
Border Health Equity Transportation Study

A Case Study of the San Ysidro Community

Final Report

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Prepared for:



San Diego Association of Governments
401 B Street, Suite 800
San Diego, CA 92101

Prepared by:

CHEN + RYAN

239 Laurel Street, Suite 203
San Diego, CA 92101

In association with:



CASA FAMILIAR



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SANDAG Committees and Working Groups

Border Health Equity Transportation Study Stakeholder Working Group
Regional Planning Committee
Borders Committee
Committee on Binational Regional Opportunities
Regional Planning Technical Working Group
Public Health Stakeholder Group

Community-Based Organizations

Casa Familiar

Caltrans Staff

Connery Cepeda, Associate Transportation Planner
Michael Kent, Associate Transportation Planner

SANDAG Staff

Dan Gallagher, Senior Regional Planner
Sarah Strand, Regional Planner
Coleen Clementson, Principal Regional Planner
Elisa Arias, Principal Regional Planner
Rachel Kennedy, Senior Regional Planner
Laurie Gartrell, Regional Planner
Hector Vanegas, Borders Program Manager

Consultant Team

Chen Ryan Associates

Sherry Ryan, PhD
Andrew Prescott
Sasha Jovanovic

Human Impact Partners

Marnie Purciel-Hill

Casa Familiar

David Flores

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Executive Summary

Purpose of the Study

Relationships between the built environment and public health are increasingly at the forefront of public policy considerations. While it is known that the presence, concentration, and proximity of various land uses and transportation systems can shape communities and the people living in them, little is understood about the health impacts of these environmental factors. The Border Health Equity Transportation Study (BHETS) was conducted to evaluate the significance of mobility and built environmental factors in the health of San Ysidro community members. The study develops a framework for identifying and assessing significant health impacts within a community and analyzes the relationship between these health issues and the built environment. Ultimately, the study may serve as a model planning document for use by other agencies, cities, and jurisdictions to identify specific mobility and built environment recommendations to help address the most significant community health issues. With this knowledge, local and regional planning agencies will have the necessary tools to make more informed decisions related to community health.

Approach

The BHETS process included four primary tasks:

1. Identify existing conditions in relation to mobility/built environment and health outcomes in San Ysidro, the City of San Diego, and the San Diego region
2. Analyze the association between mobility/built environment factors and health outcomes, and develop a final set of mobility/built environment recommendations expected to improve community health (partial correlations analysis)
3. Solicit feedback at community meetings to help shape the study
4. Develop a monitoring and evaluation plan along with a list of resources for community members and public agency staff

Each of these four tasks is summarized below.

Existing Conditions

The initial analysis phase of the BHETS utilized previously published research, studies and planning documents, public input, community health data, and mobility/built environment data to develop an understanding of the key environmental and health issues within the community of San Ysidro. A regional analysis was also conducted for the entire San Diego County to inform a general understanding of mobility/built environment associations with community health outcomes.

The existing conditions analysis identified several mobility/built environment variables in which San Ysidro is faring better than the City of San Diego as a whole. For example, San Ysidro has on average more than double the transportation infrastructure support, twice as much support for youth physical activity, and generally greater access to amenities like parks, schools, libraries, and healthcare services than the City of San Diego as a whole. There are also several ways in which San Ysidro is not faring as well compared to the City of San Diego as a whole, particularly in terms of air pollution, walkability, physical activity inhibitors, traffic safety, and crime rates.

When comparing health outcomes, the South Bay Sub-Regional Area (SRA) experiences higher rates of pedestrian injury, asthma, diabetes, and Chronic Obstructive Pulmonary Disease (COPD) than the region as a whole. Conversely, the South Bay SRA has significantly lower rates of psychological disorder, crime injury, and substance abuse when compared to region-wide outcomes.

Partial Correlations Analysis and Results

After using mobility/built environment and health data to identify disparities and establish baseline existing conditions, a partial correlations analysis was performed to gauge the significance of interactions or associations between mobility/built environment factors and community health outcomes. Partial correlation analyses allow for a simple assessment of the strength and magnitude of the linear relationship between two variables while controlling for the effects of other factors, in this case age and income.

Several interesting relationships between mobility/built environment variables and health outcomes were revealed through the partial correlations analysis. Key findings, organized by the mobility/built environment variable being analyzed, include:

- Relationships between transportation system factors (air quality, high volume arterial density, and Vehicle Miles Traveled [VMT]) and health outcomes:
 - Of the three transportation system factors examined (air quality, arterial density, and VMT), air quality has the most consistent association with health outcomes. In particular, the analysis shows there are small positive associations between living in close proximity to air pollution sources and pedestrian injury rates, cyclist injury rates, asthma, Coronary Heart Disease (CHD), stroke, psychological disorder, and substance abuse. In other words, increases in populations living close to air pollution sources is associated with increased levels of pedestrian injury rates, cyclist injury rates, asthma, CHD, stroke, psychological disorder, and substance abuse.
 - Of all health outcomes assessed, cyclist injury rates and stroke have the most consistent association with transportation system factors (air pollution, arterial density, and VMT). These two health outcomes show small to large positive associations with each of the three transportation system measures.
- Relationships between physical activity support factors (trail access, sidewalk coverage, transportation support, walkability, youth physical activity support factors, and physical activity inhibitors) and health outcomes:
 - Of the six physical activity support factors, trail access and sidewalk coverage show the most consistent expected associations with health outcomes, including small to large negative associations with all health outcomes except CHD, cancer, and pedestrian injury (trail access only).
 - Of all health outcomes assessed, motor vehicle injury rates and two of the community-level health outcomes – substance abuse and injury from crime – showed consistent, expected associations with the physical activity support measures.
- Relationships between traffic-related safety risk factors (pedestrian safety, bicycle safety, and youth safety) and health outcomes:
 - Of the three safety-related composite measures, pedestrian safety and youth safety show the most consistent, expected associations with health outcomes, including small negative

associations with pedestrian injury, cyclist injury, COPD, CHD, stroke, cancer, psychological disorder, and substance abuse.

- Of all health outcomes assessed, cyclist injury rates, CHD, and stroke showed the most consistent, expected associations with the safety composite measures.
- Relationships between access to social support (parks, libraries, elementary schools, health care, day care, healthy food, fast food, and all amenities) and health outcomes:
 - Three of the health outcome measures appear to be fairly consistently associated with levels of access to social support amenities, including motor vehicle injury, substance abuse and injury from crime. For each of these health outcomes, the majority of access measures show small negative associations with those three health outcomes.
 - Of all the mobility/built environment factors examined in the BHETS, access to social support measures showed the least consistent associations with health outcomes.

The results of the partial correlations analysis were used to identify existing planning projects with the strongest potential for bringing about improved community health. The mobility/built environment variables were separated into three tiers using the total number of health outcomes having an association with each respective mobility/built environment variable. Mobility/built environment variables were categorized as Tier-1 if they were found to have a significant, expected relationship with more than six health outcomes; factors found to have a significant, expected relationship with four to six health outcomes were categorized as Tier-2; and factors showing associations with less than four health outcomes were categorized as Tier-3. The results of this categorization are as follows:

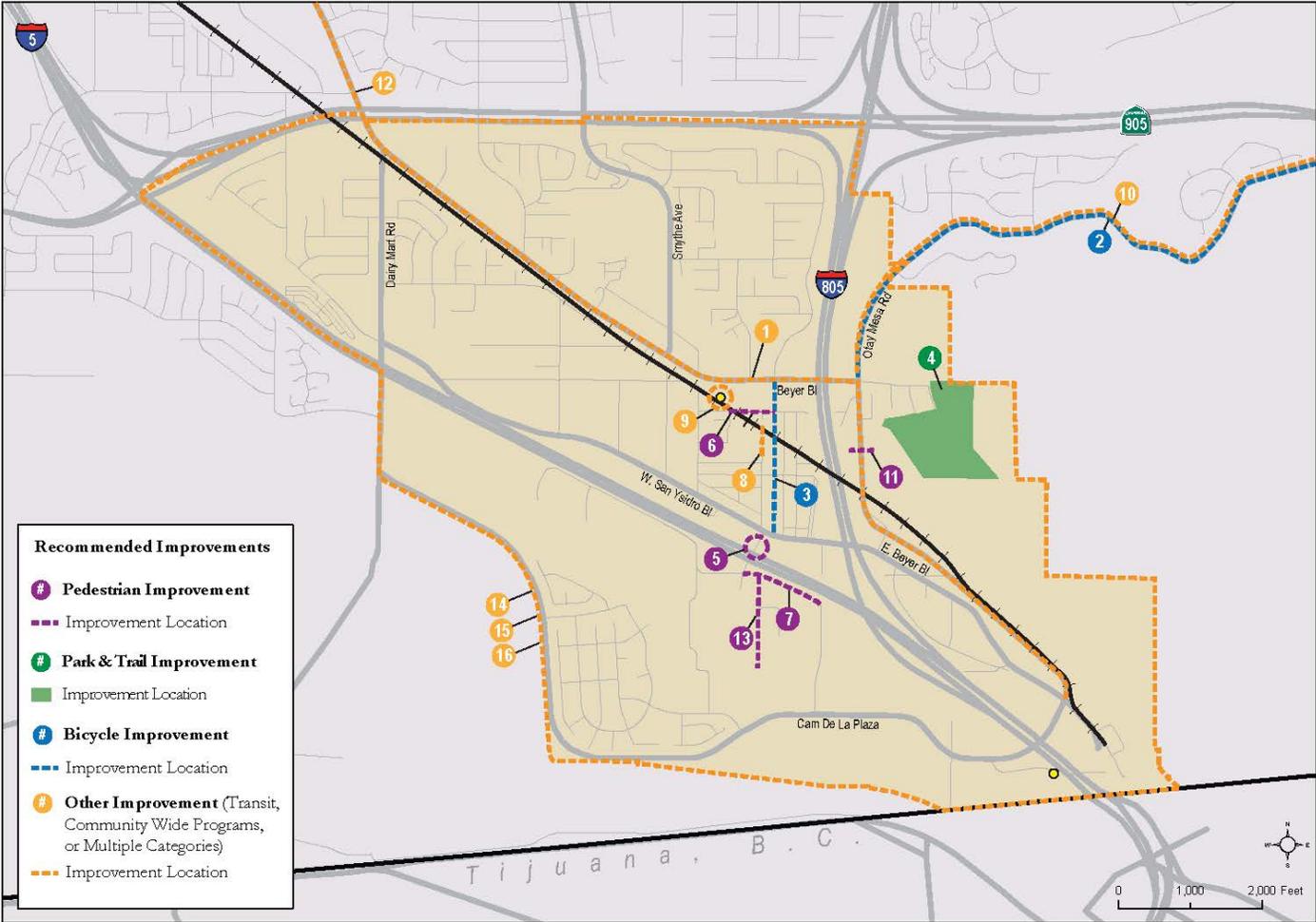
- The four mobility/built environment factors represented in Tier-1 include the percent of households within 500-feet of a transportation-related air pollution sources, sidewalks, pedestrian safety, and youth safety.
- The four mobility/built environment factors represented in Tier-2 include trail access, transportation support, youth physical activity support, and access to parks.
- Twelve mobility/built environment factors were categorized in Tier-3, including high volume arterials, traffic density, walkability, physical activity inhibitors, cyclist safety, access to libraries, access to elementary schools, access to health care, access to day care, access to healthy food, access to fast food, and a composite of access to all social support amenities.

Recommendations addressing Tier-1 and Tier-2 mobility/built environment mobility factors were identified from existing planning documents and presented to community members for prioritization as well as to identify any key gaps in recommendations. The likely health impacts that could result from implementing the identified recommendations were then estimated. A final set of sixteen mobility/built environment projects were recommended based on their potential to have the greatest positive impact on community health, as well as their consistency with community and stakeholder input.

Final Recommendations

The final recommendations reflect previously adopted recommendations, community input, project team and stakeholder group review, and additional research regarding potential mitigation techniques to reduce exposure to transportation-related pollution. **Figure E-1** displays the final recommendation locations within San Ysidro, with map ID's corresponding to the recommendation numbers outlined below.

Figure E-1: Final Mobility/Built Environment Recommendations



Border Health Equity Transportation Study

Figure E-1
Final Mobility/Built Environment Recommendations

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1. Create a **landscaped active transportation corridor** traversing the community adjacent to the railroad right-of-way, connecting key land uses such as schools, transit stops, recreational facilities, and commercial districts with an emphasis on improved bicycle and pedestrian mobility.
2. Install a **Class II bicycle lane** extending the length of Otay Mesa Road.
3. Establish a **Class III bicycle route** running the length of W. Park Avenue.
4. Create a **ten-acre park** site east of Beyer Elementary School.
5. **Install traffic signals** at the I-5 NB on/off ramps and Via de San Ysidro.
6. **Widen sidewalks** on Seaward Avenue from W. Park Avenue to the Beyer Trolley Station. **Install sidewalks** on south side of Seaward Avenue, west of railroad tracks. Install pedestrian scale lighting.
7. **Construct new sidewalk** along the north side of Calle Primera; install ADA compliant curb ramps at Via San Ysidro/Calle Primera; install pedestrian scale lighting near access point to the pedestrian bridge
8. **Create a distinctive gateway** from the Beyer Trolley Station entrance at Cypress Drive, including changes to landscaping, pavement, fencing treatments, and a gateway sign that reflects the culture of the community in order to encourage transit use.
9. Improve the Beyer Boulevard Trolley Station to include **curb bulb-outs** at all four intersections along Seaward Avenue and install **high visibility crosswalks**.
10. Implement the planned **Class I multi-use path along the SR-905 Corridor**, from San Ysidro to the proposed Otay Mesa East Border Crossing near SR-11.
11. **Enhance/raise crosswalk at existing school crossing** along East Beyer Boulevard near Beyer Elementary School.
12. Create a **Class I or enhanced Class II facility connecting San Ysidro** to the Imperial Beach Bikeway and Bayshore Bikeway.
13. Install **pedestrian scale lighting** on Sycamore Road from Calle Primera to Cesar Chavez Park.
14. Create a **comprehensive community wayfinding program** that identifies and links key community assets. Key destinations to highlight through the wayfinding program would include location of bicycle facilities and non-motorized facilities (such as pedestrian bridges), parks within and around the community, community centers and other key civic uses, and the Dairy Mart Ponds and Tijuana River Valley Regional Park access points.
15. **Implement an air quality monitoring program** to better understand transportation-related emissions within the community. The program should seek to illuminate how different weather, topography, and travel conditions in and around San Ysidro affect the concentration of pollutants near roadways. The monitoring program should also provide a toolbox of mitigation measures depending on air quality conditions at various locations across the community.
16. **Identify potential funding mechanisms**, such as grants or subsidies, to help with recommendation implementation.

Table E.1 identifies the health outcome variables potentially influenced as a result of implementing each mobility/built environment recommendation. It is important to recognize that this study’s findings do not establish a causal linkage between mobility/built environment factors and health outcomes, however, it does allow for an understanding of patterns in the two types of phenomena in the South Bay. For example, this analysis does not show that lack of sidewalk causes diabetes, only that these two measures vary in concert with one another fairly consistently across SRAs in the San Diego region. In other words, as the presence of sidewalk increases in a community, the incidence of diabetes decreases. The Study results show associations between measures rather than suggesting one phenomenon causes another.

Table E.1: Potential Health Outcomes Influenced by Recommendations

		Potential Health Outcomes Influenced by Recommendations										
ID	Recommendation Description	Asthma	COPD	Coronary Heart Disease	Crime Injury	Cyclist Injury	Diabetes	Motor Vehicle Injury	Pedestrian Injury	Psychological Disorder	Stroke	Substance Abuse
1	Landscaped active transportation corridor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	Class II bike lane on Otay Mesa Road	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	Class III bike route on W. Park Avenue	✓		✓		✓			✓	✓	✓	✓
4	Ten-acre park site east of Beyer Elementary School	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
5	Traffic signal at I-5 NB ramps & Via de San Ysidro	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
6	Seaward Avenue sidewalk widening and lighting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	Calle Primera sidewalk, ADA ramps, and lighting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8	Cypress Drive Trolley entrance gateway	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
9	Beyer Trolley Station pedestrian improvements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	Class I bike facility along SR-905 corridor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	Beyer Elementary School crosswalk enhancement	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12	Class I or enhanced Class II facility connecting to Bayshore Bikeway	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
13	Sycamore Road pedestrian scale lighting	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
14	Comprehensive community wayfinding program	✓		✓		✓			✓	✓	✓	✓
15	Air quality monitoring program	✓		✓		✓			✓	✓	✓	✓
16	Identify potential funding mechanisms	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Source: Source: *Healthy Communities Atlas, 2012; Chen Ryan Associates, February 2015*

1.0 Introduction

1.1 Overview

The purpose of the Border Health Equity Transportation Study (BHETS) is to evaluate how mobility/built environment factors in the community of San Ysidro are related to the health of the people who live and work in the community. This report presents an analysis approach and results that assist with connecting mobility/built environment conditions to trends in key community health outcomes. This is largely an exploratory study and is being conducted to provide a model for how health can be a consideration in long-range transportation and land-use planning.

San Ysidro is a unique community within the City of San Diego in that it sits adjacent to the United States/Mexico border at one of the busiest international crossings in the world. The San Ysidro community experiences a variety of distinct environmental, economic, and social impacts related to its proximity to the border. As a majority of border crossers are traveling by car, air quality impacts are of particular concern. In addition to this unique dynamic, San Ysidro also shows high concentrations of low income, minority populations, leading to broad concerns related to social and environmental equity. **Figure 1-1** shows San Ysidro located within the San Diego region.

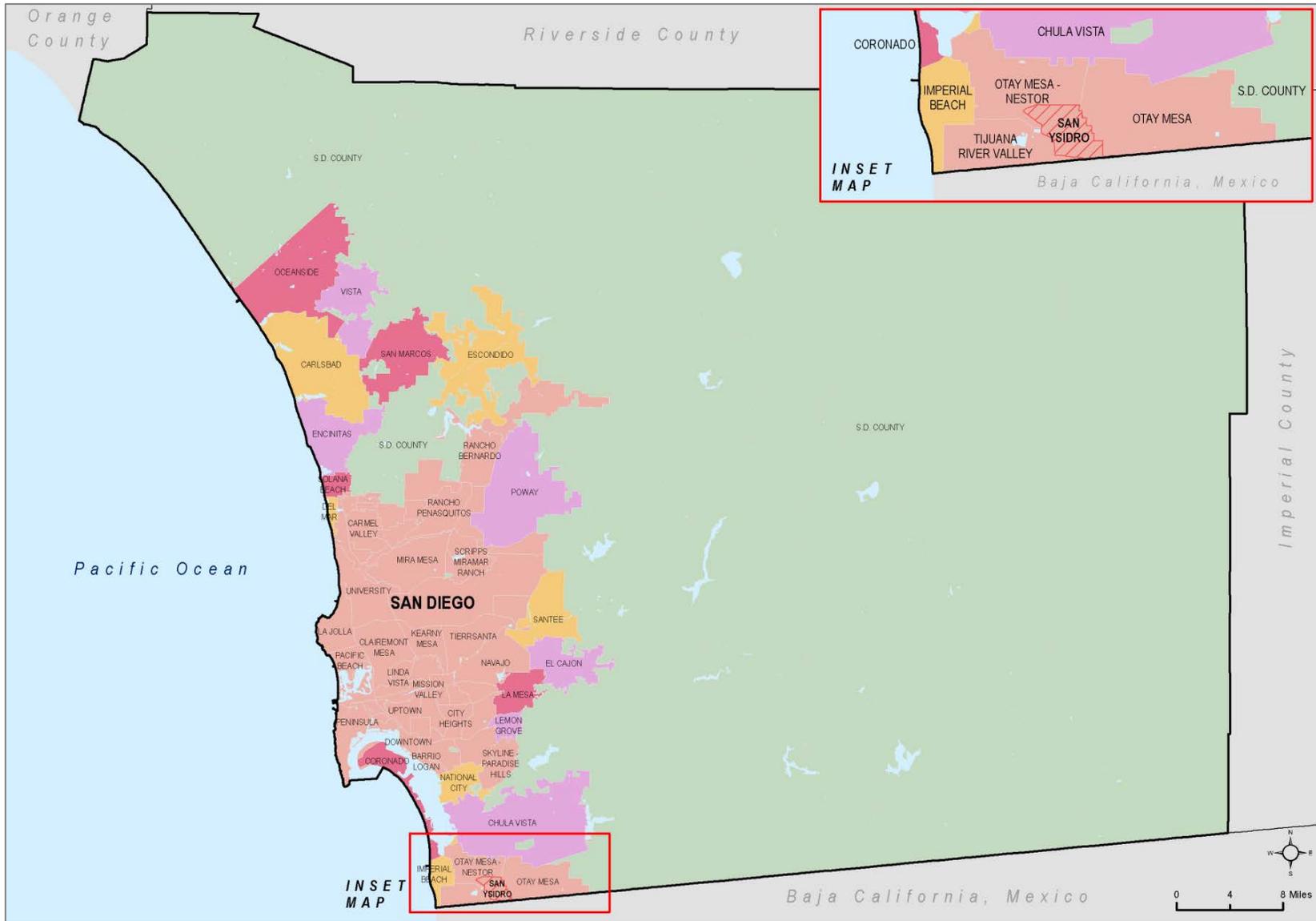
Increasingly, research suggests that transportation and land use policies, plans, and programs affect health outcomes. Transportation and land use decisions directly influence exposure to air and noise pollution; traffic safety; access to jobs, goods, and services; and social cohesion. Research has connected these “determinants of health”ⁱ to health outcomes such as asthma, cancer, cardiovascular disease, diabetes, injuries, adverse birth outcomes, and mental illness.

This report attempts to document the current status of health and mobility/built environment conditions in the San Ysidro community, identify existing transportation infrastructure and land use recommendations, and develop a final set of recommendations with potential to positively impact significant health outcomes.



ⁱ Determinants of health are defined as those social, physical, environmental, economic, and individual factors that combine together to affect a person or community's health.

Figure 1-1: San Ysidro within the San Diego Region

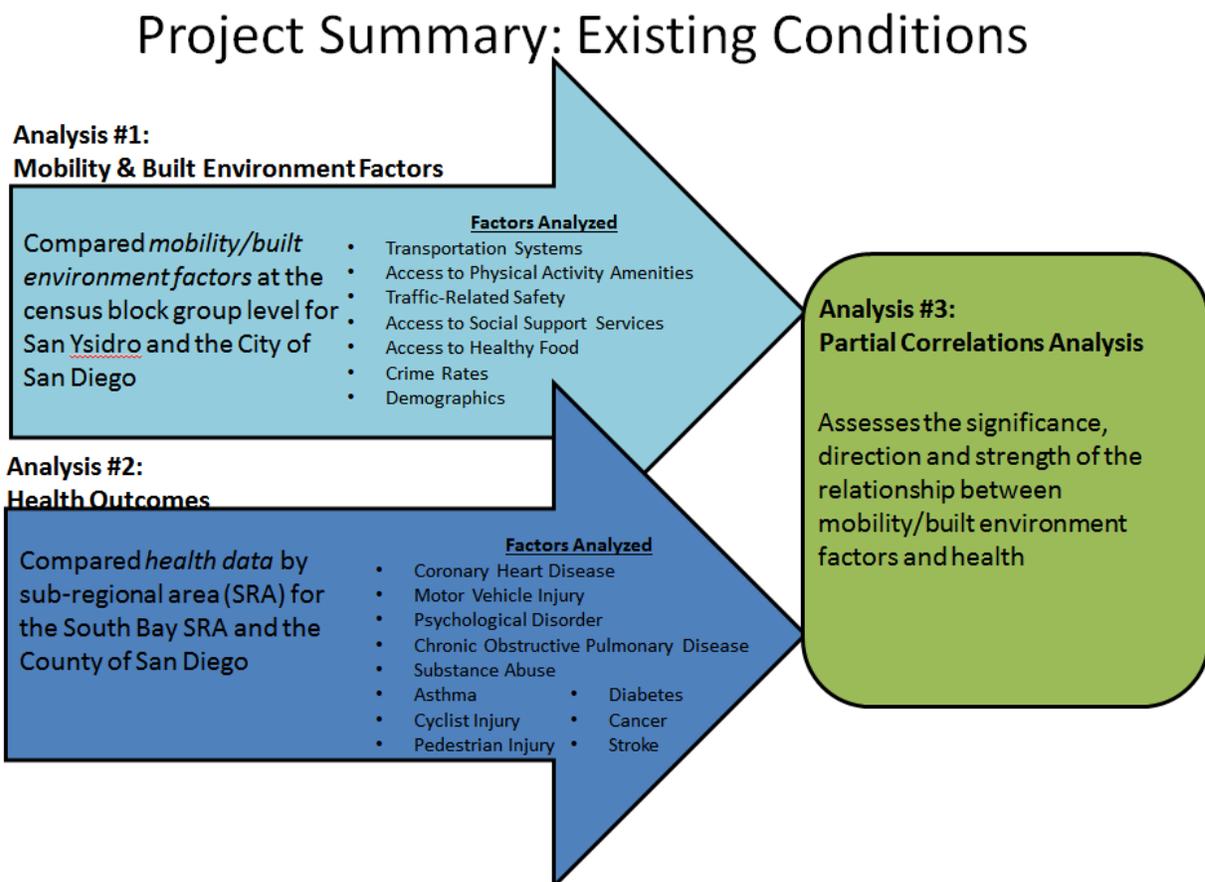


1.2 Analysis Framework

A key goal of the BHETS is to develop a process for identifying mobility/built environment and health issues within a community. The analysis framework for this report includes first identifying connections between these issues, then quantifying the significance, direction and strength of the relationships between these mobility/built environment and health issues, and lastly, using this understanding to recommend various improvements that could influence health in a measureable way. Although there is no one set method for conducting such an analysis, the BHETS could serve as a regional prototype for incorporating health into regional and local long-range transportation and land use planning and design considerations.

Figure 1-2 displays the existing conditions analysis framework used to compare mobility/built environment factors between San Ysidro and the City of San Diego (Analysis 1); compare health outcomes between the South Bay Sub-Regional Area (SRA) and the region (Analysis 2); and assess the significance, direction and strength of the relationships between mobility/built environment and health outcomes (Analysis 3). These three existing conditions analyses were the foundation for identifying recommendations with the potential to address health issues.

Figure 1-2: Analysis Process for Identifying Community Mobility/Built Environment Health Issues



Source: Chen Ryan Associates, February 2015

Research relevant to this project was gathered from multiple sources, with a focus on information about how various mobility/built environment issues relate to health. The BHETS relied upon community and stakeholder input, along with publically available health and mobility/built environment data. The decision to conduct this BHETS with strictly secondary data was purposeful, and is hoped to illustrate to other agencies that such a study can be a relatively cost-efficient, feasible endeavor.

1.3 The San Ysidro Community

1.3.1 Historical Context

Much of the development and growth within the community of San Ysidro, both historically and presently, relates to its proximity to the United States/Mexico international border. The San Ysidro Port of Entry (POE) is the world's busiest land POE, with 25,000 pedestrians and 50,000 vehicles crossing northbound on average each day.

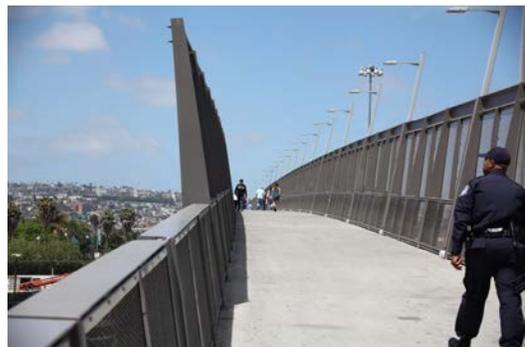
San Ysidro was first settled as a Spanish trading post in 1818, named in honor of the patron saint of agriculture, Saint Isidore.¹ San Ysidro's importance in the international context began in 1848 with the signing of the Treaty of Guadalupe Hidalgo by the United States and Mexico, creating today's International Border.² Present day San Ysidro was founded in 1909 by William Smythe, a San Diego booster and historian, with a vision of developing an agricultural community on the area's fertile land.³

The construction of Interstate 5 in 1954 forever transformed San Ysidro. The freeway bisected the community, displacing residents, and establishing a major route to the border.⁴ San Ysidro was further altered by the construction of Interstate 805 in the 1970s. Construction of these freeways established major transportation corridors traversing San Ysidro, leading to increased vehicular traffic and congestion, as well as growing travel demands associated with the San Ysidro POE. Construction of the two interstates also affected pedestrian mobility for San Ysidro community members, leaving few connections for pedestrians to traverse the freeways and travel to communities and destinations adjacent to San Ysidro.

The community today reflects its border location, rich in binational culture and industries that are supported by commerce and tourists from both the United States and Mexico.

1.3.2 San Ysidro's Proximity to the International Border

The community's proximity to the international border significantly affects development, transportation, the economy, and overall daily life in San Ysidro. The border adds a noticeable federal government presence in and around the community including buildings, infrastructure, motor vehicles, and federal officers. The federal presence sets additional limitations and poses unique challenges not experienced in other San Diego communities.



The 50,000 northbound vehicles crossing the San Ysidro POE each day add substantial volumes of traffic and congestion to the freeways and local roads, significantly impacting local residents. The

heavy traffic volumes also release emissions that can be harmful to the health of community members and travelers in the area. A report analyzing the economic impacts of border wait times between 2011 and 2012 found that passenger vehicle crossing times averaged 74 minutes. Multiplied by the 50,000 daily vehicle crossings, border traffic contributes a significant amount of vehicle emissions, and impacts the air quality in San Ysidro and neighboring communities.⁵ However, the recent expansion of vehicular lanes at the San Ysidro POE have reduced wait times significantly since completion of the study, with additional improvements still to be made.

The border provides economic life to the region. Much of the community’s commercial and retail industry is supported by tourists, evident by the numerous money exchange establishments, travel services, and the outlet mall sited at the border. San Ysidro and the City of San Diego as a whole can benefit from these industries through sales tax revenues and increased employment opportunities.

1.3.3 Planning Area

The San Ysidro Community Planning Area encompasses approximately 1,862 acres. San Ysidro is comprised of predominantly single-family and multi-family residential land uses. Commercial and industrial land uses are located along the Interstate 5 corridor. **Figure 1-3** displays key land uses within San Ysidro as well as the transit routes servicing the community. **Figures 1-4** and **1-5** show existing sidewalk coverage and bicycle facilities within the community, respectively.

Table 1.1 displays population, housing, and economic characteristics for the community of San Ysidro and the City of San Diego as a whole. As shown, there are approximately 28,008 people living in San Ysidro. Housing is dispersed across San Ysidro with the exception of the southernmost portion, which is primarily commercial and industrial land uses, and federal infrastructure. Compared to the City of San Diego, San Ysidro has a relatively high youth population, with 31.6 percent of the population under the age of eighteen, and a senior population that is slightly lower relative to the City of San Diego, accounting for 9.1 percent of San Ysidro’s population.

Table 1.1: 2010 San Ysidro Demographics

Characteristic	San Ysidro	City of San Diego
Population	28,008	1,301,617
Total Housing Units	7,362	515,426
Persons Per Household	3.8	2.5
Median Age	29.1	33.8
Percent Under 18	31.6%	21%
Percent Over 65	9.1%	11%
Median Household Income	\$35,993	\$63,198
Poverty Rate	25.1%	9.9%
Unemployment Rate	12.4%	8.4%

Source: SANDAG 2010 Community Profile; U.S. Census Bureau, 2007 -2011 ACS 5-Year Estimates

The median household income in San Ysidro is \$35,993, substantially lower than the City of San Diego’s average of \$63,198. Additionally, the unemployment rate in San Ysidro is almost 50 percent greater than that of the San Diego. Most alarming is the difference in poverty rates between San Ysidro and San Diego, shown at 25.1 percent and 9.9 percent, respectively.

Figure 1-3: San Ysidro Transit Network and Key Land Use

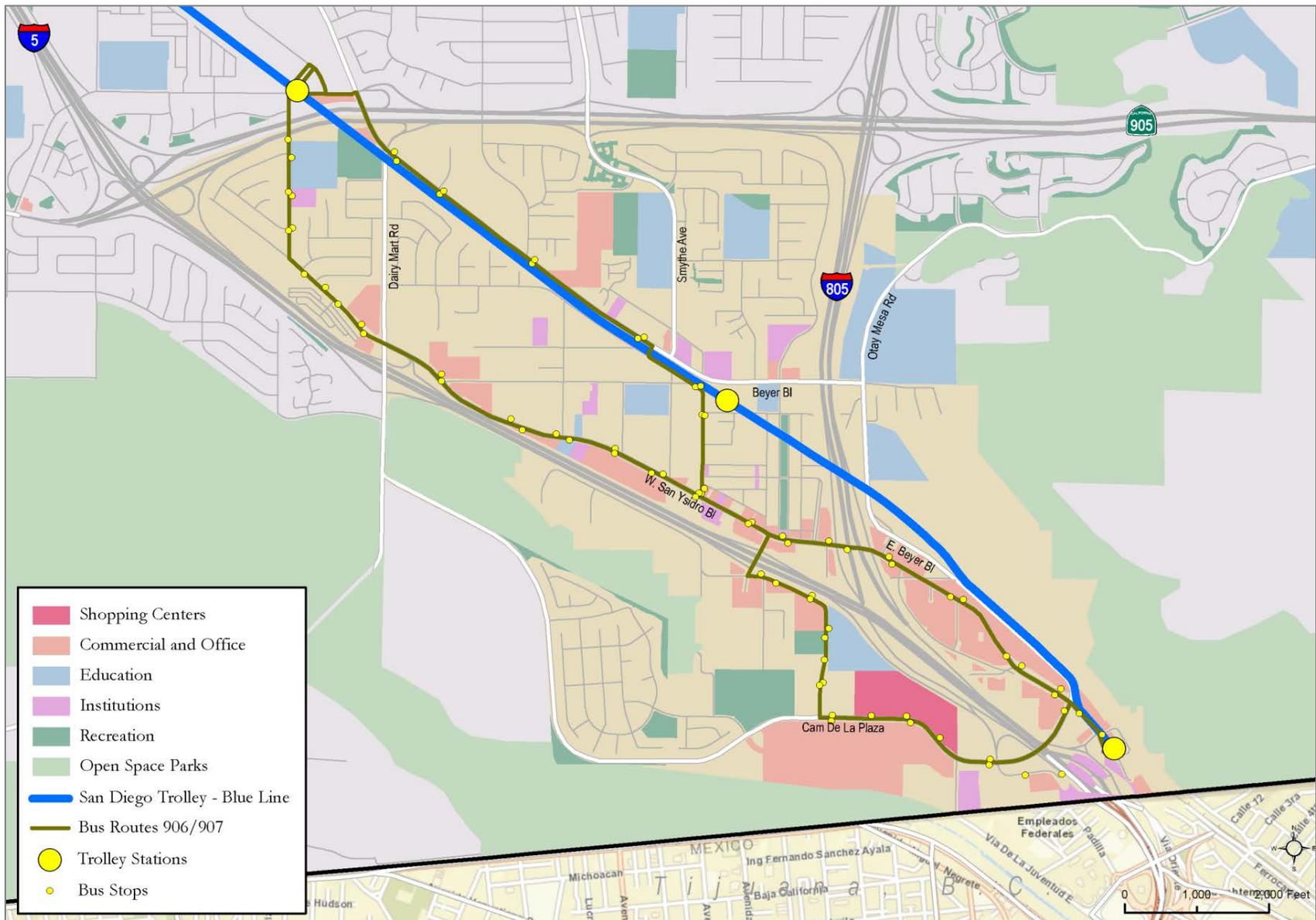


Figure 1-4: San Ysidro Pedestrian Network



Figure 1-5: San Ysidro Bicycle Network

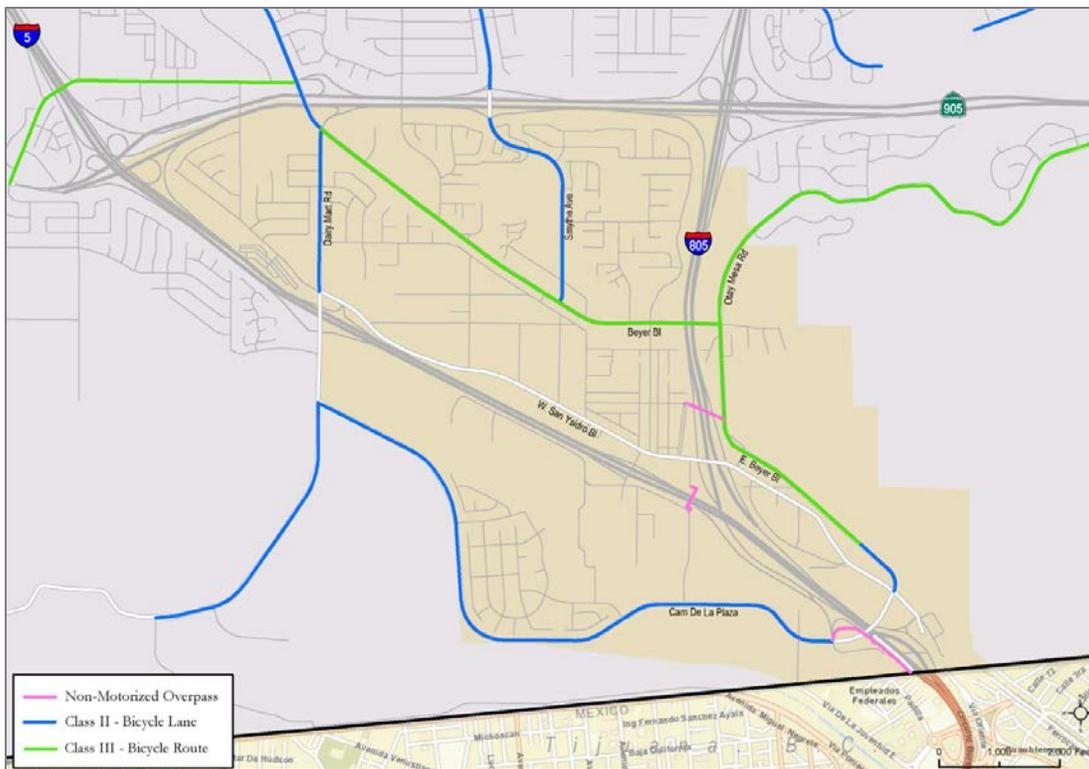


Table 1.2 summarizes the available transit service within San Ysidro, including the transit mode, route name, and areas served. Seven bus routes and one Trolley line provide public transit options within the community and connections to the region.

Table 1.2: San Ysidro Transit Service

Type	Route	Areas Served
Bus	901	Iris Avenue Trolley to Downtown San Diego via Imperial Beach/Coronado
Bus	905	Otay Mesa to Iris Avenue Trolley via SR-905/Otay Mesa Road
Bus	906/907	Iris Ave Trolley to San Ysidro Loop via Beyer Boulevard/San Ysidro Boulevard/Calle Primera
Bus	950	Otay Mesa to Iris Avenue Trolley via SR-905/Siempre Viva Road
Bus	929	Downtown San Diego to Iris Avenue Trolley via Highland Avenue/3rd Avenue
Bus	932	8th Street Trolley to Iris Avenue Trolley via National City Boulevard/Broadway
Bus	933/934	Iris Ave Trolley to Seacoast via Imperial Beach Boulevard/Palm Avenue
Trolley	Blue Line	Downtown San Diego to San Ysidro Trolley via Iris Avenue Trolley/Beyer Boulevard Trolley

Source: Metropolitan Transit System (MTS), 2014; Chen Ryan Associates, February 2015

1.4 Public Participation

The public participation process for the BHETS project consisted of three community workshops, the creation of a Stakeholder Group, and hosting a project webpage. This section provides a description of each of these engagement methods and the role they played throughout the project.

1.4.1 Community Workshops

A series of three community workshops were held to invite public participation and community member input. The initial workshop focused on identifying specific health and mobility/built environment issues perceived by community members, while the second workshop focused on identifying recommendations to improve health outcomes in San Ysidro. The public input gained and a description of how it was incorporated into the project is provided in Section 2.2, while the second workshop's results are further elaborated upon in Section 6.1. Workshop participants were also asked to evaluate and prioritize proposed recommendations in their community during the second workshop. The final set of recommendations, which included stakeholder group, SANDAG, Caltrans, and City of San Diego input, was presented to the public at the third and final workshop for comment. Additionally, a toolbox of resources available to community members to influence community change was presented at the third workshop, further described in Section 8.3.

1.4.2 Stakeholder Group

The Border Health Equity Stakeholder Group was formed to complement the efforts of the project team by bringing together a wide range of perspectives and expertise to develop recommendations and provide ongoing guidance throughout the study process. Additionally, the Stakeholder Group provided feedback and input regarding key deliverables.

Stakeholder Group Membership

Stakeholder Group membership was made available to local, state, and federal agencies and community organizations/representatives with interests that reflect the following subject areas:

environmental/public health, academia/education, federal/state/local government, United States-Mexico Border relations, land use and/or transportation planning, social equity, and economic development.

Active members of the Stakeholder Group represented the following agencies and organizations:

Local Agencies

- City of San Diego Planning Department

Regional and State Agencies

- California Department of Transportation (Caltrans)
- San Diego County Health and Human Services Agency
- San Diego County Air Pollution Control District
- San Diego County Office of Border Health

Federal Agencies

- US Customs and Border Patrol
- US Environmental Protection Agency
- Centers for Disease Control and Prevention

Transit/Transportation

- Metropolitan Transit System
- Representative from the SANDAG Freight Stakeholder Working Group

Research Institutions/Education

- Active Living Research
- Institute of Regional Studies of the Californias
- San Diego State University, Graduate School of Public Affairs
- San Ysidro School District

Health Advocacy

- San Ysidro Health Center
- Calidad de Vida

Business and Economic Development

- San Ysidro Chamber of Commerce

San Ysidro Community

- Representatives from San Ysidro Community Planning Group

Other interested participants included representatives from the Consul General of Mexico's office, the Environmental Health Coalition, the San Diego Foundation, Circulate San Diego, and the Mexican American Business and Professional Association. Casa Familiar is a grassroots community organization based in San Ysidro that, in addition to being a key community stakeholder, was also a member of the Consultant Team, significantly contributing to this Border Health Equity Transportation Study.

Stakeholder Group Charter

A charter was developed to guide the Stakeholder Group and to identify the purpose, membership, and meeting time and location. A copy of the charter was presented to Stakeholder Group members at the initial meeting, held on June 27, 2013, and is included as **Appendix A**.

1.5 Organization of the Report

This Final Report is organized into the following chapters:

Chapter 1.0 Introduction

Provides an overview of the BHETS purpose, analysis framework, and report organization.

Chapter 2.0 Identification of San Ysidro Mobility/Built Environment and Health Issues

Describes the techniques and results associated with efforts to understand mobility/built environment and health issues in San Ysidro from the perspectives of community members and stakeholders. In addition, issues were identified through a content analysis of the multiple previous studies conducted in San Ysidro related to health and mobility/built environment.

Chapter 3.0 Previous Research on Mobility/Built Environment and Health

Summarizes the key United States and international research examining relationships between health and mobility/built environment measures.

Chapter 4.0 Methodology

Presents the health and mobility/built environment data sources and analysis methodologies employed for assessing trends in San Ysidro, as well as for assessing the correlations between these factors.

Chapter 5.0 Analysis Results

Presents the analysis results from methodologies described in Chapter 4.0

Chapter 6.0 Mobility/Built Environment Recommendations and Potential Health Effects

Proposes a final set of recommendations, developed from community and stakeholder input and additional research. This chapter also lists the potential health outcomes that could be positively influenced through implementation of the recommendations.

Chapter 7.0 Monitoring and Evaluation Plan

Proposes a framework and method for tracking and assessing changes in key recommendations identified in this report.

Chapter 8.0 Implementation

Concludes with two “toolboxes” to help influence built environment change, including an agency toolbox which identifies potential funding mechanisms, and a community member toolbox summarizing available resources that community members can utilize to influence change and get their voices heard.

2.0 Identification of San Ysidro Mobility/Built Environment and Health Issues

This chapter summarizes efforts to identify and document notable health and mobility/built environment issues in the community of San Ysidro based upon a review of previous San Ysidro studies and planning documents for content related to health and mobility/built environment issues, as well as from collecting input from community members at a workshop held in July 2013. Each of these resources is discussed below.

2.1 Previous San Ysidro Studies and Plans

A wide range of studies have been conducted in San Ysidro over the past 20 years with a focus on health and mobility/built environment. Over 25 studies were identified that either focused specifically on San Ysidro or addressed the community in addition to other areas within the greater San Diego region. These studies were reviewed to inform the identification of health and mobility/built environment issues for the BHETS. One-page project summaries were prepared identifying the purpose, the health or mobility/built environment issues addressed, and any conclusions drawn from the BHETS. The project summary sheets are included as **Appendix B**.

Table 2.1 summarizes content addressed for those studies focusing largely on health. A total of 11 studies were found that addressed health in San Ysidro over the past ten years. The studies were reviewed for health issues, and for the relative level of treatment of each issue. Table 2.1 shows health issues as column headers. For each study, the table notes whether the health topic was addressed as a “focus issue ●,” a “peripheral issue ◐,” or only “mentioned ○,” but not examined in depth. Points were assigned to the level of treatment of the respective health issues, with three points for a focus issue, two points for a peripheral issue, and one point for only mentioned. The content analysis allows for a ranking of health topics based on the level of attention they have received from agencies, university researchers, and nonprofit groups. The top three health issues receiving the most attention in studies covering the San Ysidro community include:

- Access to healthcare centers
- Physical activity
- Diabetes

Table 2.2 summarizes content addressed for those studies focusing largely on mobility and built environment. Approximately 15 studies were reviewed for this content type. The top three mobility and built environment issues receiving attention in studies and plans covering San Ysidro include:

- Pedestrian safety and infrastructure
- Streetscape features
- Vehicular infrastructure

Table 2.1: Content Analysis of San Ysidro Health Studies

	Healthcare Access	Physical Activity	Diabetes	Respiratory Issues	Cardiovascular Issues	Nutrition	Communicable Disease	HIV/AIDS	Personal Safety	Obesity	Ped/Bike Traffic Safety	Mental Health	Cancer	Maternal-Child Health	Quality of Well-Being	Substance Abuse
White Paper: Health Impacts of Crossings at US-Mexico Land Ports of Entry (2013)	○		○	●	●				○			○	●	●		
Healthy Community Atlas (2012)	●	●	◐	◐		●			●	◐	●					○
HHSa South Region Community Health Improvement Plan (2012)	●	●	●	●	●	●			●				●			●
South Region Health Status Report (2012)	○		●	●	●		●	●	○				○	◐		
2010 Health Status in the California Border Region (2011)	●	●	●	●	●	●	●	●		●		●	◐	●	●	
Healthy Borders: Intercept Surveys at the San Ysidro Port of Entry (2011)								◐								
San Diego Prevention Research Center Community Door-to-Door Survey (2009)		●									●				●	
Salsita Community Mapping Project		●	◐		○	◐				●						
Shaping a Binational Agenda for Health Priorities in the San Diego - Baja California Border Region (2006)	●		◐			○	●	●	○	◐		◐				
Improving Walkability in San Ysidro (2005)		○									●				○	
The Border that Divides and Unites: Addressing Border Health in California (2004)	●						●	●				●				●
Content Analysis Ranking (Total Points)	17	16	16	14	13	12	12	12	11	10	9	9	9	8	7	7
	● (3 points) Focus Issue			◐ (2 points) Peripheral Issue				○ (1 point) Mention of Issue								

Source: Chen Ryan Associates, February 2015

Table 2.2: Content Analysis of San Ysidro Mobility/Built Environment Studies

	Pesestrian Safety & Infrastructure	Supporting Features*	Vehicular Infrastructure	Port of Entry	Multi-modal Transportation	Bicycle Infrastructure	Rail Infrastructure	Access to Transit	Bus Infrastructure	Traffic Calming Measures
Blue Line Trolley Renewal Project (2013 – on-going)		◐				●	●			
Intermodal Transportation Center Study (2012 – on-going)	●	●	●	●	●	●	●	●	●	
San Ysidro Walks & Wheels to School SRTS Final Plan (2012)	●	●				◐				●
2050 San Diego Regional Transportation Plan (2011)	●	●	●	●	●	●	●	●	●	
San Ysidro Community Plan Update (2010 – on-going)	●	●	●	●	●	●	●	●	●	●
San Ysidro Port of Entry Reconfiguration Mobility Study (2010)	●		●	●	●	●	●	●	●	
Riding to 2050 San Diego Region Bicycle Plan (2010)		◐			◐	●				
San Ysidro Land Port of Entry Improvement Project (2009 – on-going)	●	◐	●	●	●					
San Ysidro Mobility Strategy (2009)	●		●	●	●	●	◐	◐	○	
San Ysidro Port of Entry Border Investment Strategy (2008)	●	●	●	●	●		◐	●	◐	
California-Baja California Border Master Plan (2008)			●	●	◐		●	◐	●	
San Ysidro Public Facilities Financing Plan FY 2008 (2007)	◐	◐	●			◐				◐
Third San Ysidro Redevelopment Area Implementation Plan (2006 – 2011)	●	●	●	●		○	○	○	○	
San Diego Pedestrian Master Plan (2006)	●	◐								◐
Improving Walkability in San Ysidro (2005)	●	◐								◐
Content Analysis Ranking (Total Points)	35	32	30	27	25	23	23	23	19	12
● (3 points) Focus Issue ◐ (2 points) Peripheral Issue ○ (1 point) Mention of Issue										
*Supporting features include: lights, benches, shelters, trashcans, signage, landscaping, etc.										

Source: Chen Ryan Associates, February 2015

2.2 Community Workshop

The first of three community workshops was held on Thursday, July 11, 2013, introducing the San Ysidro community members to the BHETS and to the relationships between health and mobility/built environments. The workshop was conducted in both English and Spanish. The workshop was themed as an Existing Conditions Workshop, and focused largely on community members' identification of existing health and mobility concerns and priorities.



To increase participation in the workshop, and to help identify specific issues and indicators perceived by community members, a “tree exercise” was conducted. The exercise utilized a poster diagram of a tree, with the three parts of the tree – the roots, the trunk, and the leaves – labeled as places to record social, economic, environmental, and political forces; daily habits; and health issues facing the community, respectively. The tree diagram tool is included in **Appendix C**.



The workshop participants were divided into five groups of 10 to 15 participants at each station, with the entire workshop group completing a total of five diagrams. A facilitator at each table led the community members through the exercise, beginning the discussion by asking, “What are the major health issues facing San Ysidro community members?” Responses were written verbatim, helping to build a list of community-prioritized health outcomes. Following the identification of specific health concerns, discussions focused on identifying the daily habits, and behaviors contributing to the health issues listed.

The “tree exercise” concluded with participants discussing the different social, economic, environmental, and political factors that influence daily habits. These factors are the community's perceived health determinants or indicators, the issues they feel are at the “root of the problem”.

Following the workshop, the tree exercise responses were organized into two summary tables of priority issues. **Table 2.3** shows the health outcomes, daily habits, and contributing factors (health indicators) identified by the community members. **Table 2.4** displays mobility and built environment concerns expressed by San Ysidro community members.

Table 2.3: Community-Identified Health Issues, Habits, and Contributing Factors

Health Issue	Daily Habits Related to Health Issue	Social, Economic, Environmental, and Political Factors Affecting Health Issues and Daily Habits
Cancer	<ul style="list-style-type: none"> • Lack of Exercise • Alcoholism • Substance abuse • Smoking • Eating habits 	<ul style="list-style-type: none"> • Healthcare access • Healthy food access • Healthy eating education • Recreational space • Bicycle facility
Mental health, stress, depression, anxiety, sleep disorder, bipolar, aggression	<ul style="list-style-type: none"> • Lack of Exercise • Alcoholism • Substance abuse • Driving 	<ul style="list-style-type: none"> • Unemployment • Recreational space • Healthcare access • Noise pollution • Bicycle facility • Pedestrian infrastructure
High blood pressure, high cholesterol, diabetes	<ul style="list-style-type: none"> • Lack of Exercise • Smoking • Eating habits 	<ul style="list-style-type: none"> • Recreational space • Healthcare access • Healthy eating education • Healthy food access
Respiratory, asthma, bronchitis, allergies, sinusitis	<ul style="list-style-type: none"> • Air quality • Smoking 	<ul style="list-style-type: none"> • Air pollution from freeways • Media
UV exposure, skin cancer	<ul style="list-style-type: none"> • Waiting for bus/Trolley 	<ul style="list-style-type: none"> • No shade at transit stops
Obesity	<ul style="list-style-type: none"> • Eating habits • Food quality • Lack of Exercise 	<ul style="list-style-type: none"> • Recreational space • Healthcare access • Bicycle facility • Pedestrian sidewalks
Personal safety		<ul style="list-style-type: none"> • Lighting • Security at transit stops

Source: Chen Ryan Associates, February 2015

Table 2.4: Community-Identified Mobility Concerns and Impacts on Health

Mobility Topic	Mobility Concerns	Health Impacts
Bicycle/pedestrian infrastructure	<ul style="list-style-type: none"> • Infrastructure • Signage • Safety • Pedestrian crossings 	<ul style="list-style-type: none"> • Prevents physical activity • Safety issue for users • Prevents walking/bicycling as utilitarian transportation
Transit system	<ul style="list-style-type: none"> • Peak hour times not coordinated • Need higher frequency on weekends (Sundays) • Cost • Bathrooms on Trolley • Buses crowding and cleanliness 	<ul style="list-style-type: none"> • Long travel times • Cost (\$) of travel
Transit stops	<ul style="list-style-type: none"> • Benches • Trashcans • Shade 	<ul style="list-style-type: none"> • Cleanliness • Sun exposure • Seating
Private automobile	<ul style="list-style-type: none"> • Traffic • Pollution • Driver courtesy 	<ul style="list-style-type: none"> • Travel takes a long time • Health effects from pollution • Mental health effects from congestion • Pedestrians/bicyclists safety

Source: Chen Ryan Associates. February 2015

2.3 Synthesis of Health and Mobility/Built Environment Issues

This section synthesizes the previous studies reviewed (Section 2.1) and the community input (Section 2.2) into a preliminary listing of San Ysidro health and mobility/built environment issues. These issues will be further evaluated in Chapter 3.0 through a literature review of national and international published research, and in Chapters 4.0 and 5.0 through an analysis of secondary health and mobility/built environment data.

Table 2.5 displays a preliminary listing of health and mobility/built environment issues as determined via previous studies and community input. As shown in Table 2.5, 10 of the 15 health issues identified were noted through both sources – previous studies and community input.

Table 2.5: Synthesis of Health and Mobility/Built Environment Issues from Previous Studies and Community Input

	Issues	Source	
		Previous Studies	Community Input
HEALTH	Healthcare Access	√	
	Physical Activity	√	√
	Diabetes	√	√
	Respiratory Issues	√	√
	Cardiovascular Issues	√	√
	Nutrition	√	√
	Communicable Diseases	√	
	HIV/AIDS	√	
	Personal Safety	√	√
	Obesity	√	√
	Pedestrian/Bike Traffic Safety	√	
	Mental Health	√	√
	Cancer	√	√
	Quality of Well-Being	√	
	Substance Abuse	√	√
MOBILITY/BUILT ENVIRONMENT	Bicycle Safety and Infrastructure	√	√
	Pedestrian Safety and Infrastructure	√	√
	Transit System	√	√
	Transit Stops	√	√
	Vehicular Infrastructure	√	√
	Port of Entry	√	√
	Bus System	√	√
	Traffic Calming	√	
	Streetscape Features	√	√

Source: Chen Ryan Associates, February 2015

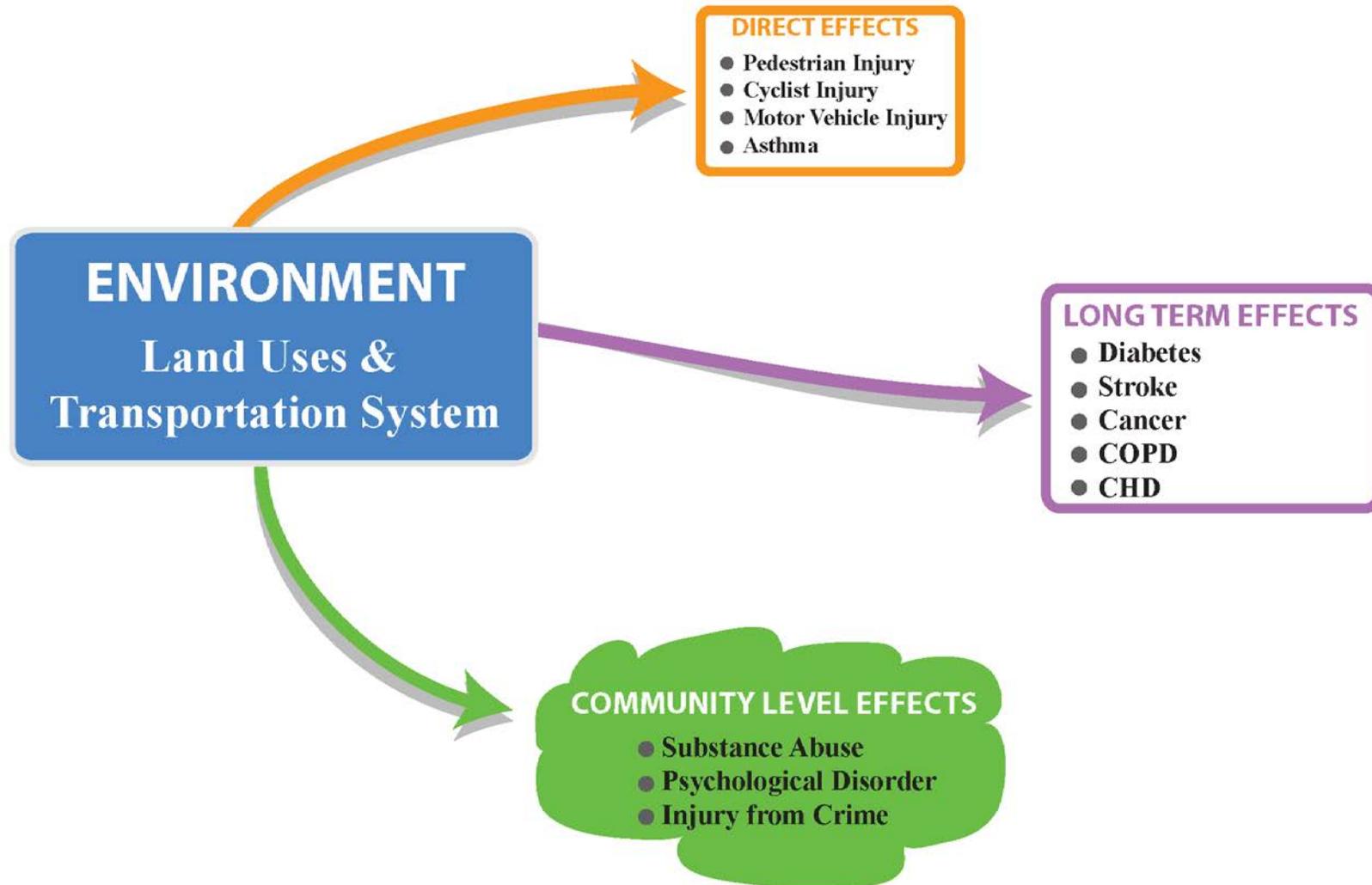
Note: Bold text indicates the issue was identified in both previous studies and at the community workshop.

Figure 2-1 displays a diagram of the general relationships between the mobility/built environment and health issues identified. Three levels of relationships between the environment and health outcomes are identified: direct effects, long-term effects, and community-level effects.

- Direct effects between the environment and health would include pedestrian injury, cyclist injury, motor vehicle injury, and asthma, and are characterized as manifesting after short periods of exposure.
- Long-term effects would include diseases that develop slowly from exposure to unhealthy environments over longer periods of time. Examination of the mobility/built environment factors leading to chronic disease is a major focus of current public health research. One of the critical pathways from environment to disease stems from environments inhibiting an individual's physical activity. Lack of physical activity is a fundamental determinant of several chronic diseases such as diabetes, heart disease, and stroke. The County of San Diego considers achieving healthy environments as a critical facet of their *Healthy Strategy Agenda: Building Better Health*, which has the 3-4-50 concept as its centerpiece ("3 behaviors" – smoking, physical inactivity, and poor nutrition – lead to "4 chronic diseases" – cancer, heart disease and stroke, diabetes, and respiratory disease – that result in over 50 percent of all deaths region wide).
- Community-level effects describe health outcomes that evolve out of social disorder, and might include substance abuse, psychological disorder, and injury from crime.

These relationships will be further explored and documented in a review of previously published research in Chapter 3.0, and in the correlations analysis presented in Chapter 5.0.

Figure 2-1: Environmental Impacts on Health Outcomes Assessed in this BHETS



3.0 Previous Research on Mobility/Built Environment and Health

This chapter reviews previous national and international published research on the relationships between mobility/built environment and health with the goal of documenting the current state of knowledge about the direction and strength of these relationships. This understanding helped ensure that recommendations resulting from the BHETS have strong potential for positive influences on health outcomes. The specific findings reporting the current status of San Ysidro mobility/built environment variables and health outcomes are presented in Chapters 4.0 and 5.0.

3.1 Transportation Systems, Land Use, and Mobility

The term mobility encompasses several concepts, each with its own connections to health. Mobility reflects mode choice, which refers to the type of travel one uses to get to a destination. This is a function of auto ownership, land use, the density of development and transportation infrastructure. A variety of travel options can lead to increases in non-motorized or active travel (i.e., walking and biking), which can lead to better health as a result of increased physical activity. Mode choice may also have implications for the cost of transportation, how affordable it is to get around and the level of resources available for other necessities.

Mobility also reflects how quickly, easily and safely one can travel to desired destinations. Faster and easier travel, which is often a function of auto ownership, land use and transportation system configurations, potentially leads to more free time, less stress and more access to necessary goods and services. This can improve health by allowing for more time for health-promoting activities and ensuring that people have access to facilities and amenities to lead healthy lives. Although convenience may be important for mobility, creating conditions that are safe for all modes of transportation is also important.

Lastly, the term can describe accessibility of routine destinations. Increased access to goods and services necessary to lead healthy lives has been shown to improve health.⁶ There are many types of transportation-related improvements (including land use changes) that can lead to mobility enhancements. There are inherent trade-offs in various types of transportation system improvements. Roadway widening, for example, while beneficial to automobile level of service, can serve to increase vehicle mode share and Vehicle Miles Traveled (VMT) per household, while decreasing the quality of the pedestrian and cycling environments, and reducing physical activity and neighborhood completeness.

The following sections review the published literature related to the potential health effects associated with these characteristics of mobility: mode choice (or how we travel); livability, convenience and safety; and access to resources. The intention of this chapter is to explore the broader context for issues that may be uncovered in San Ysidro, as well as to establish the current state of understanding on general relationships between health and built environment.

3.2 Travel Mode Choice

The way one travels has subsequent health effects on individuals and on the broader community. Individuals can be affected through physical activity benefits of walking and biking, or through

stress and time spent sedentary that may occur from long vehicle commutes. The choice of mode also affects broader groups of people through environmental effects, such as air and noise emissions from motor vehicles, creating conditions that can put people at risk for developing health outcomes associated with exposure to excess pollution. The empirical evidence related to these health effects, and documented through peer-reviewed published research, will be reviewed here.

3.2.1 Walking and Cycling

Walking for transportation and leisure is a form of physical activity. The research evidence supporting the health benefits of physical activity demonstrates a positive correlation. A comprehensive review conducted by the United States Department of Health and Human Services in 2008 documents the evidence for a causal relationship between levels of physical activity and better cardiorespiratory and muscular fitness, cardiovascular and metabolic health, bone health, and body mass and composition in children and youth. In adults and older adults, the evidence shows that, compared to less active people, more active men and women may have lower rates of all-cause mortality, coronary heart disease, high blood pressure, stroke, type 2 diabetes, metabolic disorders, colon cancer, breast cancer, and depression. And for older adults, being physically active is associated with higher levels of functional health, a lower risk of falling, and better cognitive functioning. The review also found benefits specifically for walking; the evidence showed a consistently lower risk of all-cause mortality for those who walked two or more hours per week.⁷ Physical activity has also been linked to better mental health outcomes.⁸



Similarly, cycling is a practical mode of transportation, physical activity, and leisure, and shares many of the same co-benefits to health as walking. A 2011 report by the World Health



Organization (WHO) documents similar (to walking) all-cause mortality benefits from regular cycling for commuting, controlling for socio-demographics and leisure time physical activity.⁹ A 20-year longitudinal study in the United States found that active commuting (walking or biking to work) was positively associated with fitness in men and women and negatively associated with Body Mass Index (BMI), obesity, and blood pressure in men.¹⁰ Cycling can reduce the risk of serious conditions such as heart disease, high blood pressure, obesity and the most common form of diabetes.¹¹ Even new cyclists covering short distances can

reduce their risk of death (mainly due to the reduction of heart disease) by as much as 22 percent.¹² Other benefits have been shown to accrue from bicycle infrastructure improvements. A study prepared by the City of New York Department of Transportation (2011) reports a 49 percent increase in retail sales, a 47 percent decrease in commercial vacancies along roadways where protected bike lanes, or cycle tracks, were installed.¹³

Physical activity benefits can be gained via utilitarian travel by foot or by bike. While regular physical activity can help people lead longer, healthier lives, a 2009 summary by the Robert Wood Johnson Active Living Research program revealed that fewer than 50 percent of children and adolescents and fewer than 10 percent of adults in the United States achieve public health recommendations of 30 to 60 minutes per day of moderate- to vigorous-intensity physical activity on five or more days of the week recommendations.¹⁴

Transportation and land use patterns can allow, incentivize, or prevent healthy behavior such as walking.¹⁵ In fact, the Transportation Research Board and the Institute of Medicine of the National Academies has identified walking or cycling as a form of travel for utilitarian trips as a strategy for increasing daily physical activity.¹⁶ Built environmental factors that are associated with active transportation via walking and cycling typically include increased residential and employment density, greater diversity of land use mix (e.g., residential land use near retail land uses), shorter distances to destinations, and street design factors, such as gridded street networks and the presence of sidewalks.^{17 18 19} Long street block faces, which create longer distances between safe crossing locations, can also negatively affect community walkability. Access to transit may also play an important role in the walkability of a neighborhood. According to an analysis of US travel survey data, 16 percent of all recorded walking trips are part of transit trips, and these tend to be longer than average walking trips.²⁰ In pedestrian-oriented neighborhoods, people walk an average of 70 minutes longer per week than in non-pedestrian-oriented neighborhoods.²¹ Sallis et al. (2009) found, in a study of 11 countries, that people who live in neighborhoods with sidewalks on most streets are 47 percent more likely to be active at least 30 minutes per day.

Researchers focusing specifically on children have also found similar relationships between the built environment and physical activity among children. One review of 33 quantitative studies found positive associations between access to recreational facilities (including schools) and transportation infrastructure, including the presence of sidewalks, controlled intersections, access to destinations and public transportation and children's physical activity. Conversely the review found negative associations between the number of roads to cross and traffic density and speed and children's physical activity.²²

3.2.2 Public Transportation

Access to (including proximity, affordability, reliability, and quality of service) and use of public transit facilities can positively contribute to health and well-being. Many people depend upon public transit for travel to jobs, school, childcare, grocery stores, medical care, social and family activities, and for accessing other goods and resources necessary for health, and connecting with family and friends. Public transit may be especially crucial for households without vehicles. For low-income residents who do not own automobiles, accessible, affordable, and convenient mass transit is particularly important for accessing daily activities. A study of 15 low-income neighborhoods in the San Francisco Bay Area found that 66 percent of residents had no transit access to hospitals and 48 percent had no walking access to a supermarket.²³ The BHETS outreach

process suggested that residents may not utilize available medical services if they are difficult to reach and thus, limited or no access to transit may affect low-income residents' health and quality of life in a critical manner. Even for households that have access to vehicles, public transit provides an alternative to driving. Choosing public transit over driving can improve public health by reducing air pollution, Greenhouse Gases (GHG), vehicle collisions, and increasing physical activity.



Public transportation can have many benefits relating to health, due to improvements in air quality, noise reduction, reduced motor vehicle–related accidents, increased social cohesion, and reduced stress. Several studies have described the benefits of public transportation:

- A more dense mix of uses, well served by mass transportation systems, can ensure access to essential needs and services while reducing VMT, thereby reducing environmental and health costs associated with personal vehicle trips.²⁴
- Public transit use (instead of driving) reduces noise and air emissions from cars (see air quality and noise sections below). A recent, comparative life-cycle assessment conducted at University of California Los Angeles' California Center for Sustainable Communities reported lower rates of end-use energy, GHG, and smog for *Rapid* and light rail transit compared to a passenger vehicle.²⁵
- Workers with access to public transit are more likely to walk, bike, and take public transit to work than those without.²⁶ Edwards (2008) found that public transit users take 30 percent more steps per day than people who rely on cars.
- Taking public transportation aids in decreasing isolation and encourages what city planning advocate Jane Jacobs referred to as "casual contact from unplanned social interactions." For the elderly and the disabled, limited access to public transit creates barriers to participation in community and civic life, potentially leading to feelings of depression and alienation. Social connection has a variety of health impacts, ranging from reducing stress, having a longer lifespan, to supplying access to emotional and physical resources.^{27 28}
- A household with two adults that uses public transit saves an average of \$6,251 per year compared to an equivalent household that owns two cars. The savings associated with taking public transit can be used for other necessities such as health care, food, housing, and clothing, and thereby lead to improved health.²⁹

3.2.3 Driving

Obesity/Physical Activity

In contrast to the health benefits mentioned above, studies have shown that there are a number of health effects associated with driving. A study in the United States showed that each additional hour spent in a car per day was associated with a 6 percent increase in the likelihood of obesity, and each additional hour walked per day was associated with a 4.8 percent reduction in the likelihood of obesity.³⁰ In a California study assessing VMT and obesity, counties with the highest average VMT were positively associated with the highest average rank of obesity.³¹

A study in Atlanta, Georgia suggests neighborhood type is at least partly responsible for this relationship. Comparing people living in walkable versus car-dependent neighborhoods, they found that those living in car-dependent neighborhoods drove an average of 43 miles per day (versus 26 in walkable neighborhoods), and walked much less (only 3% walked versus 34% in the walkable areas).³²

Mental Health

Driving may also impact mental health and well-being. One study found that regular exposure to traffic congestion affected individual's psychological adjustment, work performance, and overall satisfaction with life.³³ Sitting in traffic can increase blood pressure and decrease one's tolerance for frustration. This of course affects the person experiencing the constraints, but can also lead to aggressive behavior and an increased likelihood of involvement in a crash.³⁴

Vehicle Air Emissions

Personal motor vehicles are recognized as contributors to a number of air pollutants that have been shown to negatively impact public health. Air pollutants in vehicle exhaust can include the following "criteria pollutants": carbon monoxide (CO), Particulate Matter (PM), and nitrogen oxides (NO_x), as well as other "non-criteria" mobile-source toxic air contaminants such as benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, naphthalene, and Diesel Particulate Matter (DPM). Particulate matter, carbon monoxide, nitrogen dioxide, and ozone have well-established causal relationships with human health and are subject to national ambient air quality standards, monitoring and control requirements under the Federal Clean Air Act.³⁵



Previous studies have found correlations between the health effects of pollution from traffic sources and asthma and other respiratory diseases, cardiovascular disease, lung cancer, pre-term and low birth weight births, and premature death. There is also emerging evidence about the potential connections between air quality and obesity and neurological effects. The following describes the evidence for these health effects in more detail.

- *Asthma and other respiratory diseases* – Many studies have shown that air quality and respiratory diseases such as asthma are associated with poor air quality.^{36 37 38} By age 18, children exposed to higher levels of PM_{2.5}, NO_x, and elemental carbon (products of fossil fuel combustion, especially diesel) are five times more likely (7.9% versus 1.6%) to have underdeveloped lungs (80% of normal) compared to teenagers living in communities with lower pollutant levels.³⁹
- *Cardiovascular disease* – Air pollutants, including ozone and particulate matter, have been reported as causal factors for cardiovascular mortality and respiratory disease and illness.⁴⁰ Particulate matter from roadway vehicles may exacerbate cardiovascular disease, leading to hospital visits and premature death.⁴¹ In a Los Angeles study, researchers found that people

with an increased exposure to 10 $\mu\text{g}/\text{m}^3$ of $\text{PM}_{2.5}$ had a carotid intima-media thickness (thickness of artery walls) increase of 5.9 percent.⁴²

- *Lung Cancer* – Several studies, including two meta-analyses, have concluded that occupational exposure to diesel engine exhaust may increase the risk of lung cancer.^{43 44} In 1999, the State of California concluded that diesel engine exhaust is a carcinogen, and a 2000 California risk assessment attributed 70 percent of the cancer risk from air pollution to diesel engine exhaust.⁴⁵ On-road diesel trucks represent the largest emission source of diesel engine exhaust PM in the state.⁴⁶
- *Birth outcomes* – A number of studies performed between 1996 and 2010 examined the relationship between exposure to air pollution and preterm birth and low birth weight. Both preterm births and low birth weight are a significant health concern to infants as they are highly correlated to physical and mental disabilities and infant mortality.^{47 48 49} A 2003 study conducted in Los Angeles County found that those living closest to distance-weighted traffic density (living close to heavy traffic roads and thus having higher exposure levels to motor vehicle emissions) may have an 8 percent increase in risk of pre-term birth.⁵⁰ Ritz et al. (2007) subsequently conducted a case-control survey study in Southern California to analyze air pollution effects on pregnancy outcomes.⁵¹ They found that pregnant women who were exposed to $\text{PM}_{2.5}$ and CO in their first trimester had associated increased risk of preterm births (10 to 29% and 20 to 25%, respectively). Additionally, pregnant women exposed to CO levels of 0.91 ppm and above during their last six weeks of pregnancy showed increased odds of preterm birth (3 to 33%).⁵²

Birth defects have also been found to be associated with air pollutants. Ritz et al. (2002) found a dose-response effect for second-month exposure to CO and ozone and resulting cardiac ventricular septal defects (CO) and aortic artery and valve defects, pulmonary artery and valve anomalies, and conotruncal defects (ozone).⁵³

- *Premature death and mortality* – Poor air quality may also be associated with premature death (defined as dying before one's average life expectancy). The WHO estimates that air pollution causes approximately two million premature deaths worldwide each year.⁵⁴ The WHO also estimates that there may be an increased risk of dying of between 0.2 and 0.6 percent for each increase in 10 $\mu\text{g}/\text{m}^3$ in ozone.⁵⁵ Specifically in relation to the presence of particulate matter, WHO reports that average life expectancy may decrease by 1.5 years when you compare cities at the highest and lowest PM levels.⁵⁶

In addition to premature death, poor air quality may also be associated with mortality. Mortality rates from respiratory illness in the most air-polluted cities compared to the least air-polluted cities are 1.26 times higher.⁵⁷ In a 2008 draft study, the Environmental Protection Agency (EPA) stated that there is a 1 to 8 percent increased risk of mortality for every 50 $\mu\text{g}/\text{m}^3$ of PM_{10} and a 1 to 3.5 percent increase in mortality for every 25 $\mu\text{g}/\text{m}^3$ of $\text{PM}_{2.5}$.⁵⁸ Jerrett et al. (2005) concluded that there was a 1.17 relative risk of all-cause mortality associated with an increase of 10 $\mu\text{g}/\text{m}^3$ in $\text{PM}_{2.5}$,⁵⁹ and Ostro (2006) found $\text{PM}_{2.5}$ levels to be associated with mortality.⁶⁰ Specifically, a 10 $\mu\text{g}/\text{m}^3$ change in two day average $\text{PM}_{2.5}$ concentration corresponded to a 0.6 percent increase in all-cause mortality.⁶¹

- *Obesity* – A recent study has linked prenatal exposure to Polycyclic Aromatic Hydrocarbons (PAHs), which are a byproduct of combustion that are known human carcinogens and have endocrine disrupting effects, with increase BMI in children.⁶² This, too, may support emerging evidence of a connection between poor air quality and obesity and more research is needed.

Exposure to Air Pollutants in Vulnerable Populations

Some populations may be more physically vulnerable to the impacts of air pollution exposures. The elderly and the young, as well as populations with higher rates of respiratory disease such as asthma and Chronic Obstructive Pulmonary Disease (COPD), and populations with other environmental or occupational health exposures (e.g., indoor air quality) that impact cardiovascular or respiratory diseases may be more sensitive to adverse health effects.

The locations of roadways, the volume of traffic on roadways and people’s proximity to these facilities determines their exposure to transportation-related air pollutants from vehicle sources. Epidemiologic studies have demonstrated that children and adults living in proximity to freeways or busy roadways may have poorer health outcomes.^{63 64 65 66 67 68}

Health-based standards for ambient air have been developed by the EPA for each of the “criteria pollutants” (O₃, CO, PM, NO₂, SO₂, and lead) as mandated by the Clean Air Act. The Clean Air Act also requires states to develop specific plans to achieve these standards. One way that these pollutants are regulated is through a national network of air quality monitors that provides information on ambient concentrations for each of the criteria air pollutants. Despite promulgation of National Ambient Air Quality Standards (NAAQS) for criteria pollutants, implementation of air quality control plans, and nationwide monitoring, air pollutants are believed to continue to have significant impacts on human health.

Air Pollution and Equity

The California Environmental Justice Advisory Committee asserts that highways and freeways may act as a stationary source of emissions for residents in nearby communities, exposing residents to disproportionate amounts of air pollutants such as PM 2.5 from vehicle emissions.⁶⁹ In California, African Americans, Asians, and Latinos are more likely to live close to major highways and suffer from more pollution and resultant public health problems such as increased cancer risk.^{70, 71} Low-income residents may be more likely to live in poorer housing conditions with higher levels of indoor air pollutants, and may also live closer to industrial land uses or busy roadways. A study in Southern California showed that income and non-white racial status was associated with significantly higher rates of PM 2.5 (specifically PM 2.5 from chromium and diesel) exposure.⁷² These factors may result in variation in the estimates of air pollution-related health effects. For example, a recent study of mortality and air pollution in Los Angeles found that concentration response functions based on a within-city estimate were two-to-three times those based on regional studies.⁷³

Vehicle speeds also have been shown to have an impact on emissions and risks from exposure. In particular, idling vehicles such as trucks and school buses have been highlighted as a source of air pollution because they produce emissions that can contribute to negative health outcomes such as cancer, premature death, and other acute and chronic conditions.^{74 75} Heavy-duty diesel trucks can emit up to 95 grams of CO, 57 grams of NO_x, and 2.6 grams of PM₁₀ per hour.⁷⁶ Reducing idling-

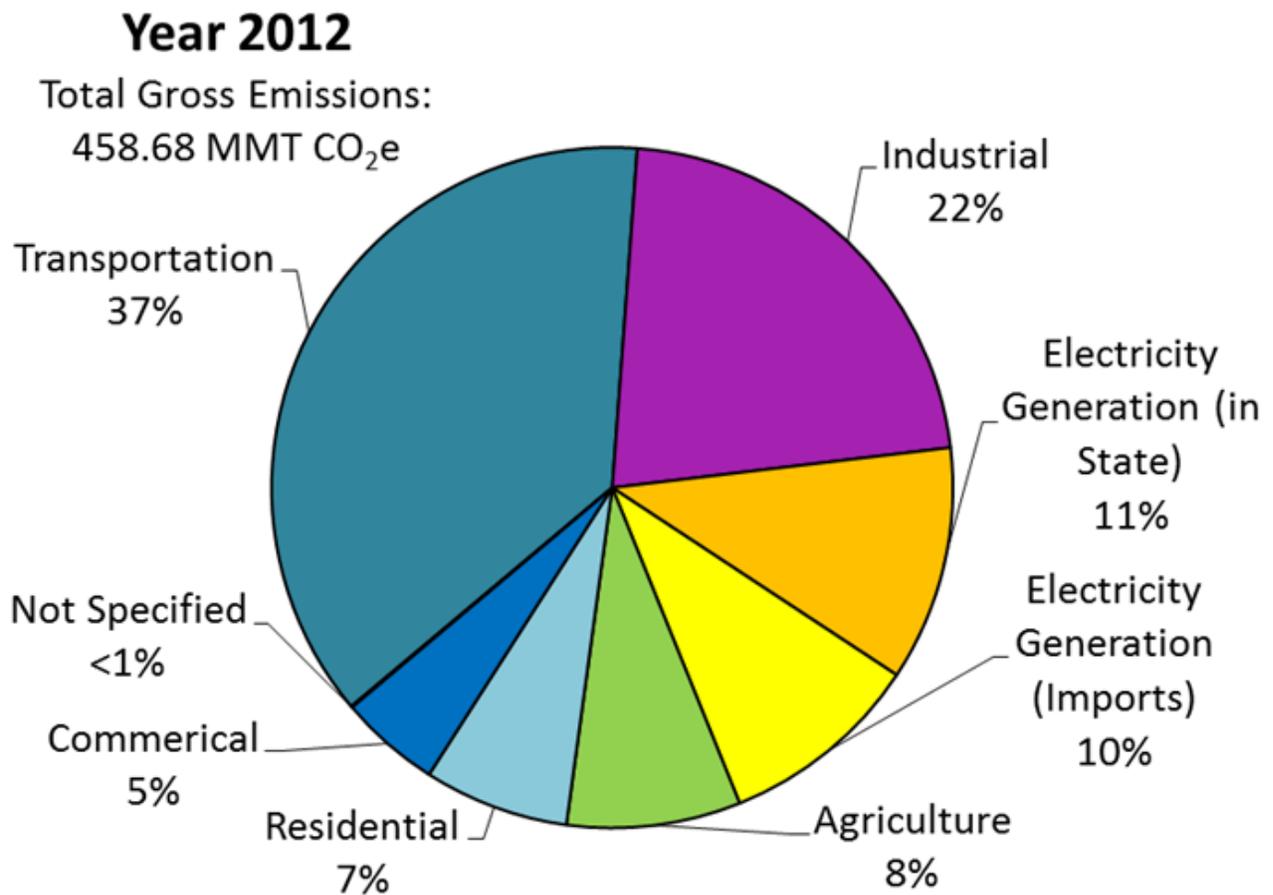
related emissions may be especially important in high truck-trafficked areas, because greater numbers of idling trucks will have a cumulative effect on air pollutants.

GHG Emissions

Studies have indicated that vehicle emissions of GHG can contribute to global climate change. GHG, through their climate change effects, may increase heat-related illness (i.e., illnesses such as heat stroke that result when a body's temperature control system is overloaded) and death, health effects related to extreme weather events, health effects related to air pollution, water-borne and food-borne diseases, and vector-borne and rodent-borne disease.^{77 78 79}

The California EPA Air Resource Board estimates that the transportation sector accounted for about 37 percent of GHG statewide in 2012, as reflected in the chart below.⁸⁰

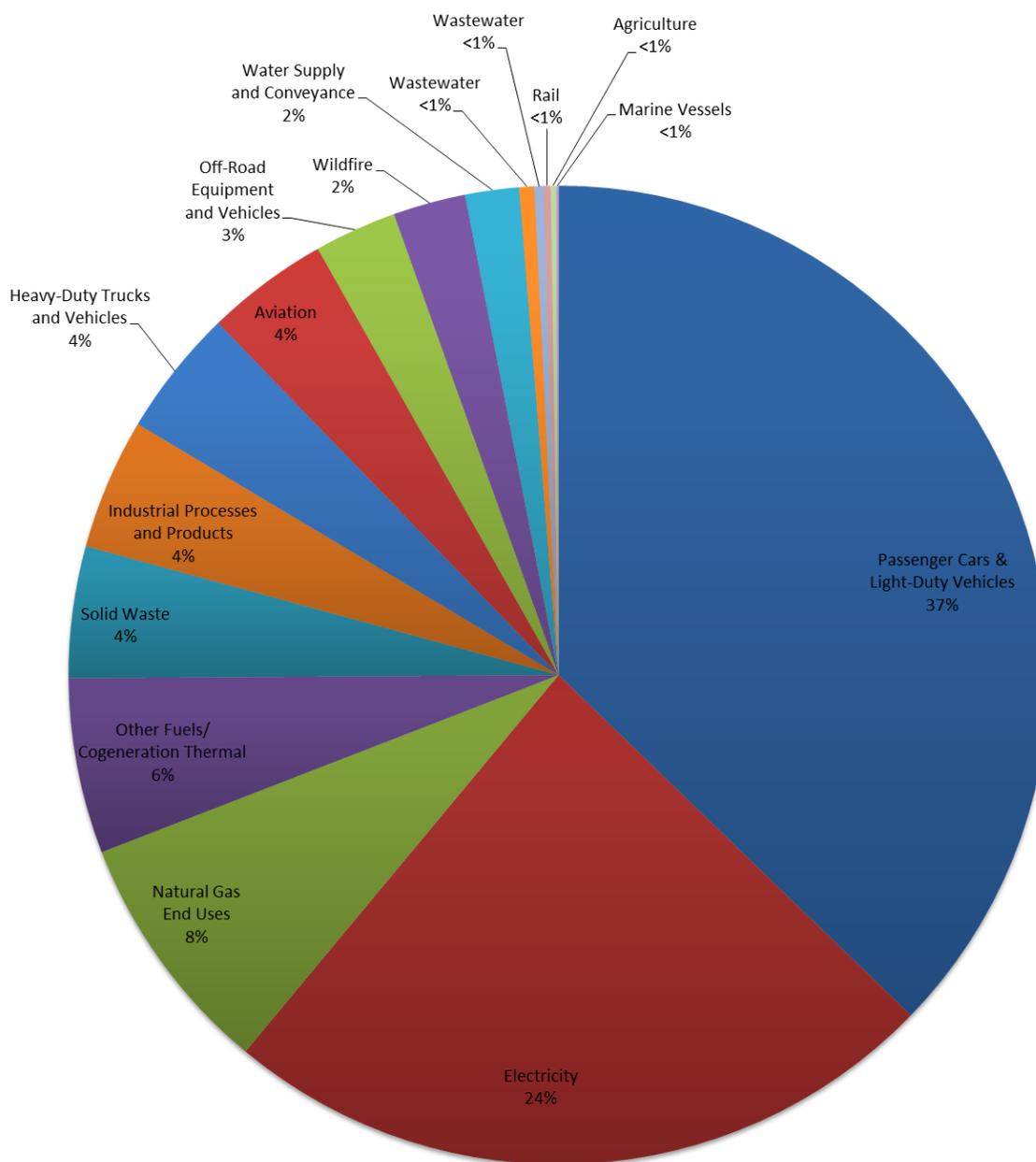
Figure 3-1: California GHG Inventory (2012)⁸¹



Researchers at the University of San Diego estimated that the transportation sector accounted for a full 37 percent of GHG in 2012 within the San Diego region, as shown in the following chart.

Figure 3-2: San Diego GHG Emissions by Sector (2012)⁸²

Greenhouse Gas Inventory for San Diego Region 2012



Source: Energy Policy Initiatives Center (EPIC)

Vehicle Noise

Roadway traffic may act as a significant source of noise in urban areas.⁸³ The noise generated by vehicles on a highway depends on the number of vehicles, the speed of vehicles, the type of vehicles (trucks or cars), and the road surface. Higher traffic volumes, higher speeds, and greater proportions of trucks are all associated with higher levels of noise.⁸⁴

The health impacts of environmental noise may depend on the intensity of noise, the duration of exposure, and the context of exposure. According to the WHO Guidelines for Community Noise, which reviews a significant amount of the research on noise and health, long-term exposure to moderate levels of environmental noise can adversely affect sleep, school, and work performance; blood pressure; and cardiovascular disease.⁸⁵ A significant body of the research on noise and health investigates roadway traffic noise specifically. The following findings are identified in this literature:

- *Sleep* – Traffic noise has been linked to perceived impairment in sleep quality.^{86 87} Reductions of noise by six to fourteen decibel A (dB[A]) result in subjective and objective improvements in sleep; studies show an increase in the percentage of awakenings at night at noise levels of 55 to 60 dB(A).⁸⁸ A lack of sleep may have health consequences such as fatigue, impaired endocrine and immune system, and psychological effects. Sleep can also impact quality of life, intellectual capacity, education, and risk of accidents.^{89 90}
- *Annoyance* – Annoyance is defined as “a feeling of displeasure associated with any agent or condition known or believed by an individual or a group to be adversely affecting them.”^{91 92} Annoyance is related to several health effects associated with noise, including elevated blood pressure, circulatory disease, ulcer, and colitis.⁹³ Subjective reports of annoyance are the most widely studied impact of noise and the relationship has been quantified.^{94 95} Annoyance from noise may result in anger, disappointment, dissatisfaction, withdrawal, helplessness, depression, anxiety, distraction, agitation, or exhaustion.^{96 97 98}
- *Speech and language* – Noise can interfere with speech communication outdoors, in workplaces, and in schoolrooms, interfering with the ability of people to perform their work.⁹⁹
- *Learning and educational performance* – Chronic road noise can affect cognitive performance of children, including attention span, concentration and remembering, and reading ability.^{100 101 102}
- *Cardiovascular disease* – The biological pathway between noise and cardiovascular disease (both hypertension and myocardial infarction) is based on noise-induced stress, which triggers the release of hormones such as cortisol, noradrenaline, and adrenaline, which in turn can affect hypertension, blood lipids, and blood glucose, all of which are risk factors for cardiovascular disease.
- *Hypertension* – There is a dose-response relationship between environmental noise from traffic and high blood pressure.¹⁰³ People who live near chronic roadway noise (more than 20,000 vehicles/day) are twice as likely to have hypertension, and men specifically are almost four times more likely.¹⁰⁴ A review by Babisch summarizes studies on the relationship between noise and hypertension.^{105 106} A large study published in 2009 found a notable effect of noise on hypertension at more than 64 dB(A) (or 1.45, 95% CI 1.04 - 2.02) with age acting as an effect modifier (effects in middle aged 40 to 59).¹⁰⁷
- *Myocardial Infarction* – Increasing community noise, including traffic noise, may increase the risk of myocardial infarction at noise levels above 50 to 60 dBA.^{108 109 110 111}
- *Stress* – The combination of noise and poor quality housing can be associated with higher stress and stress hormone levels.¹¹²

Groups who are at higher risk for adverse effects due to noise exposure can be those less able to cope with the impacts, including people with decreased abilities (senior, ill, or depressed people); people with particular diseases; and people dealing with complex cognitive tasks, such as reading acquisition, young children, and the elderly in general.

3.3 Livability, Convenience, and Safety

3.3.1 Livability

Various components of the built and social environment can contribute to a community's level of livability. The transportation system and nearby land uses facilitate the livability of a neighborhood. The quality and design of the built environment affect neighborhood livability by facilitating movement, physical activity, and social engagement and potentially limiting crime and social disorder in one's immediate neighborhood surroundings. Neighborhoods that include pedestrian spaces or that have lower levels of street traffic where one can walk comfortably and safely benefit health by enabling physical activity, leisure, and social interaction.¹¹³

A seminal study of the impact of traffic on three streets in a San Francisco neighborhood illustrates how traffic volumes and speed influence the way people use streets for non-traffic functions.¹¹⁴ The study found associations between traffic intensity and aspects of perceived livability, levels of social interaction, and families' preferences for living in the neighborhoods, whereby the streets with greater traffic intensity had lower levels of perceived livability and fewer neighborhood families that socialized with each other.¹¹⁵

Further, a study by Hüttenmoser investigated two contrasting groups of five year-olds.¹¹⁶ One group was raised in surroundings that allowed them to play on streets with little street traffic and without the presence of adults. The other group could not leave their homes unaccompanied by adults and had nearby access to streets with more traffic. The study found a clear connection between the time children spent outside and the dangerousness and perceived attractiveness of their living environments. Adults accompanied the children that lived near traffic hazards, which had the effect of limiting the time this group of children spent outside. The researchers found that, for the traffic hazard children, the social contact with other children in the immediate neighborhood was half of that of the children in the low-traffic neighborhoods. They also found that the same was true for the adults.¹¹⁷ This research highlighted how street traffic and unsuitable surroundings may hinder children's social and motor development and can put a strain on parents, as well. Poor motor skills development in children has been shown to have social and psychological consequences, such as difficulties interacting with other children.¹¹⁸

A vibrant neighborhood environment – with active, human-scaled streets, public spaces, and thriving business – is one type of setting for social interaction, which can lead to an increased sense of community and less crime. Social networks and interaction have been linked to improvements in physical and mental health through multiple mechanisms.¹¹⁹ Social support, perceived or provided, can buffer stressful situations, prevent feelings of isolation, and contribute to high self-esteem.¹²⁰ Certain types of social activities, including group membership in a community, have been shown to decrease mortality rates and cognitive impairment.¹²¹ ¹²² A higher level of civic engagement through ties to community groups can be associated with increased exposure to health-promoting messages.¹²³ On the other hand, individuals with low levels of social support or who are socially isolated have higher mortality rates, for example from cardiovascular disease, cancer, and HIV.¹²⁴ ¹²⁵ ¹²⁶ ¹²⁷ ¹²⁸ There is also a strong association between perceived social isolation and depression.¹²⁹

3.3.2 Convenience

Mobility can also be viewed in terms of convenience – how fast and easily the transportation systems and land uses allow people to get to where they need to go. Researchers have examined the effects of commuting through different modes (driving, walking/biking, public transportation, etc.) on stress, social outcomes, and mental health.

Each mode of travel likely has its benefits and drawbacks in relation to stress and mental health. However, a survey of university employees found that car commuters feel their journey to work is more stressful than other modes due to delays and other road users. These researchers also found public transit users feel stress related to delays as well as to boredom. Walking and cycling commuters find these modes to be the most relaxing and exciting.¹³⁰

Related to having a long commute, some researchers have found that having a long commute can increase stress and decrease life satisfaction and one's sense of well-being.^{131 132 133 134} One study that examined the satisfaction of married couples with long commutes found that those with long commutes had greater rates of marriage dissolution.¹³⁵ Moreover, among one-parent commuter families, the commuting parent reported making sacrifices due to missing vital parts of everyday life.¹³⁶ There are studies showing that commuters would like to decrease their commuting time, regardless of mode.^{137 138 139}

Commuting can also have positive effects, however, if people view this time as an opportunity to do other useful things, such as socializing or reading (if on public transit). Researchers have found that for people who have this perspective, their commutes are not stress-producing. In fact, the commute can be a welcome time, as it allows for a mental transition from home to work or work to home.^{140 141 142}

As previously mentioned, it is not possible to conclude a definitive health effect of commuting via different modes. However, the research does point to a negative impression of longer commute times and potential stress, social, and quality of life effects of longer commutes.

Transportation affordability is another important consideration related to the issue of mobility and convenience. Transportation is a major household expenditure, particularly for lower-income families, and it is also often beyond an individual's control, which was previously mentioned as a factor in determining people's impressions of their commutes. Unaffordable transportation can reduce economic opportunity and productivity for transportation-disadvantaged persons. High transportation costs can discourage lower-income people from attending school, reducing their productivity. A lack of qualified labor can make it difficult for businesses to fill positions, which can decrease overall economic activity in the long run. High expenditures on vehicles and fuel can reduce spending on other goods that provide more regional economic benefits, and reduce household wealth as vehicle expenditures build little equity in comparison to home investments.¹⁴³

Consumers also consider transportation affordability an important issue. Respondents to the 2009 National Household Travel Survey rated affordability ("price of travel") as the most important of six issues considered (price of travel, safety, aggressive/distracted drivers, congestion, access to public transit, and inadequate walking facilities).¹⁴⁴

There are several indicators that can be used to evaluate transportation affordability, including the portion of household expenditures devoted to transportation, the quantity and quality of affordable transportation options available to a particular group or for a particular type of trip, and the quality of accessibility for non-drivers compared with drivers.¹⁴⁵

3.3.3 Safety

Transportation Accidents and Injuries

Related to both livability and convenience is the issue of traffic safety. In 2011 there were over 32,000 fatalities and over 2.2 million injuries from crashes on United States roadways, for all modes of transportation. Fourteen percent of the fatalities and thirty-three percent of the injuries (ranging from non-severe to severe) were pedestrians. Two percent of the fatalities and two percent of the injuries were bicyclists. Children aged 10 to 15 have the highest population-based injury rate (33 per 100,000) and people over 74 years have the highest population-based fatality rate (at 2.19 per 100,000 – almost double the overall population rate of 1.33).¹⁴⁶ These rates do not take exposure into consideration.

The risk of pedestrian injuries may discourage pedestrian activity and negatively impact physical activity levels. Pedestrians are even likely to limit their exposure if there is a perception of danger.^{147 148 149} For example, one study found that three factors – traffic volume, traffic speed, and the separation between pedestrians and traffic – explained 85 percent of the variation in perceived safety and comfort for pedestrians.¹⁵⁰ Such impacts to safety are real as well as perceived: environmental variables that may be associated with actual pedestrian collisions include pedestrian volume,¹⁵¹ vehicle volume,¹⁵² vehicle type,¹⁵³ vehicle speed,¹⁵⁴ intersection design, pedestrian facilities, lighting, and weather.¹⁵⁵

Roadway designs shown to enhance cyclist safety include clearly-marked lanes, paths, and routes¹⁵⁶ (separated by barriers from vehicle traffic when possible);¹⁵⁷ street lighting; paved surfaces; low-angled grades;¹⁵⁸ bicycle signage; shared lane markings; and bicycle-specific signals.¹⁵⁹ In addition, these features enhance pedestrian safety by separating bicycles from sidewalks.

Vehicle Volume and Safety

Public health and transportation safety research demonstrates that vehicle volumes can be an independent environmental predictor of pedestrian injuries.^{160 161 162 163 164} The magnitude of effect of vehicle volume on injuries is significant. For example, in a study of nine intersections in Boston's Chinatown, researchers calculated an increase in three-to-five injuries per year for each increase in 1,000 vehicles.¹⁶⁵

Other studies illustrate that as pedestrian and cycling volumes increase, collisions with automobiles may decrease. For instance, an analysis of pedestrian and bicycle volume found that with increasing numbers of walkers and cyclists, injury rates decreased.¹⁶⁶ Similarly, an analysis of pedestrian injuries in Oakland illustrated that the risk for pedestrian-vehicle collisions was smaller in areas with greater pedestrian flows and greater in areas with higher vehicle flows.¹⁶⁷

Vehicle Speed

Vehicle speeds predict both the frequency as well as the severity of pedestrian injuries. Below 20 miles per hour (mph) the probability of serious or fatal injury is generally less than 20 percent; this proportion rapidly increases with increasing speed and above 35 mph, most injuries are fatal or incapacitating.¹⁶⁸ Another study showed that the average pedestrian has an 85 percent likelihood of fatality when struck by a vehicle traveling at 40 mph, whereas if the vehicle is traveling at 30 mph the likelihood is reduced to 45 percent, and when vehicles are traveling at 20 mph the likelihood of fatality is only 5 percent.¹⁶⁹

On average, each one mph reduction in speed may reduce collision frequency by five percent, with effects greatest for urban main roads and low speed residential roads.¹⁷⁰ There can be a positive linear relationship between posted speed limits and severity of pedestrian injury and fatality. Where the speed limit of 25 mph is posted, 2.2 percent of pedestrian collisions result in fatality, whereas in locations with 30 mph and 35 mph the percentage of pedestrian fatalities rose to 3.9 percent and 8.1 percent respectively.¹⁷¹

One-Way Streets

One-way streets have generally been found to reduce pedestrian collisions as well as pedestrian injury and fatalities.¹⁷² ¹⁷³ Some argue that one-way streets may provide an advantage to pedestrians by having primary traffic coming from only one direction (and hence one may need to only prioritize looking in one direction when crossing).¹⁷⁴ At least one study, however, found that one-way streets pose a greater risk for child pedestrian injuries.¹⁷⁵ On the other hand, since one-way streets tend to have higher vehicle speeds,¹⁷⁶ some injuries due to crashes may be more severe or lead to fatality.¹⁷⁷ At least one study indicates that in residential areas, one-way streets face worse air quality, traffic, and traffic-related concerns.¹⁷⁸ This may also be due to higher auto speeds. Careful considerations and contextual differences should be examined when converting one-way streets to two-way and vice versa.

Pedestrian Vehicular Conflict

Pedestrian collisions are more common in areas of more densely populated low-income and/or minority individuals, potentially reflecting greater traffic volumes and lower automobile ownership among residents of these neighborhoods.¹⁷⁹ Additionally, older adults also may suffer disproportionately from both risk and impact of pedestrian auto collisions. Older adults tend to walk more slowly and have slower reaction times that may put them at more risk as a pedestrian, and in the unfortunate event of a collision, older adults are more likely to have severe and fatal injuries due to frail physical conditions. Medians, speed bumps, and other traffic calming efforts can reduce the number of auto crashes with pedestrian injuries by up to 15 percent.¹⁸⁰

3.4 Access to Resources

This aspect of mobility relates to the level of access to private and public resources provided by transportation systems. Access to local resources, including employment and goods and services, is fundamental for people's ability to meet their basic needs for survival and health. The transportation system can facilitate or inhibit access to these resources, including access to a means of livelihood, fuel, food and water, and essential services like health care, childcare, and education.

Having access to these resources is a function of proximity, travel time, and/or transportation mode. Therefore, access is influenced by local land use, the transportation infrastructure, and people's individual circumstances (e.g., car ownership). The health effects of these influences on access have been reviewed previously. Therefore, this section will be focused on the potential health effects of the resources themselves.

3.4.1 Employment

Employment impacts health in many direct and indirect ways. Within the population, as the availability of jobs that pay family-supporting wages and provide health-related benefits increases, income and access to health care increase. As the economic means of individuals and communities as a whole increase, they become better able to make decisions that are health-protective, such as buying more healthy food, having time to exercise and to maintain strong social connections at the individual level, and investing in health-promoting resources, such as parks and schools, at the community level. All of these decisions can impact lifespan, chronic disease levels, and mental health. However, it is important to consider that in addition to job availability and access, the skills and education required to secure available jobs is a major contributing factor. For example, if a family-supporting wage position is available or accessible to members of a certain community, but the community members lack the skill set or education required for the position they will not be hired. This relates to higher education and job training accessibility.

Employment affects the Socio-Economic Status (SES) of an individual or family, and has been extensively researched as a key factor that affects health.^{181 182} SES typically refers to the income and educational levels of an individual. Three major indicators of SES often cited in the literature as having links to health are education,¹⁸³ income,¹⁸⁴ and occupational prestige or status, or "job control."¹⁸⁵ A recent issue brief on the subject of SES summarizes this literature.¹⁸⁶ Its findings include the following:

- As income increases, overall life expectancy is typically higher
- There is a near-linear gradient correlating step-wise increases of job status to decreasing negative health outcomes such as cardiovascular disease, hypertension, and general mortality risk¹⁸⁷
- Self-reported health status for adults and their children generally improves with income
- Low birth weight, an indicator of health later in life, may be highest among low-income mothers
- Wealth may be negatively correlated to obesity and other cardiovascular risk factors, meaning that as household income rises, rates of obesity and some chronic diseases falls

Unemployment, especially long-term unemployment, has been shown to be a serious risk factor for both physical and mental health.¹⁸⁸ A comprehensive systematic review and meta-analysis of 42 studies found that unemployment may lead to increased mortality risk for early- and middle-career workers, and less so for late-career workers.¹⁸⁹ Unemployment has also been shown to impact access to health insurance and other health outcomes including cardiovascular disease, hypertension, depression, and suicide.^{190 191 192}

3.4.2 Childcare Centers, Public Schools, and Public Libraries

Today, the majority of United States children live in families in which both parents work.¹⁹³ Access to childcare is essential for working parents to maintain employment and/or continue education. Accessible, high-quality childcare provides children with valuable opportunities for cognitive, behavioral, and educational development and typically results in positive physical health outcomes.^{194 195 196 197} Parents are more likely to use childcare if it is accessible in terms of proximity and cost. For low-income families, the costs of childcare can consume a major portion of income, leaving less money for food, housing, and other essentials.

Lack of accessibility to local schools can have negative social impacts and affect both physical and mental well-being.¹⁹⁸ Living within a half-mile of schools has been shown to greatly increase the likelihood of walking or biking to school across all racial groups.¹⁹⁹ Health benefits of active commuting to school can include higher cardiovascular fitness among youth, which can be linked with reduced risk for coronary heart disease, stroke, cardiovascular disease, and cancer later in life.²⁰⁰ Active commuting has also been associated with increased levels of independence in children and with increased social interaction and communication.^{201 202}

While proximity is only one measure of access, the physical presence of libraries encourages improved literacy and provides access to health information. Libraries serve as important public educational and cultural facilities that help to disseminate health information to the general public, promote general and health literacy, organize/filter and improve access to reliable internet resources, facilitate educational collaborations between agencies and communities, and promote art and cultural activities both on and off library property.²⁰³ Recently, libraries have become an important resource for accessing computers. Many libraries allow free internet and computer use, providing access to resources such as job searches, word processing, information gathering, and printing. Libraries can also serve as “cooling centers” during extreme heat waves, which also affect physical and mental well-being.

3.4.3 Parks, Community Centers, and Community Gardens²⁰⁴

Availability of recreational facilities has been shown to increase physical activity. Several studies have examined the association between facility availability and physical activity behavior among youth. Studies involving measures of perceived availability, as well as actual availability, of facilities for physical activity largely show a positive association between availability and physical activity.^{205 206 207}

Parks and open space can impact health through several mechanisms, including physical activity, social interaction, environmental quality, and illness recovery. In addition to community centers and gyms, parks, and open space are important resources for physical activity because they provide fields for play, scheduled and supervised activities, and destinations to which people can walk.²⁰⁸ Parks are particularly important



for low-income populations who might not have access to other means of physical activity because they provide low-cost choices for recreation.²⁰⁹

Several studies have quantified the health effects of parks and open space:

- Nationally, about 30 percent of physically active people report exercising in public parks²¹⁰
- Parks and open space improve mental health by providing a needed reprieve from everyday stressors, and acting as “escape facilities.” Being able to escape fast-paced, urban environments improves health by reducing stress and depression and improving the ability to pay attention, be productive, and recover from illness²¹¹
- Hospitalized patients with views of trees or natural settings have faster recoveries²¹²
- Children with higher levels of outdoor play have been found to have lower rates of attention deficit hyperactivity disorder symptoms²¹³
- Families with access to green space have fewer arguments due to less mental fatigue²¹⁴

In addition, community gardens, another form of urban green space, offer participants the chance to learn new skills, grow and have access to fresh, healthy food, save money, and build community.²¹⁵

3.4.4 Post Offices, Banks, and Pharmacies

Services such as post offices, banks, and pharmacies are important resources for local residents. Pharmacies and drug stores are important to health, not only for the sale of medications or as resources for medical guidance, but also as places to purchase food. In the past decade, non-traditional food stores of this variety have increased the availability and variety of food options for customers.²¹⁶ The variety of services offered in a neighborhood can also increase the number of walking or bicycling trips within the area.

3.4.5 Food Retail²¹⁷

Diet-related disease has been shown as one of the top sources of preventable deaths among Americans, with the burden of overweight and obesity typically falling disproportionately on populations with the highest poverty rates.^{218 219} The presence of a supermarket in a neighborhood predicts higher fruit and vegetable consumption and a reduced prevalence of overweight and obesity.^{220 221} Public health researchers have identified 30 million “food deserts” in the United States and an estimated 1 million “food deserts” in California. Food deserts are defined as urban areas where residents have to travel more than 1 mile to access a grocery store, or rural areas where residents have to travel more than 10 miles to access a grocery store. Having a supermarket close to one’s residence may lead to healthier eating and a healthier body weight. One study conducted in Los Angeles County concluded that longer distances traveled to grocery stores were associated with an increased BMI.²²² The study surmised



that for a person with a height of five feet and five inches, traveling 1.75 miles or more to get to a grocery store correlated to a weight difference of about five pounds.

For low-income populations in urban areas, in particular, accessible and affordable nutritious food remains a significant unmet need. Poorer households tend to buy less expensive but more accessible food at fast food restaurants or highly processed food at corner stores, which typically charge about ten percent more for products than supermarkets.²²³ These types of foods are often higher in calories and lower in nutritional value.^{224 225} Fast food restaurants tend to serve food of low-quality nutrition and are statistically associated with diet-related disease rates, while full-service restaurants are associated with better health outcomes.^{226 227} A national study reported a clear association between each state's obesity rate and the density of fast food retailers in the state.²²⁸

3.4.6 Health Care Facilities

The type of health services in a community can impact the health outcomes of local residents. The location of these resources and their proximity to where people live help determine whether people use them, how often, and how they access them (e.g., by walking or driving).

Living in a disadvantaged neighborhood can reduce the likelihood of having a usual source of health care and of obtaining recommended preventive services, while it increases the likelihood of having unmet medical needs.²²⁹ Individuals living in neighborhoods with greater health care resources may be more likely to use primary care due to shorter travel distances required to see a provider and greater provider choice.²³⁰ Health care resources are not distributed equally among neighborhoods, with areas of greater wealth generally having greater health care resources.^{231 232} However, it should be noted that many healthcare providers tend to cluster near hospitals or major healthcare facilities. The types of industries in a community also affect the presence of health care resources because certain types of employers are more likely to provide private health insurance coverage, which has higher reimbursement rates than public insurance.²³³ Additionally, populations with a greater percentage of the very young or seniors may demand more health care because these demographics have greater health care needs, drawing more providers to an area.²³⁴

Primary care is defined as care that gives patients entry into the health care system, coordinates health care services for patients, provides care to the same patient over time, is comprehensive, and takes into account the patient's societal context outside the health care system.²³⁵ The use of this type of health care over time may improve individual and population health by helping patients prevent and control illnesses. Research has found that access to primary care can help to mitigate the negative effects of lower SES and income inequality on health.²³⁶ Social capital, health care resources, and where one lives have been shown to be predictors of an individual's ability to access primary care.^{237 238} The difference in ability to access primary care is one of the factors that explain individual-level health disparities between neighborhoods.²³⁹

3.5 Shaping Communities

Communities are not defined by a single variable, but rather they are a reflection of how the different elements described throughout this chapter work together. Similarly, the health of an individual is not solely reliant on the mobility options and built environment within their community. Additional factors to consider may include personal choices as well as income. For example, a person living in a highly urbanized area with access to transit, sidewalks, bike facilities,

parks, healthy food options, and other social support amenities may not have improved health over a person in an area absent of these features if they do not take advantage of the resources available. Similarly, a person's access is potentially restricted by a lower income, limiting their transportation, food choices, and health care options to what they can afford.

4.0 Methodology

The previous Chapter 3.0 provides a strong foundation of evidence about the linkages between health and mobility/built environments. This broad foundation established by the previous research provides context for further exploring the nature of these relationships more specifically in the San Diego region and in San Ysidro. As mentioned in Chapter 1.0, a key goal of this study is to present an analysis approach that can assist in informing the strength and direction of mobility/built environment and health outcome relationships for San Ysidro and other similar communities. This type of analysis will strengthen local and regional planning agencies' abilities to extend the relevance of mobility/built environment recommendations to the arena of community health outcomes. Chapter 4.0 outlines key data sources used in this study in support of analyses for improving our understanding of mobility/built environment and health issues in the community of San Ysidro.

The project team sought to carry out this Border Health Equity Transportation Study (BHETS) using publically available data covering a majority of the San Diego region so that similar types of analyses can be replicated in other communities across San Diego. Two key sources were identified and employed in this BHETS, including the *2012 Healthy Communities Atlas*, which was prepared under contract to SANDAG, and the *2013 San Diego County Community Profiles* for non-communicable diseases, behavioral health, and injury, which were compiled by the County of San Diego Health and Human Services Agency in its Public Health Services - Community Health Statistics Unit.

The following sections discuss these two data sources and various approaches to preparing the data for analysis to support this BHETS.

4.1 Healthy Communities Atlas (SANDAG)

The *Healthy Communities Atlas* compiled socio-economic and physical environment health determinant data at the census block group level for the entire San Diego region. Two types of maps were provided in the *Healthy Communities Atlas*, including base maps which display a single indicator and composite maps which include multiple factors as a numeric index. The *Healthy Communities Atlas* presented indicators identified through a literature review of factors found to influence health, including those related to physical activity and active transportation, injury prevention, nutrition, and air quality. The *Healthy Communities Atlas* data covers the entire San Diego region with 1,762 census block groups.

The *Healthy Communities Atlas* data is used in this BHETS to show how San Ysidro compares to the City of San Diego as a whole in terms of a range of mobility/built environment variables. For the purposes of this comparison, the census block group level data was aggregated to the community of San Ysidro boundary and to the City of San Diego boundary. This allowed for a comparison of the community with the city as a whole to determine whether San Ysidro is noticeably different from San Diego in terms of mobility/built environment conditions.

Table 4.1 describes the 29 *Healthy Communities Atlas* variables considered in this BHETS. The built environment and mobility variables were categorized into seven groupings, as follows:

1) demographics; 2) transportation systems; 3) physical activity support; 4) traffic-related safety; 5) access to social support; 6) crime-related safety; and 7) food environment.

Table 4.1: Description of Healthy Communities Atlas Built Environment and Mobility Variables

Indicator	Description
Demographics	
Low-Income	Areas have over one-third of all households earning under \$30,000 per year
Minority	Areas have over 65 percent minority population
Low-Mobility	Areas have more than 25 percent of households without a car, 25 percent of population has a disability, or 20 percent of the population is over 65 years
Low Community Engagement	Areas with over 20 percent disabled persons, 20 percent non-English speaking households, or over 20 percent of population is without a high school diploma
Multiple Communities of Concern	Areas with one or more communities of concern (defined by SANDAG as low-income, minority, low-mobility, and low community engagement)
Transportation System	
High Volume Arterials	Arterial centerline miles per acre
Traffic Volume Density	Average daily vehicle miles traveled per acre
Air Pollution	Percentage of households within 500-feet of transportation-related air pollution sources (high volume roadway) or within 0.25 miles of rail yards or ports
Physical Activity Support	
Sidewalk Coverage	Percent of roadways with sidewalks
Non-Motorized Trails Access	Percent of households within walking distance (1.2 miles) of a non-motorized trail
Walkability Index	Composite measure of retail floor area ratio, land use mix, residential density, and intersection density
Transportation Infrastructure Support Index	Composite measure of access to transit stations/stops, to non-motorized trails, and sidewalks
Youth Physical Activity Support Index	Composite measure including sidewalk coverage, parks and open space access, non-motorized trails access, and elementary school access
Physical Activity Inhibitor Index	Composite measure of traffic volume density, arterial density, vacant parcels, property crimes, and violent crimes
Traffic-Related Safety	
Pedestrian Collision Rate	Average yearly pedestrian-motor vehicle collisions per 1,000 persons
Cyclist Collision Rate	Average yearly cyclist-motor vehicle collisions per 1,000 persons
Pedestrian Safety	Composite measure of pedestrian collision rate, arterial density, traffic volume density, and sidewalk coverage
Cyclist Safety	Composite measure of cyclist collision rate, arterial density, traffic volume density, and non-motorized trails access
Traffic Safety for Youth	Composite measure of sidewalk coverage, pedestrian collision rate, cyclist collision rate, arterial density, and traffic volume density

Table 4.1: Description of Healthy Communities Atlas Built Environment and Mobility Variables (Continued)

Indicator	Description
Access to Social Support Amenities	
Daycare Facility Access	Percent of households within walking distance of a daycare facility
Library Access	Percent of households within walking distance of a library
Elementary School Access	Percent of households within walking distance of an elementary school
Healthcare Facility Access	Percent of households within walking distance of a healthcare facility
Parks and Open Space Access	Percent of households within walking distance of a park entrance or trailhead
Healthy Food Access	Percent of households within walking distance of a grocery store or farmer's market
Crime-Related Safety	
Rate of Property Crime Incidents	Average yearly rate (of vandalism and malicious mischief) per 1,000 persons
Rate of Violent Crime Incidents	Average yearly rate (of robbery, homicide, rape, assault) per 1,000 persons
Food Environment	
Healthy Food Density	Percentage of households within walking distance of a grocery store or farmer's market
Fast Food Density	Number of fast food outlets per 100 acres

Source: *Healthy Communities Atlas, 2012; Chen Ryan Associates, February 2015*

4.2 Community Health Statistics (County Health And Human Services Agency)

The County of San Diego Health and Human Services Agency Public Health Services - Community Health Statistics Unit maintains and compiles community profiles about health behaviors, diseases, and injury across the region. The community profile reports are intended to provide health professionals with data for describing health trends and needs of San Diego residents.

The community profile reports provide health data aggregated to 41 Sub-Regional Areas (SRAs) across the region. Health outcome data is reported in terms of deaths, hospitalizations, and emergency room discharges. For the purposes of this analysis, emergency room discharges are used to represent the respective health outcome.

Figure 4-1 displays the San Diego region's SRAs with are the unit of analysis for the health outcome data.

Table 4.2 reports descriptive statistics for the health outcome data by SRA used in this BHETS. The disease incident data for each SRA was divided by the 2008 total population of the SRA, which was obtained from the SANDAG Data Warehouse. For example, the data presented in Table 4.2 would be interpreted as follows: *"Across the San Diego region, emergency room discharges associated with diabetes occurred at a mean rate of 0.0016 discharges per person by SRA."*

Appendix D presents definitions of the health outcomes listed in Table 4.2 per the County of San Diego’s Community Health Statistics report.

Figure 4-1: SRAs for the Region of San Diego

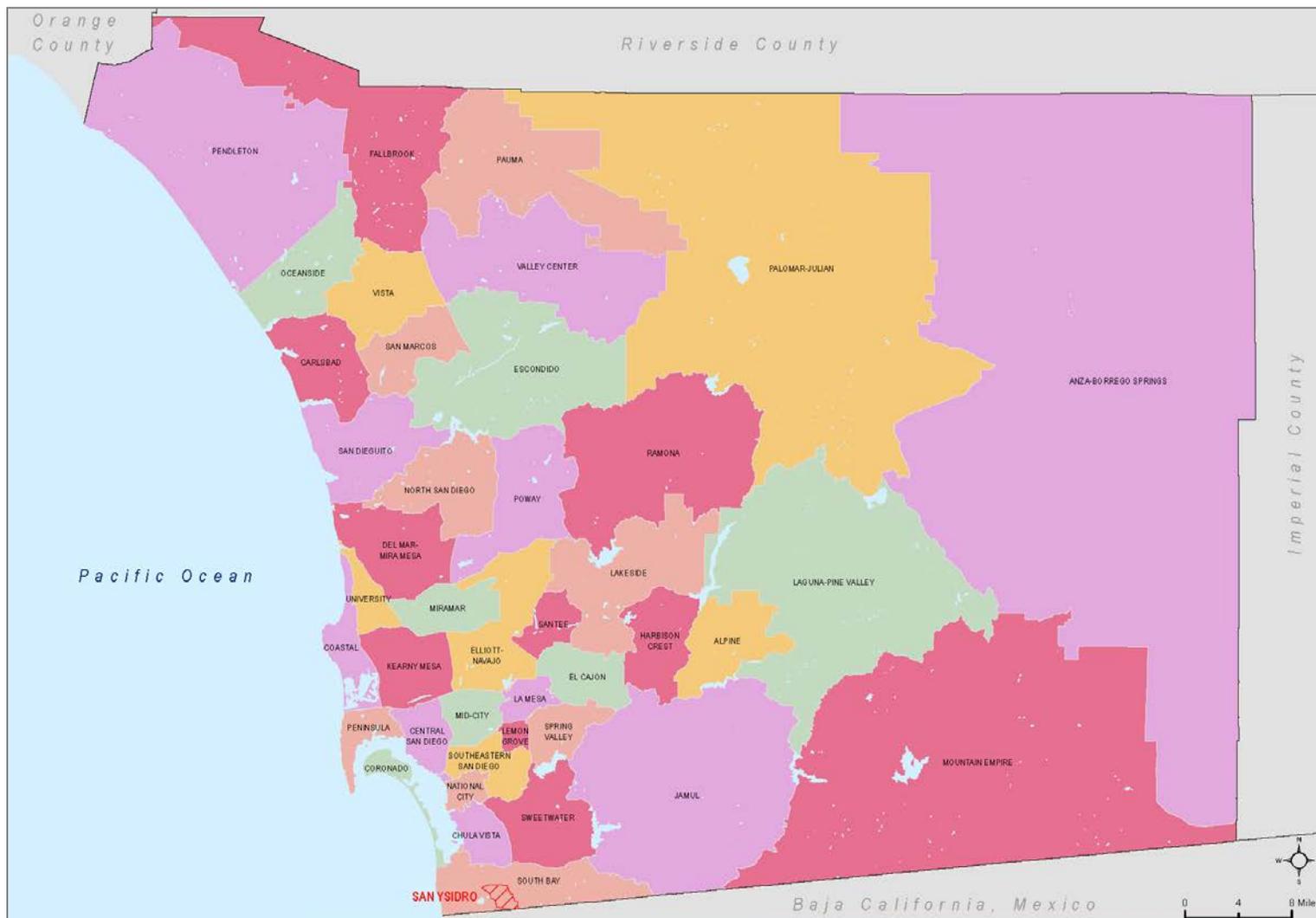


Table 4.2: 2010 Health Outcome Rates (Emergency Room Discharges per Population) by SRA for the San Diego Region

Potential Environmental Influence on Health Outcome	Health Outcome ¹	Minimum	Maximum	Mean	Standard Deviation
Direct Effect	Pedestrian Injury	.00	.0029	.0003	.0004
	Cyclist Injury	.00	.0025	.0003	.0004
	Motor Vehicle Injury	.00	.0671	.0066	.0099
	Asthma	.00	.0370	.0034	.0057
Long-Term Effect	Diabetes	.00	.0170	.0016	.0026
	Stroke	.00	.0057	.0005	.0009
	Chronic Obstructive Pulmonary Disease	.00	.0371	.0031	.0057
	Coronary Heart Disease	.00	.0038	.0004	.0006
	Cancer	.00	.0200	.0020	.0030
Community-Level Effect	Injury from Crime	.00	.0119	.0010	.0021
	Substance Abuse	.00	.0074	.0007	.0011
	Psychological Disorder	.00	.0213	.0013	.0033

Source: 2010 County of San Diego Health and Human Services, Community Health Statistics Unit; SANDAG, 2008; Chen Ryan Associates, February 2015

Note: Health Outcome is measured in terms of the number of emergency room discharges associated with each health outcome by SRA, divided by the total population of the SRA.

4.3 Comparing San Ysidro, the City of San Diego and the Region

Two types of comparisons are presented utilizing the mobility/built environment and health outcome data. The smaller geographic scale of the mobility/built environment data (census block groups) allowed for a community of San Ysidro to City of San Diego comparison, where simple rates associated with each of the measures are compared.

The health outcome data did not allow for a direct comparison of San Ysidro to the City or region, rather this data type was limited to a comparison of the South Bay SRA to the remainder of the San Diego region. San Ysidro falls within the South Bay SRA, but this SRA also includes the City of Imperial Beach and the community of Otay Mesa within the City of San Diego. Although not ideal, the SRA was the smallest available geographic unit for the County of San Diego health outcome data.

Table 4.3 shows how San Ysidro compares to the remainder of locations within the South Bay SRA in terms of population density, income, and percent Hispanic. As shown, San Ysidro has higher population densities, lower incomes, and higher percent Hispanic compared to other communities within the South Bay SRA.

Table 4.3: Comparing San Ysidro to Other Portions of the South Bay SRA

Characteristic	San Ysidro	Otay Mesa	Otay Mesa-Nestor	Tijuana River Valley	Imperial Beach	Average (Excluding San Ysidro)
Population	28,008	15,001	60,809	64	26,324	25,550
Acres	1,862	9,316	5,368	3,589	2,841	4,595
Population Density (persons per acre)	15.0	1.6	11.3	.02	9.3	5.6
Median Household Income	\$35,993	\$82,259	\$49,373	\$52,500	\$45,785	\$57,479
Percent Hispanic	92.9%	59.3%	70.5%	68.8%	49.0%	61.9%

Sources: SANDAG 2010 Community Profile; United States Census Bureau, 2007-2011 ACS 5-Year Estimates; Chen Ryan Associates, February 2015

Figure 4-2 illustrates the various geographies employed in this BHETS, including the community planning area boundaries, city boundaries, and the South Bay SRA boundary.

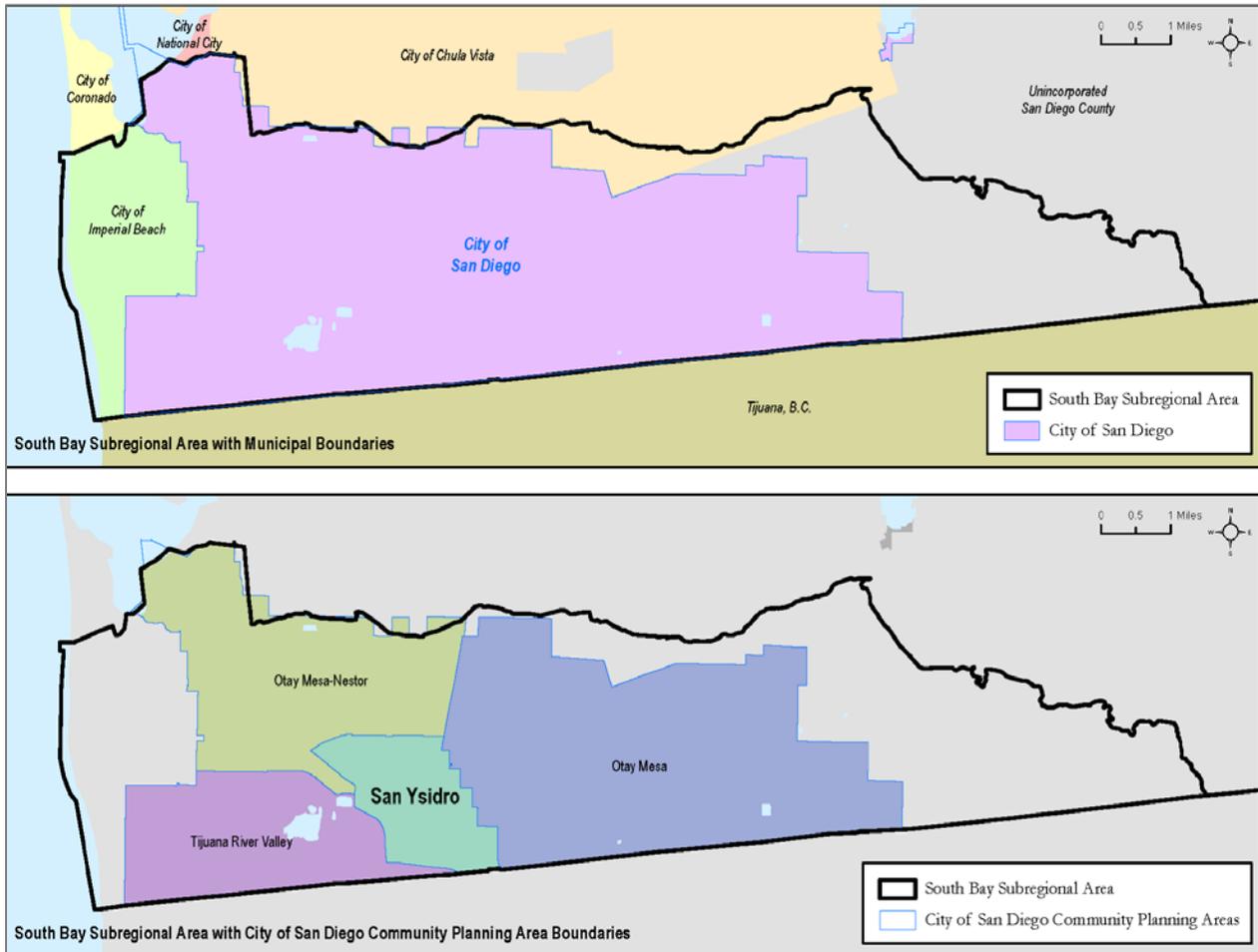
Comparing community-level measures to the larger city context is a typical approach to understanding how a community is similar to, or different from, the city where it is situated. The City of San Diego routinely includes community-to-citywide comparisons in their community plan updates. Given the San Ysidro Community Plan Update was in process at the time of the BHETS, it was hoped that some of the San Ysidro to City comparisons and final study recommendations would be relevant to that planning process, and possibly used in the City's community plan update.

4.4 Partial Correlations

Partial correlations were performed to understand the strength and magnitude of the linear associations between the mobility/built environment variables and the health outcome measures, while adjusting for the effects of age and income. The effects of age and income were controlled for in this analysis since these factors are known to have strong relationships with disease rates. The results reported in this BHETS therefore are independent of age and income. The partial correlations coefficient helps us to answer a question like, "Does the presence of sidewalks have an effect on the rate of diabetes-related emergency room discharges within an SRA, holding age and income constant?" In other words, is there an association between the presence of sidewalks in a community and the rate of diabetes-related emergency room discharges? This type of objective assessment, based upon quantitative analysis, helps to provide stronger foundations and support for transformative policy-making.

A limitation of using emergency room visit discharges as a health indicator of the SRA is that emergency room visits are likely related and thus confounded by health care access. In other words, emergency room visits are related to the level of access community members have to health care facilities, and this phenomenon could not be accounted for in this BHETS. This limitation was addressed to a certain extent by adjusting for SRA income, which is a common indicator of health care access.

Figure 4-2: City, Community Planning Area, and South Bay SRA Boundaries



The BHETS is an “ecological study” of mobility/built environment effects on health outcomes in San Diego County. It is considered an ecological study because the unit of analysis – the SRA – is relatively large and necessitates an undesirable level of aggregation of mobility/built environment and health outcome measures. This type of aggregation is not ideal because the variability in mobility/built environment and health outcome measures across an SRA is lost. In general, a smaller geography such as a census tract would produce stronger analysis results, since more variability across the BHETS area is maintained. This may have resulted in limited power to detect associations in some cases. Future studies should assess built environment effects on health outcomes using a smaller (and thus more precise and specific) unit of analysis such as census tracts or census block groups. The research design aspects of the BHETS and BHETS measures should be considered when interpreting the present findings.

5.0 Analysis Results

This chapter presents analysis results of the San Ysidro to City of San Diego comparisons for mobility/built environment variables, as well as the comparison of health outcomes for the South Bay Sub-Regional Area (SRA) and the region. The last section of this chapter presents results of the partial correlations analysis assessing the relationship between the mobility/built environment and health outcome measures, while controlling for age and income.

5.1 Comparing San Ysidro and the City of San Diego (Healthy Communities Atlas Data)

Table 5.1 compares key demographic information for San Ysidro and the City as a whole using the SANDAG Community of Concern definitions found in the Healthy Communities Atlasⁱⁱ (2012). As shown, San Ysidro has noticeably more minority, low income, and low engagement populations relative to the city as a whole, while it has about the same level of low mobility populations.

Table 5.1: Comparing San Ysidro and City of San Diego Demographics

Community Demographics	San Ysidro	City of San Diego
Percent of Census Tracts –Minority (65 percent or more people are minority)	100.0%	52.5%
Percent of Census Tracts – Low Mobility (20 percent or more people are older than 65 years; or 25 percent or more households do not own a car; or 25 percent or more people are disabled)	23.6%	24.9%
Percent of Census Tracts – Low Income (33 percent or more households earn less than \$30,000; or 25 percent or more people live at 100 percent of poverty; or 10 percent or more housing units have more than two persons per room)	86.3%	20.5%
Percent of Census Tracts – Low Engagement (20 percent or more people do not have a high school diploma; or 20 percent of more households do not speak English as primary language)	100.0%	32.1%
Percent of Census Tracts – Multiple Communities of Concern	100.0%	65.7%

Source: *Healthy Communities Atlas, 2012; Chen Ryan Associates, February 2015*

ⁱⁱ For purposes of this report, “Communities of Concern” is defined based on the Healthy Communities Atlas since this data is already publically available. As it pertains to San Diego Forward: The Regional Plan; however, SANDAG defines Communities of Concern through a social equity analysis of the region, identifying all households that have any of the following characteristics: minority; 200 percent of the federal poverty rate; and/or are 75 years or older. Due to enhanced modeling capabilities that enable analysis at the household scale, there are no thresholds necessary to identify these communities.

Table 5.2 compares key transportation systems measures for San Ysidro and the City as a whole for those indicators shown in previous literature to influence health outcomes. As shown, San Ysidro has higher rates of households living near air pollution sources relative to households across the City as a whole. In relation to arterial roadway density and average daily Vehicle Miles Traveled (VMT) density, San Ysidro has slightly lower rates than the City as a whole.

Table 5.2: Comparing San Ysidro and City of San Diego Transportation Systems

Transportation System	San Ysidro	City of San Diego	San Ysidro – City Difference
Percent of Households within 500 feet of Transportation-Related Air Pollution Source (Air Pollution)	41.3%	12.0%	+++
Arterial Roadway Miles per Acre (High Volume Arterials)	7.3 miles/acre	8.4 miles/acre	–
Average VMT per Acre (Traffic Density)	33.1 VMT/acre	46.2 VMT/acre	–

Source: *Healthy Communities Atlas, 2012; Chen Ryan Associates, February 2015*

Notes:

“+” indicates rate for San Ysidro is higher relative to citywide rates.

“-” indicates rate for San Ysidro is lower relative to citywide rates.

Red font indicates the differences in built environment/mobility measures between San Ysidro and the city as a whole likely have negative implications for San Ysidro in terms of health outcome, while green font indicates a likely positive implication for health outcomes in San Ysidro.

One mark indicates small difference; two marks indicate a medium difference; and three marks indicate a strong difference.

Table 5.3 compares physical activity support measures for San Ysidro and the City of San Diego. As shown, San Ysidro households have slightly higher levels of access to trails relative to households across the City of San Diego, and slightly lower levels of sidewalk coverage.

Table 5.3: Comparing San Ysidro and City of San Diego Physical Activity Environments

Physical Activity Environments	San Ysidro	City of San Diego	San Ysidro – City Difference
Percent of Households within 2 kilometer (km) of a Trail	54.5%	52.4%	+
Percent of Roadways with Sidewalks	82.8%	83.5%	-
Transportation Infrastructure Support Index (Transit Service, Trail Access, Sidewalk Coverage)	0.694	0.273	++
Walkability Index (Retail, Land Use Mix, Residential Density, Intersection Density)	-0.729	0.625	---
Youth Physical Activity Support (Trail Access, Sidewalks, Elementary School Access)	0.567	0.249	++
Physical Activity Inhibitors (Traffic Density, High Volume Arterials, Vacant Parcels, Property Crime, Violent Crime)	0.144	0.001	+++

Source: *Healthy Communities Atlas, 2012; Chen Ryan Associates, February 2015*

Notes:

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“-” indicates rates for San Ysidro are lower relative to citywide rates.

Red font indicates the differences in built environment/mobility measures between San Ysidro and the city as a whole likely have negative implications for San Ysidro in terms of health outcome, while green font indicates a likely positive implication for health outcomes in San Ysidro.

One mark indicates small difference; two marks indicate a medium difference; and three marks indicate a strong difference.

The walkability index (retail Floor Area Ratio, land use mix, residential density, and intersection density) is lower for San Ysidro than for the City of San Diego as a whole, meaning it is “less” walkable. Furthermore, the physical activity inhibitors index (traffic density, arterial density, vacant parcels, property crime and violent crime) is higher in San Ysidro than for the City of San Diego as whole, meaning there are relatively more barriers to physical activity in San Ysidro. The transportation infrastructure support index (transit access, sidewalks and trails) and the youth physical activity support index (trails, sidewalks, elementary schools) is higher for San Ysidro than for the City of San Diego as a whole.

Table 5.4 compares traffic-related safety information for San Ysidro and the City of San Diego. As shown, San Ysidro has noticeably more pedestrian collisions per year per capita than the City of San Diego as a whole, and just slightly fewer cyclist collisions. For the safety indices – the pedestrian safety risk index (pedestrian collisions, traffic density, arterial density, and sidewalks), the cyclist safety risk index (cyclist collisions, traffic density and arterial density), and for the youth safety risk index – San Ysidro shows higher safety risk levels relative to the City of San Diego as a whole,

meaning environments are potentially more dangerous for pedestrians, cyclists and youth, who would typically travel more frequently by foot or by bike since they may not have access to a car.

Table 5.4: Comparing San Ysidro and City of San Diego Traffic-Related Safety

Safety	San Ysidro	City of San Diego	San Ysidro – City Difference
Average Annual Pedestrian Collisions Rate per 1,000 Daytime Population	0.801	0.499	++
Average Annual Cyclist Collisions per 1,000 Daytime Population	0.337	0.362	–
Pedestrian Safety (Pedestrian Collisions, Traffic Density, High Volume Arterials, Sidewalks)	0.191	0.030	+++
Cyclist Safety (Cyclist Collisions, Traffic Density, Arterial Density)	0.033	-0.034	+++
Youth Traffic Safety (Access to Parks, Schools, Daycare, Cyclist Collision, Pedestrian Collisions, Traffic Density, Arterial Density, Sidewalks)	0.149	-0.001	+++

Source: *Healthy Communities Atlas, 2012; Chen Ryan Associates, February 2015*

Notes:

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“-” indicates rates for San Ysidro are lower relative to citywide rates.

Red font indicates the differences in built environment/mobility measures between San Ysidro and the city as a whole likely have negative implications for San Ysidro in terms of health outcome, while green font indicates a likely positive implication for health outcomes in San Ysidro.

One mark indicates small difference; two marks indicate a medium difference; and three marks indicate a strong difference.

Table 5.5 compares the level of access to social support amenities for San Ysidro and for the city as a whole. As shown, San Ysidro has higher numbers of housing units located within one km of parks, libraries, elementary schools, health care facilities, and healthy food stores than housing units across the City of San Diego. This is not the case, however, for day care facilities.

Table 5.5: Comparing San Ysidro and City of San Diego Access to Social Support Amenities

Access to Amenities	San Ysidro	City of San Diego	San Ysidro – City Difference
Park Access	80.9%	66.9%	+
Library Access	25.8%	19.9%	+
Elementary Schools Access	55.8%	50.1%	+
Health Care Facility Access	31.6%	16.4%	++
Day Care Facility Access	48.9%	64.1%	-
Healthy Food Source Access	74.2%	67.4%	+
All Amenities Access (Average number of amenities accessible to each block group)	6.2	4.2	+

Source: *Healthy Communities Atlas, 2012; Chen Ryan Associates, February 2015*

Table 5.6 compares food environment information for San Ysidro and the City of San Diego. As shown, San Ysidro has a higher density of fast food establishments than the City.

Table 5.6: Comparing San Ysidro and City of San Diego Food Environment

Food Environment	San Ysidro	City of San Diego	San Ysidro – City Difference
Fast Food Density per 100 acres	2.4	1.6	++
Healthy Food Density per 100 acres	0.6	0.8	-

Source: *Healthy Communities Atlas, 2012; Chen Ryan Associates, February 2015*

Notes:

“+” indicates rates for San Ysidro are higher relative to citywide rates.

“-” indicates rates for San Ysidro are lower relative to citywide rates.

Red font indicates the differences in built environment/mobility measures between San Ysidro and the city as a whole likely have negative implications for San Ysidro in terms of health outcome, while green font indicates a likely positive implication for health outcomes in San Ysidro.

One mark indicates a small difference; two marks indicate a medium difference; and three marks indicate a strong difference.

Table 5.7 compares crime rates for San Ysidro and the City of San Diego as a whole. San Ysidro has a noticeably higher violent and property crime rates relative to the City.

Table 5.7: Comparing San Ysidro and City of San Diego Crime Rates

Crime Rates	San Ysidro	City of San Diego	San Ysidro – City Difference
Average Annual Violent Crime per 1,000 population	12.3	7.5	++
Average Annual Property Crime per 1,000 population	7.9	5.6	++

Source: *Healthy Communities Atlas, 2012*; *Chen Ryan Associates, January 2015*

Notes:

"+" indicates rates for San Ysidro are higher relative to citywide rates.

"-" indicates rates for San Ysidro are lower relative to citywide rates.

Red font indicates the differences in built environment/mobility measures between San Ysidro and the city as a whole likely have negative implications for San Ysidro in terms of health outcome, while green font indicates a likely positive implication for health outcomes in San Ysidro.

One mark indicates a small difference; two marks indicate a medium difference; and three marks indicate a strong difference.

Of the 24 total *Healthy Communities Atlas* mobility and built environment measures presented for San Ysidro and for the City of San Diego, twelve of these measures show San Ysidro as faring better than the City of San Diego as a whole. San Ysidro is doing well in terms of the access to social support measures, such as parks, libraries, healthcare facilities, and healthy food. San Ysidro is also doing relatively well in terms of transportation infrastructure support (transit service, trail access) and youth physical activity support (trail access, sidewalk coverage and access to schools).

Half of the mobility and built environment measures indicate that San Ysidro is faring worse than the City of San Diego as a whole. In particular, San Ysidro is doing relatively worse in terms of households living in close proximity to transportation-related air pollution sources, sidewalk coverage, walkability, barriers to physical activity, pedestrian collisions, pedestrian safety, cyclist safety, youth traffic safety, access to day care, concentration of fast food, and crime.

Understanding the mobility/built environment opportunities and strengths of San Ysidro provides an important framework for shaping pertinent recommendations.

5.2 Comparing the South Bay SRA and the Remainder of the San Diego Region (Community Health Statistics)

This section presents a comparison of health outcome trends for the South Bay SRA and the County as a whole. The geography for this analysis is different than for the mobility and built environment analysis because the SRA represents the smallest geography at which health outcome data is available. For the mobility and built environment assessments, data was available at a smaller geography, the census block group. This allowed for a direct comparison of the community of San Ysidro to the city of San Diego. Unfortunately, this was not the case for the comparative analysis of health.

Table 5.8 presents a comparison of health outcome measures for the South Bay SRA and the San Diego region. As shown in Table 5.8, populations in the South Bay SRA experience higher rates

of seven key health outcomes relative to the region, including pedestrian injury, motor vehicle injury, asthma, diabetes, Chronic Obstructive Pulmonary Disease (COPD), Coronary Heart Disease (CHD), and stroke. An interesting pattern can be observed in the health outcome comparison, which is that the South Bay SRA appears to be more susceptible in relation to direct and long-term effects of mobility/built environment factors on health, and less susceptible in relation to community-level effects such as substance abuse, psychological disorder, and crime injury.

Table 5.8: Comparing South Bay SRA to Countywide 2010 Health Outcome Rates (Emergency Room Discharges per 1,000 Population)

Potential Environmental Influence on Health Outcome	Health Outcome	South Bay SRA	San Diego Region	Percent Difference (South Bay relative to Region)
Direct Effect	Pedestrian Injury	0.35	0.29	+13.7%
	Cyclist Injury	0.23	0.29	-15.5%
	Motor Vehicle Injury	5.18	5.17	+0.1%
	Asthma	4.10	3.09	+17.8%
Long-Term Effect	Diabetes	2.05	1.36	+25.1%
	COPD	3.71	2.70	+20.1%
	CHD	0.32	0.29	+6.2%
	Stroke	0.49	0.46	+3.9%
	Cancer	1.29	1.64	-17.0%
Community-Level Effect	Psychological Disorder	0.71	1.06	-28.4%
	Substance Abuse	0.47	0.66	-23.1%
	Crime Injury	0.19	0.27	-24.1%

Source: County of San Diego Health and Human Services Agency Community Health Statistics, 2010;

Chen Ryan Associates; February 2015

Some of the starkest differences in health outcomes between the South Bay SRA and the region as a whole include differences in rates of diabetes, COPD, asthma, cancer, and the community-level effects. In the South Bay SRA, about 2.05 people per 1,000 population had a diabetes-related emergency room discharge, while only 1.36 persons per 1,000 population had this experience regionwide. The South Bay SRA had a rate of about 3.71 persons per 1,000 population for COPD, while the regionwide rate is about 2.70 per 1,000 population. The rates associated with asthma are about 18 percent greater in the South Bay SRA relative to the region as a whole.

San Ysidro is faring better than the rest of the San Diego region in terms of the community-level effects (psychological disorder, substance abuse rates, injury from crime), cyclist injury, and cancer.

Understanding the particular health vulnerabilities of South Bay residents provides an important framework for making mobility/built environment recommendations that will improve the long-term health outlook in this community. The comparison between the South Bay SRA and the greater San Diego region shows that there are some clear disparities in certain health outcomes, but also some distinct advantages in other health outcomes. This understanding will serve to focus recommendations in future tasks.

5.3 Partial Correlations Analysis Results

Section 5.1 presented mobility/built environment trends, while Section 5.2 presented health outcome trends. A critical next step in improving the state of practice related to health and planning is to understand the degree to which these two sets of factors are related. The partial correlations analysis allows for a simple assessment of the strength of the linear relationship between two variables while controlling for the effects of other factors, in this case, age and income.

Tables 5.9 through 5.12 present results from the mobility/built environment and health outcomes partial correlations analysis, controlling for the effects of age and income.

For ease of interpretation, rather than presenting the actual correlation coefficient, the magnitude of the association between mobility/built environment variables and health outcomes is categorized as no effect, small, medium, or large effect, as follows:

No effect:	Correlation Coefficient = 0.0 to 0.09	No association found between mobility/built environment variables and health outcomes
Small effect:	Correlation Coefficient = 0.10 to 0.29	Small association between mobility/built environment variables and health outcomes
Medium effect:	Correlation Coefficient = 0.30 to 0.49	Medium association between mobility/built environment variables and health outcomes
Large effect:	Correlation Coefficient > 0.50	Large association between mobility/built environment variables and health outcomes

Results from the statistical analysis in SPSS, a predictive analytics software program, are presented in **Appendix E**. Because of the small sample size, the partial correlations analysis results are not necessarily generalizable to other regions, but are most definitely informative of patterns in the San Diego region.

Table 5.9 presents relationships between transportation system factors (air quality, high volume arterial density, and VMT) and health outcomes. Several interesting results can be identified:

1. Of the three transportation system factors examined (air quality, arterial density, and VMT), the air quality measure has the most consistent association with health outcomes. In particular, the analysis shows small positive effects of living in close proximity to air pollution source on pedestrian injury rates, cyclist injury rates, asthma, coronary heart disease, stroke, psychological disorder, and substance abuse. In other words, increases in populations living in close proximity to an air pollution source is shown to be associated with increased levels of pedestrian injury rates, cyclist injury rates, asthma, CHD, stroke, psychological disorder, and substance abuse.
2. Of all health outcomes assessed, cyclist injury rates and stroke appear to be most strongly associated with the transportation system factors analyzed (air pollution, arterial density, and VMT). These two health outcomes show small to large positive effects from each of three transportation system measures.

Table 5.9: Partial Correlations Analysis Results: Categorizing *Vehicle Transportation System* Potential Effects on Health Outcomes

Potential Environmental Association with Health Outcome	Health Outcome	Transportation System Factors		
		Percent of HH within 500 or Transportation-Related Air Pollution Source	High Volume Arterials (centerline per acre)	Traffic Density (VMT per acre)
Potential Direct Effects	Pedestrian Injury	Small positive effect	Small negative effect	No effect
	Cyclist Injury	Small positive effect	Medium positive effect	Large positive effect
	Motor Vehicle Injury	Small negative effect	Medium negative effect	Large negative effect
	Asthma	Small positive effect	Small negative effect	Small negative effect
Potential Long-Term Effects	Diabetes	No effect	Medium negative effect	Medium negative effect
	COPD	No effect	Small negative effect	No effect
	CHD	Small positive effect	No effect	No effect
	Stroke	Small positive effect	Small positive effect	Small positive effect
	Cancer	No effect	No effect	No effect
Potential Community-Level Effects	<i>Psychological Disorder</i>	<i>Small positive effect</i>	<i>Small negative effect</i>	<i>Small negative effect</i>
	<i>Substance Abuse</i>	<i>Small positive effect</i>	<i>No effect</i>	<i>Small positive effect</i>
	<i>Crime Injury</i>	<i>Medium negative effect</i>	<i>Large negative effect</i>	<i>Large negative effect</i>

Source: County of San Diego Health and Human Services Agency Community Health Statistics, 2010; Chen Ryan Associates; February 2015

Note: Shading indicates that mobility/built environment variable has the expected association with the respective health outcome based on the literature review presented in Chapter 3 of this report.

Table 5.10 presents relationships between physical activity support factors (trail access, sidewalk coverage, transportation support, walkability, youth physical activity support, and physical activity inhibitors) and health outcomes. Several interesting patterns emerge from this analysis, as follows:

1. Of the six physical activity support factors, trail access and sidewalk coverage show the most consistent expected association with health outcomes, including small to large negative effects on all health outcomes except CHD, cancer, and pedestrian injury (trail access only).
2. Of all health outcomes assessed, motor vehicle injury rates and two of the community-level health outcomes – substance abuse and injury from crime – showed consistent associations with the physical activity support measures.

Table 5.10: Partial Correlations Analysis Results: Categorizing *Physical Activity Support* Potential Effects on Health Outcomes

Association with Health Outcome	Health Outcome	Physical Activity Support					
		Trail Access	Sidewalk	Transportation Support	Walkability	Youth Physical Activity Support	Physical Activity Inhibitors
Potential Direct Effects	Pedestrian Injury	No effect	Small negative effect	No effect	Small positive effect	No effect	No effect
	Cyclist Injury	Large positive effect	Large positive effect	Large positive effect	Large positive effect	No effect	No effect
	Motor Vehicle Injury	Medium negative effect	Large negative effect	Medium negative effect	Medium negative effect	Medium negative effect	Small negative effect
	Asthma	Medium positive effect	Small negative effect	No effect	No effect	No effect	No effect
Potential Long-Term Effects	Diabetes	Small negative effect	Small negative effect	No effect	No effect	Small negative effect	Small negative effect
	COPD	Small negative effect	Small negative effect	No effect	No effect	No effect	Small negative effect
	CHD	No effect	No effect	No effect	No effect	No effect	Small positive effect
	Stroke	Small positive effect	Small positive effect	Small positive effect	Small positive effect	Small positive effect	Medium positive effect
	Cancer	No effect	Small negative effect	No effect	No effect	Small negative effect	Small negative effect
Potential Community-Level Effects	Psychological Disorder	Small negative effect	Small negative effect	Small negative effect	Small positive effect	No effect	No effect
	Substance Abuse	Medium negative effect	Medium negative effect	Large negative effect	Small negative effect	Medium negative effect	Large negative effect
	Crime Injury	Medium negative effect	Large negative effect	Large negative effect	Medium negative effect	Large negative effect	Small negative effect

Source: County of San Diego Health and Human Services Agency Community Health Statistics, 2010; Chen Ryan Associates; February 2015

Note: Shading indicates that mobility/built environment variable has the expected association with the respective health outcome based on the literature review presented in Chapter 3 of this report.

Table 5.11 presents relationships between traffic-related safety risk factors (pedestrian safety, bicycle safety, and youth safety) and health outcomes. Several interesting patterns emerge from this analysis, as follows:

1. Of the three safety composite measures, pedestrian safety and youth safety show the most consistent expected associations with health outcomes, including small negative effects on pedestrian injury, cyclist injury, COPD, CHD, stroke, cancer, psychological disorder, and substance abuse.
2. Of all health outcomes assessed, cyclist injury rates, CHD, and stroke showed the most consistent associations with the safety composite measures.

Table 5.12 presents relationships between access to social support (to parks, libraries, elementary schools, health care, day care, healthy food, fast food, and all amenities) and health outcomes. Several findings can be summarized from this analysis, as follows:

1. Three of the health outcome measures appear to be fairly consistently associated with levels of access to social support amenities, including motor vehicle injury, substance abuse and injury from crime. For each of these health outcomes, the majority of access measures show small negative associations with those three health outcomes.
2. Of all the mobility/built environment factors examined in this BHETS, the access to social support measures show the least consistency in association with health outcomes.

Table 5.11: Partial Correlations Analysis Results: Categorizing *Traffic-related Safety* Potential Effects on Health Outcomes

Potential Environmental Influence on Health Outcome	Health Outcome	Traffic-related Safety		
		Pedestrian Safety	Cyclist Safety	Youth Safety
Potential Direct Effects	Pedestrian Injury	Small negative effects	No effects	Small negative effects
	Cyclist Injury	Small negative effects	Medium negative effect	Small negative effects
	Motor Vehicle Injury	No effects	Small positive effects	Small negative effects
	Asthma	No effects	Small positive effects	No effects
Potential Long-Term Effects	Diabetes	Small positive effects	Medium positive effect	No effects
	COPD	Small negative effects	Small positive effect	Small negative effects
	CHD	Small negative effects	Small negative effects	Small negative effects
	Stroke	Small negative effects	Small negative effects	Small negative effects
	Cancer	Small negative effects	No effects	Small negative effects
Potential Community-Level Effects	Psychological Disorder	Small negative effects	No effects	Small negative effects
	Substance Abuse	Small negative effects	No effects	No effect
	Crime Injury	Medium positive effect	Large positive effect	No effect

Source: County of San Diego Health and Human Services Agency Community Health Statistics, 2010; Chen Ryan Associates; February 2015

Note: Shading indicates that mobility/built environment variable has the expected association with the respective health outcome based on the literature review presented in Chapter 3 of this report.

Table 5.12: Partial Correlations Analysis Results: Categorizing Access to Social Support Amenities
Potential Effects on Health Outcomes

Potential Environmental Influence on Health Outcome	Health Outcome	Access to Social Support Amenities							
		Parks	Libraries	Elementary Schools	Health Care	Day Care	Healthy Food	Fast Food	All Amenities
Potential Direct Effects	Pedestrian Injury	No effects	Small positive effects	Small positive effects	Small positive effects	Small positive effects	Small positive effects	Small positive effects	Small positive effects
	Cyclist Injury	Large positive effects	Large positive effects	Large positive effects	Large positive effects	Large positive effects	Large positive effects	Large positive effects	Large positive effects
	Motor Vehicle Injury	Medium negative effects	Small negative effects	Small negative effects	No effects	Medium negative effects	Small negative effects	Small negative effects	Medium negative effects
	Asthma	Small positive effects	Small positive effects	Medium positive effects	Medium positive effects	Small positive effects	No effects	No effects	Small positive effects
Potential Long-Term Effects	Diabetes	Small negative effects	No effect	Small positive effects	Small positive effects	No effects	No effects	No effects	No effects
	COPD	No effects	No effect	Small positive effects	Medium positive effects	Small positive effects	No effects	No effects	Small positive effects
	CHD	Small positive effects	Small positive effects	Small positive effects	Small positive effects	Small positive effects	No effects	No effects	No effects
	Stroke	Small positive effects	Small positive effects	Medium positive effects	Medium positive effects	Medium positive effects	Small positive effects	Small positive effects	Small positive effects
	Cancer	No effects	No effect	Small positive effects	Small positive effects	Small positive effects	No effects	No effects	Small positive effects

Table 5.12: Partial Correlations Analysis Results: Categorizing *Access to Social Support Amenities*
Potential Effects on Health Outcomes (continued)

Potential Environmental Influence on Health Outcome	Health Outcome	Access to Social Support Amenities							
		Parks	Libraries	Elementary Schools	Health Care	Day Care	Healthy Food	Fast Food	All Amenities
Potential Community-Level Effects	Psychological Disorder	No effects	Small positive effects	Small positive effects	No effects	Medium positive effects	Small positive effects	Small positive effects	Small positive effects
	Substance Abuse	Medium negative effects	Small negative effects	Medium positive effects	Small negative effects	Medium positive effects	Medium negative effects	Small positive effects	Medium negative effects
	Crime Injury	Medium negative effects	Small negative effects	Medium negative effects	Small negative effects	Large negative effects	Medium negative effects	Medium negative effects	Large negative effects

Source: County of San Diego Health and Human Services Agency Community Health Statistics, 2010; Chen Ryan Associates; February 2015

Note: Shading indicates that mobility/built environment variable has the expected association with the respective health outcome based on the literature review presented in Chapter 3 of this report.

5.4 Partial Correlations Analysis Key Findings

Community members in the South Bay SRA and San Ysidro appear to experience several health outcomes at relatively higher rates than residents in the region as a whole. The analyses presented in this chapter allow us to draw connections between these health outcomes and several mobility/built environment factors.

It is important to recognize that this analysis does not establish a causal linkage between mobility/built environment factors and health outcomes, but it does allow for an understanding of patterns in the two types of phenomena in the South Bay. For example, this analysis does not show that lack of sidewalk causes diabetes, only that these two measures vary in concert with one another fairly consistently across SRAs in the San Diego region. In other words, as the presence of sidewalk increases in a community, the incidence of diabetes decreases; we are showing associations between measures rather than proving one phenomenon causes another.

Tables 5.13 through 5.15 rank the mobility and built environment factors into three tiers by total number of health outcomes having an association with each respective mobility/built environment measure. Mobility/built environment measures were only considered if the nature of the relationship with health was consistent with that identified in the literature review presented in Chapter 3.

Table 5.13, for example, presents the mobility/built environment variables found to have the greatest number of expected associations with health outcomes as identified through the partial correlations analysis and literature review. Factors were categorized as Tier-1 if they were found to have expected associations with more than six health outcomes. The four factors represented in Tier-1 include the percent of households within 500-feet of transportation-related air pollution source, sidewalks, pedestrian safety, and youth safety. Each of these mobility/built environment measures had expected associations with between seven and eight of the health outcomes analyzed in this BHETS.

Table 5.14 summarizes the factors ranks as Tier-2 mobility/built environment measures. These factors were found to have an expected association with four to six health outcomes in the partial correlations analysis. These relationships were also consistent with findings in the literature review. Physical activity support was the most common mobility/built environment category in Tier-2. In particular, trail access, transportation support, and youth physical activity support all had expected associations with four to six of the health outcomes. Access to parks was also associated with four of the health outcomes analyzed in BHETS.

Table 5.15 displays the Tier-3 of mobility/built environment factors, including factors that had associations with less than four health outcomes. Mobility/built environment factors falling within the “access to social support amenities” category had the most frequent expected association with health outcomes was access to social support amenities, representing seven of the twelve factors in Tier-3.

The relationships recognized in this chapter provide an understanding of health outcomes and mobility/built environment factors particularly relevant to San Ysidro and the region as a whole. Evidence supports that the Tier-1 and Tier-2 factors play an important role in community health and will serve as a strong focus of the recommendations development.

Table 5.13: Tier-1 Mobility/Built Environment Factors

Mobility/Built Environment Factor	Category of Mobility/Built Environment Factor	Associated Health Outcomes
Percent of HH within 500' of Transportation-Related Air Pollution Source	Transportation System Factors	<ul style="list-style-type: none"> • Pedestrian Injury • Cyclist Injury • Asthma • CHD • Stroke • Psychological Disorder • Substance Abuse
Sidewalks	Physical Activity Support	<ul style="list-style-type: none"> • Pedestrian Injury • Motor Vehicle Injury • Diabetes • COPD • Psychological Disorder • Substance Abuse • Crime Injury
Pedestrian Safety	Traffic-related Safety	<ul style="list-style-type: none"> • Pedestrian Injury • Cyclist Injury • Asthma • CHD • Stroke • Psychological Disorder • Substance Abuse
Youth Safety	Traffic-related Safety	<ul style="list-style-type: none"> • Pedestrian Injury • Cyclist Injury • Asthma • CHD • Stroke • Psychological Disorder • Substance Abuse

Source: Chen Ryan Associates, February 2015

Table 5.14: Tier-2 Mobility/Built Environment Factors

Mobility/Built Environment Factor	Category of Mobility/Built Environment Factor	Associated Health Outcomes
Trail Access	Physical Activity Support	<ul style="list-style-type: none"> • Motor Vehicle Injury • Diabetes • COPD • Psychological Disorder • Substance Abuse • Crime Injury
Transportation Support	Physical Activity Support	<ul style="list-style-type: none"> • Motor Vehicle Injury • Psychological Disorder • Substance Abuse • Crime Injury
Youth Physical Activity Support	Physical Activity Support	<ul style="list-style-type: none"> • Motor Vehicle Injury • Diabetes • Substance Abuse • Crime Injury
Parks	Access to Social Support Amenities	<ul style="list-style-type: none"> • Motor Vehicle Injury • Diabetes • Substance Abuse • Crime Injury

Source: Chen Ryan Associates, February 2015

Table 5.15: Tier-3 Mobility/Built Environment Factors

Mobility/Built Environment Factor	Category of Mobility/Built Environment Factor	Associated Health Outcomes
High Volume Arterials (centerline per acre)	Transportation System Factors	<ul style="list-style-type: none"> • Cyclist Injury • Stroke
Traffic Density (vehicle miles traveled per acre)	Transportation System Factors	<ul style="list-style-type: none"> • Cyclist Injury • Stroke • Substance Abuse
Walkability	Physical Activity Support	<ul style="list-style-type: none"> • Motor Vehicle Injury • Substance Abuse • Crime Injury
Physical Activity Inhibitors	Physical Activity Support	<ul style="list-style-type: none"> • CHD • Stroke
Cyclist Safety	Traffic-related Safety	<ul style="list-style-type: none"> • Cyclist Injury • CHD • Stroke
Libraries	Access to Social Support Amenities	<ul style="list-style-type: none"> • Motor Vehicle Injury • Substance Abuse • Crime Injury
Elementary Schools	Access to Social Support Amenities	<ul style="list-style-type: none"> • Motor Vehicle Injury • Crime Injury
Health Care	Access to Social Support Amenities	<ul style="list-style-type: none"> • Substance Abuse • Crime Injury
Day Care	Access to Social Support Amenities	<ul style="list-style-type: none"> • Motor Vehicle Injury • Crime Injury
Healthy Food	Access to Social Support Amenities	<ul style="list-style-type: none"> • Motor Vehicle Injury • Substance Abuse • Crime Injury
Fast Food	Access to Social Support Amenities	<ul style="list-style-type: none"> • Psychological Disorder • Substance Abuse
All Amenities	Access to Social Support Amenities	<ul style="list-style-type: none"> • Motor Vehicle Injury • Substance Abuse • Crime Injury

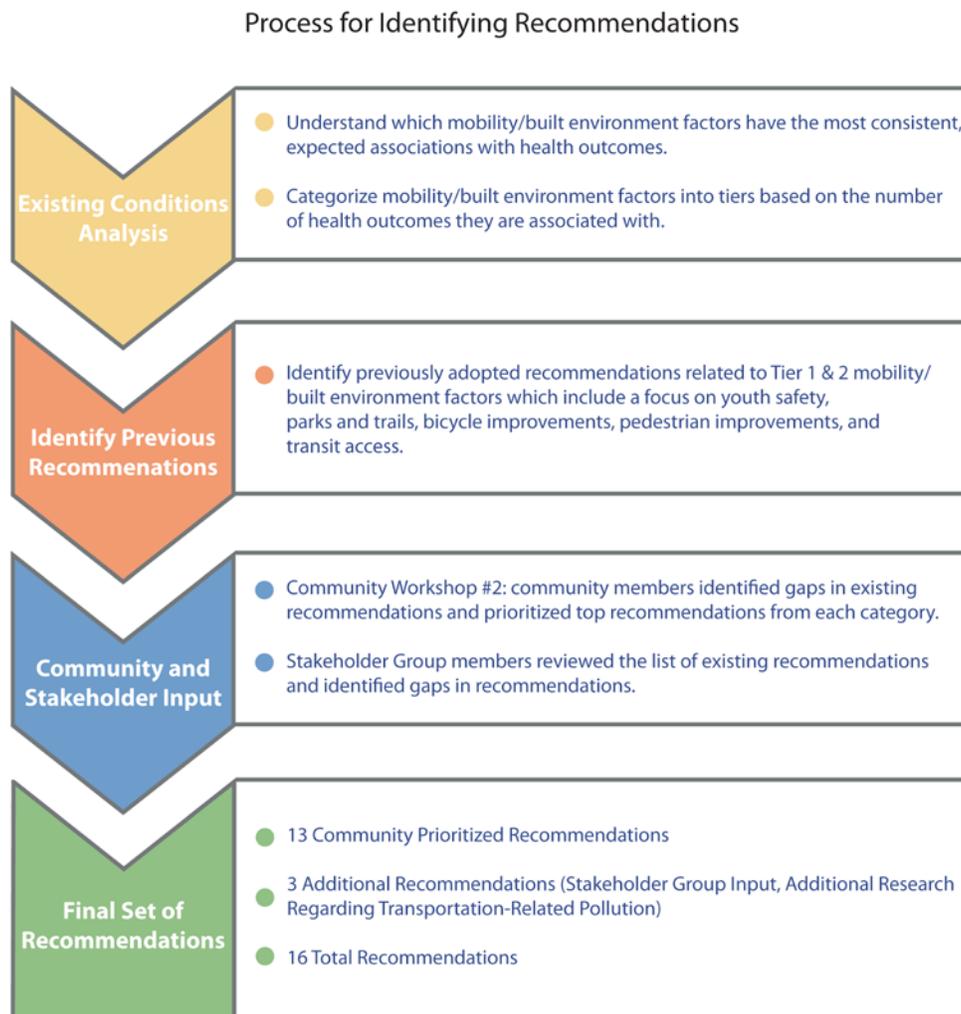
Source: Chen Ryan Associates, February 2015

6.0 Mobility/Built Environment Recommendations and Potential Health Effects

This chapter uses results from the partial correlations analysis as well as community input to identify a set of planning recommendations with the potential to bring about improved community health. Recommendations include specific improvement projects, as well as plans, policies and programs, such as wayfinding or HVAC (heating, ventilation and air conditioning) policies. The following sections describe the process used to identify, review, and finalize key recommendations. The chapter also presents estimates of the potential health effects of implementing these recommendations.

6.1 Identification of Key Recommendations

Three processes were used to identify key recommendations, including qualitative and quantitative assessments carried out as part of the existing conditions analysis; a review of previous plans, studies and research; and community and stakeholder input. The graphic below illustrates the three inputs and how they fit into the recommendations development process.



6.1.1 Existing Conditions Report

The existing conditions analyses first identified mobility/built environment issues from previous studies and plans, community workshops, and a literature review of mobility/built environment and health research. The report then gathered existing data measuring mobility/built environment and health outcomes for the San Diego region and for the community of San Ysidro. Comparisons were drawn between the community of San Ysidro and the City of San Diego as a whole to understand how San Ysidro is faring in terms of mobility/built environment factors and health outcomes compared to the City of San Diego.

Using regionwide data, partial correlations were performed to understand the significance, direction and strength of the associations between the mobility/built environment factors and health outcomes, adjusting for the effects of age and income. These analyses facilitated an understanding of which mobility/built environment factors have the most consistent, expected association with health outcomes. Following the partial correlations analysis, mobility/built environment factors were separated into three tiers based on the total number of health outcomes having an association with each respective factor.

6.1.2 Previous Plans and Studies

In addition to identifying mobility/built environment and health issues within the community of San Ysidro, a key goal of the Border Health Equity Transportation Study (BHETS) is to develop a set of recommendations that can potentially mitigate the identified issues. Because the project scope of work did not include primary data collection, previously published literature, planning documents and studies were relied upon to inform the project team of existing issues and recommendations.

After identifying health issues and categorizing contributing mobility/built environment factors into tiers based on the number of associated health outcomes, the previous studies and plans were referenced to identify recommendations consistent with the first two tiers of mobility/built environment factors. The recommendations were organized into one of the following five categories due to significant overlapping among the different mobility and built environment factors: 1) youth safety (improvements related to access to and around schools); 2) parks and trails; 3) bicycle improvements; 4) pedestrian-related improvements; and 5) transit access. These same categories of mobility/built environment factors were developed and used for the second community workshop in March 2014.

Table 6.1 displays the five categories of recommendations and cites the relevant plan or study where it was obtained. A complete listing and description of each of the recommendations presented at the second community workshop is provided in **Appendix F**, along with a summary of the input received from community members.

Table 6.1: Categorizing Recommendations for Mobility/Built Environment in San Ysidro

Mobility/Built Environment Category	Source of Recommendations
Youth Safety	San Ysidro Walks Wheels to School – SRTS Final Plan (2012) – SANDAG; County Health and Human Services Agency City of San Diego Pedestrian Master Plan Phase 4 (2011) – City of San Diego San Ysidro Mobility Strategy (2009) – City of San Diego
Parks & Trails	Draft San Ysidro Community Plan Update: Proposed Land Uses (2012) – City of San Diego Draft San Ysidro Community Plan Update: Existing Parks and Community Suggested Parks and Urban Design Ideas (2011) – City of San Diego San Ysidro Mobility Strategy (2009) – City of San Diego San Ysidro Community Plan (1990) – City of San Diego Salsita Community Mapping Project (unknown publish date) – San Ysidro Health Center
Bicycle Improvements	City of San Diego Bicycle Master Plan Update (2013) – City of San Diego SANDAG Regional Bike Early Action Program (2013) – SANDAG San Ysidro Mobility Strategy (2009) – City of San Diego San Ysidro Community Plan (1990) – City of San Diego
Pedestrian Improvements	City of San Diego Pedestrian Master Plan Phase 4 (2011) – City of San Diego San Ysidro Mobility Strategy (2009) – City of San Diego Improving Walkability in San Ysidro (2005) – City of San Diego; Casa Familiar
Transit Access	City of San Diego Pedestrian Master Plan Phase 4 (2011) – City of San Diego San Ysidro Mobility Strategy (2009) – City of San Diego San Ysidro Land Port of Entry Expansion Mobility Study (2009) – US General Services Administration Improving Walkability in San Ysidro (2005) – City of San Diego; Casa Familiar San Ysidro Community Plan (1990) – City of San Diego

Source: Chen Ryan Associates, February 2015

6.1.3 Community Workshop

The second of three community workshops was conducted to inform the public of the BHETS and to receive input from community members on the breadth and importance of mobility/built environment recommendations. The workshop reviewed the process and findings of the existing conditions report, including specifically the mobility/built environment effects categorized as Tier 1 and Tier 2, and existing project recommendations that have been proposed in San Ysidro-related planning documents. The workshop was conducted in both Spanish and English.

Following a staff presentation that reviewed the BHETS status and goals, existing conditions report findings, and existing proposed recommendations, workshop participants broke into small groups for an exercise with the following goals: to identify gaps in mobility/built environment recommendations, to prioritize recommendations, and to learn participants' views on how recommendation implementation might affect quality of life for the community.

Recommendations were divided into five categories, as described in the previous section, and in accordance with the Tier 1 and Tier 2 mobility/built environment factors: Youth Safety, Trails and Parks, Bicycle Improvements, Pedestrian Improvements, and Transit Access. The matrix distributed to workshop participants, displaying the five categories of recommendations, is provided in Appendix F.

Workshop tables were set up to facilitate each mobility/built environment category in both Spanish and English, creating a total of ten workshop exercise tables. Attendees were asked to select one category in the language of their choice to participate in the workshop exercise. All five categories provided in Spanish received participants, as well as one English language table focused on Transit Access. Maps and other visual aids were provided to illustrate the locations and potential implementation results of the recommendations.

Participants were asked to evaluate and prioritize proposed recommendations in their community, as well as to identify gaps in the recommendations. Facilitators led participants through each proposed recommendation to solicit feedback. After reviewing all proposed recommendations, participants then prioritized the recommendations by placing three dot stickers beside their preferred projects. Participants were permitted to place a sticker beside three separate recommendations, or place all three stickers beside a single recommendation. Additionally, participants were provided space to propose new recommendations, which they could also vote for during the prioritization exercise. Lastly, participants were asked to discuss how the implementation of their top ranking recommendations might influence daily life in San Ysidro.

Following the group exercise, each facilitator presented the top three recommendations identified at their table, and how the group thought their daily lives might be impacted by these recommendations if they were implemented. The questions used to facilitate group discussions are provided in Appendix F, along with a comprehensive workshop summary, further detailing the workshop structure, exercises, and a summary of the community input collected.

The community prioritized recommendations and identified gaps are described in the following section.

6.2 Review of Recommendations

This section outlines the project team's approach to finalizing key mobility/built environment recommendations for improved health in the community of San Ysidro. The project team carried out a three-pronged approach to refining and finalizing recommendations for the BHETS. This approach consisted of the following steps, each of which is discussed in greater detail in the following sections: a project team and stakeholder group member review, City of San Diego and Caltrans input, and the identification of potential mitigation techniques to reduce exposure to transportation-related pollution.

6.2.1 Project Team Review

The project team identified one significant gap in existing recommendations. This gap is related to the Tier-1 mobility/built environment factor “percent of households within 500 feet of transportation-related air pollution sources.” The BHETS process did not result in identifying any existing recommendations specifically focused on addressing the effects of living or working near major high-emissions transportation infrastructure. Given the high ranking of this issue, through the quantitative analysis and the community input, the project team noted this topic as requiring additional research to develop enhanced strategies aimed at reducing the impact of transportation-related emissions on San Ysidro community members. The results of this additional research are provided in Section 6.2.3.

6.2.2 City of San Diego and Caltrans Input

Staff from the City of San Diego’s Planning Department reviewed the community prioritized list of recommendations and provided initial input to the project team. One suggestion included forming two sets of collective recommendations that work towards similar goals. The project team agreed with that approach, especially considering the amount of overlap that exists between recommendations.

Additional comments from Caltrans and City staff were related to gaps in the existing recommendations including the following:

- Improve health outcome data collection to better understand health impacts
- Incorporate technologies to better manage congestion and support improved air quality
- Use of air filtration systems to improve air quality
- Pursue subsidies to retrofit existing structures with air filtration technologies
- Pursue subsidies to retrofit existing structures with energy efficiency technologies
- Improve access to healthy foods

City of San Diego and Caltrans staff also highlighted the exclusion of the proposed San Ysidro Intermodal Transportation Center (ITC) from the list of currently adopted recommendations that would improve transit access. A new and improved ITC was studied to improve circulation for all travel modes and transit efficiencies and to better integrate land uses. A 2014 SANDAG study analyzed the service needs and assessed the cost for a future transit center. Through this process and outreach it was determined there will be a growing demand for a larger transit facility at the Port of Entry (POE). Components to improve mobility at the San Ysidro POE include:

- Expanded Trolley platforms
- Expanded bus service for MTS/Intercity Bus Center to meet growing need
- Passenger Pick-up and Drop-off (PPUDO) situated on the former MTS bus loop in front of the Station Plaza between the Trolley tracks and the POE, plus additional area for PPUDO further north along San Ysidro Boulevard
- Locate and integrate all necessary modes and uses, including public right-of-way and waiting areas to avoid mode conflicts as much as possible
 - PPUDO
 - A Bike Center

- Expanded facilities for all transit modes
- Dedicated taxi and auto pick-up and drop-off facilities
- Improved/expanded pedestrian plaza with public art and amenities
- Upgrades to San Ysidro Boulevard including landscaping and wider sidewalks
- Dedicated bike lanes on San Ysidro Boulevard leading to the Bike Center and Pedi-cab Station
- Dedicated Intercity Bus facility – ticketing, waiting, and baggage handling
- Dedicated facilities for security and operations
- Ability to incorporate a private/paid parking structure, approximately 560 spaces

A potential future ITC will improve access to transit at the Port of Entry and surrounding area.

6.2.3 Potential Mitigation Techniques to Reduce Exposure to Transportation-Related Pollution

Given the general lack of previous recommendations for San Ysidro related to exposure to transportation infrastructure emissions and air quality mitigation, the project team investigated recent research on this topic to fill this void.

Recent environmental research discusses broad planning recommendations to reduce community exposure to major infrastructure (such as freeways and rail yards), including avoiding siting new residential buildings and other sensitive land uses (such as health care facilities, child daycare centers, and playgrounds) within 500 feet of freeways and high-traffic roads,²⁴⁰ and siting truck routes away from areas that include sensitive land uses.²⁴¹ These recommendations are admittedly difficult to implement in a community such as San Ysidro that is bound by freeways and largely built out. Additional options to reduce exposure include setting standards for vehicle emissions, reducing Vehicle Miles Travelled (VMT) through land use planning and multi-modal transportation options, and use of roadside structures such as sound walls and vegetation. At times, air emissions from traffic become a concern for siting new recreational facilities, such as a trail alongside a freeway, or a neighborhood park served by a busy arterial road. In general, the health benefits of physical activity usually outweigh the risks from ambient air pollution. Guidelines from the federal Centers for Disease Control and Prevention state that, except for sensitive populations with chronic lung conditions, physical activity should be avoided entirely only under the worst air quality conditions, which rarely occur in the San Diego region. For recreational facilities, emissions from point sources such as roadways should be minimized to the extent possible, but short duration exposures typical of park or trail use do not warrant avoiding such physical activity opportunities except for sensitive populations.²⁴²

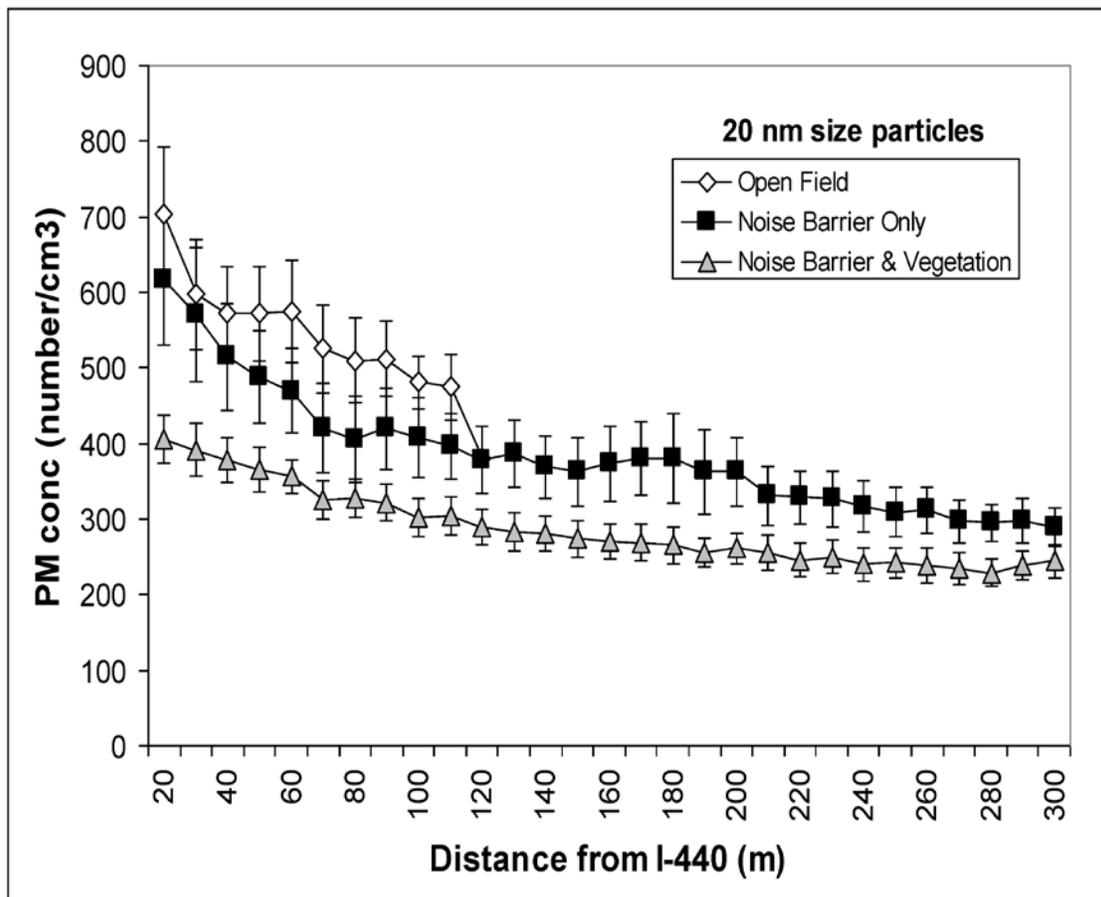
A 2012 study prepared by the California Environmental Protection Agency’s (EPA) Air Resources Board looked at previously published research on potential measures to reduce exposure to nearby traffic pollution. The study cited research on both site-related measures and methods related to building design as potential solutions to reducing community exposure.

“No single building-related measure has been identified as adequate to reduce entry of pollutants from nearby roadways to the extent expected from set-back under common conditions.”
 – California Air Resources Board, 2012

Site-related measures included the use of sound walls (roadside barriers) and vegetation located near the roadway. Sound barriers near roadways were found to reduce pollutant concentrations near the roadway; however, this led to higher concentrations of pollutants both on the roadway itself and at a distance from the roadway. Placing vegetation near roadways was found to remove some gaseous pollutants through absorption or interception, however, some of the polluting particles can be re-released by blowing winds.

Chart 6-1 displays the results of a 2008 study examining the impacts of combining noise barriers and vegetation on air quality near roadways. Sound walls and roadside barriers combined with vegetation was found to be more effective than either measure alone, showing more consistent dispersal of pollutants and to greater distances. The study cautions that while pollutant concentrations near the roadway were reduced, concentrations of pollutants both on the roadway and at a distance are shown to increase, resulting in shifting exposure to others rather than reducing it all together. Additionally, the effectiveness of these techniques was found to vary under different environmental conditions related to weather and topography.²⁴³ Other research on roadside barriers and vegetation found that roadway elevation also influences the effectiveness of these measures. Barriers and vegetation were shown to be most effective along at-grade roadways.²⁴⁴

Figure 6-1: Mobile monitoring measurements of 20 nm size particles at varying distances from the road for open terrain, behind a noise barrier, and behind a noise barrier with vegetation

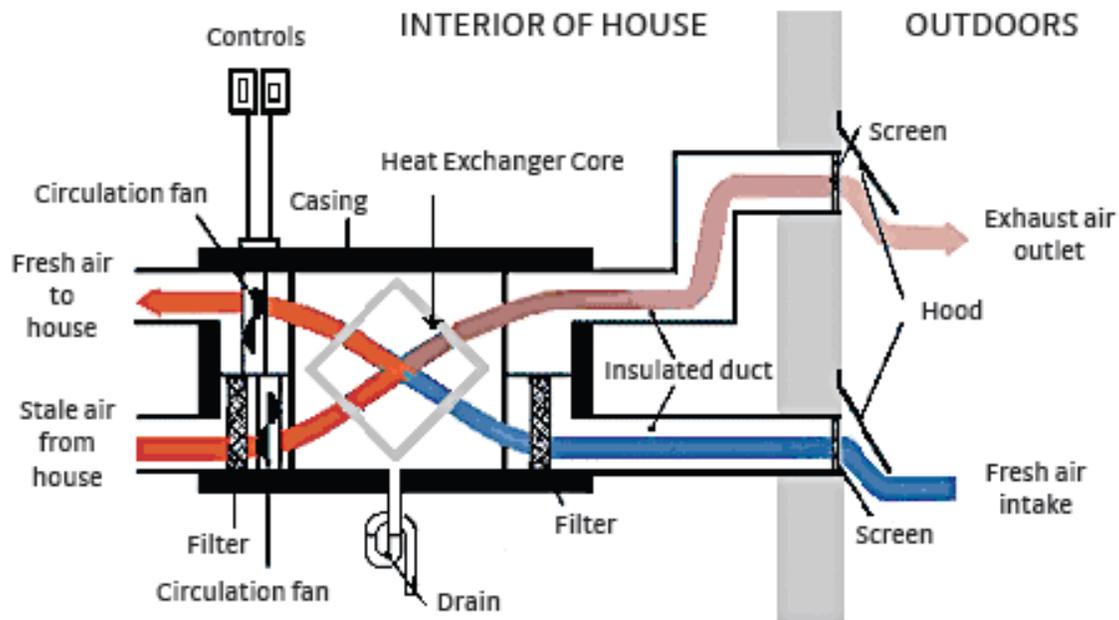


Source: Baldauf et al., 2008²⁴⁵

Building-related mitigation measures were also addressed by the 2012 California EPA Air Resources Board's study. Three building features were a key focus in this study, including the location of air intake, high efficiency filtration with mechanical ventilation, and portable air cleaning devices. The study recommended locating air intakes for mechanical ventilation systems on the sides of buildings furthest from polluting sources, such as major roadways, to limit the amount of pollutants that are absorbed through the intake.²⁴⁶ Locating air intake and exhaust is an increasingly important topic in California due to California Energy Code, Part 6, Title 24 of the California Code of Regulations requiring all new homes to use mechanical ventilation.²⁴⁷ An article entitled "Air Intake Placement – Recommendations from Years of Modeling Results" (Smith and Schuyler, 2006) examines optimal placement of outdoor air intakes to minimize the amount of contaminants entering a building. Exhaust sources including diesel and gas generators and boilers, idling diesel vehicles (loading area and/or bus stop), and mobile vehicle traffic on roadways are key concerns related to air intake. Similar to the California EPA study, Smith and Schuyler recommend using the building itself as a protection from exhaust sources for ground level air intakes. Additionally, placing ground level intakes between two closely situated buildings should be avoided to reduce a potential "valley effect" caused by buildings trapping and funneling pollutants through a corridor.²⁴⁸

The use of high efficiency filtration systems in conjunction with mechanical ventilation is gaining increased interest. Mechanical ventilation utilizes a fan to actively draw in outdoor air through an intake vent and then push the air throughout the building. The outdoor air is pulled through a filter to remove contaminants. Filter efficiency is commonly measured using the Minimum Efficiency Reporting Value (MERV) rating system. An example of air's travel path through a filtration system is displayed in **Figure 6-2**.

Figure 6-2: Filtration System with Mechanical Ventilation



Source: Natural Resources Canada – Office of Energy Efficiency, 2005²⁴⁹

The 2012 California Air Resources Board’s study reports that utilizing high efficiency, (MERV) 13 to 16 or higher, pleated particle filters near busy roadways “would generally be considered the most effective approach to filtration because they can remove the very small particles emitted by motor vehicles without emitting ozone, formaldehyde, or other harmful byproducts.” Research has found filters with a MERV 16 rating to reduce the concentration of ultrafine particles by approximately 90 percent on average.²⁵⁰

High efficiency portable air cleaners can be useful in existing homes that do not have mechanical ventilation. As described above, air cleaners were found to significantly reduce indoor exposure to pollutants such as black carbon and ultrafine particles. Portable air cleaners are not as capable as in-duct air cleaners for treating large areas; however, they can be effective for smaller, appropriately sized areas such as individual rooms or an apartment.²⁵¹

Figure 6-3 displays a portable air cleaner approximately 26 inches tall and capable of purifying a 1,700 square foot room with its MERV 18 rated filter.²⁵² The California Air Resources Board is currently funding an effort to further examine the effectiveness of portable air cleaners in a study entitled “*Evaluation of Pollutant Emissions from Portable Air Cleaners*”.

Figure 6-3: Portable Air Cleaner



Source: www.sylvane.com

6.3 Final Recommendations and Potential Health Effects

6.3.1 Final Set of Proposed Recommendations

The final set of proposed recommendations was developed to consolidate any overlap and to include supplemental recommendations developed from additional research related to air quality mitigation. This list also reflects public input gathered from community workshops and stakeholder group members.

Table 6.2 displays the final set of the 16 mobility/built environment recommendations proposed for the BHETS. The table also presents the specific health outcomes shown to be associated with these mobility/built environment variables, as indicated by the statistical analysis presented in this report.

Figure 6-4 displays the locations of the final 16 mobility/built environment recommendations. Table 6.2 accompanies Figure 6-4 and provides descriptions of the proposed improvements that can be referenced using each recommendation’s ID.

Table 6.2: Final Mobility/Built Environment Recommendations and Associated Health Outcomes

ID	Description of Recommendation	Health Outcomes Associated with Recommendation	Potential Tier 1 and Tier 2 Mobility/Built Environment Factors Influenced
1	Create a landscaped active transportation corridor traversing the community adjacent to the railroad right-of-way, connecting key land uses such as schools, transit stops, recreational facilities, and commercial districts with an emphasis on improved bicycle and pedestrian mobility. (Based on the Green Spine from the 2009 San Ysidro Mobility Strategy).	<ul style="list-style-type: none"> • Asthma • Chronic Obstructive Pulmonary Disease (COPD) • Coronary Heart Disease (CHD) • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Park Access • Pedestrian Safety • Sidewalk Coverage • Transportation Support • Youth Safety • Youth Physical Activity Support
2	Install a Class II bicycle lane extending the length of Otay Mesa Road.	<ul style="list-style-type: none"> • Asthma • CHD • COPD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Youth Safety • Youth Physical Activity Support

Table 6.2: Final Mobility/Built Environment Recommendations and Associated Health Outcomes (Continued)

ID	Description of Recommendation	Health Outcomes Associated with Recommendation	Potential Tier 1 and Tier 2 Mobility/Built Environment Factors Influenced
3	Establish a Class III bicycle route running the length of W. Park Avenue.	<ul style="list-style-type: none"> • Asthma • CHD • Cyclist Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Youth Physical Activity Support • Youth Safety
4	Create a ten-acre park site east of Beyer Elementary School.	<ul style="list-style-type: none"> • Asthma • CHD • COPD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Park Access • Trail Access • Youth Physical Activity Support • Youth Safety
5	Install traffic signal at I-5 NB on/off ramps and Via de San Ysidro.	<ul style="list-style-type: none"> • Asthma • CHD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Physical Activity Inhibitors • Youth Physical Activity Support • Youth Safety

Table 6.2: Final Mobility/Built Environment Recommendations and Associated Health Outcomes (Continued)

ID	Description of Recommendation	Health Outcomes Associated with Recommendation	Potential Tier 1 and Tier 2 Mobility/Built Environment Factors Influenced
6	Widen sidewalk on Seaward Avenue from W. Park Avenue to the Trolley stop to the west. Install sidewalk on south side of Seaward Avenue west of railroad tracks. Install pedestrian scale lighting.	<ul style="list-style-type: none"> • Asthma • COPD • CHD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Sidewalk Coverage • Youth Physical Activity Support • Youth Safety
7	Construct new sidewalk along north side of Calle Primera; install ADA compliant curb ramps at Via San Ysidro/Calle Primera; install pedestrian scale lighting near access to pedestrian bridge	<ul style="list-style-type: none"> • Asthma • COPD • CHD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Sidewalk Coverage • Youth Physical Activity Support • Youth Safety

Table 6.2: Final Mobility/Built Environment Recommendations and Associated Health Outcomes (Continued)

ID	Description of Recommendation	Health Outcomes Associated with Recommendation	Potential Tier 1 and Tier 2 Mobility/Built Environment Factors Influenced
8	Create a distinctive gateway from the Beyer Trolley Station entrance at Cypress Drive including changes to landscaping, pavement, fencing treatments, and a gateway sign that reflects the culture of the community in order to encourage transit use.	<ul style="list-style-type: none"> • Asthma • CHD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Transportation Support • Youth Physical Activity Support • Youth Safety
9	Improve the Beyer Boulevard Trolley Station to include curb bulb-outs at all four intersections along Seaward Avenue and install high visibility crosswalks.	<ul style="list-style-type: none"> • Asthma • COPD • CHD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Sidewalk Coverage • Transportation Support • Youth Physical Activity Support • Youth Safety

Table 6.2: Final Mobility/Built Environment Recommendations and Associated Health Outcomes (Continued)

ID	Description of Recommendation	Health Outcomes Associated with Recommendation	Potential Tier 1 and Tier 2 Mobility/Built Environment Factors Influenced
10	Implement the planned Class I bike facility along the SR-905 Corridor, from San Ysidro to the proposed Otay Mesa East Border Crossing near SR-11.	<ul style="list-style-type: none"> • Asthma • CHD • COPD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Sidewalk Coverage • Youth Physical Activity Support • Youth Safety
11	Enhance/raise crosswalk at existing school crossing on East Beyer Boulevard near Beyer Elementary School.	<ul style="list-style-type: none"> • Asthma • COPD • CHD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Sidewalk Coverage • Youth Physical Activity Support • Youth Safety

Table 6.2: Final Mobility/Built Environment Recommendations and Associated Health Outcomes (Continued)

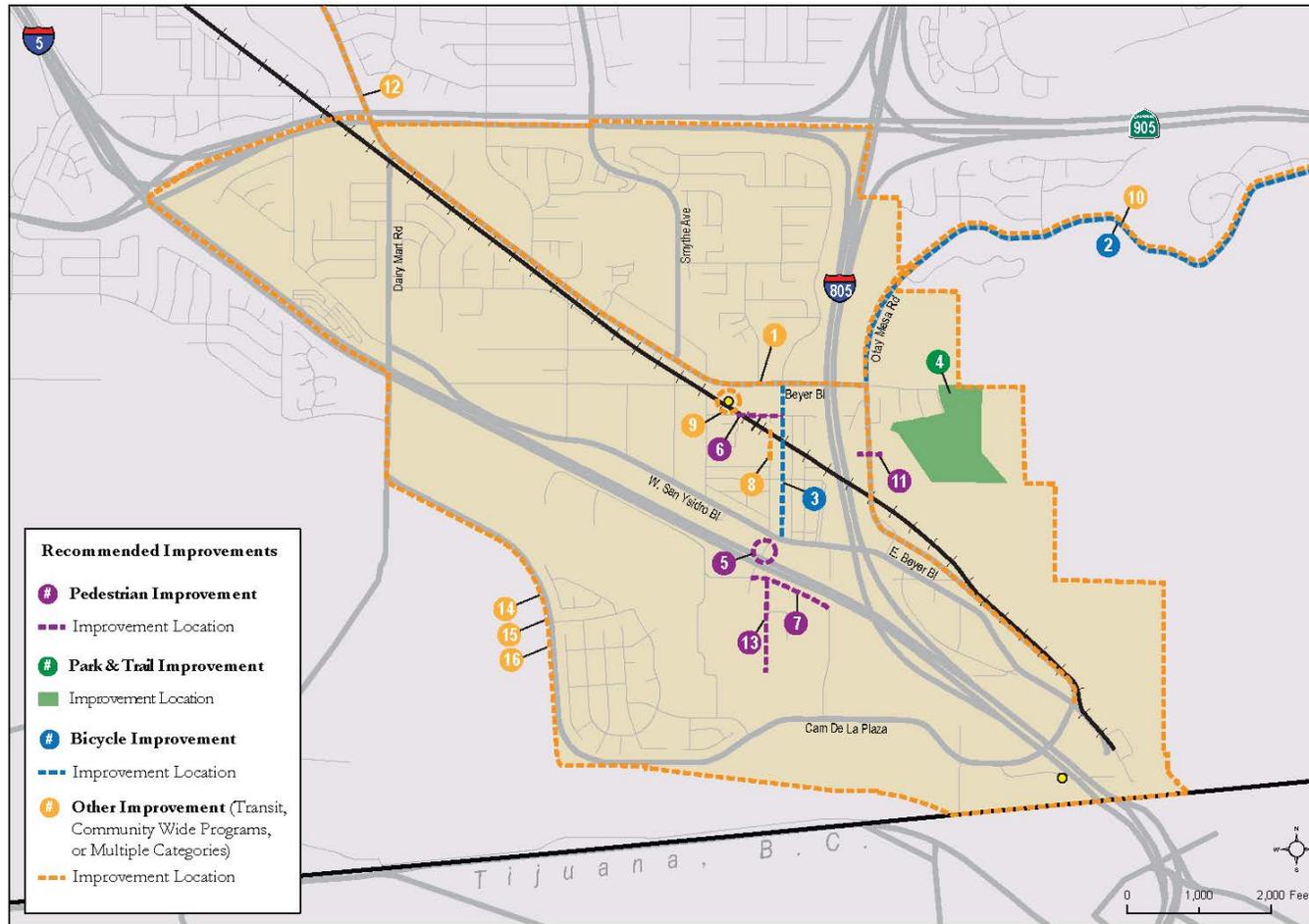
ID	Description of Recommendation	Health Outcomes Associated with Recommendation	Potential Tier 1 and Tier 2 Mobility/Built Environment Factors Influenced
12	Create a Class I or enhanced Class II facility connecting San Ysidro to the Imperial Beach Bikeway and Bayshore Bikeway.	<ul style="list-style-type: none"> • Asthma • CHD • COPD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Sidewalk Coverage • Youth Safety • Youth Physical Activity Support
13	Install pedestrian scale lighting on Sycamore Road from Calle Primera to Cesar Chavez Park.	<ul style="list-style-type: none"> • Asthma • CHD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Pedestrian Safety • Youth Physical Activity Support • Youth Safety
14	Create a comprehensive community wayfinding program that identifies and links key community assets. Key destinations to highlight through the wayfinding program would include location of bicycle facilities and non-motorized facilities (such as pedestrian bridges), parks within and around the community, community centers and other key civic uses, and the Dairy Mart Ponds and Tijuana River Valley Regional Park access points.	<ul style="list-style-type: none"> • Asthma • CHD • Cyclist Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Park Access • Trail Access • Youth Physical Activity Support • Youth Safety

Table 6.2: Final Mobility/Built Environment Recommendations and Associated Health Outcomes (Continued)

ID	Description of Recommendation	Health Outcomes Associated with Recommendation	Potential Tier 1 and Tier 2 Mobility/Built Environment Factors Influenced
15	Implement a monitoring program to better understand transportation-related emissions within the community. The monitoring program should seek to illuminate how different weather, topography, and travel conditions in and around San Ysidro affect the concentration of pollutants near roadways. The monitoring program should also provide a toolbox of mitigation measures depending on air quality conditions at various locations across the community.	<ul style="list-style-type: none"> • Asthma • CHD • Cyclist Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Percent of Households within 500' of a Transportation-Related Air Pollution Source
16	Identify potential funding mechanisms, such as grants or subsidies, to help with recommendation implementation.	<ul style="list-style-type: none"> • Asthma • CHD • COPD • Crime Injury • Cyclist Injury • Diabetes • Motor Vehicle Injury • Pedestrian Injury • Psychological Disorder • Stroke • Substance Abuse 	<ul style="list-style-type: none"> • Park Access • Pedestrian Safety • Sidewalk Coverage • Trail Access • Transportation Support • Youth Safety • Youth Physical Activity Support • Percent of Households within 500' of a Transportation-Related Air Pollution Source

Source: Chen Ryan Associates, February 2015

Figure 6-4: Final Mobility/Built Environment Recommendations



Border Health Equity Transportation Study

Figure 6-4
Final Mobility/Built Environment Recommendations

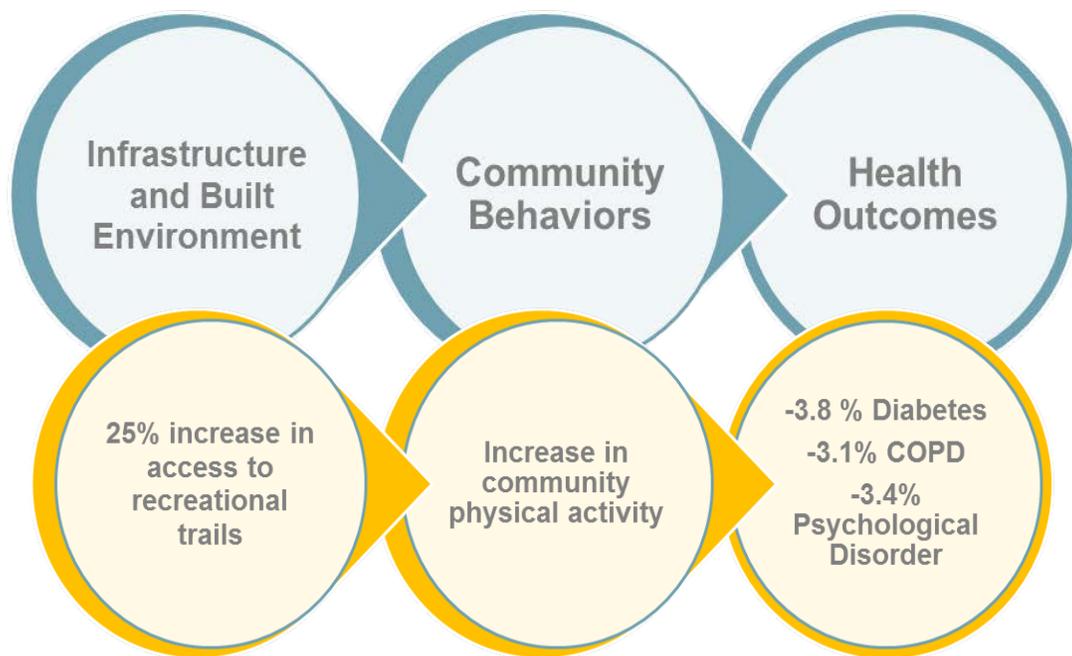
CHEN RYAN

6.3.2 Potential Health Impacts of Implementing Final Recommendations

Table 6.3 reports the estimated change in health outcomes associated with a 25 percent change in each of the mobility/built environment factors associated with the recommendations, as reported in Table 6.2. Understanding the health effects of changes in the mobility/built environment context was generated from the partial correlations analysis presented in Chapter 5. Table 6.3 presents an interpretation of the correlation coefficients that facilitates understanding how a change in the mobility/built environment variables relates to changes in health outcomes across the county at the Sub-Regional Area (SRA) level. A “correlations calculator” was developed in Excel and used to translate each of the partial correlation coefficients into a percent change in health outcome, assuming a fixed 25 percent change in the mobility/built environment measure. The partial correlation coefficient is a measure of the linear association between any two variables. The “correlations calculator” equation is provided in **Appendix G**.

Figure 6-5 illustrates the relationship between mobility/built environment factors and health outcomes.

Figure 6-5: Assessing Mobility/Built Environment and Health Outcome Relationships



As shown in the top row of Figure 6-5, mobility/built environment factors are thought to influence community behaviors, which in turn influence overall community health outcomes. The second row of Figure 6-5 shows an estimation of the strength of the relationship between trail access and key health outcomes. In this particular example, the partial correlations analysis shows that a 25 percent increase in access to recreational trails in the San Diego region is associated with a 3.8 percent reduction in diabetes, a 3.1 percent reduction in COPD, and a 3.4 percent reduction in psychological disorder.

As shown in **Table 6.3**, pedestrian safety is significantly related to the highest number of health outcomes. Eight of the twelve health outcomes were shown to be significantly related to pedestrian safety, and an estimated 3 percent to 7 percent decrease in the rates of these health outcomes could be expected with a 25 percent increase in pedestrian safety in San Ysidro.

Table 6.3: Partial Correlations Analysis Results: How a 25 percent Change in Tier 1 and Tier 2 Mobility/Built Environment Factors *Could* Relate to Changes in Health Outcomes (Percent Increase or Decrease)

Health Outcome	Youth Physical Activity Support	Trail Access	Park Access	Sidewalk Coverage	Transportation Support	Proximity (500 feet) to Air Pollution Source	Pedestrian Safety	Youth Safety
Diabetes	-3.35	-3.83	-2.28	-5.20				
COPD		-3.05		-3.48			-3.40	-4.58
CHD						6.30	-4.58	-4.58
Stroke						6.60	-6.33	-3.45
Cancer							-5.58	-4.55
Asthma				-1.35		3.63		
Psychological Disorder		-3.40		-3.83	-2.83	5.45	-6.68	-5.88
Substance Abuse	-10.75	-7.70	-11.25	-10.73	-9.18	8.90	-7.03	
Pedestrian Injury				-3.93		4.28	-5.43	-5.05
Cyclist Injury						6.05	-3.48	
Motor Vehicle Injury	-11.93	-10.40	-9.03	-13.3	-10.50			-4.15
Crime Injury	-14.48	-11.08	-10.75		-12.65			

Source: County of San Diego Health and Human Services Agency Community Health Statistics, 2010; Chen Ryan Associates; February 2015

7.0 Monitoring and Evaluation Plan

This chapter proposes a framework and methodology for monitoring and evaluating the implementation of key recommendations and their associated impacts on the mobility/built environment and community health outcomes. This chapter describes the purpose of the monitoring and evaluation plan and identifies a set of indicators that can be used to measure and assess the changes brought about by implementing key recommendations.

7.1 Purpose of the Monitoring/Evaluation Plan

The plan proposes a method for monitoring and evaluating three main factors:

1. Changes in the status of key recommendations
2. The effects of implementing recommended projects, programs, or policies on mobility/built environment factors
3. The effects of changes in the mobility/built environment on community health behaviors and outcomes

Additional reasons for conducting monitoring and evaluation include:

- Facilitate inter-agency and community collaboration for conducting the monitoring and evaluation
- Provide a proposal to assist in the procurement of funding to perform monitoring and evaluation
- Identify gaps in data needed to monitor and/or evaluate the impacts of key recommendations, mobility/built environment factors, and health behaviors and outcomes
- Establish goals for recommendation implementation and performance targets to track progress toward those goals
- Build consensus around goals for planning actions and objectives
- Provide a way for stakeholders, including the City of San Diego and San Ysidro residents, to continue to be engaged and updated about progress related to the Border Health Equity Transportation Study (BHETS); and lastly
- Support and validate investments in key infrastructure improvements

The partial correlations analysis related indicators of the mobility/built environment to health outcomes. The key recommendations intend to change mobility/built environment factors in a manner that positively impacts health outcomes. In order to perform an evaluation, it is first necessary to understand the extent to which recommendations could potentially impact indicators of the mobility/built environment in San Ysidro and the timing of these impacts. For example, to what extent could enhancing a crosswalk at a school crossing (recommendation no. 14) impact mobility/built environment indicators, such as pedestrian safety, sidewalk coverage, youth physical activity support, and traffic safety for youth? In order to draw meaningful conclusions, realistic estimations and targets for anticipated impacts must be developed for each recommendation.

The goal of implementing key recommendations is to improve the mobility/built environment and positively influence community health outcomes. It is important to recognize that this chain of events may take years to complete, and that there are other contributing factors that may enhance

or limit changes in health behaviors and outcomes. Thus, there are a number of factors to consider before monitoring and evaluation efforts can draw conclusions about whether key recommendations were ultimately successful in changing community health behaviors and outcomes.

7.1.1 Monitoring Methodology

Monitoring and evaluation have been referred to in this chapter so far as one activity. While the two tasks are closely related, it is important to distinguish monitoring from evaluation. Monitoring informs the evaluation process by measuring baseline conditions and tracking changes into the future through data, indicators, and performance targets. The evaluation process analyzes and synthesizes the data acquired through monitoring to form meaningful conclusions about the process, outcomes, and impact of (in this case) the implementation of recommended plans, projects, or policies. The monitoring and evaluation processes are complimentary and can enable those who monitor and/or evaluate recommendations to extract meaning from data that can inform local and regional transportation and land use decisions.

The proposed indicators to monitor come from the following sources:

- SANDAG *Healthy Communities Atlas* (mobility/built environment factors);
- San Diego Health and Human Services (HHS) San Diego County Community Profiles by Region and Sub-regional Areas (health outcome data); and
- Agencies responsible for implementing recommendations.

Proposed indicators to be used for monitoring changes in the mobility/built environment come from the SANDAG *Healthy Communities Atlas* and should include:

- Transportation Infrastructure Support Index
- Youth Physical Activity Support Index
- Pedestrian Safety
- Traffic Safety for Youth
- Transportation Air Pollution Exposure
- Sidewalk Coverage
- Non-Motorized Trails Access
- Parks and Open Space Access

A detailed description of each mobility/built environment indicator is available in Table 4.1.

Proposed indicators to be used for monitoring changes in community health-related behaviors and health outcomes come from the San Diego County HHS Community Health Statistics and should include:

- Pedestrian Injury
- Cyclist Injury
- Motor Vehicle Injury
- Asthma
- Stroke
- Cancer
- Psychological Disorder
- Substance Abuse
- Crime Injury
- Diabetes
- Chronic Obstructive Pulmonary Disease (COPD)
- Coronary Heart Disease (CHD)

A detailed description of each health outcome indicator is available in the Health Outcomes Indicator Table in **Appendix D**.

7.1.2 Evaluation Methodology

Different methods of evaluation are employed in order to measure progress or change over time. Each evaluation method uses a different set of questions to assess status and performance. The following describes three types of evaluation – process, outcome, and impact evaluation – and how they are appropriate for the BHETS.

Process Evaluations focus on the process of carrying out a set of activities that have previously been established. These types of evaluations ask whether and how well activities are carried out, often for the purpose of addressing the quality or efficiency of a program’s adherence to its design. Measures used to evaluate program implementation may also be incorporated into plans to monitor and report on the performance of the set of activities. In the case of the BHETS, a process evaluation would consider whether the recommendations were implemented, and to what extent they were carried out. Ideally, the evaluation would provide a description and explanation of the implementation status of each recommendation.

Outcome Evaluations assess the effects, or what happened as a result of a recommendation or set of activities, assuming that the recommendation has operated as planned. Outcomes may be analyzed to determine whether the recommendation produced the intended effect. This type of evaluation determines whether short and/or long term objectives are achieved. In the case of the BHETS, an outcome evaluation frame would guide an assessment of the extent to which recommendations have led to the desired level of change in the mobility/built environment factors.

Impact Evaluations go one step further to evaluate the impact a program has had on stakeholders. Impact evaluation asks whether the program has made a difference in community behaviors and/or the health outcomes associated with those behaviors.

An important consideration in impact evaluation is the extent to which other factors outside the recommendation could also be influencing the same health behaviors and outcomes. Some of the health behaviors and outcomes of interest in the BHETS are also influenced by factors that occur outside the reach of the key recommendations. For example, many of the key recommendations aim to make San Ysidro a safer and more enjoyable place in which to walk, ride, or take public transportation. These environmental conditions could contribute to increases in physical activity, but the daily schedule, family structure, or participation in the labor force of any given individual can also influence one’s choice to walk, for transportation or leisure. Therefore, in the process of impact evaluation, the evaluation design should attempt to identify the extent to which the key recommendation contributed to observed changes. This can be done by comparing the observed outcomes to an estimate of what would have happened in the absence of the program. Professional discretion should be used to identify potential cumulative impacts from beyond the study area and in explaining any variance from expected impacts.

In the case of the BHETS, an impact evaluation would assess the extent to which the implementation of key recommendations and resultant changes in the mobility/built environment could be expected to contribute to changes in community behaviors and health outcomes.

7.1.3 Identifying Performance Targets

Identifying “performance targets” is a key element of the evaluation framework described above. In order to draw meaningful conclusions about the success of actions taken, or reasons for lack of action, it is necessary to develop performance targets, or goals for ideal levels of change balanced with realistic expectations based on existing literature, in order to measure progress. For example, how many recommendations would need to be implemented in order to create a meaningful level of change in the mobility/built environment? Or, how much change in the mobility/built environment factors would be needed to adequately contribute to changes in health behaviors and outcomes? As a result of changes in the mobility/built environment, how many more people could be expected to have improved health outcomes and over what period of time to signal population health improvements?

Although the BHETS does not recommend a program for improving health, its overall goal is to create a model for incorporating health into local and regional transportation and land use planning that can lead to improved community health outcomes. As part of this model, the monitoring and evaluation plan should facilitate an understanding of the “performance targets” that should be pursued in order to help achieve improved community health.

7.2 Monitoring and Evaluation Questions

This section identifies a set of questions for monitoring and evaluating key recommendations or planning process, mobility/built environment outcomes, and health impacts. Methods for answering these questions are proposed in Section 7.3.

7.2.1 Planning Process Evaluation

Questions 1 through 8 (as shown in Table 7-1A) facilitate monitoring and evaluation of the *planning process* followed to implement key recommendations. Questions consider whether and how recommendations have been carried out.

1. Has the key recommendation been implemented? If so, when?
2. If implemented, who is responsible for implementing the recommendation?
3. If implemented, were there any changes to the recommendation compared to what was originally proposed?
4. If not implemented, has the recommendation been proposed? If so, when?
5. If not implemented, has the recommendation been approved? If so, when?
6. If not implemented, has the recommendation been funded? If so, when?
7. If not implemented, but approved and funded, what is the timeframe for implementation?
8. If not implemented, what are the barriers to recommendation implementation?

7.2.2 Mobility/Built Environment Outcome Evaluation

Questions 1 through 5 (see Table 7-2A) facilitate evaluation and monitoring of the effect of recommendation implementation on mobility/built environment factors. Questions are focused on the extent to which recommendations changed the mobility/built environment and other potential contributing factors.

1. How have mobility/built environment indicators changed in the given time period?
2. Did recommendation implementation influence changes in mobility/built environment indicators? If so, which recommendations?
3. How much did recommendation implementation contribute to mobility/built environment indicator change?
4. If it is not clear that recommendation implementation contributed to mobility/built environment indicator change, which actions could have contributed to indicator change?
5. Did recommendations result in changes that meet performance targets for mobility/built environment factors?

7.2.3 Health Impact Evaluation

Questions 1 through 6 (see Table 7-3A) facilitate evaluation and monitoring of the impact of recommendations and mobility/built environment changes on health outcomes.

1. How have health outcome indicators changed in the given time period? Was there an increase or decrease over expected values? If so, by how much?
2. Did recommendation implementation and subsequent mobility/built environment change influence change in health outcome indicators?
3. If so, which recommendations and mobility/built environment factors could have contributed?
4. How much did recommendations and mobility/built environment factors contribute to changes in health outcomes?
5. If it is not clear whether the mobility/built environment factor contributed to health indicator change, which factors could have contributed?
6. Did recommendations result in changes that meet performance targets for community health outcomes?

7.2.4 BHETS Performance Targets

Monitoring and evaluation are enhanced by establishing performance targets. They provide a sense for the ideal level of change expected for recommendation implementation, mobility/built environment outcomes, and health impacts.

This study does not call out specific performance targets since they are very closely linked to specific, institutional priorities. Rather than proposing targets, this study proposes a list of possible types of performance targets. Local staff would need to vet the details of performance targets with elected officials and other adopted city documents that set priorities for the city.

Performance targets could include:

- An ideal number of recommendations to be implemented
- A proposed amount of change for each mobility/built environment factor
- Key mobility/built environment factors that should be a focus
- A proposed amount of change for each health outcome indicator
- Health outcome indicators that are higher priorities for improvement

7.3 BHETS Framework for Monitoring and Evaluation

This section provides a proposed framework for monitoring and evaluating planning processes, built environment/mobility outcomes, and associated health impacts. It serves as a model to foster integration of mobility/built environment and health in long range community planning, in particular through provision of two key tools that support rigorous monitoring and evaluation. For each type of evaluation (planning process, mobility/built environment outcomes, and health impacts), two tables are provided that serve as basic tools for guiding the monitoring and evaluation of effects associated with local and regional community planning. These tools are intended to be adaptable to a range of transportation and land use planning efforts, and most importantly, they are intended to strengthen accountability associated with local long range planning with the ultimate goal of achieving positive community health outcomes. For the purposes of the current effort, detailed information was not generated and included in these tables since this would be highly dependent on the agency or local government carrying out the monitoring and evaluation process. The key intent of this section is only to provide a framework for the monitoring and evaluation process.

This section is organized by evaluation type – planning process evaluation, mobility/built environment outcomes, and health impact evaluation.

7.3.1 Monitoring and Evaluation *Planning Process Outcomes*

Table 7.1A provides a framework for monitoring and evaluating a set of indicators designed to address the questions outlined in Section 7.2, specifically related to *planning process evaluation*.

Table 7.1A is comprised of the following six types of information:

1. A set of *monitoring questions* related to planning process;
2. *Indicators* that will help answer the set of monitoring questions;
3. *Timeframe* for data collection (no detail provided);
4. The key data sources;
5. The *activities or analyses* that should be carried out; and
6. *Targets* that may be relevant to the questions and indicators (no detail provided).

Table 7.1A directs an agency to a set of planning process topics that will be monitored overtime.

Table 7.1B provides a framework for recommendation-specific tracking related to a community planning process, including the following information types:

- Date of recommendation implementation
- Responsible entity
- Changes to original recommendation
- Proposed date of recommendation implementation
- Date of recommendation approval
- Date recommendation was funded
- Timeframe for recommendation implementation
- Barriers to recommendation implementation

Table 7.1A: Planning Process Evaluation Methodology – What to Monitor and Evaluate?

ID	Monitoring/Evaluation Question	Indicator	Time Frame ¹	Data Source	Activity/Analysis	Performance Target ²
1	Has the recommendation been implemented? If so, when?	Yes/No; Date of recommendation implementation	--	City of San Diego; Caltrans; SANDAG; MTS	Research and document in Table 7.1B	--
2	If implemented, who is responsible for implementing the recommendation?	Name of entity	--	City of San Diego; Caltrans; SANDAG; MTS	Research and document in Table 7.1B	--
3	If implemented, were there any changes to the recommendation compared to what was originally proposed?	Description of changes	--	City of San Diego; Caltrans; SANDAG; MTS	Research and document in Table 7.1B	--
4	If not implemented, has the recommendation been proposed? If so, when?	Yes/No; Date recommendation was proposed	--	City of San Diego; Caltrans; SANDAG; MTS	Research and document in Table 7.1B	--
5	If not implemented, has the recommendation been approved? If so, when?	Yes/No; Date recommendation was approved	--	City of San Diego; Caltrans; SANDAG; MTS	Research and document in Table 7.1B	--
6	If not implemented, has the recommendation been funded? If so, when?	Yes/No; Date recommendation was funded	--	City of San Diego; Caltrans; SANDAG; MTS	Research and document in Table 7.1B	--
7	If not implemented, but approved and funded, what is the timeframe for implementation?	Date implementation expected to begin	--	City of San Diego; Caltrans; SANDAG; MTS	Research and document in Table 7.1B	--
8	If not implemented, what are the barriers to recommendation implementation?	Description of barriers	--	City of San Diego; Caltrans; SANDAG; MTS	Research and document in Table 7.1B	--

Source: Human Impact Partners, Chen Ryan Associates, February 2015

Notes:

1. Timeframe for indicator data collection is not provided since it is highly dependent on the type of indicator and funding levels associated with data collection programs.
2. Performance targets are not provided here as they will be determined by local agency staff on a case-by-case basis.

Table 7.1B: Recommendations-Specific Information to Support Monitoring and Evaluation

ID	Description of Recommendation	Rec. Implemented/ Date	Responsible Entity	Rec. Changes from Original Proposal	Rec. Proposed/ Date	Rec. Approved/ Date	Rec. Funded/ Date	Timeframe for Implementation	Barriers to Implementation
1	Create a landscaped active transportation corridor traversing the community, connecting key land uses such as schools, transit stops, recreational facilities, and commercial districts with an emphasis on improved bicycle and pedestrian mobility.								
2	Proposed Class II bicycle lane extending the length of Otay Mesa Road.								
3	Proposed Class III bicycle route running the length of W. Park Avenue.								
4	Create a comprehensive community wayfinding program that identifies and links key community assets. Key destinations to highlight through the wayfinding program would include location of bicycle facilities and non-motorized facilities (such as pedestrian bridges), parks within and around the community, community centers and other key civic uses, and the Dairy Mart Ponds and Tijuana River Valley Regional Park access points.								
5	Implement a monitoring program to better understand transportation-related emissions within the community. The monitoring program should seek to illuminate how different weather, topography, and travel conditions in and around San Ysidro affect the concentration of pollutants near roadways. The monitoring program should also provide a toolbox of mitigation measures depending on air quality conditions at various locations across the community.								

Table 7.1B: Recommendations-Specific Information to Support Monitoring and Evaluation (Continued)

ID	Description of Recommendation	Rec. Implemented/ Date	Responsible Entity	Rec. Changes from Original Proposal	Rec. Proposed/ Date	Rec. Approved/ Date	Rec. Funded/ Date	Timeframe for Implementation	Barriers to Implementation
6	Identify potential funding mechanisms, such as grants or subsidies, to retrofit existing sensitive land use structures with high efficiency air filtration systems.								
7	The area east of Beyer Elementary School and south of the east end of Beyer Boulevard is identified as a future park site in the current San Ysidro Community Plan. It is owned by the City of San Diego. The recommendation also proposes acquiring an additional three acres to create a ten-acre park site.								
8	Install traffic signal at I-5 NB on/off ramps & Via de San Ysidro.								
9	Widen sidewalk on Seaward Avenue from W. Park Avenue to the Trolley stop to the west. Install sidewalk on south side of Seaward Avenue west of railroad tracks. Install pedestrian scale lighting.								
10	Construct new sidewalk along north side of Calle Primera; install ADA compliant curb ramps at Via San Ysidro/Calle Primera; install pedestrian scale lighting near access to pedestrian bridge								
11	Create a distinctive gateway to the Beyer Boulevard Trolley Station entrance from Cypress Drive including changes to landscaping, pavement, fencing treatments, and a gateway sign that reflects the culture of the community in order to encourage transit use.								

Table 7.1B: Recommendations-Specific Information to Support Monitoring and Evaluation (Continued)

ID	Description of Recommendation	Rec. Implemented/ Date	Responsible Entity	Rec. Changes from Original Proposal	Rec. Proposed/ Date	Rec. Approved/ Date	Rec. Funded/ Date	Timeframe for Implementation	Barriers to Implementation
12	W. Seaward Avenue improvements at Beyer Boulevard Trolley Station – bulb-outs at all four intersections to decrease crossing distance and increase pedestrian visibility, install high visibility crosswalks, extend the sidewalk along the south side of Seaward Avenue just west of the Trolley tracks.								
13	Implement the planned Class I bike facility along the SR-905 Corridor, from San Ysidro to the proposed Otay Mesa East Border Crossing near SR-11.								
14	Enhance/raise crosswalk at existing school crossing on East Beyer Boulevard near Beyer Elementary School.								
15	Create a Class I or Enhanced Class II facility connecting San Ysidro to the Imperial Beach Bikeway and Bayshore Bikeway.								
16	Add human scale lighting on Sycamore Road from Calle Primera to Cesar Chavez Park.								

Source: Human Impact Partners, Chen Ryan Associates, February 2015

7.3.2 Monitoring and Evaluating *Mobility/Built Environment Outcomes*

Table 7.2A provides a framework for monitoring and evaluating a set of indicators designed to address the questions outlined in Section 7.2, specifically related to *mobility/built environment outcomes*.

Table 7.2A follows a similar structure as Table 7.1A, and is comprised of the following six types of information:

1. A set of *monitoring questions* related to the status of mobility/built environment characteristics
2. *Indicators* that will help answer the set of monitoring questions
3. *Timeframe* for data collection (no detail provided)
4. The key data sources
5. The *activities or analyses* that should be carried out
6. *Targets* that may be relevant to the questions and indicators (no detail provided)

Table 7.2A directs an agency to a set of mobility/built environment characteristics or topics that will be monitored overtime.

Table 7.2B provides a framework for mobility/built environment-specific tracking related to a community planning process, including the following information types:

- Number of recommendations that could affect indicator;
- Baseline value of indicator;
- First post-baseline measurement of indicator (e.g., *at timeframe 1*);
- Change in indicator (timeframe 1 measurement – baseline measurement) ;
- Listing of recommendations relevant to each mobility/built environment indicator;
- Implementation status of each recommendation relevant to a mobility/built environment indicator
- Estimate of indicator change attributable to recommendation implementation (e.g., *substantial, moderate or minor*)

Table 7.2A: Mobility/Built Environment Outcome Evaluation Methodology – What to Monitor and Evaluate?

ID	Monitoring/Evaluation Question	Indicator	Time Frame ¹	Data Source	Activity/Analysis	Performance Target ²
1	How have M/BE indicators changed in the given time period?	Change in value of M/BE indicators from baseline year	--	Healthy Communities Atlas	Collect current year's indicator values and compare to baseline. Document in Table 7.2B	--
2	Did recommendation implementation influence changes in M/BE indicators? If so, which recommendations?	List of recommendations that were implemented for each indicator, and Yes/No indicating whether the recommendation was implemented	--	Table 7.1B	Research and document in Table 7.2B	--
3	How much did recommendation implementation contribute to M/BE indicator change?	Number of recommendations implemented for each indicator	--	Table 7.1B	Summarize number of recommendations per indicator	--
		Professional assessment of the extent of indicator change attributable to recommendation implementation (substantial, moderate, or minor)	--	Healthy Communities Atlas	Assess and describe in Table 7.2B	--
4	If it is not clear that recommendation implementation contributed to M/BE indicator change, which actions could have contributed to indicator change?	List of planning actions/developments that could have contributed to indicator change	--	City of San Diego; Caltrans; SANDAG; MTS	Assess planning activities/developments in the community relevant to MBE factors and describe	--
5	Did recommendations result in changes that meet performance targets for mobility/built environment factors?	Determination about whether target was met	--	Table 7.2B	Assess and summarize target attainment	--

Source: Human Impact Partners, Chen Ryan Associates, January 2015

Notes:

1. Timeframe for indicator data collection is not provided since it is highly dependent on the type of indicator and funding levels associated with data collection programs.
2. Performance targets are not provided here as they will be determined by local agency staff on a case-by-case basis

Table 7.2B: Mobility/Built Environment-Specific Information to Support Monitoring and Evaluation

Mobility/Built Environment Indicator	Description	Number of Recs That Could Affect Indicator	Baseline Value of Indicator (2012)	Timeframe 1: Value of Indicator (DATE)	Indicator Change (Baseline to Timeframe 1)	Listing of Relevant Rec	Rec Implemented (Yes/No)	Estimate of Indicator Change Attributable to Recommendation Implementation
Transportation Infrastructure Support Index	Composite measure of access to transit stations/stops, to non-motorized trails, and sidewalks	4				1 11 12		
Youth Physical Activity Support Index	Composite measure including sidewalk coverage, parks and open space access, non-motorized trails access, and elementary school access	13				1 2 3 4 7 8 9 10 11 12 13 14 15 16		
Pedestrian Safety	Composite measure of pedestrian collision rate, arterial density, traffic volume density and sidewalk coverage	11				1 4 8 9 10 11 12 13 14 15 16		

Table 7.2B: Mobility/Built Environment-Specific Information to Support Monitoring and Evaluation

Mobility/Built Environment Indicator	Description	Number of Recs That Could Affect Indicator	Baseline Value of Indicator (2012)	Timeframe 1: Value of Indicator (DATE)	Indicator Change (Baseline to Timeframe 1)	Listing of Relevant Rec	Rec Implemented (Yes/No)	Estimate of Indicator Change Attributable to Recommendation Implementation
Traffic Safety for Youth	Composite measure of sidewalk coverage, pedestrian collision rate, cyclist collision rate, arterial density, and traffic volume density	13				1		
						2		
						3		
						4		
						7		
						8		
						9		
						10		
						11		
						12		
						13		
						14		
						15		
16								
Transportation Air Pollution Exposure	Percentage of households within 500 feet of transportation-related air pollution sources (high volume roadway) or within 0.25 miles of rail yards or ports	2				5		
						6		
Sidewalk Coverage	Percent of roadways with sidewalks	6				1		
						9		
						10		
						12		
						13		
14								
15								

Table 7.2B: Mobility/Built Environment-Specific Information to Support Monitoring and Evaluation

Mobility/Built Environment Indicator	Description	Number of Recs That Could Affect Indicator	Baseline Value of Indicator (2012)	Timeframe 1: Value of Indicator (DATE)	Indicator Change (Baseline to Timeframe 1)	Listing of Relevant Rec	Rec Implemented (Yes/No)	Estimate of Indicator Change Attributable to Recommendation Implementation
Non-Motorized Trails Access	Percent of households within walking distance (1.2 miles) of a non-motorized trail	3				1 4 7		
Parks and Open Space Access	Percent of households within walking distance of a park entrance or trailhead	3				1 4 7		

Source: Human Impact Partners, Chen Ryan Associates, January 2015

7.3.3 Monitoring and Evaluating *Health Impact Outcomes*

Table 7.3A provides a framework for monitoring and evaluating a set of indicators designed to address the questions outlined in Section 7.2, specifically related to *health impact outcomes*.

Table 7.3A follows a similar structure as Table 7.1A and 7.2A, and is comprised of the following six types of information:

1. A set of *monitoring questions* related to the status of mobility/built environment characteristics
2. *Indicators* that will help answer the set of monitoring questions
3. *Timeframe* for data collection (no detail provided)
4. The key data sources
5. The *activities or analyses* that should be carried out
6. *Targets* that may be relevant to the questions and indicators (no detail provided)

Table 7.3A directs an agency to a set of health outcome impacts or topics that will be monitored overtime.

Table 7.3B provides a framework for health outcomes-specific tracking related to a community planning process, including the following information types:

- Number of recommendations that could affect indicator
- Baseline value of indicator
- First post-baseline measurement of indicator (e.g., *at timeframe 1*)
- Change in indicator (timeframe 1 measurement – baseline measurement)
- Listing of recommendations relevant to each mobility/built environment indicator
- Implementation status of each recommendation relevant to a mobility/built environment indicator
- Estimate of indicator change attributable to recommendation implementation (eg. *substantial, moderate or minor*)

Table 7.3A: Health Outcome Impact Evaluation Methodology – What to Monitor and Evaluate?

ID	Monitoring/Evaluation Questions	Indicators	Time Frame ¹	Data Source	Activity/Analysis	Performance Target ²
1	How have health outcome indicators changed in the given time period? Was there an increase or decreased over expected values? If so, by how much?	Change in value of health outcome indicators from baseline year		SD County HHSA, Community Health Statistics	Collect current year's indicator values (local and countywide) and compare to baseline. Compare local changes to countywide changes to determine expected values. Document in Table 7.3B	
2	Did recommendation implementation and subsequent mobility/built environment change influence change in health outcome indicators?	Yes/No, indicating whether mobility/built environment factors changed, in the expected direction, from baseline year Yes/No, indicating whether recommendations were implemented for mobility/built environment factors		Table 7.2B Table 7.2B	Assess and describe in Table 7.3B Assess and describe in Table 7.3B	
3	If so, which recommendations and mobility/built environment factors could have contributed?	List/number of mobility/built environment factors that changed and determination of attribution to recommendation implementation		Table 7.2B	Assess and describe in Table 7.3B	
4	How much did recommendations and mobility/built environment factors contribute to changes in health outcomes?	Estimate of the effect of new mobility/built environment indicator values on health outcomes		Table 7.2B; SD County HHSA, Community Health Statistics	Collect current data and re-run partial correlation analyses	

ID	Monitoring/Evaluation Questions	Indicators	Time Frame ¹	Data Source	Activity/Analysis	Performance Target ²
5	If it is not clear whether the mobility/built environment factor contributed to health indicator change, which factors could have contributed?	List of factors that could have contributed to changes in health outcomes		Literature/published reports	Assess contributors to health outcomes and describe	
6	Did recommendations result in changes that meet performance targets for community health outcomes	Determination about whether target/s was/were met		Table 7-3B	Assess and summarize target attainment	

Source: Human Impact Partners, Chen Ryan Associates, February 2015

Note:

1. Timeframe for indicator data collection is not provided since it is highly dependent on the type of indicator and funding levels associated with data collection programs.
2. Performance targets are not provided here as they will be determined by local agency staff on a case-by-case basis.

Table 7.3B: Health Impact-Specific Information to Support Monitoring and Evaluation

Health Outcome Indicator	Baseline Value of Indicator (2012)	Timeframe 1: Value of Indicator (DATE)	Indicator Change (Baseline to Timeframe 1)	Associated M/BE factors	M/BE Indicator Change from Baseline (Yes/No)	Recs implemented for factors (Yes/No)	M/BE	Extent of Health Outcome Change Attributable to M/BE Factor Change
Pedestrian Injury				Transportation Infrastructure Support Index Pedestrian Safety Traffic Safety for Youth Air Pollution Exposure/ Percent of HH within 500' of Transportation-Related Air Pollution Source Sidewalk Coverage Non-Motorized Trails Access				
Cyclist Injury				Pedestrian Safety Traffic Safety for Youth Air Pollution / Percent of HH within 500' of Transportation-Related Air Pollution Source				
Motor Vehicle Injury				Youth Physical Activity Support Index Traffic Safety for Youth Sidewalk Coverage Non-Motorized Trails Access Parks and Open Space Access				
Asthma				Pedestrian Safety Air Pollution / Percent of HH within 500' of Transportation-Related Air Pollution Source				
Diabetes				Youth Physical Activity Support Index				

Table 7.3B: Health Impact-Specific Information to Support Monitoring and Evaluation (Continued)

Health Outcome Indicator	Baseline Value of Indicator (2012)	Timeframe of 1: Value of Indicator (DATE)	Indicator Change (Baseline to Timeframe 1)	Associated M/BE factors	M/BE Change from Baseline (Yes/No)	Indicator from Year	Recs implemented for M/BE factors (Yes/No)	Extent of Health Outcome Change Attributable to M/BE Factor Change
Chronic Obstructive Pulmonary Disease (COPD)				Sidewalk Coverage Non-Motorized Trails Access Parks and Open Space Access				
Coronary Heart Disease (CHD)				Pedestrian Safety Traffic Safety for Youth Air Pollution / Percent of HH within 500' of Transportation-Related Air Pollution Source				
Stroke				Pedestrian Safety Traffic Safety for Youth Air Pollution / Percent of HH within 500' of Transportation-Related Air Pollution Source				
Cancer				Youth Physical Activity Support Index Traffic Safety for Youth				
Psychological Disorder				Transportation Infrastructure Support Index Pedestrian Safety Traffic Safety for Youth Air Pollution / Percent of HH within 500' of Transportation-Related Air Pollution Source Sidewalk Coverage Non-Motorized Trails Access				

Table 7.3B: Health Impact-Specific Information to Support Monitoring and Evaluation (Continued)

Health Outcome Indicator	Baseline Value of Indicator (2012)	Timeframe of 1: Value of Indicator (DATE)	Indicator Change (Baseline to Timeframe 1)	Associated M/BE factors	M/BE Indicator Change from Baseline (Yes/No)	Recs implemented for M/BE factors (Yes/No)	Extent of Health Outcome Change Attributable to M/BE Factor Change
Substance Abuse				Transportation Infrastructure Support Index Pedestrian Safety Air Pollution / Percent of HH within 500' of Transportation-Related Air Pollution Source Sidewalk Coverage Non-Motorized Trails Access Parks and Open Space Access			
Crime Injury				Transportation Infrastructure Support Index Youth Physical Activity Support Index Sidewalk Coverage Non-Motorized Trails Access Parks and Open Space Access			

Source: Human Impact Partners, Chen Ryan Associates, February 2015

8.0 Implementation

This concluding chapter presents a prioritized list of the final recommendations and identifies potential resources for both agency staff and community members to effect change within the community of San Ysidro. Agency resources include the identification of potential funding sources, while community member resources focus on forums, contacts, and programs to help get their voices heard.

8.1 Ease of Implementation

The final recommendations presented in Chapter 6.0 were ranked considering three variables: potential cost, planning/construction duration, and the overall number of potential health outcomes that could be influenced by implementing each of the recommendations. Higher priority was awarded to lower estimated costs, lower duration, and higher number of health outcomes influenced. The prioritized recommendations are displayed in **Table 8.1**.

Table 8.1: Ease of Implementation

Relative Ease of Implementation	ID	Recommendation	Ranking Considerations
Easy	16	Identify potential funding mechanisms	Requires comparatively minimal staff time to find and apply for grants.
	3	Class III bike route on W. Park Avenue	Material costs are inexpensive (paint and signage).
	14	Comprehensive community wayfinding program	Wayfinding signage materials are relatively inexpensive and could be installed within the existing right-of-way.
	13	Sycamore Road pedestrian scale lighting	Replace/reconfigure existing lighting and install additional lighting as needed to improve street and sidewalk coverage.
	11	Beyer Elementary School crosswalk enhancement	Install enhancement within the existing right of way, minimal engineering required.
Moderate	2	Class II bike lane on Otay Mesa Road	Paint stripping is inexpensive, however, additional construction may be required in some locations.
	6	Seaward Avenue sidewalk installation, widening and lighting	Widening of approximately 640' of existing sidewalk, and 85' of new sidewalk, requiring engineering, construction and materials.
	7	Calle Primera sidewalk, ADA ramps, and lighting	May require moving existing utilities, engineering and construction of approximately 1,100' of sidewalk, 4 ADA ramps, and lighting.
	8	Cypress Drive gateway entrance to Beyer Boulevard Trolley Station	Street resurfacing, landscaping, fencing, lighting and a gateway sign along approximately 640' of Cypress Drive and 380' adjacent to the Trolley tracks
	9	Beyer Trolley Station pedestrian improvements	Curb bulb-outs at four intersections, and installation of two crosswalks.
	5	Traffic signal at I-5 NB ramps & Via de San Ysidro	Installation would require extensive analysis and moderately expensive materials and construction.
	15	Air quality monitoring program	Costs can differ greatly given the technology, number of locations, and reporting tools.
Difficult	10	Class I bike facility along SR-905 corridor	The San Diego Regional Bicycle Plan estimated the 9-mile corridor project cost at \$29,579,000.
	12	Class I or Enhanced Class II bike facility connecting to Bayshore Bikeway	The facility would span approximately 3.4 miles, roughly following the Trolley corridor.
	1	Landscaped active transportation corridor	Obtain right-of-way, engineering and construction of a multi-use path, landscaping, lighting, pedestrian amenities, and intersection treatments.
	4	Ten-acre park site east of Beyer Elementary School	Property is City of San Diego owned but would require design, engineering and development.

Source: Chen Ryan Associates, February 2015

Note: Ease of Implementation was determined using professional judgment, and may not account for all cost considerations.

8.2 Funding Resources

One of the significant barriers agencies encounter when attempting to implement physical changes impacting mobility or the built environment is lack of funding. This section outlines potential funding sources primarily for City of San Diego and public agency staff to consider pursuing to assist with funding the recommendations made in this Border Health Equity Transportation Study (BHETS). While SANDAG, nor any other agencies are committing to constructing or implementing the BHETS recommendations, the funding sources will assist agencies wanting to pursue implementation. Additionally, due to the location of many of the recommendations, implementation would likely require significant inter-agency coordination.

Many of the funding sources are specific to one or more mobility/built environment or public health categories such as active transportation mobility and/or safety, air quality, youth safety, parks and trails, and transit access. The funding sources are organized by Federal, State, and regional sources. Additionally, numerous non-profit organizations provide funding opportunities to improve community health or transportation options. The funding mechanisms are primarily intended for public agencies, however, in some instances public and private universities/colleges, hospitals, laboratories, other public or private non-profit institutions, and/or 501(c)(3) organizations may be eligible. The programs outlined in this section serve to provide examples of potential sources to explore but do not constitute the full breadth of resources available. It should be noted that new funding sources may arise and current funding sources may become obsolete, and therefore funding opportunities should be explored in more detail independently.

8.2.1 Federal Funding Opportunities

Moving Ahead for Progress in the 21st Century Programs

In 2012, the United States Department of Transportation enacted Moving Ahead for Progress in the 21st Century (MAP-21) to govern federal surface transportation spending. Seven MAP-21 programs are outlined in this section; however, there may be additional MAP-21 funding sources available.

Transportation Alternatives Program

The Transportation Alternatives Program (TAP) was established to provide for a variety of alternative transportation projects, including many that were previously eligible activities under separately funded programs. Funds may be used for the following activities:

- Construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation
- Construction, planning, and design of infrastructure-related projects and systems that will provide safe routes for non-motorized users, including children, older adults, and individuals with disabilities to access daily needs
- Conversion and use of abandoned railroad corridors for trails for pedestrians, bicyclists, or other non-motorized transportation users

Congestion Management and Air Quality Improvement Program

The Congestion Management and Air Quality Improvement Program serves as a flexible funding source available to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve

air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter. Eligible activities relevant to the BHETS include:

- Funds may be used for transportation projects likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution
- Projects that shift traffic demand to other transportation modes

Federal Lands Access Program

The Federal Lands Access Program aims to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. The program supplements funding for public roads, transit systems, and other transportation facilities with an emphasis on high-use recreation sites and economic generators. Examples of eligible activities include:

- Transportation planning, research, engineering, preventive maintenance, rehabilitation, restoration, construction, and reconstruction of transportation facilities that are located on or adjacent to, or that provide access to federal land
- Operation and maintenance of transit facilities
- Any transportation project eligible for assistance under Title 23 that is within or adjacent to federal land

Highway Safety Improvement Program

The Highway Safety Improvement Program serves to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. Examples of eligible activities include:

- Intersection safety improvement
- Safety improvements for pedestrians, bicyclists, or persons with disabilities
- Construction and improvement of a railway-highway grade crossing safety feature
- Construction of a traffic calming feature
- Installation of a traffic control or other warning device at a location with high crash potential
- Transportation safety planning
- Installation of signs and signals at pedestrian and bicycle crossings and in school zones
- Other roadway safety infrastructure improvements

National Highway Performance Program

The National Highway Performance Program (NHPP) provides funds for the construction of new facilities on the National Highway System (NHS). NHPP projects must support progress toward achievement of national performance goals for improving infrastructure condition, safety, mobility, or freight movement on the NHS. Examples of eligible uses include:

- Bicycle transportation and pedestrian walkways
- Construction, reconstruction, resurfacing, restoration, preservation, or operational improvements of NHS segments
- Capital and operating costs for traffic and traveler information, monitoring, management, and control facilities and programs

Railway-Highway Crossings Program

This program funds safety improvements to reduce the number of fatalities, injuries, and crashes at public grade crossings.

Surface Transportation Program

The Surface Transportation Program (STP) provides flexible funding for projects to preserve and improve the conditions and performance on Federal-aid highway, bridge and tunnel projects on any public road, and pedestrian and bicycle infrastructure. Examples of some of the STP eligible activities include:

- Bicycle transportation and pedestrian walkways
- Recreational trails projects
- Environmental mitigation efforts
- Border infrastructure projects
- Construction, reconstruction, rehabilitation, resurfacing, restoration, preservation, or operational improvements for highways and local access roads
- Surface transportation planning
- Transportation alternatives (pedestrians, bicyclists, and other non-motorized forms of transportation)
- Intersections with high accident rates or levels of congestion

For more information visit: www.fhwa.dot.gov/map21/funding.cfm

Safe Routes to School Programs

Caltrans administers two separate Safe Routes to School (SRTS) Programs: the state-legislated program (SR2S), and the federal program (SRTS). Both programs seek to increase the number of children walking and bicycling to school by making it safer for them to do so. In 2012, the federal SRTS Program was consolidated into the MAP-21 TAP, but is also eligible for STP and HSIP funds. Some expected outcomes of the program include:

- Increased bicycle, pedestrian, and traffic safety around schools
- More children walking and bicycling to and from schools
- Decreased traffic congestion around schools
- Reduced childhood obesity
- Improved air quality, community safety and security, and community involvement
- Improved partnerships among schools, local agencies, parents, community groups, and nonprofit organizations

A minimum of 70 percent of each year's apportionment will be made available for infrastructure projects with up to 30 percent for non-infrastructure projects.

Infrastructure projects are considered to be engineering projects or capital improvements that will substantially improve safety and the ability of students to walk and bicycle to school. They typically involve the planning, design, and construction of facilities within a two-mile radius from a grade school or middle school. The maximum funding cap for an infrastructure project is \$1 million.

Caltrans does not set minimum caps. The project cost estimate may include eligible direct and indirect costs. Infrastructure projects should directly support increased safety and convenience for children in K-8 (including children with disabilities) to walk and bicycle to school.

Eligible infrastructure projects may include but are not limited to:

- New bicycle trails and paths, bicycle racks, bicycle lane striping and widening, new sidewalks, widening of sidewalks, sidewalk gap closures, curbs, gutters, and curb ramps
- New pedestrian trails, paths, and pedestrian over and under crossings, roundabouts, bulb-outs, speed bumps, raised intersections, median refuges, narrowed traffic lanes, lane reductions, full or half-street closures, and other speed reduction techniques
- Included in the category of traffic control devices are new or upgraded traffic signals, crosswalks, pavement markings, traffic signs, traffic stripes, in-roadway crosswalk lights, flashing beacons, bicycle-sensitive signal actuation devices, pedestrian countdown signals, vehicle speed feedback signs, pedestrian activated upgrades, and all other pedestrian- and bicycle-related traffic control devices

Non-infrastructure projects are education, encouragement, and enforcement activities that are intended to change community behaviors, attitudes, and social norms to make it safer for children in grades K-8 to walk and bicycle to school. Non-infrastructure projects should increase the likelihood of programs becoming institutionalized once in place. Deliverables from a non-infrastructure project must be clearly stated in the application and tangible samples must be attached to the final invoice or progress report (i.e., sample training materials or promotional brochures). The funding cap for a non-infrastructure project is \$500,000. Multi-year funding allows the applicant to staff up and deliver their project over the course of four years, therefore reducing overhead and increasing project sustainability.

The Safe Routes to School Program funds non-motorized facilities in conjunction with improving access to schools through the Caltrans Safe Routes to School Coordinator. For more information visit: www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm

Rivers, Trails, and Conservation Assistance Program

Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service program, which provides technical assistance via direct staff involvement, to establish and restore greenways, rivers, trails, watersheds, and open space. The RTCA program provides only for planning assistance, as there are no implementation monies available. Projects are prioritized for assistance based upon criteria which include conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation and focusing on lasting accomplishments. For more information visit: www.nps.gov/orgs/rtca/index.htm

Environmental Justice Small Grant Program

The Environmental Justice Small Grants (EJSG) Program is administered by the Environmental Protection Agency (EPA), providing eligible applicants funds for projects that address local environmental and public health issues within an affected community. Eligible applicants are defined as “an incorporated non-profit organization; or a Native American tribal government.” The EJSG Program is designed to help communities understand and address exposure to multiple

environmental harms and risks. The FY 2015 EJSG program is anticipated to award up to four grants per EPA region in amounts of up to \$30,000 per award for a one year project period. For more information visit: www.epa.gov/compliance/environmentaljustice/grants/ej-smgrants.html

Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program

The Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program was created to provide financial assistance to “community-based organizations to collaborate and partner with other stakeholders (e.g., industry, government, academia, etc.) to develop and implement solutions that will significantly address environmental and/or public health issues at the local level.” The EPA developed the National Air Toxics Ambient Monitoring Program to research and assess priority Hazardous Air Pollutant (HAP) data on a national scale. The Community-Scale Air Toxics Ambient Monitoring grant was created to “identify and more accurately define the extent of local scale HAP impacts.” The program is available to state or state agencies, public and private universities and colleges, hospitals, laboratories, other public or private non-profit institutions, and 501(c)(3) organizations.

8.2.2 State Funding Opportunities

Recreational Trails Program

The Recreational Trails Program provides funds annually for recreational trails and trails-related projects. The program is administered at the federal level by the Federal Highway Administration and at the state level by the California Department of Parks and Recreation. At the end of 2013, legislation was signed by the Governor creating the new Active Transportation Program and enabled a portion of the Recreational Trails Program funding to remain with California State Parks. Applicants must fund at least 12 percent of the total project cost and the maximum amount of program funds allowed for each project is 88 percent of the total project cost. For more information visit: www.parks.ca.gov/?page_id=24324

Land and Water Conservation Fund

The Land and Water Conservation Fund allocates money to state and local governments to acquire new land for recreational purposes, including bicycle paths and support facilities such as bike racks. The United States Recreation and Heritage Conservation Service and the State Department of Park and Recreation administer this funding source.

Cities, counties, and districts authorized to acquire, develop, operate, and maintain park and recreation facilities are eligible to apply. Applicants must fund the entire project, and will be reimbursed for 50 percent of costs. Property acquired or developed under the program must be retained in perpetuity for public recreational use. The grant process for local agencies is competitive, and 60 percent of grants are reserved for Southern California. For more information visit: www.parks.ca.gov/?Page_id=21360

Active Transportation Program

On September 26, 2013, legislation was enacted creating the Active Transportation Program (ATP) in the Department of Transportation. The ATP consolidates existing federal and state transportation programs, including the Transportation Alternatives Program, Bicycle Transportation Account, and

state Safe Routes to School, into a single program with a focus to make California a national leader in active transportation.

The purpose of the ATP is to encourage increased use of active modes of transportation by achieving the following goals:

- Increase the proportion of trips accomplished by biking and walking
- Increase safety and mobility for non-motorized users
- Advance the active transportation efforts of regional agencies to achieve greenhouse gas reduction goals
- Enhance public health
- Ensure that disadvantaged communities fully share in the benefits of the program
- Provide a broad spectrum of projects to benefit many types of active transportation users

The ATP eligible projects include:

- Planning, design, and construction of new bikeways
- Improvements to existing bikeways and walkways
- Safe routes to transit projects
- Bike share programs
- Bike-carrying facilities on public transit
- Bike parking
- Bike/pedestrian traffic control devices
- Education programs

Of the ATP funds, 40 percent are awarded to metropolitan planning organizations in urban areas with populations over 200,000, 10 percent are awarded to small urban and rural regions with populations of 200,000 or less, and 50 percent are awarded to projects on a competitive statewide basis. For more information visit: www.dot.ca.gov/hq/LocalPrograms/atp/index.html

Caltrans Sustainable Transportation Planning Grant Program

As of 2014, the Caltrans Environmental Justice (EJ) and Community-Based Transportation Planning (CBTP) Grant Programs have been rebranded as the Sustainable Transportation Planning Grant Program. The Sustainable Transportation Planning Grant Program was created to support Caltrans' current mission: "Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability." Although dedicated grants no longer exist for EJ and CBTP, these important areas are still eligible for funding under the new Grant Program, which was revised to reflect the current emphasis on transportation planning efforts that promote sustainability. For more information visit: www.dot.ca.gov/hq/tpp/grants.html

Safe Routes to School

Established in 1999, the state-legislated SR2S program came into effect with the passage of Assembly Bill 1475. In 2001, Senate Bill 10 was enacted which extended the program for three additional years. In 2004, Senate Bill 1087 was enacted to extend the program another three years. In 2007, Assembly Bill 57 was enacted to extend the program indefinitely.

The SR2S program is primarily a construction program. Projects funded by the program are intended to improve the safety of students who walk or bicycle to school. Construction improvements must be made on public property. Eligible project elements include bicycle facilities, traffic control devices, and traffic calming measures. Up to 10 percent of funding provided for an individual project can be used for non-infrastructure improvements including outreach, education, encouragement, and/or enforcement activities. The maximum reimbursement percentage for any SR2S project is 90 percent. The maximum amount of funds that will be allocated to any single project is \$900,000. For more information visit: www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm

Transportation Development Act, Article III (Senate Bill 821)

Transportation Development Act (TDA) Article III funds are distributed by the State of California and administered at the county level, which can be used by cities for planning and construction of bicycle and pedestrian facilities. SANDAG administers this program and establishes its policies within the San Diego region. These funds are allocated annually on a per-capita basis to both cities and the County of San Diego. Local agencies may either draw down these funds or place them on reserve. SANDAG allocates TDA funds in conjunction with the *TransNet* program.

TDA Article III funds may be used for the following activities related to the planning and construction of bicycle and pedestrian facilities:

- Engineering expenses leading to construction
- Right-of-way acquisition
- Construction and reconstruction
- Retrofitting existing bicycle and pedestrian facilities, including installation of signage, to comply with the Americans with Disabilities Act
- Route improvements such as signal controls for bicyclists, bicycle loop detectors, rubberized trail crossings, and bicycle-friendly drainage grates
- Purchases and installation of bicycle facilities such as secure bicycle parking, benches, drinking fountains, changing rooms, restrooms, and showers which are adjacent to bicycle trails, employment centers, park-and-ride lots, and/or transit terminals and are accessible to the general public.

For more information visit: www.dot.ca.gov/hq/MassTrans/State-TDA.html

8.2.3 Regional Funding Opportunities

Regional active transportation grant programs come from a variety of sources, including MAP-21, the state budgets, vehicle registration fees, bridge tolls, and local sales tax. Most regional funds are allocated by regional agencies such as SANDAG.

Active Transportation Grant Program

In addition to the TDA revenue that comes from state sales tax described in the previous sections, the San Diego region levies an additional half-cent local sales tax to fund transportation projects under the *TransNet* program. In 2004, *TransNet* was extended for 40 years by voters. Each year, the SANDAG Board of Directors allocates funds under the TDA and the *TransNet* local sales tax

program to the Active Transportation Grant Program (ATGP) to support non-motorized transportation projects in the San Diego region. These funds are awarded on a competitive basis to cities as well as the County of San Diego, although non-profits, community based organizations and private organizations can *partner* with a city or the county to participate. Encourage planning and development of Complete Streets and provide multiple travel choices for the region's residents. ATGP goals include: fund bicycle and pedestrian-oriented transportation facility improvements, planning efforts, encouragement and education programs, and bicycle parking; and support the goals and objectives of Riding to 2050: The San Diego Regional Bicycle Plan. For FY 2010, approximately \$7.7 million was available for allocation. For more information visit: sandag.org/cycle3grants.

TransNet Smart Growth Incentive Program

The *TransNet* Smart Growth Incentive Program (SGIP) funds transportation and transportation-related infrastructure improvements and planning efforts that support smart growth development. This program is a longer-term version of the SANDAG Pilot SGIP, which uses funding incentives to encourage coordinated regional planning to bring transit service, housing, and employment together in smart growth development. This program is a longer-term version of the SANDAG Pilot SGIP, which uses funding incentives to encourage coordinated regional planning to bring transit service, housing, and employment together in smart growth development. The pilot program distributed \$9.6 million in smart growth incentive grants to 13 projects in the San Diego region in June 2013.

The program funds two grant types: capital projects and planning projects. The goal of SGIP is to fund public infrastructure projects and planning activities that will support compact, mixed-use development focused around public transit, and will provide more housing and transportation choices. The projects funded under this program will serve as a model for how good infrastructure and planning can make smart growth an asset to communities in a variety of settings. Grants range from \$200,000 to \$2,000,000 for capital projects and \$50,000 to \$400,000 for planning projects. Project screening criteria includes local commitment/ authorization, funding commitment, and funding eligibility.

Project Evaluation Criteria include:

- Project readiness (level of project development)
- Smart Growth Area land use characteristics (intensity of development; land use and transportation characteristics of project area; urban design characteristics of project area; related land development projects; affordable housing)
- Quality of proposed project (bicycle access improvements; pedestrian access improvements; transit facility improvements; streetscape enhancements; traffic calming features; parking improvements)
- Matching funds
- Low-income household bonus points

For more information visit: www.sandag.org/cycle3grants

8.2.4 Non-Profit Funding Opportunities

Robert Wood Johnson Foundation

The Robert Wood Johnson Foundation is the nation's largest philanthropy devoted solely to public health. It provides grants to improve the health and health care of Americans. The amounts awarded and funding cycles vary, as do scopes of projects, however, most grants range from \$100,000 to \$300,000 and run from one to three years. For more information visit: www.rwjf.org/en/grants.html.

California Wellness Foundation

The mission of The California Wellness Foundation is to improve the health of Californians by providing grants for health promotion, wellness education and disease prevention. Since its founding in 1992, the Foundation has awarded 7,690 grants totaling more than \$912 million. One of the Foundation's programs, Promoting Healthy and Safe Neighborhoods, provides funding to ensure effective systems; infrastructure and resources are in place to support healthy living in underserved, low-income communities. Examples of some of the Healthy and Safe Neighborhood's key strategies as identified by the Foundation include:

- Increasing access to parks and open space in underserved communities to improve recreational opportunities and social cohesion
- Support for community organizing, civic engagement, and public policy advocacy efforts to promote environmental justice and healthy land use and infrastructure planning in underserved communities
- Increasing access to healthy food in underserved communities

For more information visit: www.calwellness.org/grants_program.

The San Diego Foundation

The San Diego Foundation provides program grants that focus on community needs and provide an impact that will benefit the region. Grants are awarded on a competitive process for programs that advance WELL (Work-Enjoy-Learn-Live) in San Diego. One program for the San Diego Foundation Environment Division's grant cycle goal in 2015 is to advance community-driven efforts that develop an interconnected network of natural area, gathering places, and trails across the county. For more information visit: www.sdfoundation.org/Grants.aspx.

8.3 Community Member Resources for Community Change

Public officials and agency staff are generally responsible for making decisions regarding what is implemented and where, however, there are still resources available to community members to influence community change. Some of the resources currently available to San Ysidro community members were presented at the third and final community workshop, and are outlined below. Following the presentation, comment cards were distributed to workshop participants, asking "What tools would help community members influence community change?" as well as providing an opportunity for additional comments. A summary page of comment card responses and the comment card tool are provided in **Appendix H**.

San Ysidro Community Planning Group

The San Ysidro Community Planning Group provides an opportunity for community members to take part in the local planning process and share opinions with fellow community members, City of San Diego and agency staff. Meetings are held on the third Monday of every month at 5:30 p.m. at the San Ysidro School District Education Center Board Room.

Location: 4350 Otay Mesa Road San Diego, California 92154
San Ysidro Community Planner: Sara Osborn – (619) 263-6368
San Ysidro Community Park Planner: Howard Greenstein – (619) 525-8233

Contact City Council District 8 Councilmember

The community of San Ysidro is located within San Diego City Council District 8, represented by Councilmember David Alvarez. Councilmembers serve to protect and advocate for the interests of the community members they represent.

David Alvarez – (619) 236-6688
davidalvarez@sandiego.gov
www.davidalvarez.com

City of San Diego Street Division Service Request

The City of San Diego Street Division is responsible for city street maintenance. The Street Division accepts service requests from the public regarding the following issues:

- Alley Grading/Resurfacing
- Street Damage
- Sidewalk and/or Curb Maintenance
- Curb/Gutter Damage
- Streetlight Out
- Pedestrian/Handicap Ramp Damage
- Pothole
- Missing Traffic Sign
- Faded Striping (Crosswalk, Bike Lanes, Traffic Lanes)

The following methods can be used to create a service request for repairs on street related issues:

- Call Street Division Customer Services at (619) 275-7500
- Submit a written description of the problem (<http://apps.sandiego.gov/streetdiv/>)
- Use online mapping system to identify a problem (<http://apps.sandiego.gov/streetdiv/>)

Casa Familiar San Ysidro Sin Limites/Unlimited Program

Casa Familiar is a grassroots community organization based in San Ysidro with approximately 135 active members. The organization helps to establish local expertise and control over personal destinies and quality of life issues, which in turn relate a sense of community responsibility and accountability. The program allows for a vehicle or forum for community input and feedback on issues related to:

- Community Organizing
- Redevelopment
- Policy Development
- Community Visioning
- Urban Planning
- Other Community Topics

Meetings are held on an as needed basis at the San Ysidro Recreation Center, located at:

268 West Park Avenue San Ysidro, California 92173

Main Phone: (619) 428-1115

Email: info@casafamiliar.org

Website: www.casafamiliar.org

Casa Familiar Promotoras

The Casa Familiar Promotoras are an active group of community leaders that focus on physical activity and health promotion intervention to improve community members' health and wellbeing. Promotoras and Promotores are trained to instruct groups of 10-20 adults in 10 healthy lifestyle classes including: exercise, healthy eating, sleep, weight control, emotional health, family communication and relationships, self-esteem, depression, community advocacy, and disaster preparedness. Currently five exercise classes are offered at no cost, available six days a week.

The Promotoras are considering Safety Lighting along pedestrian corridors and Park Audits as their next coordinated projects. For additional information contact Casa Familiar:

Main Phone: (619) 428-1115

Email: info@casafamiliar.org

Website: www.casafamiliar.org

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Appendix A



CHARTER

Border Health Equity Stakeholder Group

BACKGROUND

Increasingly, research and evidence suggest that transportation policies, plans, and projects affect health outcomes. For example, transportation decisions directly influence exposure to air and noise pollution; pedestrian and bike conditions; traffic safety; access to jobs, goods and services; and social cohesion. Substantial evidence connects these “determinants of health” to health outcomes such as asthma, cancer, cardiovascular disease, diabetes, injuries, adverse birth outcomes, and mental illness.

In August 2012, SANDAG received a Caltrans Environmental Justice Planning Grant for nearly \$165,000 to study the mobility- and health-related challenges facing the border community of San Ysidro. Such challenges include traffic congestion, air quality, and access to goods, services, and community facilities, among others. SANDAG has partnered with Chen Ryan Associates, Human Impact Partners, and Casa Familiar to complete the work on this project.

The Border Health Equity Transportation Study (BHETS) will bring together existing research and data under the umbrella of public health to provide health outcomes analysis and recommendations to inform decision-making of future projects. A health outcome is identified as the health status of an individual (e.g. whether or not one is obese, has diabetes/coronary heart disease/cancer, etc.). To guide the health outcomes analysis, the study will assess community-wide issue areas through qualitative and quantitative approaches (e.g. the quality and extent of bicycle and walking infrastructure and the monitoring of air quality near the border crossings). In addition to analyzing existing research and data, the study also will look to the community and the Stakeholder Group to help identify priority issue areas, such as mobility, connectivity, air quality, etc., within the border community.

Ultimately, the study will serve as a resource to improve community health and to inform future decision making— while considering health outcomes in the planning, development, and implementation processes.

PURPOSE

The purpose of the Border Health Equity Stakeholder Group (BHESG) is to engage a wide range of perspectives and sectors in developing recommendations and guidance for the Border Health Equity Transportation Study and provide feedback and input to SANDAG on key deliverables.

ROLES AND RESPONSIBILITIES

The BHESG will not report directly to any SANDAG policy advisory committees. Instead, as appropriate, SANDAG staff will provide updates on the study to the Committee on Binational Regional Opportunities (COBRO), the Borders Committee, and the Regional Planning Committee (RPC). The BHESG will serve solely as an advisory body and will have no decision-making or other delegated authority. The BHESG will help support SANDAG in the following ways:



- Provide insight to the consultant team on key priority health and mobility issues within the San Ysidro community;
- Provide input on study methodologies
- Review draft and final deliverables; and,
- Advise the consultant team on potential health- and mobility-related recommendations for future developments, projects, and planning efforts (such as the Regional Plan).

MEMBERSHIP

The membership to the BHESG is available to local, state, and federal agencies and community organizations/representatives with interests that reflect the following subject areas: environmental/public health, academia/education, federal/state/local government, US-Mexico Border relations, land use and/or transportation planning, economic development, and social equity. The current membership for the BHESG was developed in collaboration with the lead Consultant team for this project (Chen Ryan Associates) and can be found in Attachment 1.

The membership of the BHESG will be limited to a maximum of twenty members. BHESG members are not characterized as voting or non-voting because members will be providing input to staff only, and will not be making formal recommendations to the SANDAG Policy Advisory Committees. BHESG members will represent their respective organizations, and will not participate as individuals.

MEETING TIME AND LOCATION

The BHESG will meet every other month through the course of the Border Health Equity Transportation Study. All BHESG meetings will be held on the fourth Thursday of every other month from 9:30 AM to 11:00 AM at SANDAG offices on 401 B Street, San Diego, CA 92101, unless otherwise stated. Additional meetings may be scheduled, if needed; however, the occurrence of additional meetings is not anticipated.

DURATION OF EXISTENCE

The BHESG will exist until, and will dissolve automatically on, February 28, 2015, without further action.

BROWN ACT AND CONFLICT OF INTEREST

As appropriate, SANDAG staff will present reports seeking additional input related to the BHETS grant to the Borders Committee and the RPC. SANDAG's Executive Director approved the creation of the BHESG and approved this Charter. For these reasons, BHESG is not subject to the Ralph M. Brown Act.

Input from the BHESG will undergo intervening analysis by SANDAG staff, the Borders Committee, and the RPC. Therefore, members of the BHESG will not be required to submit Statements of Economic Interest (Form 700).

Last Revised: 6/12/2013

Appendix B

White Paper: Health Impacts of Crossings at US-Mexico Land Ports of Entry

Date: Conference occurred May 3 & 4, 2012, Final paper released 2013

Sponsoring Agency: Southwest Consortium for Environmental Research and Policy & U.S. Environmental Protection Agency

Prepared By: San Diego State University Graduate School of Public Health; El Colegio de la Frontera Norte, Tijuana; Universidad Autónoma de Baja California, Mexicali; Universidad Autónoma de Baja California, Tijuana

Purpose: The White Paper summarizes the discussions held on May 3 and 4, 2012, which brought together researchers, community leaders, planners, government agencies, and concerned citizens from both sides of the US-Mexico border together in San Ysidro, CA to discuss issues of critical importance in recognizing health issues related to border crossings along the US-Mexico border. Participants were engaged in presentations on traffic exposures at crossings, health effects of traffic exposures, and potential solutions as well as to jointly identify gaps and needs to make recommendations concerning health impacts of border crossings.

Conclusions: Four major workgroup areas were held during the conference, leading participants to identify significant gaps, needs and recommendations which are summarized for each of the four topics: (1) planning and design, (2) exposure and health, (3) policy and emissions reductions, and (4) border crossing experience.



Health Indicators

- Traffic exposures and health effects at border crossing POEs
- Health effects of traffic emissions
- Environmental justice
- Air quality

Mobility Indicators

- Design & planning recommendations

The Border that Divides and Unites: Addressing Border Health in California

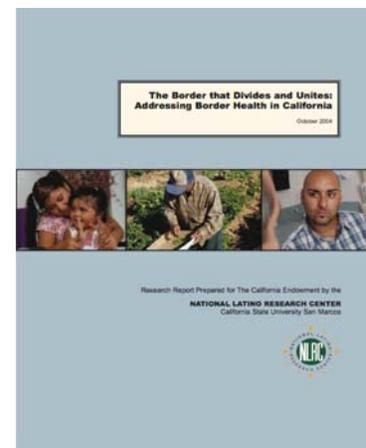
Date: October 2004

Sponsoring Agency: The California Endowment

Prepared By: National Latino Research Center at California State University San Marcos

Purpose: The report covers six months of research regarding the organizational and system-wide needs in border health in California. The project involved thirty-two participants in seventeen agencies that were asked to provide feedback on the most urgent border health issues organizational capacity needs in the border region; and system-wide needs in border health.

Conclusions: Identification of special health indicators that require binational approach due to the demographic, ecological, social and cultural factors that are distinct to the border region. The research identified the most pressing health issues in the region as public health emergencies; access to health care; environmental health; infectious diseases; HIV and AIDS; substance abuse; mental health; and migrant and agricultural worker health. The research demonstrated that isolated and uncoordinated efforts in border health, lack of organizational infrastructure, lack of best practices in border health/binational collaboration, and sustainability play key roles in the capacity of agencies working in the border region.



Health Indicators

- Public health emergencies
- Access to health care
- Mental care
- Migrant worker health
- HIV/AIDS
- Infectious diseases

Healthy Communities Atlas

Date: March 2012

Sponsoring Agency: SANDAG, San Diego County Health and Human Services Agency

Prepared By: Urban Design 4 Health, Inc.

Purpose: The Healthy Communities Atlas serves to compile, visualize, and analyze conditions related to health and wellness in the San Diego region. Existing data was used to develop a variety of health-related indicators at the Census block group level. The Atlas maps and GIS tool can be used to identify areas that already support health, as well as areas that need further investment in infrastructure, programs, or policies.

Demographics such as population density, low-income areas, minority areas, low community engagement, and low mobility areas are identified. Physical activity and active transportation topics include: utilitarian walkability, access to transit stations and stops, parks and open space access, non-motorized trails access, transportation infrastructure support, complete neighborhoods, youth and physical activity support, road design, pedestrian and cyclist involved motor vehicle crashes, and physical activity inhibitors are discussed.

Healthy Communities Atlas



San Diego Region,
California

Prepared for the San Diego
Department of Public Health and
Community Development
by Urban Design 4 Health, Inc.
March 2012



Health Indicators

- Healthcare facility access
- Access to parks
- Physical activity inhibitors
- Complete neighborhoods
- Healthy food access
- Air quality

Mobility Indicators

- Pedestrian & Cyclist motor vehicle crashes
- Access to transit
- Walkability
- Road design
- Complete neighborhoods

Healthy Communities South Region Community Health Improvement Plan

Date: 2010

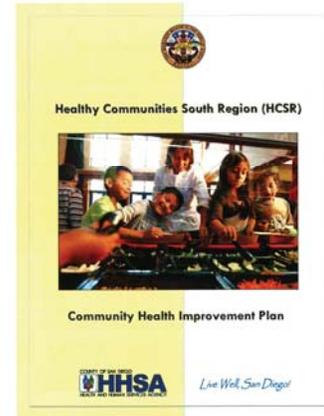
Sponsoring Agency: The California Endowment

Prepared By: County of San Diego Health and Human Services Agency

Purpose: The South Region Health Improvement Plan serves to improve community wellness and reduce health disparities among children and families in the south region of San Diego.

Conclusions: The major needs identified for the community include:

- Lack of physical activity and active living;
- Lack of healthy food access;
- Tobacco use;
- Lack of security and violence; and
- Lack of access to healthcare



Health Indicators

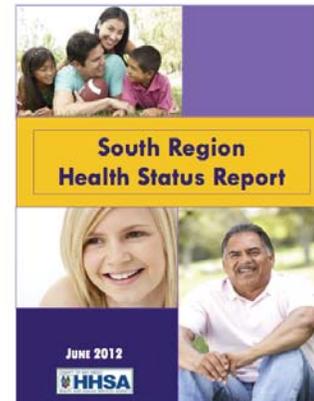
- Healthcare access
- Coronary heart disease
- Stroke
- Diabetes
- Cancer
- Maternal and child health
- Injury
- Substance abuse
- Personal safety
- Obesity
- Lung disease

South Region Health Status Report San Diego County

Date: 2012

Sponsoring Agency: County of San Diego Health and Human Services Agency

Prepared By: County of San Diego Health and Human Services Agency



Purpose: The South Region Health Status Report summarizes health indicators in the South Region SRA and compares the results to the rest of San Diego County. Indicators analyzed include: insurance, healthcare access, communicable disease, non-communicable disease, maternal and child health, and injury.

Health Indicators

- Healthcare access
- Communicable disease
- Non-communicable disease
- Maternal and child health
- Injury

Conclusions: Based on 2009 data, South Region SRA rates that were statistically significantly higher than the county overall for the following indicators: chronic hepatitis C, tuberculosis incidence, diabetes hospitalization, COPD Emergency

department discharge, coronary heart disease hospitalization, asthma emergency department discharge, diabetes emergency department discharge, chlamydia incidence, arthritis emergency department discharge, stroke hospitalization, and dorsopathy emergency department discharge.

Rates that are statistically significantly lower than the county overall include: overdose/poisoning death, COPD death, dorsopathy hospitalization, unintentional injury death, arthritis hospitalization, and deaths due to motor vehicle crashes.

2010 Health Status in the California Border Region

Date: 2010

Sponsoring Agency: California Department of Public Health
Office of Binational Border Health

Prepared By: California Department of Public Health Office of
Binational Border Health

Purpose: The California Office of Binational Border Health was created to help identify health successes and challenges that are specific to the border region and California’s Hispanic population. With the large number of individuals crossing the border, there are public health challenges that must be addressed. The highly mobile border population makes it imperative for health agencies in both California and Mexico to work together effectively. The report uses the Healthy People 2010 objectives as a framework for presenting the health status of the California border region.

Conclusions: The 2010 Health Status report covers demographics, overall health, maternal and child health, environmental health, infectious diseases, mental health, and diabetes and risk factors. For each of the topics a description is provided as to what it is, the importance, the current status in the border region, and what is currently being done to improve the conditions.

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
OFFICE OF BINATIONAL BORDER HEALTH

2010 HEALTH STATUS IN THE CALIFORNIA BORDER REGION



Health Indicators

- Demographics
- Overall health
- Maternal and child health
- Environmental health
- Infectious diseases
- Mental health
- Diabetes and risk factors

Healthy Borders: Intercept Surveys at the San Ysidro Port of Entry

Date: 2011

Sponsoring Agency: The California Endowment

Prepared By: San Diego Prevention Research Center, Casa Familiar

Purpose: The projects specific aims are to assess the impact of the border crossing experience and border delays among pedestrians who cross the San Ysidro Port of Entry; and to evaluate the frequency and purpose of their crossings. Intercept surveys were conducted between May 13, 2010 and August 2, 2010.

Conclusions: A total of 148 surveys were included for analysis. The surveys were divided into three main sections: personal data, border crossing experience at San Ysidro, and additional questions regarding the San Ysidro border. Respondents identify any safety concerns they have both in line and after crossing into San Ysidro, physical discomforts they experience, as well as, their perceptions about wait times to name a few.

Healthy Borders Intercept Surveys at the San Ysidro Port of Entry

Final Report

Prepared by:
San Diego Prevention Research Center
In Association with:
San Diego State University

2011

Funding:
The Healthy Protection Border Project
of Casa Familiar
Sponsored by The California Endowment, 658887320

Mobility Indicators

- Border crossing purpose
- Border crossing perceptions
- Mode of transportation
- Wait time at crossing

Health Indicators

- Health concerns of crossers
- Impact of border violence on crossing rate
- Safety concerns

San Diego Prevention Resource Center Community Door-to-Door Survey

Date: 2009

Sponsoring Agency: San Diego Prevention Resource Center

Prepared By: San Diego Prevention Resource Center

Purpose: The 2009 survey was the SDPRC's second community health survey in 4 communities in South San Diego including San Ysidro, Chula Vista, Imperial Beach, and National City. It focused on physical activity, quality of life and health behaviors of Latinos living near the U.S.-Mexico border. 397 adults completed the survey. The survey included a Quality of Well-Being Scale (QWB), made up of four components: mobility, physical activity, social activity, and a list of symptom and problem complexes. Additional question topics included social mobility, social networks, and civic participation, food security and perceived discrimination. Physical activity was measured using the Global Physical Activity Questionnaire (GPAQ) and data on physical activity community resources, neighborhood cohesion, and safety. Behavioral topics included fast food, fruit and vegetable, alcohol and soda consumption; television viewing, sleep duration and general health questions on disease diagnosis, depression, and use of healthcare.



Health Indicators

- Quality of well-being
- Physical activity
- Social activity
- General health

Salsita Community Mapping Project

Date:

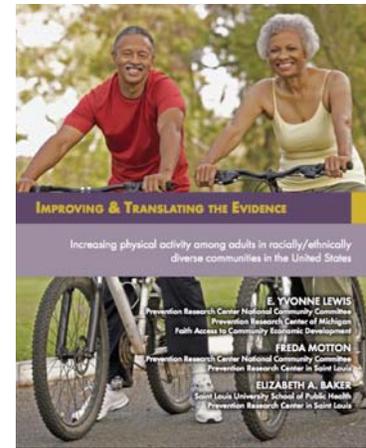
Sponsoring Agency: Centers for Disease Control and Prevention

Prepared By: San Ysidro Health Center, San Diego Prevention Research Center

Purpose: The project aimed to increase the awareness and utilization of resources available for physical activity within the community of San Ysidro in San Diego, CA. A local artist and GIS expert collaborated to create individualized maps identifying accessible physical activity resources such as parks, trails, recreation centers, within a 1/2 mile radius of community members' homes. Additionally, a resource guide was provided, also identifying physical activity resources within San Ysidro but included all information about each resource including hours of operation, cost to participate, and the population served.

Conclusions: Participants stated their appreciation for the maps and did not realize how close physical activity resources were to them. The San Ysidro Health Center noted that in order to increase physical activity in Latino communities, one must take the entire family into consideration during program design. Latino adults often prioritize their children's health over their own. By engaging adults in their children's health, the Health Center promoted the idea that parents needed to model the behavior in which they desire their children to engage.

Another takeaway is the importance in how prevention messages are framed. To promote a program it is important to focus on the skills participants would gain by attending. "For instance, rather than promoting an activity as an obesity prevention class, they framed it as a healthy eating class."



Health Indicators

- Promoting physical activity
- Physical activity resources
- Community health

Shared Destiny: Shaping a Binational Agenda for Health Priorities in the San Diego – Baja California Border Region

Date: May 2006

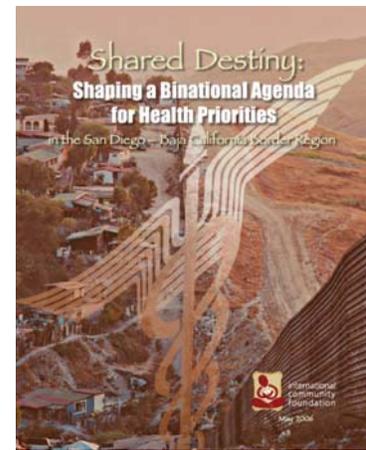
Sponsoring Agency:

Prepared By: International Community Foundation

Purpose: This report highlights existing cross-border health deficits in the San Diego-Baja California region, particularly in the areas of health care access and disease risks and identifies existing institutional barriers that are currently inhibiting expanded cross-border health coverage today. The report identifies that the need for expanded cross-border health services is now more urgent than ever before and this need now goes beyond existing border area residents to the growing number of fixed income Americans now retiring in Baja California due to economic reasons.

Conclusions: A forum of binational public health practitioners was convened to discuss the region's health priorities and begin identifying cross border collaboration opportunities. The forum's participants identified tuberculosis (TB) as a clear example of cross-border risks people face. The incidence of TB at the border is twice as high as elsewhere in the United States. The rate of HIV infection also generated concern among participants. Additionally, obesity, diabetes and mental illness are disproportionately harming Latino youth throughout the San Diego – Baja California region and the state of California.

Regardless of disease, the inability to gain access to healthcare was identified as the critical unmet need that affected the entire cross-border community. The counties along the border where residents are most vulnerable to infectious and non-infectious diseases also have very low levels of health insurance and far fewer healthcare practitioners than the rest of the United States.



Health Indicators

- Health care access
- Disease risks
- Institutional barriers

San Diego Trolley Renewal Project

Date: 2010

Sponsoring Agency: SANDAG

Prepared By: SANDAG & MTS

Purpose: Construction for the Trolley Renewal Project began in 2010 and is scheduled for completion in 2015. One of the significant improvements includes the addition of 65 new low-floor vehicles to ease boarding and exiting the trolley for all users, especially wheelchair users, passengers with strollers, and bicyclists. Construction on the Blue Line, which services San Ysidro, will begin in summer 2014. Additionally, new shelters will be installed that provide more protection from the sun and rain. New benches and trash receptacles will be included at the new shelters also. The \$660 million project is funded primarily through *TransNet*.



Mobility Indicators

- Access to transit
- Transit station amenities

San Ysidro Port of Entry Border Investment Strategy

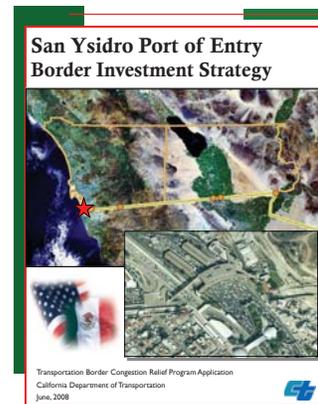
Date: 2006

Sponsoring Agency: Caltrans

Prepared By: Caltrans

Purpose: The San Ysidro Port of Entry Border Investment Strategy includes prioritized pedestrian and vehicular improvements that will improve mobility at the Port of Entry and the surrounding business community. The project includes four specific projects: “1) a half-mile people mover system with various ITS amenities; 2) an assessment of parking needs surrounding the federal island which will include kiss and ride zones and possible smart parking strategies; 3) an enhanced multi-modal transportation hub, which will seamlessly serve cross border travelers; and 4) an updated commercial esplanade in an area that is now referred to as the ‘public plaza deck area’ above Interstate 5.”

Conclusions: Four investment projects were prioritized to improve pedestrian and vehicular mobility.



Mobility Indicators

- Pedestrian infrastructure
- Vehicular infrastructure
- Multi-modal transportation

California-Baja California Border Master Plan

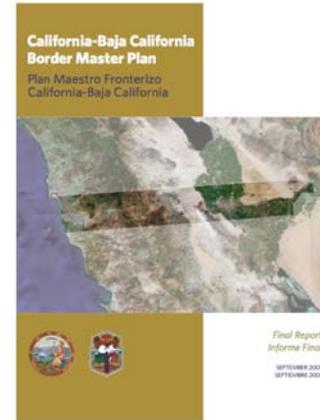
Date: Final Report submitted September 2008

Sponsoring Agency: Caltrans

Prepared By: SANDAG

Purpose: The California-Baja California Border Master Plan is a binational comprehensive approach to coordinate the planning and delivery of projects at land POEs and transportation infrastructure serving those POEs. Primary objectives of the Master Plan include: increase the understanding of POE and transportation planning on both sides of the border, develop criteria for prioritizing projects, and to establish a process for dialogue among federal, state, regional, and local stakeholders in the US and Mexico to identify future needs and coordinate projects.

Conclusions: A current and projected demographic and economic assessment is given. Two sets of evaluation criteria for POE and transportation facilities were developed, one set for roadway and interchanges and another set for rail evaluation. With these criteria, a list of prioritized medium and long-range projects was identified.



Mobility Indicators

- Long range planning
- Binational dialogue
- POE and transportation facility evaluation criteria

San Ysidro Public Facilities Financing Plan Fiscal Year 2008

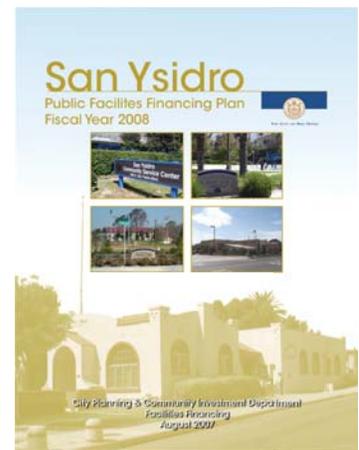
Date: 2007

Sponsoring Agency: City of San Diego

Prepared By: City of San Diego

Purpose: The San Ysidro Public Facilities Financing Plan identifies major public facilities needed in San Ysidro related to transportation, libraries, park and recreation facilities, and fire stations. Each project includes a description, justification for the need, scheduling, and identified and unidentified funds.

Conclusions: The plan identifies fifteen priority transportation projects for the community of San Ysidro, including vehicular, bicycle and pedestrian infrastructure improvement projects. Additional priority projects were identified for parks and recreation, libraries, and a fire station.



Mobility Indicators

- Pedestrian infrastructure
- Vehicular infrastructure
- Bicycle infrastructure
- Traffic calming measures

Third Implementation Plan for the San Ysidro Redevelopment Project Area

Date: 2006

Sponsoring Agency: City of San Diego

Prepared By: City of San Diego

Purpose: The San Ysidro Redevelopment Project Area's Third Implementation Plan identifies projects scheduled during 2006 - 2011 within the San Ysidro Redevelopment Project Area. Additionally, the plan includes a description of the Project Area blighting conditions, goals and objectives, and the strategies and plans to eliminate blight.

Conclusions: For each of the eight priority projects to be implemented during the plan's five-year period a description, project schedule, and explanation of how the projects will improve blighting conditions are provided.

Third Implementation Plan
April 16, 2006 – April 16, 2011

for the
San Ysidro
Redevelopment Project Area

Adopted
April 16, 1996

The Redevelopment Agency of the City of San Diego

Mobility Indicators

- Bicycle infrastructure
- Pedestrian infrastructure
- Vehicular infrastructure
- Identification of inadequate public facilities and infrastructure (public street lighting, sidewalks, parks, and recreational facilities)

San Diego Pedestrian Master Plan

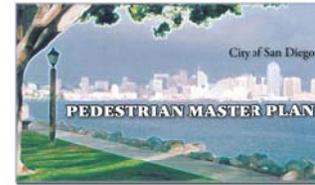
Date: 2006

Sponsoring Agency: City of San Diego

Prepared By: City of San Diego

Purpose: The Pedestrian Master plan serves to guide the planning and implementation of pedestrian improvement projects based on technical analysis and community input to improve pedestrian mobility and enhance neighborhood quality. Additional phases allow for the continued development of the plan in each of the City's community planning areas. The San Ysidro community was scheduled for Phase 4 with the

Conclusions: A list of 10 specific improvement areas was identified in San Ysidro, including concerns, recommendations and potential improvements.



CITY-WIDE IMPLEMENTATION FRAMEWORK REPORT

December 2006



Mobility Indicators

- Pedestrian infrastructure concerns and recommendations

Improving Walkability in San Ysidro

Date: 2005

Sponsoring Agency: California Kids' Plates Program, City of San Diego, Casa Familiar

Prepared By: WalkSanDiego

Purpose: Improving Walkability in San Ysidro provides an analysis of pedestrian collision data, walk audits, and input received at community workshops to prioritize issues and recommendations for pedestrian improvements within the community of San Ysidro.

Conclusions: Four locations were identified as having the highest priority for improvements, including: Cypress Drive; the trolley stop at Seaward Avenue and the gateway to Cypress Drive; the corner of Hall Avenue and Olive Drive; and intersections at Hall Avenue and E & W Park Avenue.

Improving Walkability in San Ysidro



Prepared by



for
Casa Familiar and the City of San Diego
Funded by the California Kids' Plates Program

Mobility Indicators

- Pedestrian infrastructure
- Pedestrian safety
- Traffic calming measures

San Ysidro Intermodal Transportation Center

Date: Ongoing (Market Assessment & Parking Overview completed in March 2013)

Sponsoring Agency: Caltrans

Prepared By: IBI Group & BAE Urban Economics (*Market Assessment and Parking Overview*)

Purpose: Initial planning efforts are underway to redesign and expand the San Ysidro Intermodal Transportation Center (SYITC). The SYITC is being designed to be an iconic development and gateway to California and the United States. The SYITS Study will analyze the feasibility and cost estimates for accommodating potential public/private uses and services within the center including:

- Public transportation facilities and services, as well as access for private vehicles, jitneys, taxis and long-distance bus services
- Improved bicyclists and pedestrian facilities and access to the border and San Ysidro Boulevard commercial area
- Retail, office, educational, and general administrative buildings
- Paid off-street parking
- Drop-off/pickup and waiting areas

Conclusions: The initial *Market Analysis and Parking Overview* identified development opportunities for retail, lodging, meeting space, and office and institutional space. Estimations for the potential limits to accommodate those land uses are summarized in the table below:

Land Use	Square Feet Estimate
Retail	<ul style="list-style-type: none"> • 30,000 to 105,000 SF by 2020 • 42,000 to 170,000 SF by 2035
Lodging	75 rooms
Meeting Space	3,000 SF
Institutional	Up to 20,000 SF



Mobility Indicators

- Multi-modal infrastructure
- Multi-modal facilities
- Parking facilities

The 2030 demand estimates indicate a weekday deficiency of 692 parking spaces and 1,546 on the weekend.

San Diego Trolley Renewal Project

Date: 2010

Sponsoring Agency: SANDAG

Prepared By: SANDAG & MTS

Purpose: Construction for the Trolley Renewal Project began in 2010 and is scheduled for completion in 2015. One of the significant improvements includes the addition of 65 new low-floor vehicles to ease boarding and exiting the trolley for all users, especially wheelchair users, passengers with strollers, and bicyclists. Construction on the Blue Line, which services San Ysidro, will begin in summer 2014. Additionally, new shelters will be installed that provide more protection from the sun and rain. New benches and trash receptacles will be included at the new shelters also. The \$660 million project is funded primarily through *TransNet*.

SAN DIEGO TROLLEY RENEWAL PROJECT FACT SHEET

Introduction
As the San Diego Trolley celebrates 40 years of successful operations, a reimagining of the Blue and Orange Lines and high floor trolleys is underway. When the \$660 million project is complete, passengers will benefit from new, more efficient and modern trolleys.

TransNet
Trolley users of the system's original cars are nearing the end of their useful lives. The Blue Line opened in 1981, San Diego's first trolley line. The Orange Line and the Blue Line opened in 1996. The first trolley opened in 1981, and the second trolley opened in 1986. Some trolleys have been upgraded at MTS's 17 trolley shops.

SANDAG
To upgrade the older trolley systems, the Metropolitan Transit System (MTS) and SANDAG teamed up for the Trolley Renewal Project.

Construction began in fall 2010 and is scheduled to be complete in 2015. Work includes:
- Replacing 65 low-floor trolleys with modern, wheelchair accessible trolleys.
- Replacing 65 high-floor trolleys with modern, wheelchair accessible trolleys.
- Replacing 65 high-floor trolleys with modern, wheelchair accessible trolleys.
- Replacing 65 high-floor trolleys with modern, wheelchair accessible trolleys.

Key components:
- 65 new low-floor vehicles.
- 65 new high-floor vehicles.
- 65 new high-floor vehicles.
- 65 new high-floor vehicles.

Timeline of the project:
- Construction began in fall 2010 and is scheduled to be complete in 2015.
- Work includes: Replacing 65 low-floor trolleys with modern, wheelchair accessible trolleys.
- Replacing 65 high-floor trolleys with modern, wheelchair accessible trolleys.
- Replacing 65 high-floor trolleys with modern, wheelchair accessible trolleys.
- Replacing 65 high-floor trolleys with modern, wheelchair accessible trolleys.

Mobility Indicators

- Access to transit
- Transit station amenities

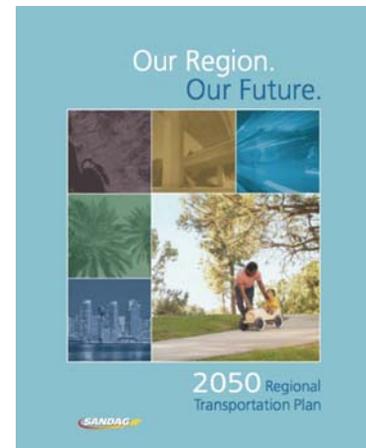
2050 Regional Transportation Plan

Date: Adopted October 2011

Sponsoring Agency: SANDAG

Prepared By: SANDAG

Purpose: The 2050 RTP is the guiding document for investing local, state, and federal transportation funds in the region over the next 40 years. The largest proportion of the funds will be directed toward transit (36% in the first 10 years), with 34 percent to highway improvements, and 21 percent to local roads and streets.



Mobility Indicators

- Pedestrian/Bicycle infrastructure
- Public transit infrastructure
- Parking facilities
- Vehicular infrastructure

San Ysidro Community Plan Update

Date: 2010 - On-going

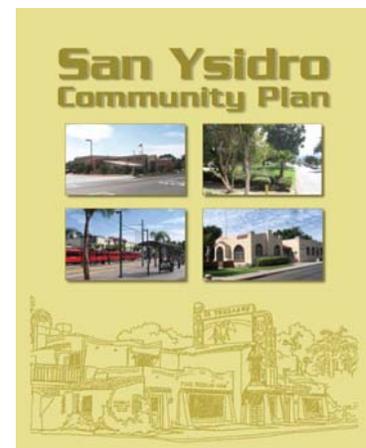
Sponsoring Agency: City of San Diego

Prepared By:

Purpose: The City of San Diego is currently in the process of updating the San Ysidro Community Plan to guide the long-range, physical development in the community. The current Plan was written in 1990 and includes amendments through December 2003. The updated plan aims to convey community goals, objectives and recommendations with an emphasis on sustainable design principles and policies. The goals identified by the City for the community update process include: ensure consistency between the community's land use policies with the General Plan, the infrastructure strategy, and the redevelopment strategy; to apply appropriate zoning that is consistent with plan policies; to prepare a master or program Environmental Impact Report (EIR) that evaluates cumulative impacts; and to establish community specific policies that are organized and formatted to compliment the general Plan and its elements:

- Land Use (including Housing and Community Planning)
- Urban Design
- Public Facilities, Services and Safety
- Economic Prosperity
- Mobility
- Conservation
- Noise
- Historic Preservation
- Recreation

Conclusions: Projected completion of the updated Community Plan & EIR Final/Public Hearings is January 2015.



Mobility Indicators

- Guiding document for the community
- Multi-modal development

San Ysidro POE Reconfiguration Mobility Study

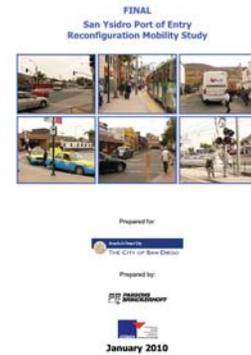
Date: Final study submitted January 2010

Sponsoring Agency: City of San Diego

Prepared By: Parsons Brinckerhoff & Estrada Land Planning

Purpose: To evaluate border expansion issues and conduct a mobility study to develop concepts to address circulation, access, and community integration at the border. Specific goals of the study include: identifying existing and future conflicts and deficiencies in transportation, circulation, and border access; establishes transportation facility needs for autos, light rail, public buses, private buses, jitneys, shuttles, taxis, bicycles, and pedestrians; address integration of border facilities, circulation, and access with the San Ysidro community; creates a concept for reconfiguring border transportation facilities to address the conflicts, deficiencies, access, and needs.

Conclusions: The preferred alternative conceptual site plan for an ITC incorporates a two-level rail/bus passenger station, an at-grade pick-up/drop-off area for taxis, shuttles, and jitneys. Potential commercial uses integrated into the site design, and a pedestrian plaza, promenade and pathways that connect to on-site services and the community. The concept would incorporate symbolic architectural design into the ITC facilities.



Mobility Indicators

- POE reconfiguration
- Pedestrian facility
- Bicycle facility
- Vehicular infrastructure
- Access

Riding to 2050: San Diego Regional Bicycle Plan

Date: 2012

Sponsoring Agency: SANDAG

Prepared By: SANDAG

Purpose: The Regional Bicycle Plan is the region’s guiding document to create a “diverse regional bicycle system of interconnected bicycle corridors, support facilities, and programs to make bicycling more practical and desirable to a broader range of people in our region.” The plan outlines recommendations to realize these goals, including bicycle infrastructure improvements; education, safety, and enforcement programs; implementation strategies, and policy and design guidelines.



Mobility Indicators

- Bicyclist Safety
- Barriers facing bicyclists

San Ysidro Land POE Improvements Project

Date: 2009 - Current

Sponsoring Agency: United States General Services Administration

Prepared By: United States General Services Administration

Purpose: A three phase Improvement project is underway for the San Ysidro Land Port of Entry (LPOE), which includes a reconfiguration and expansion of the existing LPOE. The project's purpose is to improve operational efficiency, security, and safety for cross-border travelers and federal agencies at the San Ysidro LPOE. Specific project goals include: increase vehicle and pedestrian inspection processing capacities; reduce northbound vehicle and pedestrian queues and wait times to cross the border; improve the safety for vehicles, pedestrians, and employees; modernize facilities to accommodate current and future demands and implementation of border security initiatives.

Conclusions: Phase 1 of the project includes improvements to the northbound facilities: primary inspection area, secondary inspection area, auto seizure and impound facilities, operations center, employee parking structure, pedestrian facilities, southbound pedestrian crossing, and a central plant. Phase 2 improvements would involve the reconfiguration of the eastern operational area and construction of new buildings. Proposed Phase 3 improvements include the reconfiguration of the southbound facilities to connect with Mexico's planned El Chaparral facility.

San Ysidro Land Port of Entry
Improvements Project
San Ysidro, California
Final Environmental Impact Statement
Volume 1



Prepared by the
United States General Services Administration
GSA
August 2009

Mobility Indicators

- Pedestrian facility
- Bicycle facility
- Parking facilities
- Vehicular infrastructure

San Ysidro Mobility Strategy

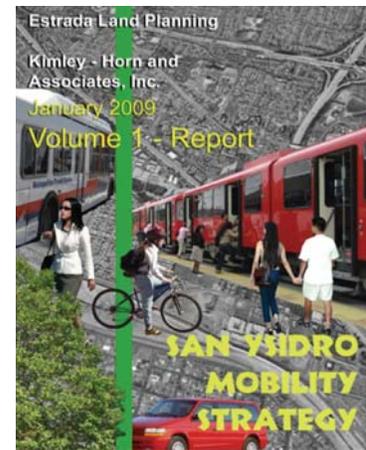
Date: January 2009

Sponsoring Agency: City of San Diego

Prepared By: Estrada Land Planning, Kimley-Horn and Associates, Inc.

Purpose: The San Ysidro Mobility Strategy measures and evaluates the existing and future vehicular, pedestrian, bicycle, and transit travel patterns and needs for the San Ysidro Community. Some of the purposes identified include "To develop a mobility plan; To study traffic and pedestrian circulation and how it affects sustainable long-term economic growth, revitalization, mobility and parking throughout the community of San Ysidro; To identify strategies and improvement measures that improve traffic circulation, address parking demand, and promote walkability, bicycling and improved accessibility to transit use for residents, visitors and business people."

Conclusions: Through evaluation of existing and future condition data, community survey data, and traffic analysis several improvement projects were identified and recommendations were made.



Mobility Indicators

- Pedestrian infrastructure
- Bicycle infrastructure
- Vehicle infrastructure
- Parking facilities

Appendix C

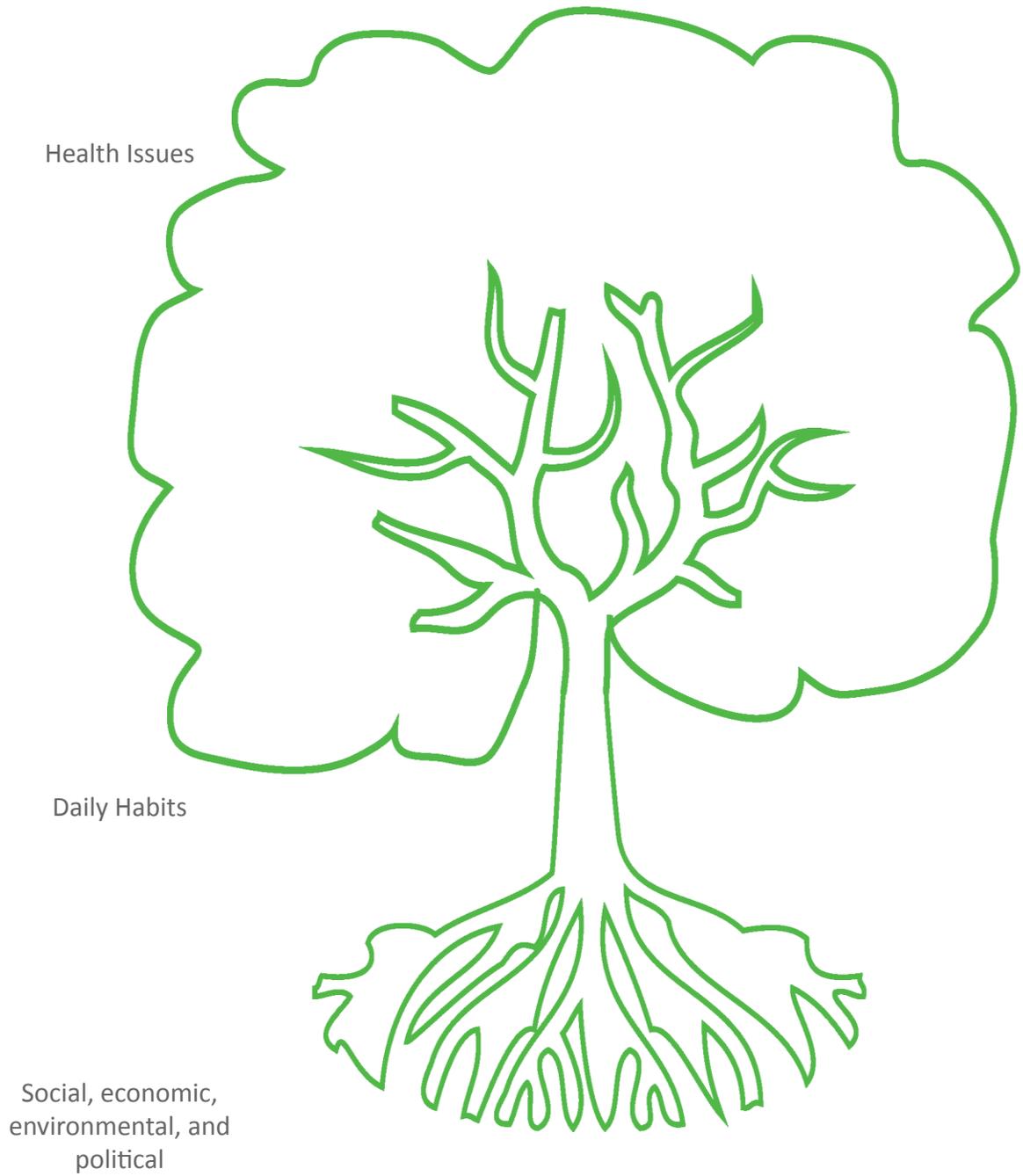
Talking about Health, Place, and Policy - Tree Exercise

This exercise provides a useful framework to discuss how health outcomes are a product of social determinants.

Directions:

1. Draw a bare tree with roots, a trunk, and branches.
2. Ask participants to list several disease outcomes prevalent in their community. These may include asthma, diabetes, obesity, injury, heart attacks, and depression. List these diseases as the leaves on the tree.
3. Next, ask people to list behaviors that contribute to the disease outcomes they identified. These may include overeating, lack of physical activity, and substance abuse. List these on the trunk of the tree.
4. Finally, ask people to list social, economic, and political determinants that influence the behaviors they described. These may include poverty, racism, unaffordable housing, lack of public transportation and grocery stores, and air pollution. List these determinants at the roots of the tree.
5. These determinants represent the “root causes of disease.” Describe how some of the root causes impact health outcomes through behaviors (e.g., lack of a grocery store impacts diet and therefore diabetes) and others impact health outcomes directly (e.g., air pollution leads to respiratory disease).

Very often, people begin by listing either behaviors or root causes when initially asked about disease outcomes. The facilitator must write these things in the correct part of the tree to clearly illustrate antecedents to poor health. At the end, state that HIA can be described as a process to assess how a project or plan impacts the roots of the tree, and through those determinants, the disease outcomes listed on the branches. See below for a sample tree.



Health Issues

Daily Habits

Social, economic,
environmental, and
political

Appendix D

Data Sources

Health and demographic data are available from a variety of sources, represented by three different categories of data. Population data, such as the census, is collected from the entire population. Sample or survey data are collected from a portion of the population, and extrapolated to represent the entire population. Administrative data are collected based on an organization's day-to-day operations, such as the prehospital database. The following data sources were used in the preparation of this report.

American Community Survey (ACS): ACS is a new nationwide survey designed to provide communities a fresh look at how they are changing. It is intended to eliminate the need for the long form in the 2010 Census. The ACS collects information from U.S. households similar to what was collected on the Census 2000 long form, such as income, commute time to work, home value, veteran status, and other important data. Information is available by county.

Emergency Department Data (ED Data): ED data is collected and maintained for most emergency hospitals in San Diego County. ED data elements include patient's home zip code, demographic information, source of payment, disposition, diagnoses and procedures performed for all patients treated and discharged from the ED.

HIV/AIDS Reporting System (HARS): HARS is used to report HIV and AIDS cases in San Diego County. HIV reporting began recently (July 2002), has not been evaluated and therefore is not available for zip code level analysis. The number of AIDS cases is available by zip code if the total is 5 or more.

Hospital Discharge Data: Discharge data is collected and maintained for most inpatient facilities in San Diego County. Discharge data elements include patient's home zip code, demographic information, source of payment, disposition, diagnoses and procedures performed for all patients admitted to the hospital for any condition.

Medical Examiner's Data: EMS receives an Investigative Summary and Autopsy for every individual who dies in San Diego County from a traumatic injury. Medical Examiner's Records contain injury related information including date and time of injury, incident location, patient home zip code, external cause of injury (ICD9 CM E code), age, sex, race/ethnicity, vehicle make and type, law enforcement agency and report number, mechanism of injury and detailed narrative of injuries sustained.

Prehospital Database: EMS receives a prehospital patient record (PPR) for every patient seen by a paramedic or emergency medical technician from 911 calls. The PPR contains information including demographics, incident zip code location, chief complaint, patient status, injury event information, restraint use, contributing factors, times and outcomes. At this time, only those calls in which paramedic or EMT made contact with a MICN at a base hospital are included in this data.

San Diego Association of Governments (SANDAG): SANDAG creates and maintains a tremendous quantity of demographic, economic, land use, transportation and criminal justice information about the San Diego region. Demographic data includes population characteristics like age, education, and employment. SANDAG develops annual demographic estimates and long range forecasts in addition to maintaining census data files. Data is available by County, SRA, zip code, and census tract.

STD Morbidity Surveillance Data: Data is available for three STDs: Chlamydia, gonorrhea and syphilis (primary and secondary). Information on age, gender, race/ethnicity are available for all 3 diseases. Data is also available at the zip code level, although this data is incomplete.

Statewide Integrated Traffic Record System (SWITRS): SWITRS is traffic collision data collected by the California Highway Patrol. Collisions with personal injury on public roads are included. Detailed information on the circumstances of the crash, drivers, passengers, and other victims are available by incident zip code.

Trauma Registry: EMS receives a Trauma Registry for every trauma patient admitted to any of the designated trauma center hospitals who meets one or more of the following criteria: length of hospitalization of 24 hours or more, death due to traumatic injuries, or transfer to or from another acute care hospital.

Vital Records Data: A birth certificate is required for every live birth in San Diego County; a death certificate is completed for every person who dies in San Diego County. Vital records data includes information on birth (e.g. weight) or death (e.g. underlying and contributing causes of death) and basic demographic information by zip code.

Additional abbreviations used in sources:

CA DPH – State of California, Department of Public Health

CDC – Centers for Disease Control and Prevention

CHIP – Community Health Improvement Partners

HASD & IC – Hospital Association of San Diego & Imperial Counties

NCHS – National Center for Health Statistics

NVSS- National Vital Statistics System

OSHPD – California Office of Statewide Health Planning and Development

GLOSSARY: Health Indicator Terms

Glossary of Health Indicator Terms

The following are definitions of health indicator terms for population and service data used in this document, including which databases data comes from (noted in italics). For more information, see **Data Sources**.

Disease data here represent only principal diagnoses (or underlying cause of death) and do not include secondary diagnoses. Injury data using ICD10 coding (death) only uses underlying cause of death; injury data using Ecodes from Emergency Department and Hospital discharges include only primary Ecode (mechanism of injury).

The majority of the data here are reported by location of residence of the subject. Non-fatal motor vehicle injury data from SWITRS is reported by location of occurrence; while motor vehicle death data (from Death Statistical Master Files) is reported by location of residence.

Population and Service Data Definitions:

Coronary Heart Disease: ischemic and hypertensive heart disease, ICD9 codes 402, 410-414, 429.2; ICD10 codes I11, I20-I25. *Death, Hospital, Emergency Department.*

Cardiac Chief Complaint: cardiac chest pain, congestive heart failure, palpitations and STEMI (st-elevation myocardial infarction). *Prehospital (911).*

Stroke: cerebrovascular disease, ICD9 codes 430-438; ICD10 codes I60-I69. *Death, Hospital, Emergency Department.*

Stroke Chief Complaint: cardiovascular accident (cva). *Prehospital (911).*

Diabetes: Diabetes Mellitus, includes insulin-dependent and non insulin-dependent diabetes, ICD9 code 250; ICD10 codes E10-E14. *Death, Hospital, Emergency Department.*

Asthma: ICD9 code 493; ICD10 codes J45-J46. *Death, Hospital, Emergency Department.*

Chronic Obstructive Pulmonary Disease (COPD): ICD9 codes 490-492, 496; ICD10 codes J40-J44. *Death, Hospital, Emergency Department.*

Respiratory-related Chief Complaint: asthma, chronic obstructive pulmonary disease (COPD) and respiratory distress. *Prehospital (911).*

Female Breast Cancer: ICD10 code C50. *Death.*

Prostate Cancer: ICD10 code C61. *Death.*

Cervical Cancer: ICD10 code C53. *Death.*

Colorectal Cancer: cancer of the colon, rectum or anus, ICD10 codes C18-C21. *Death.*

Lung Cancer: cancer of the trachea, bronchus or lung, ICD10 codes C33-C34. *Death.*

Arthritis: ICD9 codes 95.6, 95.7, 98.5, 99.3, 136.1, 274, 277.2, 287.0, 344.6, 353.0, 354.0, 355.5, 357.1, 390, 391, 437.4, 443.0, 446, 447.6, 696.0, 710-716, 719.0, 719.2-719.9, 720-721, 725-727, 728.0-728.3, 728.6-728.9, 729.0-729.1, 729.4. *Hospital, Emergency Department.*

Dorsopathies: ICD9 codes 720-724. *Hospital, Emergency Department.*

Tuberculosis (TB): new active cases reported to and confirmed by County Public Health Services, see [CDC clinical case definition](#). *TB Registry.*

Chronic Hepatitis C: cases reported by providers* to County Public Health Services, see [CDC clinical case definition](#). *Hepatitis Reporting.*

AIDS: new cases reported by providers* to County Public Health Services, cases need not be investigated and confirmed, see [CDC clinical case definition](#). *HIV/AIDS Reporting System.*

Chlamydia: new cases reported by providers* to County Public Health Services, cases need not be investigated and confirmed, see [CDC clinical case definition](#). For estimated Chlamydia (Regional Tables), cases with unknown residence are statistically distributed to Regions to better estimate Regional needs. SRA Tables do not include a substantial number of cases reported in San Diego County, due to cases with unknown residence. Approximately 30%, or 2500 Chlamydia cases per year, are missing residence data. Chlamydia numbers are underestimated at the SRA level. *STD Reporting.*

Gonorrhea: new cases reported by providers* to County Public Health Services, cases need not be investigated and confirmed, see [CDC clinical case definition](#). For estimated Gonorrhea, cases with unknown residence are statistically distributed to Regions to better estimate Regional needs. SRA Tables do not include a substantial number of cases reported in San Diego County, due to cases with unknown residence. Approximately 30%, or 600 gonorrhea cases per year, are missing residence data. Gonorrhea numbers are underestimated at the SRA level. *STD Reporting.*

Primary and Secondary Syphilis: new cases reported to and confirmed by County Public Health Services, see [CDC clinical case definition](#). *STD Reporting.*

Live Birth: a product of conception, which after complete expulsion or extraction from the mother, breathes or shows any other evidence of life. This is not synonymous with the term “pregnancy”, which can result in a miscarriage, fetal death, induced abortion or live birth. *MCFHS.*

Early Prenatal Care: Care beginning during the 1st trimester of pregnancy.

Rates (%) are calculated amongst those births whose start of prenatal care is known (i.e. those whose start of care is unknown or missing are excluded from the denominator).

MCFHS.

Preterm birth: birth prior to 37 completed weeks of gestation. *MCFHS.*

Low birth weight: birth weight less than 2,500 g (approximately 5lbs, 8oz). *MCFHS.*

Very low birth weight: birth weight less than 1,500 g (approximately 3lbs, 5oz).

MCFHS.

Fetal mortality: number of deaths of fetuses more than 20 weeks gestation per 1,000 live births and fetal deaths. *MCFHS.*

Infant mortality: number of deaths of infants under one year of age per 1,000 live births.

MCFHS.

Unintentional Injury: ICD9 Ecodes E800-E869, E880-E929; ICD10 codes V01-X59, Y85-Y86. This generalized unintentional injury may overlap with specific indicators below, such as drowning, smoke/fire, suffocation, falls, motor vehicle or pedestrian deaths, as well as the unintentional portion of overdose/poisoning and firearm injuries. *Death, Hospital, Emergency Department.*

Drowning: Accidental drowning and submersion, including those caused by accident to watercraft or related to water-transport, ICD10 codes W65-W74, V90, V92. *Death.*

Accidental exposure to smoke, fire or flame: ICD10 codes X00-X09. *Death.*

Unintentional suffocation: ICD10 codes W75-W84. *Death.*

Fall-related: accidental falls, ICD9 Ecodes E800-E886, E888; ICD10 codes W00-W19. *Death, Hospital, Emergency Department.*

Overdose/Poisoning: all intents, ICD-9 Ecodes E850-E869, E950-E952, E962; ICD10 codes X40-X49, X60-X69, X85-X90, Y10-Y19, Y35.2, Y40-59, Y60-69, U01.6-U01.7. *Death, Hospital, Emergency Department.*

Motor Vehicle Injury: unintentional injury of anyone involved in a motor vehicle accident (collision or non-collision) on a public road, including occupants, pedestrians, and cyclists, ICD9 codes E810-819; ICD10 codes V30-V39 (.4-.9), V40-V49 (.4-.9), V50-V59 (.4-.9), V60-V69 (.4-.9), V70-V79 (.4-.9), V81.1, V82.1, V83-V86 (.0-.3), V20-V28 (.3-.9), V29 (.4-.9), V12-V14 (.3-.9), V19 (.4-.6), V02-V04 (.1, .9), V09.2, V80 (.3-.5), V87 (.0-.8), V89.2. *Death, Hospital.*

Total Motor Vehicle Accident Injuries: those injured in motor vehicle accidents occurring on public roads; injured may be cyclists, pedestrians or occupants of motor vehicles (such as cars, trucks, or buses). Data here is based on injuries involving a motor

vehicle in transport (in motion or readiness for motion) and is not defined by ICD codes of collision or non-collision. Data is by location of occurrence. *SWITRS*.

Alcohol-related: those injured in motor vehicle accidents occurring on public roads where alcohol was involved. The drinking driver need not be injured and need not be declared at fault, nor tested for being under the influence of alcohol. Data is by location of occurrence. *SWITRS*.

Drinking Drivers: drivers noted as drinking, involved in motor vehicle accidents occurring on public roads with injury to any party. The drinking drivers need not be injured and need not be determined to be at fault nor impaired. Data is by location of occurrence. *SWITRS*.

Active Restraint Use: those injured in motor vehicle accidents occurring on public roads where active restraints were used. Rates are calculated amongst those whose status of restraint use/non use was known. Data applies to those ages 6 years and older. Data is by location of occurrence. *SWITRS*.

Child Restraint Use: those injured in motor vehicle accidents occurring on public roads where child restraints were used. Rates are calculated amongst those whose status of restraint use/non use was known. Data applies to those ages 0-5 years. Data is by location of occurrence. *SWITRS*.

Pedestrian injury attributed to Motor Vehicle Accidents: unintentional injury of pedestrians involved in motor vehicle accidents on a public road, ICD9 codes E810-819(.7); ICD10 codes V02-V04 (.1, .9), V09.2. *Death, Hospital*.

Homicide: deaths that are intentionally inflicted by another, ICD10 codes U01-U02, X85-Y09, Y87.1. *Death*.

Assault injury: injuries that are intentionally inflicted by another, ICD9 codes E960-E969. *Hospital, Emergency Department*.

Suicide: deaths that are intentionally inflicted by self, ICD10 codes U03, X60-X84, Y87.0. *Death*.

Self-inflicted injury: injuries that are intentionally inflicted by self, ICD9 codes E950-E959. *Hospital, Emergency Department*.

Firearm-related: all intents, ICD9 Ecodes E922, E955.0-E955.4, E965.0-E965.4, E970, E985.0-E985.4; ICD10 codes W32-W34, X72-X74, U01.4, X93-X95, Y22-Y24, Y35.0. *Death, Hospital, Emergency Department*.

Dental-related: injury as well as non-injury medical/dental primary diagnoses, ICD9 codes 521-523, 525.3, 525.9, 873.63, 873.73. *Emergency Department*.

* Providers may refer to health care providers (e.g. physicians, nurses, or hospital administrators), laboratories, or school administrators who are legally mandated to report diseases indicated in CCR, Title 17, sections 2500, 2508, and 2505.

Appendix E

Relation of TRANSPORTATION variables to health, adjusted for percent seniors and low income

Correlations					
		TRAF_VOLUM	PER_DU_TSA	ARTER_DEN	PER_DU_POL
PCT_ER_MVSB	Correlation	-.506	-.147	-.459	-.245
	Significance (2-tailed)	.002	.392	.005	.151
	df	34	34	34	34
PCT_ER_PEDSB	Correlation	-.096	.298	-.194	.171
	Significance (2-tailed)	.577	.077	.257	.320
	df	34	34	34	34
PCT_ER_PSYCH	Correlation	-.015	.026	-.203	.218
	Significance (2-tailed)	.932	.881	.236	.202
	df	34	34	34	34
PCT_ER_ANXIETY	Correlation	.047	.284	-.060	.225
	Significance (2-tailed)	.786	.093	.729	.187
	df	34	34	34	34
PCT_ER_CHR_ALCOHOL	Correlation	.095	.512	-.005	.252
	Significance (2-tailed)	.582	.001	.977	.138
	df	34	34	34	34
PCT_ER_ACU_ALCOHOL	Correlation	.198	.472	.046	.431
	Significance (2-tailed)	.248	.004	.788	.009
	df	34	34	34	34
PCT_ER_CHR_SUBSTANCE	Correlation	.170	.259	-.031	.356
	Significance (2-tailed)	.321	.127	.857	.033
	df	34	34	34	34
PCT_ER_ACU_SUBSTANCE	Correlation	-.484	-.198	-.487	-.393
	Significance (2-tailed)	.003	.247	.003	.018
	df	34	34	34	34
PCT_ER_CHD	Correlation	-.004	.105	-.049	.252
	Significance (2-tailed)	.981	.543	.775	.138
	df	34	34	34	34
PCT_ER_DIABETES	Correlation	-.307	.107	-.320	-.008
	Significance (2-tailed)	.068	.533	.057	.965
	df	34	34	34	34
PCT_ER_STROKE	Correlation	.261	.265	.108	.264
	Significance (2-tailed)	.125	.118	.529	.120
	df	34	34	34	34
PCT_ER_COPD	Correlation	-.099	.198	-.214	.045
	Significance (2-tailed)	.567	.247	.209	.795
	df	34	34	34	34
PCT_ER_ASTHMA	Correlation	-.146	.271	-.259	.145
	Significance (2-tailed)	.396	.109	.128	.398
	df	34	34	34	34
PCT_ER_ARTHRITIS	Correlation	-.143	.325	-.192	.244
	Significance (2-tailed)	.407	.053	.262	.152
	df	34	34	34	34

Relation of PHYSICAL ACTIVITY variables to health, adjusted for percent seniors and low income

		Correlations										
		CS_YPA S	CS_TSF Y	WLK_IND_0 6	CS_TI S	PER_DUBIK 2	SIDE_C_PE R	CS_PED_SA F	PED_C_RAT E	CS_PA I	CS_CYC_SA F	CYC_C_RATE
PCT_ER_MVSB	Correlation	-.477	-.166	-.309	-.420	-.416	-.532	-.007	.339	-.280	.460	-.122
	Significance (2-tailed)	.003	.332	.067	.011	.012	.001	.967	.043	.098	.005	.477
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_PEDSB	Correlation	-.081	-.202	.262	.000	-.044	-.157	-.217	.518	-.037	.021	.213
	Significance (2-tailed)	.640	.237	.123	.999	.799	.360	.204	.001	.832	.905	.213
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_PSYCH	Correlation	-.070	-.235	.210	-.113	-.136	-.153	-.267	.374	.022	-.045	.009
	Significance (2-tailed)	.686	.168	.219	.511	.428	.373	.116	.024	.900	.792	.958
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_ANXIET Y	Correlation	.073	-.197	.215	.098	.018	-.015	-.214	.433	-.062	.007	-.026
	Significance (2-tailed)	.672	.249	.208	.571	.919	.932	.211	.008	.720	.965	.882
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_CHR_ ALCOHOL	Correlation	.255	.054	.628	.318	.339	.176	-.011	.583	-.170	.072	.402
	Significance (2-tailed)	.134	.753	.000	.059	.043	.303	.949	.000	.320	.677	.015
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_ACU_ ALCOHOL	Correlation	.307	.052	.676	.329	.335	.239	-.072	.630	-.016	-.095	.451
	Significance (2-tailed)	.069	.764	.000	.050	.046	.160	.676	.000	.925	.583	.006
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_CHR_ SUBSTANCE	Correlation	.157	-.103	.425	.148	.142	.067	-.281	.353	.259	-.105	.061
	Significance (2-tailed)	.360	.551	.010	.390	.407	.699	.097	.035	.127	.543	.723
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_ACU_ SUBSTANCE	Correlation	-.430	-.072	-.231	-.367	-.308	-.429	.250	.316	-.569	.425	.094
	Significance (2-tailed)	.009	.675	.175	.028	.068	.009	.141	.061	.000	.010	.585
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_CHD	Correlation	-.003	-.130	.036	.005	-.016	.012	-.183	.168	.217	-.122	-.155
	Significance (2-tailed)	.984	.448	.835	.976	.927	.945	.284	.327	.203	.477	.366
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_ DIABETES	Correlation	-.134	-.017	-.092	-.095	-.153	-.208	.121	.357	-.254	.419	-.176
	Significance (2-tailed)	.436	.922	.593	.581	.374	.223	.481	.033	.135	.011	.304
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_STROKE	Correlation	.266	-.138	.224	.252	.249	.205	-.253	.012	.434	-.172	-.210
	Significance (2-tailed)	.117	.421	.188	.138	.144	.231	.136	.942	.008	.317	.219
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_COPD	Correlation	-.053	-.183	.067	-.013	-.122	-.139	-.136	.341	-.202	.148	-.131
	Significance (2-tailed)	.759	.284	.698	.942	.478	.418	.428	.042	.238	.390	.446
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_ASTHM A	Correlation	.038	-.055	.058	.034	-.039	-.054	.077	.465	-.009	.226	-.078
	Significance (2-tailed)	.826	.748	.735	.844	.823	.754	.657	.004	.957	.186	.653
	df	34	34	34	34	34	34	34	34	34	34	34
PCT_ER_ARTHRI TIS	Correlation	.087	-.035	.213	.077	.020	-.020	.070	.612	-.202	.182	.136
	Significance (2-tailed)	.612	.838	.212	.655	.909	.908	.685	.000	.236	.287	.430
	df	34	34	34	34	34	34	34	34	34	34	34

Relation of ACCESS variables to health, adjusted for percent seniors and low income

		Correlations					
		PER_DU_PARK	PER_DU_LIB	PER_DU_HEA	PER_DU_ELE	PER_DU_DAY	NU_CN_INDI
PCT_ER_MVSB	Correlation	-.361	-.144	.040	-.151	-.333	-.318
	Significance (2-tailed)	.030	.402	.819	.380	.047	.058
	df	34	34	34	34	34	34
PCT_ER_PEDSB	Correlation	.037	.233	.298	.254	.142	.152
	Significance (2-tailed)	.829	.171	.078	.134	.410	.377
	df	34	34	34	34	34	34
PCT_ER_PSYCH	Correlation	-.040	.164	.343	.255	.243	.120
	Significance (2-tailed)	.818	.340	.041	.133	.154	.485
	df	34	34	34	34	34	34
PCT_ER_ANXIETY	Correlation	.193	.178	.421	.394	.274	.259
	Significance (2-tailed)	.258	.300	.010	.017	.106	.127
	df	34	34	34	34	34	34
PCT_ER_CHR_ALCOHOL	Correlation	.257	.591	.592	.336	.438	.440
	Significance (2-tailed)	.130	.000	.000	.045	.008	.007
	df	34	34	34	34	34	34
PCT_ER_ACU_ALCOHOL	Correlation	.343	.504	.544	.379	.502	.445
	Significance (2-tailed)	.040	.002	.001	.022	.002	.007
	df	34	34	34	34	34	34
PCT_ER_CHR_SUBSTANCE	Correlation	.142	.286	.397	.374	.462	.353
	Significance (2-tailed)	.407	.091	.017	.025	.005	.035
	df	34	34	34	34	34	34
PCT_ER_ACU_SUBSTANCE	Correlation	-.450	-.107	-.008	-.320	-.415	-.405
	Significance (2-tailed)	.006	.533	.964	.057	.012	.014
	df	34	34	34	34	34	34
PCT_ER_CHD	Correlation	.152	.170	.217	.142	.191	.085
	Significance (2-tailed)	.376	.323	.203	.409	.263	.624
	df	34	34	34	34	34	34
PCT_ER_DIABETES	Correlation	-.119	.063	.298	.163	-.048	.005
	Significance (2-tailed)	.490	.714	.078	.341	.780	.975
	df	34	34	34	34	34	34
PCT_ER_STROKE	Correlation	.351	.240	.331	.373	.469	.375
	Significance (2-tailed)	.036	.159	.049	.025	.004	.024
	df	34	34	34	34	34	34
PCT_ER_COPD	Correlation	.013	.080	.430	.265	.116	.148
	Significance (2-tailed)	.942	.644	.009	.119	.499	.388
	df	34	34	34	34	34	34
PCT_ER_ASTHMA	Correlation	.205	.213	.389	.432	.191	.196
	Significance (2-tailed)	.230	.212	.019	.009	.264	.251
	df	34	34	34	34	34	34
PCT_ER_ARTHRITIS	Correlation	.241	.354	.517	.514	.294	.282
	Significance (2-tailed)	.157	.034	.001	.001	.082	.096
	df	34	34	34	34	34	34

Relation of FOOD ACCESS, CRIME and COMMUNITY DEMOGRAPHICS variables to health, adjusted for percent seniors and low income

		Correlations								
		PER_DUHFOO	FF_DEN_100	CRM_RT_VIO	CRIM_MAPOP	CT_LOW_MOB	CT_LOW_INC	CT_MINORI	CT_CONCERN	CT_LOW_COM
PCT_ER_MVSB	Correlation	-.294	-.227	.373	.162	.312	.	.463	.281	.627
	Significance (2-tailed)	.081	.184	.025	.344	.064	.	.004	.096	.000
	df	34	34	34	34	34	34	34	34	34
PCT_ER_PEDSB	Correlation	.185	.348	.423	.458	.042	.	.095	.014	.183
	Significance (2-tailed)	.280	.037	.010	.005	.806	.	.582	.935	.285
	df	34	34	34	34	34	34	34	34	34
PCT_ER_PSYCH	Correlation	.171	.244	.326	.127	.254	.	.253	.153	.248
	Significance (2-tailed)	.320	.151	.053	.462	.135	.	.137	.372	.145
	df	34	34	34	34	34	34	34	34	34
PCT_ER_ANXIETY	Correlation	.234	.234	.358	.446	.102	.	.281	.162	.359
	Significance (2-tailed)	.170	.169	.032	.006	.555	.	.096	.345	.031
	df	34	34	34	34	34	34	34	34	34
PCT_ER_CHR_ALCOHOL	Correlation	.484	.661	.291	.250	.265	.	.114	.024	.123
	Significance (2-tailed)	.003	.000	.086	.142	.119	.	.509	.891	.475
	df	34	34	34	34	34	34	34	34	34
PCT_ER_ACU_ALCOHOL	Correlation	.497	.739	.418	.345	.142	.	-.077	-.072	-.068
	Significance (2-tailed)	.002	.000	.011	.039	.408	.	.655	.676	.694
	df	34	34	34	34	34	34	34	34	34
PCT_ER_CHR_SUBSTANCE	Correlation	.368	.465	.281	.206	-.041	.	-.024	-.082	.003
	Significance (2-tailed)	.027	.004	.097	.228	.812	.	.888	.634	.986
	df	34	34	34	34	34	34	34	34	34
PCT_ER_ACU_SUBSTANCE	Correlation	-.353	-.127	.401	-.033	.536	.	.253	.244	.531
	Significance (2-tailed)	.035	.459	.015	.850	.001	.	.137	.152	.001
	df	34	34	34	34	34	34	34	34	34
PCT_ER_CHD	Correlation	.056	.003	.142	.317	-.227	.	-.048	-.220	.064
	Significance (2-tailed)	.748	.985	.408	.060	.183	.	.780	.196	.713
	df	34	34	34	34	34	34	34	34	34
PCT_ER_DIABETES	Correlation	-.008	-.016	.298	.061	.374	.	.607	.407	.768
	Significance (2-tailed)	.961	.924	.078	.725	.025	.	.000	.014	.000
	df	34	34	34	34	34	34	34	34	34
PCT_ER_STROKE	Correlation	.304	.150	-.018	.262	-.296	.	-.112	-.229	-.003
	Significance (2-tailed)	.072	.382	.919	.122	.079	.	.515	.180	.986
	df	34	34	34	34	34	34	34	34	34
PCT_ER_COPD	Correlation	.094	.096	.307	.245	.375	.	.429	.300	.576
	Significance (2-tailed)	.587	.576	.069	.150	.024	.	.009	.075	.000
	df	34	34	34	34	34	34	34	34	34
PCT_ER_ASTHMA	Correlation	.192	.074	.391	.334	.219	.	.453	.296	.508
	Significance (2-tailed)	.262	.667	.018	.046	.199	.	.006	.079	.002
	df	34	34	34	34	34	34	34	34	34
PCT_ER_ARTHRITIS	Correlation	.315	.243	.488	.364	.367	.	.360	.223	.432
	Significance (2-tailed)	.061	.154	.003	.029	.028	.	.031	.192	.009
	df	34	34	34	34	34	34	34	34	34

Appendix F

Currently Recommended Bicycle, Park & Trail, Transit Access, Walkability, and Youth Safety Improvements

Key ID	Improvement Location Type		Description of Recommended Improvement	Source
	Community Wide	Site Specific		
<i>Bicycle Improvements</i>				
B-1	--	✓	Approves funding for the construction of a “High-Priority Urban Bikeway” connecting San Ysidro from the south end of E. San Ysidro Blvd to the Bayshore Bikeway in Imperial Beach.	<i>Regional Bike Plan Early Action Program (September 27, 2013)</i>
B-2	--	✓	The Green Spine—a walkable, bikeable natural link adjacent to the railroad and Beyer Boulevard with trees, wide walkways, bike paths, lighting, and benches.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
B-3	--	✓	Proposed Class II bicycle lane extending the length of Otay Mesa Road.	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>
B-4	--	✓	Widen Dairy Mart Road by 30 to 34 feet between West San Ysidro Boulevard and Camino de la Plaza to provide new Class II bike lanes.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
B-5	--	✓	Provide Class II bicycle facilities along San Ysidro Boulevard from Dairy Mart Road to the southern terminus of San Ysidro Boulevard. This is identified as high priority project number 39 in the City of San Diego Bicycle Master Plan (2013).	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>
B-6	--	✓	Proposed Class I running parallel to the railroad tracks, extending the length of the community.	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>
B-7	--	✓	Proposed Class II bicycle lanes on Smythe Avenue from S. Vista Avenue to San Ysidro Boulevard.	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>
B-8	--	✓	Proposed Class III bicycle route running the length of Sunset Lane.	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>
B-9	--	✓	Proposed Class III bicycle route along Cottonwood Road, south of Sunset Lane.	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>
B-10	--	✓	Proposed Class III bicycle route running the length of W. Park Avenue.	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>

Key ID	Improvement Location Type		Description of Recommended Improvement	Source
	Community Wide	Site Specific		
B-11	--	✓	Proposed Class III bicycle route running the length of W. and E. Hall Avenue.	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>
B-12	--	✓	Proposed Class II bicycle lane extending the length of Via De San Ysidro then heading west along Calle Primera then south along Willow Road until meeting with Camino De la Plaza.	<i>City of San Diego Bicycle Master Plan (July, 2013)</i>
NA	✓	--	Integrate bicycle facilities such as bike lanes, bikeway guide signs, bicycle sensitive traffic detector loops and bicycle parking facilities at major activity centers.	<i>San Ysidro Community Plan (1989, amended 2005)</i>
NA	✓	--	Provide bicycle storage facilities at each of the trolley stations.	<i>San Ysidro Community Plan (1989, amended 2005)</i>
Park & Trail Improvements				
P-1	--	✓	The area east of Beyer Elementary School and south of the east end of Beyer Boulevard is identified as a future park site in the current San Ysidro Community Plan. It is owned by the City of San Diego. The recommendation also proposes acquiring an additional three-acres to create a ten-acre park site.	<i>Draft San Ysidro Community Plan Update – Proposed Land Uses (2012) & San Ysidro Community Plan (1989, amended 2005)</i>
P-2	--	✓	The Green Spine—a walkable, bikeable natural link adjacent to the railroad and Beyer Boulevard with trees, wide walkways, bike paths, lighting, and benches.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
P-3	--	✓	Mini-park site of approximately 1.16-acres on southwest corner of Sunset Lane & Averil Road. The northeast corner was proposed by community members in the San Ysidro Community Plan Update “Community Suggested Park and Urban Design Ideas.”	<i>Draft San Ysidro Community Plan Update – Proposed Land Uses (2012) & San Ysidro Community Plan (1989, amended 2005)</i>
P-4	--	✓	Proposed park site or plaza on Blanche Street & Cypress Drive, northwest corner. Plaza will serve as the foundation for a town center or “mercado/plaza” at the center of the historic district.	<i>Draft San Ysidro Community Plan Update – Proposed Land Uses (2012) & San Ysidro Community Plan (1989, amended 2005)</i>

Key ID	Improvement Location Type		Description of Recommended Improvement	Source
	Community Wide	Site Specific		
P-5	--	✓	Proposed Vista Terrace Park expansion site of 14.4-acre to the west of the existing park, to create a 21-acre Community Park.	<i>Draft San Ysidro Community Plan Update – Proposed Land Uses (2012) & San Ysidro Community Plan (1989, amended 2005)</i>
P-6	--	✓	Park site on the southeast corner of Dairy Mart Road and Beyer Boulevard.	<i>Draft San Ysidro Community Plan Update – Existing Parks and Community Suggested Park and Urban Design Ideas (2011)</i>
P-7	--	✓	South end of Via Tercero is being considered as a potential anchor site for access to the Open Space area.	<i>Draft San Ysidro Community Plan Update – Existing Parks and Community Suggested Park and Urban Design Ideas (2011)</i>
P-8	--	✓	Dairy Mart Ponds, northeast of Dairy Mart Road and Camino De la Plaza. Portions of the Open Space area may have active park and trail potential, however, there may be environmental constraints.	<i>Draft San Ysidro Community Plan Update – Existing Parks and Community Suggested Park and Urban Design Ideas (2011)</i>
P-9	--	✓	Calle Primera open space west of the curve. Portions of the open space area may have active park and trail potential, however, there may be environmental constraints.	<i>Draft San Ysidro Community Plan Update – Existing Parks and Community Suggested Park and Urban Design Ideas (2011)</i>
NA	✓	--	Provide community members maps of their neighborhood with areas for physical activity highlighted to increase the community’s readiness to change their behaviors (study focused specifically on racially/ethnic diverse communities in U.S.).	<i>Salsita Community Mapping Project (Date published unknown)</i>
NA	✓	--	Publicize the facilities and hours of the Tijuana River National Estuarine Research Reserve and Border Field State Park.	<i>San Ysidro Community Plan (1989, amended 2005)</i>
NA	✓	--	Develop a pedestrian path network throughout the planning area to permit-pedestrians safely and easily walk to various community facilities, including schools,	<i>San Ysidro Community Plan (1989, amended 2005)</i>

Key ID	Improvement Location Type		Description of Recommended Improvement	Source
	Community Wide	Site Specific		
			parks, and residential, commercial, industrial and institutional development.	
Transit Access Improvements				
T-1	--	✓	Create a distinctive gateway from the trolley entrance to Cypress Drive including changes to landscaping, pavement, fencing treatments, and a gateway sign that reflects the culture of the community in order to encourage transit use.	<i>Improving Walkability in San Ysidro (June, 2005)</i>
T-2	--	✓	Create pedestrian links from the Beyer Trolley Station to the surrounding neighborhoods, linear park and, nearby commercial districts.	<i>San Ysidro Community Plan (1989, amended 2005)</i>
T-3	--	✓	Enhance the bus stop on Beyer Boulevard at Del Sur Boulevard and facilitate connections to nearby trolley stations to more effectively serve the large residential population of the adjacent high-density multifamily developments.	<i>San Ysidro Community Plan (1989, amended 2005)</i>
T-4	--	✓	Improvements at Beyer Boulevard including an additional driveway, new signalized intersection and a shift in the existing intersection in order to facilitate access to and from the trolley station.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
T-5	--	✓	Reconfigure or relocate the Camiones Way Transit Station to accommodate MTS bus and private bus unloading and staging as well as privately owned vehicle unloading to provide convenient access to the southbound port at Virginia Avenue.	<i>San Ysidro Land Port of Entry (LPOE) Expansion Mobility Study (April, 2009)</i>
T-6	--	✓	W. Seaward Avenue trolley stop improvements – bulb-outs at all four intersections to decrease crossing distance and increase pedestrian visibility, install high visibility crosswalks, extend the sidewalk along the south side of Seaward Avenue just west of the trolley tracks.	<i>Improving Walkability in San Ysidro (June, 2005) & City of San Diego Pedestrian Master Plan Phase 4</i>

Key ID	Improvement Location Type		Description of Recommended Improvement	Source
	Community Wide	Site Specific		
NA	✓	--	Design transit stops to be attractive, highly visible and provide shelter.	<i>San Ysidro Community Plan (1989, amended 2005)</i>
NA	✓	--	Develop pedestrian paths to link the trolley station to the surrounding neighborhood.	<i>San Ysidro Community Plan (1989, amended 2005)</i>
<i>Walkability Improvements (sidewalk improvements, traffic calming projects, pedestrian safety)</i>				
W-1	--	✓	W San Ysidro Blvd pedestrian improvements between Averil Road and Sunset Lane to include construction of a new sidewalk within the old right of way and new pop-outs on each side of the driveways.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
W-2	--	✓	Widen sidewalk on Seaward Avenue from W. Park Avenue to the trolley stop to the west. Install sidewalk on south side of Seaward Avenue west of railroad tracks. Install pedestrian scale lighting.	<i>San Ysidro Mobility Strategy (January, 2009) & City of San Diego Pedestrian Master Plan Phase 4</i>
W-3	--	✓	Install traffic signal at I-5 NB on/off ramps & Via de San Ysidro.	<i>City of San Diego Pedestrian Master Plan Phase 4</i>
W-4	--	✓	Widen Dairy Mart Road 30 to 34 feet between West San Ysidro Boulevard and Camino de la Plaza in order to expand sidewalks to provide additional capacity for pedestrian traffic.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
W-5	--	✓	The creation of two small pedestrian-oriented plazas on either side of East San Ysidro Boulevard along with the development of curb pop-outs and wider sidewalks throughout the commercial area.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
W-6	--	✓	Construct new sidewalk along north side of Calle Primera; install ADA compliant curb ramps at Via San Ysidro/Calle Primera; install pedestrian scale lighting near access to pedestrian bridge.	<i>City of San Diego Pedestrian Master Plan Phase 4</i>
W-7	--	✓	Install missing sidewalks on northwest corner of Beyer/North; install pedestrian scale street lights from North to Otay Mesa Road; install sidewalks from I-805 overcrossing to Otay Mesa Road on south side of Beyer Boulevard.	<i>City of San Diego Pedestrian Master Plan Phase 4</i>

Key ID	Improvement Location Type		Description of Recommended Improvement	Source
	Community Wide	Site Specific		
W-8	--	✓	Construction of a new pedestrian bridge over the tracks at Del Sur Boulevard. The grades at this location are favorable for the construction of the bridge to meet the existing grade on the north side of the tracks flush, then turning the bridge southeastward with a gradual ramp down to the existing grade at Vista Lane, south of the tracks.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
W-9	--	✓	Narrow Olive Drive by adding a landscaped median to reduce speeds. Add bulb-out to southwest corner of Hall Avenue and Olive Drive to low vehicle turning speeds and increase visibility of pedestrians. Add marked crosswalks to intersection of Olive Drive and Hall Avenue.	<i>Improving Walkability in San Ysidro (June, 2005)</i>
W-10	--	✓	Improve intersections of Hall Avenue & E. and W. Park Avenue by installing bulb-outs at each corner and adding high visibility crosswalks. Add parking to east side of W. Park Avenue to narrow the roadway, potentially slowing vehicle speeds, provide a buffer for pedestrians, and increase park access.	<i>Improving Walkability in San Ysidro (June, 2005)</i>
W-11	--	✓	The Green Spine—a walkable, bikeable natural link adjacent to the railroad and Beyer Boulevard with trees, wide walkways, bike paths, lighting, and benches.	<i>San Ysidro Mobility Strategy (January, 2009)</i>
W-12	--	✓	Install sidewalk from the railroad tracks to 162 West Seward on the south side of the street, and pedestrian scale lighting fronting the railroad tracks.	<i>City of San Diego Pedestrian Master Plan Phase 4</i>
<i>Youth Safety Improvements (improvements related to the safety of children)</i>				
Y-1	--	✓	Add better lighting and a high visibility crosswalk to the pedestrian overpass bridge near Beyer Elementary School.	<i>San Ysidro Walks & Wheels to School – SRTS Final Plan (2012)</i>

Key ID	Improvement Location Type		Description of Recommended Improvement	Source
	Community Wide	Site Specific		
Y-2	--	✓	Install a buffer zone between sidewalks and the roadway and more human scaled lighting on West Park north of Hall Avenue.	<i>San Ysidro Walks & Wheels to School – SRTS Final Plan (2012)</i>
Y-3	--	✓	Otay Mesa Road sidewalk construction and street lights from Beyer Boulevard north to just south of Crescent Bay Drive to provide a sidewalk route from San Ysidro to San Ysidro High School.	<i>San Ysidro Mobility Strategy (January, 2009) & City of San Diego Pedestrian Master Plan Phase 4</i>
Y-4	--	✓	Update school zone signs, implement traffic calming enhancements, and construct curb extensions and/or speed table on Sunset Lane near Sunset Elementary School.	<i>City of San Diego Pedestrian Master Plan Phase 4</i>
Y-5	--	✓	Enhance/raise crosswalk at existing school crossing on East Beyer Boulevard near Beyer Elementary School.	<i>City of San Diego Pedestrian Master Plan Phase 4 & San Ysidro Walks & Wheels to School – SRTS Final Plan (2012)</i>
Y-6	--	✓	City should study all streets surrounding Beyer Elementary School to determine which streets should be marked with crosswalks and which type of crosswalk should be installed.	<i>San Ysidro Walks & Wheels to School – SRTS Final Plan (2012)</i>
Y-7	--	✓	Organize clean up days and arrange for more school staff, police or security to keep an eye on pedestrian bridge leading to Willow Elementary School specifically around pick up and drop off time. Also install more lighting on bridge.	<i>San Ysidro Walks & Wheels to School – SRTS Final Plan (2012)</i>
Y-8	--	✓	Repaint crosswalk and add high visibility crosswalk at intersection of Willow Road and Camino de la Plaza.	<i>San Ysidro Walks & Wheels to School – SRTS Final Plan (2012)</i>
Y-9	--	✓	Add human scale lighting on Sycamore Road from Calle Primera to Cesar Chavez Park.	<i>San Ysidro Walks & Wheels to School – SRTS Final Plan (2012)</i>
NA	✓	--	Promote walk to school programs to get more people walking and less people driving to school.	<i>San Ysidro Walks & Wheels to School – SRTS Final Plan (2012)</i>

Border Health Equity Transportation Study
March 27th Community Workshop

Facilitation Questions

Introduction

We just saw several examples of recommended improvements in San Ysidro related to bicycling, walkability, youth safety, transit access, and parks and trails. Our group will now focus on just the _____ recommendations.

Here are some image examples of different types of _____ improvements to give everyone an idea of what some of the current recommendations might look like and to show some other options.

Gaps in Current Recommendations

Now we will identify gaps in the current _____ recommendations.

Are there any _____ improvements that were not listed that need to be addressed? We are looking for both location specific recommendations and community-wide programs that will benefit the health or mobility of San Ysidro community members.

How can we improve _____ in San Ysidro?

Prioritize List of Recommendations

Now that we have addressed the gaps related to _____, we are going to prioritize or rank the top three recommendations for San Ysidro.

In other words, which of the three _____ improvements do you think will most benefit San Ysidro?

Everyone will now take three stickers and place them next to your top three recommendations. You can place all your stickers on one recommendations or on different recommendations.

Impact on Daily Life in San Ysidro

For the final part of this group exercise, we are going to list the ways we think these top three recommendations will improve health or mobility in San Ysidro.

The top ranked recommendation is _____. How do you think this can improve daily life for you, your family and friends?

Will you be able to get around more easily? Will it make you feel safer when traveling in San Ysidro? Do you think it will improve your health or that of your family member?

Thank you for all of your input. We are now going to share our top three recommendations with the other groups.

Workshop #2 Summary

Border Health Equity Transportation Study (BHETS)

San Diego Association of Governments (SANDAG)

This document provides a record of the second of three workshops held in the community of San Ysidro to solicit input on the SANDAG *Border Health Equity Transportation Study (BHETS)*. All community input received at the March 27, 2014 workshop has been summarized here.

Workshop Structure

Staff kicked off the workshop with a presentation to provide background on the BHETS, share the key outcomes of the recently completed Existing Conditions Report, and explore existing project recommendations that have been proposed in various San Ysidro related planning documents. Visual aides were provided to illustrate how different recommendations could potentially look if implemented. The presentation was translated in Spanish by Casa Familiar staff in tandem with staff presenters.



Existing recommendations were broken into five categories: Transit Access, Park and Trail, Bikeability, Walkability, and Youth Safety. Following the staff presentation, workshop participants were broken into small groups. Each category was available at two tables (one in Spanish and one in English), creating a total of ten available tables. Attendees were asked to select one category in the language of their choice to participate in the workshop exercise. All five categories provided in Spanish received participants, as well as one English language table focused on Transit Access. Casa Familiar staff provided facilitators at each table to guide the exercise.

Workshop Exercise

Once broken into small groups by category, participants were asked to evaluate and prioritize proposed projects in their community, or to identify gaps in the recommendations. Participants were informed that they may also propose new recommendations. The following materials were provided in both English and Spanish to assist in this exercise:

- Map of Proposed Recommendations with a corresponding list of Recommendation Descriptions
- Visual Aides to illustrate each type of recommendation
- Summary of Health Outcomes from the BHETS Existing Conditions Report

Facilitators were asked to lead participants through each proposed recommendation to solicit feedback from community members. After reviewing all proposed recommendations, participants were then asked to prioritize the recommendations by placing three dot stickers beside their preferred projects. Participants were permitted to place a sticker beside three separate recommendations, or place all three stickers beside a single recommendation. Additionally, participants were provided spaces to propose new recommendations, which they were also allowed to vote for during the prioritization exercise. Lastly, participants were asked to discuss how the implementation of their top ranking recommendations might influence daily life in San Ysidro.



Following the group exercise, each facilitator was asked to present the top three ranking recommendations that their table identified, and how the group thought their daily lives might be impacted by these recommendations.

All workshop materials and comments were recorded and documented by SANDAG staff and will feed into the development of draft recommendations to address health disparities identified in the BHETS Existing Conditions Analysis.

Summary of Community Input

The table below displays the top three community prioritized recommendations that were identified during the workshop exercise. Three recommendations were selected for each category, except for Walkability which received 4 priority recommendations due to a tie. This resulted in a total of 16 projects identified as being highest priority by workshop participants. Below, each recommendation is listed by Category and Key ID (corresponding to maps), and displays the number of community votes received along with a detailed project description.

Mode	Key ID # Recomm endation	# Votes	Description
BIKABILITY	B2	7	The Green Spine—a walkable, bikeable natural link adjacent to the railroad and Beyer Boulevard with trees, wide walkways, bike paths, lighting, and benches.
BIKABILITY	B3	3	Proposed Class II bicycle lane extending the length of Otay Mesa Road.
BIKABILITY	B10	3	Proposed Class III bicycle route running the length of W. Park Avenue.
PARK AND TRAIL	P1	8	The area east of Beyer Elementary School and south of the east end of Beyer Boulevard is identified as a future park site in the current San Ysidro Community Plan. It is owned by the City of San Diego. The recommendation also proposes acquiring an additional three-acres to create a ten-acre park site.
PARK AND TRAIL	P2	6	The Green Spine—a walkable, bikeable natural link adjacent to the railroad and Beyer Boulevard with trees, wide walkways, bike paths, lighting, and benches
PARK AND TRAIL	P8	3	Dairy Mart Ponds, northeast of Dairy Mart Road and Camino De la Plaza. Portions of the Open Space area may have active park and trail potential, however, there may be environmental constraints.
TRANSIT	T1	9	Create a distinctive gateway from the trolley entrance to Cypress Drive including changes to landscaping, pavement, fencing treatments, and a gateway sign that reflects the culture of the community in order to encourage transit use.
TRANSIT	T6	8	W. Seaward Avenue trolley stop improvements – bulb-outs at all four intersections to decrease crossing distance and increase pedestrian visibility, install high visibility crosswalks, extend the sidewalk along the south side of Seaward Avenue just west of the trolley tracks.
TRANSIT	T5	7	Reconfigure or relocate the Camiones Way Transit Station to accommodate MTS bus and private bus unloading and staging as well as privately owned vehicle unloading to provide convenient access to the southbound port at Virginia Avenue.
WALKABILITY	W3	8	Install traffic signal at I-5 NB on/off ramps & Via de San Ysidro.
WALKABILITY	W2	6	Widen sidewalk on Seaward Avenue from W. Park Avenue to the trolley stop to the west. Install sidewalk on south side of Seaward Avenue west of railroad tracks. Install pedestrian scale lighting.
WALKABILITY	W6	3	Construct new sidewalk along north side of Calle Primera; install ADA compliant curb ramps at Via San Ysidro/Calle Primera; install pedestrian scale lighting near access to pedestrian bridge
WALKABILITY	W11	3	The Green Spine—a walkable, bikeable natural link adjacent to the railroad and Beyer Boulevard with trees, wide walkways, bike paths, lighting, and benches.
YOUTH SAFETY	Y5	4	Enhance/raise crosswalk at existing school crossing on East Beyer Boulevard near Beyer Elementary School.
YOUTH SAFETY	Y3	3	Otay Mesa sidewalk construction and street lights from Beyer Boulevard north to just south of Crescent Bay Drive to provide a sidewalk route from San Ysidro to San Ysidro High School
YOUTH SAFETY	Y9	3	Add human scale lighting on Sycamore Road from Calle Primera to Cesar Chavez Park.

Next Steps

Building from the input received at Community Workshop #2, staff will work to incorporate the feedback reflected in this document into a set of draft recommendations. These draft recommendations will be circulated to the BHETS Stakeholder Group for comments in May of this year. Staff anticipates finalizing the recommendations by Summer 2014. A third and final BHETS Community Workshop will be held in September 2014 to discuss monitoring and evaluation in San Ysidro following the BHETS.

Appendix G

APPENDIX G - COEFFICIENT CALCULATOR

<i>This worksheet reflects an excel-based spreadsheet that was developed for calculating the potential change in Health Outcome (y) associated with a change in Mobility/Built Environment factors (x). The calculator was developed using the results of the partial correlations analysis.</i>					
			Percent Change in "x"	0.25	<-- This percent can be changed
x = Mobility/Built Environment Variable	VMT				
y = Name of Health Outcome Variable	Pedestrian Injury				
r = Correlation Coefficient	0.132	<-- Type the correlation in here			
Percent Change in "y" based on a 25% change in "x"	3.3	<-- This number is calculated using the following equation:	=[(B5*0.34) * (F2/0.34)] *100		
Example:					
A 25% decrease in VMT is associated with a 3.3% decrease in Pedestrian Injuries.					

Appendix H

Community Workshop #3 Comment Card Responses
10-23-2014

- A. *What tools would help community members influence community change?*
 - B. *Additional Comments*
-
- 1. A. It would be interesting to develop a website that would make public the data (live data) from the proposed Air Quality Monitoring Station at Willow Elementary.
B. Keep insisting on monitoring the air quality.
 - 2. A. That we get more training so we can be more educated
B. To know how to help our community and follow-through with everything that is promised
 - 3. A. Sunset at San Ysidro Blvd. has a bus stop, but no drop off
 - 4. A. More fliers to give out and more information
 - 5. A. I think they could deliver information to the media in order to help create consciousness about the needs of San Ysidro.
 - 6. A. Try to bring more people to the meetings.
B. All of the information is very important for the community. Thank you for keeping the community informed.
 - 7. A. That's tough unless something directly affects an individual most people won't get involved.
 - 8. B. Monitoring air quality. Safer sidewalks and level
 - 9. B. Implement good routes and security for the use of bikes in all of the cities of San Diego
 - 10. A. Education about how the local government process works
 - 11. A. Education about the process of how to work to support the community
 - 12. A. Education about how the local government process works
B. More outreach for these meetings
 - 13. A. Cost estimates for proposed changes/projects
 - 14. A. More community workshops! Very informative!
B. I liked the way all recommendations were presented and reviewed



Border Health Equity
Transportation Study

Community Workshop

October 23, 2014

Please share your
comments and provide
them to a SANDAG staff
member or send them to:

Joshua.clark@sandag.org

Or

Attn: Josh Clark
SANDAG
401 B Street, Suite 800
San Diego, CA 92101

*What tools would help community members influence
community change?*

(Example: City contact information, education about local government)

Additional Comments:



Border Health Equity
Transportation Study

Community Workshop

October 23, 2014

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Additional Comments:
