0.0165	0.7293
35	5.7785	1674.25	8.8567	0.6041	0.0165	0.7034
36	5.6621	1669.29	8.8760	0.6013	0.0165	0.6857
37	5.5457	1664.32	8.8953	0.5985	0.0165	0.6680
38	5.4293	1659.36	8.9146	0.5958	0.0165	0.6504
39	5.3129	1654.39	8.9339	0.5930	0.0165	0.6327
40	5.1965	1649.43	8.9532	0.5903	0.0165	0.6151
41	5.1430	1647.77	9.0531	0.5886	0.0160	0.6041
42	5.0895	1646.12	9.1529	0.5870	0.0154	0.5930
43	5.0360	1644.46	9.2528	0.5853	0.0149	0.5820
44	4.9825	1642.81	9.3526	0.5836	0.0143	0.5710
45	4.9290	1641.15	9.4525	0.5820	0.0138	0.5599
46	4.9306	1641.15	9.6478	0.5809	0.0143	0.5528
47	4.9323	1641.15	9.8431	0.5798	0.0149	0.5456
48	4.9339	1641.15	10.0383	0.5787	0.0154	0.5384
49	4.9356	1641.15	10.2336	0.5776	0.0160	0.5312
50	4.9372	1641.15	10.4289	0.5765	0.0165	0.5241
51	4.9935	1643.91	10.7489	0.5759	0.0165	0.5202
52	5.0498	1646.67	11.0688	0.5754	0.0165	0.5163
53	5.1061	1649.43	11.3888	0.5748	0.0165	0.5125
54	5.1623	1652.19	11.7087	0.5743	0.0165	0.5086
55	5.2186	1654.94	12.0287	0.5737	0.0165	0.5048
56	5.3400	1660.46	12.5312	0.5737	0.0165	0.5048
57	5.4613	1665.98	13.0338	0.5737	0.0165	0.5048
58	5.5827	1671.49	13.5363	0.5737	0.0165	0.5048
59	5.7040	1677.01	14.0389	0.5737	0.0165	0.5048
60	5.8254	1682.53	14.5414	0.5737	0.0165	0.5048
61	6.0334	1691.35	15.3237	0.5748	0.0165	0.5070
62	6.2413	1700.18	16.1059	0.5759	0.0165	0.5092
63	6.4493	1709.00	16.8881	0.5770	0.0165	0.5114
64	6.6573	1717.83	17.6704	0.5781	0.0165	0.5136
65	6.8653	1726.66	18.4526	0.5792	0.0165	0.5158
66	7.2029	1741.55	19.6861	0.5809	0.0165	0.5213
67	7.5405	1756.45	20.9196	0.5825	0.0165	0.5268
68	7.8781	1771.34	22.1531	0.5842	0.0165	0.5323
69	8.2157	1786.24	23.3866	0.5858	0.0165	0.5379
70	8.5533	1801.13	24.6200	0.5875	0.0165	0.5434
71	9.0967	1824.30	26.6181	0.5897	0.0165	0.5533
72	9.6400	1847.47	28.6162	0.5919	0.0165	0.5632
73	10.1834	1870.64	30.6142	0.5941	0.0165	0.5732
74	10.7268	1893.81	32.6123	0.5963	0.0165	0.5831
75	11.2702	1916.98	34.6104	0.5985	0.0165	0.5930
76	12.1600	1955.59	37.9467	0.6024	0.0171	0.6074
77	13.0498	1994.21	41.2831	0.6063	0.0177	0.6217
78	13.9396	2032.82	44.6195	0.6101	0.0182	0.6360
79	14.8294	2071.44	47.9558	0.6140	0.0188	0.6504
80	15.7192	2110.05	51.2922	0.6178	0.0193	0.6647

Bus							
0	6.7367	35.88	0.9329	0.0000	0.0000	0.4575
5	8.5199	2438.77	9.8329	0.7659	0.0243	1.0942
6	8.1853	2395.98	9.5863	0.7576	0.0238	1.0616
7	7.8508	2353.19	9.3398	0.7494	0.0233	1.0290
8	7.5162	2310.39	9.0932	0.7411	0.0229	0.9964
9	7.1816	2267.60	8.8467	0.7328	0.0224	0.9638
10	6.8470	2224.80	8.6001	0.7246	0.0219	0.9313
11	6.4035	2168.39	8.2490	0.7124	0.0209	0.8846
12	5.9600	2111.98	7.8979	0.7003	0.0199	0.8379
13	5.5165	2055.57	7.5468	0.6881	0.0190	0.7912
14	5.0730	1999.16	7.1957	0.6760	0.0180	0.7445
15	4.6295	1942.75	6.8446	0.6638	0.0170	0.6978
16	4.3689	1908.71	6.6219	0.6555	0.0170	0.6677
17	4.1082	1874.67	6.3992	0.6473	0.0170	0.6375
18	3.8476	1840.63	6.1764	0.6390	0.0170	0.6074
19	3.5869	1806.59	5.9537	0.6307	0.0170	0.5772
20	3.3263	1772.55	5.7310	0.6225	0.0170	0.5471
21	3.1687	1751.15	5.5929	0.6171	0.0170	0.5271
22	3.0111	1729.75	5.4548	0.6118	0.0170	0.5072
23	2.8536	1708.36	5.3167	0.6064	0.0170	0.4873
24	2.6960	1686.96	5.1786	0.6011	0.0170	0.4673
25	2.5385	1665.56	5.0405	0.5957	0.0170	0.4474
26	2.4412	1652.92	4.9617	0.5923	0.0170	0.4343
27	2.3439	1640.28	4.8829	0.5889	0.0170	0.4211
28	2.2467	1627.63	4.8041	0.5855	0.0170	0.4080
29	2.1494	1614.99	4.7253	0.5821	0.0170	0.3949
30	2.0522	1602.34	4.6466	0.5787	0.0170	0.3817
31	1.9919	1593.59	4.6149	0.5758	0.0170	0.3730
32	1.9316	1584.84	4.5833	0.5729	0.0170	0.3642
33	1.8713	1576.08	4.5517	0.5699	0.0170	0.3555
34	1.8110	1567.33	4.5201	0.5670	0.0170	0.3467
35	1.7507	1558.58	4.4885	0.5641	0.0170	0.3380
36	1.7166	1554.20	4.4977	0.5626	0.0165	0.3321
37	1.6826	1549.82	4.5070	0.5612	0.0160	0.3263
38	1.6485	1545.45	4.5162	0.5597	0.0156	0.3205
39	1.6145	1541.07	4.5255	0.5583	0.0151	0.3146
40	1.5805	1536.69	4.5347	0.5568	0.0146	0.3088
41	1.5639	1534.75	4.5863	0.5558	0.0141	0.3049
42	1.5474	1532.80	4.6378	0.5549	0.0136	0.3010
43	1.5309	1530.86	4.6894	0.5539	0.0131	0.2971
44	1.5143	1528.91	4.7409	0.5529	0.0126	0.2932
45	1.4978	1526.97	4.7924	0.5519	0.0122	0.2893
46	1.4973	1526.97	4.8926	0.5510	0.0122	0.2869
47	1.4968	1526.97	4.9928	0.5500	0.0122	0.2845
48	1.4963	1526.97	5.0930	0.5490	0.0122	0.2821
49	1.4958	1526.97	5.1932	0.5481	0.0122	0.2796
50	1.4954	1526.97	5.2933	0.5471	0.0122	0.2772
51	1.5099	1529.40	5.4592	0.5471	0.0126	0.2762
52	1.5245	1531.83	5.6250	0.5471	0.0131	0.2752
53	1.5391	1534.26	5.7908	0.5471	0.0136	0.2743
54	1.5537	1536.69	5.9566	0.5471	0.0141	0.2733
55	1.5683	1539.13	6.1225	0.5471	0.0146	0.2723
56	1.6019	1544.48	6.3836	0.5471	0.0151	0.2723
57	1.6354	1549.82	6.6447	0.5471	0.0156	0.2723
58	1.6690	1555.17	6.9059	0.5471	0.0160	0.2723
59	1.7025	1560.52	7.1670	0.5471	0.0165	0.2723
60	1.7361	1565.87	7.4282	0.5471	0.0170	0.2723
61	1.7930	1574.63	7.8347	0.5476	0.0170	0.2738
62	1.8499	1583.38	8.2413	0.5481	0.0170	0.2752
63	1.9068	1592.13	8.6478	0.5485	0.0170	0.2767
64	1.9637	1600.89	9.0543	0.5490	0.0170	0.2782
65	2.0206	1609.64	9.4609	0.5495	0.0170	0.2796
66	2.1144	1624.23	10.1038	0.5505	0.0170	0.2821
67	2.2083	1638.82	10.7467	0.5515	0.0170	0.2845
68	2.3021	1653.41	11.3895	0.5524	0.0170	0.2869
69	2.3960	1667.99	12.0324	0.5534	0.0170	0.2893
70	2.4898	1682.58	12.6753	0.5544	0.0170	0.2918
71	2.6401	1705.44	13.7155	0.5558	0.0170	0.2957
72	2.7904	1728.30	14.7557	0.5573	0.0170	0.2996
73	2.9406	1751.15	15.7959	0.5588	0.0170	0.3034
74	3.0909	1774.01	16.8360	0.5602	0.0170	0.3073
75	3.2412	1796.86	17.8762	0.5617	0.0170	0.3112
76	3.4892	1834.31	19.6152	0.5641	0.0170	0.3171
77	3.7372	1871.75	21.3542	0.5665	0.0170	0.3229
78	3.9852	1909.20	23.0932	0.5690	0.0170	0.3287
79	4.2332	1946.64	24.8322	0.5714	0.0170	0.3346
80	4.4812	1984.09	26.5712	0.5738	0.0170	0.3404

Source: California Air Resources Board, EMFAC 2011

Notes: 1) Zero mph corresponds to starts, 2) Other emissions factors include idling emissions and exclude diurnal and evaporative emissions, 3) Five mph is best estimate for idling

HEALTH COST OF TRANSPORTATION EMISSIONS

($/ton)

Area	Proj Loc	CO	CO_2e	NO_X	PM_{10}	SO_X	VOC
LA/South Coast	1	$145	$23	$59,100	$484,300	$182,000	$3,675
CA Urban Area	2	$75	$23	$17,300	$139,900	$69,800	$1,210
CA Rural Area	3	$70	$23	$12,900	$99,700	$50,400	$950

CO_2e Uprater 2.0% increase in value per year

Sources: McCubbin and Delucchi, 1996 for emissions other than CO2e
Interagency Working Group on Social Cost of Carbon, United States Government, 2010 for CO2e

PASSENGER TRAIN EMISSIONS FACTORS

(g/train-mile)

Mode	Year	CO	CO_2	NO_X	PM_{10}	SO_X	VOC
Passenger Train	2002	45.67		583.58	62.02		19.73
	2022	45.67		250.11	31.01		19.73

LIGHT RAIL EMISSIONS FACTORS

(g/veh-mile)

Mode	Year	CO	CO_2	NO_X	PM_{10}	SO_X	VOC
Light Rail	2002	0.14		1.13	0.17		0.06
	2022	0.14		1.14	0.17		0.06

Source: California Air Resources Board

Pavement Adjustments (used only for pavement projects)

PAVEMENT DETERIORATION
(IRI in inches/mile)

	Year 20, By Loading		
Year 0	Light	Medium	Heavy
0	125	150	350
25	150	200	500
50	175	250	675
75	200	300	750
100	275	400	750
125	325	475	750
150	400	575	750
175	500	700	750
200	575	750	750
225	650	750	750
250	750	750	750
275	750	750	750
300	750	750	750
325	750	750	750
350	750	750	750
375	750	750	750
400	750	750	750
425	750	750	750
450	750	750	750

Source: Paterson, 1987

VEHICLE OPERATING SPEED
(percent adjustment)

IRI	Auto	Truck
0	1.00	1.02
25	1.00	1.02
50	1.00	1.02
75	1.00	1.02
100	1.00	1.02
125	1.00	1.02
150	1.00	1.01
175	1.00	1.00
200	1.00	0.98
225	1.00	0.95
250	1.00	0.92
275	0.99	0.89
300	0.98	0.86
325	0.97	0.83
350	0.96	0.81
375	0.95	0.78
400	0.94	0.76
425	0.93	0.73
450	0.92	0.71

Source: Botterill, 1996 and 1997

FUEL CONSUMPTION
(percent adjustment)

IRI	Auto	Truck
0	0.97	0.96
25	0.98	0.97
50	0.98	0.97
75	0.98	0.98
100	0.98	0.98
125	0.99	0.99
150	1.00	0.99
175	1.00	1.00
200	1.01	1.01
225	1.01	1.02
250	1.02	1.03
275	1.03	1.04
300	1.03	1.05
325	1.04	1.06
350	1.05	1.07
375	1.06	1.08
400	1.07	1.10
425	1.08	1.11
450	1.09	1.13

Source: Texas Transportation Institute, 1994

NON-FUEL COSTS
(percent adjustment)

IRI	Auto	Truck
0	1.00	1.00
25	1.00	1.00
50	1.00	1.00
75	1.00	1.00
100	1.00	1.00
125	1.00	1.00
150	1.02	1.02
175	1.03	1.04
200	1.05	1.06
225	1.07	1.08
250	1.09	1.10
275	1.11	1.12
300	1.12	1.14
325	1.14	1.16
350	1.16	1.18
375	1.18	1.20
400	1.19	1.22
425	1.21	1.24
450	1.23	1.26

Source: ARRB Research Board TR VOC Model

Weaving Adjustments (used only for freeway connector, HOV connector, and HOV drop ramp projects)

VEHICLE OPERATING SPEED
(percent adjustment)

Percent Weaving	Freeway Conn	HOV Project
0.000	1.00	1.00
0.002	0.98	0.99
0.004	0.96	0.98
0.006	0.95	0.96
0.008	0.93	0.95
0.010	0.91	0.94
0.012	0.89	0.93
0.014	0.87	0.92
0.016	0.85	0.90
0.018	0.84	0.89
0.020	0.79	0.88
0.022	0.75	0.87
0.024	0.71	0.85
0.026	0.66	0.84
0.028	0.62	0.82
0.030	0.58	0.79
0.032	0.54	0.76
0.034	0.50	0.73
0.036	0.48	0.71
0.038	0.47	0.68
0.040	0.47	0.65
0.042	0.47	0.62
0.044	0.47	0.60
0.046	0.46	0.57
0.048	0.46	0.54
0.050	0.46	0.51
0.052	0.46	0.48
0.054	0.45	0.48
0.056	0.45	0.47
0.058	0.45	0.47
0.060	0.45	0.47
0.062	0.45	0.47
0.064	0.45	0.47
0.066	0.45	0.47
0.068	0.45	0.46
0.070	0.45	0.46
0.072	0.45	0.46
0.074	0.45	0.46
0.076	0.45	0.46
0.078	0.45	0.46
0.080	0.45	0.45

Source: Fitzpatrick, Brewer, and Venglar, 2003

TMS Adjustments (used only for ramp metering, ramp metering signal coordination, incident management, traveler information projects, AVL, transit priority, and BRT projects)

PEAK PERIOD SPEED, VOLUME, AND NON-HIGHWAY BENEFITS
(percent adjustment)

TMS	Without		With		Non-Highway Benefits			Total	
Strategy	Speed	Volume	Speed	Volume	TT	VOC	Em	Benefit	
AMoth	1.02	0.95	1.02	0.95	-5.05	12.81	1.37	0.74	
AMsev	1.53	0.94	1.53	0.94	1.21	1.38	-0.37	1.00	
IMoth	0.88	1.18	0.98	0.96	0.51	0.15	0.06	0.74	
IMsev	1.01	0.97	1.01	0.95	0.30	0.31	0.30	1.00	
NoAdj	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00	
ORoth	0.98	1.03	1.00	1.00	-0.07	-0.03	-0.07	0.00	*18*
ORsev	0.95	1.03	1.00	1.00	0.00	0.00	5.67	0.00	*18*
RMoth	1.00	1.00	1.03	0.97	-0.07	-0.03	-0.07	1.00	
RMsev	1.00	1.00	1.05	0.97	0.00	0.00	5.67	1.00	
TIoth	1.00	1.00	1.02	0.97	-0.11	-0.12	-0.35	1.00	
TIsev	1.00	1.00	1.01	0.97	-0.39	-0.39	-0.35	1.00	

Source: California Department of Transportation TMS Master Plan, 2003
18) Chaudhary and Messer, 2000

TRANSIT TRAVEL TIME AND AGENCY COST SAVINGS
(percent savings)

TMS Strategy	Travel Time	Agency Costs	
		Capital	O&M
Transit Vehicle Location (AVL)	15%	2%	8%
Transit Vehicle Signal Priority	10%	-	-
Bus Rapid Transit (BRT)	29%	-	-

Sources: FHWA ITS Deployment Analysis System (IDAS), California PATH

MONTCLAIR

May 13, 2014

Caltrans
Division of Local Assistance, MS-1
Attention: Chief, Office of Active Transportation and Special Programs
P.O. Box 942874
Sacramento, CA 95814

Re: California Active Transportation Program (ATP) – SANBAG Metrolink Station Accessibility Improvement Project

To Whom It May Concern:

The City of Montclair wishes to express its support to San Bernardino Associated Governments (SANBAG) in the Active Transportation Program for the SANBAG Metrolink Station Accessibility Improvement Project. SANBAG, acting in its role as the San Bernardino County Transportation Commission, is proposing the project to significantly improve access to the regional transit network by the active transportation users.

The project encompasses the six existing Metrolink Commuter Rail stations along the San Bernardino line (Montclair, Upland, Rancho Cucamonga, Fontana, Rialto, and San Bernardino). These pedestrian and bicycle improvements were identified in the report *Improvement to Transit Access for Cyclists and Pedestrians*, dated November 2012. The report has received a 2014 National Planning Achievement Award for Transportation from the American Planning Association and sets the stage for major upgrades of the active transportation network in transit station areas. The Project is seeking funding for transit station area improvements, to implement the goals of SANBAG's Non-motorized Transportation Plan and to improve access to and from these stations for local residents and commuters, thereby improving safety, reducing parking demand, and increasing transit ridership.

The City of Montclair fully supports SANBAG as it, representing its local agency partners, seeks ATP resources to fund the improvements around Metrolink stations. We believe that this innovative opportunity will support public health, transit accessibility and transit oriented development for these major transit corridors in the San Bernardino Valley.

Sincerely,

Steve Lustro

Steve Lustro, AICP
Community Development Director

CITY OF MONTCLAIR
5111 Benito Street, P.O. Box 2308, Montclair, CA 91763 (909) 626-8571 FAX (909) 621-1584

Mayor Paul M. Eaton • Mayor Pro Tem Bill Ruh • Council Members: Leonard Paulitz, Carolyn Raft, J. John Dutrey • City Manager Edward C. Starr

City of Rialto
California

May 14, 2014

Caltrans
Division of Local Assistance, MS-1
Attention: Chief, Office of Active Transportation and Special Programs
P.O. Box 942874
Sacramento, CA 95814

Re: California Active Transportation Program (ATP) – SANBAG Metrolink Station Accessibility Improvement Project

To Whom It May Concern:

The City of Rialto wishes to express its support to San Bernardino Associated Governments (SANBAG) in the Active Transportation Program for the SANBAG Metrolink Station Accessibility Improvement Project. SANBAG, acting in its role as the San Bernardino County Transportation Commission, is proposing the project to significantly improve access to the regional transit network by the active transportation users.

The project encompasses the six existing Metrolink Commuter Rail stations along the San Bernardino line. (Montclair, Upland, Rancho Cucamonga, Fontana, Rialto, and San Bernardino) These pedestrian and bicycle improvements were identified in the report *Improvement to Transit Access for Cyclists and Pedestrians*, dated November 2012. The report has received a 2014 National Planning Achievement Award for Transportation from the American Planning Association and sets the stage for major upgrades of the active transportation network in transit station areas. The Project is seeking funding for transit station area improvements, to implement the goals of SANBAG's Non-motorized Transportation Plan and to improve access to and from these stations for local residents and commuters, thereby improving safety, reducing parking demand, and increasing transit ridership.

The City of Rialto supports SANBAG as they, representing their local agency partners, seek ATP resources to fund the improvements around Metrolink stations. We believe that this innovative opportunity will support public health, transit accessibility and transit oriented development for these major transit corridors in the San Bernardino Valley.

Sincerely,

Marcus L. Fuller, P.E., P.L.S.
Public Works Director/City Engineer

150 South Palm Avenue, Rialto, California 92376

COMMUNITY DEVELOPMENT DEPARTMENT

300 North "D" Street • San Bernardino • CA 92418-0001
Planning & Building 909.384.5057 • Fax: 909.384.5080
www.sbcity.org

May 13, 2014

Caltrans
Division of Local Assistance, MS-1
Attention: Chief, Office of Active Transportation and Special Programs
P.O. Box 942874
Sacramento, CA 95814

Re: California Active Transportation Program (ATP) – SANBAG Metrolink Station Accessibility Improvement Project

To Whom It May Concern:

The City of San Bernardino, Community Development Department wishes to express its support to San Bernardino Associated Governments (SANBAG) in the Active Transportation Program for the SANBAG Metrolink Station Accessibility Improvement Project. SANBAG, acting in its role as the San Bernardino County Transportation Commission, is proposing the project to significantly improve access to the regional transit network by the active transportation users.

The project encompasses the six existing Metrolink Commuter Rail stations along the San Bernardino line. (Montclair, Upland, Rancho Cucamonga, Fontana, Rialto, and San Bernardino) These pedestrian and bicycle improvements were identified in the report *Improvement to Transit Access for Cyclists and Pedestrians*, dated November 2012. The report has received a 2014 National Planning Achievement Award for Transportation from the American Planning Association and sets the stage for major upgrades of the active transportation network in transit station areas. The Project is seeking funding for transit station area improvements, to implement the goals of SANBAG's Non-motorized Transportation Plan and to improve access to and from these stations for local residents and commuters, thereby improving safety, reducing parking demand, and increasing transit ridership.

The Community Development Department fully supports SANBAG as they, representing their local agency partners, seek ATP resources to fund the improvements around Metrolink stations. We believe that this innovative opportunity will support public health, transit accessibility and transit oriented development for these major transit corridors in the San Bernardino Valley.

Sincerely,

Mark Persico, AICP
Interim Director of Community Development
City of San Bernardino
300 N. D Street
San Bernardino, CA 92418
(909) 384-5357
Persico_ma@sbcity.org

COMMUNITY VITAL SIGNS INITIATIVE
County of San Bernardino

COMMUNITY VITAL SIGNS INITIATIVE
351 North Mountain View Avenue, Second Floor
San Bernardino, CA 92415-0010

(909) 387-9107 ◆ Fax (909) 387-6228

MAXWELL OHIKHUARE, M.D.
San Bernardino County Health Officer
Community Vital Signs Initiative, Co-Chair

May 6, 2014

Caltrans
Division of Local Assistance, MS-1
Attention: Chief, Office of Active Transportation and Special Programs
P.O. Box 942874
Sacramento, CA 95814

Re: California Active Transportation Program (ATP) – SANBAG Metrolink Station Accessibility Improvement Project

To Whom It May Concern:

The San Bernardino County Community Vital Signs Initiative wishes to express its support to San Bernardino Associated Governments (SANBAG) in the Active Transportation Program (ATP) for the SANBAG Metrolink Station Accessibility Improvement Project. SANBAG, acting in its role as the San Bernardino County Transportation Commission, is proposing the project to significantly improve access to the regional transit network by the active transportation users.

The project encompasses the six existing Metrolink Commuter Rail stations along the San Bernardino line. (Montclair, Upland, Rancho Cucamonga, Fontana, Rialto, and San Bernardino) These pedestrian and bicycle improvements were identified in the report Improvement to Transit Access for Cyclists and Pedestrians, dated November 2012. The report has received a 2014 National Planning Achievement Award for Transportation from the American Planning Association and sets the stage for major upgrades of the active transportation network in transit station areas. The Project is seeking funding for transit station area improvements, to implement the goals of SANBAG's Non-motorized Transportation Plan and to improve access to and from these stations for local residents and commuters, thereby improving safety, reducing parking demand, and increasing transit ridership.

SANBAG is also a member of the Community Vital Signs Initiative, a health improvement partnership advancing the Wellness Element of our Countywide Vision. This community-driven initiative has actively engaged and convened many stakeholders from multiple sectors and non-traditional health partners to create a framework to improve health in our County. As a partner, SANBAG is committed to using their capacity to implement effective policies and programs that impact and evaluate our collective efforts to improve the health of our region.

As the County's Health Officer and Co-Chair of Community Vital Signs, I fully support SANBAG as they, representing their local agency partners, seek ATP resources to fund the improvements around Metrolink stations. We believe that this innovative opportunity will support public health, transit accessibility and transit oriented development for these major transit corridors in the San Bernardino Valley.

Sincerely,

Maxwell Ohikhuare, M.D.
San Bernardino County Health Officer
Community Vital Signs, Co-Chair

DEPARTMENT OF PUBLIC HEALTH

COUNTY OF SAN BERNARDINO

OFFICE OF PUBLIC HEALTH ADMINISTRATION
351 North Mountain View Avenue, Third Floor ♦ San Bernardino, CA 92415-0010
(909) 387-9146 ♦ Fax (909) 387-6228

TRUDY RAYMUNDO
Public Health Director

MAXWELL OHIKHUARE, M.D.
Health Officer

May 8, 2014

Caltrans
Division of Local Assistance, MS-1
Attention: Chief, Office of Active Transportation and Special Programs
P.O. Box 942874
Sacramento, CA 95814

Re: California Active Transportation Program (ATP) – SANBAG Metrolink Station Accessibility Improvement Project

To Whom It May Concern:

San Bernardino Department of Public Health wishes to express its support to San Bernardino Associated Governments (SANBAG) in the Active Transportation Program for the SANBAG Metrolink Station Accessibility Improvement Project. SANBAG, acting in its role as the San Bernardino County Transportation Commission, is proposing the project to significantly improve access to the regional transit network by the active transportation users.
SANBAG is also a member of the Community Vital Signs Initiative, community health improvement partnership advancing the Wellness Element of our Countywide Vision. This community-driven initiative has actively engaged and convened many stakeholders from multiple sectors and non-traditional health partners to create a framework to improve health in our County. The Department of Public Health sees SANBAG as committed to using their capacity to work together with other sectors, choosing and implementing effective policies and programs that impact and evaluate our collective efforts to improve the health of our region.

The project encompasses the six existing Metrolink Commuter Rail stations along the San Bernardino line. (Montclair, Upland, Rancho Cucamonga, Fontana, Rialto, and San Bernardino) These pedestrian and bicycle improvements were identified in the report Improvement to Transit Access for Cyclists and Pedestrians, dated November 2012. The report has received a 2014 National Planning Achievement Award for Transportation from the American Planning Association and sets the stage for major upgrades of the active transportation network in transit station areas. The Project is seeking funding for transit station area improvements, to implement the goals of SANBAG's Non-motorized Transportation Plan and to improve access to and from these stations for local residents and commuters, thereby improving safety, reducing parking demand, and increasing transit ridership.

SANBAG is also a member of the Community Vital Signs Initiative, community health improvement partnership advancing the Wellness Element of our Countywide Vision. This community-driven initiative has actively engaged and convened many stakeholders from multiple sectors and non-traditional health partners to create a framework to improve health in our County. The Department of Public Health sees SANBAG as committed to using their capacity to work together with other sectors, choosing and implementing effective policies and programs that impact and evaluate our collective efforts to improve the health of our region.

San Bernardino Department of Public Health fully supports SANBAG as they, representing their local agency partners, seek ATP resources to fund the improvements around Metrolink stations. We believe that this innovative opportunity will support public health, transit accessibility and transit oriented development for these major transit corridors in the San Bernardino Valley.

Sincerely,

Ms. Trudy Raymundo
Public Health Director

GREGORY C. DEVEREAUX
Chief Executive Officer

Board of Supervisors
ROBERT A. LOVINGOOD….First District JAMES RAMOS……...Third District
JANICE RUTHERFORD.....……...Second District GARY C. OVITT….....…Fourth District
JOSIE GONZALES…….Fifth District

INLAND EMPIRE
BIKING ALLIANCE

April 28, 2014

Caltrans
Division of Local Assistance, MS-1
Attention: Chief, Office of Active Transportation and Special Programs
P.O. Box 942874
Sacramento, CA 95814

Re: California Active Transportation Program (ATP) – SANBAG Metrolink Station Accessibility Improvement Project

To Whom It May Concern:

The Inland Empire Biking Alliance (IEBA) wishes to express its support to San Bernardino Associated Governments (SANBAG) in the Active Transportation Program for the SANBAG Metrolink Station Accessibility Improvement Project. SANBAG, acting in its role as the San Bernardino County Transportation Commission, is proposing the project to significantly improve access to the regional transit network by the active transportation users.

The project encompasses the six existing Metrolink Commuter Rail stations along the San Bernardino line. (Montclair, Upland, Rancho Cucamonga, Fontana, Rialto, and San Bernardino) These pedestrian and bicycle improvements were identified in the report Improvement to Transit Access for Cyclists and Pedestrians, dated November 2012. The report has received a 2014 National Planning Achievement Award for Transportation from the American Planning Association and sets the stage for major upgrades of the active transportation network in transit station areas. The Project is seeking funding for transit station area improvements, to implement the goals of SANBAG's Non-motorized Transportation Plan and to improve access to and from these stations for local residents and commuters, thereby improving safety, reducing parking demand, and increasing transit ridership.

IEBA fully supports SANBAG as they, representing their local agency partners, seek ATP resources to fund the improvements around Metrolink stations. We believe that this innovative opportunity will support public health, transit accessibility and transit oriented development for these major transit corridors in the San Bernardino Valley.

Sincerely,

Mark Friis, Executive Director

Marven Norman, Vice President

PO BOX 9266 Redlands, Ca 92375 909-800-4322
www.iebike .org

AMERICAN LUNG ASSOCIATION®
IN CALIFORNIA

441 Mac Kay Drive
San Bernardino, CA 92408
909-884-5864 phone
909-884-6249 fax

lung.org/california

April 28, 2014

Caltrans
Division of Local Assistance, MS-1
Attention: Chief, Office of Active Transportation and Special Programs
P.O. Box 942874
Sacramento, CA 95814

Re: California Active Transportation Program (ATP) – SANBAG Metrolink Station Accessibility Improvement Project

To Whom It May Concern:

On behalf of the American Lung Association in California, I am writing to express support for the San Bernardino Associated Governments' (SANBAG) application to secure funding for their Metrolink Station Accessibility Improvement Project. This project will significantly improve access to transit stations by walking and biking for local residents of San Bernardino County.

According to the Lung Association's 2014 State of the Air report, San Bernardino ranks at the top for most ozone-polluted county in the nation. We know that supporting community designs that increase opportunities for daily physical activity and active transportation options will result in dramatic reductions in chronic illnesses, such as lung and heart disease, diabetes, obesity and stroke.

This project will help to support public health, transit accessibility and transit oriented develop for major transit corridors in the San Bernardino Valley.

Therefore, the American Lung Association fully supports SANBAG as they seek Active Transportation Program resources to fund improvements around Metrolink stations to make it more accessible by walking and biking.

Sincerely,

Terry M. Roberts

Terry M. Roberts
Area Director, San Bernardino

May 1, 2014

Teresa McWilliam
Caltrans
Division of Local Assistance, MS-1
Attention: Chief, Office of Active Transportation and Special Programs
P.O. Box 942874
Sacramento, CA 95814

Subject: California Active Transportation Program (ATP) – SANBAG Metrolink Station Accessibility Improvement Project

Ms. McWilliam:

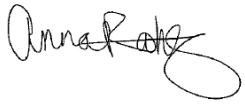
I write in support of the San Bernardino Associated Governments' (SANBAG's) application for Active Transportation funding for the SANBAG Metrolink and Bus Rapid Transit Station Accessibility Project.

The project encompasses the six existing Metrolink Commuter Rail stations along the San Bernardino line, the new San Bernardino Transit Center in Downtown San Bernardino that will be opening in 2015, and three key stations along Omnitrans' sbX Bus Rapid Transit line that will open for revenue service on April 28, 2014. These pedestrian and bicycle improvements were identified in the report Improvement to Transit Access for Cyclists and Pedestrians, dated November 2012.

The improvements proposed within this project go hand-in-hand with Omnitrans' ongoing efforts to improve transit access, including pedestrian and bicycle access to bus stops, and bus access to Metrolink rail stations. Omnitrans is applying for Active Transportation funding for the West Valley Connector Corridor, a proposed rapid bus service that will stop at Fontana Metrolink Station and Rancho Cucamonga Metrolink Station, two of the focus areas of this project. Pedestrian and bicycle facilities to improve access to those stops are proposed within this Metrolink and Bus Rapid Transit Station Accessibility Project; thus, both projects work together to provide an improved multimodal transportation system. Both projects will help to increase the mode share of transit, walking, and biking, which is vital to improve the air quality and improve local economic productivity in the San Bernardino Valley.

Omnitrans fully supports SANBAG and its local agency partners in seeking Active Transportation funding to supplement local funds for the Metrolink and Bus Rapid Transit Station Accessibility Project. Please feel free to contact me for additional information at (909) 379-7256 or anna.rahtz@omnitrans.org.

Sincerely,



Anna Rahtz
Acting Director of Planning