Santa Ana

VISION ZERO PLAN

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Contents

1 Introduction

Photo Location: Bike Trail on Bear Street at Alton Avenue

1.1 What is Vision Zero?

Traffic Safety in Santa Ana

The City is undergoing an update for the 2016 Safe Mobility Santa Ana (SMSA) Plan, now being called Santa Ana Vision Zero Plan (SAVZ), to evaluate mobility priorities and identify innovative transportation solutions for an all-around safer Santa Ana. This Vision Zero plan starts from and builds upon the original SMSA plan to further progress Vision Zero projects in Santa Ana to align with the City's mission of zero traffic fatalities. Project locations from SMSA are showcased in Figure 1-1.

Due to motor vehicle collisions, there have been 40 fatalities and 149 serious injuries amongst pedestrians and bicyclists during the years 2017 to 2021. When including drivers and passengers, there have been a total of 603 killed or seriously injured roadway users in Santa Ana during this same time period. Pedestrians and bicyclists make up about nearly one third of all collisions resulting in fatalities or serious injuries. This Plan addresses these traffic-related collisions and proposes countermeasures to enhance roadway safety for all users using the FHWA's "Safe Systems'' approach, which has a significant focus on people walking and bicycling. This study will evaluate mobility priorities and take proactive steps to innovative transportation solutions for a safer Santa Ana.

Vision Zero Overview

This Santa Ana Vision Zero Action Plan is an initiative to eliminate traffic-related fatalities and serious injuries in Santa Ana by 2040. It is guided by "Vision Zero," a traffic safety concept that aims to achieve a roadway system with no fatalities or serious injuries involving road traffic. The main principle of Vision Zero is that life and health cannot be exchanged for other societal benefits, such as a conventional cost-benefit analysis. In the 1990s, Sweden developed "Vision Zero" and the Netherlands concurrently developed "Sustainable Safety" (aka "Vision Zero Plus"), and the concepts have been widely embraced around the world. In the United States, the concepts were first adopted in New York City (NYC) which, mainly due to the widespread implementation of innovative, low-cost pedestrian safety measures, has seen the lowest number of pedestrian fatalities in the first year of enactment since 1910. After NYC, Vision Zero spread to dozens of cities across the country. Within the region, the Cities of Los Angeles, Long Beach, El Monte and Los Angeles County have all enacted Vision Zero plans, and the California Department of Transportation (Caltrans) has made a commitment to zero deaths. Notably, the City of Hoboken, New Jersey became the first US city of its size to reach Vision Zero.

Vision Zero vs. Traditional Safety Research

Vision Zero is proactive rather than reactive. In practice, this means it is necessary to identify and remedy dangerous roadway conditions and characteristics before serious injury or fatality occurs. Recent research points to the benefits of identifying the types of roadway characteristics that lead to more pedestrian-involved collisions and recommends proactive measures to mitigate safety issues at those locations. Even when there are no known collisions at the location of, for example, the intersection of two four-lane roads, the research recommends proactively introducing safety measures at that type of location as a preemptive measure against collisions.

The 94% Myth

At the heart of the traditional approach to traffic safety is the myth that human error causes most car collisions. Individual road users, bad drivers, careless bicyclists, and distracted pedestrians have historically been presented as the problem and seen as the cause of collisions. Unlike in Europe, which accepts that society at large is responsible for safer streets, in the United States historically, the responsibility for road safety largely falls on the person walking, bicycling, or driving, which is slowly shifting. American transportation departments, licensing agencies, and media outlets frequently cite that most collisions – "94% of them," are solely due to human error. Blaming poor decisions of roadway users implies that nobody could have prevented these "accidents." Even using the term "accident" versus "crash" implies an incident that is not preventable.

Many agencies in the United States focus on getting bicyclists to be "more visible" and pedestrians to be "less distracted." Data suggests the focus should be in other places, such as re-engineering roadways.

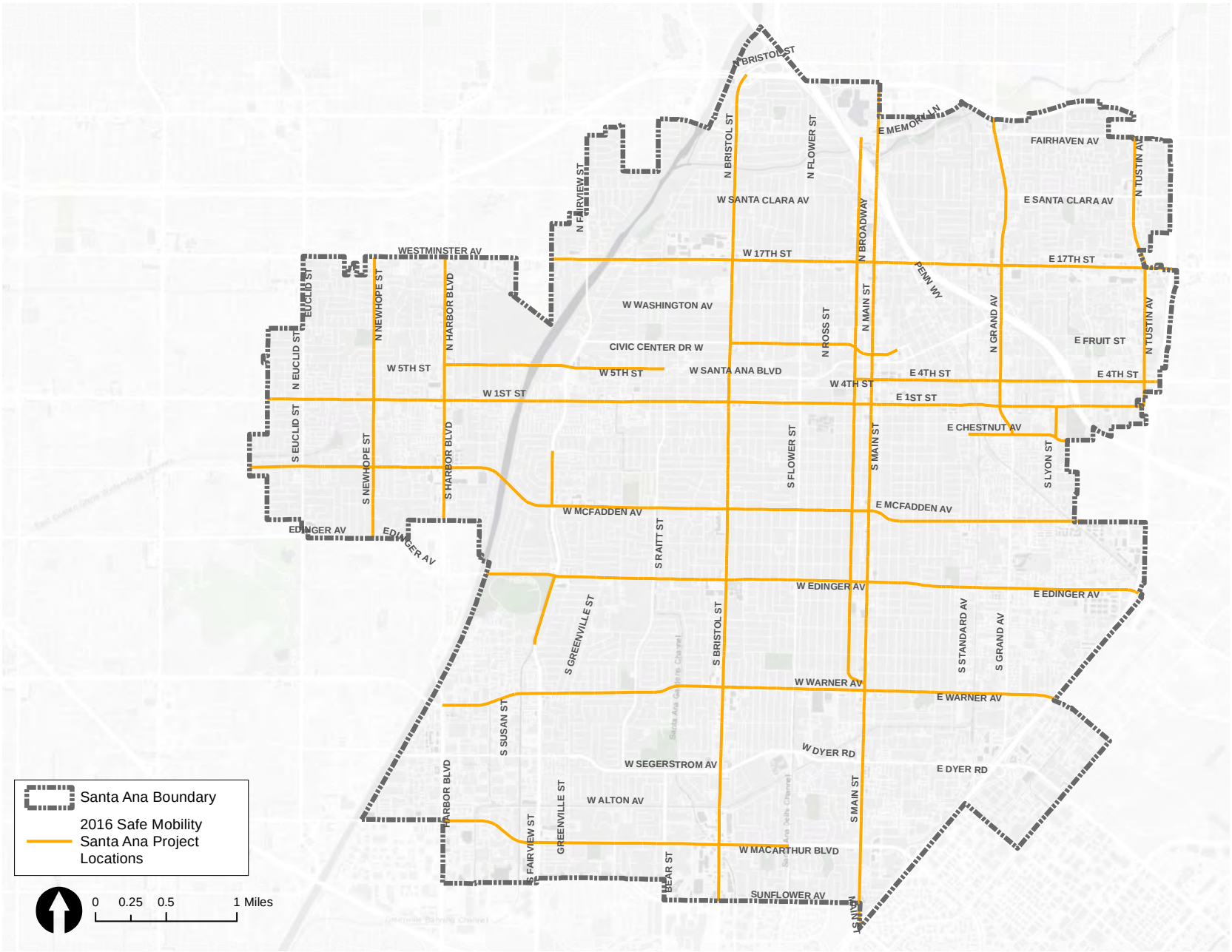


Figure 1-1: Safe Mobility Santa Ana (2016) Project Locations

A 2019 research study by the New York City Department of Transportation (NYCDOT) entitled "Distraction Shouldn't be Deadly" found that "cell phone use by pedestrians does not appear to be disproportionately contributing to fatal pedestrian crashes," and that "despite growing concerns, NYCDOT found little concrete evidence that device-induced distracted walking contributes significantly to pedestrian fatalities and injuries."

Consequently, traffic safety solutions have too often focused on perfecting human behaviors through strategies like licensing, testing, road user education, and media campaigns. But in the Vision Zero framework, the road safety problem isn't the individual but rather the flaws in the transportation system. Those flaws mean, for example, that distracted drivers in cars and road users have to share the road in unsafe conditions.

Systemic Safety and the FHWA

The Federal Highway Administration (FHWA) has taken a leading role in implementing Vision Zero or "Systemic Safety." They promote taking a "Safe System approach to road safety" – a holistic view that requires people to think about the road system in its entirety, from infrastructure projects to government agencies. This refers to understanding how the whole system operates, including "upstream factors" such as design guidelines, public participation, policy, and vehicle regulations, and how all influence transportation-related fatalities and serious injuries. Safe Systems focus on the most vulnerable road users, which are people walking and biking, and utilizes effective, low cost measures that can be systematically implemented citywide. One of the ways cities are implementing this is by creating steering committees and task forces with representation from all the different agencies involved.

Proposal for a New Traffic Safety Framework

In 2023, authors David Ederer, Rachael Thompson Panik, Nisha Botchwey, and Kari Watkins wrote a paper called "The Safe Systems Pyramid: A new framework for traffic safety." The paper moves away from the "6 Es of traffic safety," citing what they call the "false equivalence of education and engineering." They postulate that although education measures are effective, they are not as effective as widespread engineering measures in reducing traffic fatalities and serious injuries. They also stress the importance of policies and programs that focus on public health, land use, and above all, equity. The paper could be called "Energy and Equity" due to its focus on what they call "energy," from energy amounts in size of vehicles to energy in types of vehicles, explaining that "there is less latent energy in a bicycle than a car." This Plan will do its best to make recommendations in line with the thesis of the paper.

1.2 Equity-minded Strategies

This Plan intends to mobilize disadvantaged and underrepresented groups in order to implement policies and programs to create a better active transportation network to serve these populations. This is particularly important in Santa Ana, where 55 percent of the population do not have access to a vehicle and 37% of census tracts are considered disadvantaged per Senate Bill 535. Throughout the community outreach process, community members shared a variety of recommendations and concerns related to ensuring that the planning process was done in an equitable manner. These recommendations were organized into the following five categories:

1. Focus on street improvements that make the streets safer for our most vulnerable residents, such as children and senior citizens. (i.e., accessibility, mobility, and permeability)
2. Have a formula to prioritize which streets or areas to improve first (e.g., based on need, high number of collisions, excessively large street widths)
3. Have standard guidelines to proactively prevent and mitigate displacement that may result from transportation projects (i.e., housing development and affordability and street widening)
4. Focus on more education and less enforcement strategies to encourage improved behaviors (i.e., public safety)
5. Assess the impacts of Vision Zero infrastructure improvements on the surrounding community and prioritize projects that provide the most benefit. Priority was given to promote a wider range of mo-

bility choices for those Santa Ana residents who have few, if any, choices. These options would allow the community to recognize what would best establish a transportation system from one that is focused around the use of motor vehicles to one that meets the needs of all users. The goals for this plan are to facilitate social and economic opportunities by providing equitable levels of access to affordable and reliable transportation options based on the needs of the populations being served, particularly populations that are traditionally underserved and underrepresented.

Chapter 4 documents the extensive, equitable community engagement process that the Santa Ana Vision Zero Plan underwent in more detail.

1.3 Relationship of this Document to Existing Documents

The SAVZ Plan incorporates regional and local planning efforts that are directly related to walking, bicycling, and vehicle travel. These efforts range from long-range regional planning to specific plans. The following information summarizes the planning documents that were evaluated.

Santa Ana General Plan

The Santa Ana General Plan is the primary citywide comprehensive plan that guides future growth and was reviewed as part of the SAVZ Plan to ensure consistency between the report recommendations. The General Plan contains goals and objectives to guide decisions and preserve the quality of life within the City of Santa Ana. The Circulation, Growth Management, Open Space, Scenic Corridors, and Urban Design Elements contain goals and objectives that contribute to the success of this SAVZ Plan.

Santa Ana Strategic Plan

The Strategic Plan is a targeted plan, developed through a partnership between the community, elected officials and City staff. The Plan is intended as a means to implement the City's mission, "To deliver efficient public services in partnership with our community which ensures public safety, a prosperous economic environment, opportunities for our youth, and a high quality of life for residents." The SAVZ Plan aligns with the public safety and quality of life aspirations of the Strategic Plan.

Safe Mobility Santa Ana Plan

The Safe Mobility Santa Ana (SMSA) plan, the precursor to the SAVZ Plan, identified specific hotspot locations in Santa Ana, using a detailed collision analysis. This plan uses best practices and citywide trends in traffic safety to propose solutions that will make the Santa Ana road network safer for all users. The recommendations of this plan recognize the need to balance the many objectives of the local transport system, including travel time reliability, safety, and meeting the mobility needs of a variety of roadway users. The SAVZ Plan will build upon solutions, goals and objectives from the SMSA plan by providing detailed recommendations of countermeasures and which locations they should be implemented, including CAD drawings that can be submitted in grant applications.

Downtown Santa Ana Complete Streets

The Downtown Santa Ana Complete Streets Plan is intended to improve access and mobility for all modes of transportation, including walking, bicycling, transit, and motor vehicles within and around the downtown area. Through an extensive and inclusive public engagement process, stakeholder collaboration and community workshops, five priority corridors were identified, designed which the City has already begun implementing. The SAVZ Plan report started with these priority corridors as potential corridors for inspiration for detailed site layouts and builds upon them.

Central Santa Ana Complete Streets

The Central Santa Ana Complete Streets Plan was developed to provide the City of Santa Ana a guide to establish a network of Complete Streets to improve bicycling and walking throughout central Santa Ana. This plan analyzes the connections between the selected corridors and other existing or planned Complete Streets corridors to create a

connected network. The goal is to improve access and mobility for all modes including: walking, bicycling, transit and motor vehicles. Priority corridors were identified for improvement and this SAVZ Plan started with the identified corridors as selected locations for more detailed site layouts and project scope definition. The City has begun final engineering design and implementation of several corridors in this Plan such as separated bikeways and protected intersections on Standard Avenue and Willits/ Bishop Street Bicycle Boulevard.

Safe Routes to School Plan

The Santa Ana Safe Routes to School Plan involves an extensive and inclusive community engagement process, identification and prioritization of school infrastructure improvements, and the development of programs and strategies to better educate and encourage students to walk and bike to school. The result is a comprehensive "6 E's" plan that will lead to improved safety and mobility for all Santa Ana residents, especially the community's students and youth, through engineering, education, encouragement, and enforcement recommendations. Priority corridors and routes identified in the Safe Routes study were included in the list of priority projects that would include detailed site layouts and project scope definition. Typically the SRTS plan focuses on residential streets near schools while the Vision Zero plan focuses on the large roads where all the fatalities and serious injuries are occurring.

Santa Ana Active Transportation Plan

The Santa Ana Active Transportation Plan provided recommendations for safer, more walkable streets for pedestrians and bicyclists through implementation of non-motorized travel infrastructure. These recommendations are based on a thorough inventory of existing infrastructure and network deficiencies. Thirty-five priority projects were selected to create a network of complete streets that will improve non-motorized travel. The recommendations present a design concept, show cost estimates, and share various characteristics along each corridor that needs to be improved so the plans complement each other with minimum overlap which the SAVZ Plan builds upon.

1.4 Consistency Review

A review of several regional planning documents was completed to make sure previous efforts were built upon and conditions better understood.

In support of the Santa Ana Vision Zero document and its proposed project solutions, Local, Regional, and State Planning documents were reviewed for policy consistency and guidance. Documents reviewed include plans and studies by local Orange County agencies, the County of Orange, the Orange County Fire Authority, the Orange County Transportation Authority (OCTA), and Caltrans.

The following Vision Zero concepts were considered in the development of the Santa Ana Vision Zero plan:

- Implementation of "neighborways"/calm street network
- Implementation of safety interventions citywide/systemically
- Pedestrian-focused engineering countermeasures to reduce vehicle versus pedestrian collisions
- Bicyclist-focused engineering countermeasures to reduce vehicle versus bicycle collisions
- Truck aprons on large curb returns that lead to excessively high speed turns
- Curb refuge islands (CRIs) and rubber turning humps to slow turns
- Speed humps and traffic calming to reduce speed
- Roundabouts and traffic calming circles
- Senior zones for increased safety
- Pedestrian signals, lighting, high-visibility crosswalks
- Lane re-allocation/road buffet/road diet

The following section discusses the relevant documents and resources identified for the reviewed agency as they relate to Vision Zero concepts and goals. The sourced materials are organized alphabetically starting with local jurisdictions, then regional/state agencies, and then climate action plans.

City of Costa Mesa

General Plan 2015-2035

Circulation Element

The General Plan Circulation Element emphasizes the importance of complete streets, development of safety programs, and implementation of enhanced bicycle and pedestrian facilities as mechanisms for reducing collisions and fatalities, as well as increasing the bicycle and pedestrian mode share. The document identifies policies that encourage and accommodate all roadway users, consistent with Vision Zero.

Housing Element

The General Plan Housing Element discusses sustainable development aligned with transportation opportunities as a means of reducing vehicle miles traveled and greenhouse gas emissions.

Active Transportation Plan 2018

The 2018 Active Transportation Plan provides countermeasures to improve safety for bicycle and pedestrian modes that are consistent with Vision Zero goals. The document also identifies bicycle education programs and a Bicycle Safety Guide for improved comfort and confidence navigating the bicycle network appropriately.

Complete Streets Safety Assessment 2021

The Costa Mesa Complete Streets Safety Assessment was conducted by the University of California Berkeley Safe Transportation Research and Education Center (SafeTREC) to study the complete streets conditions at various study locations within the City of Costa Mesa. This assessment identified safety countermeasures with an aim to improve bicycle and pedestrian safety, walkability, and accessibility, consistent with Vision Zero goals.

Local Road Safety Plan 2022

The Costa Mesa Local Road Safety Plan identifies a framework to identify, analyze, and develop transportation safety enhancements on the City's roadway network. The plan vision stated in the document is to enhance the transportation network to achieve zero traffic fatalities and serious injury related collisions, consistent with Vision Zero goals.

Bicycle & Pedestrian Safety Education Program

The Bicycle & Pedestrian Safety Education Program has identified goals to provide bicycle safety education, encourage safe bicycling habits, and create safer, calmer streets and neighborhoods. The program includes the development of a safety curriculum for youth, bicycle rodeos, and other training materials that are all consistent with Vision Zero goals.

Pedestrian Safety Tips Webpage

The City of Costa Mesa provides a webpage on Pedestrian Safety Tips for safely navigating the roadway network that aligns with Vision Zero goals. This webpage focuses on safe habits and procedures for crossing streets, as well as improving self-awareness and visibility.

City of Fountain Valley

General Plan

Circulation Element

The draft updated General Plan includes a Mobility Element with Goal CM-2 seeking: "A comprehensive and multimodal network of streets, bikeways, and pedestrian areas that facilitates the safe and efficient movement of people and goods while minimizing vehicle miles traveled."

Housing Element 2022

The Housing Element references bicycle, pedestrian, and transit improvements to shift transportation from vehicular modes per the following:

- Single room occupancy residential projects must provide one secure bicycle stall for each 3 units, to help encourage active transportation options.
- Various references to zero net energy homes to help address climate change.
- Site improvements section quote: "Though most of the City is cur-

rently served by adequate roadways and sidewalks, improvements for access or internal navigation may be necessary."

- Auxiliary dwelling units are noted as a strategy to increase density in single family neighborhoods to increase transit feasibility to ideally reduce private vehicle use.
- Access to transit: "Access to public transit is best in the low and moderate resource areas, both for local service and access to regional transit hubs."

Fountain Valley Crossing Spec Plan (FVCSP) Webpage FAQ

The FVCSP is a city effort to rezone an industrial area to also allow commercial, office, and limited residential by existing 200 business owners. It aims to revitalize an older industrial area with more retail activities, dining, shopping, farmers market, and diverse housing options.

An Environmental Impact Report (EIR) was part of the study with greenhouse gas (GHG) as one of the topics. Based on information in the EIR, the project might support Vision Zero concepts by encouraging mixed-use development and improved walkability.

Fountain Valley Crossing Specific Plan Project (FVCSP) EIR GHG

The FVCSP includes the following measures: Transportation Demand Management (TDM) Measures and bicycle and pedestrian facilities and amenities to encourage non-motorized transportation. "The Project's diverse mix of uses would help promote a reduction in vehicle miles traveled (VMT) and GHG emissions" and "would provide residential and commercial uses in walking distance to proposed recreational uses, entertainment, and commercial retail, which would result in reduced VMT, as compared to a project of similar size and land uses at a more suburban location".

City of Garden Grove

The Garden Grove Active Streets Master Plan 2018

The Garden Grove Active Streets Master Plan is supportive of bicycle and pedestrian improvements that align with Vision Zero goals of reducing collisions and injuries. The proposed bicycle network plans numerous bicycle improvements and facilities which include shared-use paths, bicycle lanes, buffered bicycle lanes, separated bikeways, bicycle routes, neighborhood greenways, and bicycle parking. Pedestrian improvements included in the Garden Grove Active Streets Master Plan include the following:

- Crossings and intersections, ramps, enhanced crosswalks, curb extensions, median refuge, Rectangular Rapid Flashing Beacon (RRFB), Pedestrian Hybrid Beacon (PHB).
- Traffic signals and warning beacons.
- Sidewalks-separate from traffic by landscaped park strips and/or parking, accessible, continuity, shade trees, etc.
- Intersections - pedestrian friendly, area to congregate, accessible, design for safety comfort, minimize pedestrian crossing distance, lighting, transit stops.

Garden Grove General Plan 2030

Circulation Element 2030

The Circulation Element does not specifically reference Vision Zero but references accommodating OCTA corridors that include Vision Zero focused improvements and offers countermeasures that align with Vision Zero under Neighborhood Traffic Management. Funding constraints are cited as challenges to implementing proposed bikeway projects included in the plan, but the following Circulation Element goals are supportive of Vision Zero concepts.

- Goal 3 to minimize vehicle intrusions into neighborhoods "1) expanding parkways to reduce the roadway width, 2) limiting the number of ingress/egress locations on-site, 3) traffic circles, 4) diverters, or speed humps, 5) curb extensions, 6) entrance treatments, or other effective traffic management techniques that reduce or eliminate the traffic intrusion..."
- Goal 4 "...reduce vehicle miles traveled... by approving mixed use developments..."
- Goal 5 "Increased awareness and use of alternate forms of transportation generated in, and traveling through the City of Garden Grove."
- Goal 6 "A safe, appealing, and comprehensive bicycle network...." - "encourage PWD to consider bikeways in their prioritization of re-paving..." - "...amend zoning ...traffic generators to include bikeway facilities." - "...incentives to developers who incorporate bikeways...." - "...Safe Routes to schools.." - "...pursue grants for bike facilities..."

Housing Element 2014-2021

The Housing Element does not specifically address Vision Zero but site improvements sections list bikeways, walkways, and equestrian trails as typical requirements for development. The energy conservation opportunities section notes sidewalks and bike racks to encourage walking and biking supporting the Air Quality element to reduce vehicle trips.

Safety Element 2030

The Safety Element does not specifically mention Vision Zero but supports mixed-use and transit-oriented development to increase walking, bicycling, and transit use.

Garden Grove Accident Reduction Team (ART)

The ART supports Vision Zero by educating commuters on existing law and how to safely share the road with bicyclists and pedestrians. The ART also provides education specific to bicyclists and pedestrians. Funding for the team is provided by the California Office of Traffic Safety.

Garden Grove Open Streets

The City has hosted multiple RE: Imagine Garden Grove Open Streets events, with the most recent occurring in April 2022. Per the City: "The Open Streets event is part of the City's continuing efforts to highlight Garden Grove's Downtown, while promoting the Re: Imagine Garden Grove mission of bringing more art to the community, creating more walkable areas of the city, and encouraging people to live a healthier, more connected life."

City of Huntington Beach

Huntington Beach Bike Plan 2013

The Huntington Beach Bike Plan supplements an extensive existing bike lane network and supports new bicycle projects which align with Vision Zero concepts of improving safety through increased separation between bicyclists and vehicles.

City of Huntington Beach General Plan 2017

Circulation Element

Huntington Beach has developed a majority of its streets according to the Complete Streets approach.

City of Huntington Beach Capital Infrastructure Projects (CIP) Tables 2019-2023

Huntington CIP projects include a safe pedestrian walkway with sidewalks and curb ramps suggesting support for Vision Zero concepts of pedestrian-vehicle separation for improved safety.

City of Huntington Beach Webpage 2023

The City of Huntington Beach Webpage provides guidance on what context pedestrian enhancements like flashing beacons, marked crosswalks, and pedestrian signal heads are provided.

HB In Motion

The City of Huntington Beach is currently preparing the HB In Motion study, focused on enhanced access and mobility. The study focuses on the portion of the Beach Path the City is responsible for, as well as the citywide bicycle and pedestrian networks.

City of Irvine

City of Irvine General Plan 2015

Circulation Element

The Circulation Element language provides language supportive of Vision Zero concepts of separating bicyclists and pedestrians from vehicle modes to reduce collisions and injuries. The following objectives reflect support for Vision Zero concepts:

- "Plan, provide and maintain a comprehensive bicycle trail network that together with the regional trail system, encourages increased use of bicycle trails for commuters and recreational purposes."
- "Bike trip destinations…provide showers and bike racks.
- "…traffic signal phasing for bike crossing…"

- "...grade separated crossing for class 1 bikeways at major ...."
- "...increase public awareness of bike safety..."
- "Plan, develop and maintain a riding and hiking trail network and support facilities to satisfy the needs of riders and hikers."
- "Work with Orange County Transportation Authority to implement a public transit system for trips within the City and adjacent areas.

City of Irvine Active Transportation Plan 2015

The 2015 Irvine Active Transportation Plan provides countermeasures to improve safety for bicycle and pedestrian modes that are consistent with Vision Zero goals.

City of Irvine Strategic Active Transportation Plan 2020

The 2020 Irvine Strategic Active Transportation Plan (ISATP) provides extensive bicycle and pedestrian improvements to make walking and biking safer and reduce collisions and injuries consistent with Vision Zero goals.

City of Irvine Bikeways Map

The Irvine Bikeways Map shows an extensive bicycle network with a large quantity of separated bikeways which suggests support for separating bicycle and pedestrian modes from vehicles to reduce collisions and injuries.

Irvine Webpage - Biking

The Irvine Webpage for biking suggests support for Vision Zero, with the site stating, "the pedestrian and bicycle networks form the foundation for multi-modal transportation" and that plans include grade separating bicyclists and pedestrians from vehicles to reduce collisions and injuries.

Irvine Climate Action and Adaptation Plan

The City of Irvine kicked off the development of its first Climate Action and Adaptation Plan (CAAP) in June 2021. By setting ambitious but achievable emissions reduction targets and laying out thoughtfully planned greenhouse gas (GHG) emissions reduction and climate adaptation measures, the CAAP will lay a pathway to achieving the City's climate goals. The study is under preparation and draft actions include the following:

- Expand bicycling and walking options through infrastructure improvements.
- Increase transit ridership through the enhancement and expansion of connected transit lines.

City of Orange

City of Orange 2010 General Plan

General Plan Vision

The General Plan Vision offers a vision statement that aligns with Vision Zero goals; "Residential areas ... balanced, multimodal circulation network that accommodates vehicles, pedestrians, cyclists, hikers, and equestrians. This network will create additional opportunities for walking and biking, enhancing circulation safety,..."

Circulation Element

The Circulation Element has numerous references to safe multimodal connections, including bike and pedestrian modes, with cross sections showing bike lanes and separated paths which suggest support for the Vision Zero goal of reductions in roadway collisions and injuries.

Infrastructure Element

The Infrastructure Element does not directly reference Vision Zero topics but supports implementation of bike lanes and sidewalks.

Urban Design Element

The Urban Design Element does not directly reference Vision Zero topics but encourages bike facilities and sidewalks. The General Plan states the City will provide safe multi-modal routes to walk, bike, and drive; "City will update the Zoning Code to encourage features that buffer street activity and pedestrians from automobile traffic by providing both distance and substantial landscaping. Within mixed-use areas and other commercial districts, the City will employ pedestrian-friendly amenities such as enhanced crosswalk areas, lighting, benches, and trash receptacles to create a safer, more inviting, and more walkable environment."

Santiago Creek Vision Plan 2018

Prepared by a local community based organization named the Greenway Alliance, the Santiago Creek Vision Plan supports a separated bike and walking trail system which may support Vision Zero goals and concepts.

City of Tustin

City of Tustin General Plan 2018

Circulation Element

The Circulation Element states support for providing bicycle and pedestrian facilities and separating them when possible to reduce collisions and injuries. Goal 6 of the Circulation Element supports increasing transit facilities, curb ramps, bike lanes, and separated paths which are also supportive of Vision Zero.

Housing Element 2021-2029

While not explicitly discussing Vision Zero concepts, the Housing Element's Environmental Sensitivity Goal 5 - Sustainable Development states to "prioritize sustainable housing... in proximity to services and employment centers thereby enabling the use of public transit, walking or bicycling and promoting an active lifestyle."

Downtown Specific Plan 2018

The City of Tustin Downtown Specific Plan provides language supportive of Vision Zero concepts per the following:

- "Vision for downtown.....Promoting pedestrian-oriented commercial first floor development ...expand walkability; Transforming streets... pedestrian and bicycle-oriented improvements ...high-quality integrated residential mixed ...multi-family development."
- "Bike improvements...new bike lanes downtown...sharrows on various other roads... bike racks throughout downtown and transit stops."
- "Off-road bicycle lane (Class 1) integrated with the sidewalk..."
- "Balance auto-centric nature with increased pedestrian and bicycle amenities on Main Street".
- "Create "complete streets" ...pedestrians and bicyclists greater emphasis and vehicles less dominance."
- "Reduced vehicular lanes, pedestrian and bicycle improvements, on-street parallel and diagonal parking, pedestrian bulb-outs, enhanced pedestrian crossings, and landscaping to visually support the roadway transformation."
- "...Pedestrian friendly corridor by reducing...traffic lanes...widths...on-street buffered bicycle lanes, diagonal parking...wider sidewalks."
- "...Create public gathering areas adjacent to the sidewalk...seating areas...."
- Various Pedestrian improvements: Widened Sidewalks- Decorative Sidewalk Paving- Decorative Crosswalks- Bulb-Outs- Crosswalk Enhanced Paving- Pedestrian Gathering Areas Increasing Sidewalk Widths- Accessible Pedestrian Signals- Flashing Light Crosswalks.

County of Orange

OC Council of Governments - Complete Streets Handbook 2016

The Complete Streets Handbook envisions transforming Orange County streets into a Complete Streets network and supports separation of bicyclists and pedestrians from vehicles to reduce collisions and injuries.

County of Orange Active Transportation Plan

The County is currently preparing an Active Transportation Plan encompassing the unincorporated areas and flood channels throughout Orange County.

Orange County Fire Authority (OCFA)

Fire Master Plans for Commercial & Residential Development

OCFA's Fire Master Plan suggests support of Vision Zero concepts by providing guidance on roadway design standards to ensure Orange County's roadways can support the access and mobility of emergency service vehicles. These standards consider design elements such as curb-to-curb widths and the placement and accessibility of fire hydrants to improve emergency response times and efficiency.

Orange County Transportation Authority (OCTA)

Districts 1 & 2 Bikeways Strategy 2013

The Districts 1 & 2 Bikeways Strategy advances bicycle facility and pedestrian network planning within Orange County to reduce bicyclist and pedestrian visions and support Vision Zero. The document encourages the development of off-street multi-use paths and barrier-separated facilities to reduce conflicts between bikes and vehicular traffic to improve user comfort and reduce collisions.

OC Foothills Bikeways Strategy 2016

The OC Foothills Bikeways Strategy advances bicycle facility and pedestrian network planning within Orange County to reduce bicyclist and pedestrian visions and supports Vision Zero. The document encourages the development of off-street multi-use paths and barrier-separated facilities to reduce conflicts between bikes and vehicular traffic to improve user comfort and reduce collisions.

OCTA's Master Plan of Arterial Highways (MPAH) 2017

The OCTA MPAH has some language supporting Vision Zero topics, specifically regarding coordination with local agencies on safety efforts to balance regional travel demand with addressing the needs of all users of the roadway.

OCTA Long Range Transportation Plan 2022

The OCTA Long Range Transportation Plan has some language supporting Vision Zero topics including education and mentions reducing bicycle and pedestrian involved collisions.

OC Active 2019

The OC Active Plan advances bicycle facility and pedestrian network planning within Orange County to reduce bicyclist and pedestrian visions and supports Vision Zero.

South OC Multimodal Transportation Study 2022

The South OCTA Multimodal Transportation Study has few specific references to Vision Zero related concepts but mentions the OC Loops project for bicycle modes.

OCTA Mobility Hubs Study 2022

The OCTA Mobility Hub Study focuses on multi-modal vehicle lots connecting to transit services and references the OC Complete Street Handbook which supports bicycle and pedestrian separation from vehicles to reduce collisions and injuries.

OC Loops Gap Feasibility Study 2023

The OC Loops project expands the original OC Loop to additional loops and a diagonal connector that serves all of Orange County. The bikeway feasibility study prioritizes the 8 to 80 audience through enhanced bikeways that separate cyclists from moving traffic where possible.

Safe Transportation Education Program (STEP)

OCTA has secured grant funding to administer STEP, which provides approximately twenty-five schools in Orange County with free resources, activities, and events to encourage families to walk and roll to school safely and more often. Additional funding has been secured for future expansion of the program. STEP is a partnership project between OCTA and the Orange County Health Care Agency (OCHCA), and is funded by a Caltrans Active Transportation Program grant.

Safe Routes to School Action Plan

OCTA and OCHCA are leading the Safe Routes to School (SRTS) Action Plan that serves every school and school district with a series of steps to advance more SRTS improvements and activities. The study is under preparation and aligns with Vision Zero goals of improving safety for youth traveling through active transportation means.

Bus Stop Accessibility and Safety Plan

Using funding provided by the Southern California Association of Governments, OCTA will lead a study that will evaluate the busiest 41 bus stops in Orange County for pedestrian access and safety. The majority of the study locations are within the City of Santa Ana along Harbor Boulevard, Main Street, and 17th Street. The study will support Vision Zero goals of improving safety for people walking to access transit.

Southern California Association of Governments (SCAG)

Connect SoCal, 2020

SCAG's Regional Transportation Plan, titled, Connect SoCal, has a vision to locate housing, jobs, and transit closer together; increase investment in transit and complete streets; and increase mobility options to achieve a more sustainable growth pattern. Relevant policies, practices, and programs include reducing vehicle miles traveled through transportation demand management, focusing growth near destinations and mobility options and promoting livable corridors, and setting metrics to track reductions in fatalities and serious injuries. To achieve regional safety targets, SCAG developed a High Injury Network (HIN) mapping tool, provides safety education campaigns, and advocates for funding strategies.

California Department of Transportation (Caltrans)

Toward an Active California 2017

Toward an Active California is the State Bicycle & Pedestrian Plan adopted by Caltrans to support bicycle and pedestrian mobility with clear objectives, strategies, and actions. Consistent with Vision Zero goals, safety is identified as a key component of the plan with strategies including the further development of safer streets and crossings, safety education, data, and enforcement.

Caltrans District 12 Active Transportation (CAT) Plan 2022

The District 12 CAT Plan identifies pedestrian and bicycle needs across the state highway system in Orange County. Consistent with Vision Zero goals, the document identifies the types of facilities needed and a prioritization of those needs based on a number of factors, including collision history.

Freeway Ramp Active Mobility Enhancement Study

Caltrans District 12 is evaluating ten of the highest need interchanges within Orange County based on the District 12 CAT Plan to develop concept level plans for improved safety and mobility for people walking and cycling. The study is underway and includes three interchanges within the City of Santa Ana, and is planning to align with Vision Zero goals of enhanced separation between vulnerable road users and motorist traffic.

1.5 Vision Zero Strategies, Policies, and Goals to Adopt

Policies to Adopt

The City of Santa Ana has already established several policies related to achieving zero fatalities and improving the way residents travel within the City. From the 2022 General Plan's Mobility Element, the following policies provide guidance for this Vision Zero Plan and future complete street projects.

- Policy M-1.1 Safety: Achieve zero fatalities from traffic collisions through education, enforcement, and infrastructure design.
- Policy M-1.2 Balanced Multimodal Network: Provide a balanced and equitable multimodal circulation network that reflects current and changing needs.
- Policy M-1.9 Regional Consistency: Ensure the street network is consistent with standards set in the OCTA Master Plan of Arterial Highways and the Congestion Management Program.
- Policy M-1.10 Intergovernmental Coordination: Collaborate with federal, state, SCAG, OCTA, rail authorities, and other agencies to fund and improve the regional transportation system.
- Policy M-3.1 Non-motorized Travelway Network: Expand and maintain a citywide network of non-motorized travelways within both the public and private realms that create linkages between neighborhoods, recreational amenities, schools, employment centers, neighborhood serving commercial, and activity centers.
- Policy M-3.2 Non-motorized Travelway Amenities: Enhance non-motorized travelways with amenities such as landscaping, shade trees, lighting, benches, crosswalks, rest stops, bicycle parking, and support facilities that promote a pleasant and safe experience.
- Policy M-3.5 Education And Encouragement: Encourage active transportation choices through education, special events, and programs.
- Policy M-3.7 Complete Streets Design: Enhance streets to facilitate

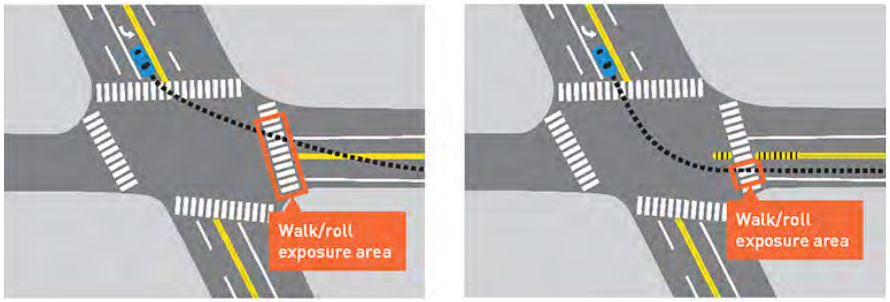
safe walking, bicycling, and other non-motorized forms of transportation through community participatory design.

- Policy M-3.9 Neighborhood Traffic: Develop innovative strategies to calm neighborhood traffic, increase safety, and eliminate collisions, while also maintaining access for emergency response.
- Policy M-5.1 Enhanced Street Design: Improve the beauty, character, and function of travelways with amenities such as landscaped parkways and medians, bike lanes, public art, and other amenities.
- Policy M-5.5 Street Design: Design and retrofit streets based on their combined land use context and road function to achieve safety objectives.
- Policy M-5.8 Traffic Safety: Prioritize the safety of all travelway users when designing transportation improvement and rehabilitation projects.

Strategies to Adopt

It is the recommendation of this plan, aside from the aforementioned policies, that the City of Santa Ana also focus on the following strategies and concepts:

- Identification of roadways with motorist speeding behaviors. Add automated enforcement of speeding at problematic locations
- Identification of roadways with motorist red light running behaviors. Add automated enforcement of red light running at problematic intersections
- Implementation of safety interventions citywide/systemically
- Pedestrian-focused engineering countermeasures to reduce vehicle versus pedestrian collisions
- Bicyclist-focused engineering countermeasures to reduce vehicle versus bicycle collisions
- Left turn tight radius, bulb-outs, Leading Pedestrian Interval signal timing
- Pedestrian refuge curb/bollards to slow left turns
- Turn calming
- Speed humps to reduce speed
- Roundabouts and traffic circles
- Senior zones for increased safety
- Pedestrian signals, lighting, crosswalks
- Lane re-allocation/road buffets/road diets
- Adding continuous sidewalks or speed humps at driveways to mitigate conflicts from vehicles turning on and off of driveways
- Adding hardened centerlines, both including tubular markers along centerlines and small rubber humps in front of crosswalks to enforce, through design, slower left turn movements and reduce pedestrian exposure to turning traffic



Hardened Centerlines, Source: Seattle Department of Transportation

- Adding “Intersection Daylighting” systematically across the City of Santa Ana. Daylighting is the simple concept that safety is improved by removing parked cars within 20 feet of crosswalks. By keeping the area next to crosswalks clear of parked vehicle obstructions, people walking and people driving/biking on the street can see each other better, thereby significantly increasing safety in a cost-effective manner. Because only paint and tubular markers are involved in tactical urbanism forms of daylighting, it is considered highly cost effective and a “tried-and-tested” way to increase safety in cities. The newly published December 2023 edition of the MUTCD has, for the first time, a section sanctioning Daylight of intersection using just paint and tubular markers. It is the recommendation of this Plan that the City of Santa Ana utilize the MUTCD to use tactical urbanism to channelize intersections city-wide where daylighting is feasible.

As seen in the Consistency Review from Section 1.4, multiple agencies within Orange County adjacent or overlapping with the City of Santa Ana have also advanced Vision Zero goals and actions. This literature review illustrates the depth of actions and additional potential ideas for consideration in the City of Santa Ana

The consistency review earlier in this chapter reviewed strategies and policies from around the region, with many standing out as good practice. Garden Grove's Circulation Element is prominent as another best practice. The Circulation Element itself does not specifically reference Vision Zero but includes Vision Zero-focused improvements and offers countermeasures that align with successful Vision Zero strategies and policies. This Plan recommends reviewing those strategies and policies for future consideration.

Namely, under Neighborhood Traffic Management, the following policies are supportive of Vision Zero concepts:

- Policy 3 to minimize vehicle intrusions into neighborhoods "1) expanding parkways to reduce the roadway width, 2) limiting the number of ingress/egress locations on-site, 3) traffic circles, 4) diverters, or speed humps, 5) curb extensions, 6) entrance treatments, or other effective traffic management techniques that reduce or eliminate the traffic intrusion..."
- Policy 4 "...reduce vehicle miles traveled... by approving mixed use developments..."
- Policy 5 "Increased awareness and use of alternate forms of transportation generated in, and traveling through the City of Garden Grove."
- Policy 6 "A safe, appealing, and comprehensive bicycle network...." - "encourage PWD to consider bikeways in their prioritization of re-paving..." - "...amend zoning ...traffic generators to include bikeway facilities." - "...incentives to developers who incorporate bikeways...." - "...Safe Routes to schools.." - "...pursue grants for bike facilities..."
- In particular, the "Los Angeles Mobility Plan 2035 Policies and Programs" are to be highlighted as an example of best practice for use in Santa Ana. Those policies and programs can be found in Appendix A.

Goals to Adopt

The goals of Santa Ana Vision Zero Plan are derived from the original Safe Mobility Santa Ana Plan to:

- Substantially increase safe mobility in all areas of the City
- Achieve zero fatal bicycle and pedestrian collisions
- Reduce vehicle speeds
- Minimize demonstrated collision patterns

The Plan's objectives include:

- Reduce collisions citywide, while focusing capital investments at high collision locations.
- Recommend solutions to evolve the roadway network so people can make transportation decisions and unanticipated mistakes without risk of severe injury or death .
- Reject severe and fatal injuries as a necessary by-product of multimodal transportation.
- Prioritize traffic safety over congestion management, accepting that improving safety for all roadway users will in some cases result in unavoidable delay.
- Suggest infrastructure improvements that reduce speeds and separate vulnerable roadway users from moving traffic.

Next Steps

- Pursue implementation of Safe Routes to School (SRST) plan.
- Develop and implement Safe Routes to Parks (SRTP) plan.
- Pursue development and implementation of Citywide Street Light Master Plan.
- Monitor laws to pursue opportunities to legally reduce the posted speed limits.

> **Let's embrace our City of Santa Ana, where bikes and pedestrians flow, hand in hand, and side by side. From busy intersections to tranquil lanes, let's share the road with empathy and refrain. Zero deaths is our mission for pedestrians, bike riders, and all road users. Together, we can build a future where safety reigns, where every traveler's life is cherished and sustained.**
>
> ***Mauricio Castaneda***
> *Associate Engineer*
> *City of Santa Ana*

Photo Location: Civic Center Drive near the County Administration building

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2 Existing Conditions

Photo Location: Santa Ana High School

In order to make recommendations to change the built environment in Santa Ana, a clear picture of current conditions must be painted. This chapter attempts to describe the existing conditions in the City of Santa Ana, with subsequent chapters describing the analysis, countermeasures, and recommendations that the City of Santa Ana needs to reach Vision Zero.

2.1 Land Use

Figure 2-1 showcases the existing land use pattern in Santa Ana is dominated with single-family residential development interspersed with pockets of low-medium and multi-family residential, institutional, commercial, and industrial. Commercial, professional, and administration offices are primarily along major thoroughfares like Tustin Avenue and Grand Avenue. Activity areas are located in places such as Downtown and areas designated as District Centers in large land use blocks that are distributed along the perimeter of the city as well as the core area of central Santa Ana near the City Hall. Urban neighborhoods are usually near these activity centers east of downtown, along Harbor Boulevard, Bristol Street, and Main Street. Open space is scattered throughout most of the City, but a large dedicated area is provided around Santa Ana River running north-south near the east edge of the city.

Commercial and office activity centers are mostly concentrated along major and secondary arterials including Bristol Street, Main Street, Harbor Boulevard, 1st Street, 17th Street, and Tustin Avenue. Public sites, such as schools and parks, are more evenly distributed throughout Santa Ana.

2.2 Roadway Network

The City of Santa Ana maintains over 400 centerline miles of streets. The streets in Santa Ana are classified into six different categories, which is consistent with OCTA's Master Plan of Streets and Highways. The street network consists of principal arterials, major arterials, primary and secondary arterials, collectors, divided collectors, and local streets. Most of these streets are not interrupted by the railroad corridors and highways that traverse and surround the City. The minor streets primarily service the residential neighborhoods near railroad, highways, and utility right-of-way corridors. Nonetheless, Santa Ana has a substantial grid network and, for a suburban community, relatively few cul-de-sacs, but enough that main roads require bike facilities to allow cyclists to get through neighborhoods. The prevalence of major arterials within Santa Ana underscores the need for defined facilities along the wide roadways with higher lane counts as they typically experience higher traffic volumes and collisions. It also identifies connector streets that may be good alternatives for bicycle facilities given that they have fewer lanes. The roadways were analyzed further to determine suitability as part of this study.

Street Classification

Primary arterial streets are limited to connections from the freeway to downtown and short segments through industrial zones at the east edge of the city. Major and secondary arterial streets follow a typical city grid pattern while supporting commercial, industrial and residential uses. A limited commuter classification runs along Broadway Boulevard, Civic Center Boulevard, and Chestnut Avenue. As shown in Figure 2-2, most streets are classified as local streets at more than 75% followed by major arterials at 12% of all roadways in Santa Ana.

Speed Limits

All speed limits in the City of Santa Ana comply with the California Vehicle Code and California Manual of Uniform Traffic Control Devices. While more than 75% of Santa Ana's roadway network has a speed limit of 25 mph, these low speeds are primarily located in residential neighborhoods, as shown in Figure 2-3. Though none of the streets have posted speeds over 45 mph, Santa Ana's busiest corridors along major arterials, such as Fairview Street and portions of Grand Avenue and 1st Street, have the highest posted speeds with nearly 80% marked at 45 mph. When factoring in primary and secondary arterials as well as major arterials, nearly 70% are marked 40 to 45 mph. The City's lowest speed streets have a posted speed limit of 25 mph, which makes them conducive to bicycle facilities, such as bicycle boulevards, also known as neighborways, while streets with more lanes and higher speeds should have physical separation if bicycle facilities exist with additional enhancements at the intersections.

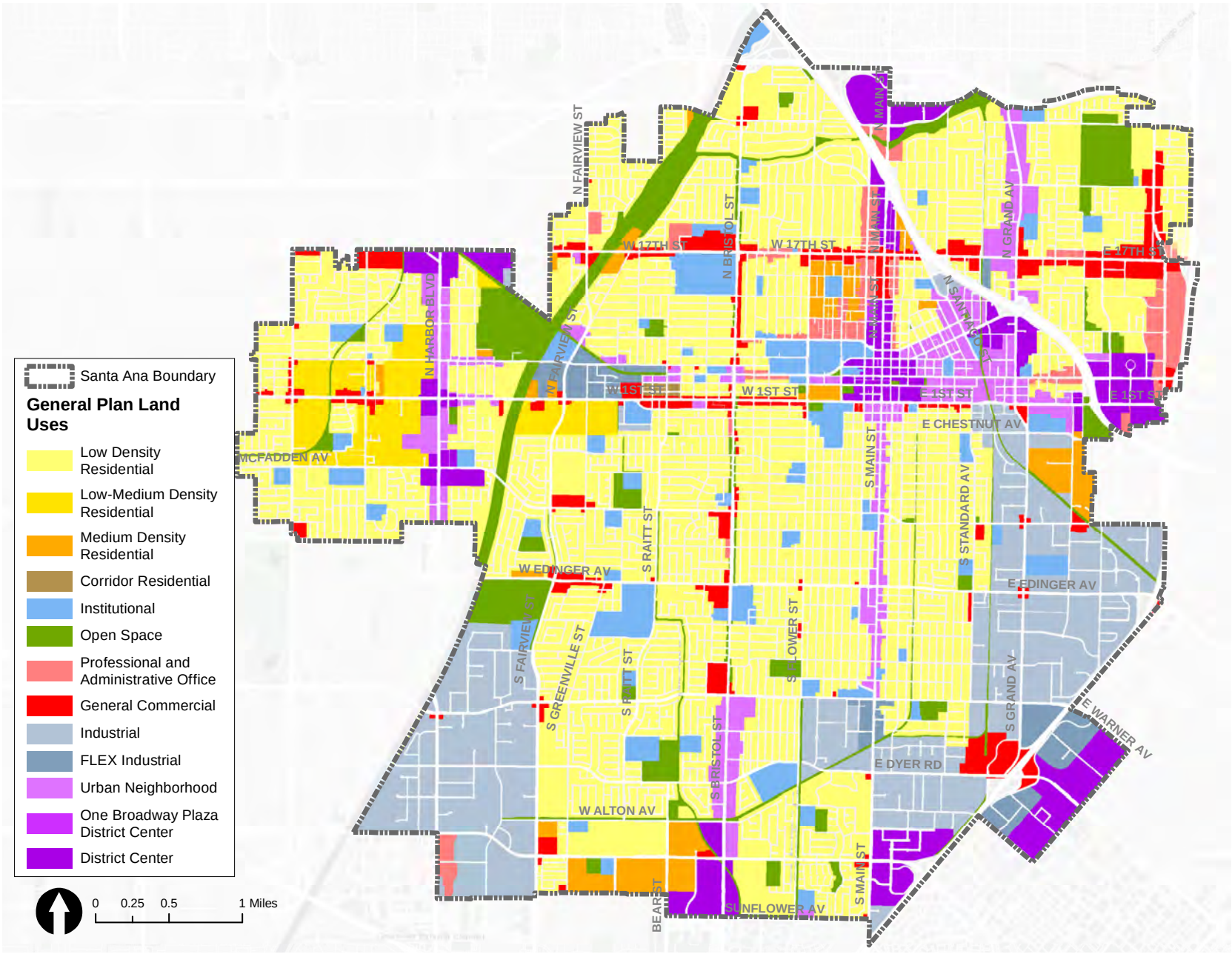


Figure 2-1: Land Use

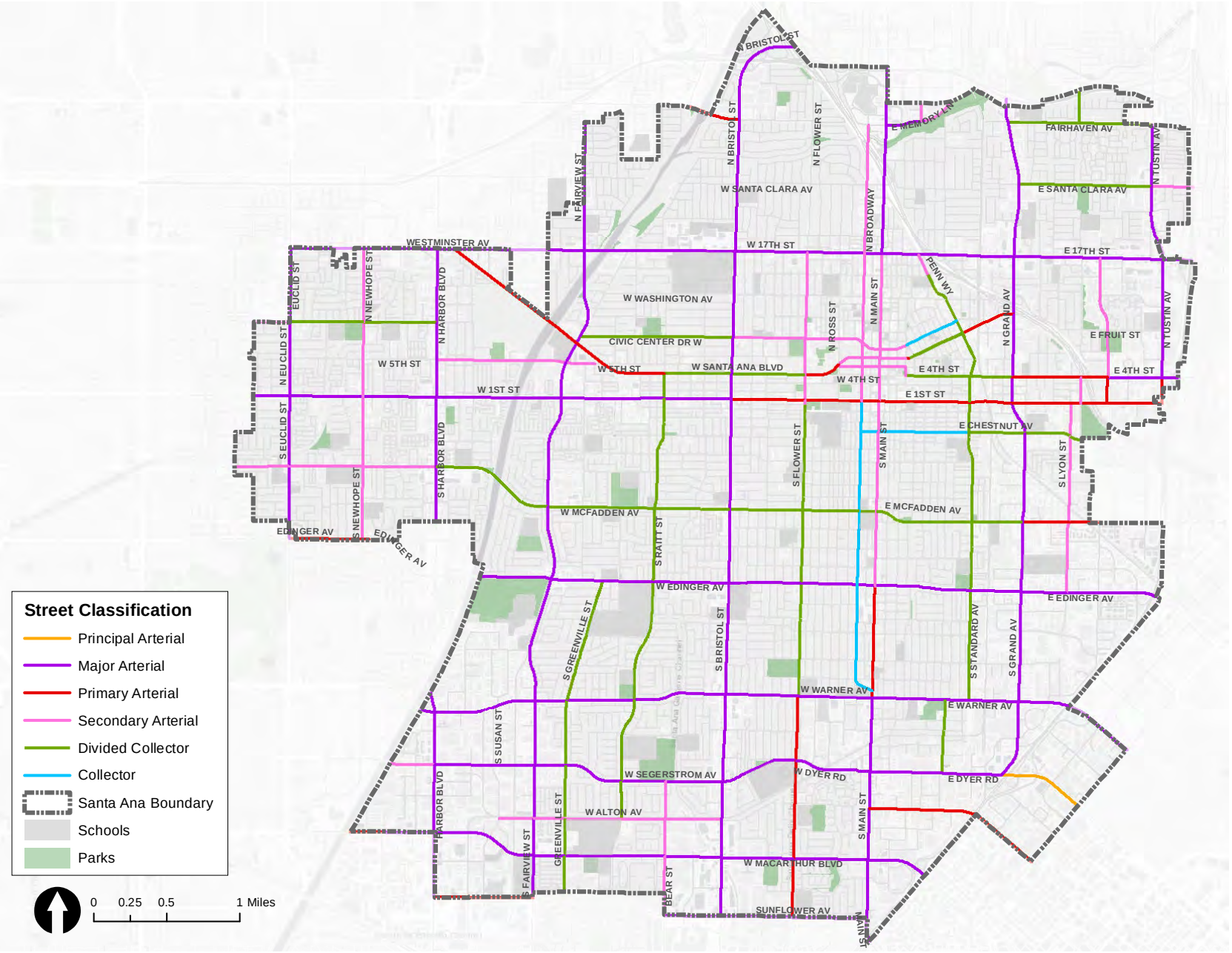


Figure 2-2: Street Classification

Table 2-1: Street Classifications, Interpreted per the General Plan, Mobility Element, page M-06

Classification	Description	Examples
Principal Arterial	A street with eight travel lanes and a center median. Typically includes bus transit, pedestrian sidewalks, and bicycle lanes. *Typical ROW: 146' / 126' curb-to-curb / 14' median / 10' sidewalk*	Dyer Road
Major Arterial	A street with six travel lanes and a center median. Typically includes bus transit, pedestrian sidewalks, and bicycle lanes. *Typical ROW: 120' / 100' curb-to-curb / 14' median / 10' sidewalk*	Bristol Street, Harbor Boulevard, and Edinger Avenue
Primary Arterial	A street with four travel lanes and a center median. Typically includes pedestrian sidewalks and may include bus transit services and bicycle lanes. *Typical ROW: 104' / 84' curb-to-curb / 14' median / 10' sidewalk 4th Street (between Grand Avenue and Interstate 5), and Sunflower Avenue*	4th Street (between Grand Avenue and Interstate 5), and Sunflower Avenue (west of Raitt Street)
Secondary Arterial	A street with four travel lanes and no center median. Typically includes pedestrian sidewalks and may include bus transit and bicycle lanes. Serves more local traffic than a Primary Arterial. *Typical ROW: 80' / 64' curb-to-curb / 8' sidewalk*	Main Street (through Downtown), and Newhope Street
Divided Collector Arterial	A street with two travel lanes and a continuous center two-way left turn lane, but may be divided by raised median, with an expanded right-of-way to accommodate bike lanes. *Typical ROW: 80' / 64' curb-to-curb / 8' sidewalk*	Raitt Street and Standard Avenue
Collector Street	A street with two travel lanes and no center median, typically includes pedestrian sidewalks, may include shared bicycle routes. *Typical ROW: 60' / 40' curb-to-curb / 10' sidewalk*	Broadway south of 1st Street (north of Civic Center)
Local Street	A street with two travel lanes serving residences and businesses. Typically includes pedestrian sidewalks and on-street parking. May include shared bicycle routes. Local streets are the most common street type. ** Not part of the City's MPSH.*	Lacy Street, Orange Avenue, Raitt Street, Santa Clara Avenue, Wilshire Avenue

Road Lane Quantities

The number of lanes on a street have a significant effect on safety and stress for people walking, rolling, and bicycling. The more lanes, the more vehicles, the more merging, the higher the speeds, and the greater risk for collisions and injuries, as shown in Section 3.6, Analysis of Systemic Safety Needs. Figure 2-4 shows major arterials can have up to six lanes but transition down to five and four lanes as they reach the center of the city. Secondary arterials will typically have four lanes but can transition down to two lanes near the center of the city.

Raised Medians

The safety benefits that raised medians provide pedestrians are unparalleled. Medians at crossing locations improve safety by giving people walking a safe place to wait in the middle of the street so they can focus on looking only one direction for each side of the road they cross. The FHWA research report entitled “Safety Benefits of Raised Medians and Pedestrian Refuge Areas” found the following:

“Providing raised medians or pedestrian refuge areas at pedestrian crossings at marked crosswalks has demonstrated a 46 percent reduction in pedestrian crashes. At unmarked crosswalk locations, pedestrian crashes have been reduced by 39 percent. Installing raised pedestrian refuge islands on the approaches to unsignalized intersections has had the most impact reducing pedestrian crashes.”

When raised medians include plantings or colored aggregate, they create an edge friction effect that can calm or reduce traffic speeds and reduce collisions. As shown in Figure 2-5, most major arterials have segments of raised medians with some gaps. Streets with higher percentages of raised medians include 1st Street, 17th Street, Edinger Avenue, Segerstrom Avenue, MacArthur Boulevard, Harbor Boulevard, and Bristol Street. The City of Santa Ana aims for all major and principal arterials to have raised medians.

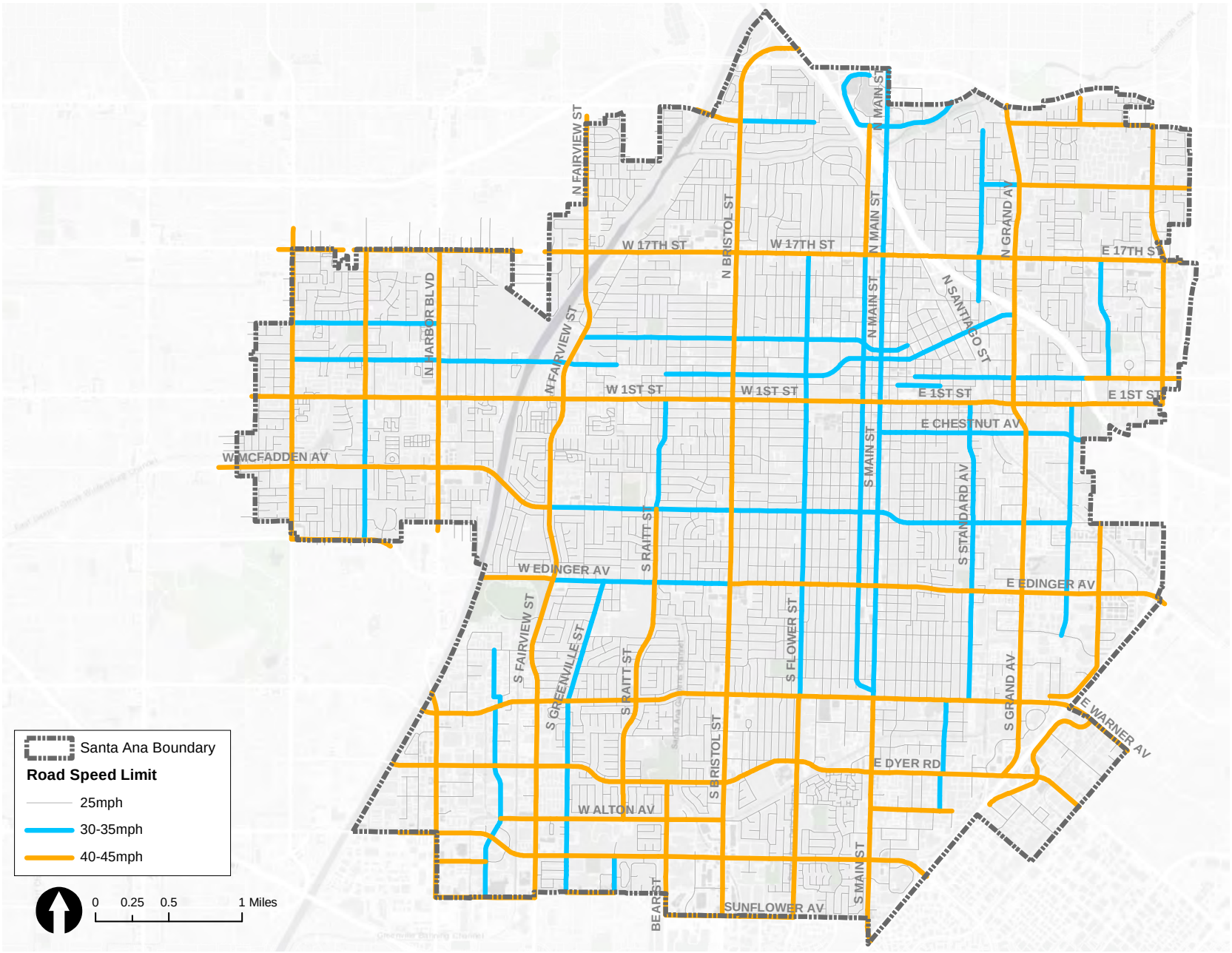


Figure 2-3: Speed Limit

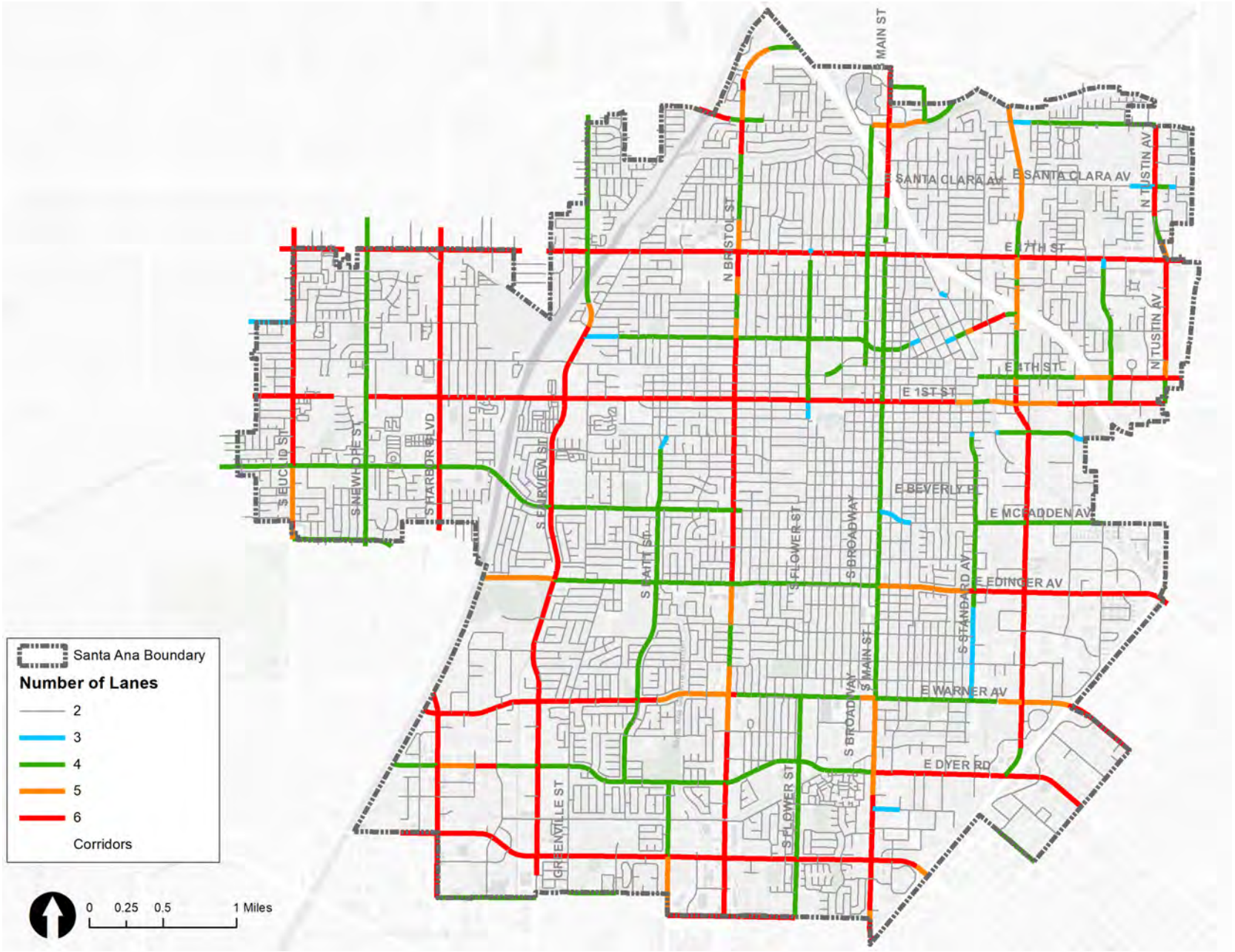


Figure 2-4: Road Lane Quantities

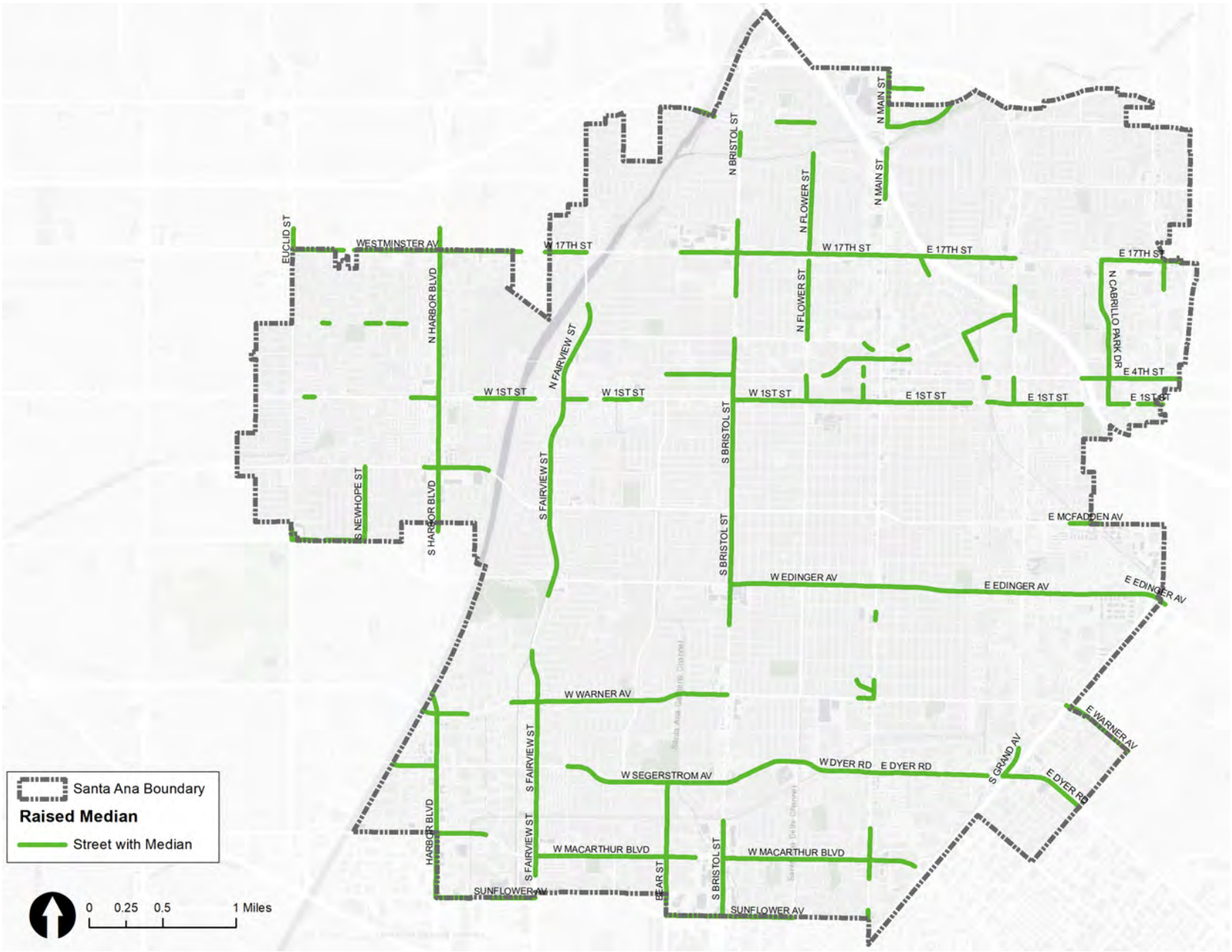


Figure 2-5: Raised Medians

2.3 Existing Infrastructure for People Walking, Rolling, and Using Mobility Aids

Sidewalks

A complete pedestrian network without gaps is helpful for encouraging people to walk to more destinations in a safe and comfortable environment. Existing sidewalk network data provided by the City was analyzed, especially around key destinations that include schools, parks, and employment centers. As shown in Figure 2-6, the sidewalk network is fairly well connected with only a few small neighborhoods and short segments missing. Some of the sidewalk obstructions relate to utilities.

Curb Ramps

Curb ramps are another important component for an effective pedestrian network for accessibility as well as comfort for walking to your destinations. City provided curb ramp data from 2017 is shown in Figure 2-7 with numerous missing curb ramps and a near equal quantity that are 'visually non compliant' in terms of geometric configuration and/or missing the standard truncated domes on the ramp surface.

Street Lighting

Street lighting is an important factor for public safety when walking at night. Community members have indicated that dark roadway segments are a concern on some residential streets and crossings. Using City provided data, Figure 2-8 shows the existing coverage throughout the City. The City of Santa Ana recently started a Citywide Street Light Master Plan. This Plan will help identify street lighting needs.

Transit Routes and Stops

There are 27 bus routes and nearly 700 bus stops within Santa Ana, as shown in Figure 2-9. The transit services include Fixed Routes, Community Shuttles, Intracounty Express Routes, and Metrolink Feeder Routes throughout the City primarily on Major and Secondary Arterials. The Santa Ana Regional Transportation Center (shown as OC Metrolink Station on figure) provides commuter rail services through Metrolink's Orange County Orange County and Inland Empire-Orange County Lines, connecting Santa Ana with Los Angeles, San Bernardino, and Oceanside. Based on the Census 2021: ACS 5-Year Estimate, approximately four percent of workers use public transit as their primary mode of transportation.

The OC Streetcar serves downtown Santa Ana and extends west to the northwest city edge to connect more of the City to downtown and the Regional Transportation Center. This project will create a last-mile connection that will provide greater mobility and transportation choices to the residents of Santa Ana and the region.

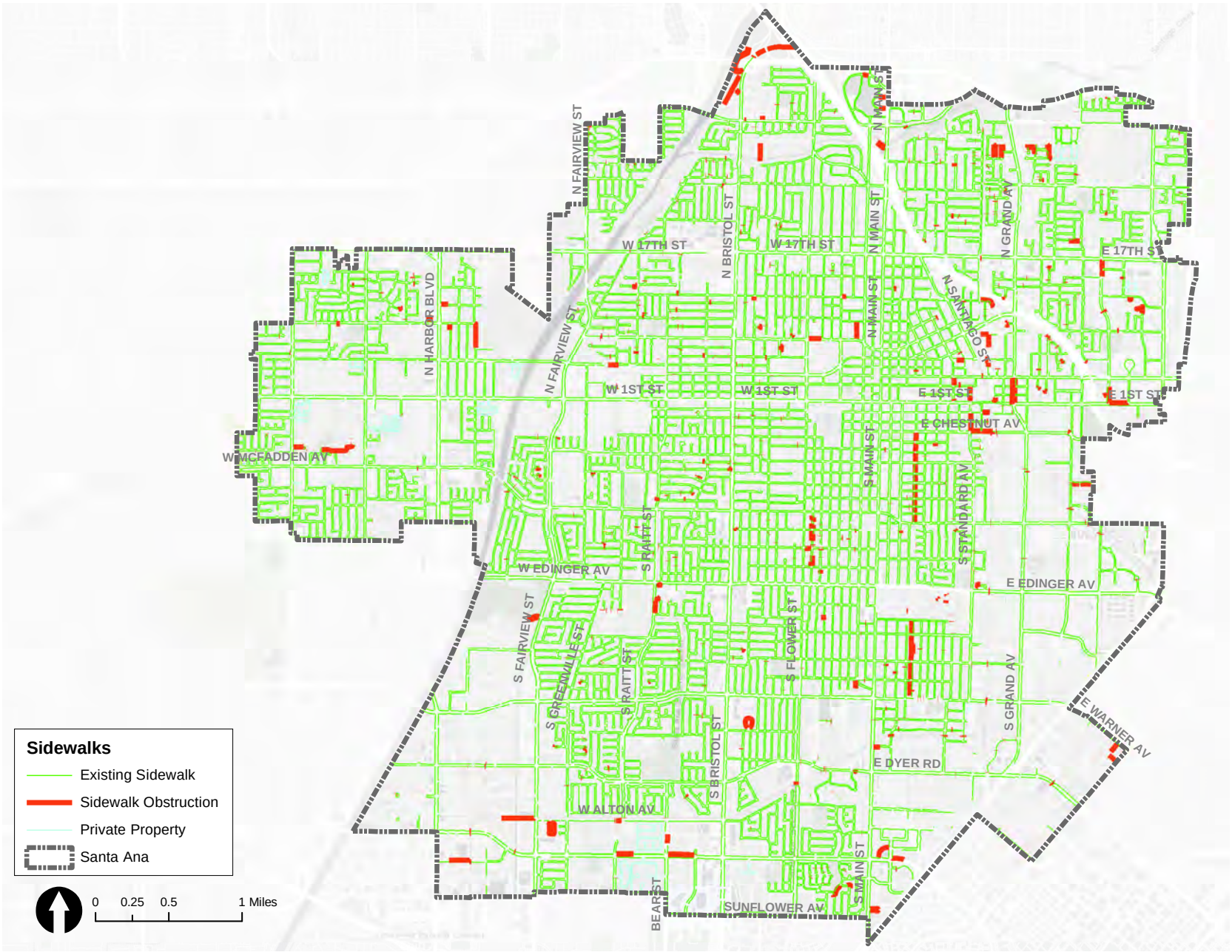


Figure 2-6: Sidewalk Network

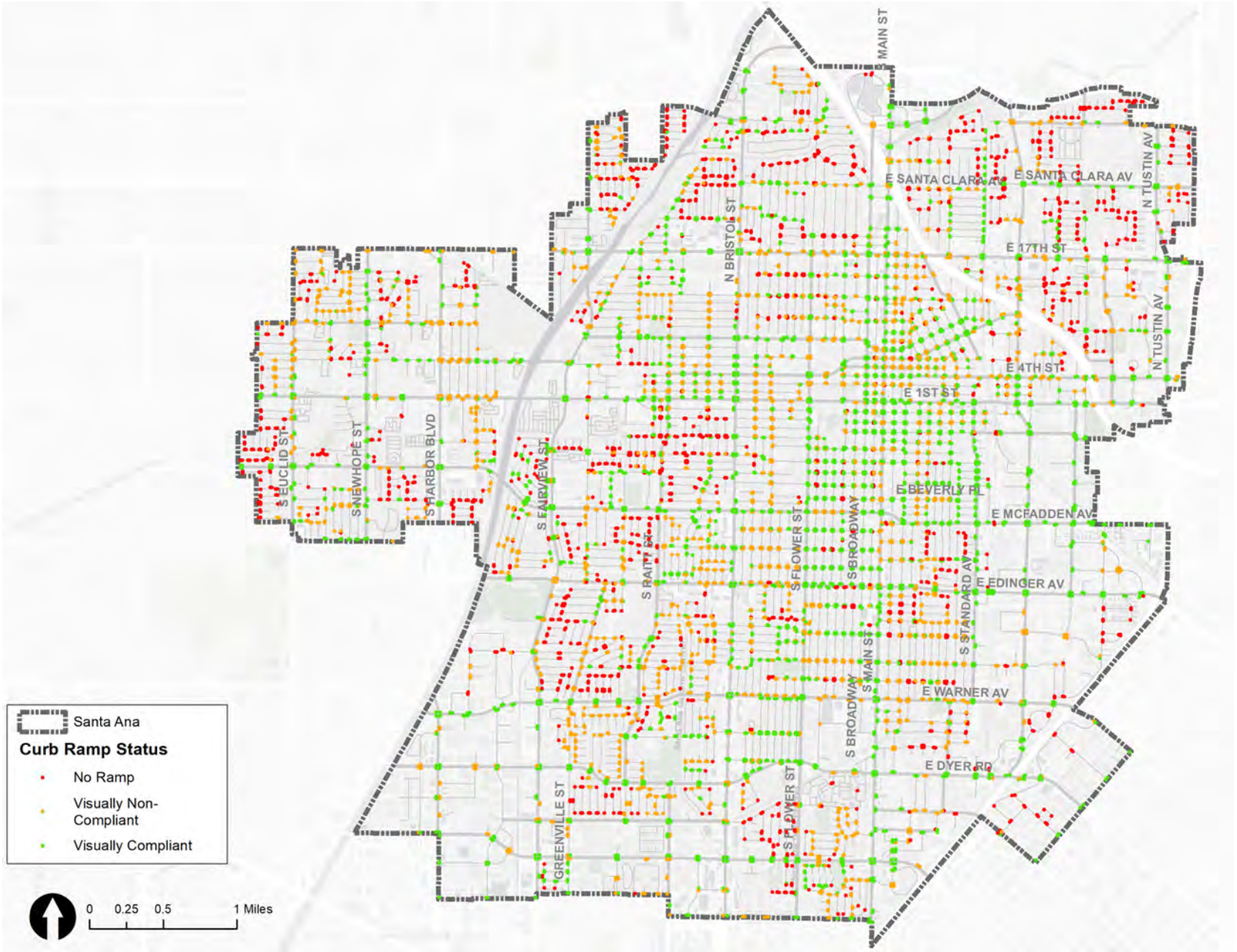


Figure 2-7: Curb Ramps

Note: Data shown is from 2017. City has installed and upgrade curb ramps not reflected on this figure.

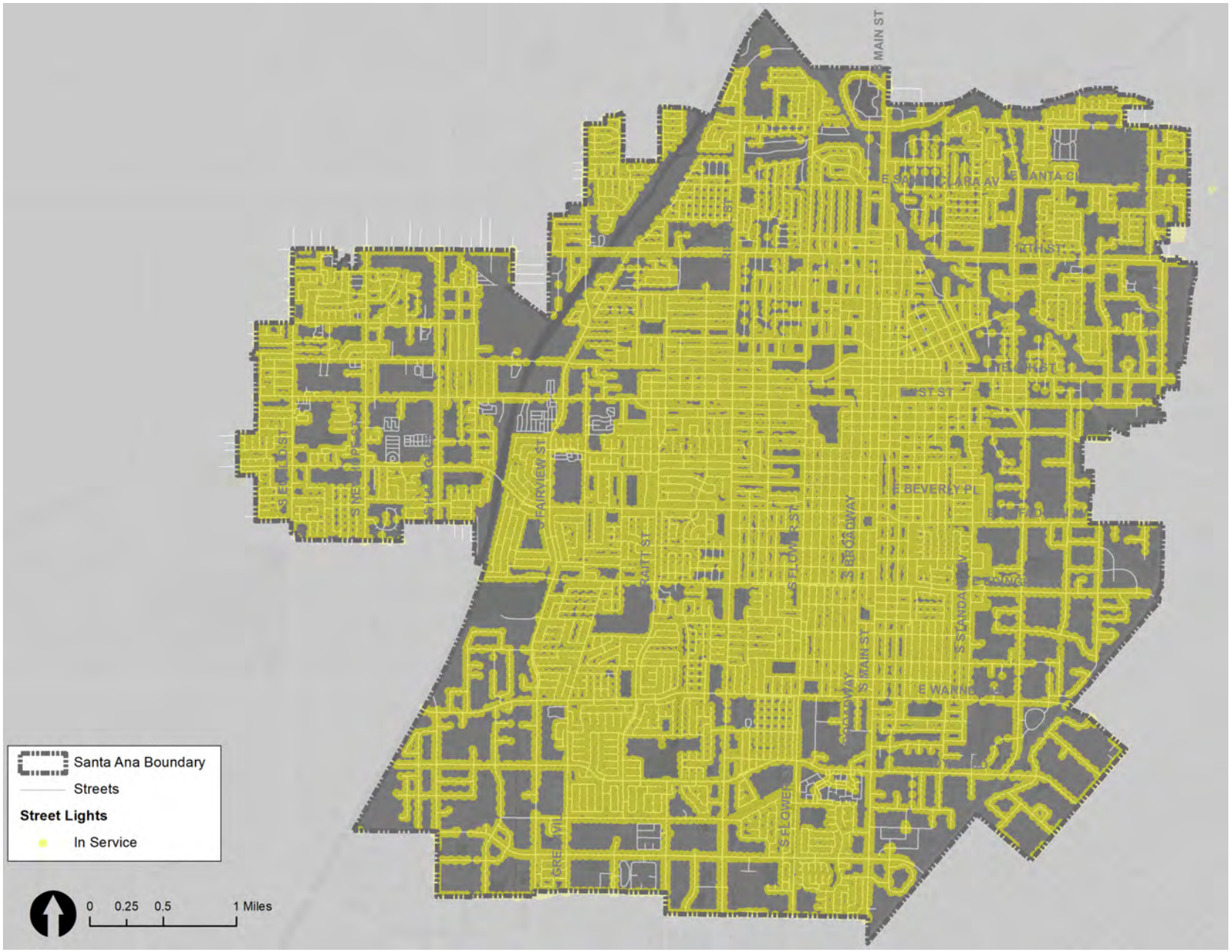


Figure 2-8: Street Lighting

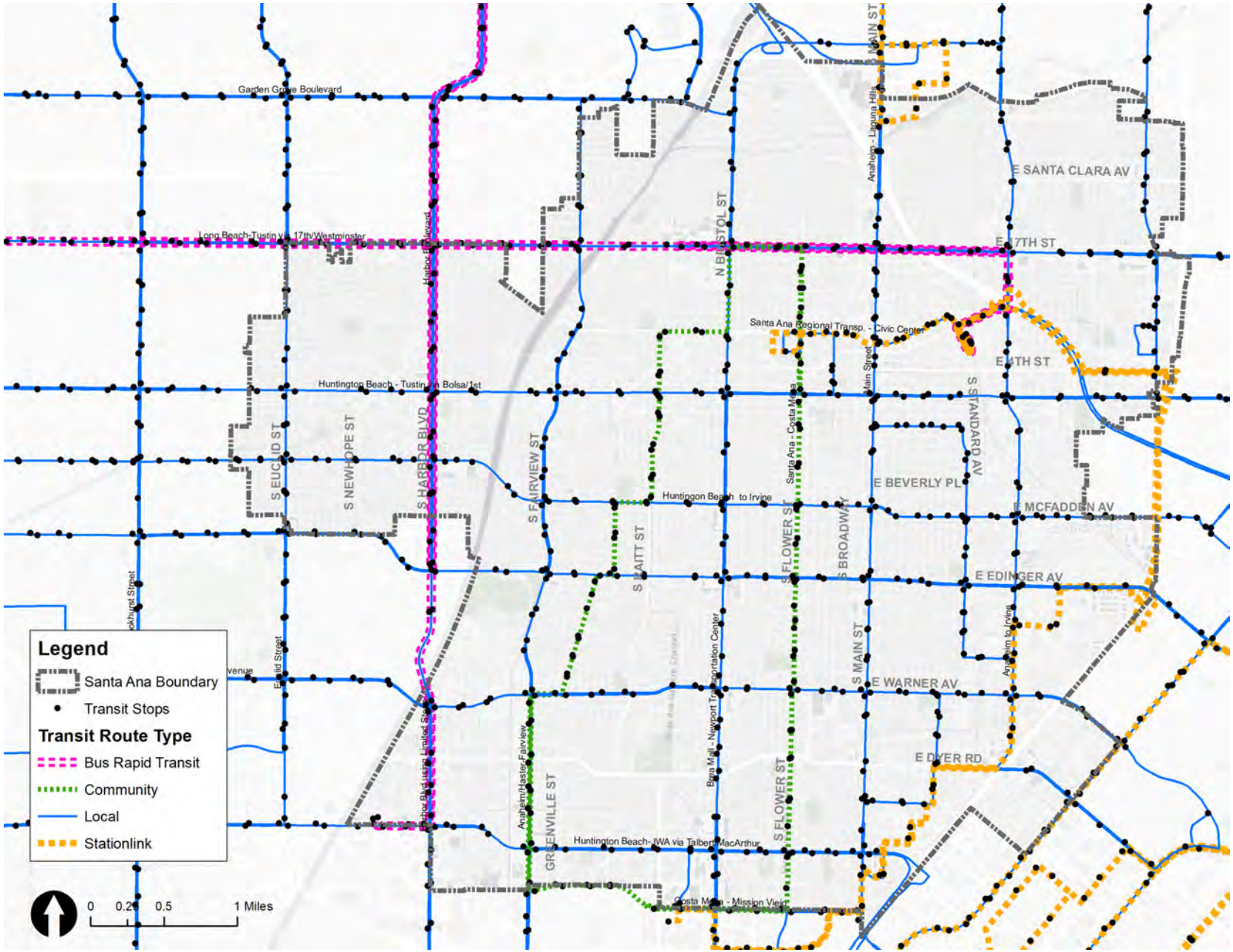


Figure 2-9: Transit Network

2.4 Existing Infrastructure for People Biking

Santa Ana's Master Plan of Bikeways 2022 aims to build upon the current bicycle network to implement many miles of new facilities. Class IV separated bikeways are proposed extensively citywide so residents will be able to get across town in a protected bikeway. A few Class I multi-use paths are being proposed, the longest segment along nearly the entire Fairview Road corridor. Though separated bikeways are prioritized, Class II bike lanes and III bike routes will be proposed as well. Calmer residential streets are designated as Class III neighborways, with sharrows and traffic calming. As shown in Figure 2-10, Santa Ana has citywide coverage which will be enhanced as each bikeway project from the Master Plan is implemented.

2.5 Equity and Disadvantaged Communities

California census tracts in the highest 25 percentile are considered disadvantaged communities per Senate Bill 535. The higher the CalEnviroScreen score, or darker the red color, the more disproportionately burdened a community is by multiple sources of pollution and with population characteristics that make them more sensitive to pollution. In Santa Ana, 24 of the City's 64 census tracts are considered disadvantaged, as shown in Figure 2-11.

Understanding where disadvantaged communities are located helps guide the City to make informed decisions during the recommendations and prioritization process. Senate Bill 535 states that at least a quarter of California Climate Investments go to disadvantaged communities. California Climate Investments are funds from the proceeds of California's Cap-and-Trade Program and specifically target reducing greenhouse gas emissions.

In recent years in the State of California, there has been an increased emphasis on safety, active transportation for public health, and greenhouse gas reduction. All mitigation measures and recommended projects for the SAVZ Plan will be passed through a community-driven lens for infrastructure and non-infrastructure programming.

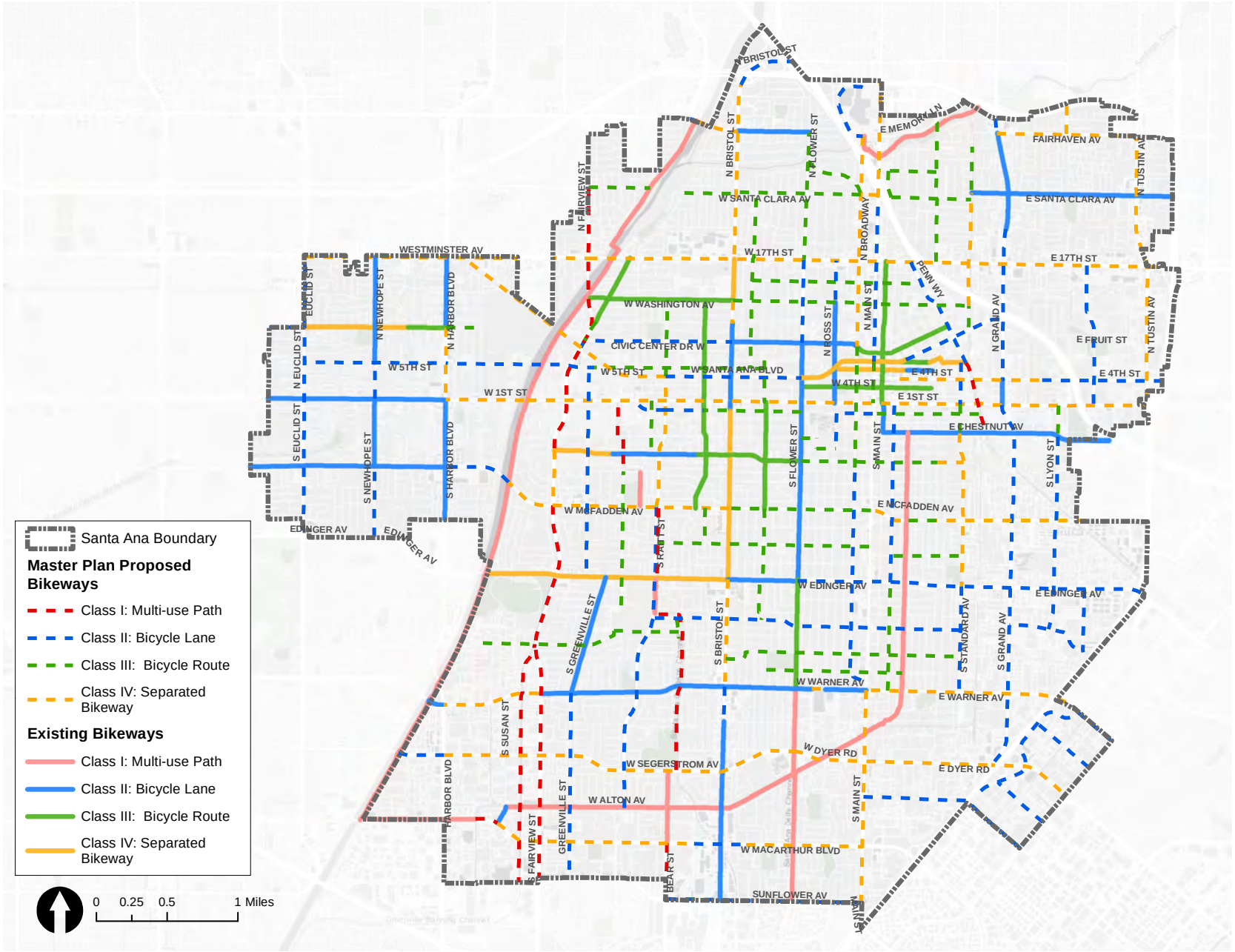


Figure 2-10: Bicycle Network

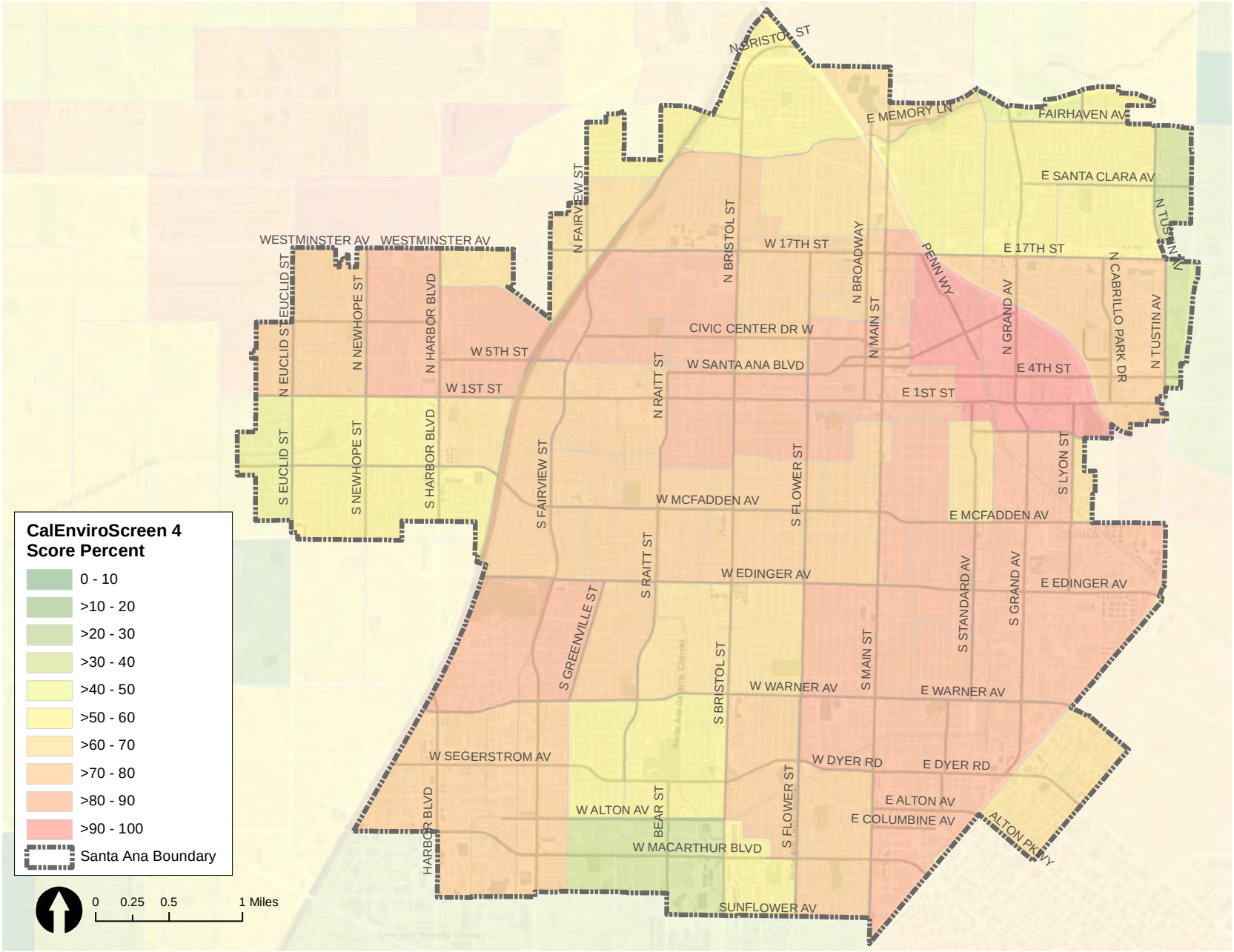


Figure 2-11: CalEnviroScreen 4.0 Percentiles

3 Collision Analysis

Photo Location: Santa Clara Avenue adjacent to Portola Park

3.1 Overview

Santa Ana is one of the most densely populated cities in Orange County. According to the American Community Survey by the U.S. Census Bureau, 44% of residents are under the age of 30, 2.5% of workers 16 and up are without a car, and 1.5% use public transportation as means of transportation to work. This Santa Ana Vision Zero Plan aims to assist those with and without access to a motor vehicle.

A quick comparison of transportation modes used by people living in Santa Ana and adjacent cities is shown in Table 3-1. As shown in the table, Santa Ana has the highest percentage of people who report commuting to work using transit (after Anaheim), but fewer people commuting by bike or on foot than Irvine or Anaheim. This may be due to Irvine's extensive bike network and the high student population in Irvine.

Mode of Transportation	Santa Ana	Orange	Irvine	Anaheim
Walk to Work	1.5%	2.2%	2.6%	1.2%
Bike to Work	0.3%	0.3%	1.3%	0.7%
Transit to Work	1.5%	0.1%	0.3%	1.7%

Table 3-1: Mode of Transportation Comparison with Adjacent Cities
Source: U.S. Census Bureau, American Community Survey, Table S0801: Commuting Characteristics by Sex

Another comparison tool is the "WalkScore" webpage, a free service available to the general public to compare the level of access to amenities and destinations via various transportation modes. WalkScore determines an areas accessibility per mode on a scale of 1 to 100, where higher scores deem a place to be more "walkable, bikeable, or transit-friendly." Table 3-2 includes a comparison of walk, bike, and transit access in adjacent cities as of February 2023. As shown in the comparison table, Santa Ana scores favorably in most categories compared to nearby cities. The WalkScore webpage describes Santa Ana as having "some public transportation, and is somewhat bikeable. The most walkable Santa Ana neighborhoods are Downtown, Willard, and Eastside."

City	Walk Score	Bike Score	Transit Score
Santa Ana	67	62	43
Irvine	43	69	26
Orange	51	53	32
Anaheim	56	52	34

Table 3-2: WalkScore Comparison with Adjacent Cities

Figures 3-1 through 3-3 show the maps provided by the website WalkScore.com. Figure 3-1 shows the Walk Score, which measures the density of destinations that are accessible by foot. Downtown, shown in a darker green, has a higher density of destinations. Figure 3-2 shows

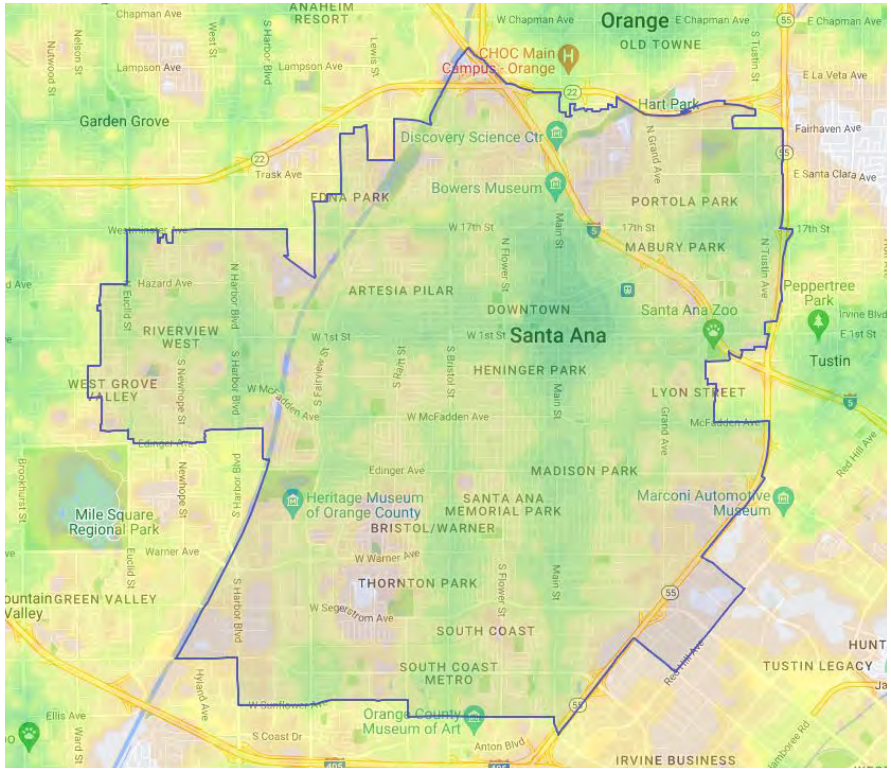


Figure 3-1: Santa Ana WalkScore

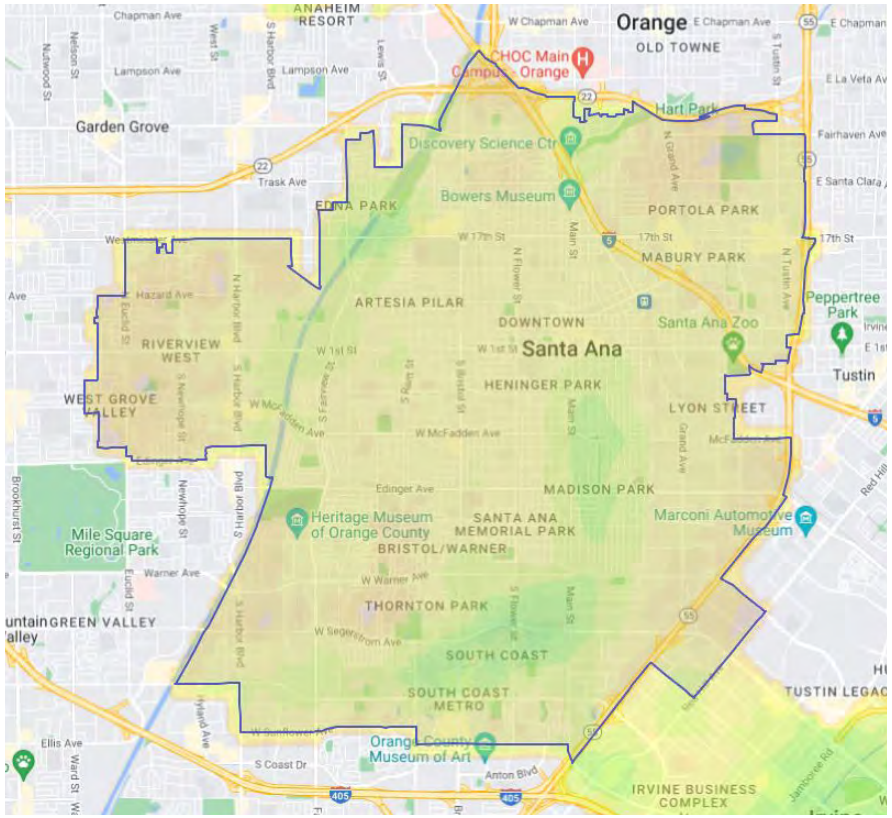


Figure 3-2: Santa Ana BikeScore

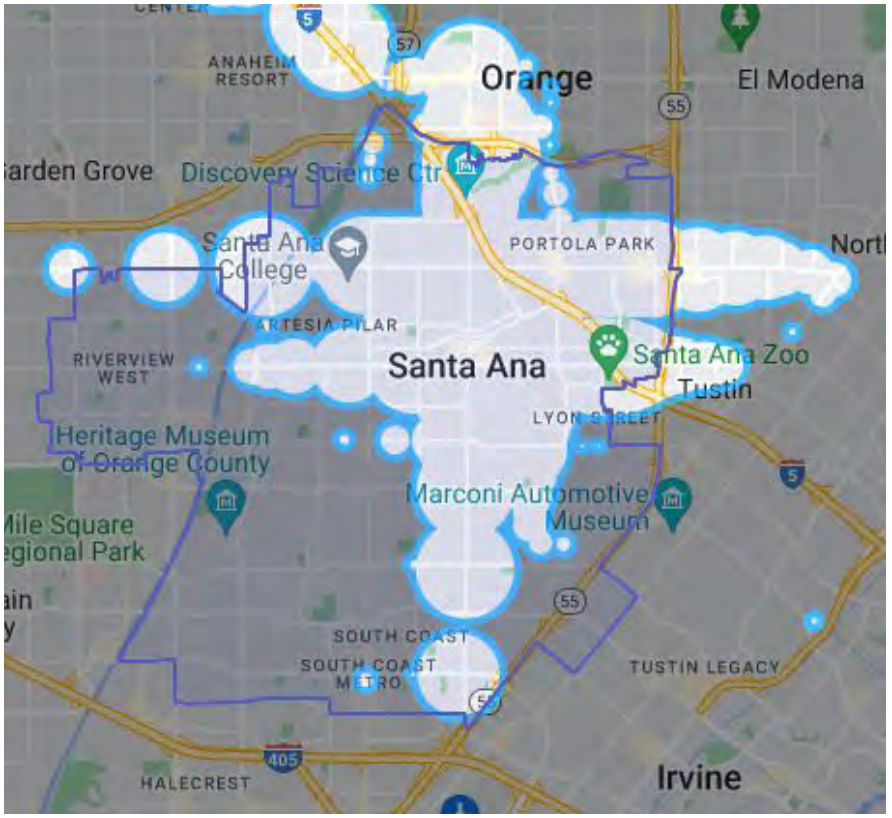


Figure 3-3: Santa Ana 30-minute Travel Distance on Public Transit

the Bike Score, which measures whether an area is good for biking based on bike lanes and trails, hills, road connectivity, and destinations. The more green it has, the more bikeable it is. Figure 3-3 illustrates the Transit Score, which measures how well a location is served by public transit based on the distance and type of nearby transit lines.

A total of 19,494 collisions occurred in Santa Ana from 2017 to 2021. Over this period, 17,915 collisions were auto-only, 906 were pedestrian-involved collisions, and 673 were bicyclist-involved. In total, 1,579 collisions (8% of total) involved pedestrians or bicyclists.

Collision data from the “Crossroads Traffic Collision Database” was used for the Collisions Analysis. This data was provided by the City. This summary focuses on fatal, severe, and visible injury collisions. To help identify locations that more frequently see serious injury or fatal collisions, this study analyzed the latest five years (2017 to 2021) of ‘Crossroads’ collision data, supplemented in certain cases by data for the 10-year period from 2012 to 2021, as can be seen in this report. Each collision is shown on maps in the following sections, then tables summarize the collisions by severity of injury, who is getting injured, and when and where disproportionate quantities of collisions occur. Additional analysis later in this chapter identifies risk factors and road characteristics at select locations that may be contributing to serious injury or fatal collisions to help inform project recommendations outlined in Chapter 6.

3.2 Equity and Collision Analysis

This Plan began with the identification of underserved communities throughout the City of Santa Ana, which makes up most of the City, as can be seen from the CalEnviroScreen data in Section 2.4. A majority of the City, particularly central, southeast, and Downtown Santa Ana score above the 75th percentile for high pollution and low income. The following safety analysis comprehensively looks at the entire City, but with an equity-lens in mind to focus improvements in the underserved communities. The following section provides an overview of all collisions in Santa Ana between 2017 to 2021 as documented in the Santa Ana Crossroads database. As summarized in Table 3-3, there were a total of 906 pedestrian collisions over five years, 673 bicycle collisions, and 17,915 motor vehicle collisions. As shown in the serious injury and fatality columns in the table, a significantly disproportionate quantity of pedestrians suffered serious injuries and fatalities when compared to total bicycle and vehicle collisions. Sixteen percent of all pedestrian collisions resulted in a serious injury or fatality compared to 5% of all bicycle collisions and 2% of all non-highway vehicle collisions.

Transportation Mode	Fatalities	Serious Injuries	Total
Pedestrian	33	119	906
Bicycle	7	30	673
Vehicle	67	347	17,915

Table 3-3: Collision Severity per Travel Mode (between years 2017-2021)
Source: Crossroads Software's Traffic Collision Database

Collisions for each of the past five years are shown for pedestrians, bicyclists, and vehicles in Charts 3-1 through 3-3. This includes serious injuries, fatalities, other visible injuries, complaints of pain, and property damage only.

Figure 3-4 shows all of the collisions as points, then Figure 3-5 uses the collision points to make a 'heatmap' that highlights locations with highest concentrations of collisions with darker shades of red.

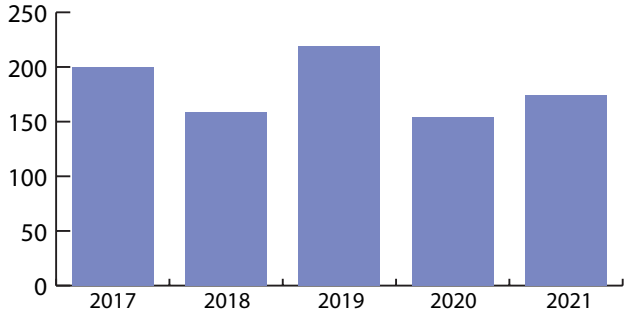


Chart 3-1: Pedestrian Collisions from 2017 to2021

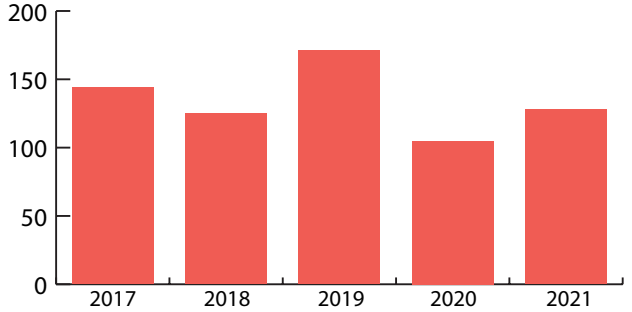


Chart 3-2: Bicycle Collisions from 2017 to 2021

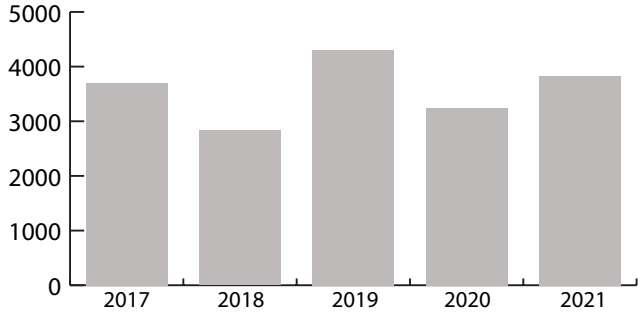


Chart 3-3: Vehicle Collisions from 2017 to 2021

Five-Year Heatmap

Figure 3-5 demonstrates a greater concentration of collisions (darker red color) along most of 1st Street (west to east), and Main Street (north to south). The full length of McFadden Avenue, Edinger Avenue, Warner Avenue and 17th Street (all west to east) also see higher levels

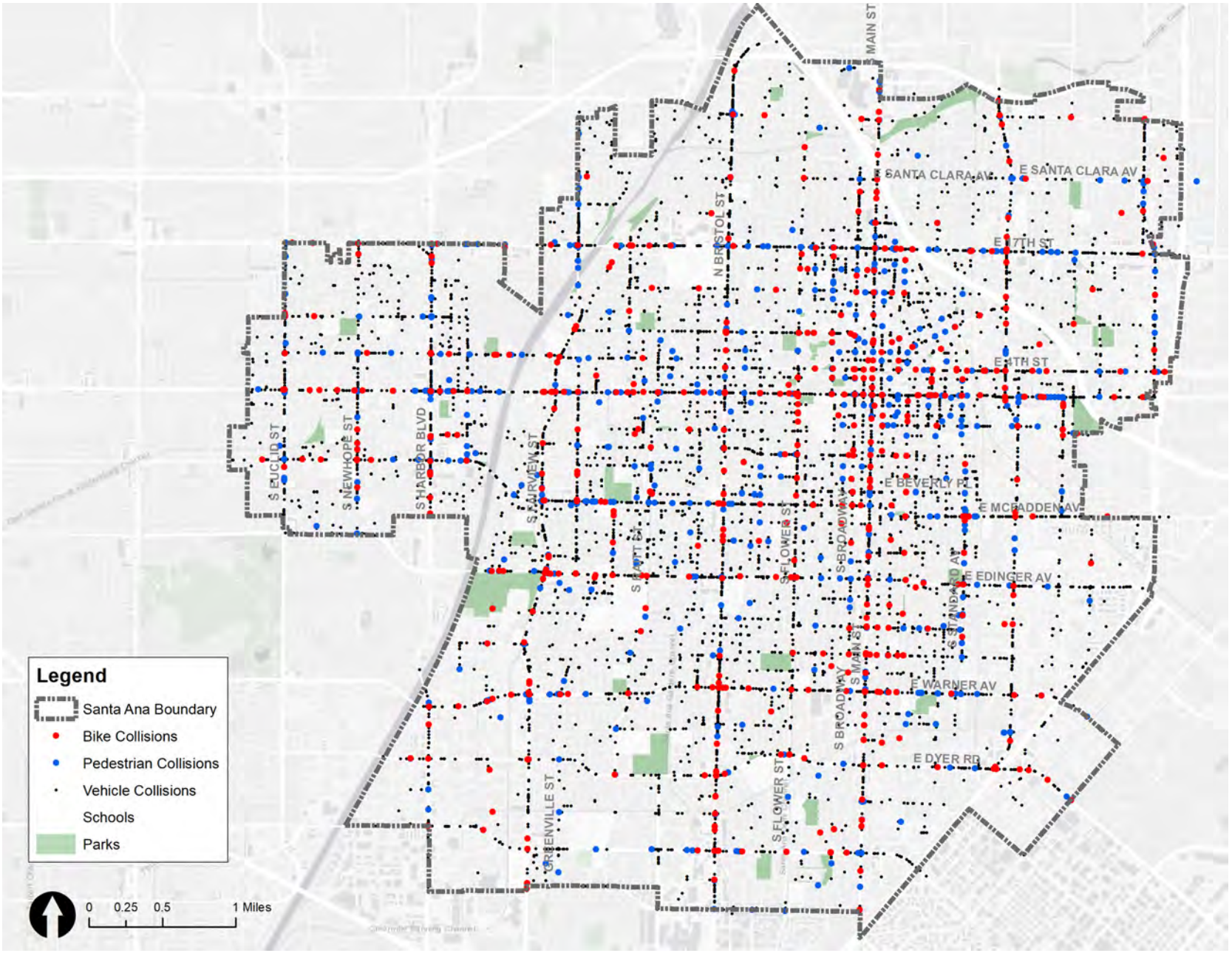


Figure 3-4: All Collisions from 2017-2021

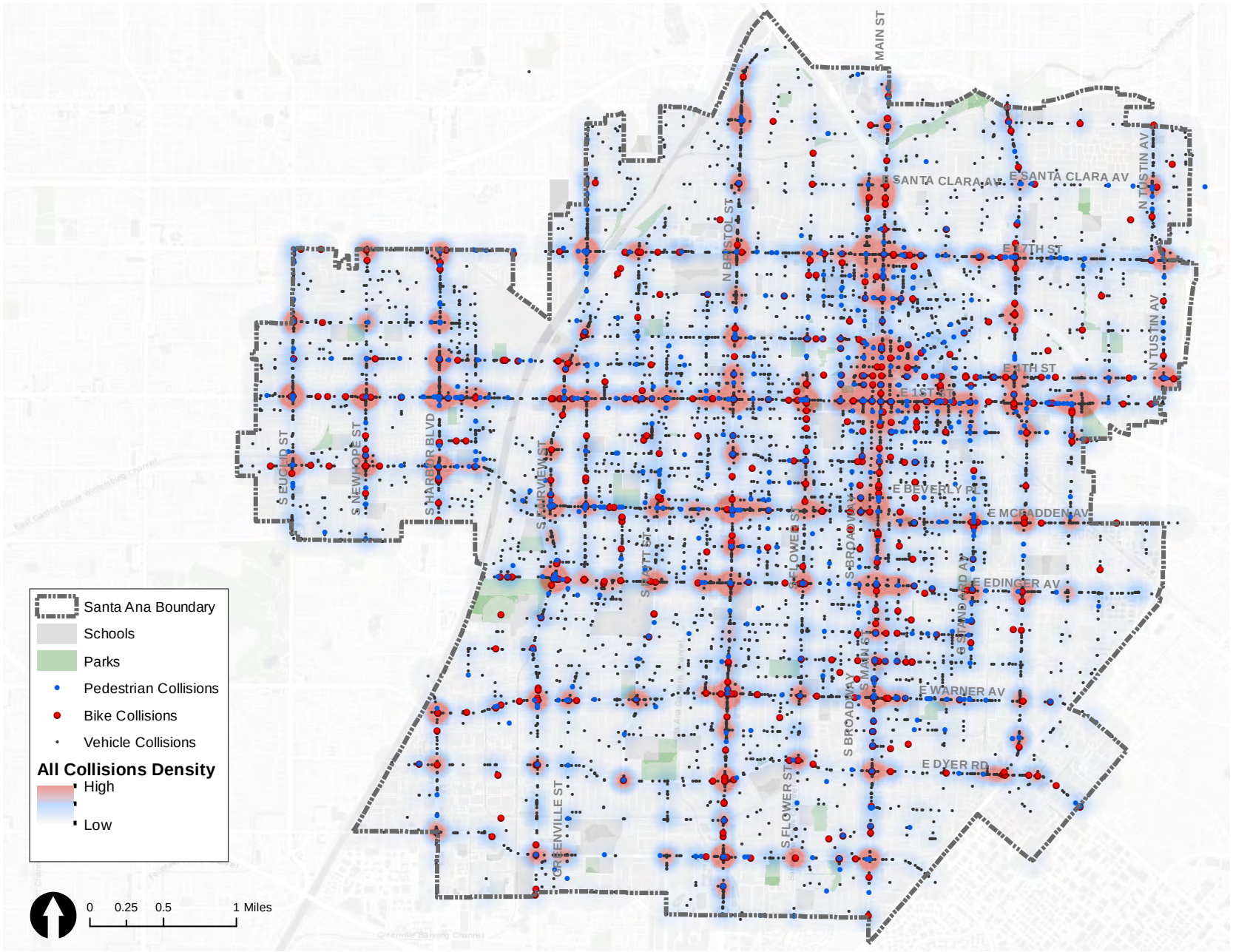


Figure 3-5: Five Year Heat Map of Collisions from 2017-2021

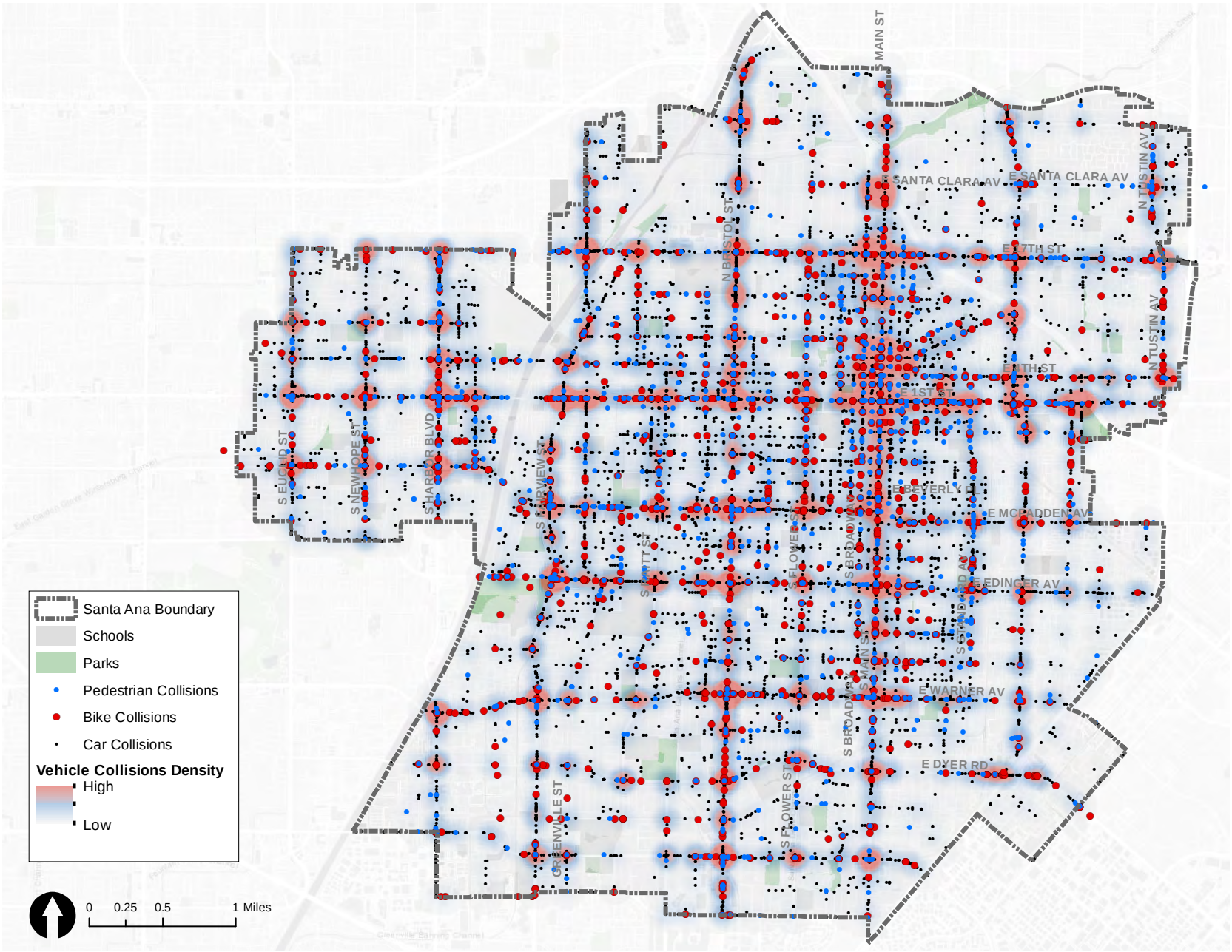


Figure 3-6: Ten Year Heat Map of Collisions from 2012-2021

of combined collisions. Similar levels of collisions occur on Fairview Street, Flower Street, North Broadway, and Bristol Street (all north to south). Some corridors are much shorter lengths within city boundaries but still demonstrate hotspots, such as along Euclid Street, Newhope Street, Harbor Boulevard, and Tustin Avenue (all north to south).

Ten-Year Heatmap

Figure 3-6 looks at ten years of collision points which appear to follow a similar pattern as the five years of collision points shown in Figure 3-5. Both heatmaps show the same hotspot areas, though have higher numbers of collisions, as is expected with a longer, but more or less remain to the same footprint.

3.3 Pedestrian Collisions

Based on collisions from the past five years of available data, Chart 3-4 shows the degree of injury for pedestrian collisions. The highest degree of injury is a complaint of pain at 39% of all pedestrian collisions, followed by visible injury at 31%. Severe injuries are the next highest at 13% followed by property damage only at 12%. The lowest degree of injury and yet most severe is fatal at 4%, which is equal to 33 lives.

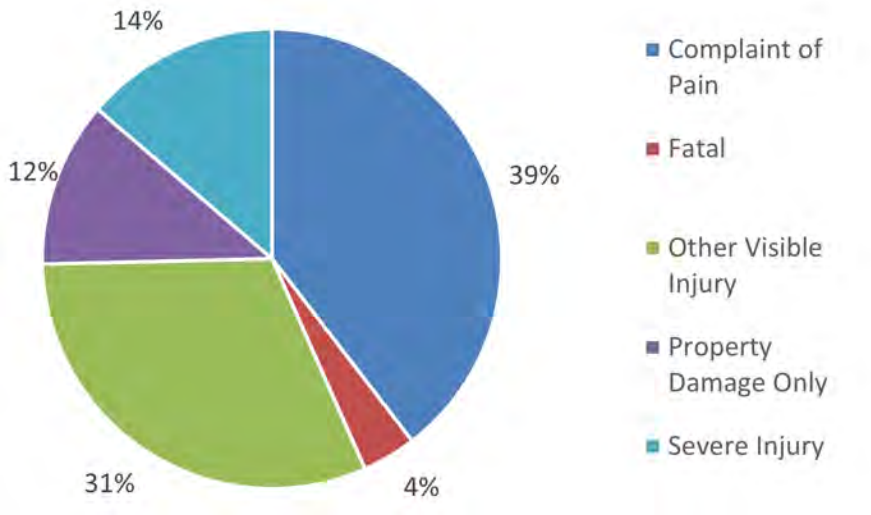


Chart 3-4: Degree of Injury for Pedestrian Collisions

Another 4% of collisions had null values and cannot be categorized. Year-over-year quantities range from 154 to 219 reported pedestrian collisions, averaging 30 fatalities and severe injuries each year.

Degree of Injury	2017	2018	2019	2020	2021	Total
Not Stated			39			39
Complaint of Pain	79	71	62	67	64	343
Fatal	8	4	3	7	11	33
Other Visible Injury	71	45	68	38	49	271
Property Damage Only	21	11	23	17	29	101
Severe Injury	21	28	24	25	21	119
Grand Total	200	159	180	154	174	906

Table 3-4: Degree of Injury per Year

Chart 3-5 shows the age of the pedestrians involved in the collision. The column noted as 'blank' is missing the age data, so a large percentage of the collisions are missing the age of the pedestrian making it difficult to find a correlation between age and collisions. If the collisions without age data are disregarded, then the age distribution may be what is expected with the greatest number of collisions occurring with ages 15 to 28 that tend to be most physically active and quantities slowly declining as people get older, become less physically active and drive more often.

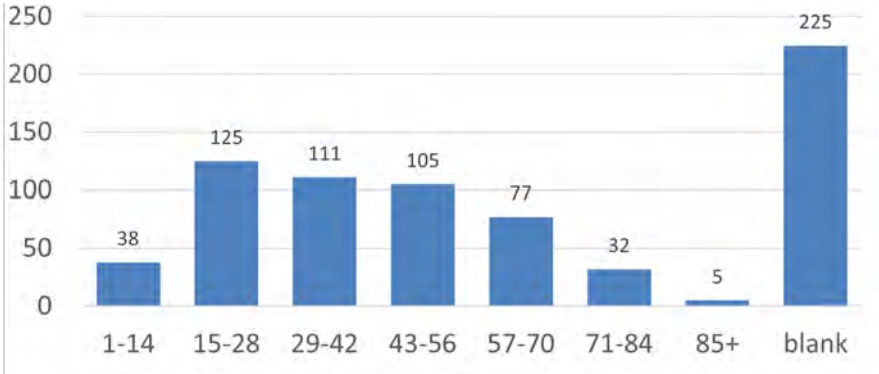


Chart 3-5: Pedestrian Collisions by Age

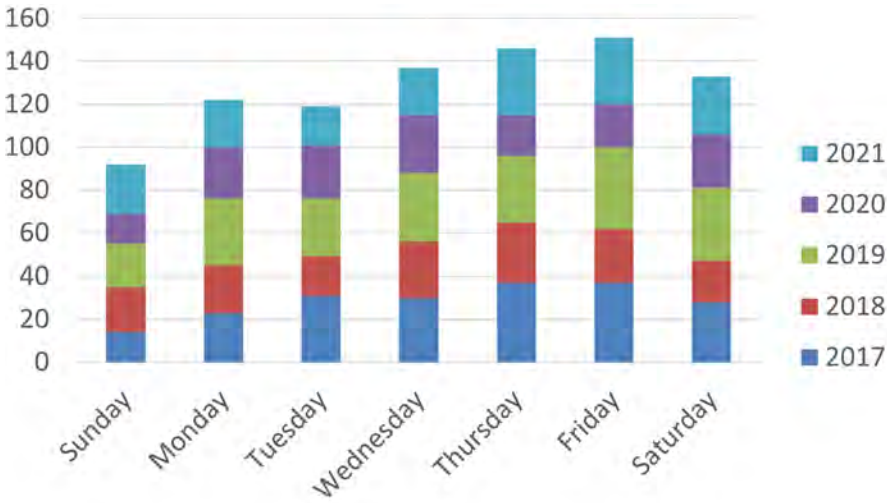


Chart 3-6: Pedestrian Collisions by Day of Week

Chart 3-6 shows the total pedestrian collisions by day of week, revealing that Thursdays and Fridays tend to see slightly more pedestrian collisions. Table 3-5 shows lighting conditions at the time of the collision. As may be expected, there are more collisions in daylight hours due to more activity during the day, and a large percentage of collisions occur under street lights at night.

Light Conditions	2017	2018	2019	2020	2021	Total
Dark - No Street Lights	5	3	4	4	2	18
Dark - Street Lights	74	53	90	66	66	349
Dark - Street Lights Not Functioning		1				1
Daylight	107	95	114	75	90	481
Dusk - Dawn	10	5	8	7	12	42
Not Stated	4	2	3	2	4	15
Grand Total	200	159	219	154	174	906

Table 3-5: Light Conditions During the Pedestrian Collision

Chart 3-7 shows nearly 38% of all pedestrian collisions occur when crossing in a crosswalk at an intersection and over 28% occur when crossing the roadway with no crosswalk. This stresses the importance of slowing down traffic, providing midblock crossings, and enhanced safety infrastructure at intersections, such as curb extensions, pedestrian refuge islands, and Leading Pedestrian Intervals (LPI), which are a traffic signal timing measure that gives people walking a three to seven second head start over motor vehicles moving in the same direction.

Other top pedestrian collisions types include:

- Vehicle proceeding straight while pedestrian is crossing in a crosswalk at an intersection
- Vehicle making a right turn while pedestrian is crossing in a crosswalk at an intersection
- Vehicle proceeding straight while the pedestrian is crossing not in a crosswalk

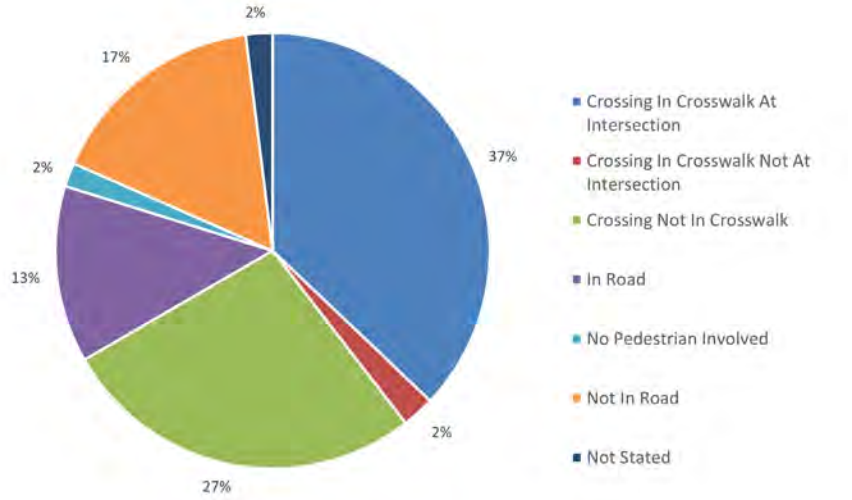


Chart 3-7: Pedestrian Action at Time of Collision

Chart 3-8 represents the movement of the automotive involved in the pedestrian collision. As shown, vehicles proceeding straight have the highest rate of pedestrian collisions followed by right and left turns, then vehicles backing up. Chart 3-9 lists the right-of-way controls (signals and signs) with most collisions occurring where there are no controls present. Chart 3-10 lists the primary collision factor showing

vehicles violating pedestrian right-of-way as the most frequent cause, followed by improper driving, then signals and signs violations, unsafe speed, and pedestrian violations.

Research from 2019 from the NYC Department of Transportation showed that in general, despite what is reported in crash reports, it is not "Pedestrian Right of Way Violation" that typically leads to crashes but instead it is "dangerous driver behavior—speeding and failure to yield—that is killing pedestrians," as described in the study.

Figure 3-7 shows five years of pedestrian collisions with a concentration in the downtown area. There are high densities around the primary east-west corridors of 1st Street and 17th Street. Slightly lower density east-west corridors are on McFadden Avenue and Warner Avenue. Pedestrian collisions resulting in severe injuries and fatalities tend to follow primary and major arterials, such as 1st Street, 17th Street, Warner Avenue, Bristol Street, Fairview Street, and Harbor Boulevard.

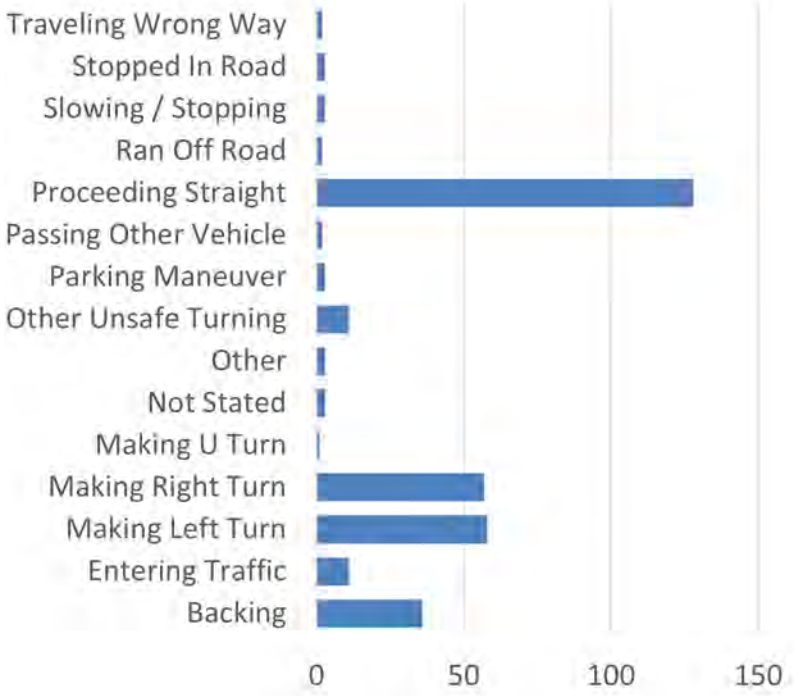


Chart 3-8: Vehicle Movement During Pedestrian Collision

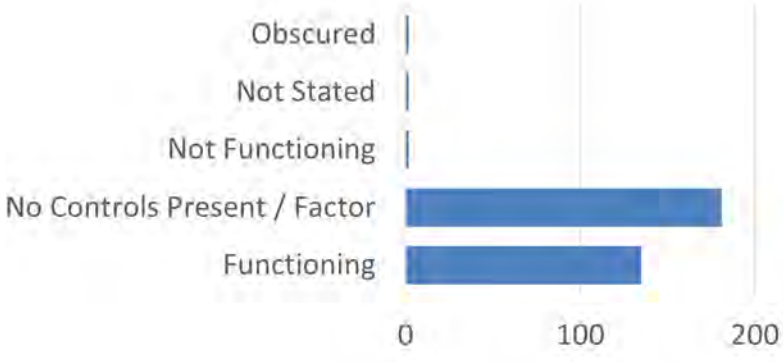


Chart 3-9: Right-of-Way Controls During Pedestrian Collision

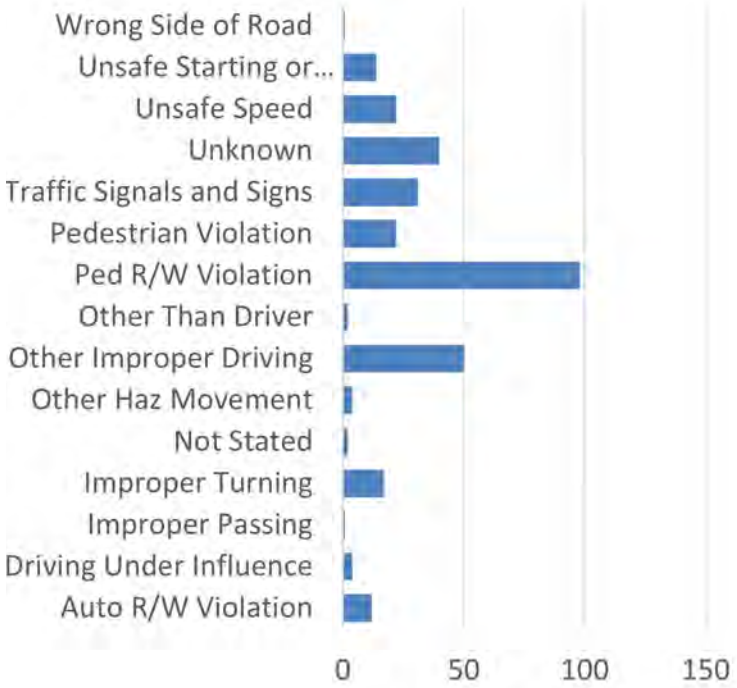


Chart 3-10: Primary Collision Factor of Pedestrian Collision

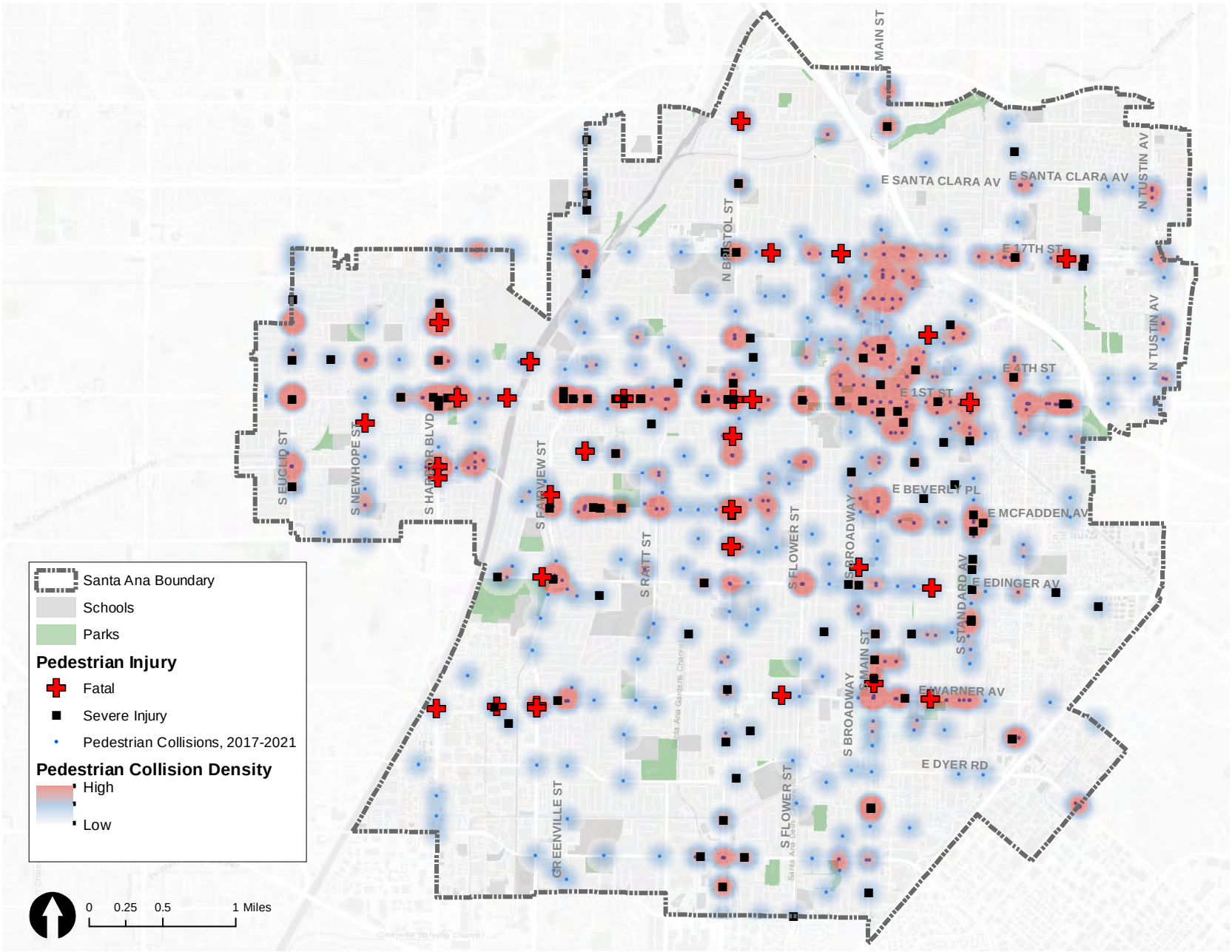


Figure 3-7: Five Year Heat Map of Pedestrian Collisions from 2012-2021

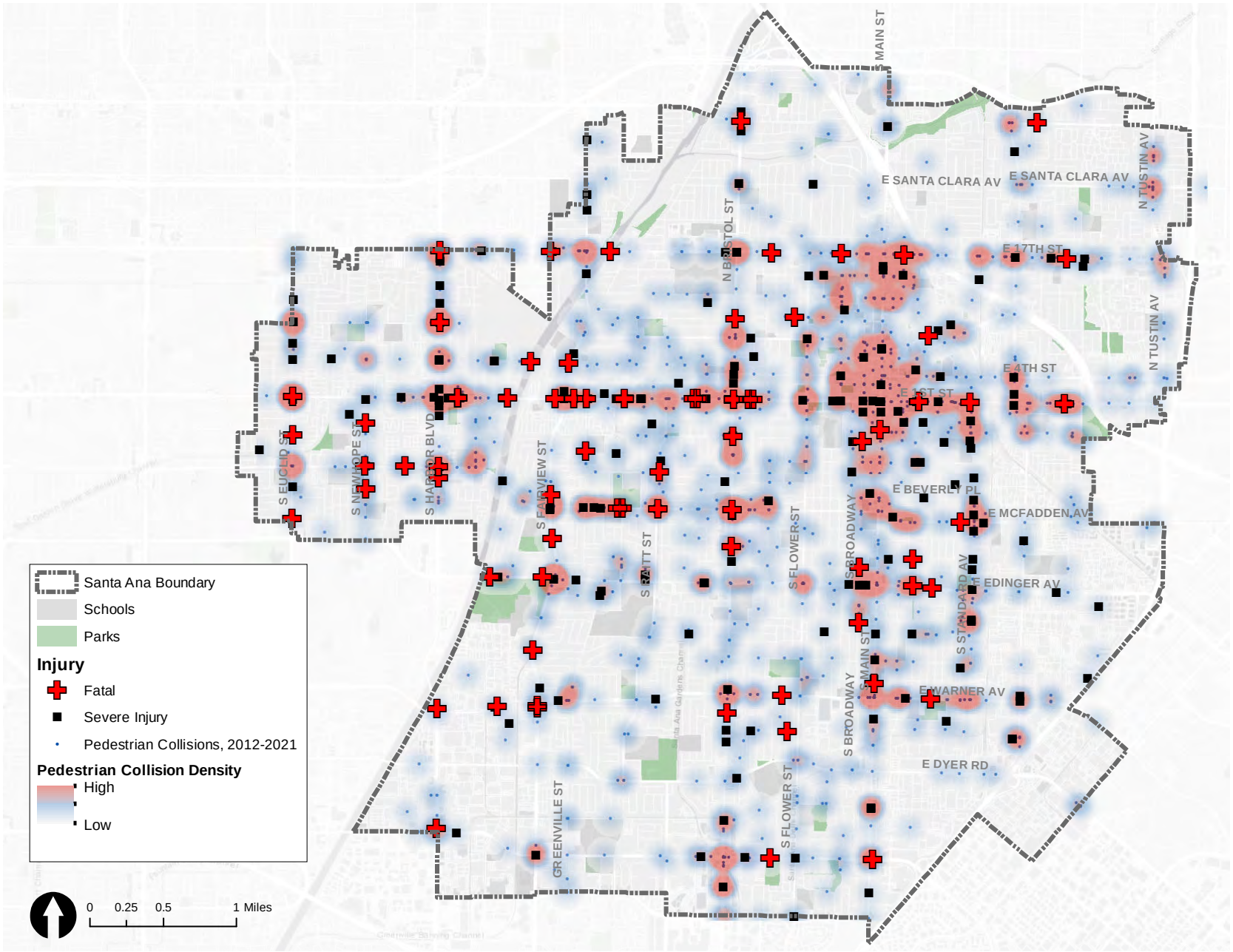


Figure 3-8: Ten Year Heat Map of Pedestrian Collisions from 2012-2021

When comparing the most recent five years of available data (2017-2021) used throughout this report to the past ten years, Figure 3-8 validates the hotspots previously identified and then some, meaning there are fewer hotspots in the more recent years. The reduced hotspots in the five year dataset could be in part because there were fewer trips being taken during peak coronavirus pandemic years, infrastructure improvements enhancing the safety along select corridors, or due to the random nature of collisions, as shown by the Schneider-Sanders research from the Journal of Transport and Land Use.

For example, the same east-west corridors are featured, except Edinger sees broader hot spots in the ten years. In recent years, Edinger has seen bicycle improvements and narrowing of the outer general purpose lane alongside protected bike lane implementation, which improves safety for all road users, including for people walking and driving.

3.4 Bicycle Collisions

Based on collisions from the past five years of available data, Chart 3-11 shows the degree of injury for bicycle collisions. The highest degree of injury is a complaint of pain at 43% of all bicycle collisions, followed by visible injury at 31%. Property damage only is the next highest at 19% followed by severe injury at 4%. The lowest degree of injury and yet most severe is fatal at 1%, which is equal to seven lives. Another 2% of collisions had null values and cannot be categorized. Year-over-year quantities range from 105 to 171 reported bicycle collisions, averaging eight fatalities and severe injuries each year. As Santa Ana increases bicycle infrastructure, ridership will likely follow. It is important to build a bike-friendly network to ensure bicyclists are protected when sharing the roadway with vehicles so that no lives are at risk when riding a bike.

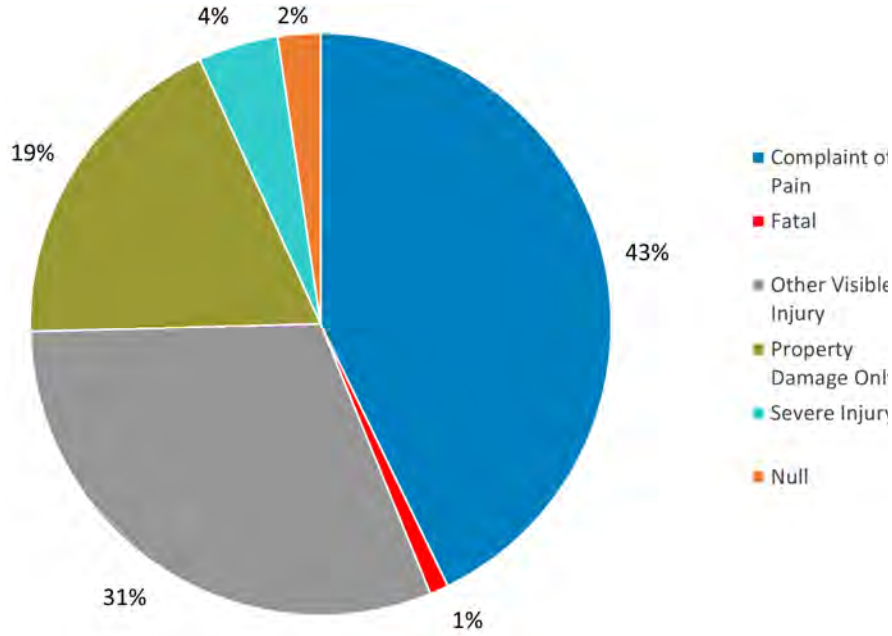


Chart 3-11: Degree of Injury for Bicycle Collisions

Degree of Injury	2017	2018	2019	2020	2021	Total
Not Stated		1	15	-	-	16
Complaint of Pain	59	55	63	52	59	288
Fatal	3	1	2	-	1	7
Other Visible Injury	59	39	46	31	32	207
Property Damage Only	20	22	39	15	29	125
Severe Injury	3	7	6	7	7	30
Grand Total	144	125	171	105	128	673

Table 3-6: Degree of Injury per Year

Chart 3-12 shows the age of the bicyclists involved in the collision. Similar to the pedestrian age data, a large percentage of the collisions are missing age data. If the collisions without age data are disregarded, then the age distribution shows the greatest number of collisions occurring with ages 15 to 28 which gradually declines in older age groups. Chart 3-13 shows the total bicycle collisions by day of week, revealing that Wednesdays tend to see slightly more bicycle collisions.

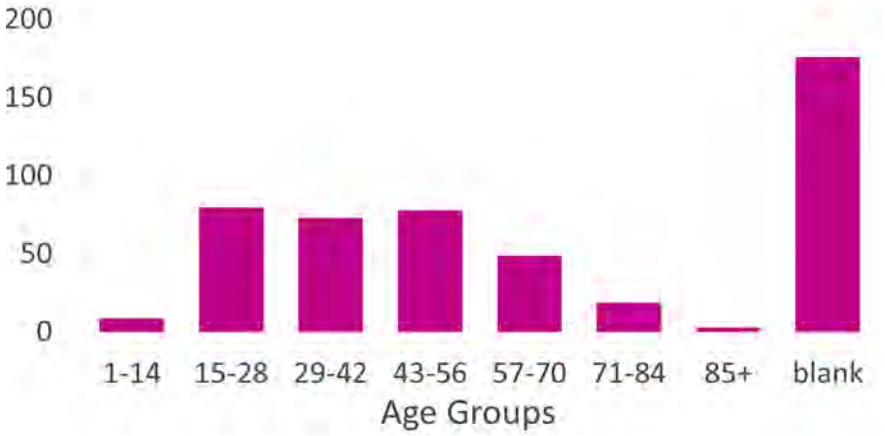


Chart 3-12: Bicycle Collisions by Age

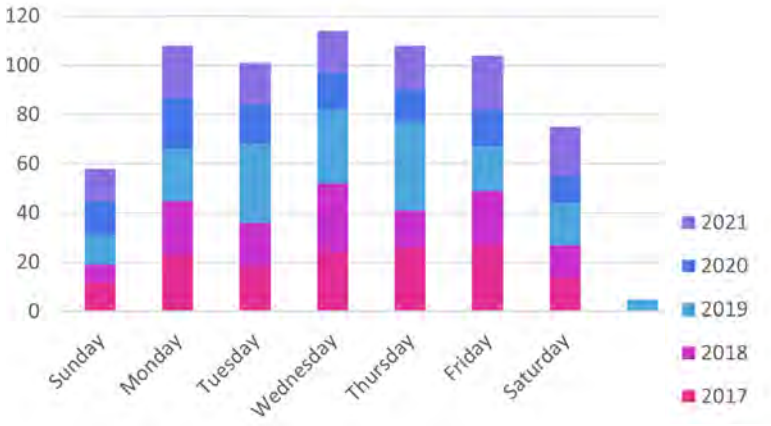


Chart 3-13: Bicycle Collisions by Day of Week

Table 3-7 shows lighting conditions at the time of the collision. Similar to the pedestrian lighting table, there are more collisions in daylight hours, likely due to more activity during the day. A large percentage of collisions occur under street lights at night.

Light Conditions	2017	2018	2019	2020	2021	Total
Dark - No Street Lights	3	2	-	1	1	7
Dark - Street Lights	26	23	42	30	30	151
Dark - Street Lights Not Functioning	-	1	1	-	-	2
Daylight	106	95	119	69	90	479
Dusk - Dawn	5	3	8	5	7	28
Not Stated	4	1	1	-	-	6
Grand Total	144	125	171	105	128	673

Table 3-7: Light Conditions During the Bicycle Collision

Chart 3-14 represents the movement of the automotive involved in bicycle collisions. As shown, vehicles making right turns are the cause of most bicycle collisions followed closely by vehicles proceeding straight. Chart 3-15 lists the right-of-way controls (signals and signs) with slightly more collisions occurring where there are no controls present Chart 3-16 lists the primary collision factor showing bicycles violating vehicles right-of-way as the most frequent cause, followed by signals and signs violations, then vehicle improper turning.

As shown in Figure 3-9 there are high concentrations of bicyclist collisions in the downtown area as well as the full length of primary vehicle corridors like 1st Street, 17th Street, McFadden Avenue, Edinger Avenue and Warner Avenue going east-west and Main Street, Flower Street, Bristol Street, and Fairview Street going north-south. Areas near the following intersections also show higher levels of bicycle collisions Warner Avenue and Main Street, Warner Avenue and Bristol Street, Edinger Avenue and Fairview Street. Bicyclist collisions resulting in

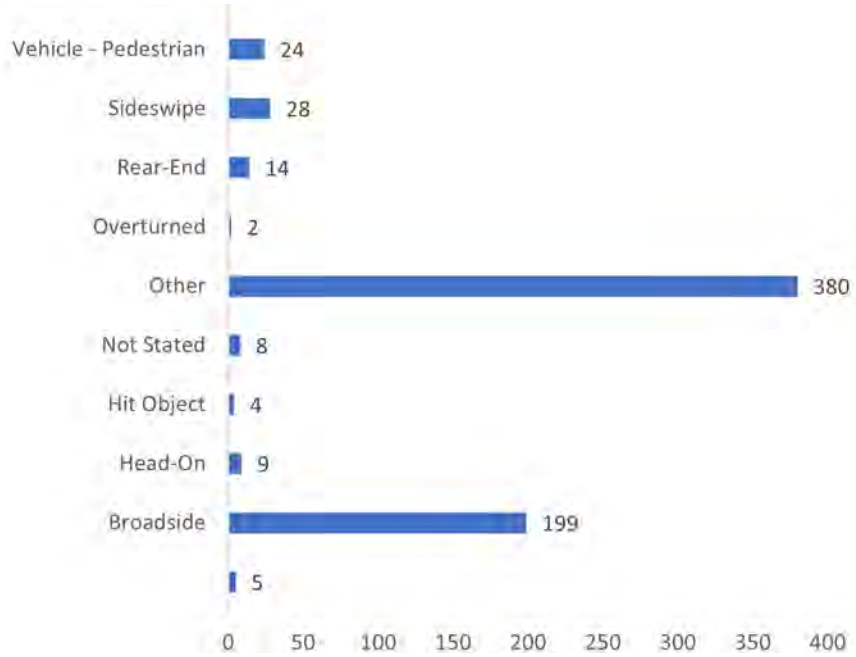


Chart 3-14: Vehicle Movement During Bicycle Collision

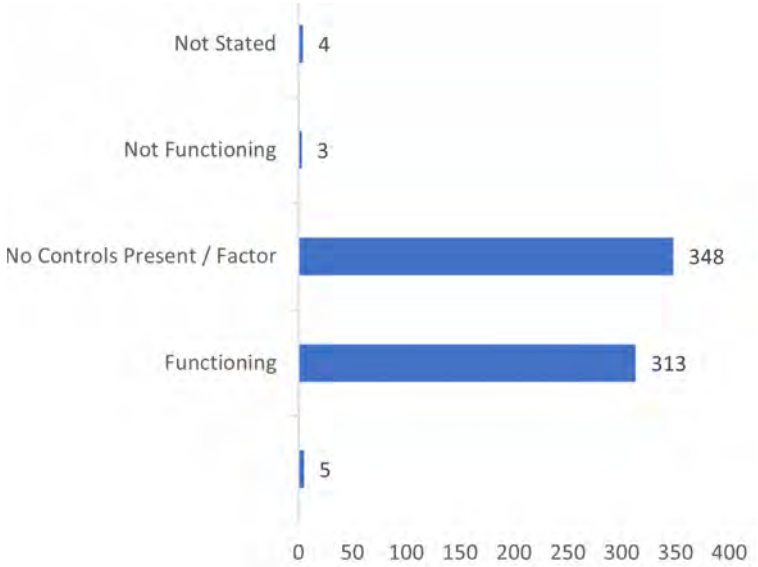


Chart 3-15: Right-of-Way Controls During Bicycle Collision

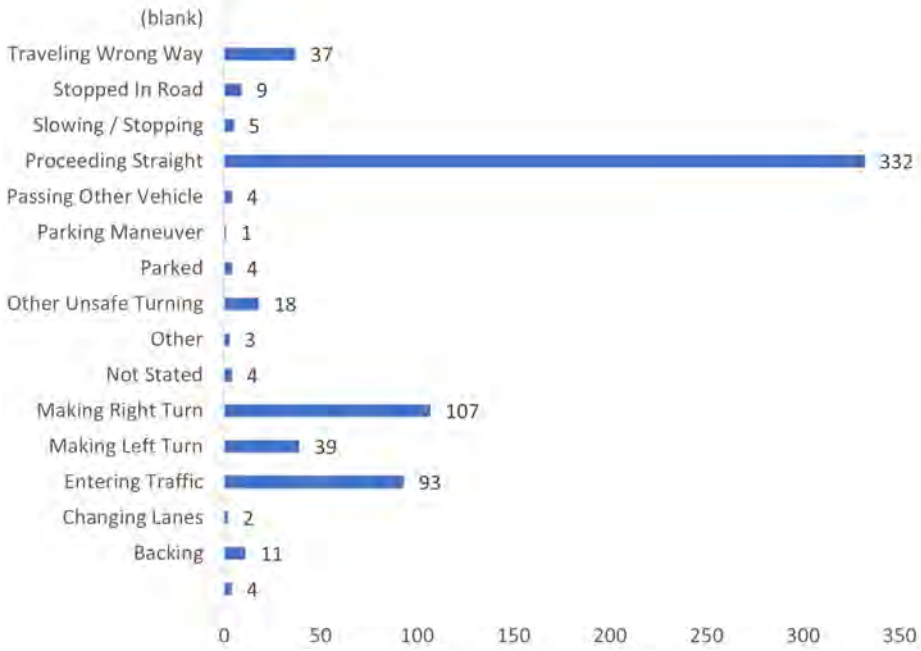


Chart 3-16: Primary Collision Factor of Bicycle Collision

severe injuries and fatalities tend to follow primary and major arterials, such as Main Street, 1st Street, 17th Street, Edinger Avenue, and Fairview Street. These roads, or roads parallel, have an opportunity to build and connect a bike-friendly network to encourage new riders, and improve safety for existing cyclists.

When comparing the most recent five years of available data (2017-2021) used throughout this report to the past ten years, Figure 3-10 validates the hotspot locations previously identified, but is broader, likely due to a higher quantity of collision points.

Some corridors, such as Edinger Avenue have seen bicycle and other roadway improvements in recent years. This may explain why this corridor amongst others has smaller hotspots in the map displaying five-years of data. For the road segments and intersections where the hotspots remain, they parallel in significance for priority locations to receive funding.

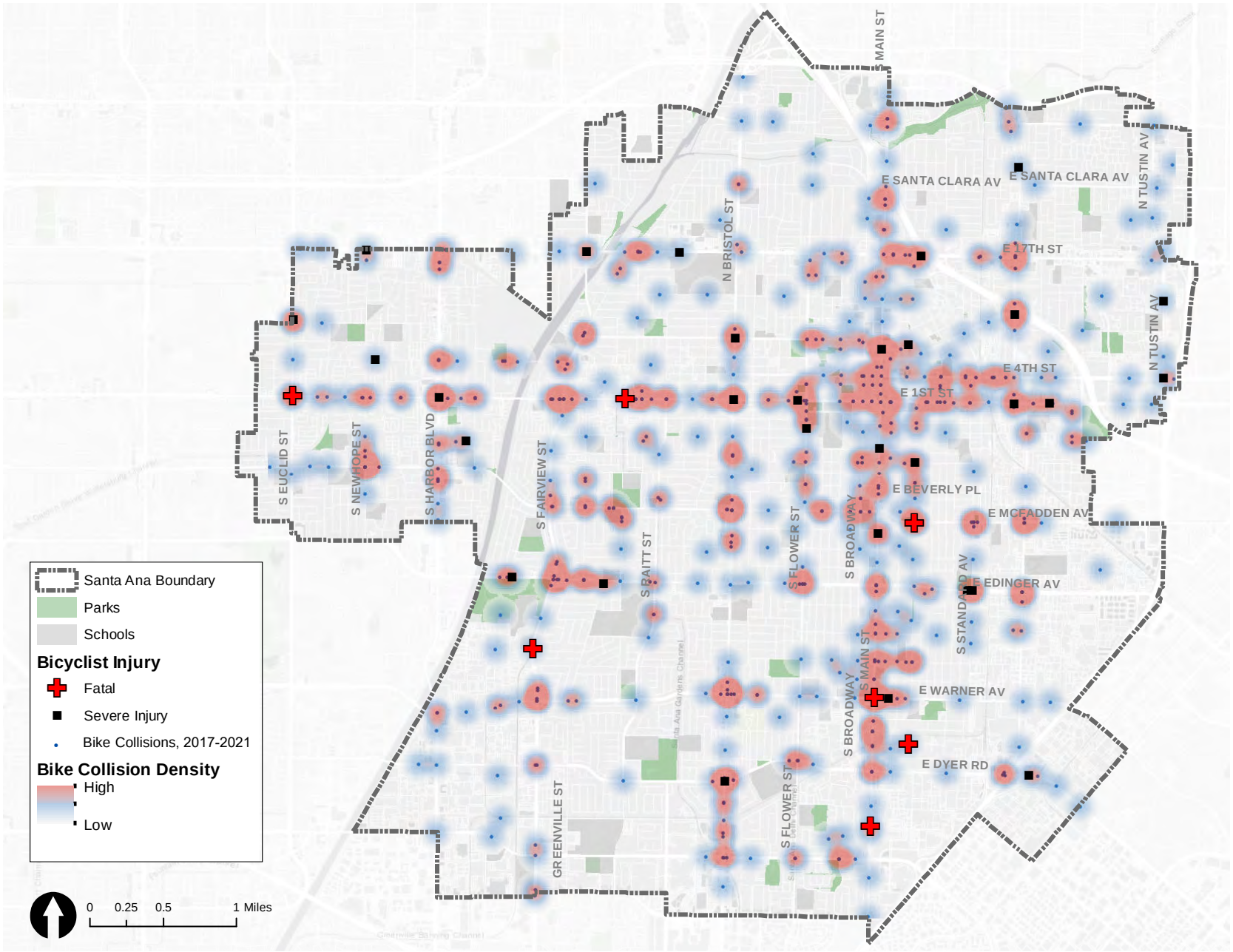


Figure 3-9: Five Year Heat Map of Bicycle Collisions from 2017-2021

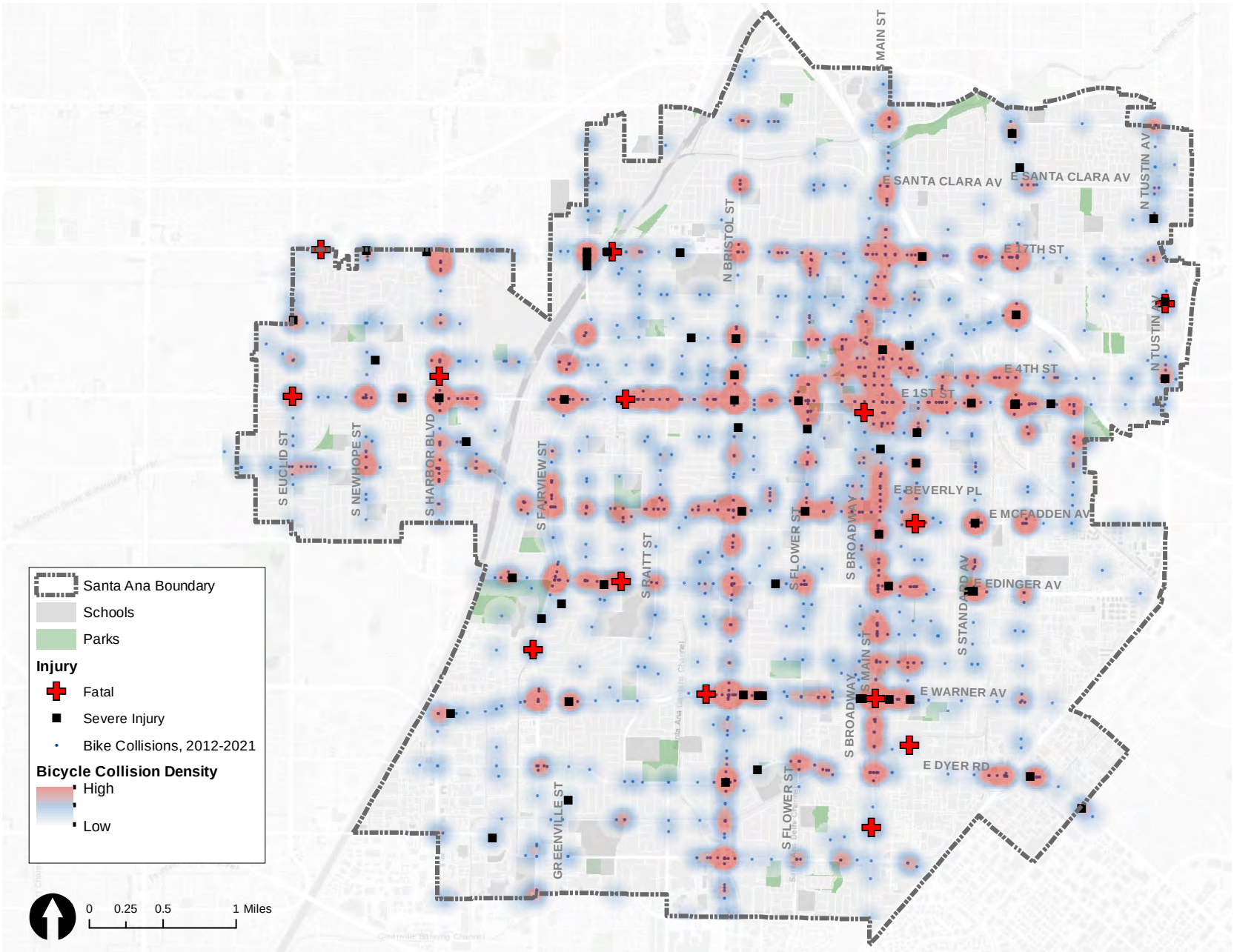


Figure 3-10: Ten Year Heat Map of Bicycle Collisions from 2012-2021

3.5 Automobile Collisions

As shown in Chart 3-17 shows the degree of injury for vehicle collisions. The highest degree of injury is property damage only at 60% of all vehicle collisions, followed by a complaint of pain at 25%. The next highest is other visible injury at 10% followed by severe injury at 2%. The lowest degree of injury and yet most severe is fatal at less than 1%, which is equal to 67 lives. Another 3% of collisions had null values and cannot be categorized. Year-over-year quantities range from 2,832 to 4,306 reported vehicle collisions, averaging a combined 414 fatalities and severe injuries each year.

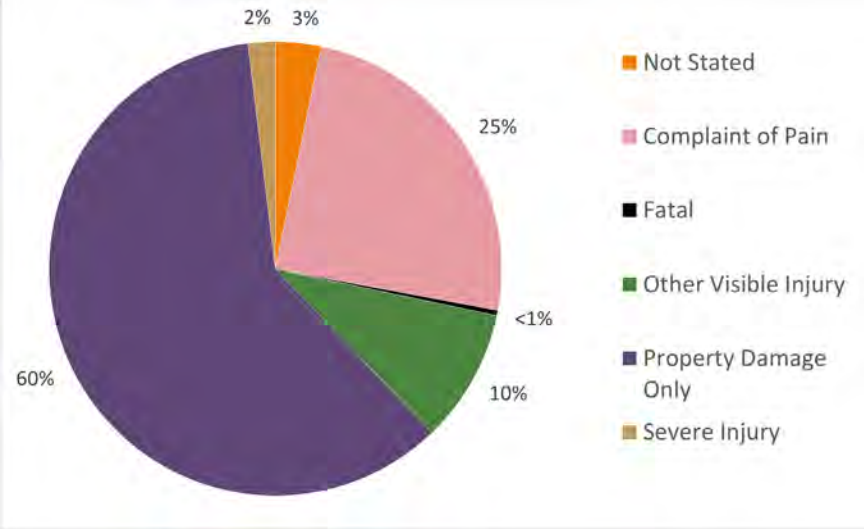


Chart 3-17: Degree of Injury for Automobile Collisions

Chart 3-18 shows the age of the vehicle occupants involved in the collision. Similar to the pedestrian and bicycle data, a large percentage of the collisions are missing age data. If the collisions without age data are disregarded, then the age distribution may be what is expected with the greatest number of collisions occurring with ages 15 to 28 and gradually declining as people get older and typically become less physically active.

Degree of Injury	2017	2018	2019	2020	2021	Total
Not Stated	-	7	576	-	-	583
Complaint of Pain	1,047	820	839	816	897	4,419
Fatal	17	8	8	16	18	67
Other Visible Injury	397	287	431	278	316	1,709
Property Damage Only	2,175	1,643	2,374	2,074	2,524	10,790
Severe Injury	68	67	78	62	72	347
Grand Total	3,704	2,832	4,306	3,246	3,827	17,915

Table 3-8: Degree of Injury per Year

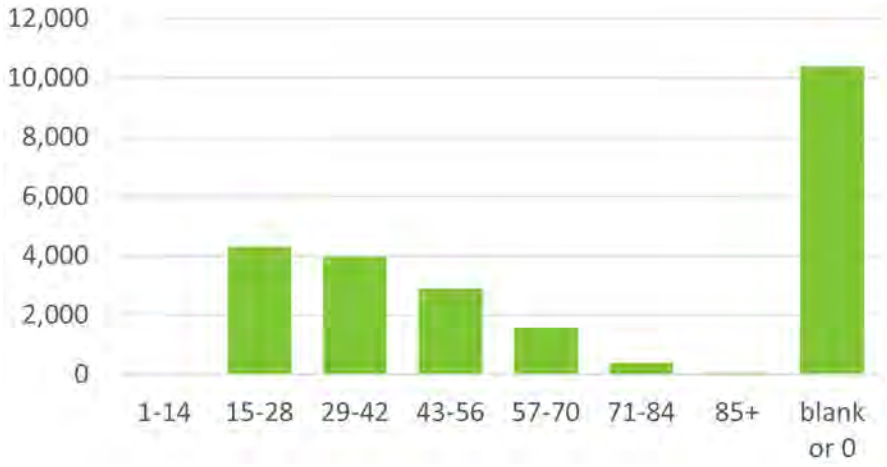


Chart 3-18: Automobile Collisions by Age

Chart 3-19 shows the total automobile collisions by day of week, revealing that Wednesdays and Fridays tend to see more automobile collisions.

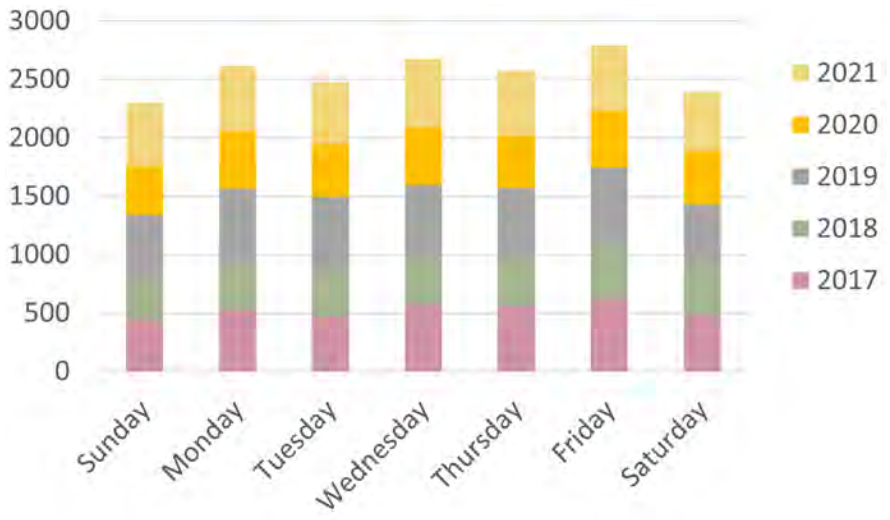


Chart 3-19: Automobile Collisions by Day of Week

Light Conditions	2017	2018	2019	2020	2021	Total
Dark - No Street Lights	3	2	-	1	1	7
Dark - Street Lights	26	23	42	30	30	151
Dark - Street Lights Not Functioning	-	1	1	-	-	2
Daylight	106	95	119	69	90	479
Dusk - Dawn	5	3	8	5	7	28
Not Stated	4	1	1	-	-	6
Grand Total	144	125	171	105	128	673

Table 3-9: Light Conditions During the Automobile Collision

Table 3-9 shows lighting conditions at the time of the collision. Similar to previous lighting tables, there are more collisions in daylight hours, likely due to more activity during the day. A large percentage of collisions occur under street lights at night.

Chart 3-20 represents the movement of the automobile in the collision. As shown, vehicles proceeding straight have the highest rate of automobile collisions followed by left and then right turns. Chart 3-21 lists the primary collision factor showing unsafe speed as the most frequent cause, auto right-of-way being violated, then signals and signs violations, and then improper turning. Chart 3-22 lists the right-of-way controls (signals and signs) with most automobile collisions occurring where controls are present and functioning.

As shown in Figure 3-11 there are concentrations of vehicle collision in the downtown area as well as the full length of primary vehicle corridors like 1st Street, 17th Street, McFadden Avenue, Edinger Avenue and Warner Avenue going east-west and Main Street, Flower Street, Bristol Street, and Fairview Street going north-south. Areas near the following intersections also show higher levels of automobile collisions: Warner Avenue and Main Street, Warner Avenue and Bristol Street, Edinger Avenue and Fairview Street. Collisions resulting in severe injuries and fatalities tend to follow primary and major arterials, such as 1st Street, 17th Street, McFadden Avenue, Edinger Avenue, Warner Avenue, Dyer Road, and going east-west. North-south corridors with higher levels of severe injury and fatalities include Harbor Boulevard, Fairview Street, Bristol Street, Main Street, Standard Avenue, and Grand Avenue.

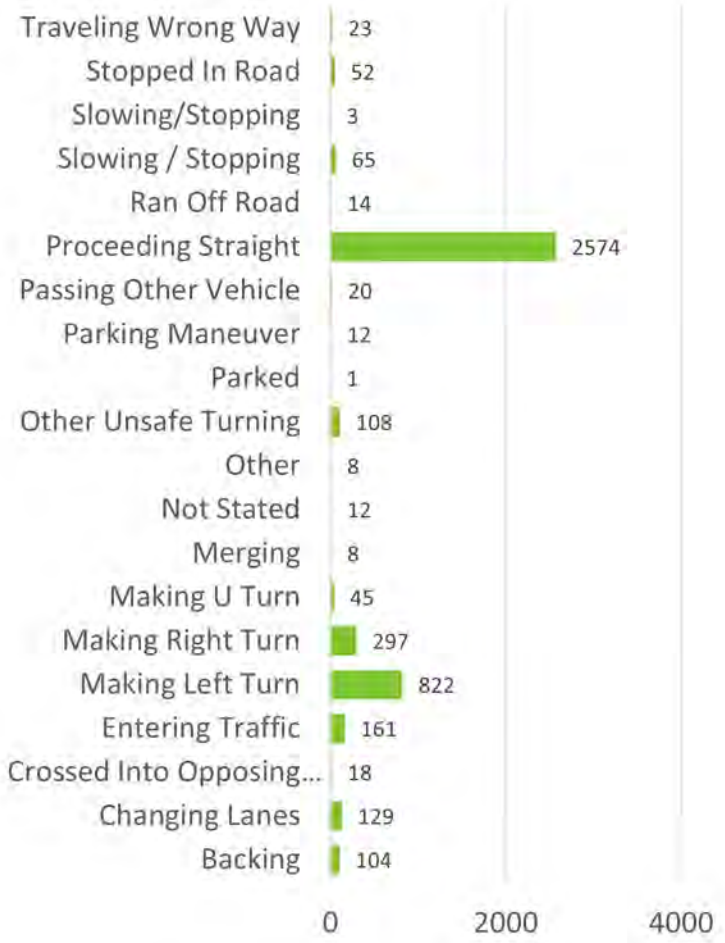


Chart 3-20: Movement During Automobile Collision

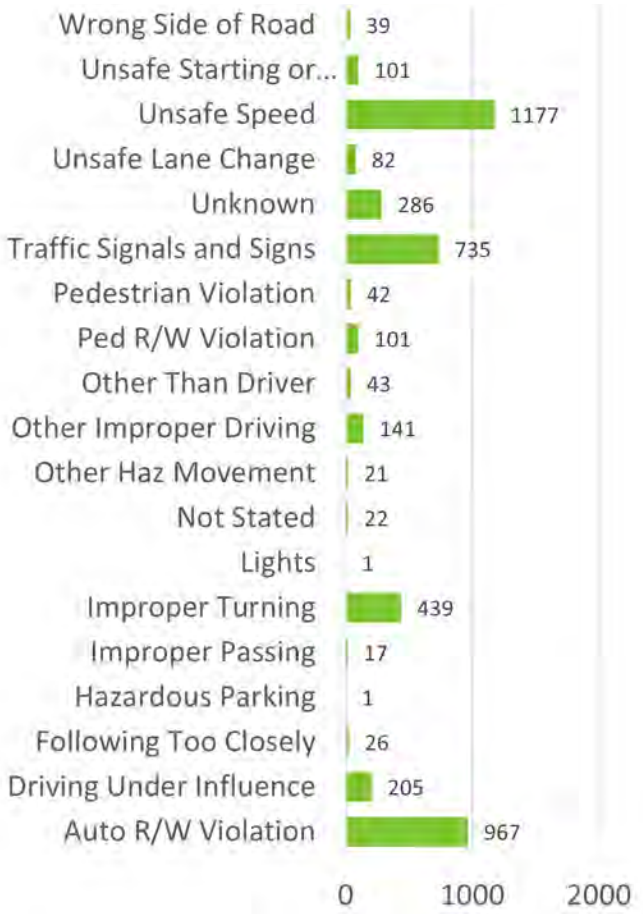


Chart 3-21: Primary Collision Factor of Automobile Collision

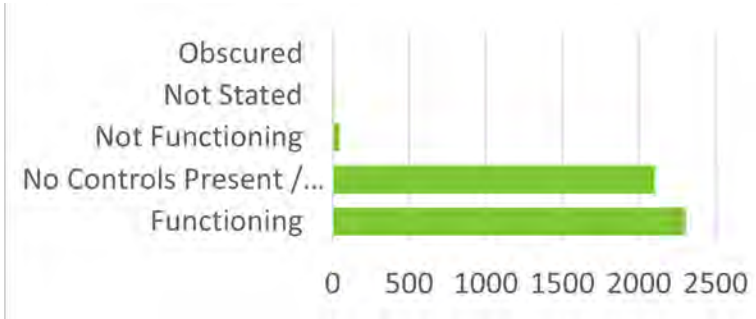


Chart 3-22: Right-of-Way Controls During Automobile Collision

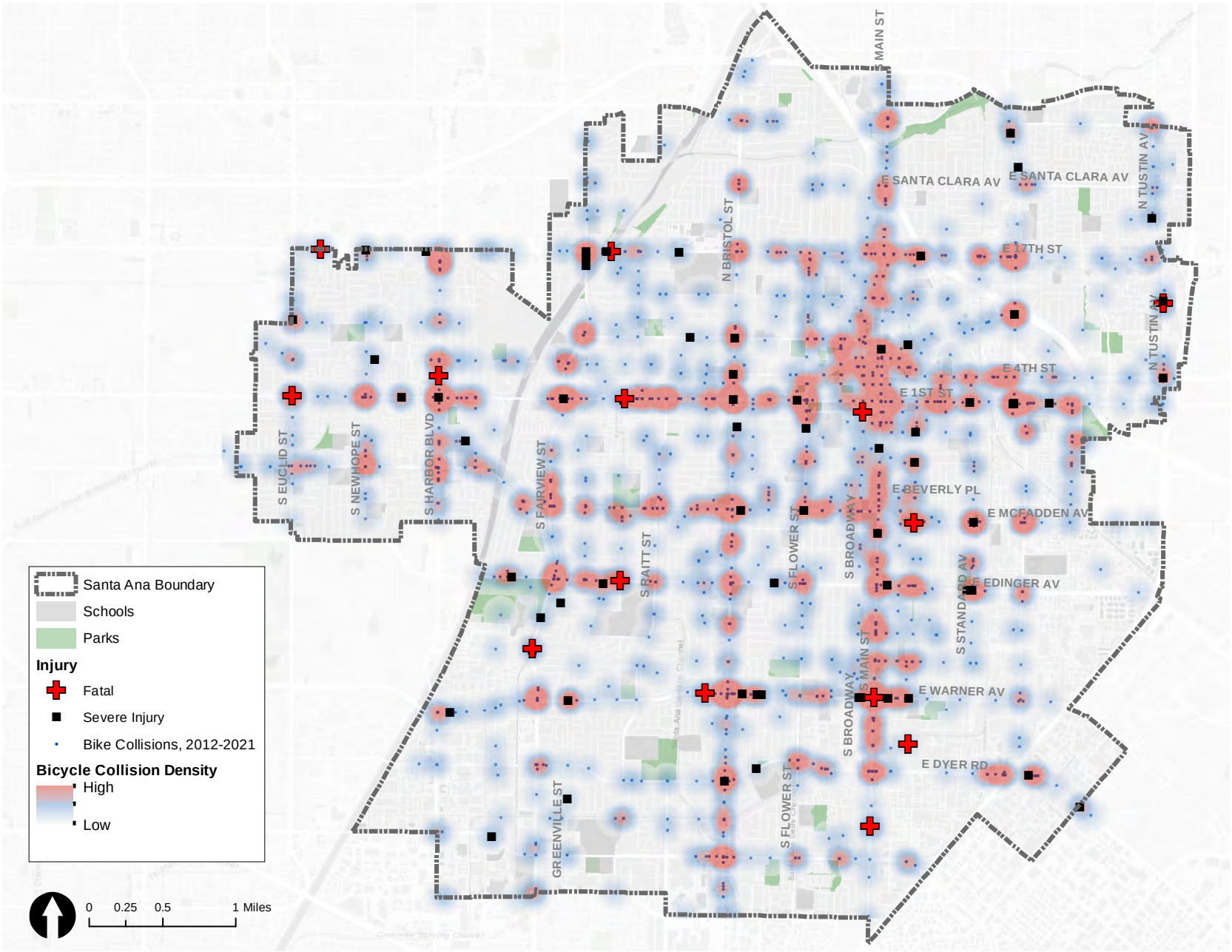


Figure 3-11: Five Year Heat Map of Automobile Collisions from 2017-2021

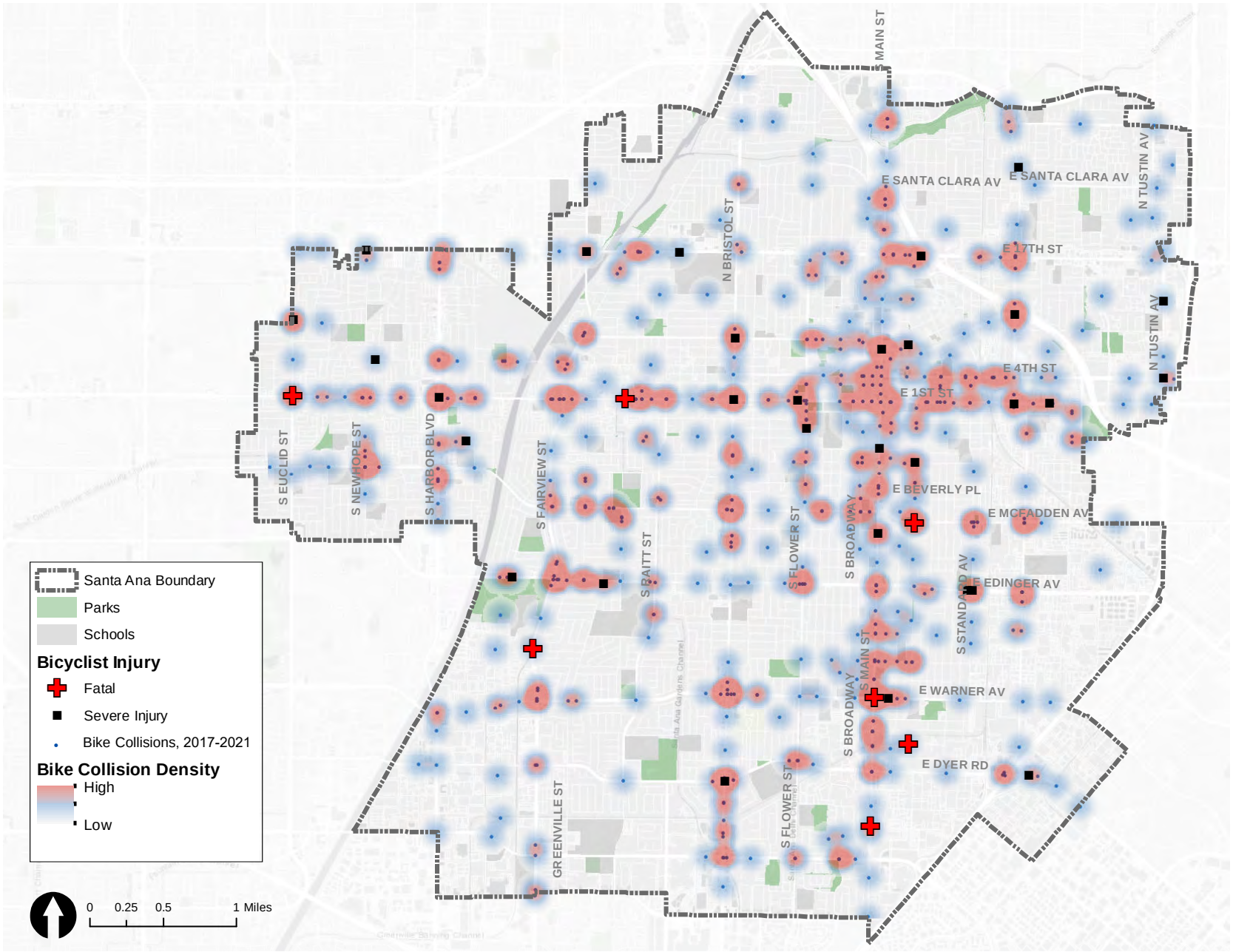


Figure 3-12: Five Year Heat Map of Automobile Collisions from 2017-2021

3.6 Analysis of Systemic Safety Needs

Figures 3-13 through Figure 3-15 show a tree diagram focused on the fatal and serious injury collisions along roadway characteristics throughout Santa Ana. The collision trees suggest that six-lane roads as well as intersections present the greatest risk of collisions. These systemic safety concerns demonstrate that as more lanes exist, so does the chance of a collision resulting in a fatality or serious injury. More lanes typically have more cars and higher speeds, increasing the quantity and severity of collision.

3.7 Collision Summary

People biking and walking, especially people with visual impairments or other disabilities, are the most vulnerable roadway users. Though there are more automobile collisions, pedestrian and bicyclist involved collisions are more likely to be involved in serious injury or fatal collisions, and they are disproportionately represented in all collisions. Of pedestrian collisions over the past five years, 16% resulted in serious injuries or fatalities and 5.5% for all bicycle collisions, whereas only 2% of automobile collisions resulted in a serious injury or fatality.

Figure 3-16 illustrates the Santa Ana corridors with moderately-high to high injuries involving pedestrians, bicyclists, and vehicles. These corridors have the highest collision rates and injury severities collision rates and injury severities. Consequently, these have been categorized as safety corridors that merit consideration for measures that can help improve their safety for all.

The methodology for this analysis involved joining each collision to the nearest street segment to quantify the number of collisions and severity of injuries that have occurred at different locations along a corridor. Each injury was given a 'score' as noted in the list below. Each road segment's score was then summed together for a total score per corridor. A more detailed version of that map that looks at each road segment can be found in Appendix B.

Description	Score
Pedestrian Fatalities or Severe Injuries	1.5
Bicycle Fatalities or Severe Injuries	1.5
All Other Pedestrian and Bicycle Collisions	1.25
Vehicle Collisions Resulting in Fatalities or Serious Injuries	1.25
All Other Vehicle Collisions	1.0

The goal is to slow travel speeds, redesign streets to accommodate multimodal travel, and reduce traffic fatalities and serious injuries to zero through the recommendations outlined in this Plan.

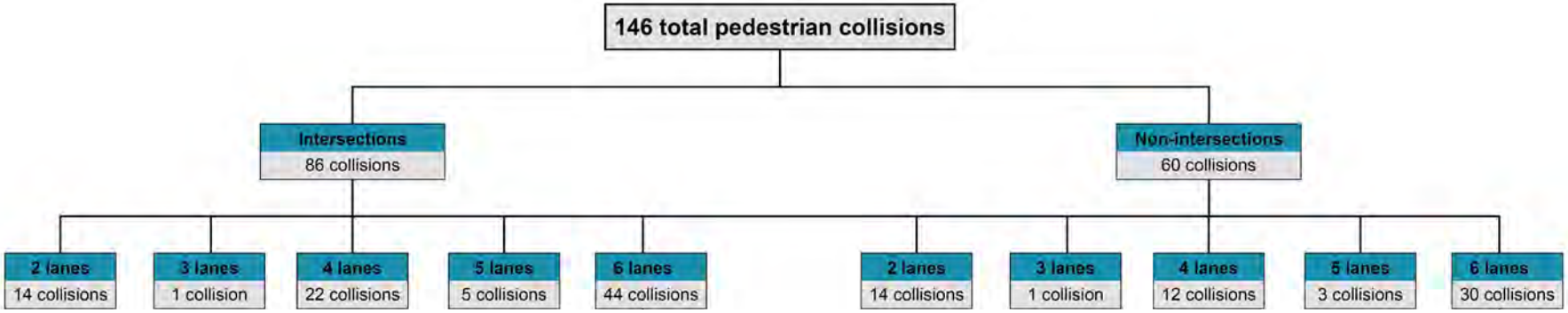


Figure 3-13: Number of Lanes and Pedestrian Collisions

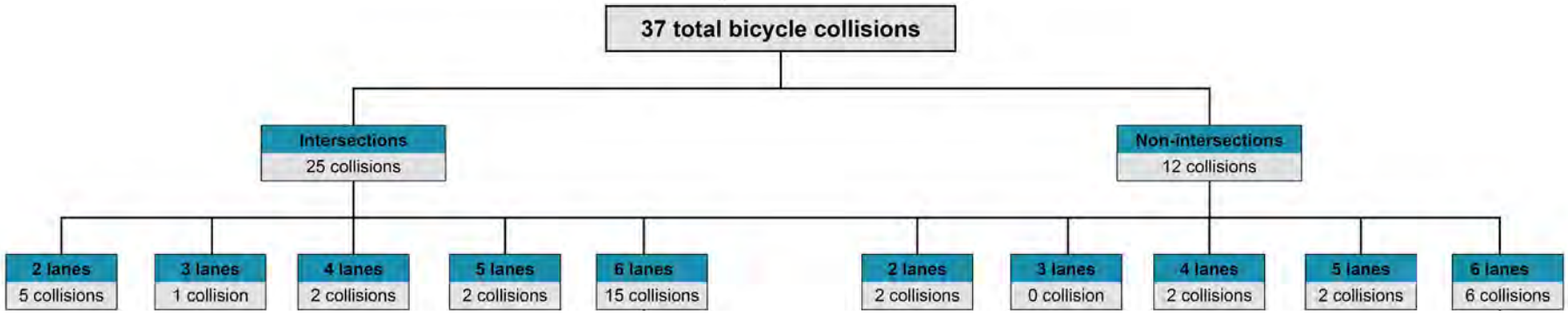


Figure 3-14: Number of Lanes and Bicycle Collisions

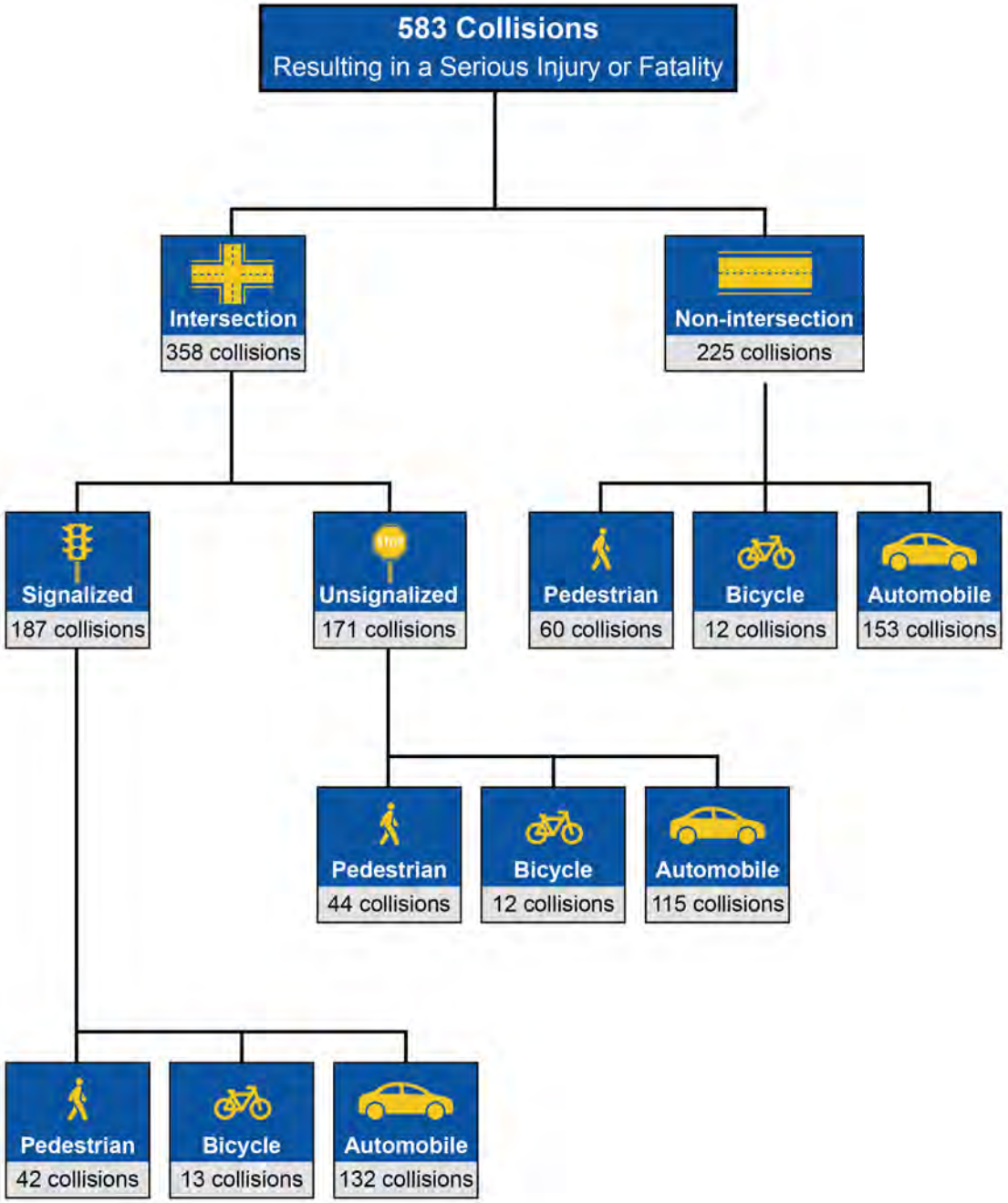


Figure 3-15: All Collisions Resulting in Serious Injuries or Fatalities and Road Segments, Intersections, and Traffic Signals

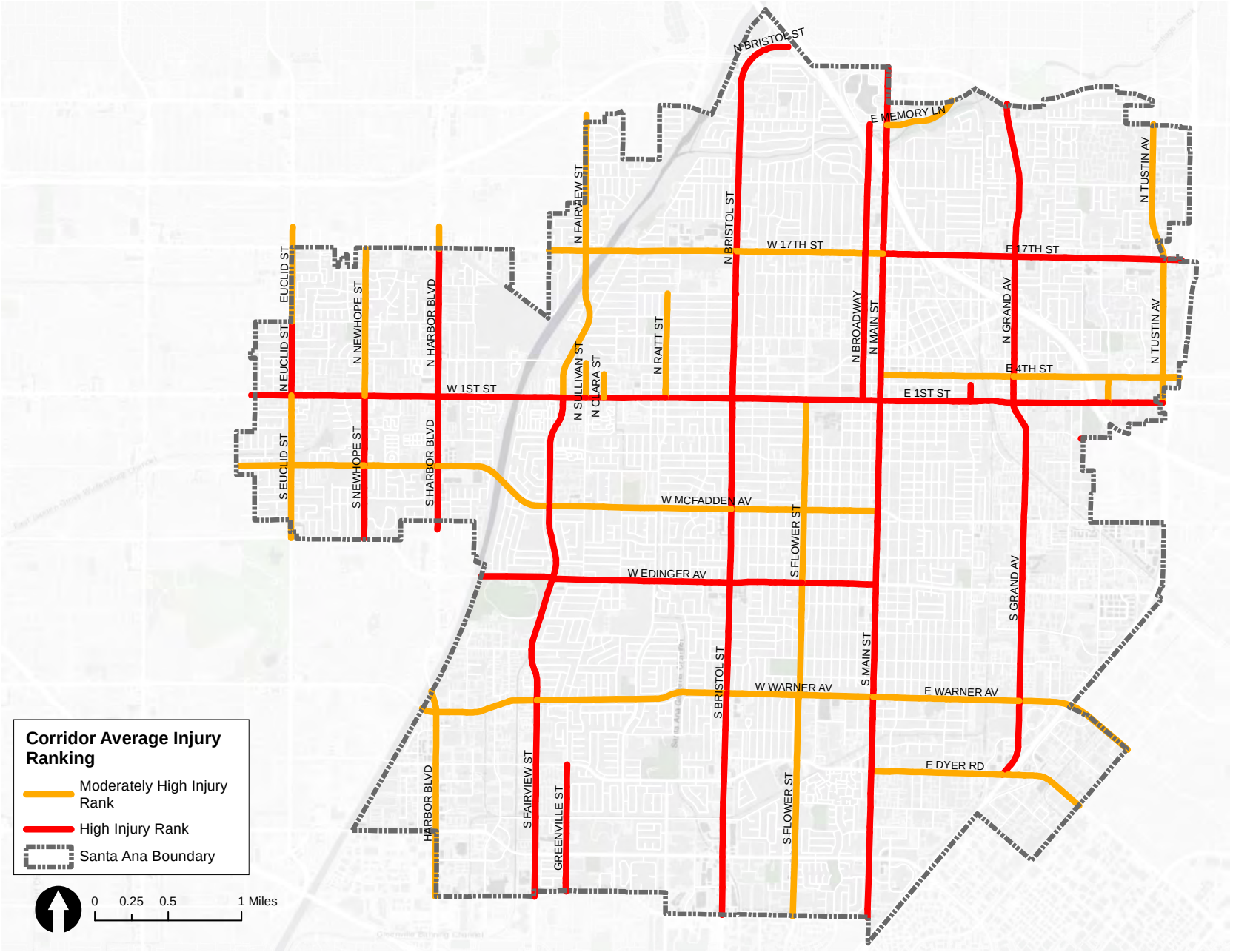


Figure 3-16: Average Injury Ranking per Corridor

> There is no silver bullet to slow down all traffic. However, every incremental change to promote traffic safety and/or reduce roadway speeds is a potentially life-saving change.
>
> ***Zdenek "Zed" Kekula***
> *Principal Civil Engineer*
> *City of Santa Ana*

Photo Location: Standard Avenue at Chestnut Avenue

4 Community Engagement Summary

Photo Location: Main Street at 17th Street

4.1 Overview

Purpose

Thorough community engagement routed in equity is essential to understand the City's current state of infrastructure and to address the types of improvements needed for a safe and enjoyable multimodal network. The Santa Ana Vision Zero Plan conducted outreach from Fall 2022 through Spring of 2023. Outreach efforts were led by Latino Health Access (LHA), a non-profit who has been ingrained in the community for many years and has built an extensive network to solicit feedback and gain trust with Santa Ana residents. They have been an integral part of the community engagement components of the Downtown and Central Complete Streets Plan and the Active Transportation Plan.

Latino Health Access

Latino Health Access (LHA) applies a highly participatory methodology in community engagement and has built long-standing relationships with community members. LHA delivers culturally appropriate health-related services and equitable programming and is well versed in engaging individuals in low-income, low-opportunity areas in transforming their environments and creating positive, concrete changes. LHA has trained volunteers, students, community-peer networks and promotores, or community experts, who live in the community and have connections with individuals and families experiencing the most significant vulnerability. The relationships with the community enable trust, information-sharing, and lifts the voices of residents who may not have otherwise been included in a conventional engagement approach. LHA brings the project to the public rather than expecting the public to show up to project meetings. This broader reach strengthens the value of the input collected in the project and has been an asset to informing project recommendations. The community engagement conducted in the SAVZ Plan helped inform project recommendations and also built a foundation for further funding to bring these projects to life.

Outreach Efforts

The team, led by LHA, collaborated to develop a Community Engagement Plan (CEP) for virtual and in-person outreach strategies in accordance with COVID-19 protocols. The tasks included in the CEP are listed below.

- Monthly Project Development Team (PDT) meetings
- Five (5) community events
- Up to five (5) Stakeholder Advisory Group meetings
- Community survey
- Pop-ups
- Social media posts
- Educational video
- Project website

4.2 Outreach Materials

Draft outreach materials were developed including project branding, social media content, online maps, infographics, flyers, and information sheets to support the community survey distribution and stakeholder meetings. All materials were designed in English, Spanish, and Vietnamese with Spanish-speakers present at all events to accommodate the diversity of City residents. Some materials such as the survey and flyers were distributed both online and in printed format as well as by City Staff at various neighborhood association meetings.

Project Fact sheet

Public outreach materials for the workshops included fact sheets, flyers, and postcards. These materials were printed and shared online in English, Spanish, and Vietnamese. These materials were distributed prior to and during community events to encourage participation and invite people to share their thoughts. These fact sheets were also shared at laundromats, food banks, and local coffee shops to broaden reach to residents.

Project Webpage

A project webpage hosted on the City's website was updated periodically throughout the project to include information about the project and share opportunities for residents to give feedback. The web page shares resources about the Vision Zero network, the US Department of Transportation's Traffic Safety Approach, and details about the City's traffic safety information including traffic counts and downloadable versions of previous planning documents such as the Safe Mobility Santa Ana Plan and the Central Santa Ana Complete Streets Plan. The webpage also included all outreach materials such as the community survey, flyer, and educational video prepared in both English and Spanish.

Community Survey

The survey questions were designed to develop a general understanding of the community's current and future state of mind regarding active transportation. A total of five questions were asked, one of which included the option to provide additional comments related to the question. Most questions allowed respondents to select more than one category, resulting in totals that exceeded 100 percent. With nearly 550 responses, the following results provided helpful insight to important issues that can be used to guide the prioritization process.

Question responses in English and Spanish were combined and shown as combined charts on the following pages.

Question 1: When you think about transportation changes or improvements, what should be our top considerations in selecting the projects we design?

For question #1, the most frequent request was to reduce vehicle speeds, followed by improving traffic flow, then a set of third most frequent requests including making it easier to cross streets, public education on safety, then reducing collisions.

Question 2: What street improvements would you like to see more of in Santa Ana?

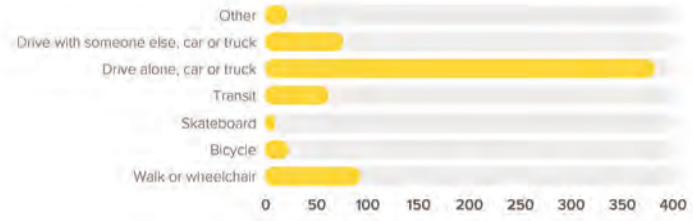
The most frequent request was to increase or improve street lighting, followed by improving safety with more signals and signage. A set of third most frequent requests include ensuring all sidewalks include curb ramps at intersections, adding multi-purpose trails, and adding sidewalks.

Question 3: What types of bicycle facilities would you like to see more of in Santa Ana?

The most frequently requested bicycle facility was protected bike lanes followed by improved traffic signals, then green colored bike lanes.

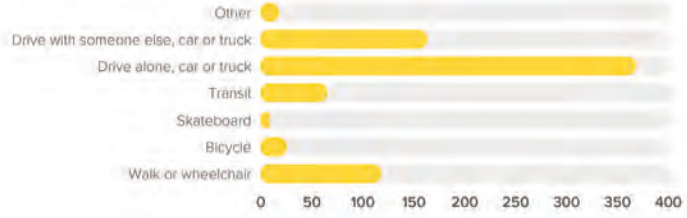
Question 4a: Commuting to work or school - What are your main means of travel in Santa Ana?

The most common commuting method is driving alone in a car or truck. Walking is a distant second common mode, then driving with someone else in a car or truck.



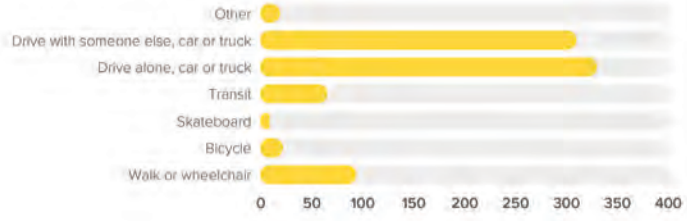
Question 4b: Personal errands or shopping - What are your main means of travel in Santa Ana?

Errands and shopping trips have similar travel methods as work and school modes noted in question 4a with driving alone or with someone else, followed by walking.



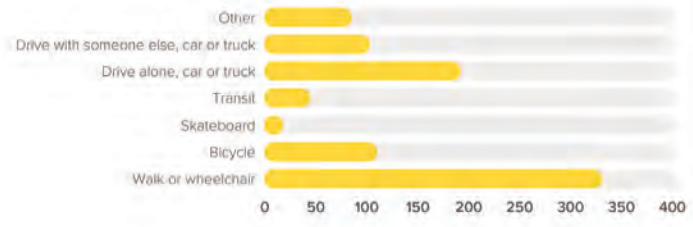
Question 4c: Fun, dining out, social destinations - What are your main means of travel in Santa Ana?

Social trips have the same travel patterns as work, school, and errands with driving alone being most common, followed very closely by driving with someone else, then walking and transit held a distant third.



Question 4d: Exercise or recreation - What are your main means of travel in Santa Ana?

Walking is the most popular mode for exercising or recreation then driving alone, with bicycling coming in third.



Question 5: "Is there more you would like to tell us about your transportation experience in Santa Ana?"

A few direct quotes in favor of and opposed to traffic calming and vision zero and listed below in addition to a summary table of the most frequent comments from over 400 provided.

Comment (Simplified)	# Comments
Add street lights	33
Fix road pavement	33
Add protected bike lanes	29
More law enforcement	29
Implement vision zero	16
Improve bus service	15
Reduce congestion from construction	15
Add speed humps	14
Remove bike lanes, add car lanes	11
Stop racing, reckless driving	11
Reduce vehicle speed in residential	10

Several open ended answers from Question 5 by Survey Participants are listed below.

- *"The streets are very dark - as a driver it is hard to see pedestrians at night. As a pedestrian, it is very hard to be seen, especially when cars are turning into a driveway entrance. We need better lighting, especially in high foot traffic areas and around bus shelters."*
- *"I think it would be better to create a safer biking lane so that people actually use their bikes more and get exercise."*
- *"Can be dangerous walking. Uneven sidewalks are a fall risk. Drivers turning right while people are in the crosswalk. Speeding drivers through intersections."*
- *"Certain transit/ buses don't come very often on some streets & it would be nice for certain routes to have more frequent buses. "*
- *"Santa Ana devotes an enormous amount of public space to cars. Traffic speed on almost all streets are dangerously high, especially on arterials, and in many cases speed limits should be reduced by half. We need to reduce the number of lanes and space we provide for cars and provide more alternatives, not the other way around."*

4.3 Outreach Events

Booths were set up at scheduled and well-attended local events, bringing the project's outreach efforts directly to community members attending these events. This outreach method generates higher levels of input than would have been possible through project-specific presentations and workshops. The project scope originally asked to attend four community events, but the fourth event had a relatively low turn out, so LHA went above and beyond to attend a fifth event to ensure that public engagement was well rounded and equitably represented the diverse population of Santa Ana.

Santa Ana Winter Village, January 6th, 2023

Event Overview

On Friday, January 6th, LHA attended the Santa Ana Winter Village, a month-long community-wide holiday event. This event draws people from all over the City and County for a family-friendly day of holiday fun with food, music, and activities for kids. LHA held a booth to inform the public about the project, distribute surveys, and solicit feedback. LHA Youth supported the survey collection process and facilitated engaging conversation around safety recommendations for Santa Ana.

Santa Ana Winter Village, January 8, 2023

Event Overview

Due to this event's popularity,, LHA attended the second day of the Winter Village on January 8th to capture feedback from community members attending on different days. LHA Youth again assisted with the outreach process and held dialogue around the Vision Zero project. Engaged residents provided valuable feedback about the existing conditions, problem areas, and suggestions for potential infrastructure improvements.

Santa Ana Unified School District (SAUSD) We Care Resource Fair, February 15, 2023

Event Overview

LHA set up a booth at the Santa Ana Unified School District's We Care Resource Fair. This event targets the youth by connect students to mental health and suicide prevention resources and education. This location was selected to specifically target student populations who are commonly walking, bicycling, and taking transit and can provide valuable feedback for the project. LHA educated students on the project and how safe streets and walkable neighborhoods connect with overall health.

Santa Ana Fun Run, April 22nd, 2023

Event Overview

The Santa Ana Fun Run, held on Saturday, April 22nd had a resource fair area where LHA set up a booth. LHA reported that the resource fair section did not attract many community members, contributing to the decision to conduct outreach at a fifth event. A youth running club was reportedly very interested in the project and gave great feedback about the existing conditions of the pedestrian network in Santa Ana.

Activa Tu Salud/Activate Your Health LHA Fair, April 29, 2023

Event Overview

LHA hosted a community wellness event that connected attendees to resources for mental, emotional, physical, and spiritual health. Over 50 surveys were collected.

Activate Your Health 2022 LHA Event

Activate Your Health 2022 LHA Event

Miscellaneous

Food Bank(s)

LHA hosts regular food banks where they were able to distribute SAVZ Plan flyers and surveys which provide a consistent avenue to gather community input. The food bank has numerous Spanish and Vietnamese speakers and older adults participating regularly.

Platicando con Promotores, February 16, 2023

LHA hosts a weekly virtual education segment called Platicando con Promotores, or Conversing with our Community Health Workers, held in Spanish. Each week focuses on a different topic to inform and promote overall wellness. On Thursday, February 16th, LHA highlighted the Santa Ana Vision Zero Plan with representatives from the City and consultant team. Participants were in favor of traffic calming in Santa Ana and pedestrian improvements, especially safe crossings. Roundabouts received mixed feedback and one parent mentioned that newer curb extensions negatively impact school drop-off for their child. Overall, this meeting provided an intimate venue to hold meaningful conversations about traffic safety in Santa Ana. Watch it here!

Educational Video

An educational video was prepared in both English and Spanish to educate residents on the importance of Vision Zero in Santa Ana, promote the project, and ask viewers to complete the survey. The video was promoted on the City's website, LHA's social media, and on YouTube. Watch the video here!

Stakeholder Advisory Group

This project required multi-jurisdictional cooperation and feedback from City staff and other agencies to meet the goals of the periodic project milestones. As part of this effort, the Stakeholder Advisory Group (SAG) was created to meet up to five times during the project, or about every other month. To expand the level of feedback collected, the SAG also included community representatives to bring alternative perspectives to the group. Stakeholder represented persons with disabilities, youth, neighborhood associations to name a few. The full list of organizations is listed below with names are listed in the Acknowledgments section.

- Artesia Pilar Neighborhood Association
- Caltrans
- Com-Link
- Dayle McIntosh Center
- Environmental and Transportation Advisory Commission (ETAC)
- KidsWork
- Orange County Health Care (OCHC)
- Santa Ana Active Streets Coalition (SAAS)
- Santa Ana Unified School District
- Santa Ana Police Department
- Santa Ana Public Works
- Santa Ana Planning
- Willard Neighborhood Association
- Resident, bus rider
- Resident, graduate student

The SAG meetings allowed routine discussion of the project's progress and each meeting offered a portion of education, information, and feedback and suggestions. The meetings ranged between one hour and one hour and a half depending on participation and discussion of the following topics.

- Project locations
- Project prioritization
- Numerous polls and surveys
- Reviewing/feedback on draft maps and graphics
- Process of data collection/analysis
- Draft countermeasures

Monitoring the progress of the Santa Ana Vision Zero will be through the City of Santa Ana Pubic Works Director to the City of Santa Ana Environmental and Transportation Advisory Commission (ETAC). Reporting to the ETAC will take place at least once every two years.

4.4 Public Outreach Summary

Numerous public events in Santa Ana were attended to share with the public and get direct feedback on improving safety for all modes of transportation including walking, bicycling and driving. The community outreach focused on considerations of equity using inclusive and representative processes, ensuring representation from all demographics of the community. A hard copy and online survey was distributed which collected 548 responses. As shown in the quoted comments above, opinions can be diverse on improving bicycle and pedestrian safety, but the overwhelming trend appears to be in favor of improving bicycle and pedestrian infrastructure and safety to increase these modes of transport and increasing safety and ridership on public transit.

Common threads for bicycle and pedestrian safety concerns, as shown in the previous set of bar charts and comments, tend to focus on reducing the danger that cars and trucks create for pedestrians and bicyclists. Slowing vehicle speeds down, improving street lighting, more traffic signals and signs, adding protected bike lanes, and improving traffic flow are the most frequent requests.

Let us ALL work together on a safer commuter future for our City. Whether you are traveling by vehicle, bus, bicycle or walking; slow down, be aware of your surroundings, be respectful of others and let us all come home safely to our families every day.

Ruben Castaneda
Senior Engineer
City of Santa Ana

Photo Location: Civic Center Drive near the County Administration building

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5 Toolbox of Potential Improvements

Photo Location: Oak Street at McFadden Avenue

5.1 Descriptions of Potential Street Improvements

This chapter includes project recommendations meant to slow down traffic and reduce the potential of fatal and serious injury collisions. These vision zero treatments are intended to improve conditions for the more vulnerable road users, people walking, rolling, and bicycling. These treatments naturally make the roadway safe for automobiles as well. Slowing down traffic both increases the time for a driver to react and reduces the potential damage severity of a collision. These potential street improvements reduce collisions across all modes of transportation and the ones that occur are less severe. The recommendations are designed to help the City of Santa Ana allocate funds as they become available and compete for grant funds as opportunities arise. The chapter begins with an overview of the different types of built infrastructure that have been designed throughout California. This "Vision Zero Toolkit" includes active transportation recommendations for all modes of travel to reduce fatalities and serious injuries to zero.

Physical Measures

Bulb Out / Curb Extensions

Curb extensions extend the curb line outward into the travel way, reducing the pedestrian crossing distance. Typically occurring at intersections, they increase pedestrian visibility, reduce the distance a pedestrian must cross, and reduce vehicular speeds. Curb extensions must be installed in locations where they will not interfere with bicycle lanes or separated bikeways. If both treatments are needed, bicycle lanes and separated bikeways can travel behind the curb extension, with a slot in the curb extension known as a bike bypass.

Corner Radius Reduction or Truck Apron

Truck aprons allow large vehicles, such as: trucks, buses, and recreational vehicles, to turn without striking people walking, rolling, or bicycling, or fixed objects by reducing the corner radius using a 3-inch high mountable area. They are located on the road surface, next to the side-

Bulb Out / Curb Extensions

Truck Apron, Source: Maricopa Association of Governments

Chicanes / Roadway Curve

walk. The mountable area slows motor vehicles while allowing large trucks to traverse the mountable area with their rear wheels. A corner radius reduction is similar to a truck apron but instead of a 3-inch high mountable area, the addition is built at the height of the sidewalk.

Chicanes / Roadway Curvature

Chicanes are a series of narrowings or curb extensions that alternate from one side of the street to the other forming an S-shaped path of travel on a roadway. Chicanes reduce drivers' speeds by causing them to shift their horizontal path of travel.

Hardened Centerlines

Hardened centerlines are flexible delineator posts or raised speed humps placed along the yellow centerline at an intersection to block the diagonal path through the intersection and encourage drivers to turn left at a slower speed.

Pedestrian Refuge Island

Refuge islands provide pedestrians and bicyclists a relatively safe place within an intersection and midblock crossing to pause and observe before crossing the next lane of traffic.

Raised Crosswalk or Speed Table

Speed tables are flat-topped road humps, often constructed with textured surfacing on the flat section. Speed tables and raised crosswalks help to reduce vehicle speeds and enhance pedestrian safety. Fire Departments tend to prefer speed tables since they can be made to accommodate emergency services vehicles.

Reduced Conflict Intersection (RCI)

This intersection design prohibits through movement and left turns from the side streets, only permitting a right turn in or a right turn out, known as "Right In Right Out" (RIRO). To continue straight or to make a left turn from the side street, cars must first turn right and then make the nearest U-turn. RCIs eliminates the potential of broadside crashes.

Hardened Centerlines with Flexposts

Pedestrian Refuge Island

Reduced Conflict Intersection (RCI)

Traffic Calming Circle

A traffic circle is a small-scale traffic calming measure commonly applied at uncontrolled intersections on low volume, local residential streets. They lower traffic speeds on each approach and typically avoid or reduce right-of-way conflicts because the overall footprint is smaller compared to roundabouts. Traffic circles may be installed using simple markings or raised islands but are best accompanied with drought-tolerant landscaping or other attractive vertical elements.

Traffic Calming Circle

Pavement Markings

Bike Boxes

A bike box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists a safe and visible way to wait ahead of queuing traffic during the red signal phase. This positioning helps encourage bicyclists traveling straight through not to wait against the curb for the signal change. With a bike box, bicyclists make a "One Stage Left Turn" since they do not wait for an additional signal phase.

Two Stage Turn Box

As opposed to a bike box where the turn is made in one stage, a two stage turn box (TSTB) is a painted box ahead of the crosswalk (instead of behind it) that allows bicyclists to travel straight across the intersection, and then wait in a designated area before turning left in a two-stage movement. It is considered a lower stress option and an easier option for beginner bicyclists turning left. TSTBs offer bicyclists a safe way make left turns at multi-lane signalized intersections from a right side cycle track or bike lane, or right turns from a left side cycle track or bike lane.

Two Stage Turn Box (TSTB)

Class I: Multi-Use Paths

Class I multi-use paths (frequently referred to as "bicycle paths") are physically separated from motor vehicle travel routes, with exclusive rights-of-way for non-motorized users like bicyclists and pedestrians. They require physical buffers to ensure safety and comfort of the user. Class I facilities differ from Class IV facilities because they allow pedestrians to use the facilities and they are generally in a different right of way, such as

Class I: Multi-Use Path

a utility company right of way or a Park's Department right of way.

Class II: Bicycle lanes

Bicycle lanes are one-way facilities that carry bicycle traffic in the same direction as the adjacent motor vehicle traffic. They are typically located along the right side of the street (although can be on the left side) and are between the adjacent travel lane and curb, road edge, or parking lane. They are not physically separated from motor vehicle traffic.

Class III Bicycle Routes

A bicycle route is a suggested bicycle corridor marked by signs designating a preferred street between destinations, usually residential streets. They are recommended where traffic volumes and roadway speeds are 35 mph or less. Traffic calming is included as needed to discourage drivers from using the street as a through route.

Class IV: Separated Bikeways

Separated bikeways, sometimes called cycle tracks, are on-street bicycle facilities with a physical separation between the bikeway and vehicle travel lanes usually with flexible posts, planters, or poured concrete. Often times, Class IV bikeways are parking-protected, where parked cars offer a buffer from traveling cars. Class IV facilities differ from Class I facilities because they are only for bicyclists as pedestrians generally are given a parallel sidewalk. Consequently, Class IV bikeways are usually preferable to Class I facilities. Class IV bikeways usually use street right of way, which is different than Class I facilities. For Class IV facilities on the approach to intersections, the bike facility needs to be adjacent to the sidewalk, and in between the right turn lane and the sidewalk if a right turn lane exists. Ideally the intersection would be a Protected Intersection, giving added protection to the bicyclists.

Edge Lane Roads or Advisory Bicycle Lanes

An edge lane road is a preferred space for bicyclists and motorists to operate on narrow streets that would otherwise be a shared roadway. Roads with edge lane road markings accommodate low to moderate volumes of two-way motor vehicle traffic and provide a more comfortable, safer space for bicyclists without widening of the paved roadway

Class III: Bicycle Route, Source: Mia Burk

Class IV: Separated Bike Path

Edge Lane Road, Source: Wash Cycle

surface. Due to their reduced cross section requirements, edge lane roads have the potential to open up more roadways to accommodate comfortable bicycle travel.

Protected Intersection

Also known as a Dutch-style Intersection, it is an intersection where bicyclists are physically separated from cars at the corners using small islands known as “Curb Refuge Islands” to separate and protect the bicyclist traveling straight from the parallel motorists turning right, thereby mitigating the right hook conflict. In protected intersections, the bikeway is set back from the parallel motor vehicle traffic. Unlike at conventional bike intersections, people biking are not forced to merge into mixed traffic. Instead, they are given a dedicated path of travel through the intersection, increasing the safety and level of comfort for people biking in intersections, which typically are among the least safe areas for bicyclists.

Green-Colored Transition Striping

Intersection or mid-block crossing markings indicate the intended path of bicyclists. Colored striping can be used to highlight conflict areas between bicyclists and vehicles, such as where bicycle lanes merge across motor vehicle turn lanes.

High Visibility Crosswalks

High visibility crosswalk markings are designed to both guide pedestrians and to alert drivers of a crossing location. The bold pattern is intended to enhance visual awareness. Cities in southern California often install “continental” style markings due to their higher contrast on a roadway. “Continental” style crosswalks only have a series of thick lines the are painted parallel to the flow of traffic. Motor vehicles travel directly over or next to the thick lines, thereby reducing maintenance costs. Continental crosswalks are also safer due to the higher visibility compared to standard crosswalks. Ladder style crosswalks, which include parallel lines perpendicular to the flow of traffic, are not recommended due to the added maintenance costs.

Lane Width Reductions

Protected Intersection, Source: Nacto

Green-Colored Transition Striping, Source: VDOT

High Visibility Crosswalk

Reducing vehicle lane widths may reduce travel speeds to slow down speeding cars. It also gives space to non-vehicle road uses such as bicycle facilities. Moreover, November 2023 research from John Hopkins University found that 10 foot lanes increase motor vehicle safety over wider lanes, while also giving more space for multimodal travel. It's considered a win-win scenario.

Road Buffets or Lane Reductions

Road buffets reallocate the uses of a roadway, reducing the number of travel lanes to make space for a center turn lane, median or pedestrian refuge island, protected bicycle facilities, curb extensions, and other traffic calming and vision zero treatments.

Road Buffet or Lane Reduction

Signs, Signal Timing, Signal Infrastructure

Pedestrian Countdown Signal Heads

Pedestrian countdown signals are an added display to a standard pedestrian signal head. These display a countdown of the seconds remaining until it is safe and permitted to cross.

Reflective Border on Signal Heads

Reflective borders on signal heads improves visibility of signal heads with a backplate and is made even more conspicuous by framing it with a yellow retroreflective border. These are more visible in both daytime and nighttime conditions.

Pedestrian Signals and Beacons

Traditional pedestrian signals with countdown timers remain the gold standard for high quality pedestrian crossings, although some cases warrant new signal technologies. Pedestrian Hybrid Beacons (PHBs) and Rectangular Rapid Flashing Beacons (RRFBs) are special beacons used to warn and control traffic at unsignalized locations to assist pedestrians in crossing a street via a marked crosswalk. PHBs include a "red phase" requiring vehicles to come to a full stop while RRFBs require yielding to pedestrians and stopping when pedestrians are present. Either of these devices should be installed at locations that have pedestrian desire lines and that connect people to popular destina-

Pedestrian Hybrid Beacon (PHB)

Rectangular Rapid Flashing Beacon (RRFB)

tions such as schools, parks, and retail. Research has shown that PHBs tend to have a 90 percent motorist compliance rate versus RRFBs, which tend to have an 80 percent motorist compliance rate. Traditional pedestrian signals with countdown timers at signalized intersections tend to have a near 100 percent compliance rate. Signals and warning devices should be paired with additional pedestrian improvements where appropriate, such as raised tables, curb extensions, enhanced crosswalk markings, lighting, median refuge islands, corresponding signage, and advance yield markings to mitigate multiple threat crashes on multi-lane roadways.

Pedestrian Lighting

Pedestrian-scale lighting provides many practical and safety benefits, such as illuminating the path and making crossing walkers and bicyclists more visible to drivers. Lighting can also be designed to be fun, artistic, and interactive and increases the feeling of safety for people waiting for the bus at night.

Signal Timing Adjustments

Signal timing adjustments can be made to slow down traffic, prioritize pedestrians and bicycles crossing with lead pedestrian or bicycle intervals, and reduce congestion by coordinating signal times. Signal timing is designed best in protected phases, incorporating protected and unprotected left turn. For the safety of pedestrians, left turn phasing should typically be protected rather than protected-permissive or permissive only phasing. NYC DOT has been testing some alternatives to protected phasing such as “Partially Split Phasing” that may be used for situations aiming to reduce delay.

5.2 Strategies and Performance Measures

The Santa Ana Vision Zero Plan outlines an initial set of projects and measures that the City of Santa Ana and its partners can implement to work toward the goal of achieving zero transportation-related deaths and serious injuries on our streets and trails by 2040. The City will implement this plan by applying for grant funding or integrating projects into the CIP program, and then providing dedicated staff to carry out the action items. All agencies and stakeholders will continue to work together within the community to build a culture of safety.

The Vision Zero Action Plan is a living document that will evolve over time, as needed, as it builds on the Safe Mobility Santa Ana plan as well as other plans before that. After funding has been procured, the goal is to implement the projects within a 10 year time frame, using both data-driven and qualitative metrics to track progress.

The best practice performance measures are listed below, each of which are meant to quantify the impact and effectiveness of Vision Zero projects and programs. Identifying and employing several strategies will help the City update the public on progress and advance efforts for the upcoming year. The City must decide on the metrics that it deems the most important to allocate limited resources towards. Each year, the overarching goal is for collision trends to decrease, while increasing the mode split for walking and bicycling, which increases safety due to the “Safety in Numbers” phenomenon. Note from the metrics that equity plays a critical role in performance measures. Annually, tracking the following infrastructure and programmatic data points are key.

- Percent of total citywide street mileage dedicated to active transportation facilities (such as bicycle parking, street closures, Class I, II, and IV bicycle facilities, and complete sidewalk networks).
- Number of CIP projects funded per year that address safety issues.
- Percent of streets where posted speed limits have been reduced, focusing around schools and parks.
- Total miles of on-street bikeways defined by streets with clearly marked or signed bicycle accommodations.
- Total miles of streets with pedestrian improvements.
- Percent of bicycle networks in the most disadvantaged neighborhoods.
- Number of grants funded per year that address equity-related safety issues.
- Number of intersections where signals have been optimized for people with disabilities and active transportation.
- Number of bicycle and pedestrian safety programs.

The City has a robust GIS program that collects crash data into the Crossroads database. The City can also use the Transportation Injury Mapping System to collect and analyze crash data. The following are metrics the City can review annually to track trends to achieve zero transportation-related deaths.

- Number of Serious Crashes
- Number of Fatal Crashes
- Number of Intersection Crashes
- Number of Pedestrian Crashes
- Number of Bicycle Crashes
- Number of Alcohol-related Crashes
- Number of Speed-related Crashes
- Number of Distraction-related Crashes
- Number of Work Zone Crashes
- Number of Crashes on the High-Injury Network
- Number Crashes in Areas of Higher Poverty or Diversity

Monitoring the progress of the Santa Ana Vision Zero will be through the City of Santa Ana Pubic Works Director to the City of Santa Ana Environmental and Transportation Advisory Commission (ETAC). Reporting to the ETAC will take place at least once every two years using the appropriate metrics noted above.

6 Recommended Engineering Improvements

Photo Location: Lacy Street at Civic Center Drive

6.1 Overview

This chapter focuses on the key outcomes of the Plan: the recommendations and initial project implementation to support Santa Ana Vision Zero. Section 6.2 presents an overview of the project prioritization process and shares a list of the ranked projects. Section 6.3 shares a field review summary from site visits at each location. Section 6.4 includes the specific corridor designs and corresponding cut sheets that show initial project recommendations and what measures should be implemented at each location. A key concept of Vision Zero is that countermeasures shouldn't just be implemented at key locations where collisions have already occurred. Rather, they should be proactively implemented at locations where collisions are likely going to occur, especially high-severity collisions. The call outs on the aerial photos are intended to be used to pursue grant funding for implementation. Some cut sheets take projects further with preliminary engineering drawings.

6.2 Project Prioritization

Developing the project prioritization criteria was a combined data-driven and interactive process consisting of cumulative scores derived from the various criteria, shown in Table 6-1. The project list with assigned scores is shown in Tables 6-2 and 6-3. The prioritization process was developed in collaboration with focused partners, with equity for all users and transportation modes in mind. See Chapter 4 for the list of public, private, and local advocacy partners who helped develop this criteria with objective and equity-based data. The equity impact assessments of the proposed projects and strategies, as well as the population demographics, were a key concern during the analysis and project recommendation process. Ultimately, the projects recommended are all in the underrepresented and underserved areas of Santa Ana and the policies and strategies recommended, focused on addressing equity concerns. Figure 6-1 maps the top twenty priority projects as per the prioritization process as well as the project corridors from the 2016 SMSA study.

Table 6-1: Project Prioritization Criteria

Criteria	Description
KSI/mile	The KSI/mile Score represents the number of people Killed or Seriously Injured (KSI) per mile. Each fatality and serious injury received one point, no weight was applied. The higher the KSI, the more likely a corridor needs Vision Zero countermeasures implemented.
Street Lane Score	The street lane score represents the number of lanes on a corridor. Each lane received one point, 6 being the highest. The more lanes a street has, the more dangerous it is for people walking and bicycling.
Median Island Score	Median Islands are one of the most effective Vision Zero countermeasures. A Corridor that has a median receives a 0, a partial median receives a 4, and no median receives an 8.
Equity, Public, and Professional Score	This score is compiled of the number of survey comments, stakeholder input; professional judgment from the project team and the City of Santa Ana on the need of a corridor to receive countermeasures, and it includes results from the Equity Analysis.
Total Score	The Total Score represents the sum of each prioritization criteria. The top 5 scores are to be the top five projects, which will go into more detailed conceptual design.

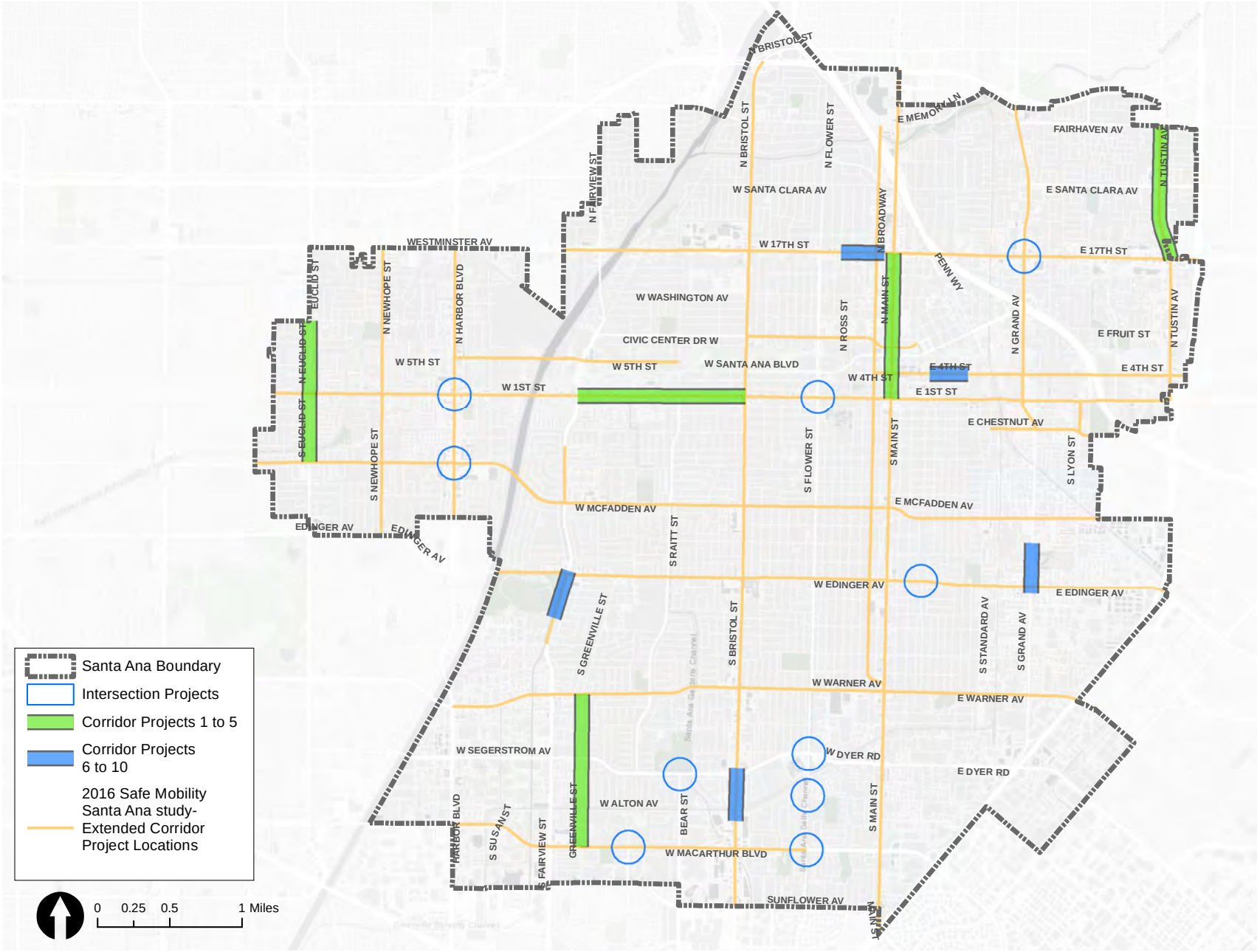


Figure 6-1: Top 20 Priority Project Locations

Table 6-2: Top Ten Road Segments

Rank	Project Name	KSI/mile SCORE (1-10)	School Zone SCORE (1-10)	Street Lane SCORE (1-10)	Median Island SCORE (1-10)	Equity, Public, and Professional SCORE (1-10)	TOTAL SCORE (Max. Score=50)
1	Main Street	6.9	9	4	8	10	37.9
2	Euclid Avenue	10.0	6	6	8	6	36.0
3	1st Street	8.4	3	6	4	10	31.4
4	Tustin Avenue	5.2	3	6	8	9	31.2
5	Greenville Avenue	4.8	9	4	8	5	30.8
6	Grand Avenue	5.7	9	6	8	2	30.7
7	Fairview Street	3.6	9	6	4	8	30.6
8	Bristol Street	5.4	9	6	8	2	30.4
9	4th Street	4.4	3	2	8	9	26.4
10	17th Street	1.6	9	6	0	9	25.6

Table 6-3: Top Ten Intersections

Rank	Project	KSI/mile SCORE (1-10)	School Zone SCORE (1-10)	Street Lane SCORE (1-10)	Median Island SCORE (1-10)	Equity, Public, and Professional SCORE (1-10)	TOTAL SCORE (Max. Score=50)
11	Harbor Boulevard at 1st Street	10	3	6	0	10	29
12	17th Street at Grand Avenue	4	6	6	4	8	28
13	Harbor Boulevard at McFadden Avenue	5	6	6	0	10	27
14	1st Street at Flower Street	3	9	6	0	8	26
15	Edinger Avenue at Maple Street	4	6	6	0	9	25
16	Segerstrom Avenue at Bear Street	0	6	6	4	8	24
17	Flower Street at Macarthur Boulevard	0	9	6	4	4	23
18	Macarthur Boulevard at Raitt Street	0	9	4	0	9	22
19	Dyer Road at Flower Street	0	9	4	8	0	21
20	Flower Street at Alton Avenue	1	6	4	0	9	20

> I have seen a major change in traffic safety in the City of Santa Ana. From car is king to actively considering all roadway users. From 'we cannot install bikeways' to 'we cannot installed them fast enough'. In general, pedestrian and bicycle traffic safety is definitely undergoing a renaissance in the City of Santa Ana.

Zdenek "Zed" Kekula
Principal Civil Engineer
City of Santa Ana

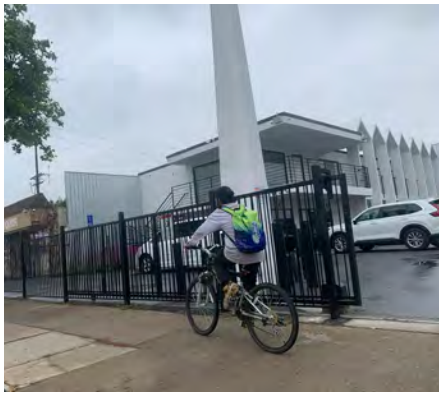
Photo Location: Civic Center Drive at Lacy Street

6.3 Field Review of Top 20 Projects

On May 24th-25th, 2023, the project team conducted a field review of Santa Ana streets, prioritizing the project list, to observe existing conditions and user behavior of people walking, bicycling, and driving. The team noted the immediate land uses, surrounding destinations, and existing infrastructure. While the existing conditions analysis from Chapter 2 helped proposed project locations based on collision density and infrastructure gaps, this exercise helped to identify elements and patterns understood from observation. The field work helped to finalize the prioritization process and solidify project ranking.

Some examples from the site visits include crosswalks shown in aerials that had since been faded in some locations, bicyclists were seen riding on sidewalks even when bicycle facilities are present, and bicyclists were spotted riding contra-flow, or against traffic, on both residential streets and primary arterials. Additionally, several near-collisions were witnessed, motorists were driving over the speed limit on wide roads, motorists were running red lights, and there were numerous instances of jaywalking, informing the team that pedestrian crossings are too far apart. These are some behavioral occurrences that can not be identified from data alone and emphasize the significance of field work. The general recommendation is to have protected pedestrian crossings in commercial and mixed use areas at least every 500 feet, usually protected with a pedestrian signal or a Pedestrian Hybrid Beacon (PHB.)

Some examples from this field work are pictured to help illustrate these observations.



Bicyclist riding on the sidewalk

Curb extensions on Main Street

A group waiting to cross 17th Street

Pedestrian Hybrid Beacon Downtown

Tustin Avenue is wide and undivided

Existing traffic circle on 16th Street

6.4 Proposed Pedestrian and Bicycle Projects

The following is a typical set of recommended improvements for all top 20 projects with minor variations noted on individual project pages. Typical improvements include adding separated bike lanes, protected intersections, high visibility continental crosswalks, pedestrian and bicycle friendly signal timing, and bike-friendly bus stop configurations.

Separated Bike Lanes

Wherever space is available, the project sheets recommend Class IV separated bikeways. Ideally, these bike lanes would include as much buffer space between the vehicle travel lane and the bicycle travel lane. This separation can be fit with flexible posts, poured concrete, or parked cars to name a few. As a separated bike lane approaches an intersection, the bike facility remains adjacent to the sidewalk and between a right turn lane or general purpose lane.

Protected Intersections

Protected intersections with raised curb refuge islands (CRIs) at the corners of intersections are recommended to provide a physical barrier between bicycles and vehicles that are turning right at intersections. This provides the bicyclist some safety while waiting for the traffic signal to change and allows them to cross the street in the "crossbike." This also gives the bicyclist a place to wait that is not on the sidewalk where pedestrians are waiting. Three inch truck aprons are included at the 'front' of the curb refuge island to allow larger vehicles to make turns without driving over the six inch raised curb. Detailed curb/apron design configurations will be required at each corner prior to construction to accommodate the design vehicle and available right-of-way. At the time of this plan, the City if finalizing the designs for a protected intersection at Standard Avenue and McFadden Avenue.

High Visibility Continental Crosswalks

High visibility continental crosswalks are recommended at all signalized intersections and ideally at many unsignalized intersections throughout the City. The bar markings should be inline with the car's direction of travel without a solid transverse pavement marking. This reduces the amount of vehicle tire markings and wear on the pavement marking and reduces frequency of remarking the crosswalks.

Pedestrian and Bicycle Friendly Signal Timing

Pedestrian and bicycle friendly signal timing can provide people walking and bicycling with a few seconds 'head start' before vehicles are allowed to proceed, especially right-turning motorists. With a head-start, people walking and bicycling occupy the crosswalks first and have priority over vehicles for safer crossings. This is known as a "Leading Pedestrian Interval." A "Leading Bicycle Interval" is similar but for people biking and a "Leading Through Interval," common in Montreal, allows through moving vehicles while holding right turning vehicles.

Bike-friendly Bus Stop Configurations

Bike friendly bus stop configurations ideally separate bike lanes, pedestrians, buses, and other vehicles in a manner that avoids conflicts. Due to space constraints, this is not always possible and optional configurations need to be implemented. A set of seven bus stop and bike lane configurations are detailed in section 6.5 and can be applied to bus stops in project locations and throughout the City.

Project Recommendations

Table 6-4 displays a matrix of the proposed countermeasures at each corridor and intersection location, followed by design concepts, cost estimates, and characteristics are included for each of the twenty project locations. These recommendations are in additions to the Citywide systematic countermeasures that have been recommended for across the City of Santa Ana.

The top five one-mile study corridors were taken further with leverage of a separate, concurrent SCAG-funded project to develop engineering concepts, cost estimates, and renderings to pursue future grant funding to advance each of the projects' implementation. The project teams from both that project and this Plan worked closely together to align efforts and recommendations. The output of the SCAG project can be found in Appendix D.

Table 6-4: Recommended Countermeasures per Location

		Add yellow reflective border on signal heads	Add crossbikes	Add high visibility crosswalks	Add hardended centerlines in front of raised median	Add bus-bike integration at transit stops	Add raised Type C curb on double yellow centerline	Add curb refuge islands with truck aprons	Add bulb outs with directional wheelchair ramps	Include bike and pedestrian friendly signal timing	Two-way multi-use path	Add bicycle facilities	Add K71 Flexible Traffic Posts	Narrow the median to widen bike lanes
Corridors														
1	Main St	X	X	X	X	X	X	X		X		X		
2	Euclid	X	X	X	X	X	X	X		X		X		
3	Tustin Ave	X	X	X	X	X	X	X		X		X		
4	Greenville	X	X	X	X	X	X	X		X		X		
5	1st St	X	X	X	X	X	X	X		X		X		
6	Grand	X	X	X	X	X	X	X		X		X		
7	Fairview	X	X	X	X	X	X	X		X	X	X		
8	Bristol	X	X	X	X	X	X	X		X		X		
9	4th	X	X	X	X	X	X	X	X	X		X		
10	17th	X	X	X	X	X	X	X		X		X	X	
Intersections														
11	Harbor Blvd / 1st St	X	X	X	X	X	X	X		X		X		
12	17th St / Grand Av	X	X	X	X	X	X	X		X		X		
13	McFadden Av /Harbor Blvd	X	X	X	X	X	X	X		X		X		X
14	1st St / Flower St	X	X	X	X	X	X	X		X		X		X
15	Edinger Av / Maple St	X	X	X		X			X			X		
16	Flower St / Macarthur Blvd	X	X	X	X	X	X	X		X	Existing	X		
17	Raitt St / Macarthur Blvd	X	X	X	X	X	X	X		X		X		
18	Flower St / Dyer Rd	X	X	X	X	X	X	X		X	Existing	X		
19	Flower St / Alton Av	X	X	X	X	X	X	X		X	Existing	X		
20	Segerstrom Av / Bear St	X	X	X	X			X		X	Existing	X		

Top Five Priority Projects

The four exhibits on this page can be used as a guide for the first five projects. Because a SCAG project is taking them further along, they are kept to a conceptual level in this Plan. Exhibits A through D depict intersection and corridor treatment options for Main Street, Euclid Avenue, 1st Street, Tustin Avenue, and Greenville Street. Engineering drawings, cost estimates, and renderings for these five projects can be found in Appendix D.

Exhibit A . Intersection Enhancements

Potential features as applicable:

- Protected Intersection
- Truck Apron
- Hardened Centerline
- Corner Refuge Islands
- Traffic Signal - new or modification
- Bike Signal and Queue Area
- High-visibility crosswalks
- Dual curb ramps

Intersection Enhancements, sourced from Bicycle Dutch

Exhibit B . Pedestrian Hybrid Beacon

Potential features as applicable:

- Warn and control traffic at an unsignalized location to assist pedestrians in crossing a street at a marked crosswalk
- Pedestrian push button
- Flashing lights with reflective border
- High-visibility crosswalk

Pedestrian Hybrid Beacon, Downtown Santa Ana

Exhibit C . Reduced Conflict Intersection

Potential features as applicable:

- Restricts left turns at an intersection
- Reduces car on car collisions
- Conflict point management

Reduced Conflict Intersection, 17th Street at Ross Street, Santa Ana

Exhibit D . Median or Type C Curb

Potential features as applicable:

- Reduces head-on collisions
- Allows for safer turning movements

Type C Curb, sourced from Google Maps

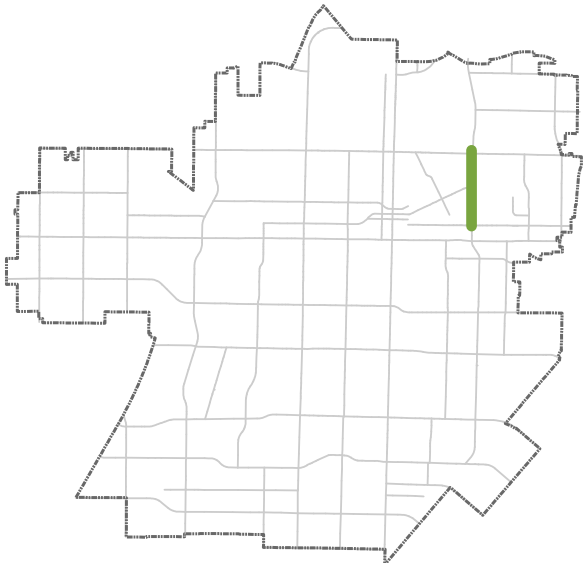
1. Main Street

17th Street to 1st Street

Existing Conditions and Recommendations

Main Street from 17th Street to 1st Street is a one-mile stretch of road located in downtown Santa Ana running north to south through the northeast quarter of the City. Land uses along the route are limited to commercial retail and public services that draw a large volume of traffic that results in one of the highest densities of traffic collision rates for the City, including one fatality and numerous severe injuries during the study period. A high quality pedestrian network of sidewalks, curb ramps, and bus stops run along the street but no bicycle facilities exist. High visibility crosswalks are missing. Figure 6-2 shows recommended improvements that could be extended farther along the route.

Serious Injuries and Fatalities between 2017-2021



Project Location

View of Main Street

Figure 6-2: Main Street from 17th Street to 1st Street

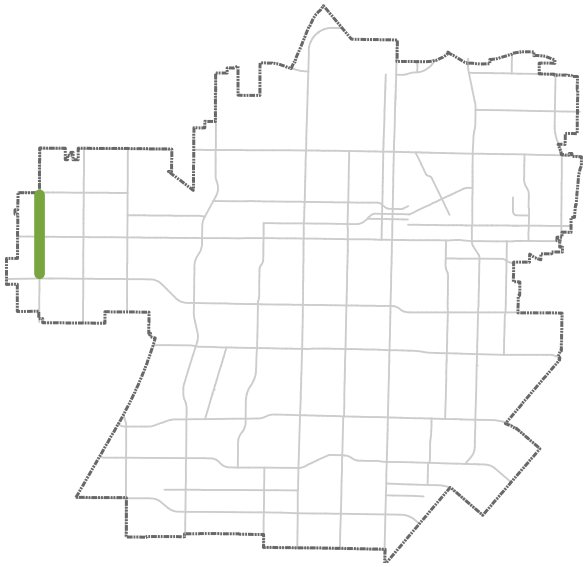
2. Euclid Street

Hazard Avenue to McFadden Avenue

Existing Conditions and Recommendations

Euclid Street from Hazard Avenue to McFadden Avenue is a one-mile stretch of road located at the west edge of the City running north to south through mixed land uses including general commercial retail and residential homes, mobile home parks and multifamily units. Large traffic volumes are generated going to and from uses that results in a high density of traffic collision rates including one fatality and numerous severe injuries during the study period. A high quality pedestrian network of sidewalks, curb ramps, and bus stops run along the street but no bicycle facilities exist. High visibility crosswalks are missing. Figure 6-3 shows recommended improvements that could be extended farther along the route.

Serious Injuries and Fatalities between 2017-2021



Project Location

View of Euclid Street and Hazard Avenue

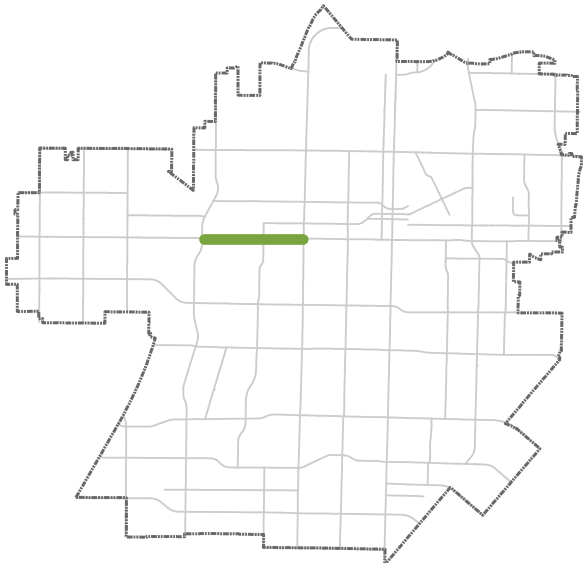
Figure 6-3: Euclid Avenue from Hazard Avenue to McFadden Avenue

3. 1st Street

Fairview Street to Bristol Street

Existing Conditions and Recommendations

1st Street from Fairview Street to Bristol Street is a one-mile stretch located near the center of the City just west of downtown Santa Ana. The street runs west to east through multifamily and mobile home park residential units on the west end and high density commercial uses along the east part of the corridor. This stretch of road generates one of the highest levels of traffic and traffic collisions including three fatalities and fourteen severe injuries during the study period. A high quality pedestrian network of sidewalks, curb ramps, and bus stops run along the street to support pedestrian mobility. Minimal bicycle facilities are provided with single line markings at the edge of vehicle travel lanes. High visibility crosswalks are missing. Figure 6-6 shows recommended improvements that could be extended farther along the route.



Project Location

Serious Injuries and Fatalities between 2017-2021

View of 1st Street

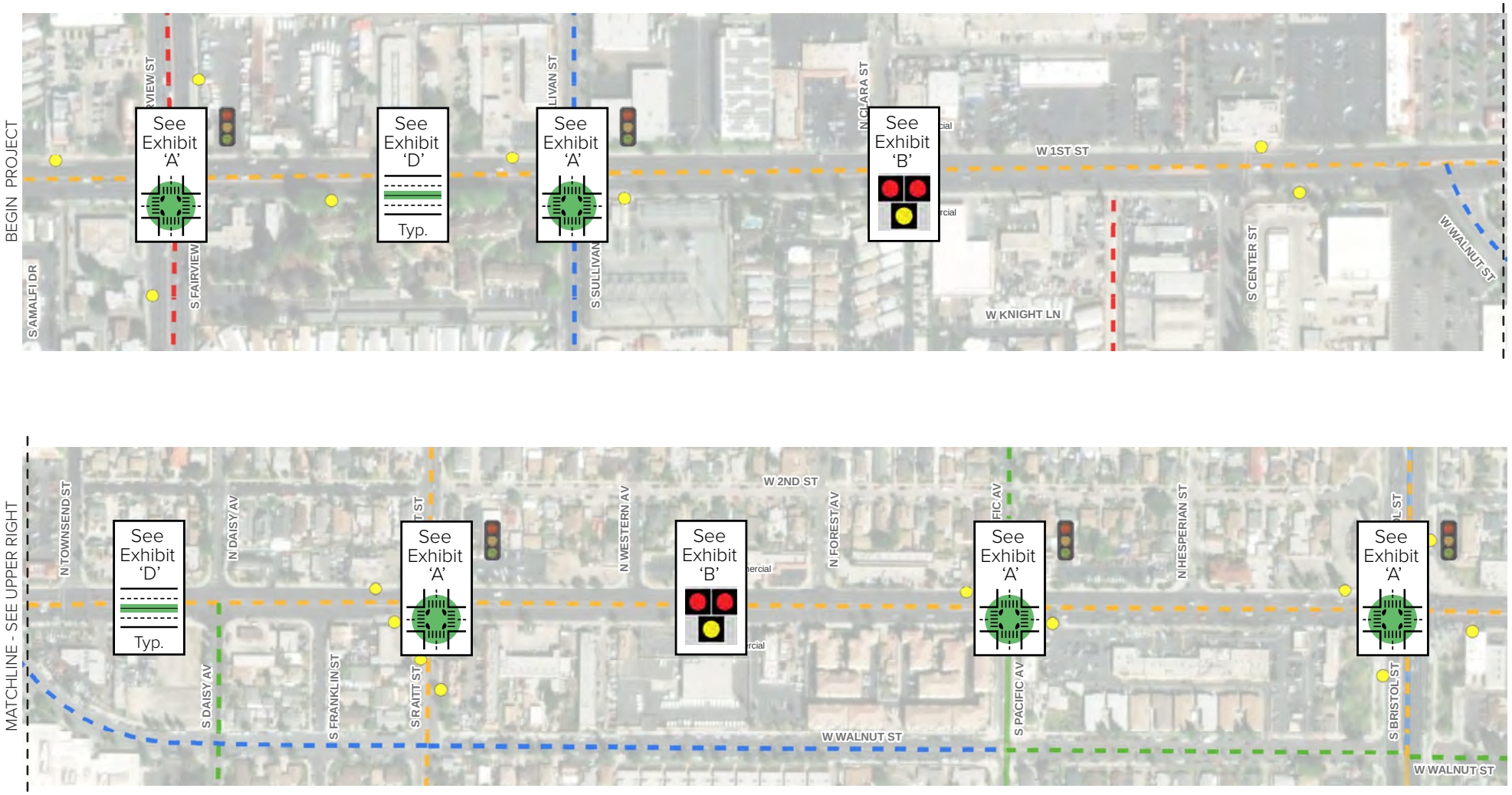


Figure 6-4: 1st Street from Fairview Street to Bristol Street

4. Tustin Avenue

Fairhaven Street to 17th Street

Existing Conditions and Recommendations

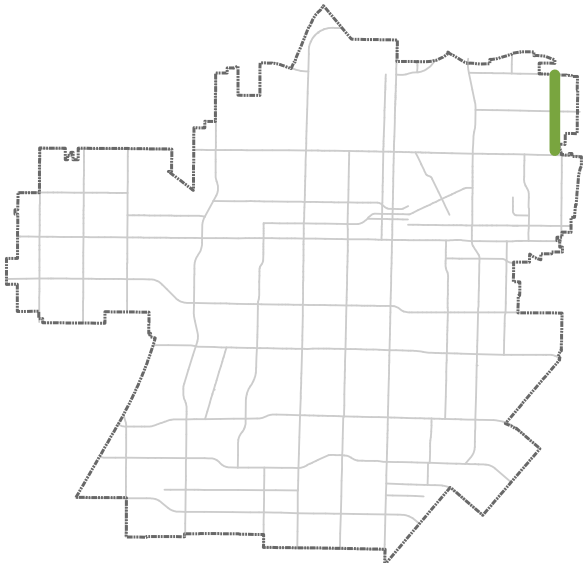
Tustin Avenue from Fairhaven Street to 17th Street is a one-mile stretch located at the farthest northeast edge of the City running north to south through primarily commercial retail and multifamily units that draw a large volume of traffic and a high density of traffic collisions including three severe injuries during the study period. A high quality pedestrian network of sidewalks, curb ramps, and bus stops run along the street but no bicycle facilities exist. High visibility crosswalks are missing. Figure 6-4 shows recommended improvements that could be extended farther along the route.

0 Pedestrian

0 Bicycle

4 Vehicle

Serious Injuries and Fatalities between 2017-2021



Project Location

View of Tustin Avenue

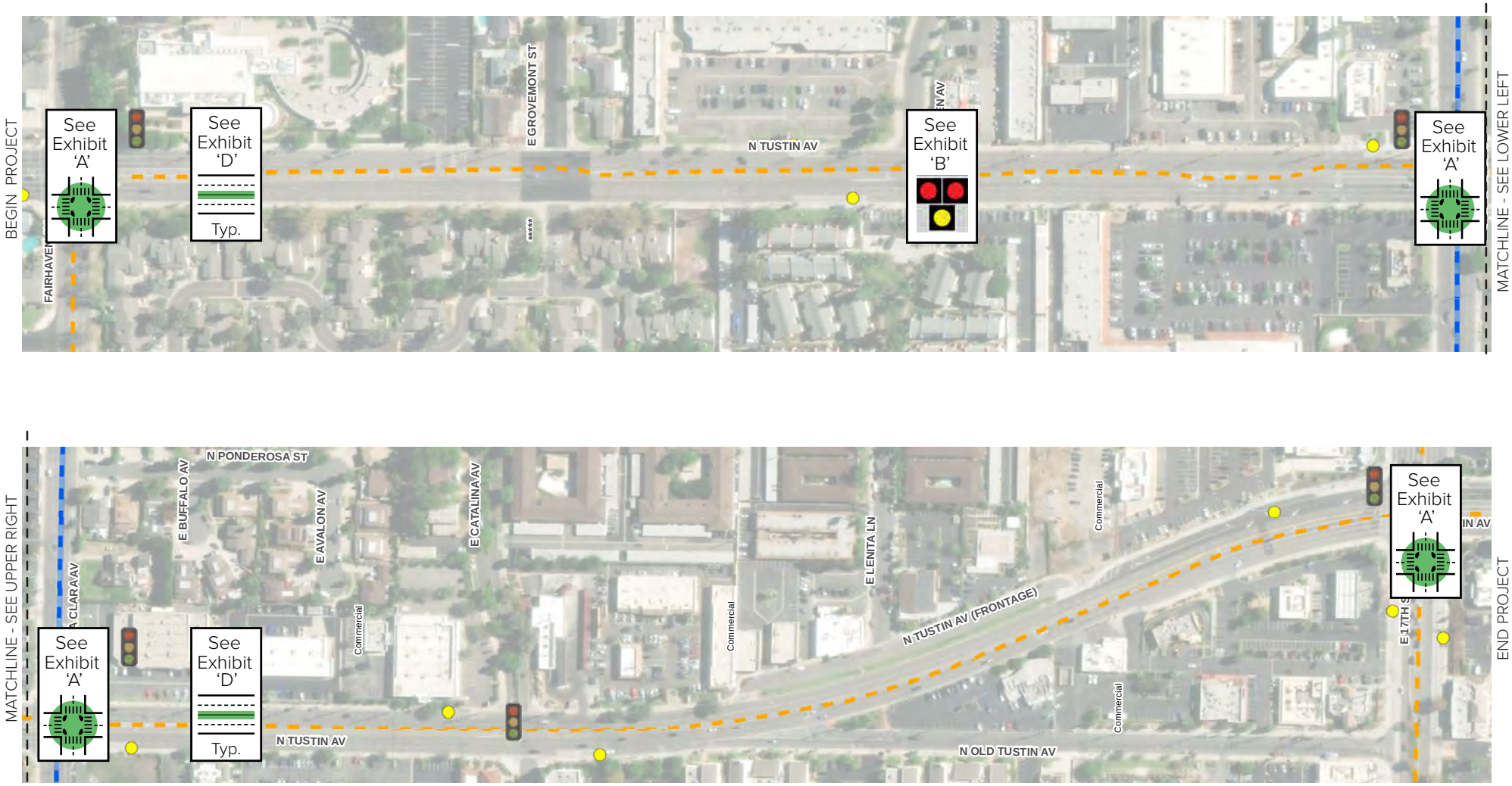


Figure 6-5: Tustin Avenue from Fairhaven to 17th Street

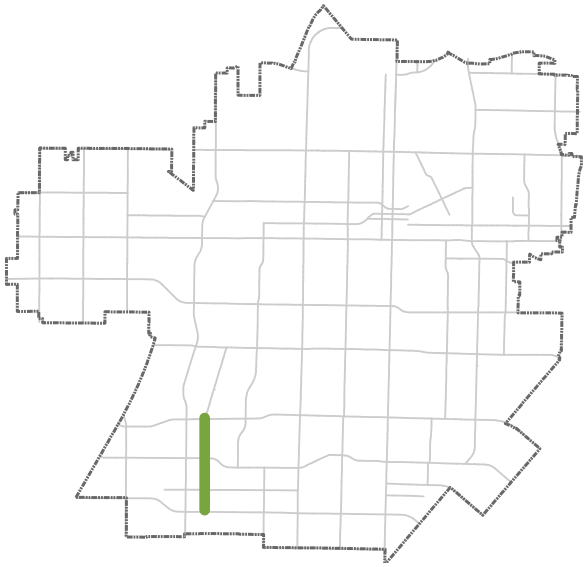
5. Greenville Street

Warner Avenue to MacArthur Boulevard

Existing Conditions and Recommendations

Greenville Street from Warner Avenue to MacArthur Boulevard is a one-mile stretch located in the southwest quarter of the City running north to south through single family, multifamily, and mobile home park residential units that generate daily traffic flows going to work or shopping. The corridor has a moderate density of traffic collisions, showing higher densities at intersections with Warner Avenue, Segerstrom Avenue and MacArthur Boulevard. A high quality pedestrian network of sidewalks and curb ramps run along the street but no bicycle facilities exist. High visibility crosswalks are missing. Figure 6-5 shows recommended improvements that could be extended farther along the route.

Serious Injuries and Fatalities between 2017-2021



Project Location

View of Greenville Street

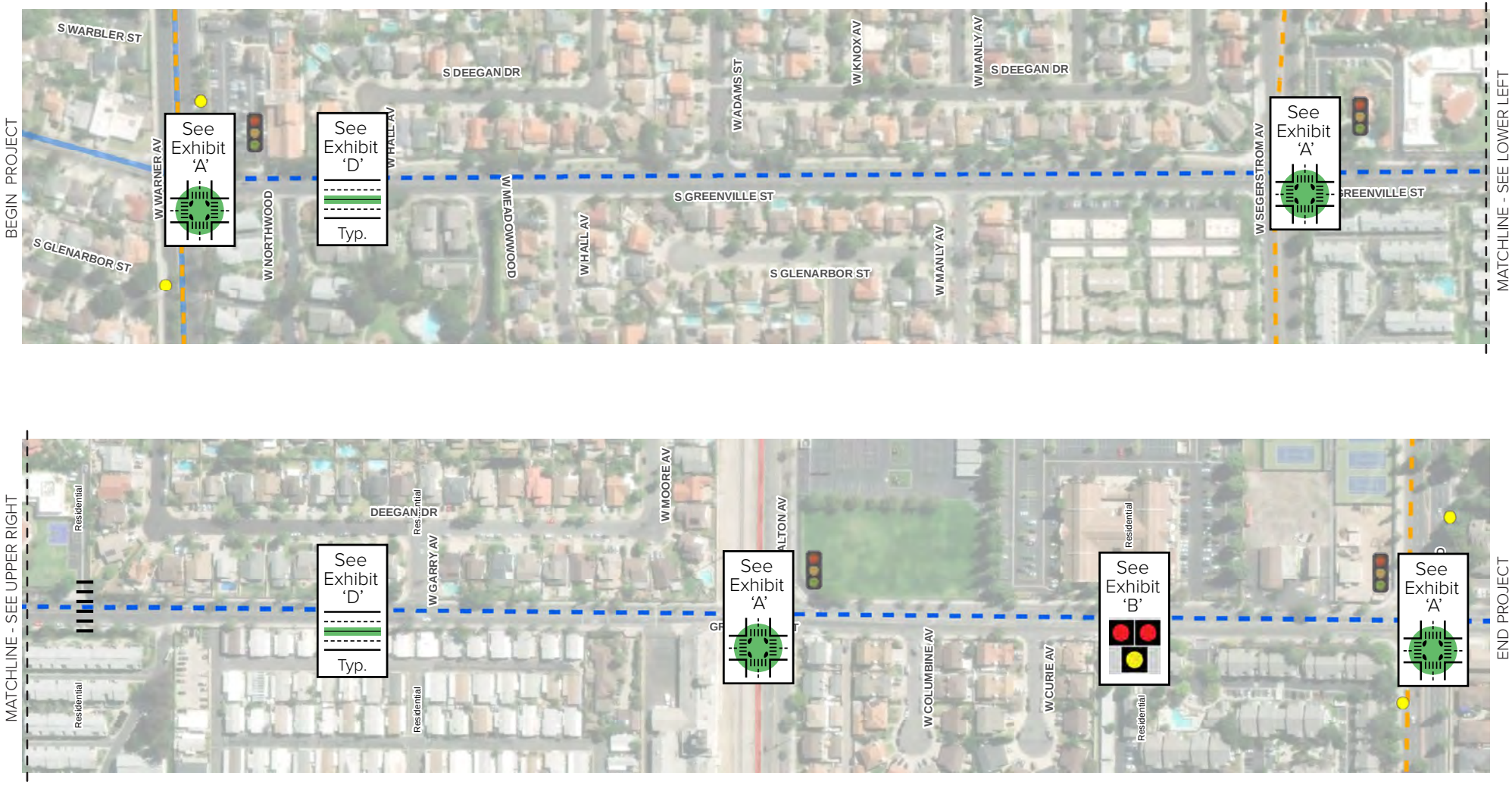


Figure 6-6: Greenville Street from Warner Avenue to MacArthur Boulevard

#6. Grand Avenue

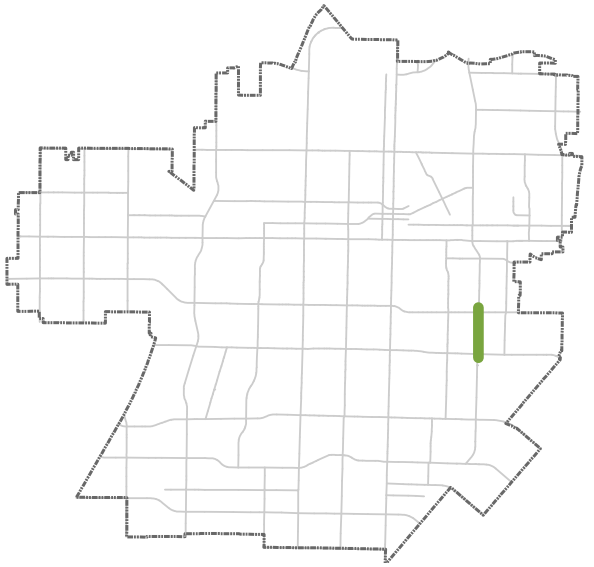
Century High School to Edinger Avenue

Existing Conditions and Recommendations

Grand Avenue from Century High School to Edinger Avenue is a one-third mile stretch running north to south at the southeast edge of the City with Century High School on the east side of the street and light industry on the west side of the street. Light commercial retail is located at the intersection with Edinger Avenue. A moderate level of traffic and collisions occur on this stretch with one severe injury at the intersection with Edinger Avenue during the study period. A high quality pedestrian network of sidewalks, curb ramps, and bus stops run along the street to support pedestrian mobility but no bicycle facilities exist. High visibility crosswalks are missing. Figure 6-7 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.

Serious Injuries and Fatalities between 2017-2021



Project Location

Santa Ana Vision Zero

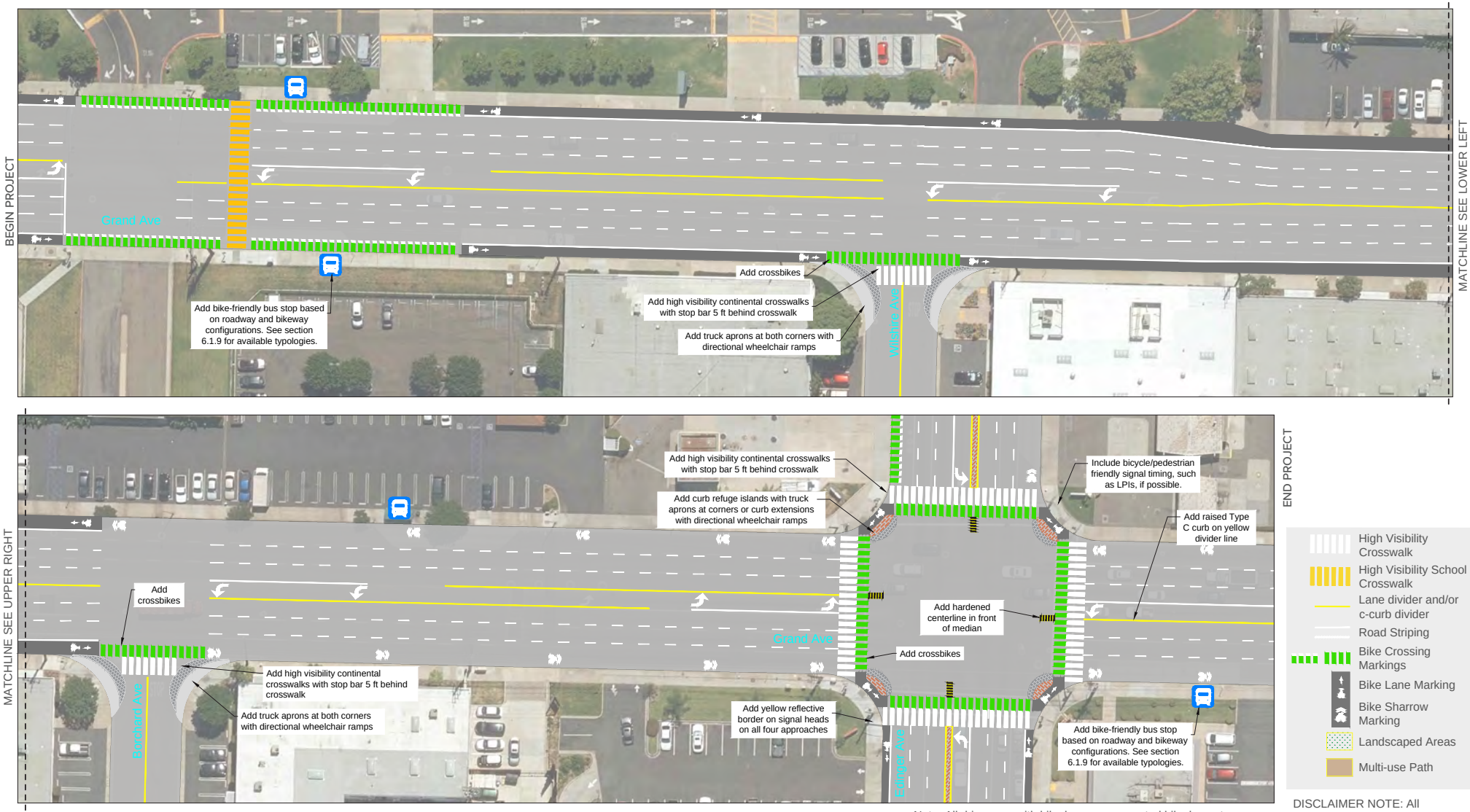
Grand Ave (Century HS - Edinger Ave)

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 4,568,769	$ 5,558,607
TOTAL RIGHT OF WAY COST		$ 210,000	$ 255,497
TOTAL CAPITAL OUTLAY COSTS		**$ 4,779,000**	**$ 5,815,000**
DESIGN	PA/ED (12.5%)	$ 600,000	$ 730,000
DESIGN	PS&E (17.5%)	$ 840,000	$ 1,030,000
DESIGN	RIGHT OF WAY (2%)	$ 100,000	$ 130,000
CM	CONSTRUCTION (19%)	$ 910,000	$ 1,110,000
TOTAL DELIVERY COST		**$ 2,450,000**	**$ 3,000,000**
TOTAL PROJECT COST		**$ 7,250,000**	**$ 8,850,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.



Note: All driveways with bike lanes or separated bike lanes to receive driveway treatments in the form of 'continuous sidewalks' or rubber humps. See details page for more information.

DISCLAIMER NOTE: All improvements shown in concept plans are subject to further evaluation.

ktua KTU+A 3916 Normal St San Diego, CA 92103		Conceptual Site Plan	Grand Ave from Century High School to Edinger Ave	Scale: 1" = 50'-0"	
		January 2024	Santa Ana Vision Zero Plan		

Figure 6-7: Grand Avenue from Edinger Avenue to Century High School Recommendations

#7. Fairview Street

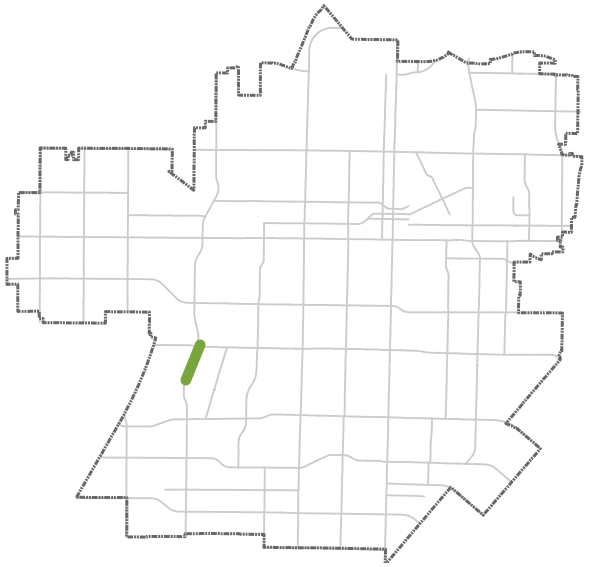
Edinger Avenue to St. Andrew Place

Existing Conditions and Recommendations

Fairview Street from Edinger Avenue to St. Andrew Place is a one-third mile stretch running north to south near the middle of the west edge of the City. The Santa Ana College of Continuing Education and Centennial Park is on the west side of the corridor and single family housing and a grocery store on the east side. As a primary through-road, it sees a daily large volume of traffic and high collisions rate with two severe injuries at the intersection with Edinger Avenue during the study period. A high quality pedestrian network of sidewalks, curb ramps, and bus stops run along the street to support pedestrian mobility but no bicycle facilities exist. High visibility crosswalks are missing. Figure 6-8 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.

Serious Injuries and Fatalities between 2017-2021



Project Location

Santa Ana Vision Zero

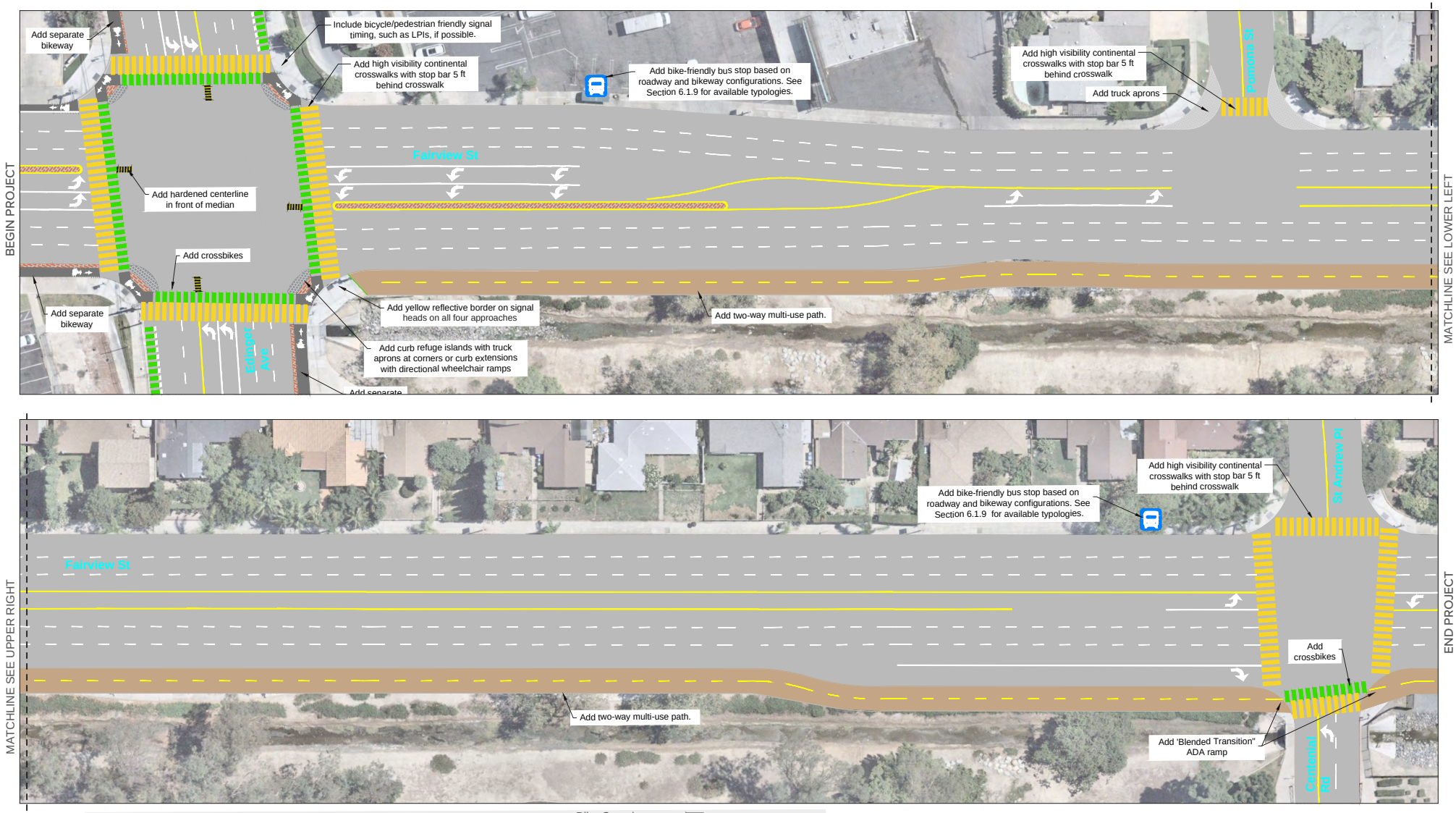
Fairview St (Edinger Ave - St Andrew Pl)

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)*
TOTAL CONSTRUCTION COST		$ 3,552,994	$ 4,322,760
TOTAL RIGHT OF WAY COST		$ 400,000	$ 486,661
TOTAL CAPITAL OUTLAY COSTS		$ 3,953,000	$ 4,810,000
DESIGN	PA/ED (12.5%)	$ 500,000	$ 610,000
DESIGN	PS&E (17.5%)	$ 700,000	$ 860,000
DESIGN	RIGHT OF WAY (2%)	$ 80,000	$ 100,000
CM	CONSTRUCTION (19%)	$ 760,000	$ 930,000
TOTAL DELIVERY COST		$ 2,040,000	$ 2,500,000
TOTAL PROJECT COST		$ 6,000,000	$ 7,350,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.



DISCLAIMER: All improvements shown in concept plans are subject to further evaluation.

ktua KTU+A 3916 Normal St San Diego, CA 92103		Conceptual Site Plan	Fairview St from Edinger Ave to St Andrew Pl	Scale: 1" = 50'-0"	
		January 2024	Santa Ana Vision Zero Plan		

Figure 6-8: Fairview Street from Edinger Avenue to Centennial Road Recommendations

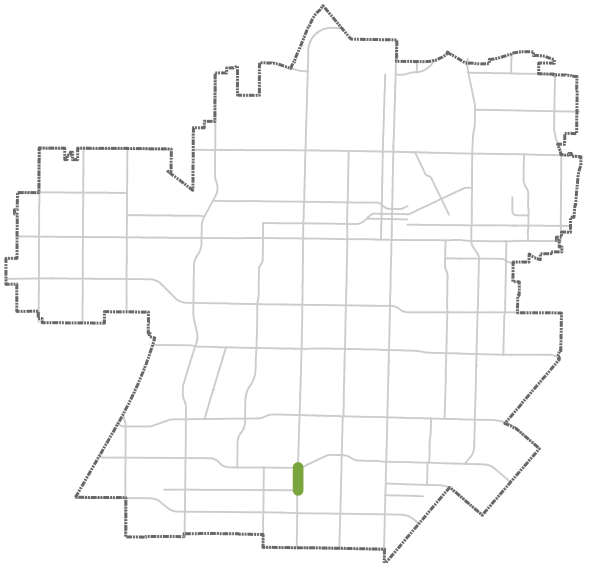
#8. Bristol Street

Segerstrom Avenue to Alton Avenue

Existing Conditions and Recommendations

Bristol Street from Segerstrom Avenue to Alton Avenue is a one-third mile stretch running north to south near the middle of the south edge of the City. Land uses include apartments and commercial retail at the intersections. As one of the main roads in Santa Ana, traffic volumes are very high along with high collision rates and two severe injuries at the intersections with Segerstrom Avenue and Alton Avenue during the study period. A high quality pedestrian network of sidewalks, curb ramps, and bus stops run along the street to support mobility for people walking and with visual and physical disabilities. Bike lanes are provided on both sides of the road with short segments providing buffers from traffic and other segments left as shared with vehicle traffic. High visibility crosswalks are missing. Figure 6-9 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero

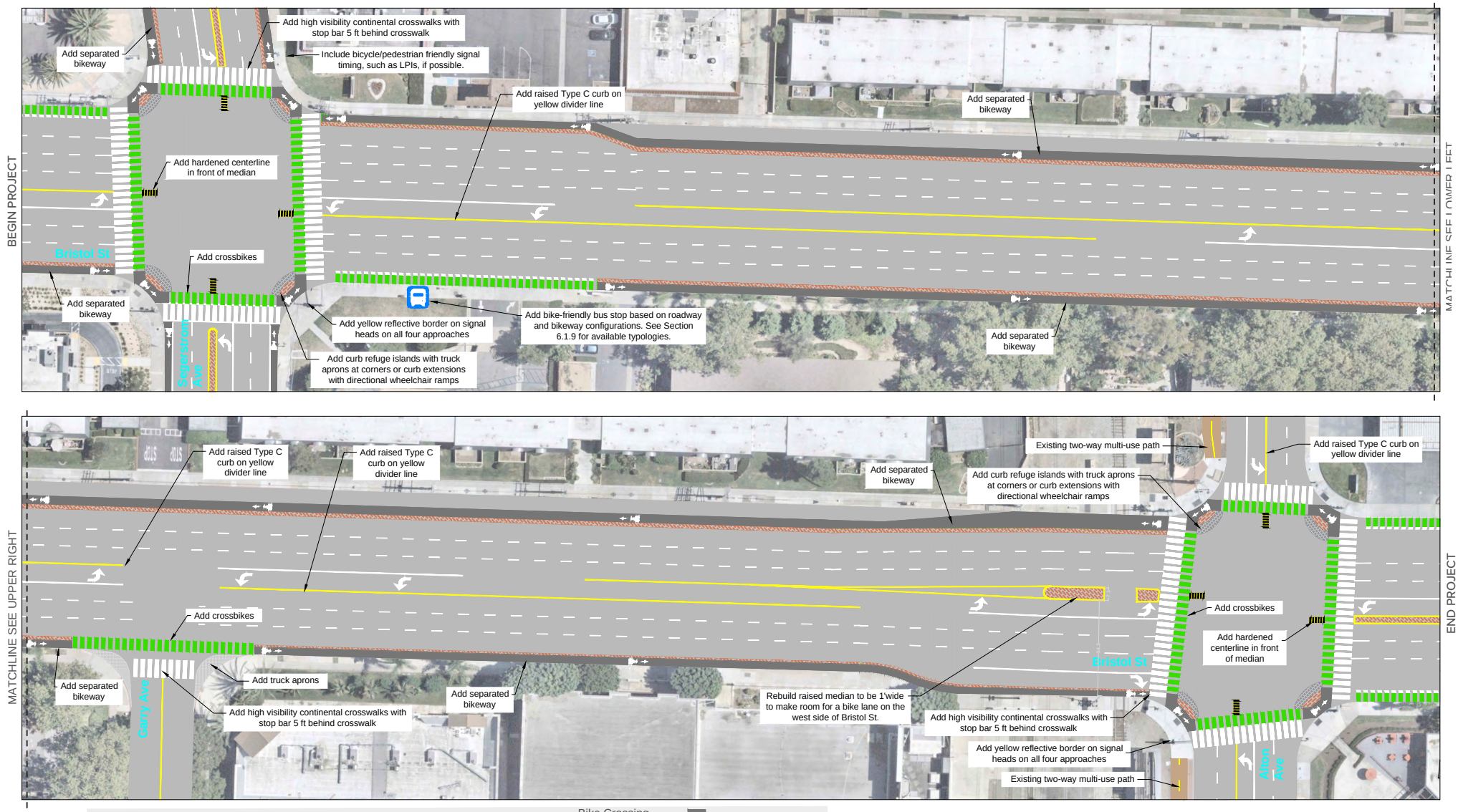
Bristol St from Segerstorm Ave to Alton Ave

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 5,047,009	$ 6,420,289
TOTAL RIGHT OF WAY COST		$ 230,000	$ 279,830
TOTAL CAPITAL OUTLAY COSTS		**$ 5,278,000**	**$ 6,701,000**
DESIGN	PA/ED (12.5%)	$ 660,000	$ 810,000
DESIGN	PS&E (17.5%)	$ 930,000	$ 1,140,000
DESIGN	RIGHT OF WAY (2%)	$ 110,000	$ 140,000
CM	CONSTRUCTION (19%)	$ 1,010,000	$ 1,230,000
TOTAL DELIVERY COST		**$ 2,710,000**	**$ 3,320,000**
TOTAL PROJECT COST		**$ 8,000,000**	**$ 10,050,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.



Note: All driveways with bike lanes or separated bike lanes to receive driveway treatments in the form of 'continuous sidewalks' or rubber humps. See details page for more information.

DISCLAIMER NOTE: All improvements shown in concept plans are subject to further evaluation.

ktua KTU+A 3916 Normal St San Diego, CA 92103		Conceptual Site Plan	Bristol St from Segerstrom Ave to Alton Ave	Scale: 1" = 50'-0"	
		January 2024	Santa Ana Vision Zero Plan		

Figure 6-9: Bristol Street from Segerstrom Avenue to Alton Avenue Recommendations

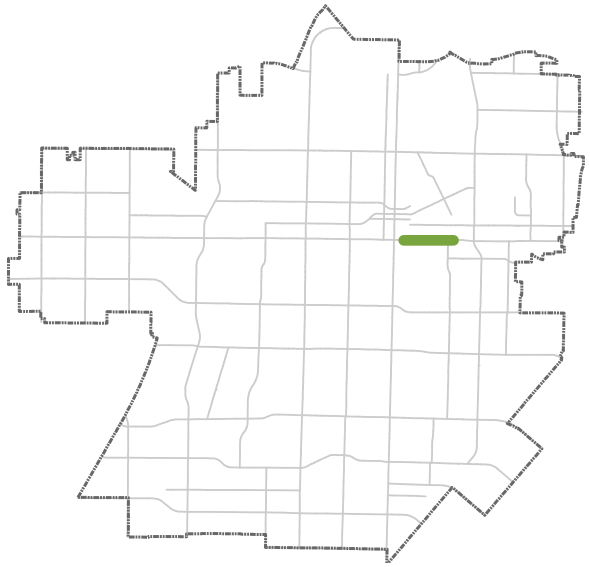
#9. 4th Street

Minter Street to Garfield Street

Existing Conditions and Recommendations

4th Street from Minter Street to Garfield Street is a one-third mile segment running west to east at the east edge of downtown Santa Ana. Land uses are primarily commercial retail and the Garfield Community Center on the north side. This segment has not had any recent fatalities or severe injuries, but due to roadway characteristics, the safe systems approach calls for improvements. A high quality pedestrian network of sidewalks and curb ramps are on both sides of the street but no bicycle facilities exist. High visibility crosswalks are missing. Figure 6-10 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero

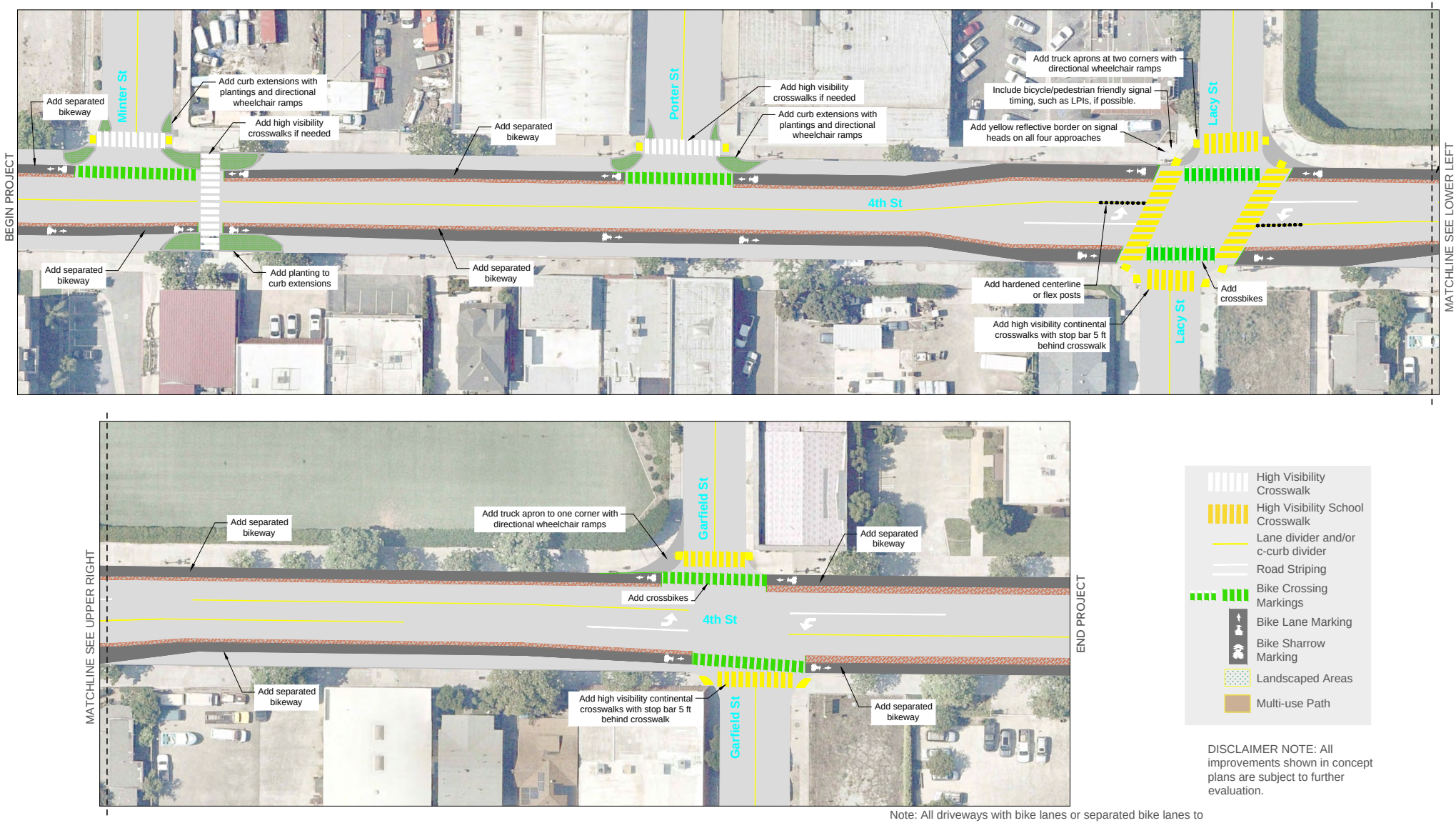
4th St from Minter St to Garfield St

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 3,725,088	$ 4,824,136
TOTAL RIGHT OF WAY COST		$ 240,000	$ 291,997
TOTAL CAPITAL OUTLAY COSTS		**$ 3,966,000**	**$ 5,117,000**
DESIGN	PA/ED (12.5%)	$ 500,000	$ 610,000
DESIGN	PS&E (17.5%)	$ 700,000	$ 860,000
DESIGN	RIGHT OF WAY (2%)	$ 80,000	$ 100,000
CM	CONSTRUCTION (19%)	$ 760,000	$ 930,000
TOTAL DELIVERY COST		**$ 2,040,000**	**$ 2,500,000**
TOTAL PROJECT COST		**$ 6,050,000**	**$ 7,650,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.



DISCLAIMER NOTE: All improvements shown in concept plans are subject to further evaluation.

Note: All driveways with bike lanes or separated bike lanes to receive driveway treatments in the form of 'continuous sidewalks' or rubber humps. See details page for more information.

ktua KTU+A 3916 Normal St San Diego, CA 92103		Conceptual Site Plan	4th St from Minter St to Garfield St	Scale: 1" = 50'-0"	
		January 2024	Santa Ana Vision Zero Plan		

Figure 6-10: 4th Street from Minter Street to Garfield Street Recommendations

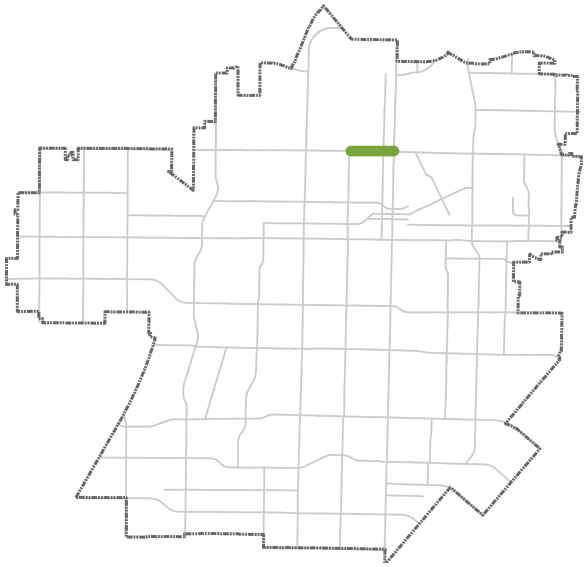
10. 17th Street

Ross Street to Broadway

Existing Conditions and Recommendations

17th Street from Ross Street to Broadway is a one-third mile segment running along the north edge of downtown Santa Ana. Land uses are primarily commercial retail and one apartment complex. As a primary route through the City, it supports high traffic volumes and has high collision rates with one fatality at the Ross Street intersection. Sidewalks, curb ramps, and bus stops are provided on both sides of the street but no bicycle facilities. High visibility crosswalks are missing. Figure 6-11 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero

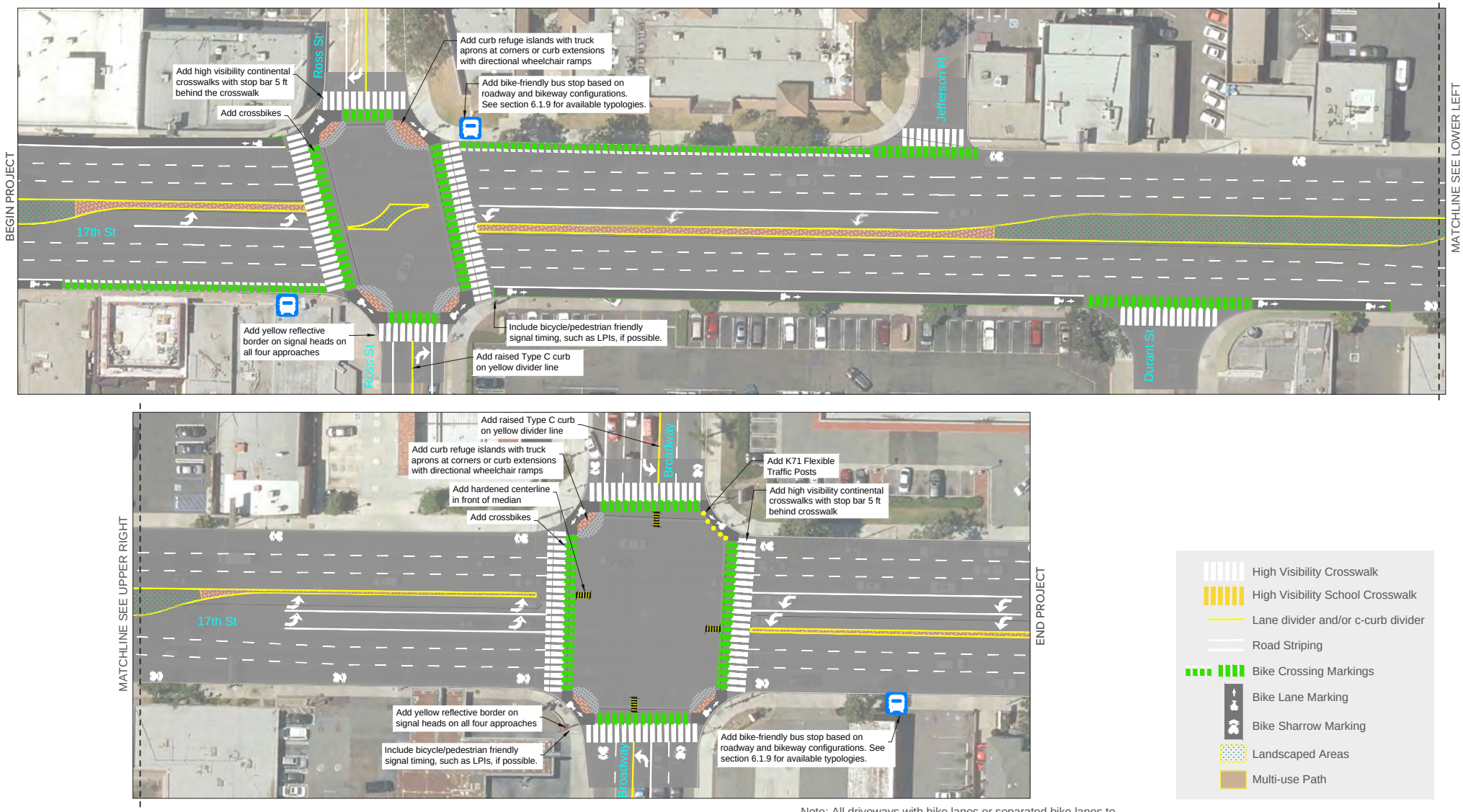
17th St from Ross St to Broadway

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 5,499,832	$ 6,959,050
TOTAL RIGHT OF WAY COST		$ 220,000	$ 267,664
TOTAL CAPITAL OUTLAY COSTS		$ 5,720,000	$ 7,227,000
DESIGN	PA/ED (12.5%)	$ 720,000	$ 880,000
DESIGN	PS&E (17.5%)	$ 1,010,000	$ 1,230,000
DESIGN	RIGHT OF WAY (2%)	$ 120,000	$ 150,000
CM	CONSTRUCTION (19%)	$ 1,090,000	$ 1,330,000
TOTAL DELIVERY COST		$ 2,940,000	$ 3,590,000
TOTAL PROJECT COST		$ 8,700,000	$ 10,850,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.



Note: All driveways with bike lanes or separated bike lanes to receive driveway treatments in the form of 'continuous sidewalks' or rubber humps. See details page for more information.

DISCLAIMER NOTE: All improvements shown in concept plants are subject to further evaluation.

KTU+A 3916 Normal St San Diego, CA 92103	City of Santa Ana 20 Civic Center Plaza Santa Ana, CA 92701	Conceptual Site Plan	**17th St from Ross St to Broadway**	Scale: 1" = 50'-0"	
		January 2024	**Santa Ana Vision Zero Plan**	DRAFT	

Figure 6-11: 17th Street from Ross Street to Broadway Recommendations

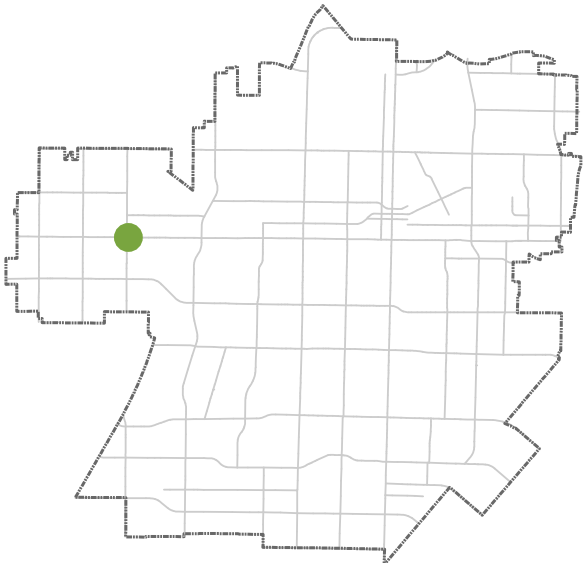
11. Harbor Boulevard and 1st Street

Intersection Project

Existing Conditions and Recommendations

Harbor Boulevard and 1st Street is a busy intersection in the upper west quarter of the City with commercial retail at all corners. Six vehicle lanes, not counting multiple turn lanes in each direction, are on each leg of the intersection. The significantly high traffic volume at this intersection results in a similarly high collision rate during the study period, with multiple severe injuries and one fatality two blocks east of this intersection where a raised median is not provided. Sidewalks, curb ramps, and bus stops are provided on both sides of the street. Bicycle facilities are provided going westbound on 1st Street and southbound on Harbor Boulevard. High visibility crosswalks are missing. Figure 6-12 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero

Harbor Blvd/1st St

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,532,310	$ 1,864,289
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		$ 1,573,000	$ 1,913,000
DESIGN	PA/ED (12.5%)	$ 200,000	$ 250,000
DESIGN	PS&E (17.5%)	$ 280,000	$ 350,000
DESIGN	RIGHT OF WAY (2%)	$ 40,000	$ 50,000
CM	CONSTRUCTION (19%)	$ 300,000	$ 370,000
TOTAL DELIVERY COST		$ 820,000	$ 1,020,000
TOTAL PROJECT COST		$ 2,400,000	$ 2,940,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana
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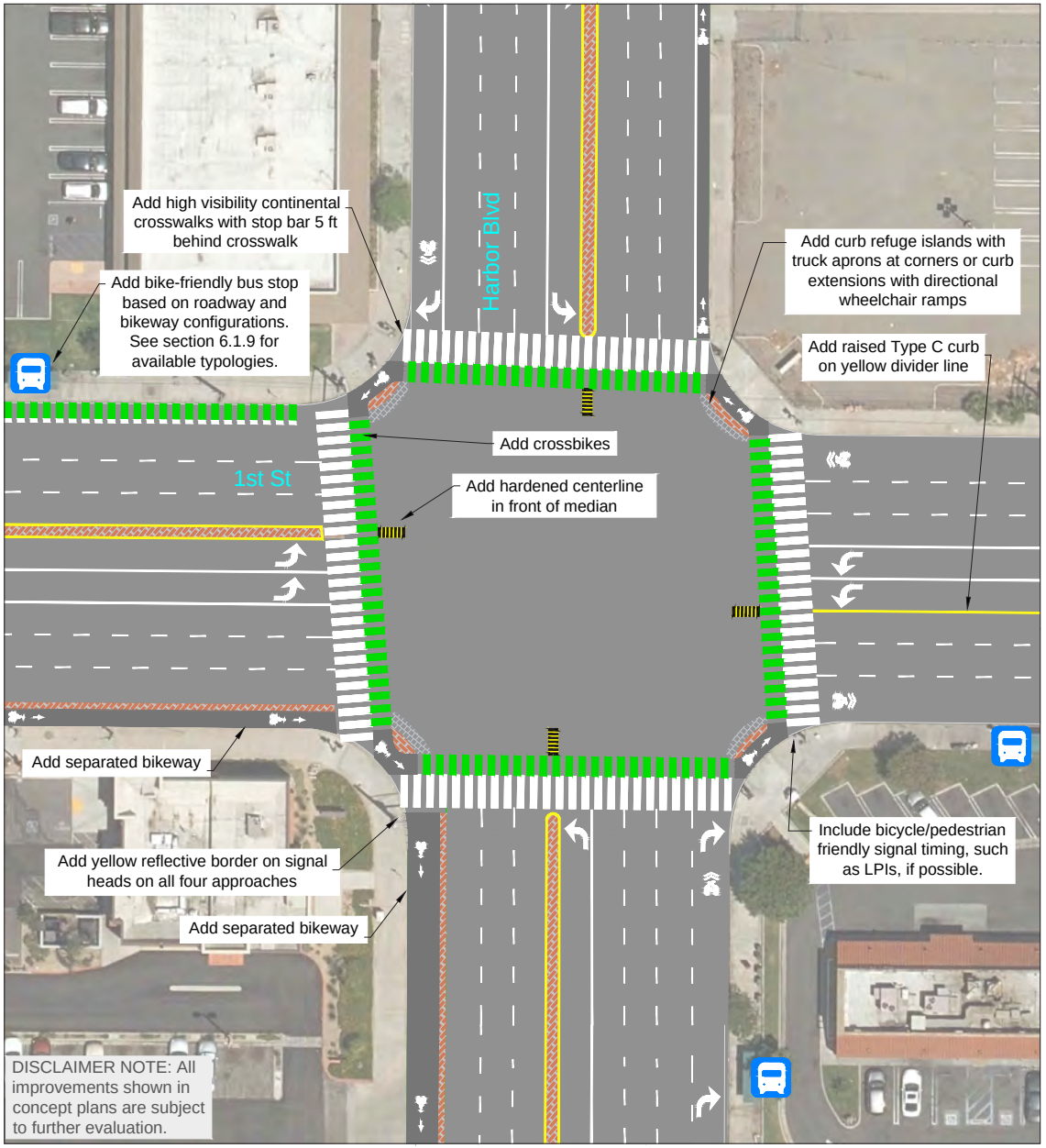


Figure 6-12: Harbor Boulevard and 1st Street Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of ‘continuous sidewalks’ or rubber humps. See details page for more information.

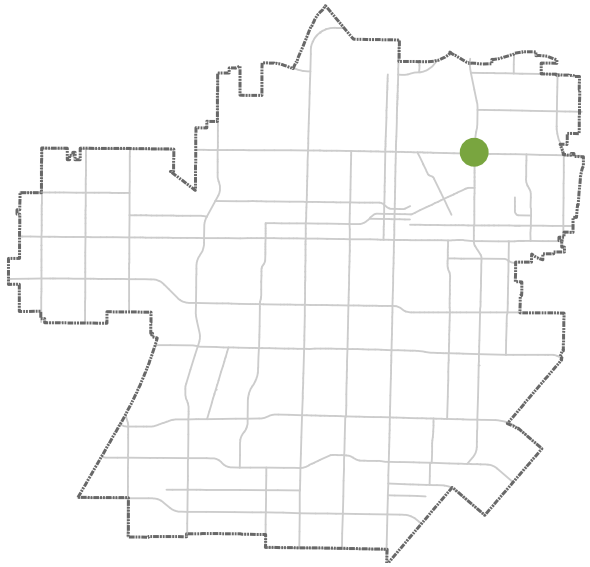
12. 17th Street and Grand Avenue

Intersection Project

Existing Conditions and Recommendations

17th Street and Grand Avenue is a busy intersection in the upper east quarter of the City with commercial retail at all corners. Five vehicle lanes, not counting multiple turn lanes in each direction, are on each leg of the intersection. Very high traffic volumes see similarly high collision rates during the study period, with multiple severe injuries near this intersection where raised medians are not provided. Sidewalks, curb ramps, and bus stops are provided on both sides of the street. No bicycle facilities are provided. Figure 6-13 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero

17th St and Grand Ave Intersection

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,383,045	$ 1,731,352
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		**$ 1,424,000**	**$ 1,781,000**
DESIGN	PA/ED (12.5%)	$ 180,000	$ 220,000
DESIGN	PS&E (17.5%)	$ 250,000	$ 310,000
DESIGN	RIGHT OF WAY (2%)	$ 30,000	$ 40,000
CM	CONSTRUCTION (19%)	$ 280,000	$ 350,000
TOTAL DELIVERY COST		**$ 740,000**	**$ 920,000**
TOTAL PROJECT COST		**$ 2,170,000**	**$ 2,710,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

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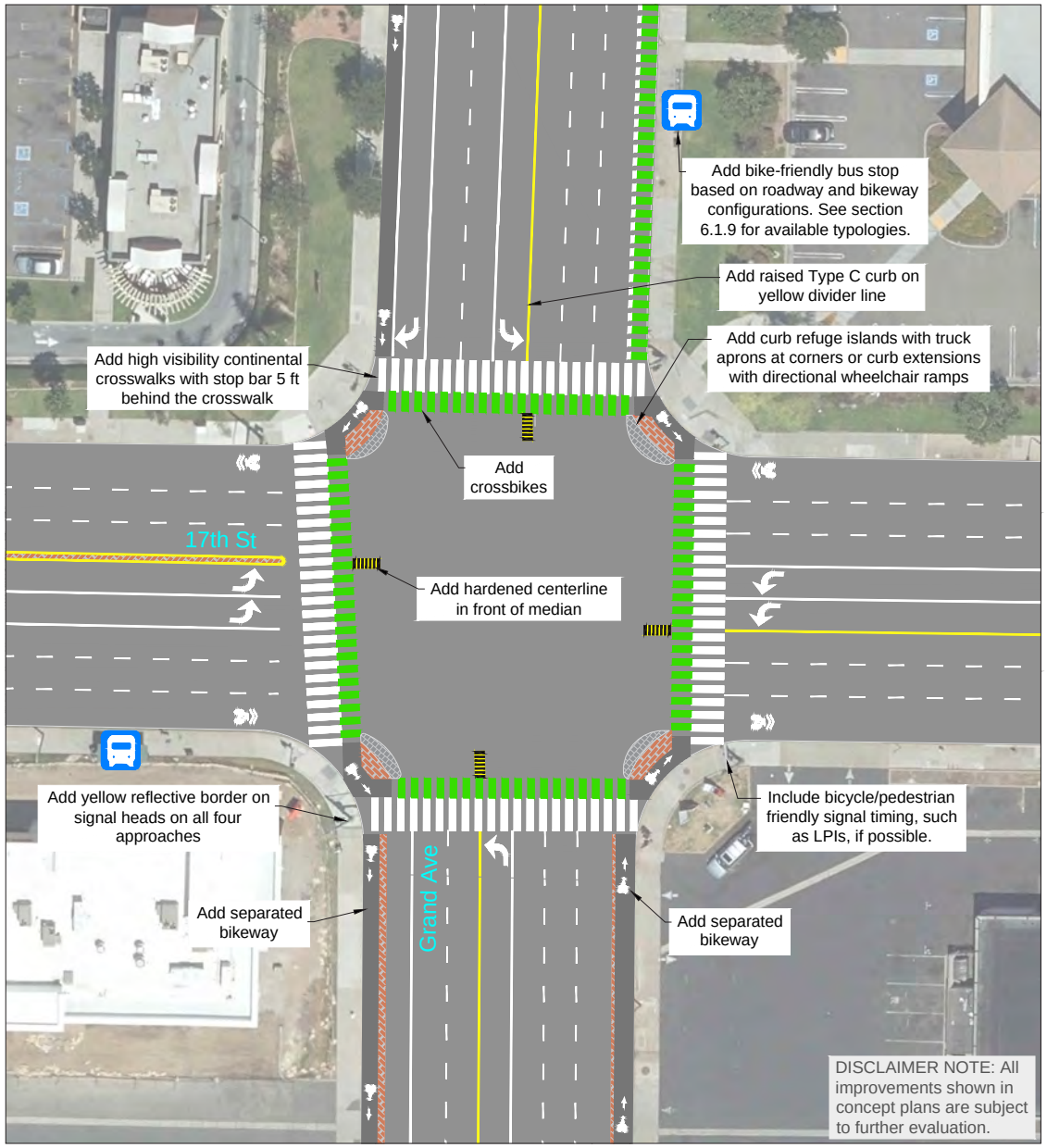


Figure 6-13: 17th Street and Grand Avenue Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of 'continuous sidewalks' or rubber humps. See details page for more information.

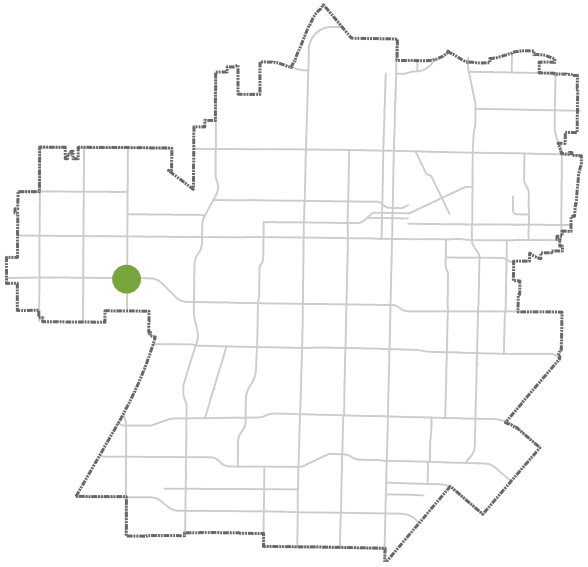
13. Harbor Boulevard and McFadden Avenue

Intersection Project

Existing Conditions and Recommendations

Harbor Boulevard and McFadden Avenue is another busy intersection in the upper east quarter of the City with commercial retail at all corners. Not counting multiple turn lanes, there are six north-south vehicle lanes, and four west-east through lanes. Significantly high traffic volumes and collision rates have resulted in two fatalities and one severe injury during the study period. Raised medians are provided on three legs of the intersection. Sidewalks, curb ramps, and bus stops are provided on both sides of the street. Bicycle facilities are provided on three legs of the intersection but the east leg of McFadden Avenue has no bike facilities. Figure 6-14 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero

Harbor Blvd/McFadden Ave

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,567,485	$ 1,907,085
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		$ 1,608,000	$ 1,956,000
DESIGN	PA/ED (12.5%)	$ 210,000	$ 260,000
DESIGN	PS&E (17.5%)	$ 290,000	$ 360,000
DESIGN	RIGHT OF WAY (2%)	$ 40,000	$ 50,000
CM	CONSTRUCTION (19%)	$ 310,000	$ 380,000
TOTAL DELIVERY COST		$ 850,000	$ 1,050,000
TOTAL PROJECT COST		$ 2,460,000	$ 3,010,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

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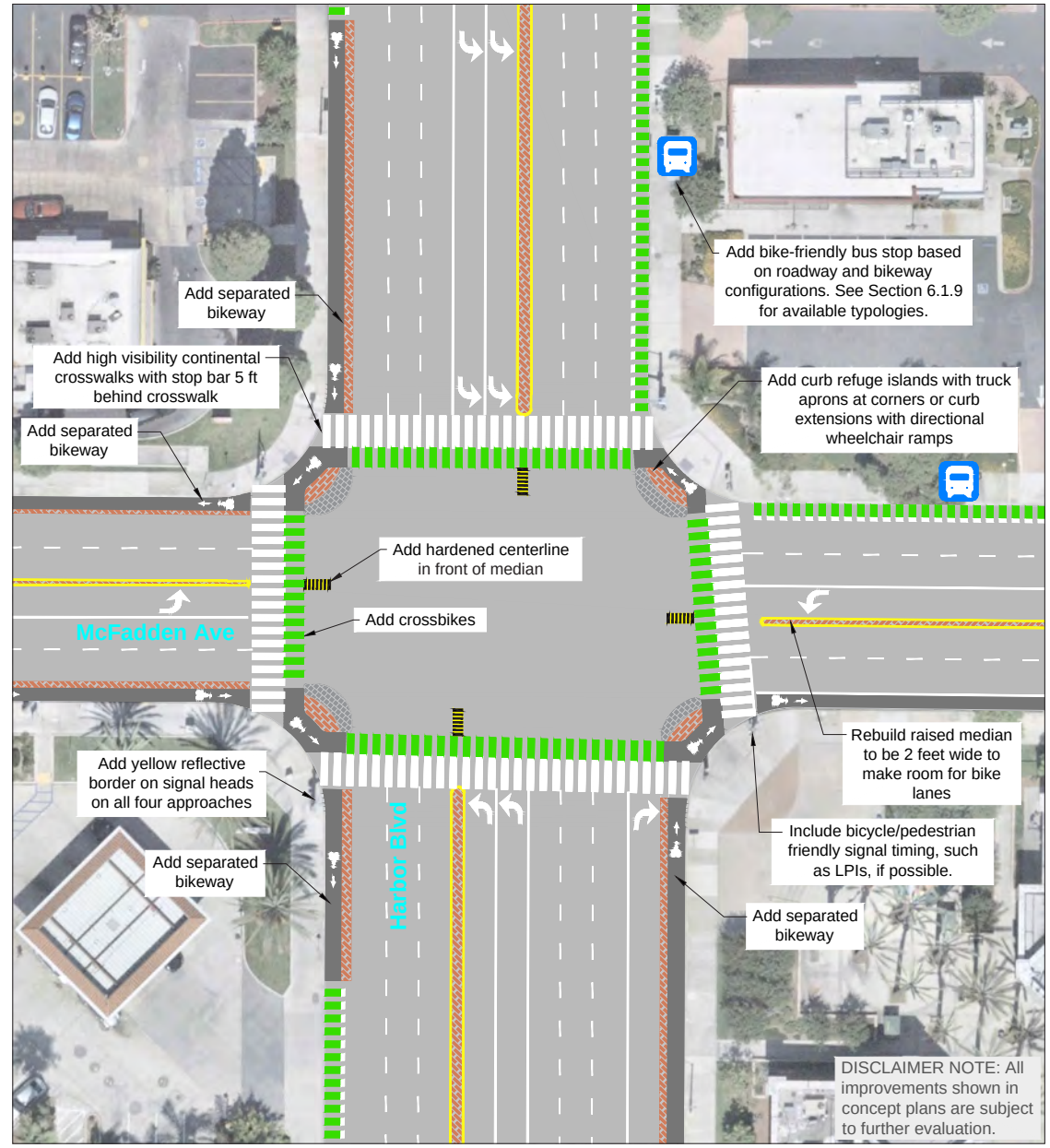


ktua KTU+A 3916 Normal St San Diego, CA 92103	Conceptual Site Plan	**McFadden Ave and Harbor Blvd**	**Scale: 1" = 40'-0"**
	January 2024	**Santa Ana Vision Zero Plan**	

Figure 6-14: Harbor Boulevard and McFadden Avenue Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of ‘continuous sidewalks’ or rubber humps. See details page for more information.

14. 1st Street and Flower Street

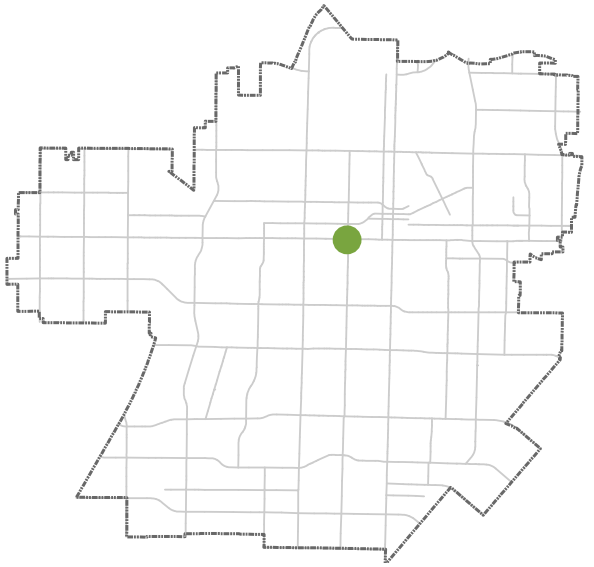
Intersection Project

Existing Conditions and Recommendations

1st Street and Flower Street is a busy intersection near the center of the City at the southwest corner of downtown Santa Ana. Tennis courts that are part of the Santa Ana High School are at the southeast corner of the intersection. Multifamily and commercial retail occupy the other three corners. There are a total of six westbound and eastbound vehicle lanes, not counting multiple turn lanes. Northbound and southbound lanes total four plus dedicated turn lanes. High traffic volumes and collision rates have resulted in two severe injuries during the study period. Raised medians are provided on three legs of the intersection. Sidewalks, curb ramps, and bus stops are provided on both sides of the street. Bicycle facilities are provided on all legs of the intersection class II bike lane markings without buffers. Figure 6-15 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.

Serious Injuries and Fatalities between 2017-2021



Project Location

Santa Ana Vision Zero

1st St and Flower St Intersection

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,239,165	$ 1,556,300
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		$ 1,280,000	$ 1,605,000
DESIGN	PA/ED (12.5%)	$ 160,000	$ 200,000
DESIGN	PS&E (17.5%)	$ 230,000	$ 280,000
DESIGN	RIGHT OF WAY (2%)	$ 30,000	$ 40,000
CM	CONSTRUCTION (19%)	$ 250,000	$ 310,000
TOTAL DELIVERY COST		$ 670,000	$ 830,000
TOTAL PROJECT COST		$ 1,950,000	$ 2,440,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

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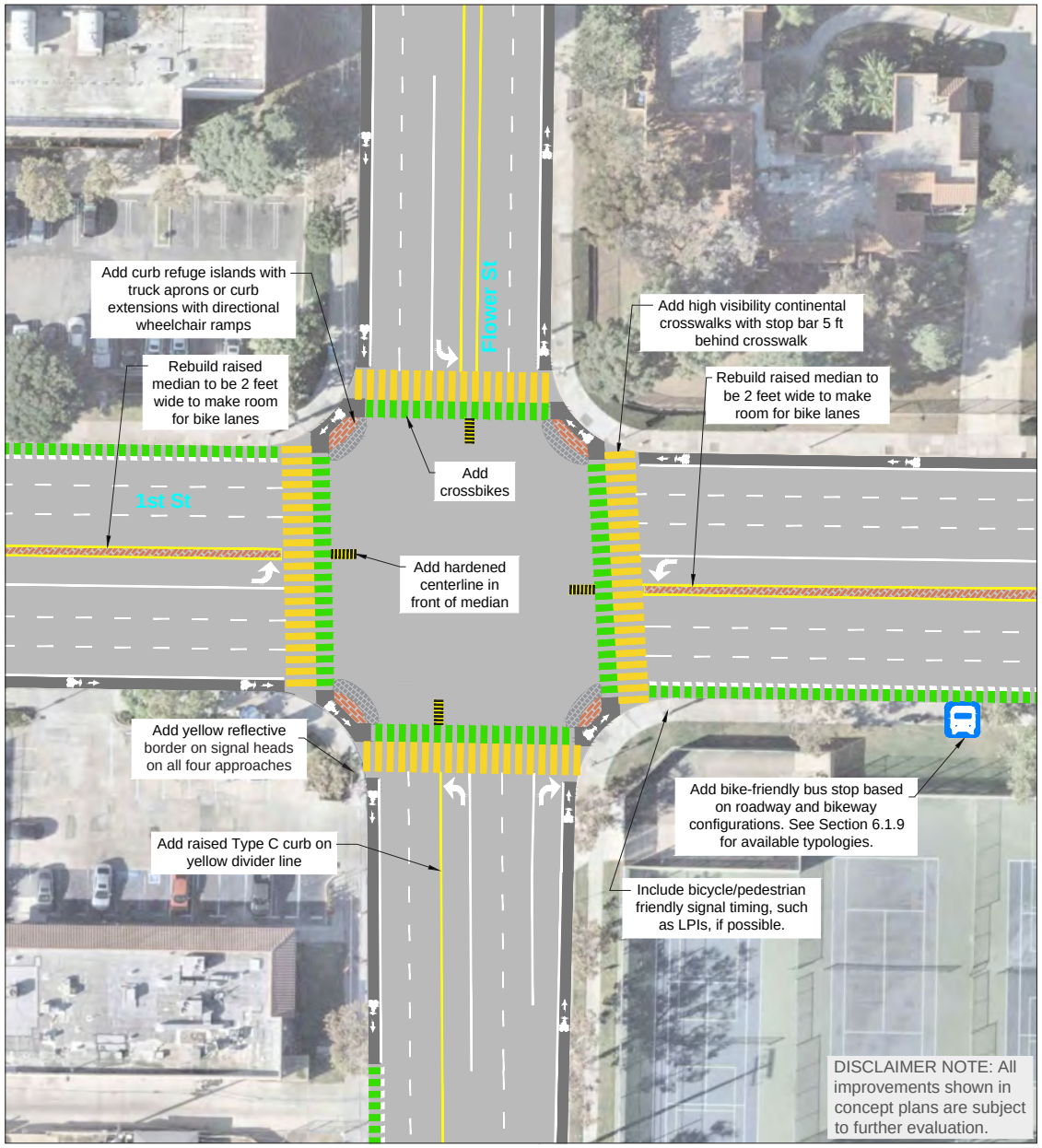


Figure 6-15: 1st Street and Flower Street Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of ‘continuous sidewalks’ or rubber humps. See details page for more information.

15. Edinger Avenue and Maple Street

Intersection Project

Existing Conditions and Recommendations

Edinger Avenue and Maple Street is a unique offset intersection, near the middle of the southeast quarter of the City, with Maple Street northbound centerline shifted west 150 feet relative to the southbound side of Maple Street. Another unique feature of the intersection is a dedicated multi-use path that runs adjacent to the southbound leg of Maple Street then runs north along a power line easement between single family residential backyards. Land uses are limited to single family residential. There are a total of five westbound and eastbound vehicle lanes. North and southbound lanes on Maple are small residential streets with limited local traffic. High traffic volumes occur on the westbound and eastbound legs. Collision rates are not high, but during the study period one severe injury has occurred at the pedestrian crossing. A raised center median with multi-use path and traffic signal is provided for people walking and bicycling across Edinger Ave. Sidewalks, curb ramps, and bus stops are provided on both sides of the street. No bicycle facilities are provided on the westbound and eastbound legs on Edinger. Figure 6-16 shows recommended improvements that could be extended farther along the route.

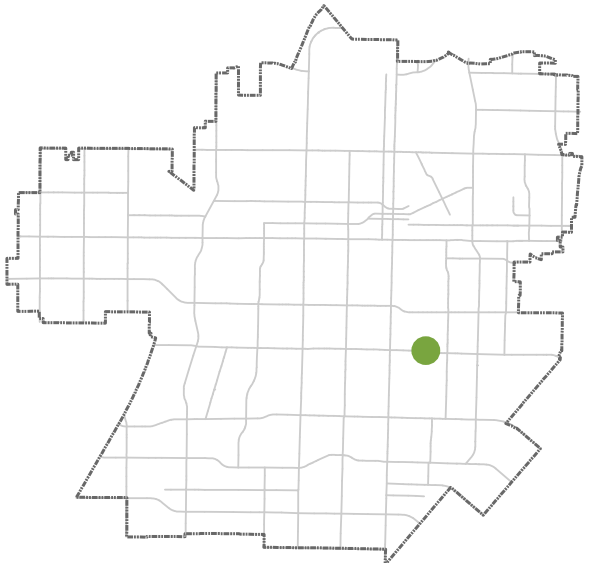
See Appendix D for a detailed breakdown of all cost estimates.

0 Pedestrian

0 Bicycle

1 Vehicle

Serious Injuries and Fatalities between 2017-2021



Project Location

Santa Ana Vision Zero
Edinger Ave/Maple St
(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,011,630	$ 1,230,803
TOTAL RIGHT OF WAY COST		$ 50,000	$ 60,833
TOTAL CAPITAL OUTLAY COSTS		$ 1,062,000	$ 1,292,000
DESIGN	PA/ED (12.5%)	$ 140,000	$ 180,000
DESIGN	PS&E (17.5%)	$ 190,000	$ 240,000
DESIGN	RIGHT OF WAY (2%)	$ 30,000	$ 40,000
CM	CONSTRUCTION (19%)	$ 210,000	$ 260,000
TOTAL DELIVERY COST		$ 570,000	$ 720,000
TOTAL PROJECT COST		$ 1,640,000	$ 2,020,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana
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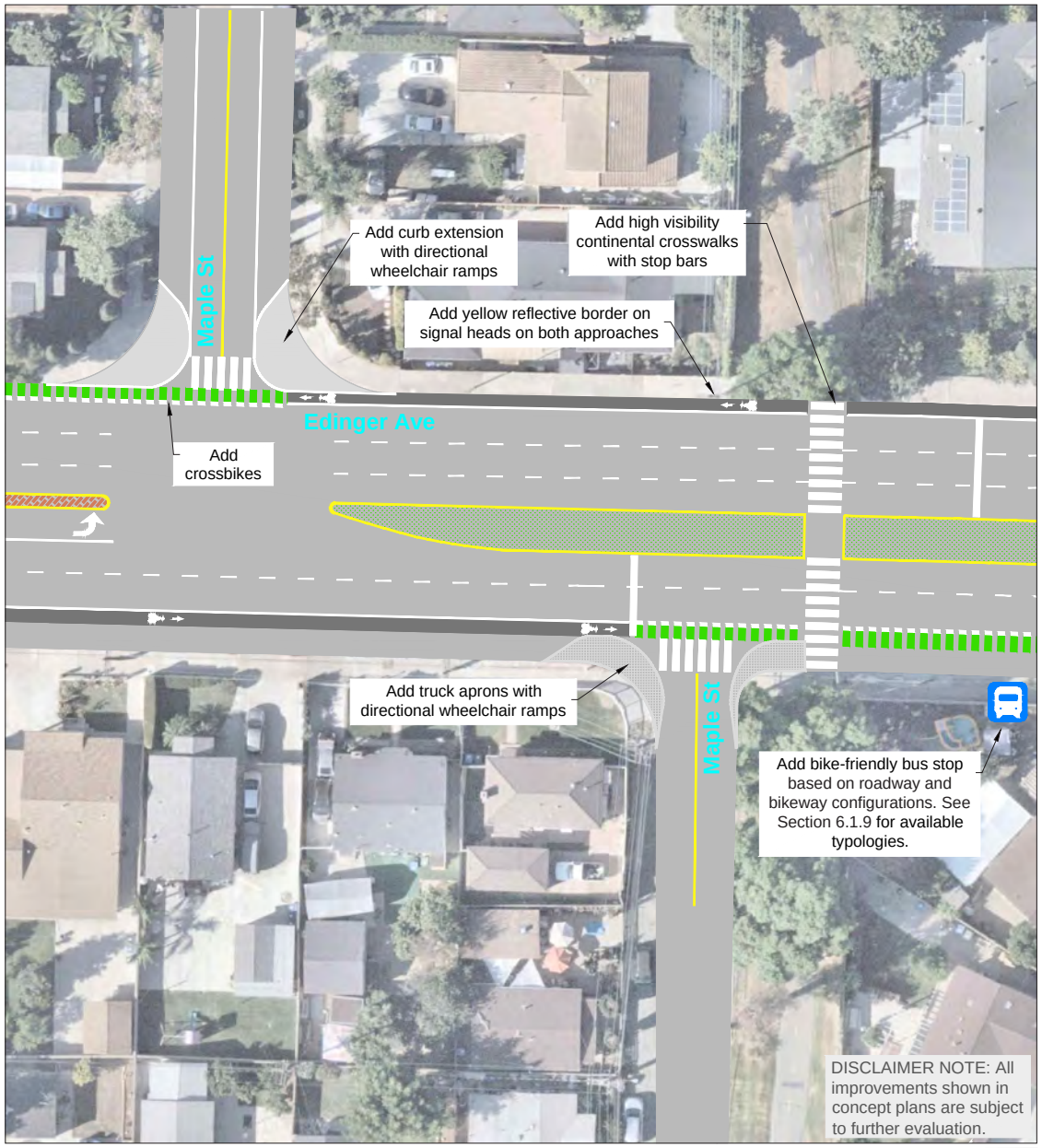


Figure 6-16: Edinger Avenue and Maple Street Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of 'continuous sidewalks' or rubber humps. See details page for more information.

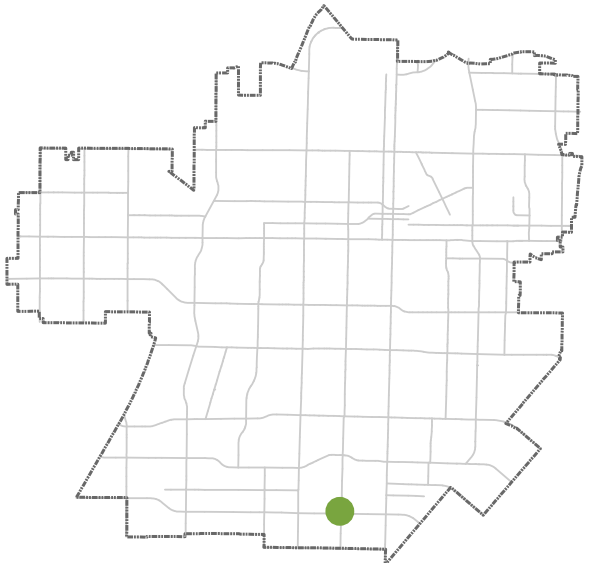
16. MacArthur Boulevard and Flower Street

Intersection Project

Existing Conditions and Recommendations

Flower Street and Macarthur Boulevard is a busy intersection at the southeast corner of the City with single family residential at all corners. Not counting turn lanes, there are six west-east vehicle lanes, and five north-south through lanes. High traffic volumes has resulted in a moderate level of collision rates and no recent fatalities or severe injuries. Raised medians are provided on the busiest westbound and eastbound legs of the intersection on MacArthur Boulevard. Sidewalks, curb ramps, and bus stops are provided on both sides of the street. No bicycle facilities are provided on the vehicle travel lane. However, there is a multi-use path running north-south along Flower Street and the channelized storm drain that starts north of the intersection. Figure 6-17 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero
Flower St/MacArthur Blvd
(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,372,355	$ 1,669,680
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		$ 1,413,000	$ 1,719,000
DESIGN	PA/ED (12.5%)	$ 180,000	$ 220,000
DESIGN	PS&E (17.5%)	$ 250,000	$ 310,000
DESIGN	RIGHT OF WAY (2%)	$ 30,000	$ 40,000
CM	CONSTRUCTION (19%)	$ 270,000	$ 330,000
TOTAL DELIVERY COST		$ 730,000	$ 900,000
TOTAL PROJECT COST		$ 2,150,000	$ 2,620,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana
VISION ZERO

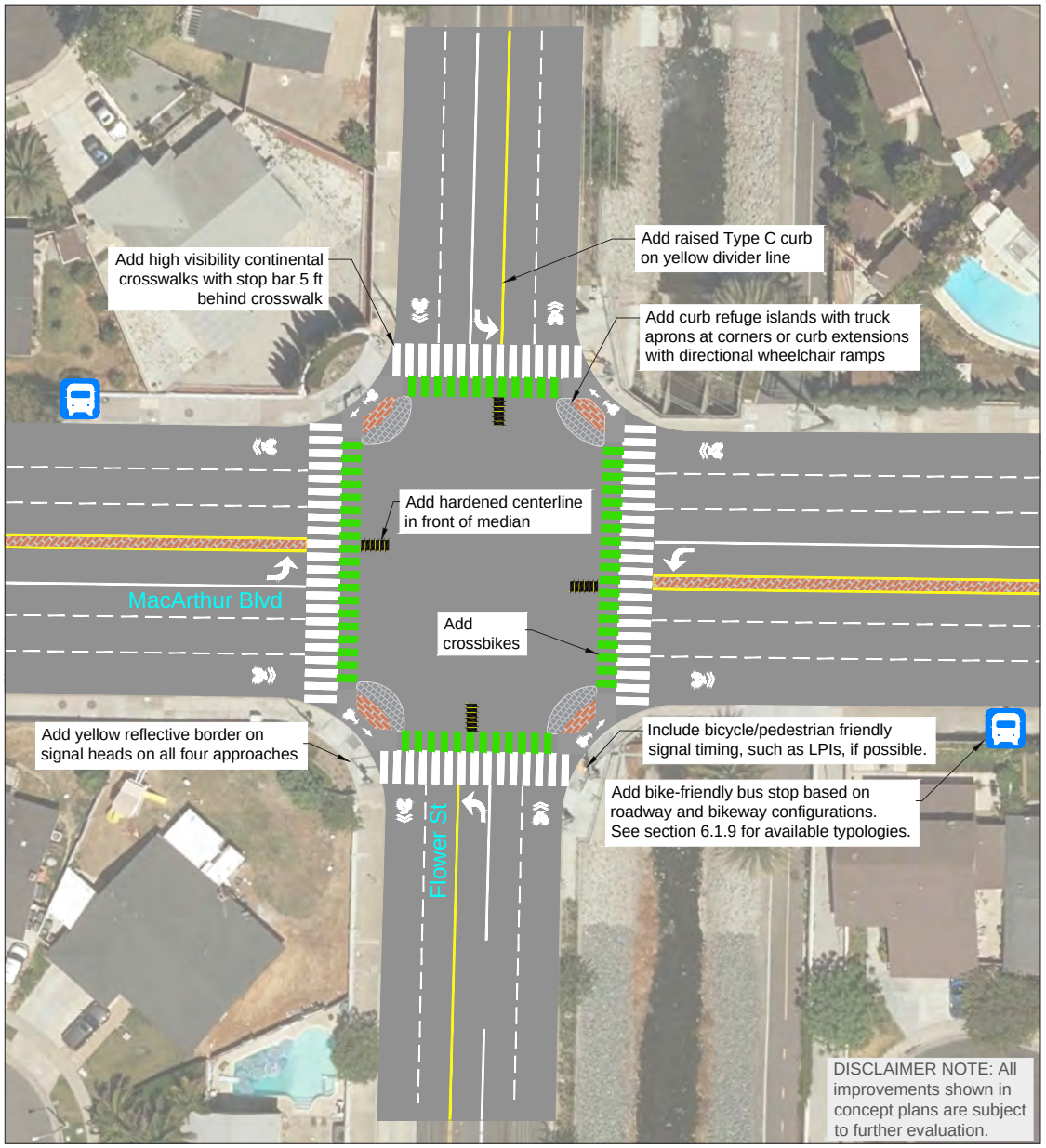


Figure 6-17: MacArthur Boulevard and Flower Street Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of ‘continuous sidewalks’ or rubber humps. See details page for more information.

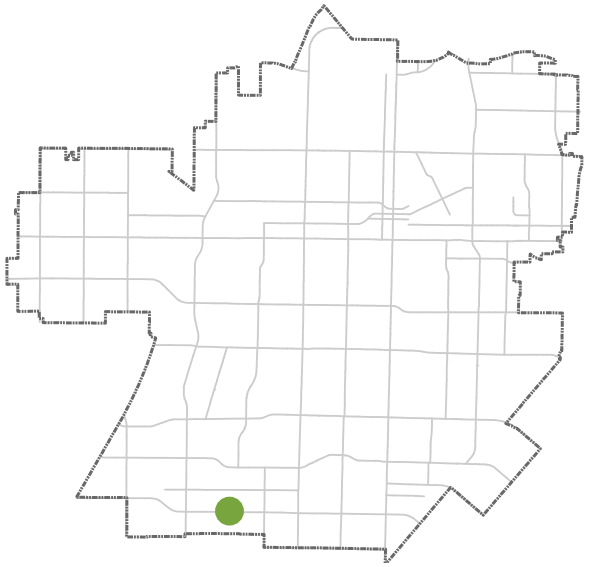
17. MacArthur Boulevard and Raitt Street

Intersection Project

Existing Conditions and Recommendations

Macarthur Boulevard and Raitt Street is a busy intersection at the southern edge of the City. The northbound and southbound legs of the intersection have single through lanes and less traffic than east-west legs. Segerstrom High School and Greenville Fundamental School occupy the west corners of the intersection. Single family residential is on both east side corners. Not counting turn lanes, there are six west-east vehicle lanes. Collision rates are low with no fatalities or severe injuries during the study period. Raised medians are provided on the busiest westbound and eastbound legs of the intersection on MacArthur Boulevard and the southbound leg on Raitt Street. Sidewalks, curb ramps, and bus stops are provided on MacArthur Boulevard. No bicycle facilities are provided. Figure 6-18 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero
MacArthur Blvd/Raitt St
(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,480,500	$ 1,801,255
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		$ 1,521,000	$ 1,850,000
DESIGN	PA/ED (12.5%)	$ 200,000	$ 250,000
DESIGN	PS&E (17.5%)	$ 270,000	$ 330,000
DESIGN	RIGHT OF WAY (2%)	$ 40,000	$ 50,000
CM	CONSTRUCTION (19%)	$ 290,000	$ 360,000
TOTAL DELIVERY COST		$ 800,000	$ 990,000
TOTAL PROJECT COST		$ 2,330,000	$ 2,840,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana
VISION ZERO

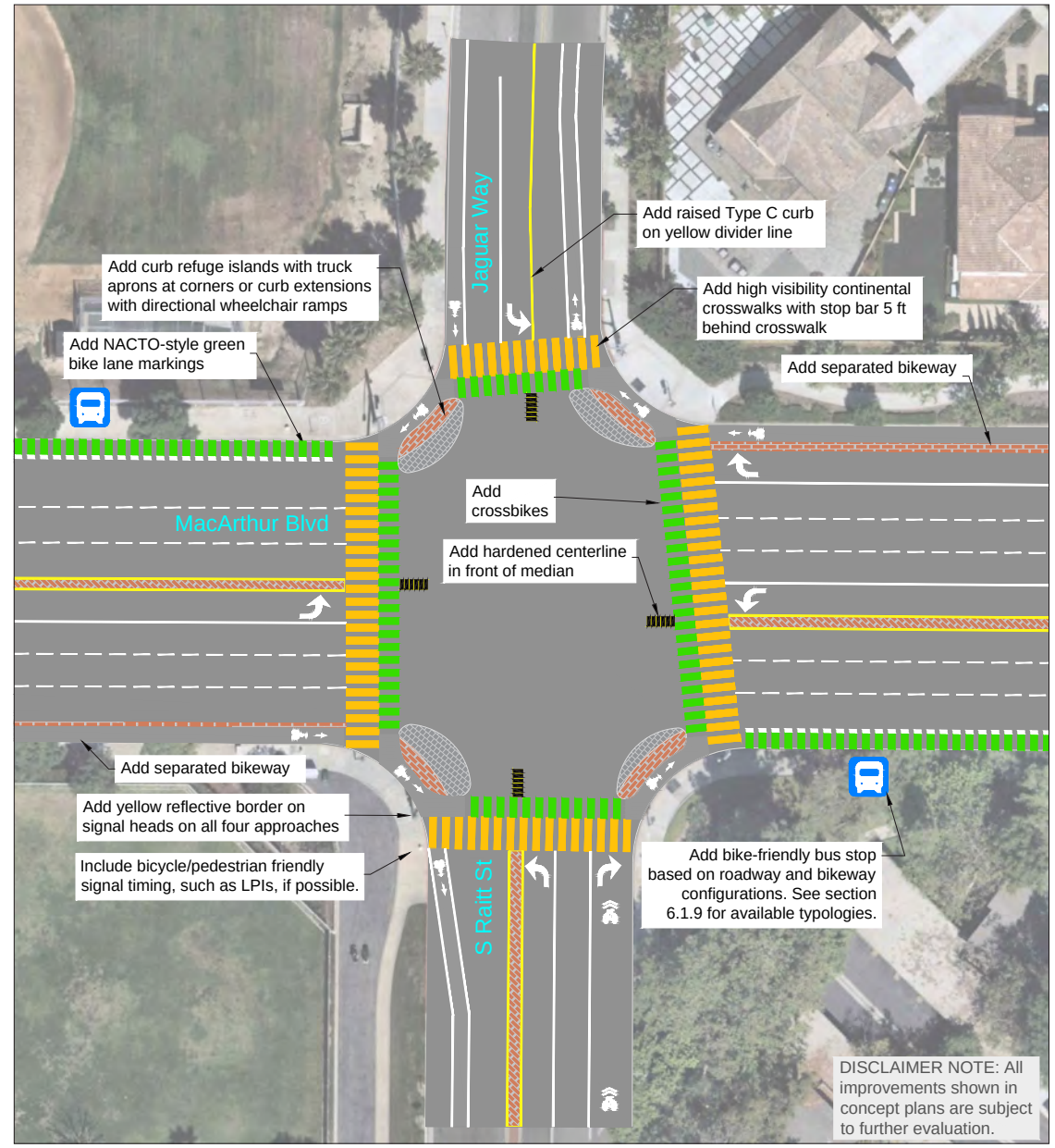


Figure 6-18: MacArthur Boulevard and Raitt Street Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of 'continuous sidewalks' or rubber humps. See details page for more information.

18. Dyer Road and Flower Street

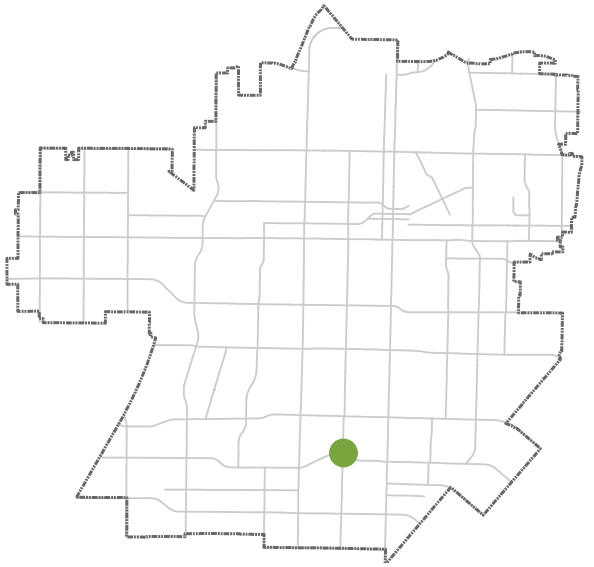
Intersection Project

Existing Conditions and Recommendations

Dyer Road/Segerstrom Avenue and Flower Street is a busy intersection, in the southeast quarter of the City. Land uses include Saddleback High School at the southwest corner, industrial and a railroad line on both east corners. Single family residential occupies the northwest corner of the intersection. Four vehicle lanes, not counting turn lanes, are on all legs of the intersection. Collision rates are moderately high around the intersection, but there were no fatalities or severe injuries during the study period. However, due to roadway characteristics, the safe systems approach calls for improvements. Raised center median exists on the westbound and eastbound lanes on Segerstrom/Dyer. Sidewalks, curb ramps, and bus stops are provided on both sides of the street. No bicycle facilities are provided on the westbound and eastbound legs. However a multi-use path runs north-south on the east side of Flower Street for bicyclists. Figure 6-19 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.

Serious Injuries and Fatalities between 2017-2021



Project Location

Santa Ana Vision Zero
Dyer Rd/Flower St
(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,260,345	$ 1,533,402
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		**$ 1,301,000**	**$ 1,583,000**
DESIGN	PA/ED (12.5%)	$ 170,000	$ 210,000
DESIGN	PS&E (17.5%)	$ 230,000	$ 280,000
DESIGN	RIGHT OF WAY (2%)	$ 30,000	$ 40,000
CM	CONSTRUCTION (19%)	$ 250,000	$ 310,000
TOTAL DELIVERY COST		**$ 680,000**	**$ 840,000**
TOTAL PROJECT COST		**$ 1,990,000**	**$ 2,430,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana
VISION ZERO

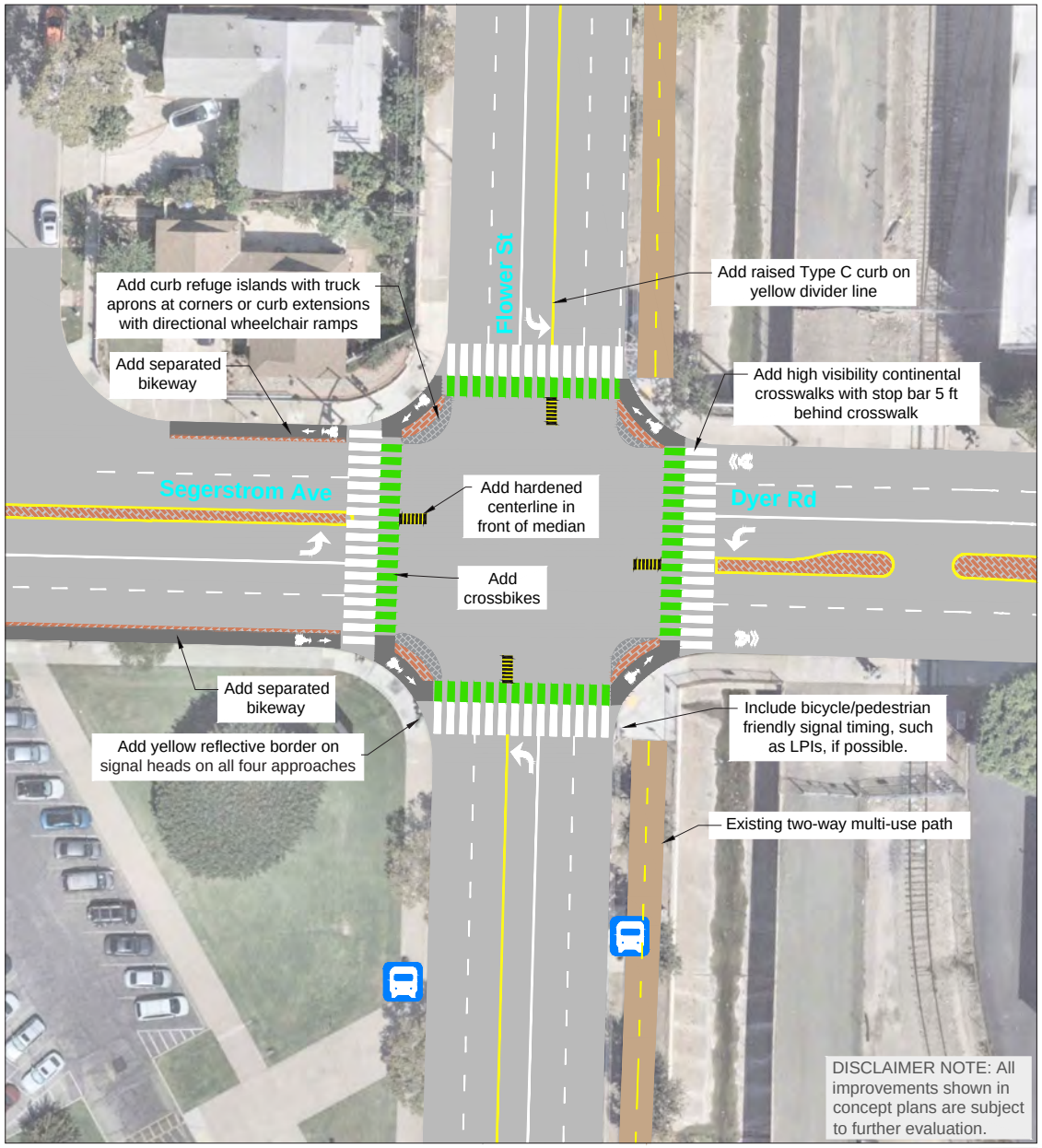


Figure 6-19: Dyer Road and Flower Street Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of ‘continuous sidewalks’ or rubber humps. See details page for more information.

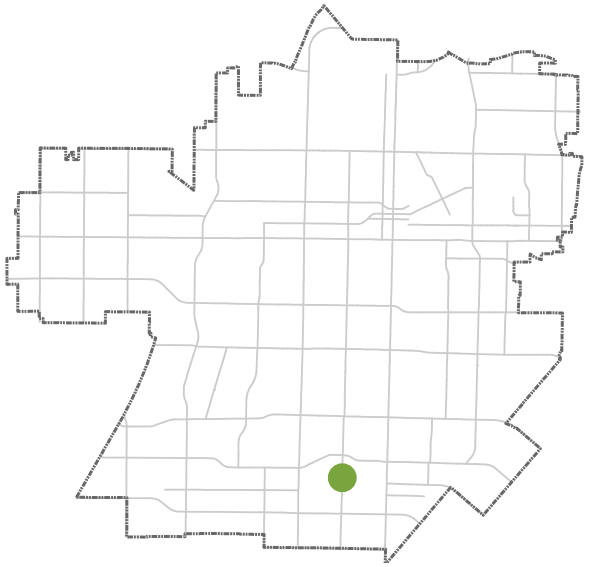
19. Flower Street and Alton Avenue

Intersection Project

Existing Conditions and Recommendations

Flower Street and Alton Avenue is a moderately busy intersection at the southeast quarter of the City with single family residential at both west side corners. MacArthur Fundamental Intermediate School is on the southeast corner and a church is on the northeast corner. Not counting turn lanes, there are four north-south vehicle lanes, but only two west-east through lanes. Moderate traffic volumes has resulted in relatively low collision rates with no fatalities or severe injuries during the study period. Sidewalks, curb ramps, and bus stops are provided on both sides of the street. No bicycle facilities are provided on the vehicle travel lane. However, there is a multi-use path running north-south along Flower Street and the channelized storm drain that starts north of the intersection. Figure 6-20 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.



Project Location

Serious Injuries and Fatalities between 2017-2021

Santa Ana Vision Zero
Flower St/Alton Ave
(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,295,910	$ 1,576,673
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		$ 1,336,000	$ 1,626,000
DESIGN	PA/ED (12.5%)	$ 170,000	$ 210,000
DESIGN	PS&E (17.5%)	$ 240,000	$ 300,000
DESIGN	RIGHT OF WAY (2%)	$ 30,000	$ 40,000
CM	CONSTRUCTION (19%)	$ 260,000	$ 320,000
TOTAL DELIVERY COST		$ 700,000	$ 870,000
TOTAL PROJECT COST		$ 2,040,000	$ 2,500,000

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana
VISION ZERO

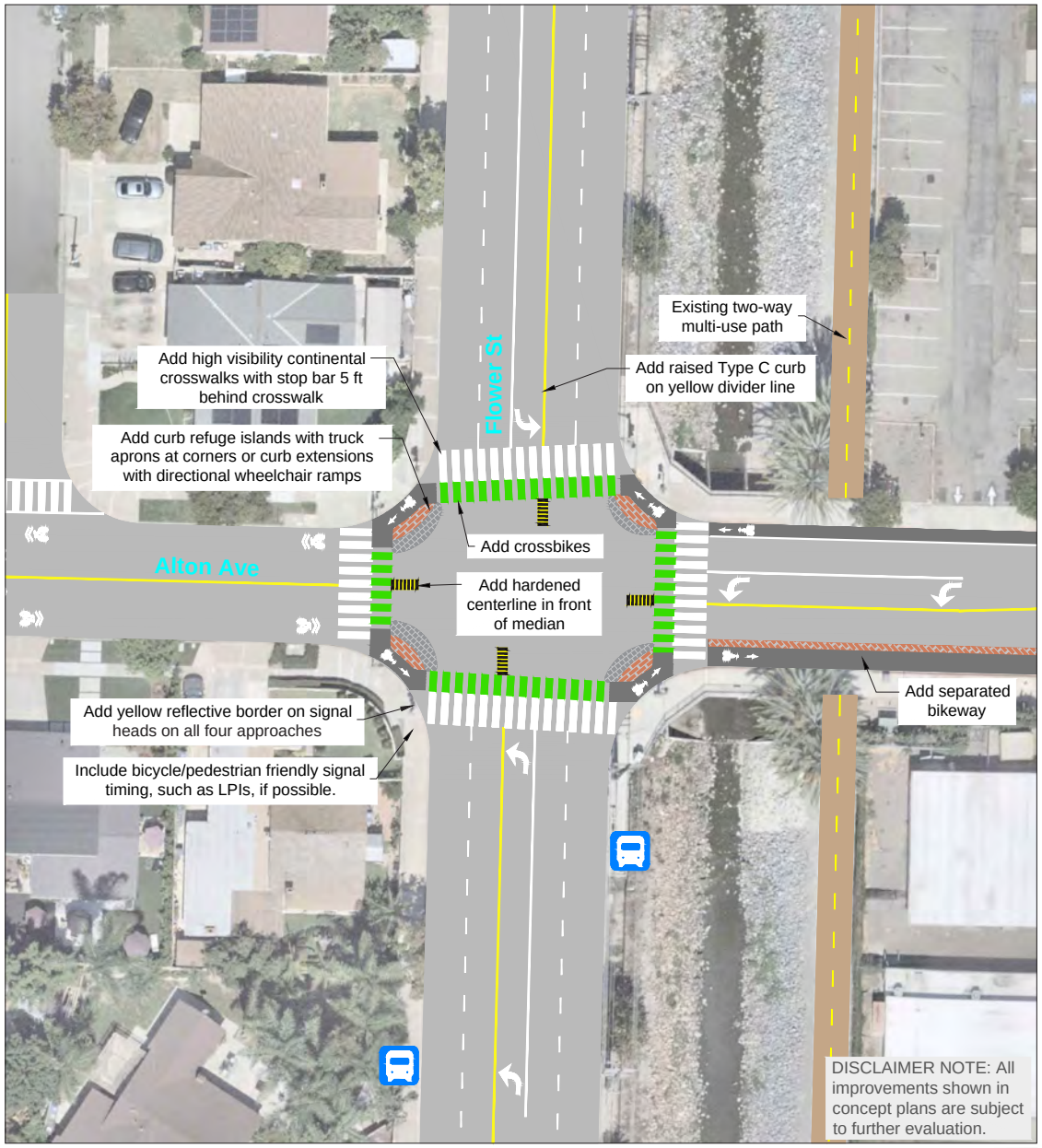


Figure 6-20: Flower Street and Alton Avenue Recommendations

Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of 'continuous sidewalks' or rubber humps. See details page for more information.

20. Segerstrom Avenue and Bear Street

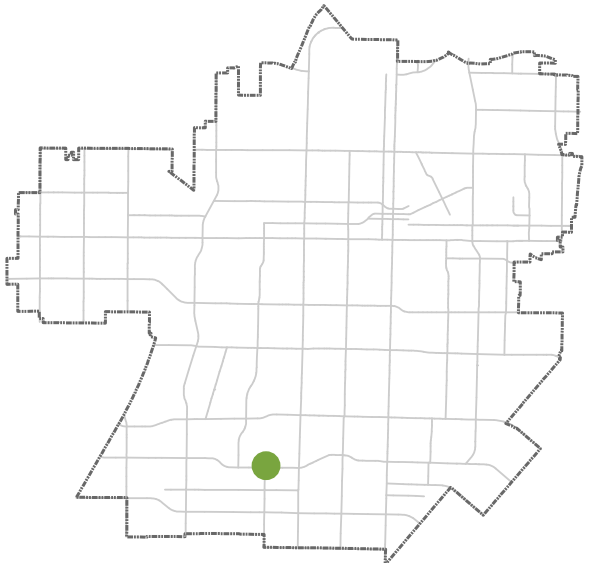
Intersection Project

Existing Conditions and Recommendations

Segerstrom Avenue and Bear Street is a three-way intersection in the southwest quarter of the City with Carl Thornton Park and McFadden Institute of Technology occupying the north side of the intersection and no through road. Both south side corners have single family residential uses. Bear Street extends south from the intersection with three through lanes; not counting turn lanes. Westbound and eastbound lanes total four without counting turn lanes. Raised medians are provided on all three legs of the intersection. Traffic levels are relatively low along with lower collision rates without fatalities or severe injuries during the study period. No bicycle facilities are provided on the vehicle travel lanes. However, there is a multi-use path running north-south along Bear Street and extending north of the intersection into Carl Thornton Park. Figure 6-21 shows recommended improvements that could be extended farther along the route.

See Appendix D for a detailed breakdown of all cost estimates.

Serious Injuries and Fatalities between 2017-2021



Project Location

Santa Ana Vision Zero

Segerstrom Ave/Bear St

(Feasibility Opinion of Probable Cost)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)**
TOTAL CONSTRUCTION COST		$ 1,102,185	$ 1,340,977
TOTAL RIGHT OF WAY COST		$ 40,000	$ 48,666
TOTAL CAPITAL OUTLAY COSTS		**$ 1,143,000**	**$ 1,390,000**
DESIGN	PA/ED (12.5%)	$ 150,000	$ 190,000
DESIGN	PS&E (17.5%)	$ 210,000	$ 260,000
DESIGN	RIGHT OF WAY (2%)	$ 30,000	$ 40,000
CM	CONSTRUCTION (19%)	$ 220,000	$ 270,000
TOTAL DELIVERY COST		**$ 610,000**	**$ 760,000**
TOTAL PROJECT COST		**$ 1,760,000**	**$ 2,150,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana
VISION ZERO

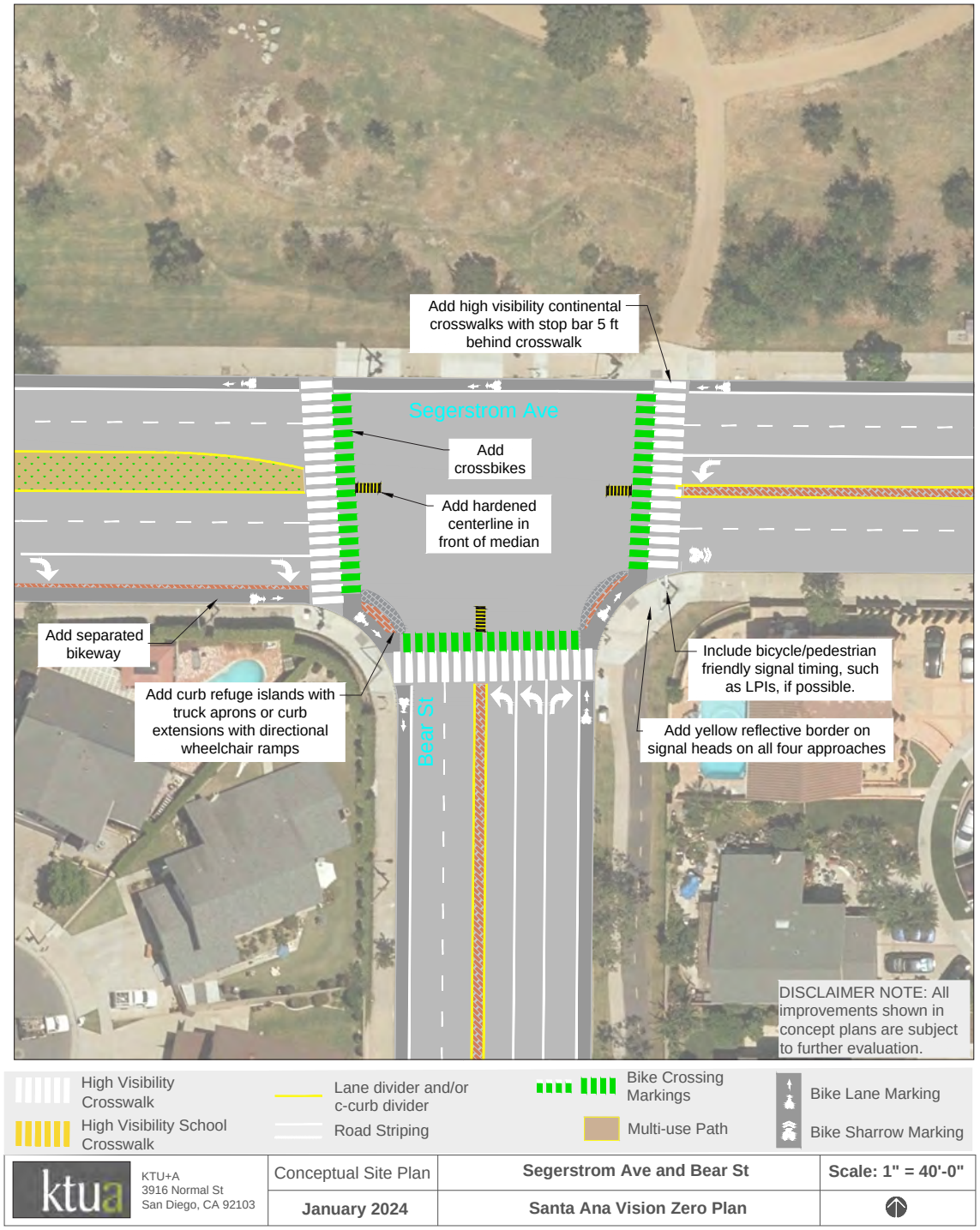


Figure 6-21: Segerstrom Avenue and Bear Street Recommendations

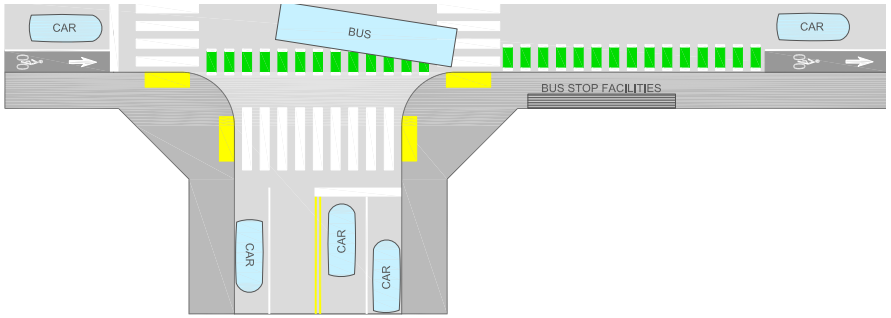
Note: All driveways with bike lanes or separated bikeways to receive driveway treatments in the form of ‘continuous sidewalks’ or rubber humps. See details page for more information.

6.5 Typical Design Details

Bike-Friendly Bus Stop Configurations

Typology #1: Shared Facility (Standard Bus Stop)

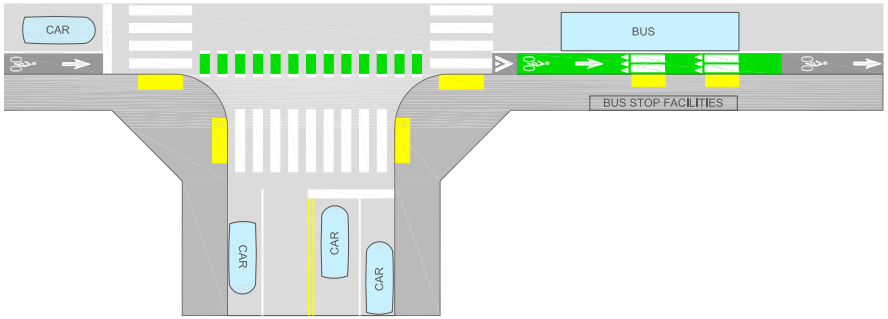
This shows the most common type of bike facility at a bus stop, where buses and people biking share space at a bus stop. It is where a Class II bicycle facility exists between the curb and a general traffic lane, or in some cases there is just a shared lane marking ("Sharrow") on the roadway. The shared bus-bike area is illustrated with green dashed conflict striping instead of solid green markings. The bus will encroach into the shared zone to board and alight passengers. Some places, like in Montreal, Canada, there are two sets of sharrows, allowing bicyclists to either continue straight through the conflict zone or go left around a stopped bus. This is typically used when there is limited right of way available and if the preferred treatment is a bike lane or a shared lane.



Typology #1: Shared Facility (Standard Bus Stop)

Typology #2: Constrained Facility

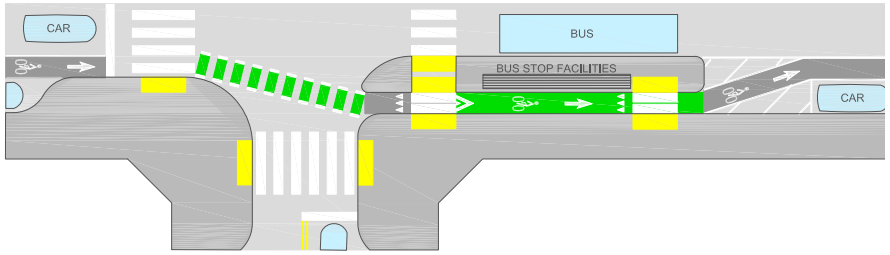
Where either a Class II bicycle lane or a Class IV separated bikeway exists, and there is not sufficient space to include a floating bus island (FBI). It is a constrained bus stop adjacent to a bike lane or separated bike lane where the bike lane is elevated to sidewalk height at the FBI. The bike lane is crossed by people walking to access the bus, and it does not have parallel parking on the street. The raised area reduces conflict with vehicle traffic, and there is a bicycle ramp to elevate bicyclists to sidewalk height. This typology provides a designated pedestrian crossing zone and bicycle yield area across the bicycle facility to reduce conflict with passengers boarding and alighting. This is typically used when there is limited right of way available and the preferred treatment is a separated bike lane.



Typology #2: Constrained Facility

Typology #3: FBI with Bike Lane and Parking

This typology has some similarities with Typologies #1 and #2, with the key difference being that it has a FBI and there is parking on-street adjacent to the curb with a tapered bike lane between the parking and the general purpose lane. The bike lane jogs behind the floating



Typology #3: Floating Bus Island with Bike Lane and Parking

bus stop and then jogs again at the on-street parallel parking. This is typically used when there is a Class II bike lane instead of a Class IV separated bikeway.

Typology#4: FBI with Buffered Bike Lane, without Parking

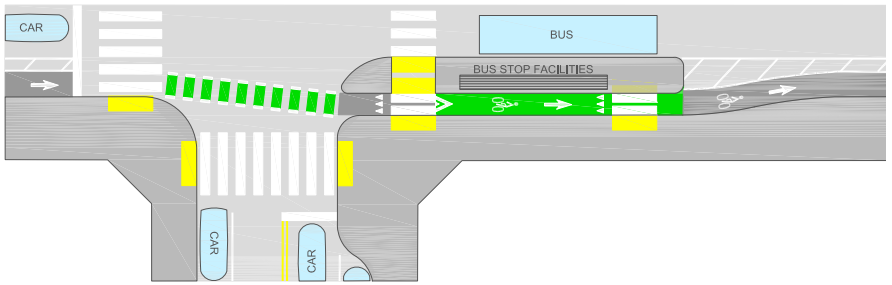
With similar conditions to Typology #3, the key difference is that it has a buffered bike lane and there is no on-street parking in this typology. As in the previous typology, the bike lane jogs behind the FBI. This is typically used when there is plenty of right of way available and the preferred treatment is a buffered bike lane.

Typology #5: FBI with One-way Cycle Track

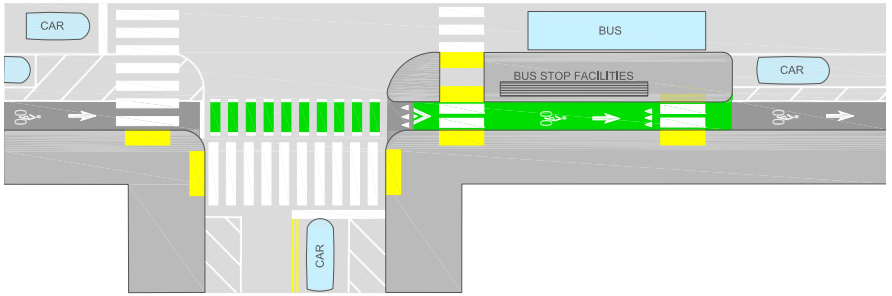
Similar to Typology #3, the key difference for this typology is that it's designed for a Class IV separated bikeway rather than a Class II bike lane. It also has on-street parking that provides a physical separation to the bicycle facility. The separated bike lane runs straight behind the FBI. This is considered the "best practice typology" for when conditions are ideal. The FBI can be permanent, typically made out of concrete, or it can be temporary, typically made out of plastic, which is popular in Oakland, California, and several other cities.

Typology #6: FBI with Bike Lane and Parking

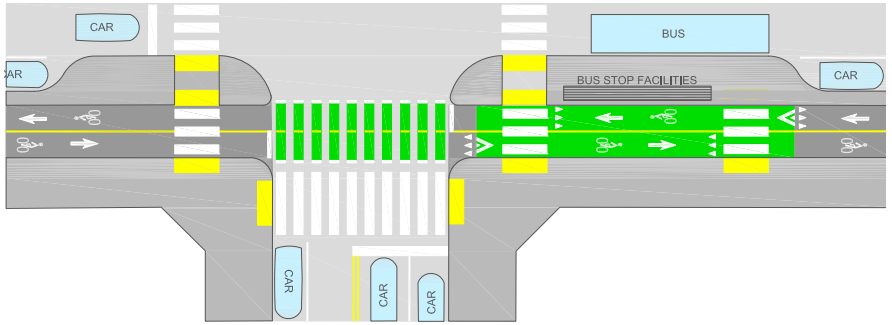
With the same conditions as Typology #5, Typology #6 also has a Class IV elevated separated bikeway that exists between the curb and the FBI. It also runs straight and there is parallel on-street parking that provides a physical separation to the bike facility. The main difference is that Typology #6 is for a two-way separated bike lane while Typology #5 is for a one-way separated bike lane. Two-way separated bike lanes have some benefits over one-way separated bike lanes, such as increased comfort and lower space requirements, but one-way separated bike lanes are more common. Two-way separated bike lanes include only about a third of the separated bike lanes in the United States.



Typology #4: Floating Bus Island with Buffered Bike Lane, without Parking



Typology #5: Floating Bus Island with One-way Cycle Track



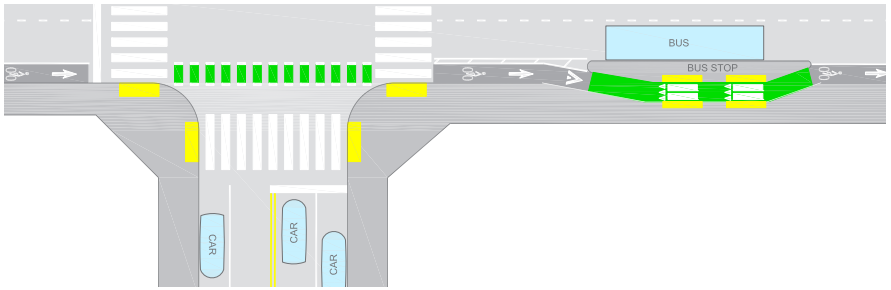
Typology #6: Floating Bus Island with Bike Lane and Parking

Typology #7: Bus Island Bike Bypass

This typology has more similarities with Typologies #1 & #2 than with the other typologies. It is for constrained environments where there is still sufficient space on the sidewalk to have a sidewalk-level bikeway next to ADA-accessible sidewalk space. This typology does not have a floating bus island and there is no on-street parking next to the bikeway. Instead, the bus island is connected to the sidewalk and the bikeway ramps up from street level to sidewalk level and then around the bus island before ramping back down to street level. The bikeway is typically either Class II or Class IV or in rare cases it consists of shared lane markings. This removes the stress of the bicyclist interacting with a bus stopped at the bus stop. Moreover, it also minimizes the interaction between people walking and people biking because, in theory, people waiting for the bus will already be on the street-side of the bicycle facility.

Engineering Treatment Details

Engineering details and photos are shown of continuous sidewalks, New Zealand rubber humps at driveways, K71 bollards, fanned curb ramps, dual curb ramps, and type C curbs.



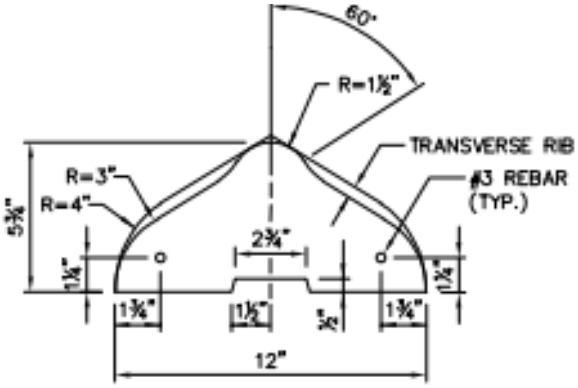
Typology #7: Bus Island Bike Bypass

New Zealand-style Driveway Humps used on Highway 101 in Encinitas, CA

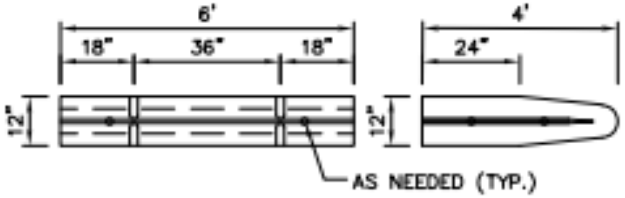
Continuous Sidewalks, Source: Congress for New Urbanism

K71 Bollards

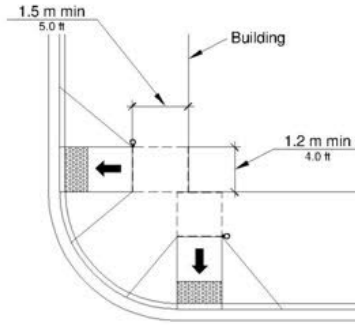
Type C-Curb used in the City of Bellevue, WA
Source: Google Maps



Type C-Curb, Cross-Sectional View, Source: City of Bellevue, WA



Type C-Curb, Plan View, Source: City of Bellevue, WA



Dual Curb Ramp, Source: PROWAG

6.6 Program Recommendations

Traditionally, Vision Zero is based on data-driven decision making, supplemented with the first three E's of safety: Engineering, Education, and Enforcement. These E's were developed around 1925 by the National Safety Council and came long before the concept of Vision Zero. The field of transportation planning is slowly expanding the E's and including a *Safe Systems*[1] approach. Rather than focusing on unachievable levels of perfection, this approach offers a human-centered approach that proactively reduces crash risk and severity of collisions. It reprioritizes the E's with an equitable, forgiving lens. The following sections display descriptions for the three E's, paired with proactive steps to further the discourse with equity as a focal point.

Engineering

Vision zero uses engineering to reduce the likelihood of fatal or serious collisions through proactive roadway designs. Proactive designs study the roadway characteristics of high collision corridors and intersections, recommend treatments, and apply those treatments to similar corridors and intersections as a preventative measure before they result in an injury hot spot.

For example, designing self-enforcing roads and offering safe, equitable options for travel by foot, bicycle, and transit and managing speeds for safety will help reduce risk of crashes and lessen the need for enforcement.

Engineering Examples:

- Roundabouts
- Road buffets/road diets
- Curb space management and edge friction
- Traffic calming
- Daylighting intersections

1 Shahum, Leah. "It's Time to Evolve Beyond the Es Approach to Traffic Safety. Vision Zero Network," Vision Zero Network, January 20, 2022, https://visionzeronetwork.org/its-time-to-evolve-beyond-the-es-approach-to-traffic-safety/

Education

It is important for roadway users to be aware of and follow roadway rules for everyone's safety and comfort. Education-based programming can be held for ages and abilities, and held in schools, senior centers, or even community events. Human beings are vulnerable, and everyone plays a role in preventing serious injuries and deaths. Education can be empowered through various levels of government, non-profit and advocacy groups, academia, and the general public. The most effective education is aimed at motorists.

Education Examples:

- Safety assemblies
- DUI awareness campaigns
- Demonstration projects
- Bike safety and maintenance workshops
- Share the Road campaign
- Safety campaign from social media to newspapers
- Driver training programming

Enforcement

It is important that roadway users must behave in a manner that is safe and respectful to everyone else to prevent serious collisions. Historically, transportation planning has over-emphasized enforcement, leading to discriminatory traffic stops. It is also important to factor in that the presence of police officers can make some communities uncomfortable. Enforcement is most effective when paired with equity and education.

For example, prioritizing warnings and education before issuing tickets and fines can help encourage residents to appreciate road rules. In Santa Ana, over a third of pedestrian collisions occur when the pedestrian is crossing in a crosswalk at an intersection. An example of a proactive measure would be to implement lead pedestrian intervals or no-turn blank out signs.

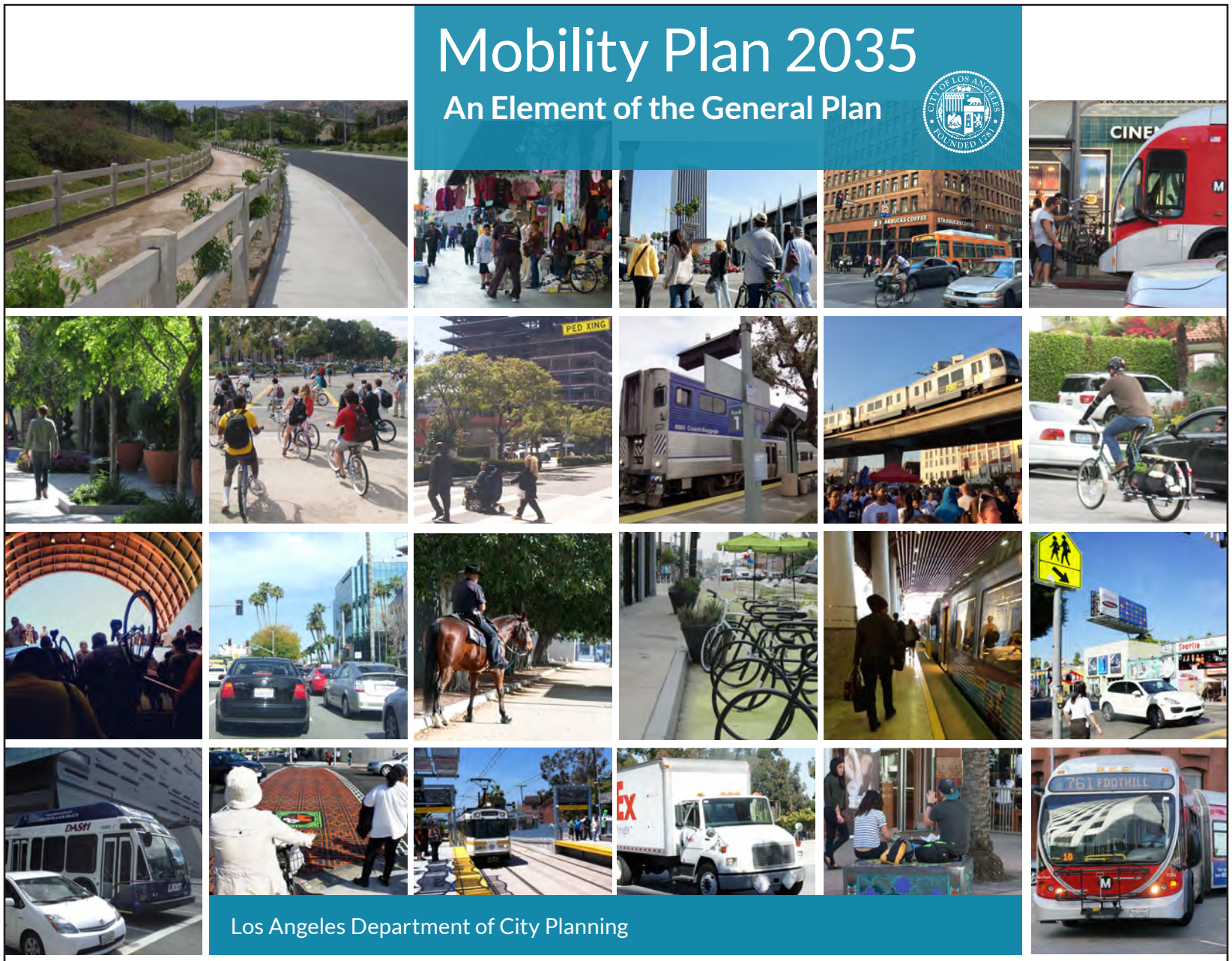
Enforcement Examples:

- Issue warnings and education before tickets and fines
- Enforcement of motorists in collision hot spots
- Speed enforcement campaign
- Red light traffic enforcements
- Encourage people to report pedestrian and bicycle crashes

7 Appendices

Photo Location: Main Street

Appendix A. Los Angeles Mobility Plan 2035



Approved by City Planning Commission: **June 23, 2016**
City Plan Case No. CPC-2013-0910-GPA-SPCA-MSC

Adopted by City Council: **September 7, 2016**
Council File No. 15-0719-S15

Mobility Plan 2035 Programs

Program No.	PROGRAM	Department.	Policy	Topic
C.1	Bicycle Ambassador Program. Develop a Bicycle Ambassador program to attend public events including health fairs and communitiy bike rodeos to broaden awareness of bicycling and provide safety information.	DOT, bicycle nonprofits	3.5, 2.6, 4.4,	Communication
C.2	Bike to Work Week. Expand the regional efforts of Bike-to-Work Week by providing City sponsored events and pit stops in every council district and supporting bicycling to school for students. Provide information, support services and incentives for bicyclists to bicycle to work and school. Distribute materials and post information on Bicycle Program Websites.	Mayor, Council Offices, LAUSD, DOT, SCAG, Metro	5.1, 2.6, 1.3	Communication
C.3	Bus Arrival Information. Work with Metro, municipal transit providers, and local businesses and organizations to provide bus arrival information near station and stop areas.	Metro, DOT, Mayor's Office, BSS, Council Offices	4.2, 4.11	Communication
C.4	Car Free Days. Coordinate a Car-Free Day on a regular basis each month. Provide information and incentives for drivers to leave the car behind for a day. Work with Metro and City Council offices to provide incentives and disseminate materials to event participants.	DOT, DPW, Council Offices, Mayor, SCAG, Metro	5.2, 4.8	Communication
C.5	Citywide Active Transportation Map. Provide and distribute physical and electronic copies of the City's existing bikeway facilities, neighborhood greenways and safe routes to school along with information about public bicycle parking facilities and mobility hub facilities.	DOT Systems, Planning, DOT Bikeways, Metro, Council Offices	4.14	Communication
C.6	Citywide Bicycle Transportation Website. Continue to maintain the BicycleLA.org website to provide bicyclists with current information about safety, future improvements, events, network maps, route information and suggestions, maintenance and other relevant information.	DOT	4.14, 1.6	Communication
C.7	Multi-Modal Access Campaign. Develop a Multi-Modal Access Campaign, in collaboration with Metro, SCAG and other transportation providers, to highlight the availability (all day, every day) of multiple transportation options (transit, vanpool, car share, bikeshare, bicycling, walking, etc.) across the region.	Metro, SCAG, DOT, BBB, Culver City Bus, Metrolink, Foothill Transit, Orange Transit, Gardena Transit	3.5, 4.11	Communication
C.8	Neighborhood Network and Business District Maps. Work with local Business Improvement Districts, Neighborhood Councils, Homeowner Associations and Chambers of Commerce to develop, fund, and distribute physical and electronic maps of localized portions of the existing bikeways, neighborhood network streets, and bicycling supportive businesses.	DOT, Council Offices	4.14	Communication
C.9	Poster Campaigns. Promote awareness of the various networks, streetscape, and green or "great street" improvements through the installation of posters and/or banners. Installation could be either temporary or permanent and could be used to inform the community about the Networks as well as focus on a variety of topics including safe driving practices and/or bicycling encouragement.	DOT, Mayor's Office, Council Offices	4.14	Communication
C.10	Roadway Safety Campaigns. Conduct outreach citywide to advance vision zero goal.	DOT, LAPD, Caltrans, OHS, LAUSD, LASPD, Council Offices	1.2	Communication
C.11	Timely Information. Provide timely information on current roadway work, including scheduled maintenance, work in progress and completed projects. Use temporary signage, social media, and web banners to warn users and provide detour strategies for vehicles, pedestrians and bicyclists. Promote the State-wide 511 Real Time Travel Information System.	DOT, BOE, BSS, Council	4.2, 1.6, 4.14	Communication

Mobility Plan 2035 Programs

Program No.	PROGRAM	Department.	Policy	Topic
C.12	Wayfinding. Develop and install a comprehensive way-finding program throughout the City to provide information about transportation routes, schedules, bikeways urban trails, and area amenities including schools, parks, cultural and retail activities.	DOT, DCP, Mayor's Office, BSS, Council Offices	4.14	Communication
C.13	CSTAN. In collaboration with Metro support efforts to promote goods movement traffic to the CSTAN and identify funding to maintain corridors.	DOT	4.14	Communication
D.1	Analysis of Existing Paths. Identify and map paved paths within City parks suitable for bicycling. Emphasize opportunities for gap closures in the active transportation network.	RAP, Council Offices	2.6	Data & Analysis
D.2	Annual Counts of Bicyclists and Pedestrians (Active Transportation). Initiate a long term strategy to count the number and type (by sex, age, disability, income and geography) of bicyclists and pedestrians traveling for all trips on the Networks and other City streets each year . Identify a specific date and locations for the annual count. The number of locations that are included each year should increase as funding increases. Utilize the locations, date, and time of the count conducted by the Los Angeles County Bicycle Coaliton (LACBC) in 2009 as the baseline; implement a methodology that is consistent with SCAG and Metro/UCLA Luskin Center.	DOT, DCP, Mayor's Office of Technology, LAPD, Council Offices	4.11, 3.1, 1.4, 2.3, 2.6, 2.15	Data & Analysis
D.3	Semi-Annual Survey. Conduct in-person and on-line interviews annually about active transportation implementation. In particular, identify on-going concerns and listen to suggested improvements. Collect data on problem areas (not just where collisions have occurred but where "near-misses" frequently occur) and identify solutions.	DOT, DCP, Council Offices	4.11, 4.10	Data & Analysis
D.4	Collision Monitoring and Analysis. Annually identify locations with high levels of auto, pedestrian, and bicycle collisions and develop and implement strategies to improve the safety of these areas and reduce overall collision rates. Analyze bicycle crash data from the Statewide Integrated Traffic Records System (SWITRS) and other sources to evaluate the impacts of prior improvements. Use collision data to produce hot zone maps (GIS maps that reflect crash data citywide) and to conduct case studies of potential improvments to reduce collisions. Coordinate engineering and enforcement reporting systems to avoid duplication and/or overlooked emergency room data; with support and data from LAPD, LAFD and LAUSD.	DCP, DOT, LAPD, LAFD, Council Offices	1.1, 4.11	Data & Analysis
D.5	Data Collection Protocols. Establish before and afer data collection protocols for all projects.	DOT, DCP	4.6, 4.7	Data & Analysis
D.6	Goods Movement Information. Compile goods movement data from the Port of Los Angeles, Los Angeles World Airport and regional goods movement providers to monitor and assess economic fluctuations.	Port, LAWA	4.12, 4.6	Data & Analysis
D.7	Greenhouse Gas Emission Tracking Program. Quantify total reduction in GHG from vehicle miles traveled reductions. Include data in the Citywide Climate Action Plan and the Climate Action Registry. Maintain a database of completed infrastructure projects; track and apply offset credits (resulting from GHG and VMT reductions) towards the city's compliance with SB 375, AB 32 and the region's Sustainable Community Strategy.	Mayor's Office on Environment and Sustainability, DCP, Council, SCAQMD	5.1, 5.4, 4.11	Data & Analysis

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Program No.	PROGRAM	Department.	Policy	Topic
D.8	Mountain Trail Spillover and Conflict Resolution Analysis. Conduct a spillover analysis to determine the extent to which mountain biking use spills over onto trails where biking is prohibited. Examine other jurisdictions to understand how they accommodate mountain biking and how they have managed conflicts.	RAP, DPW, Council Offices	1.9	Data & Analysis
D.9	Off-Road and Park Trail Bicycle Database. Develop a database and create maps of mountain and park bicycling trails within and adjacent to the City of Los Angeles.	RAP, DCP, DOT, LAPD, Council Offices	1.9	Data & Analysis
D.10	Revised Traffic Analysis Methodology. Establish a revised Traffic Analysis Methodology (TAM) that takes into consideration a project's location, design and density, based on CEQA revisions, OPR guidelines, and other state/regional authorities	DOT, DCP	5.3	Data & Analysis
D.11	Unimproved/Off-Road Database. Inventory all unimproved roads and determine their suitability for mountain biking and off-road facilities.	RAP, DCP, DOT, LAFD, Council Offices	1.9	Data & Analysis
D.12	Strategic Capital Planning Group. Establish an inter-departmental Group to determine , using data and prioritization criteria,a list of priority projects and match to funding sources.	CAO, DCP. BPE. BSS. BSL, BOE, Council Offices	4.6, 4.11, 4.7, 2.15	Data & Analysis
ED.1	Bicycle Parking Training. Develop a Bicycle Parking Requirement Training Presentation and Handbook and post on the Bicycle website. Provide training sessions to the Departments of Building and Safety, Planning, Engineering, and all other public counter staff on the LAMC bicycle parking requirements.	DBS, DOT, DCP	2.6, 3.8	Education
ED.2	Design Workshops. Host/participate in workshops on active transportation facility design.	DOT, DCP, Council Offices	1.4, 2.2, 4.4, 4.10	Education
ED.3	Goods Movement Awareness. Develop and implement strategies to increase coordination of issues relating to goods movement and increase awareness of economic role of goods movement.	POLA	1.8, 2.8, 4.12, 2.10	Education
ED.4	LAPD Officer Training. Train officers on the rights and responsibilities of all roadway users and improve their ability to evaluate conflicts and collisions between different modal users.	LAPD	1.2	Education
ED.5	Rail Crossing Safety. Work with local and regional passenger and freight services to educate all users about safe at-grade crossing practices.	DOT, Mayor's Office, Council Offices	1.5	Education
ED.6	Roadway Safety Education. Educate law enforcement, heavy duty bus and truck operators, taxis, motorists, all City employees, and roadway users on the rights of, and need for safe motoring skills, around non-motorized active transportation uses. Develop educational/ promotional materials to inform roadway users about the benefits of active transportation facilities.	DOT, POLA, LAUSD, GSD, LAPD, Council Offices	1.1, 1.2, 1.4	Education
ED.7.	Roadway Safety Public Service Announcements. Continue to produce a series of Roadway Safety Public Service Announcements (PSA's) for distribution on television, radio, and outdoor signage.	DOT, LAPD, ITA	1.1, 1.2, 1.5	Education
ENF.1	Commercial Loading Zones. Target enforcement efforts against parking by vehicles not in the act of loading/unloading in Commercial Loading Zones.	DOT	2.10	Enforcement

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Program No.	PROGRAM	Department.	Policy	Topic
ENF.2	Enforcement Stings. Target enforcement efforts against unsafe behavior by roadway users, especially in school and commercial loading zones. Publicize the stings to encourage healthy interaction among all roadway users.	LAPD, Council Offices	1.1	Enforcement
ENF.3	Local Truck Use. Target enforcement efforts against truck use on local streets where cut-through traffic has been expressly forbidden.	DOT, LAPD, Council Offices	1.8	Enforcement
ENF.4	Speed Limit Enforcement. Execute speed limit enforcement checks 48 hours prior to calculating prevailing speeds in Engineering and Traffic Surveys used for adjusting speed limits.	LAPD, DOT	1.4	Enforcement
ENF.5	Truck Inspection Areas. Develop a Truck Inspection Program in coordination with Highway Patrol and Port of Los Angeles.	DOT, POLA, LAPD	2.8, 4.12	Enforcement
ENF.6	Enforcement Program. Utilize LAPD and LADOT Traffic Officers to identify bicycle lane parking violations and issue citations.	LAPD, DOT, DPW	1.1	Enforcement
ENG.1	ATSAC. Continue to implement and update as needed the City's signal management program (ATSAC) to monitor and manage the traffic flows.	DOT	4.11, 4.2	Engineering
ENG.2	Bicycle-Sensitive Detectors. Continue to install bicycle sensitive detectors at all actuated signal controlled intersections, including pavement markings for bicyclists.	DOT	2.6, 1.2	Engineering
ENG.3	Transit Enhanced Network. Collaborate with transit providers to implement the TEN, an approximately 300 mile network ofroadway improvements to provide a frequent and reliable bus system that interfaces and supports the fixed-transit lines.	DOT, DCP, Metro, Mayor's Office, Council Offices	2.5	Engineering
ENG.4	Bridge Design Program. Incorporate bicycle and pedestrian facilities when designing new or retrofitting bridges. Particular attention to bridge underpasses that cross existing or future bicycle/walking paths to ensure design integration.	DOT, BOE	2.12	Engineering
ENG.5	Caltrans Design. Work with Caltrans to develop and implement design improvements to freeway entrances and exit ramps to transition motorists from freeways speeds to an urban environment that includes vulnerable roadway users.	DOT, Caltrans	1.1, 1.4, 2.2	Engineering
ENG.6	Bicycle Enhanced Network. Create and maintain an interconnected bicycle network of 150 miles of bicycle paths and 300 miles of protected bicycle lanes to provide a regional low-stress bicycle system.	DOT, DCP, Council Offices	1.4, 2.6, 4.14	Engineering
ENG.7	Flexible Installation Standards. Use engineering judgement and the approval of the City transportation engineer or designee, in lieu of warrants, to install facilities that will improve safety and comfort for bicyclists and pedestrians.	DOT, City Attorney, Caltrans, BOE, BSS, BSL	1.4, 2.1, 2.2	Engineering
ENG.8	Grade Crossing Elimination. Work with Southern California Regional Railroad Association (Metrolink) as well as with freight rail operators to eliminate rail/ street at-grade crossings on regional passenger rail and freight lines.	BOE, Port of LA, DOT, FRA, FTA, FHWA, CPUC, Metro, Expo Authority, City Attorney, Railroad Owners and Operators.	1.5	Engineering

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Program No.	PROGRAM	Department.	Policy	Topic
ENG.9	Green Alleys Program. Continue the Green Alleys program to introduce low-impact development stormwater features and improve the overall quality and safety of neighborhood alleys.	BOS, DOT, LASAN, Council Offices	5.5, 2.3, 1.2, 1.7	Engineering
ENG.10	Industrial Street Infrastructure. Provide adequate street infrastructure in established industrial areas; revise geometric design standards for intersections in/around industrial areas with high truck volumes.	DOT, DCP, BOE	1.7, 1.8, 2.8	Engineering
ENG.11	Manual of Policies and Procedures. Update LADOT Manual of Policies and Procedures to incorporate innovative engineering standards and traffic control devices (for all modes of transportation) included in the City's Complete Street Design Guide. Regularly update both manuals as new standards and devices are adopted by the California Traffic Control Devices Committee in the MUTCD and/or the CA Highway Esign Manual and/or Federal Highway Administration.	BOE, DOT, DCP, LASAN	2.2, 1.4, 1.2	Engineering
ENG.12	Complete Street Design Guide (CSDG). Utilize the CSDG to guide decisions about specific complete street enhancements and potential cross-section designs of streets on the BEN, Bicycle Lane, TEN, PED, and VEN networks.	DCP, BOE, DOT, LASAN, LAPD, LAFD	2.2	Engineering
ENG.13.	Neighborhood Traffic Calming and Slow Zones. Establish a procactive neighborhood traffic management program and institute "slow zones" in targeted areas. Support and advocate for 20 new zones.	DOT, DCP, CLA, LAPD, Council Offices	1.4, 2.4, 3.1, 3.2	Engineering
ENG.14	Neighborhood Enhanced Network. Implement the NEN, an approximately 800 mile system of collector and local streets designed to facilitate pedestrian and bicycle activity. A subset of this network has been priortized to fill gaps in the protected bicycle lane system defined by the Bicycle Enhanced Network.	DOT, DCP, LASAN, Council Offices	2.4, 3.1, 3.2	Engineering
ENG.15	Vehicle Enhanced Network (VEN). Implement the VEN, an 80 mile roadway system of existing city streets that have been prioritized for vehicular movement due to their ability to improve vehicular access to the regional freeway system.	DOT, DCP, BOE, BSS, Council Offices	2.7	Engineering
ENG.16	Los Angeles River. Implement Greenway 2020 (a locally led effort to complete the bicycle path along the entire 32 mile stretch of the Los Angeles River by 2020.) and Los Angeles River Greenway Trail to provide a multi-generational trail and provide active transportation options to disadvantaged communities.	RiverWorks Team and local non-profit partners, Council Offices	2.3, 2.4, 2.6, 3.1	Engineering
ENG.17	Bicycle Lane Network. Implement and maintain an interconnected 700 mile bicycle lane system 300 of which are intended to be upgraded to protected bicycle lanes. See above BEN.	DOT, DCP, Council Offices	1.4, 2.6, 4.14	Engineering
ENG.18	Pedestrian Enhanced Districts. Implement pedestrian improvements on targeted intersections and arterial street segments based on a set of criteria.	DOT, DCP, LASAN, Council Offices	2.3, 3.1, 3.2	Engineering

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Program No.	PROGRAM	Department.	Policy	Topic
ENG.19	First Mile/Last Mile Transit Connectivity Program. Install pedestrian and bicycle connectivity improvements at every major Metro transit station by providing enhanced sidewalk amenities such as landscaping, shading, lighting, directional signage, shelters, curb extensions and mid-block crosswalks where feasible, ADA rampos, lead pedestrian interval signal phases, secure bike parking, etc.	DOT, Council Offices	3.5	Engineering
F.1	Commercial Vehicle Related Revenue: Dedicate revenues generated by commercial vehicle fees to roadway-related purposes	DOT	1.7, 4.6	Funding
F.2	Congestion and Cordon Pricing. Evaluate potential revenues and performance improvements in congestion relief from the implementation of congestion or cordon pricing. Identify the boundaries of, and access points in and out of cordon pricing districts on which to implement congestion pricing.	DOT, DCP, Mayor's Office, CLA, SCAG, Council Offices	4.6, 4.8	Funding
F.3	Coordinated Grant Application. Establish a coordinated effort to apply for and administer federal, state, and local transportation grants to provide additional funding to support transportation and streetscape efforts.	Mayor's Office, Council Offices, LADOT, DCP, Public Works	1.2, 4.6, 4.11	Funding
F.4	Funding Reports. Identify the total amount of funding needed to design, construct and maintain transportation related priority projects on an on-going basis. Identify existing sources of funds and evaluate funding gaps.	CAO, DOT, BOE, BSS, BOS	1.7, 4.6	Funding
F.5	Maintenance Options. Establish procedures and protocols to facilitate partnerships with community groups and the private sector to provide maintenance of street investments; encourage the utilization of assessment districts by local non-profits or businesses to fund and maintain specific infrastructure improvements	DOT, BOE, BSS, LASAN Council Offices	4.10, 4.6	Funding
F.6	Priority Grading System (PGS). Pursue funding for projects based upon the criteria established by the PGS as defined by the Strategic Capital Planning Group.	DOT, DCP, BOE, BSS, BSL, LASAN	1.7, 4.6	Funding
F.7	State Highway Control. Identify funding, and initiate process with Caltrans to transfer oversight of, and improve State Highways within the City limits including Lincoln, Santa Monica, Venice and Topanga Canyon Boulevards.	Mayor's Office, DOT, DCP Council Offices	2.13, 4.6,	Funding
F.8	State Highway Funding. Coordinate with Caltrans, other local, regional, state and federal agencies, and the private sector to identify and implement funding alternatives for the City's transportation network including the State highway system.	Mayor's Office, DOT, DCP Council Offices	2.13, 4.11, 4.6	Funding
F.9	Active Transportation Funding. Update Mobility Plan every five years to stay competitive for state funding of active transportation grants.	DCP, DOT	1.2, 2.15, 4.6	Funding
L.1	Advocacy for Funding Multi-Modal Infrastructure Projects. Aggressively advocate for continued and expanded Federal, State, Regional, and Local funding for multi-modal transportation programs and infrastructure projects in transportation legislation. Ensure representation of issues with City's lobbyists in Sacramento and Washington DC.	Mayor's Office, City Council, CLA	1.2, 3.5, 4.6	Legislation

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Program No.	PROGRAM	Department.	Policy	Topic
L.2	Legislation Monitoring. Continually monitor and develop state and federal legislation to support or oppose legislation that could impact plan/project implementation.	DOT, DCP, Mayor's Office, CLA	4.11, 4.6	Legislation
L.3	Posted Speed Limit Reductions. Develop and advocate for state legislation to support reducing posted traffic speeds. Revised methodology should account for all roadway users (including pedestrians and bicyclists), adjacent land uses, and street user demand.	Mayor's Office, CLA	1.4, 1.2, 3.2	Legislation
L.4	Resetting Speed Limits. Evaluate the effectiveness of the State's speed limit requirements on street safety and performance.	DOT, City Attorney	1.4	Legislation
L.5	Tailpipe Emission Legislation. Support legislation to reduce tailpipe emissions from cars and trucks.	Mayor's Office, CLA, SCAQMD	5.3, 5.4	Legislation
L.6	Vehicular Travel Safety Training. Work with the Los Angeles County Superior Court to develop a program that offers training on driving behavior around other users of the roadway to motorists receiving citations and/or involved in collisions with non-auto modes.	DOT, City Attorney, Council Offices	1.1	Legislation
L.7	Local Street Speed Limit. Advocate for and support for a 20 mph speed limit on all local streets within California.	DOT, City Attorney	1.4	Legislation
MT.1	Bicycle Path Maintenance Program. Regulary inspect and maintain Class I bicycle paths.	DOT, BOE, Council Offices	1.7	Maintenance
MT.2	Crosswalk Maintenance. Implement a crosswalk upgrade and maintenance program to ensure all crosswalks are kept to City standards. See Street Design Manual.	DOT, Council Offices	3.2, 1.7	Maintenance
MT.3	Mandeville Canyon Park. Maintain off-road bicycle trails in Mandeville Canyon.	RAP	1.9	Maintenance
MT.4	Notification System. Develop a coordinated interdepartmental maintenance and response program for the City's network of roads and bikeways; continue to utilize DPW service request forms and the 311 System for the public to directly inform the City.	Mayor's Office, BSS, BOE, Council Offices	4.1, 4.2	Maintenance
MT.5	Pavement Preservation Program. Annually fund a baseline pavement preservation program that provides for major rehabilitation (resurface and reconstruction) and preventive maintenance (crack and slurry seal). Make annual schedule public and easily accessible on the BSS website. Prioritize bikeways and other areas of high need. BSS to Coordinate non-emergency resurfacing with other departments one year in advance.	BSS, Council Offices	1.7, 4.6	Maintenance
MT.6	Sidewalk Cleaning. Work with local businesses and community organizations to maintain sidewalks, along arterials, free of debris	Mayor's Office, BSS, Council Offices	1.7, 4.10	Maintenance
MT.7	Sidewalk Repair. Implement a sidewalk improvement program to bring up all existing degraded sidewalk sections to City standards and implement a program to ensure that future degraded sidewalk sections are promptly identified and repaired in a timely manner.	BSS, Council Offices	1.7	Maintenance
MT.8	Street Services Budget Allocation Formula. Continue to utilize the Bureau of Street Services' Budget Allocation Formula that allows for the equalization of pavement conditions citywide.	BSS	1.7	Maintenance

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Program No.	PROGRAM	Department.	Policy	Topic
MT.9	Street Trees. Implement a tree trimming cycle for all street trees within the public ROW. Use Priority Grading System to prioritize streets.	BSS	1.7, 2.3	Maintenance
MG.1	Five Year Mobility Plan Implementation Report. Develop and submit a report every five years detailing accomplishments of prior five years and prepare a proposed work plan for the next five year cycle.	DCP, DOT, BOE, BSS, BSL, BOS, Council Offices	4.7	Management
MG.2	Green Streets Committee. Continue the Green Streets Committee to identify and evaluate the effectiveness of existing green street features and to continue to identify funding and location options in which to upgrade with green street features.	DOT, DCP, BOE, BSS, LASAN	5.5, 4.6, 4.7	Management
MG.3	Off-Peak Deliveries. Identify and Implement incentives to encourage off-peak hour delivery operations.	DOT, DCP, Mayor's Office	2.10	Management
MG.4	Regional Cooperation. Work cooperatively with adjoining jurisdictions and agencies to coordinate transportation related planing and implementation activities to ensure regional connectivity.	DOT, DCP, Metro, Mayor's Office, SCAG	3.7, 4.11	Management
MG.5	State Highway Management. Collaborate with Caltrans on any modifications to the State highway system necessary to accommodate new development or on any modifications to City's transportation network.	DOT, DCP, Caltrans, Council Offices	2.13	Management
MG.6	State Highway Management continued. Cooperate with Caltrans to identify State highway deficiencies and associated improvement plans, to be used in the City's long range planning and individual project review.	DOT, DCP, Caltrans, Council Offices	2.13, 4.11	Management
MG.7	Transportation Management Organizations. Continue to work with businesses and future development projects to establish geographically and/or industry based Transportation Management Organizations throughout the City for the purposes of implementing a coordinated transportation demand management program.	DCP, DOT , Council Offices	4.9	Management
MG.8	Non-Ownership Models for Vehicle Mobility. Support existing and future innovations that support access to vehicle mobility without the cost and responsibility of ownership.	DOT, Metro, BIDS, Chambers of Commerce, Departments of Aging and Disability, User Groups, Council Offices	4.1, 4.2, 4.10, 5.2, 5.4	Management
O.1	City Fleet. Convert the City's, including proprietary departments, fleets into alternative fuel, very- low and zero-emission vehicles.	GSD, LAWA, POLA, DPW	5.3, 5.4	Operations
O.2	City Work-related Trips. Instruct departments to establish protocols to facilitate the use of transit for short trips (< 5 miles during work hours when the employee does not need to transport materials). Facilitate non-vehicular alternatives to City employees for work-related trips.	Mayor's Office, GSD, Council Offices	4.8, 4.9	Operations
O.3	Construction Zone Standards. Implement and expand upon standard procedures as defined in the MUTCD to ensure safe bicycle and pedestrian travel through construction zones and detours.	DOT, BSS, BOE, DWP, POLA, Utilities, Council Offices	1.6	Operations

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Program No.	PROGRAM	Department.	Policy	Topic
O.4	Feeder Network/Transit Circulator (DASH System and Commuter Express). Coordinate local bus transit services so as to provide neighborhoods with local feeder buses where the roadway system permits.	DOT	3.4	Operations
O.5	Flyaway Shuttle. Continue the Flyaway Shuttle service from Westwood, Van Nuys, Expo, La Brea and Union Station locations, and evaluate other regional locations, such as San Pedro, for expanded service.	LAWA	3.4, 3.6, 3.7	Operations
O.6	Operational Efficiencies. Establish and strengthen public/private partnerships (with the goods movement industry) to coordinate and improve operational efficiencies for the movement of goods. Work could include the implementation of incentives to encourage off-peak and extended hour Port operations, an appointment system, the consideration of short-haul intermodal rail operations, and the establishment of an Advanced Transportation Management and Information System (ATMIS) which would include changeable message signs and video surveillance.	DOT, POLA, Mayor's Office, Council Offices	2.8, 4.10	Operations
O.7	Region-Wide Traffic Control Center. Link all of the traffic control centers in region on a 24 hour basis.	Mayor's Office, ITA, DOT, Metro, Caltrans.	4.1, 4.2	Operations
O.8	Shuttle Bus. Work with special event providers, employers and community-based organizations to identify and implement shuttle bus programs to serve as a first-mile, last-mile solution between transit stations and special events and/or specific populations. Continue programs like Cityride, to provide transportation assistance for senior citizens and individuals with disabilities.	DOT, Mayor's Office, DOA, Council Offices	3.2, 3.4, 3.5	Operations
O.9	Signal Timing. Identify opportunities to re-time street signals to provide safer speeds, improve safety for all, and create smoother traffic throughput. Identify opportunities to re-time street signals to allow longer crossing times for bicyclists and pedestrians in large intersections.	DOT, Council Offices	1.4, 2.3, 2.5, 2.6	Operations
O.10	Transit Coordination. Actively collaborate with regional transit partners to achieve seamless transfers between systems, including scheduling, ticketing, shared fare systems, and stops and loading areas.	DOT, IT, and other transit providers, Mayor's Office	3.4, 4.11	Operations
O.11	Transit/Event Coordination. Facilitate collaboration between regional transit partners and event providers to provide and promote awareness of additional and timely transit service before and after large events.	DOT, Council Offices	4.2, 3.4	Operations
O.12	Improve the Flow of Freight Traffic. Identify and implement strateigies to facilitate the flow of freight traffic.	DOT, Council Offices	2.8	Operations
O.13	Truck Inspections and Service Patrol. Identify locations for temporary and long-term truck inspection stations and Implement a Truck Service Patrol Program to remove disabled commercial trucks from freeway lanes.	DCP	2.8	Operations
O.14	Improve the Flow of Passenger Traffic. Identify and implement strategies to provide reliable travel times during peak hours and during special events.	DCP, DOT, Council Offices	2.5, 3.4	Operations

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Program No.	PROGRAM	Department.	Policy	Topic
O.15	Zero Emission Truck Collaborative (ZETC). Promote consistency among public agencies in working to catalyze the development and deployment of zero emission trucks in the region.	POLA, Metro, AQMD, POLB, Caltrans, SCAG and Gateway Cities COG.	5.4, 5.1	Operations
PK.1	Creative Parking Solutions. Work with communities, businesses, and organizations to identify and implement creative strategies to resolve parking conflicts in areas with high-parking demand.	DCP, DOT, Council Offices	4.13, 4.10	Parking/ Loading Zones
PK.2	Curb Parking Conversion. Standardize processes to facilitate the conversion of curb parking spaces for other uses such as parklets, plazas, bike corrals and docking stations for bicycle sharing, especially in high volume areas of pedestrians and bicyclists.	DOT, BOE, DCP, LASAN, Council Offices	2.1, 3.8, 3.11	Parking/ Loading Zones
PK.3	Individualized Parking Requirements. Permit businesses to identify their respective parking demand and establish criteria whereby projects can reduce on-site parking through the inclusion of a package of transportation demand management strategies.	DCP, DOT	4.8, , 4.9	Parking/ Loading Zones
PK.4	LA Express Park. Continue LA Express Park system using reak-time technology to increase awareness of the availability of parking spaces.	DOT, BIDS, Chambers of Commerce, Council Offices	4.13	Parking/ Loading Zones
PK.5	Meter Pricing. Establish demand based meter pricing to maximize efficient use of on-street meters.	DOT	4.13	Parking/ Loading Zones
PK.6	Neighborhood Parking Districts. Explore modifying some Neighborhood Parking Districts to permit the utilization of residential streets for metered commercial parking and direct revenue to specific neighborhood improvements.	DOT, DCP, City Attorney, Council Offices	4.13	Parking/ Loading Zones
PK.7	Off-Street Loading. In non-industrial areas, require off-street dock and/or loading facilities for all new non-residential buildings and for existing non-residential buildings and undergoing extensive renovations and/or expansion, whenever practical.	DCP	2.10	Parking/ Loading Zones
PK.8	On-Street Loading. Encourage the designation of on-street loading areas, through removal of curb parking, in established industrial areas where off-street loading facilities are lacking. Update the Commercial Loading Zone Ordinance (see B-2, page 6, 2-14 of Mayor's Task Force-Mar 2004)	DOT, DCP, City Attorney, Council Offices	2.10	Parking/ Loading Zones
PK.9	Pedestrian Design Features in Parking Areas. Update zoning code to require the inclusion of pedestrian design features into all parking lots and provide safe, clear paths of travel from parking lots and/or structures to the associated buildings and/or uses. Ensure that all features are ADA compliant.	DCP	2.3, 3.1	Parking/ Loading Zones
PK.10	Pedestrian Improvement Incentives. Establish an incentive program to encourage projects to retrofit parking lots, structures and driveways to include pedestrian design features.	DCP	2.3, 3.1, 4.13,	Parking/ Loading Zones
PK.11	Reduced Size Parking. Develop parking, design, and replacement parking standards for reduced size vehicles (e.g. sub-compact cars, scooters, motorcycles, bike corrals) in residential and non-residential developments as well as public parking facilities and public rights-of-way.	DCP	4.13	Parking/ Loading Zones
PK.12	Shared Off-Street Parking. Facilitate the shared utilization of privately owned off-street parking facilities.	DOT, City Attorney, BIDS, DCP, Council Offices	4.13	Parking/ Loading Zones

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Program No.	PROGRAM	Department.	Policy	Topic
PK.13	Transit Area Parking Reductions. Reduce parking requirements for developments that locate near transit (e.g. within a half-mile of a transit stop)or a major bus stop and provide facilities to enable pedestrian, bicycle and disabled access. Parking requirement reductions are being reviewed as a potential component of the Central City and Central City North Community Plans.	DCP	4.13	Parking/ Loading Zones
PK.14	Unbundled Parking Options. Evaluate potential for the unbundling of parking from rental or purchase options for all new multi-family development.	DCP	4.13	Parking/ Loading Zones
PK.15.	Accessible Parking in Residential Areas. Update policies and guidelines for accessible parking in residential areas.	DOT, DCP, City Attorney, Council Offices	3.2, 3.3, 4.13	Parking/ Loading Zones
PK.16.	Park and Ride. Expand the park and ride network.	Dot, Caltrans, Metro	3.4, 3.5, 4.13	Parking/ Loading Zones
PL.1	Driveway Access. Require driveway access to buildings from non-arterial streets or alleys (where feasible) in order to minimize interference with pedestrian access and vehicular movement.	DCP	3.9, 4.3	Planning & Land Use
PL.2	Local Access. Explore opportunities to incorporate community assets (food, retail) in locations immediately adjacent to residential areas to promote local walking and biking trips and reduce VMT.	DCP, Council Offices	3.3, 1.2, 5.2	Planning & Land Use
PL.3	Mixed-Use. Encourage mixed-use residential, employment and commercial serving uses where appropriate to facilitate increased utilization of walking, bicycling, and transit use.	DCP, Council Offices	3.3, 1.2, 5.1	Planning & Land Use
PL.4	Network Additions. Identify bicycle, neighborhood, and transit enhanced streets and pedestrian enhanced areas in Community Plan updates to provide local complements to the Citywide Transit Neighborhood, and Bicycle Enhanced Networks, and Pedestrian Enhanced Destinations and increase access to area amenities including medical, schools, parks, major employment centers, and community facilities through continuous, predictable and safe sidewalks, intersections, bikeways, and transit support facilities.	DOT, DCP, Council Offices	3.3, 2.3, 2.4, 2.5, 2.6, 1.2	Planning & Land Use
PL.5	Pedestrian Safety Action Plan. Develop a Pedestrian Safety Action Plan for that enhances mobility and accessibility for pedestrians.	DOT, Mayor	3.1, 2.3	Planning & Land Use
PL.6	Regional Transportation Plan. Coordinate with Metro and SCAG on the development of the Regional Transportation Plan, Sustainable Communities Strategy, and the Long Range Transportation Plan.	DCP, DOT,LASAN, Metro, SCAG	4.11	Planning & Land Use
PL.7	Transit Coordination. Continue to work with Metro and various Construction Authorities on station location, portal siting, station access, support features and parking strategies that maximize ridership and transit revenue.	DCP, DOT, Metro, other bus providers	4.11, 3.7	Planning & Land Use
PL.8	Transit Neighborhood Plans. Adopt and implement Transit Neighborhood Plans that enhance access to transit stations and set new zoning regulations to effectuate appropriate mixes and scales of uses as well as site design.	DCP	3.3	Planning & Land Use

Mobility Plan 2035 Programs

Program No.	PROGRAM	Department.	Policy	Topic
PL.9	Transportation Demand Management Ordinance Revision (TDM). Update the TDM ordinance (LA Municipal Code 12.26.J) to expand the number and type of projects required to incorporate TDM strategies and expand the number and variety of available TDM strategies. Include bicycle parking and other bicycle use incentives as a TDM measure to mitigate traffic/ vehicle trips for purposes of CEQA compliance for commercial, residential and mixed-use development projects. Continue to require eligibile projects to provide work-trip reduction plans and parking cash-out programs in compliances with ACMD's Regulation XV.	DCP, DOT	4.8	Planning & Land Use
PL.10	Truck Staging Facilities. Identify locations within the City where regional truck staging and service facilities are permitted and address solutions to illegal freight staging practices.	DOT, DCP, Council Offices	1.8, 2.10	Planning & Land Use
PL.11	Union Station Master Plan. Continue to work with Metro to complete the Union Station Master Plan and implement Connect US. Connect US is a strategy to improve active transportation options to and from Union Station.	DCP, DOT, Mayor's Office, Council Offices	3.6	Planning & Land Use
PL.12	Greenways to Rivers Arterial Stormwater System (GRASS). Establish a stormwater greewnay planning network and an intergrative planning tool for Los Angeles' One Water Plan.	DCP, DOT, Mayor's Office, Council Offices	5.1, 5.5	Planning & Land Use
PL.13	Special Street/Alley Treatments. Explore the use of special materials used within public right of ways.	DCP, DOT, DPW	2.1, 2.2	Planning & Land Use
PL.14	Community Engagement - Conduct extensive community engagement, develop detailed operational studies and design options and undertake additional environmental analysis for the following network segments within the Council District Four boundaries before implementing any street modifications: Melrose Avenue between Highland and Western Avenues; Lankershim between 134 Freeway and Cahuenga Boulevard, 4th Street between Highland and Western and segments of the BEN and/or TEN within the boundaries of the Sherman Oaks Neighborhood Council. The Council office and community stakeholders would play a critical role in finalizing any plans or projects for these corridors. Alternative parallel corridors, in lieu of the ones identified here, may be considered as potential network substitutes during this process.	DCP, DOT, Community Stakeholders, Council Office	4.4	Planning & Land Use
PS.1	Plazas/Paseos. Identify temporary and/or permanent opportunities to establish car free zones and/or plazas/paseos/play streets in select locations around the City. Play streets provide an opportunity to open public spaces to families and residents in park-poor communities without fear of conflicts with motor vehicles.	DCP, DOT, Council Offices	3.11	Public Space
PS.2	Great Streets. Continue to support the Mayor's Great Streets Initiative by creating a comprehensive matrix of project elements and associated costs, outlining an implementation timeline, tracking project impacts, evaluating funding strategy, and strategizing the coordination of city services to Great Streets.	DOT, BOE, BSS, LASAN, RAP, DCP, DCA, DPW, BSL, EDD, Council Offices	2.15, 3.11	Public Space
PS.3	Pedestrian Loops. Explore the development of a connected network of walking passageways utilizing both public and private spaces, local streets and alleyways to facilitate circulation.	DOT, BOE, BSS, RAP, DCP, DPW, Council Offices	3.9, 3.10, 3.11	Public Space

Mobility Plan 2035 Programs

Program No.	PROGRAM	Department.	Policy	Topic
PS.4	People Street. Continue the People Street program for community partners to repurpose underused portions of streets (below the curb) using cost effective materials into temporary plazas, parklets, bike parking, and other public spaces.	DOT, BOE, LASAN, BOS, RAP, Council Offices	4.10, 3.11	Public Space
PS.5	Recreational Rides. Organize and lead local and citywide recreational rides ranging from 5-30 miles. Prioritize routes that include the Green, Bicycle Enhanced or Neighborhood Networks.	RAP, LAPD, Mayor's Office, Council Offices, DOT, BOE, Bicycle non-profits	2.6	Public Space
PS.6	Open Streets. Establish procedures and protocols to support and expand non-profit efforts to coordinate and plan frequent and predictable events.	Mayor's Office, Council Offices, RAP, DOT, DPW, LAPD, LAFD	3.11	Public Space
S.1	Active Transportation Education. Coordinate with LAUSD to incorporate mobility education (for children ages 4-18) into regular physical education curriculum.	DOT, LAUSD, Council Offices	1.3, 1.2	Schools
S.2	Bike, Walk, and Roll Weeks. Support Metro's Bike, Walk, and Roll Week by providing City sponsored events and pit stops in every council district and supporting bicycling to school for students. Provide information, support services and incentives for bicyclists to bicycle to work and school. Distribute materials, post information, and evaluate the progress of the program.	DOT, LAPD, Council, Mayor, LAUSD, Metro, SCAG	1.3, 1.4, 3.1, 4.10, 5.1, 5.2	Schools
S.3	Safe Routes to School. Continue to work/partner with LAUSD, (with support from PTAs and traffic officers) to develop an education program, develop and implement a safe routes to school program and maps and a Comprehensive SRTS Strategic Plan to calm traffic in communities surrounding all elementary, middle and high schools to maximize pedestrian and bicycle convenience and safety. Refer to the Citywide Safe Routes to School Strategic Plan	DOT, DPW, LASAN, support from LAPD, and LAUSD, Council Offices	1.3	Schools
S.4	School Locations. Work with LAUSD and other school providers to site new schools in appropriate locations that can be easily accessed and integrated into the surrounding community.	DCP, LAUSD, Council Offices	1.3, 3.3	Schools
SF.1	Artist Designed Bicycle Parking Standards. Support and develop creative bicycle parking solutions in the public rights-of-way and adopt as city standard guidelines.	DOT, BOE	3.8, 3.11	Support Features
SF.2	Bicycle Parking at Existing Major Destinations. Work with special event facilities' managers to provide convenient, secure, good quality and well-lit bicycle parking facilities at special event venues such as Dodger Stadium, the Staples Center/LA Convention Center, and the LA Memorial Coliseum/Sports Arena.	DOT, Council Offices	3.8	Support Features
SF.3	Bicycle Path Landscaping. Incorporate drought tolerant and low maintainence plant materials along bicycle paths.	DOT, DPW, MRCA, Council Offices	2.6,5.5	Support Features
SF.4	Bicycle Path Lighting. Adopt and install standard lighting designs for bicycle paths and grade separated bikeways.	DOT, BSL, Council Offices	2.6	Support Features
SF.5	Bicycle Path Mile Markers. Continue to install and retrofit mile markers along bike paths; work with LAPD and LAFD to facilitate emergency response on paths.	DOT, LAPD, LAFD, BOE	2.6	Support Features
SF.6	Bicycle Racks on Taxis. Investigate the integration of bicycles with taxi service by adding bicycle racks on to all of the taxi cabs that are permitted through DOT.	DOT	3.5, 3.8	Support Features

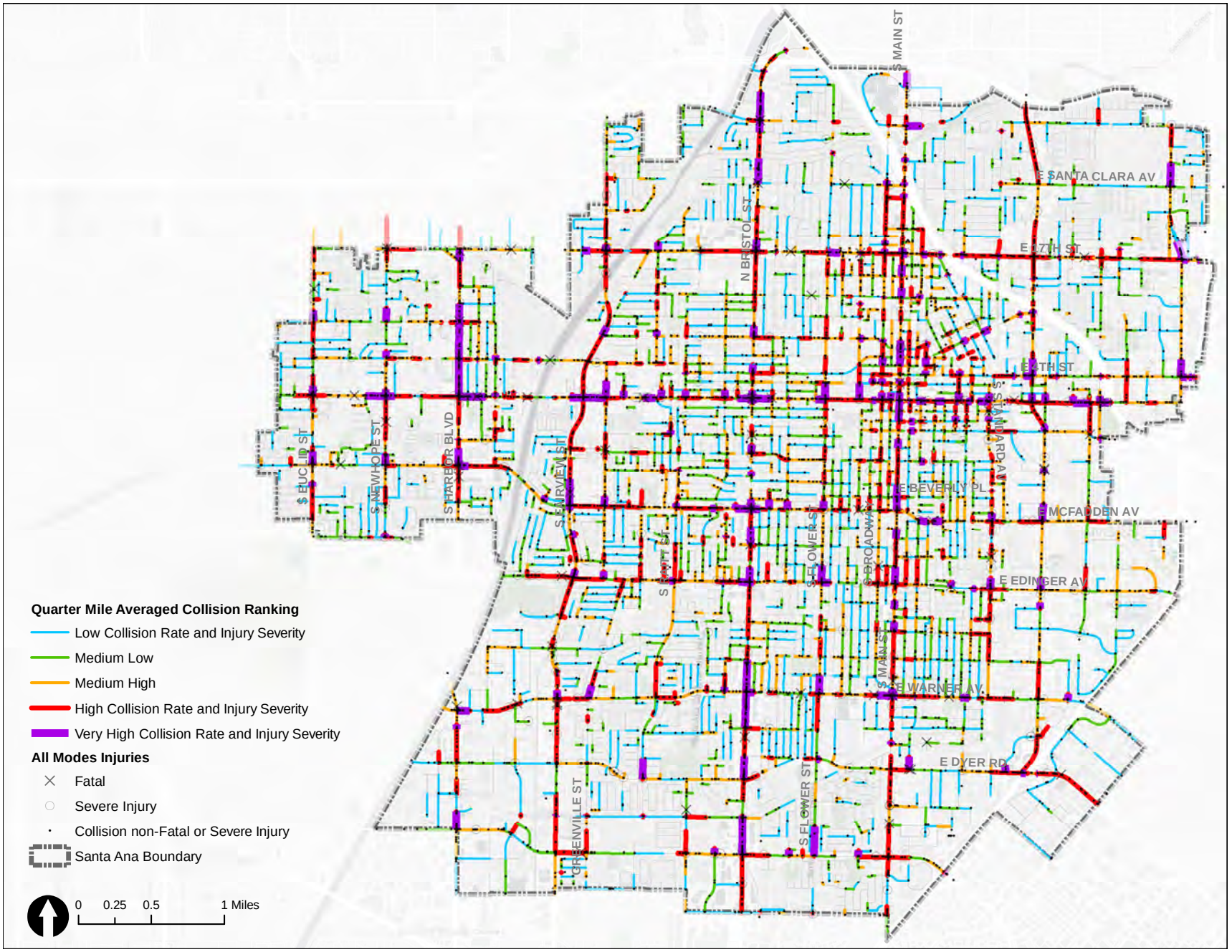
Mobility Plan 2035 Programs

Program No.	PROGRAM	Department.	Policy	Topic
SF.7	Bicycle Sharing Network. Work with Metro and other area jurisdictions to launch a Bicycle Share Program. Identify a strategy to enable city staff to access the bicycle share system as a "fleet" option for work related tasks.	Metro, DOT, DCP, Council Offices, Office of the Mayor	2.6, 4.11	Support Features
SF.8	Bicycle Valet. Work with special event providers, employers and community-based organizations to provide bicycle valet services at large public and private special events.	DOT, bicycle non-profits, Council Offices	3.8	Support Features
SF.9	Bus Bike Racks (on/off-board). Work with transit providers to provide solutions for additional bike storage, such as bike rack systems to accommodate at least three bicycles on-board the bus, or permitting bicyclists to board with their bicycles at the rear of the bus.	DOT Transit, Metro, regional transit providers	3.8, 3.5, 4.11	Support Features
SF.10	Essential Transit Components. Include short-term and long-term bicycle parking and way-finding as essential components of all stations.	Metro, DOT	3.8	Support Features
SF.11	Increase Publicly Available Bicycle Parking. Review all City-owned, operated, and leased facilities for compliance with the City's bicycle parking standards. Increase bicycle parking to meet LAMC requirements where deficiencies are present.Continue to implement bicycle parking and corrals at major destinations, especially where demand is already high. Encourage the Los Angeles Unified School District (LAUSD), local four-year universities, and the Los Angeles Community College District (LACCD) to install quality bicycle parking at public schools within the City of Los Angeles.	All	3.8, 1.3, 2.6	Support Features
SF.12	LED Street Lighting. Continue to retrofit existing street lighting infrastructure with energy-efficient LEDs.	BSL	1.7, 2.3, 3.2	Support Features
SF.13	Mobility Hubs/Multi-Modal Transit Plaza. Facilitate the implementation of multi-modal transportation support activities and services in proximity to transit stations and major bus stops, including but not limited to: adequate bus stop and layover space, transit shelters with real-time bus arrival information, bike share docking stations, car share facilities, taxi-waiting/call areas, Wi-Fi service, public showers/toilets, bicycle storage and repair facilities, and food and beverage providers.Develop a coordinated permitting proceess for the installation of the support features identified above.	DOT/Metro, Council Offices, DCP, Office of the Mayor, DPW	3.5, 4.1, 4.2	Support Features
SF.14	Off-Street Alternative Energy Charging. Continue to support off-street alternative energy charging and fueling stations within privately and city-owned parking and/or fueling facilities.	DOT, DCP, Mayor's Office, DWP	5.3, 5.4	Support Features
SF.15	On-Board Storage. Work with transit providers to provide an on-board location for the storage of shopping bags and/or luggage.	Metro, DOT	3.4, 4.11	Support Features
SF.16	On-Street Bicycle Corrals.Develop bicycle parking corrals in on-street parking spaces as a public-private partnership. Continue implemention of a pilot program and evaluate the feasibility and criteria for widespread use.	DOT, BSS, BOE, Council Offices	3.8, 3.11	Support Features
SF.17	Operator Judgement of Bicycles on Buses. Work with Metro and local transit operators in the City of Los Angeles to allow operators to make decisions regarding allowing bicycles on buses when space on bus allows, racks are full, service is last of the day or in inclement weather	DOT, City Council, Mayor's Office, BAC, Metro	3.5, 3.8, 4.11	Support Features

Mobility Plan 2035 Programs

Program No.	PROGRAM	Department.	Policy	Topic
SF.18	Parking Meter Posts. Develop pilot project to install bicycle parking mechanism on parking meter posts.	DOT Parking	3.8	Support Features
SF.19	Sidewalk Bicycle Parking Program. Continue to install and maintain City-standard bicycle racks on sidewalks. Identify areas with demand for bicycle racks and implement an installation schedule. Prioritize the installation of racks on streets.	DOT, Council Offices	3.8	Support Features
SF.20	Street Furniture Definition. Include bicycle racks in the definition of street furniture to utilize streetscape funding opportunities	City Attorney, BSS	1.7, 2.2, 3.8, 2.15	Support Features
SF.21	Street Lighting. Support equitable distribution of funds for appropriate street and/or pedestrian lighting, especially in areas of high crime rate and high volume of pedestrian activities.	BSL, DCP, DOT, Council Offices	1.7, 2.3, 3.2	Support Features
SF.22	Transit District Curbside Management. Manage curb areas adjacent to transit stops to facilitate the loading and unloading of buses, para transit, smart shuttles, van/car pools and taxi queuing. Include curb areas for bicycle parking and car share facilities where space warrants.	DCP, DPW, DOT, Metro & other transit providers	3.5, 3.8, 3.2	Support Features
SF.23	Transit Furniture. Transit furniture shall be prioritized on corridors with the highest rates of public transit ridership; design features shall incorporate aesthetic, comfort, and protection from the elements (sun and rain) considerations. Target the equitable provision of transit furniture throughout the City. Evaluate and pursue all possible alternatives to increase transit furniture in underserved corridors.	DPW, Council Offices	1.7, 2.5, 4.3, 4.6	Support Features
SF.24	Transit Pass. Collaborate with Metro to encourage schools, employers, and residential developers to provide monthly or annual transit passes for their respective students, employees, and residents.	DOT, DCP, LAUSD, Metro	4.8, 4.9, 4.11	Support Features
SF.25	Trash Facilities. Increase the number of trashcans on sidewalks. Work with local business and community organizations to develop an adopt-a-trash can program.	DPW, BOS, Council Offices	1.7, 4.10	Support Features
SF.26	Tree Canopy. Continue to expand the City's tree canopy using tree species that are appropriate for the location, climate, water supply, planting conditions and existing street infrastructure.	LASAN, BSS, BOE, DWP, Tree People, Council Offices	1.7, 3.2, 2.3, 2.4, 3.1	Support Features
SF.27	Turnstile Design. Work with Metro and local transit agencies to ensure that all turnstiles can accommodate a bicycle.	DOT, City Council, Mayor's Office, BAC	3.5, 4.11	Support Features
SF.28	Bicycle Friendly Businesses. Continue to support Bicycle Friendly Business Program	DOT, Council Offices	2.6	Support Features

Appendix B. Collision Severity per Road Segment



Purpose

This map illustrates the Santa Ana road segments with moderately-high to high injuries involving pedestrians, bicyclists, and vehicles. These corridors have the highest collision rates and injury severities collision rates and injury severities. This map can be used as a variety of purposes, such as determining high collision, high injury areas to prioritze improvements as well as where to reduce speed limits.

Methodology

The methodology for this analysis involved joining each collision to the nearest street segment to quantify the number of collisions and severity of injuries that have occurred at different locations along a road segment. Each injury was given a 'score' as noted in the list below. Each road segment's score was then summed together for a total score per segment. The total score was divided by the length of the street segment to get a decimal number that can be used to rank each segment relative to all other street segments and identify highest to lowest relative ranking of collisions and injury severity. This final decimal number was multiplied by the feet in one quarter mile to get a larger whole number for facilitation. The final rank on road segments varied from a minimum 'score' of less than one per quarter mile to a maximum of 660 per quarter mile where multiple collisions with pedestrian or bike injuries have occured, often times at busy intersections. The ranks for each segment was then symbolized in GIS as quartile groups for this map. The highest ranking road segments are shown in thick purple lines and the lowest ranking are shown in thin light blue lines. A second overlay of collision points, circles and crossed lines show where the actual collisions have occurred.

Description	Score
Pedestrian Fatalities or Severe Injuries	1.5
Bicycle Fatalities or Severe Injuries	1.5
All Other Pedestrian and Bicycle Collisions	1.25
Vehile Collisions Resulting in Fatalities or Serious Injuries	1.25
All Other Vehicle Collisions	1.0

Appendix C. SS4A worksheet

Safe Streets and Roads for All
Self-Certification Eligibility Worksheet

Applicants should follow the instructions in the NOFO to correctly apply for a grant. See the SS4A website for more information.

Instructions: The purpose of this worksheet is to determine whether an applicant's existing plan(s) is substantially similar to an Action Plan for purposes of applying for an Implementation Grant or to conduct Supplemental Planning/Demonstration Activities only. Use of this worksheet is required. Applicants should not adjust the formatting or headings of the worksheet.

For each question below, answer "yes" or "no." If "yes," cite the specific page in your existing Action Plan or other plan(s) that corroborate your response, or cite and provide other supporting documentation separately.

An applicant is eligible to apply for an Action Plan Grant that funds supplemental action plan activities, or an Implementation Grant, only if the following two conditions are met:

- **Answer "yes" to Questions** 3 7 9
- **Answer "yes" to at least four of the six remaining Questions** 1 2 4 5 6 8

If both conditions are *not met*, an applicant is still eligible to apply for an Action Plan Grant that funds creation of a new Action Plan.

Lead Applicant: **UEI:**

1 Are both of the following true?
- Did a high-ranking official and/or governing body in the jurisdiction publicly commit to an eventual goal of zero roadway fatalities and serious injuries?
- Did the commitment include either setting a target date to reach zero, OR setting one or more targets to achieve significant declines in roadway fatalities and serious injuries by a specific date?

☐ YES ☐ NO
If yes, provide documentation:

2 To develop the Action Plan, was a committee, task force, implementation group, or similar body established and charged with the plan's development, implementation, and monitoring?

☐ YES ☐ NO
If yes, provide documentation:

3 Does the Action Plan include all of the following?
- Analysis of existing conditions and historical trends to baseline the level of crashes involving fatalities and serious injuries across a jurisdiction, locality, Tribe, or region;
- Analysis of the location where there are crashes, the severity, as well as contributing factors and crash types;
- Analysis of systemic and specific safety needs is also performed, as needed (e.g., high risk road features, specific safety needs of relevant road users; and,
- A geospatial identification (geographic or locational data using maps) of higher risk locations.

☐ YES ☐ NO
If yes, provide documentation:

U.S. Department of Transportation

Still have questions? Visit the SS4A website

Safe Streets and Roads for All
Self-Certification Eligibility Worksheet

4 Did the Action Plan development include all of the following activities?
- Engagement with the public and relevant stakeholders, including the private sector and community groups;
- Incorporation of information received from the engagement and collaboration into the plan; and
- Coordination that included inter- and intra-governmental cooperation and collaboration, as appropriate.

☐ YES ☐ NO
If yes, provide documentation:

5 Did the Action Plan development include all of the following?
- Considerations of equity using inclusive and representative processes;
- The identification of underserved communities through data; and
- Equity analysis, in collaboration with appropriate partners, focused on initial equity impact assessments of the proposed projects and strategies, and population characteristics.

☐ YES ☐ NO
If yes, provide documentation:

6 Are both of the following true?
- The plan development included an assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize safety; and
- The plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards.

☐ YES ☐ NO
If yes, provide documentation:

7 Does the plan identify a comprehensive set of projects and strategies to address the safety problems in the Action Plan, time ranges when projects and strategies will be deployed, and explain project prioritization criteria?

☐ YES ☐ NO
If yes, provide documentation:

8 Does the plan include all of the following?
- A description of how progress will be measured over time that includes, at a minimum, outcome data.
- The plan is posted publicly online.

☐ YES ☐ NO
If yes, provide documentation:

9 Was the plan finalized and/or last updated between 2018 and June 2023?

☐ YES ☐ NO
If yes, provide documentation:

U.S. Department of Transportation

Still have questions? Visit the SS4A website

Appendix D. Priority Projects Engineering Concept Development Summary

To:	Hina Chanchlani	Project No.:	22-00136
Cc:	Zed Kekula, Mauricio Castaneda		
From:	Paul Martin		
Date:	February 7th, 2024		
RE:	**Santa Ana Vision Zero – Priority Projects Engineering Concept Development Summary**		

Overview

In support of the update to the Santa Ana Vision Zero (SAVZ), formerly the Safe Mobility Santa Ana (SMSA) plan, Mark Thomas has developed planning level conceptual plans at the following five (5) top ranked SAVZ priority corridors:

- **Main Street** 1st Street to 17th Street
- **Tustin Avenue** 17th Street to Fairhaven Avenue
- **Euclid Street** Hazard Avenue to McFadden Avenue
- **Greenville Street** MacArthur Boulevard to Warner Avenue
- **First Street** Fairview Street to Bristol Street

As scoped through guidance by SCAG and City staff, the concept plans evaluate one-mile of each corridor and incorporate active transportation design countermeasures recommended by the SAVZ plan and based on discussions with City staff. See Figure 1 for the Study Corridors Map.

The City of Santa Ana can leverage the SCAG-funded project to develop engineering concepts, cost estimates, and renderings to pursue future grant funding to advance each of the projects' implementation.

Engineering Concepts

Engineering concepts have been developed for each of the five (5) study corridors (Attachment A). The concepts were developed based on multiple discussions with City staff and refined for consistency with the SAVZ and industry best practices.

Main Street

The Main Street concept implements the following improvements between 1st Street and 17th Street:

- High-visibility crosswalk striping
- Stop lines
- Crossbike striping
- Raised center medians
- Directional pedestrian curb ramps

Euclid Street

The Euclid Street concept implements the following improvements between Hazard Avenue and McFadden Avenue:

- High-visibility crosswalk striping
- Stop lines
- Buffered Class II bicycle lanes
- Green conflict zone striping
- Crossbike striping
- Raised center medians
- Directional pedestrian curb ramps
- Protected intersection features
- New Traffic Signal

Tustin Avenue

The Tustin Avenue concept implements the following improvements between 17th Street and Fairhaven Avenue:

- High-visibility crosswalk striping
- Stop lines
- Buffered Class II bicycle lanes
- Green conflict zone striping
- Crossbike striping
- Raised center medians
- Directional pedestrian curb ramps
- New traffic signal
- Floating bus island
- Rapid Rectangular Flashing Beacon (RRFB)

Greenville Street

The Greenville Street concept implements the following improvements between MacArthur Boulevard and Warner Avenue:

- High-visibility crosswalk striping
- Stop lines
- Class II bike lane
- Crossbike striping
- Raised center medians
- Directional pedestrian curb ramps
- Protected intersection features

1st Street

The 1st Street concept implements the following improvements between Fairview Street and Bristol Street:

- High-visibility crosswalk striping
- Stop lines
- Class II bicycle lanes
- Crossbike striping
- Raised center medians
- Directional pedestrian curb ramps

Engineering Cost Estimates

Grant-ready engineering cost estimates have been developed for each of the five (5) study corridors (Attachment B). The cost estimates incorporate the most recently available Active Transportation Program (ATP) cost estimate template to position the City for future ATP grant pursuits.

Project Renderings

A conceptual project rendering has been prepared for each of the five (5) study corridors and are included in Attachment C.

Funding Opportunities

The project concepts, cost estimates, and renderings can be used by the City to seek implementation funding through various local, state, and federal grant programs listed below . Table 1 provides additional program details, including anticipated submittal period, eligible phases and costs, match requirements, and key selection criteria.

Local Funding Opportunities

- Complete Streets Program (CSP) – Funds local agency projects in Orange County that contribute to the creation of a complete transportation network for all modes, improve transportation access, improve safety and health, and incorporate community input.

State Funding Opportunities

- Active Transportation Program (ATP) – Funds projects that increase use of active modes of transportation, such as walking and bicycling.
- Clean California Local Grant Program (CCLGP) – Funds local communities to beautify and improve local streets and roads, tribal lands, parks, pathways, and transit centers.
- Local Highway Safety Improvement Program (HSIP) – Fund projects that achieve a significant reduction in fatalities and serious injuries on public roads.
- Local Partnership Program (LPP) – Funds projects that align with the state's climate and equity goals.
- Reconnecting Communities: Highways to Boulevards (RC:H2B) – Funds the conversion of key underutilized highways into multi-modal corridors to reconnect communities divided by transportation infrastructure.
- Solutions for Congested Corridors Program (SCCP) – Funds projects that achieve a balanced set of transportation, environmental, and community access improvements to reduce congestion throughout the state.

- Sustainable Transportation Planning Grants (STP) – Funds projects that reduce greenhouse gas (GHG) emissions, develop climate adaptation plans, and address statewide, interregional, or regional transportation deficiencies on the highway system.

Federal Funding Opportunities

- Rebuilding American Infrastructure with Sustainability and Equity (RAISE) – Funds projects that help communities build transportation projects that have significant local or regional impact and improve safety and equity.
- Rural Surface Transportation Grant (RSTG) – Funds projects that increase connectivity, improve the safety and reliability of the movement of people and freight, and generate regional economic growth and improve quality of life.
- Strengthening Mobility and Revolutionizing Transportation (SMRT) – Funds demonstration projects focused on advanced smart community technologies and systems to improve transportation efficiency and safety.
- Safe Streets and Roads for All (SS4A) – Funds initiatives to prevent roadway deaths and serious injuries.
- Areas of Persistent Poverty (AOPP) – Funds increased transit access for environmental justice populations, equity-focused community outreach and public engagement of underserved communities and adoption of equity-focused policies, reducing GHG, and addressing the effects of climate change.

Please contact me with any questions – Paul.

Table 1- Local, State, and Federal Funding Programs

Funding Program	Submittal Period	Eligible Phases /Costs	Match Requirement	Selection Criteria
Local Funding Sources				
Complete Streets Program	• October deadline	• Planning • Capital	12% match	Complete streets, DAC[1], community input, air quality improvements
State Funding Sources				

[1] Disadvantaged Communities

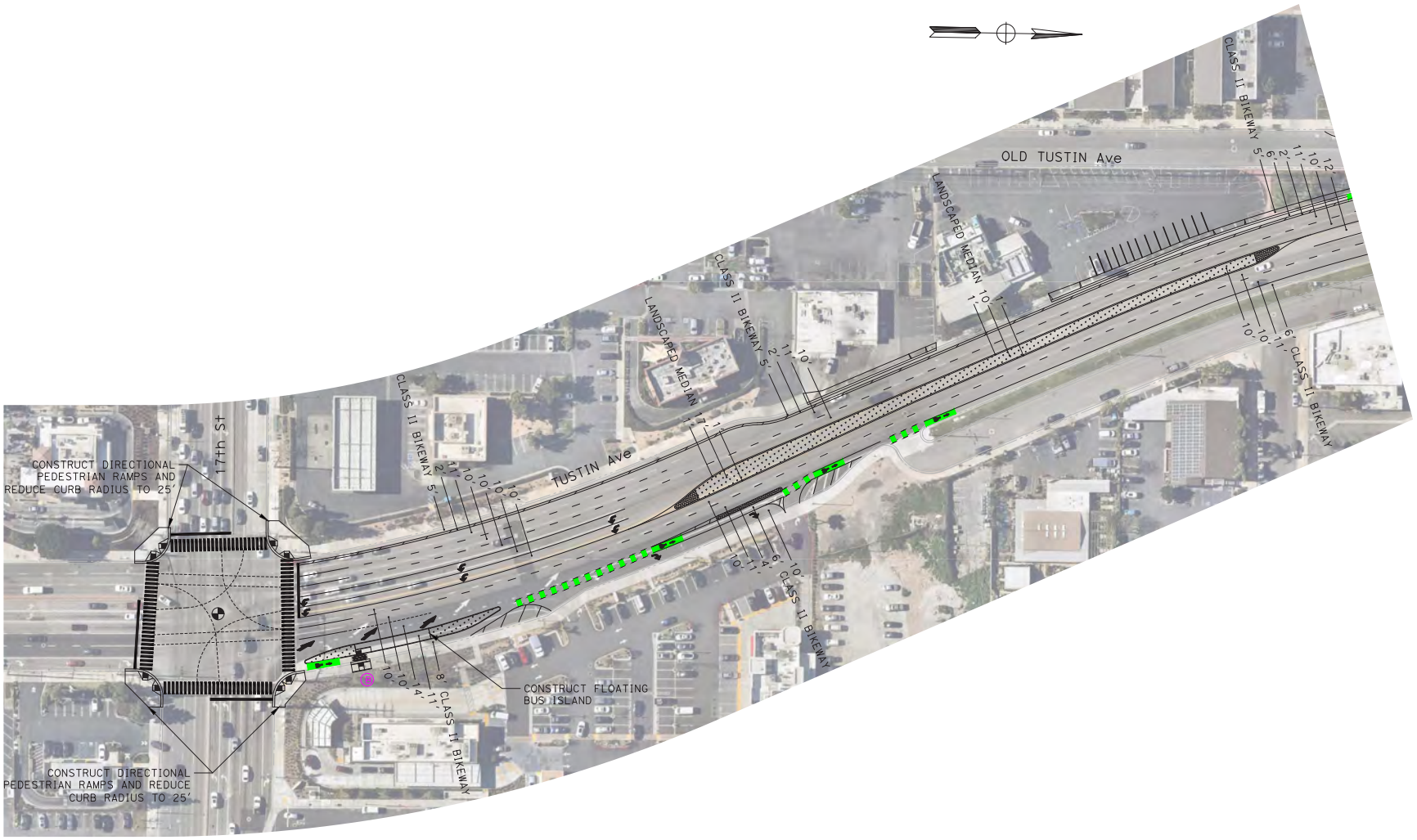
Funding Program	Submittal Period	Eligible Phases /Costs	Match Requirement	Selection Criteria
Active Transportation Program	• Call for projects in even years • Summer deadline	• PA&ED[2] • PS&E[3] • ROW[4] • CON[5]	No match requirement	DAC, safety, public participation in planning, transformative projects, evaluation, and sustainability
Clean California Local Grant Program	• April deadline	• PA&ED • PS&E • ROW • CON	0%-50% of project cost based on severity of disadvantaged	Partially or fully located in underserved community AND at least 75% of the population surrounding the project site must be underserved
Local Highway Safety Improvement Program	• Call for projects in even years • September deadline	• PE • ROW • CON	Reimbursement ratio depends on the project's countermeasures with maximums of 100%, 90%, or 50%	Benefit-Cost Ratio, funding set-asides
Local Partnership Program	• Call for projects in even years • November deadline	• CON	1:1 match	Accessibility, air quality and GHG, community engagement, safety, transportation, land use, and housing goals, VMT[6]
Reconnecting Communities: Highways to Boulevards	• Late summer/ early fall deadline	• PA&ED • PS&E • ROW • CON	No match requirement	DAC, mobility and community connectivity, community partnerships
Solutions for Congested Corridors Program	• Call for projects in even years • December deadline	• CON	No match requirement	Safety, congestion, accessibility Economic development, job creation, and retention, air pollution and GHG reductions, efficient land use

[2] Project Approval & Environmental Document
[3] Plans, Specifications, And Estimates
[4] Right-of-Way
[5] Construction
[6] Vehicle Miles Traveled

Funding Program	Submittal Period	Eligible Phases /Costs	Match Requirement	Selection Criteria
Sustainable Transportation Planning Grants	• Annual call for projects • March deadline	• Studies or Plans	11.47%-20% local match	GHG[7] reduction, DAC, housing, land use and transportation planning
Federal Funding Sources				
Rebuilding American Infrastructure with Sustainability and Equity	• Annual call for projects • February deadline	• Planning • Capital	Federal cost share may not exceed 80%	Safety, environmental sustainability, quality of life, mobility and community connectivity, economic competitiveness, partnership, innovation
Rural Surface Transportation Grant	• May deadline	• PA&ED • PS&E • ROW • CON	Federal cost share may not exceed 80%	Regional economic, mobility, or safety benefits
Strengthening Mobility and Revolutionizing Transportation	• November deadline	• PA&ED • PS&E • ROW • CON	No match requirement	Safety and reliability, resiliency, equity and access, climate, partnerships, integration
Safe Streets and Roads for All	• September deadline	• Planning • Implementation	20% local match	DAC, Safety
Areas of Persistent Poverty	• March deadline	• Planning • Engineering • Development of technical or financial plans	Minimum federal share is 90% of total project cost	DAC

[7] Greenhouse Gas

Attachment A – Engineering Concepts



LEGEND:

- BUS STOP LOCATION
- EXISTING TRAFFIC SIGNAL
- PROPOSED TRAFFIC SIGNAL
- PROPOSED RECTANGULAR RAPID FLASHING BEACON
- TEXTURED PAVEMENT
- LANDSCAPING
- HARDENED CENTERLINE

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 1 OF 3

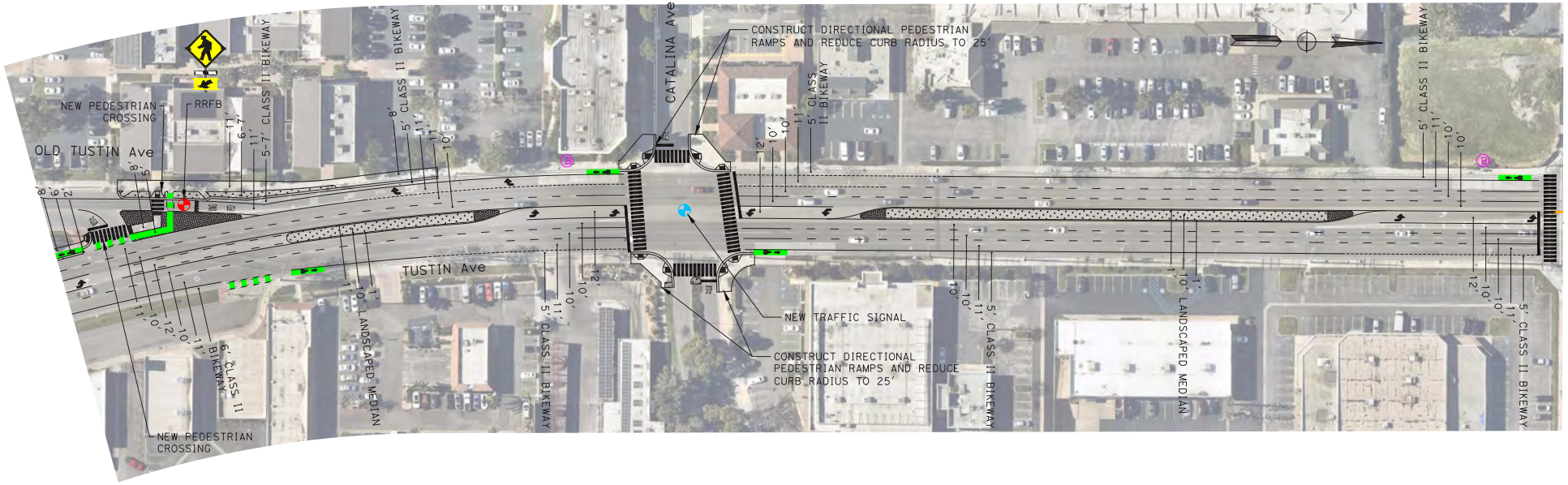
SCALE: 1" = 50'

SANTA ANA VISION ZERO - TUSTIN Ave

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS



LEGEND:

- BUS STOP LOCATION
- EXISTING TRAFFIC SIGNAL
- PROPOSED TRAFFIC SIGNAL
- PROPOSED RECTANGULAR RAPID FLASHING BEACON
- TEXTURED PAVEMENT
- LANDSCAPING
- HARDENED CENTERLINE

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 2 OF 3

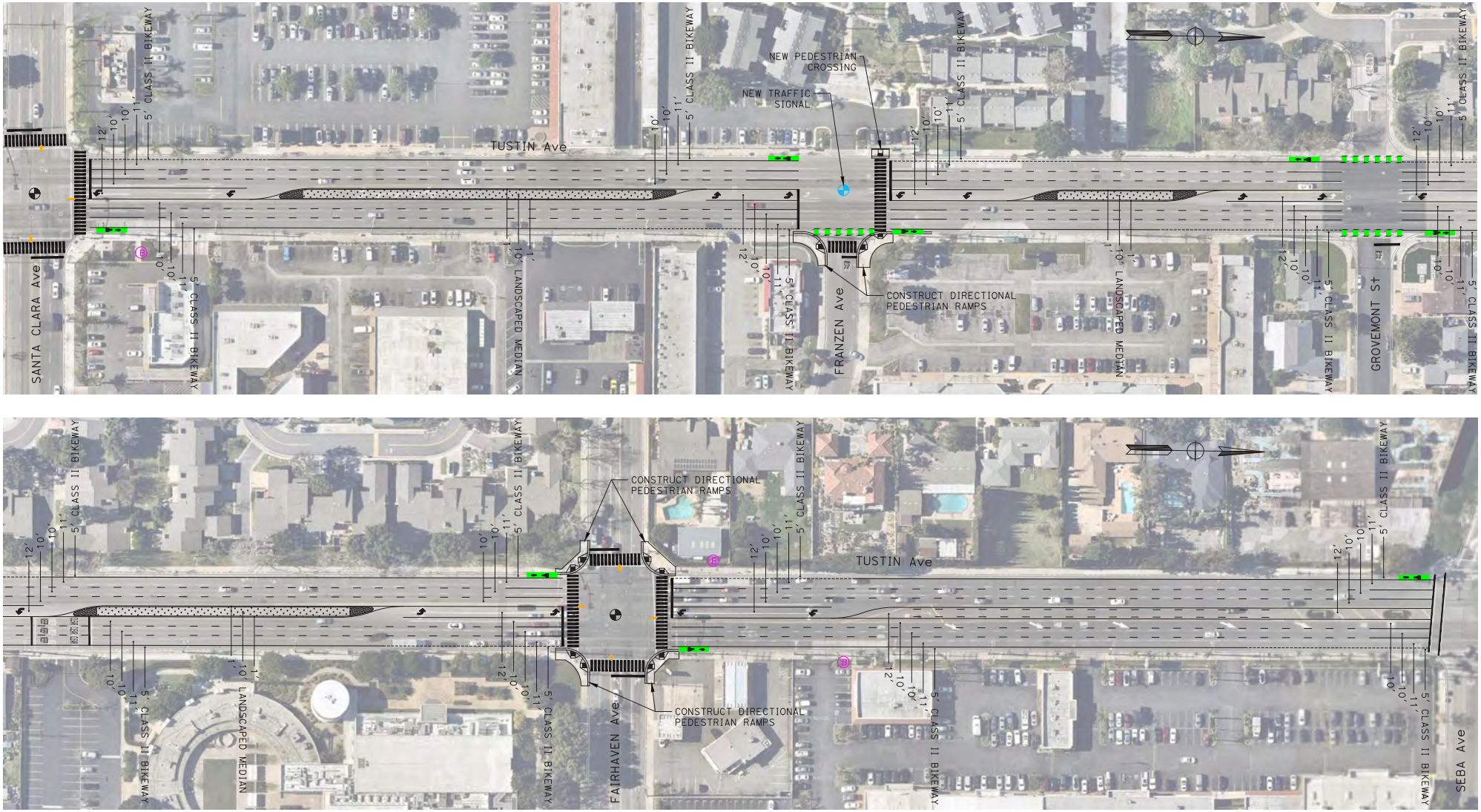
SCALE: 1" = 50'

SANTA ANA VISION ZERO - TUSTIN Ave

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS



LEGEND:

- Ⓑ BUS STOP LOCATION
- EXISTING TRAFFIC SIGNAL
- PROPOSED TRAFFIC SIGNAL
- PROPOSED RECTANGULAR RAPID FLASHING BEACON
- TEXTURED PAVEMENT
- LANDSCAPING
- HARDENED CENTERLINE

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 3 OF 3

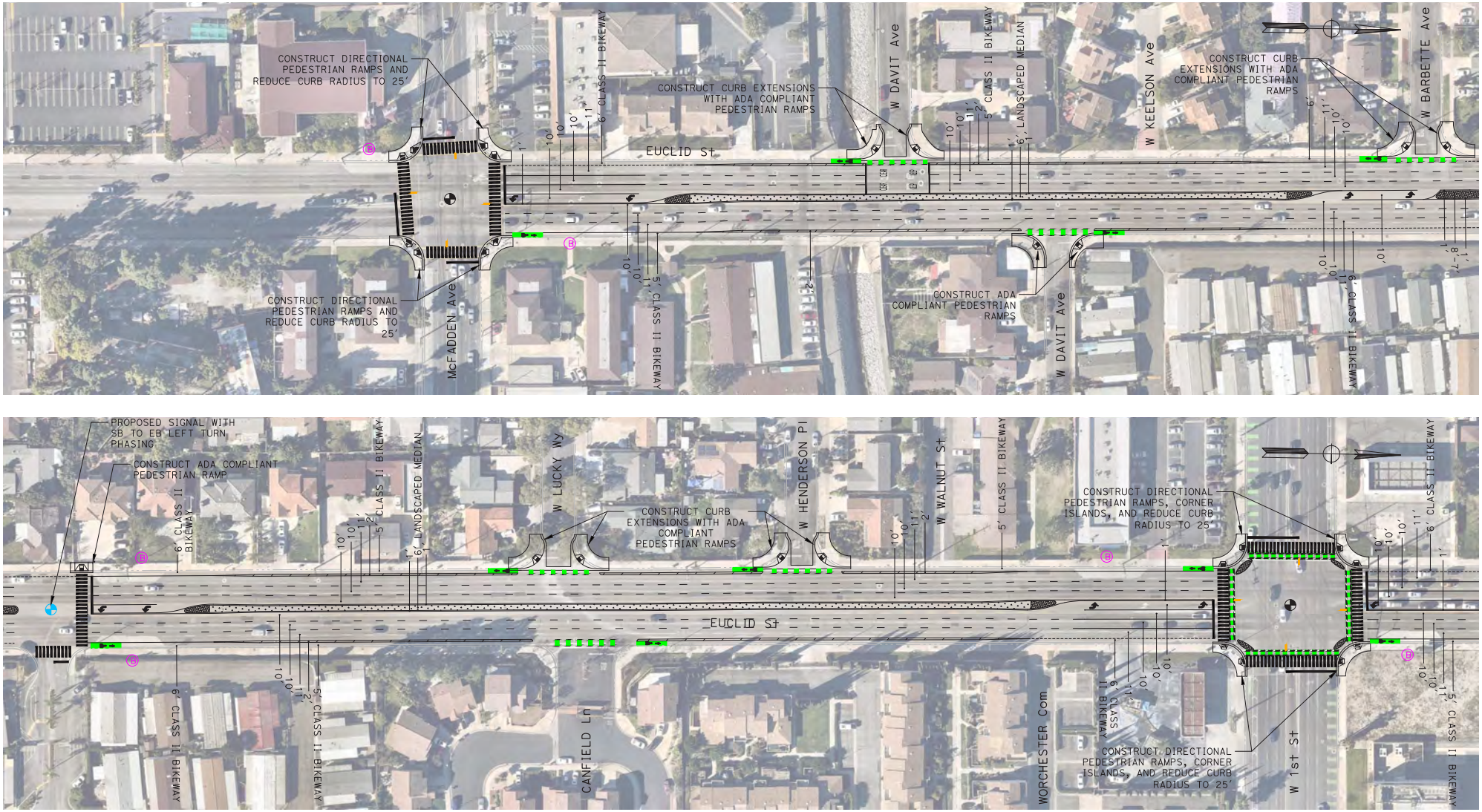
SCALE: 1" = 50'

SANTA ANA VISION ZERO - TUSTIN Ave

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS



LEGEND:

- EXISTING SIGNAL
- BUS STOP LOCATION
- PROPOSED SIGNAL
- TEXTURED PAVEMENT
- LANDSCAPING
- HARDENED CENTERLINE

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 1 OF 2

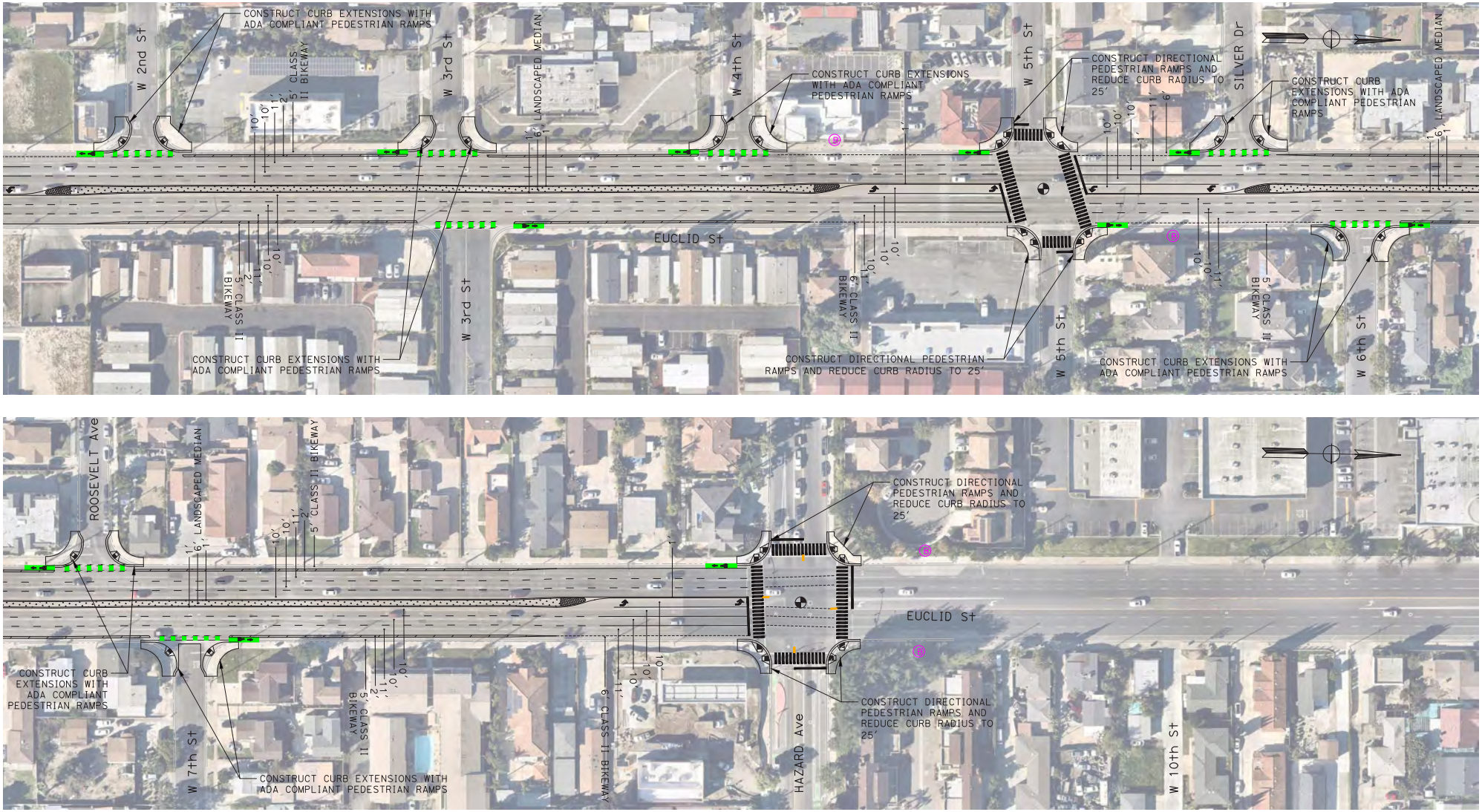
SCALE: 1" = 50'

SANTA ANA VISION ZERO - EUCLID St

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS



LEGEND:

- EXISTING SIGNAL
- BUS STOP LOCATION
- PROPOSED SIGNAL
- TEXTURED PAVEMENT
- LANDSCAPING
- HARDENED CENTERLINE

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 2 OF 2

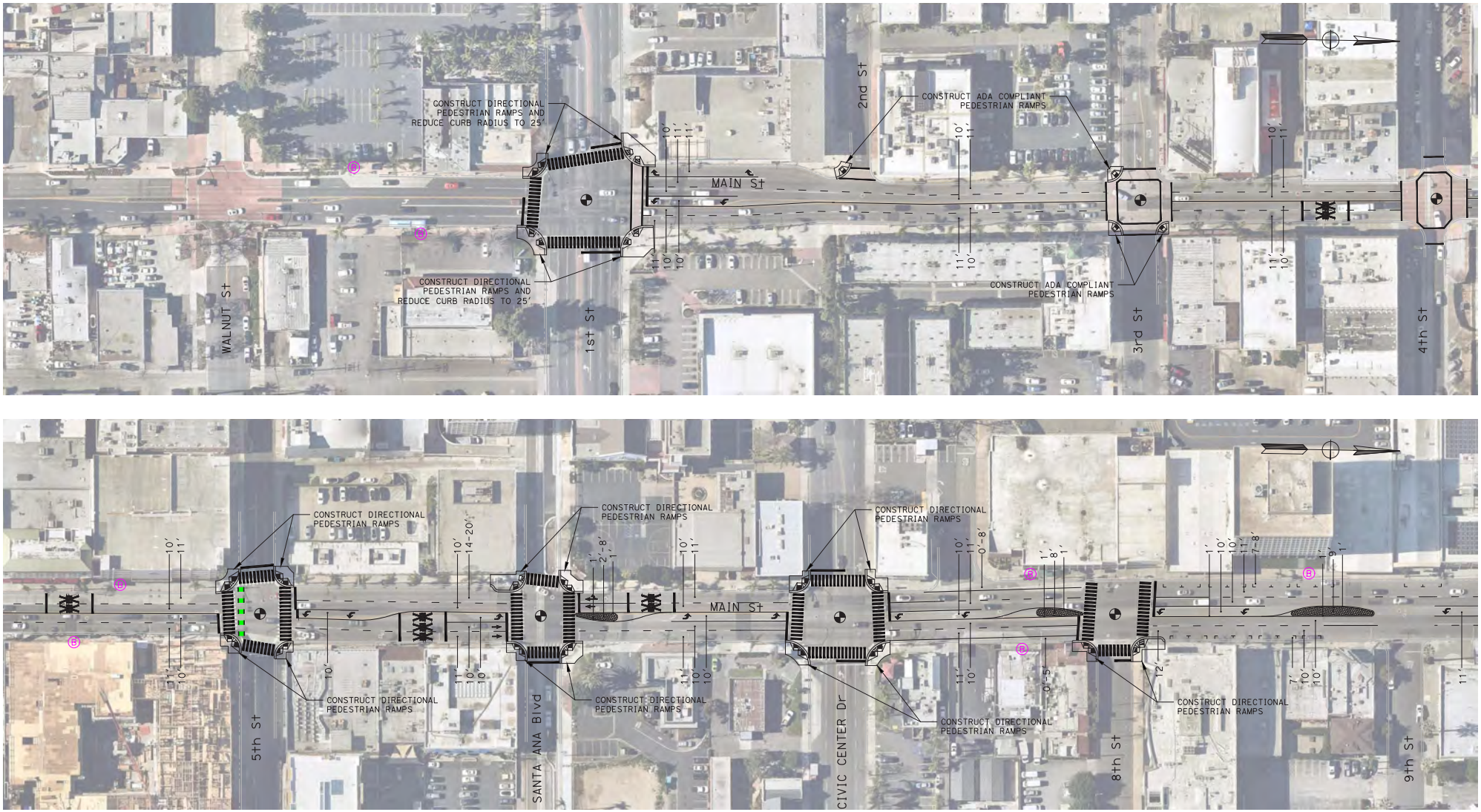
SCALE: 1" = 50'

SANTA ANA VISION ZERO - EUCLID St

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS



LEGEND:

- EXISTING SIGNAL
- BUS STOP LOCATION
- TEXTURED PAVEMENT
- LANDSCAPING

NOTE:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.

Santa Ana VISION ZERO

PAGE 1 OF 2

SCALE: 1" = 50'

SANTA ANA VISION ZERO - MAIN St

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS

LEGEND:

- EXISTING SIGNAL
- BUS STOP LOCATION
- TEXTURED PAVEMENT
- LANDSCAPING

NOTE:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.

Santa Ana VISION ZERO

PAGE 2 OF 2

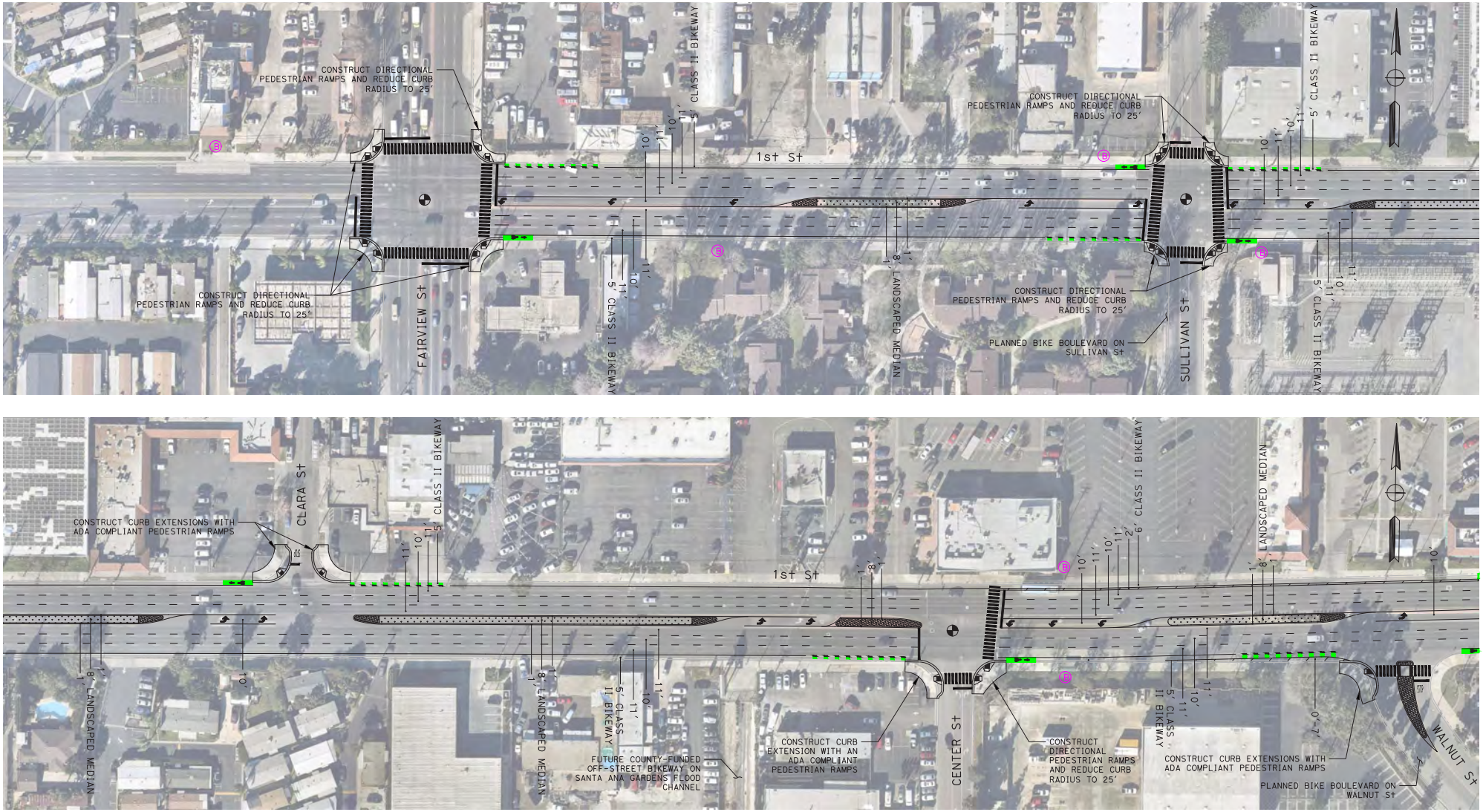
SCALE: 1" = 50'

SANTA ANA VISION ZERO - MAIN St

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS



LEGEND:

- EXISTING SIGNAL
- BUS STOP LOCATION
- HARDENED CENTERLINE
- TEXTURED PAVEMENT
- LANDSCAPING

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

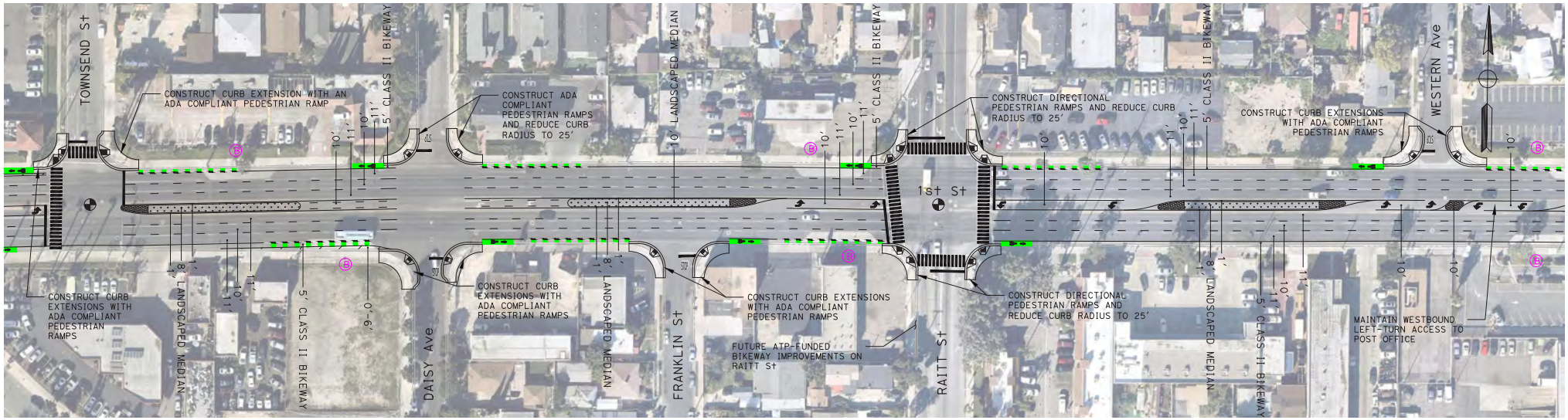
PAGE 1 OF 3

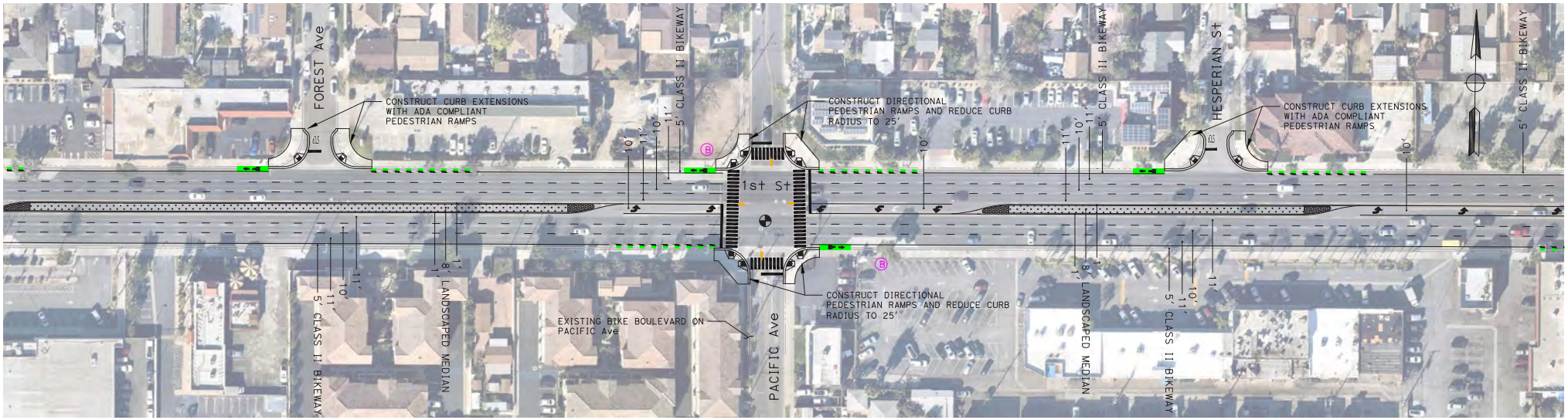
SCALE: 1" = 50'

SANTA ANA VISION ZERO - 1st St
CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS





LEGEND:

- EXISTING SIGNAL
- BUS STOP LOCATION
- HARDENED CENTERLINE
- TEXTURED PAVEMENT
- LANDSCAPING

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 2 OF 3

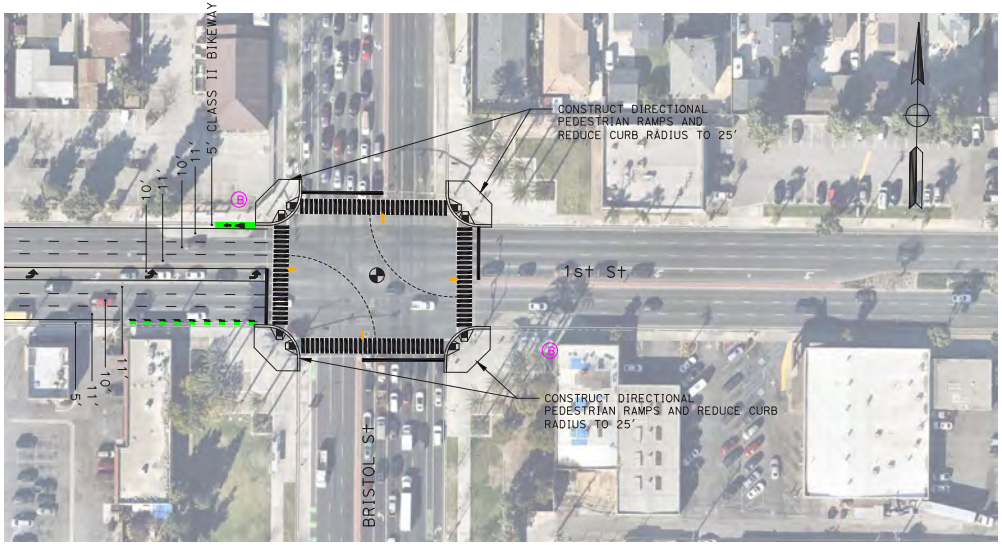
SCALE: 1" = 50'

SANTA ANA VISION ZERO - 1st St

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS



LEGEND:

- EXISTING SIGNAL
- BUS STOP LOCATION
- HARDENED CENTERLINE
- TEXTURED PAVEMENT
- LANDSCAPING

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 3 OF 3

SCALE: 1" = 50'

SANTA ANA VISION ZERO - 1st St

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS

LEGEND:

- EXISTING SIGNAL
- TEXTURED PAVEMENT
- LANDSCAPING
- HARDENED CENTERLINE
- BIKEWAY DELINEATORS

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II & IV BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 1 OF 2

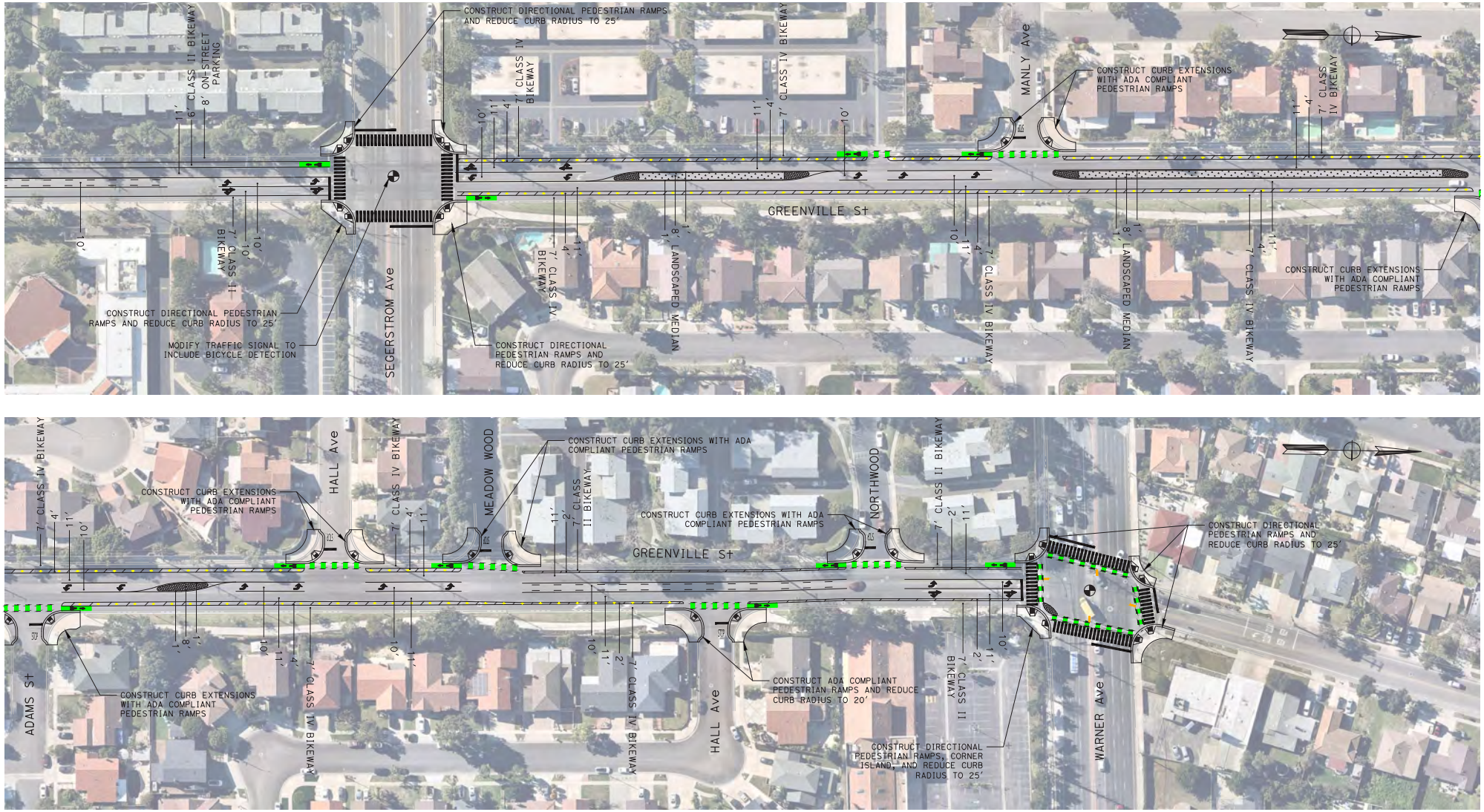
SCALE: 1" = 50'

SANTA ANA VISION ZERO - GREENVILLE St

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS



LEGEND:

- EXISTING SIGNAL
- TEXTURED PAVEMENT
- LANDSCAPING
- HARDENED CENTERLINE
- BIKEWAY DELINEATORS

NOTES:

1. ALL IMPROVEMENTS SUBJECT TO FURTHER EVALUATION.
2. CLASS II & IV BIKEWAYS PROPOSED THROUGH PROJECT LIMITS.

Santa Ana VISION ZERO

PAGE 2 OF 2

SCALE: 1" = 50'

SANTA ANA VISION ZERO - GREENVILLE St

CONCEPT PLANS

CITY OF SANTA ANA

MARK THOMAS

Attachment B – Cost Estimates

Santa Ana Vision Zero

Tustin Ave (17th St to Fairhaven Ave)

(Corridor Safety Enhancements including: Median Islands, Bike Lanes, Bike Crossings, Curb Extensions, Directional Curb Ramps, Sidewalk Extensions and Bus Stop improvements)

MARK THOMAS

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)*
TOTAL CONSTRUCTION COST		$ 7,210,000	$ 8,770,000
TOTAL RIGHT OF WAY COST		$ 300,000	$ 370,000
TOTAL CAPITAL OUTLAY COSTS		**$ 7,510,000**	**$ 9,140,000**
DESIGN	PA/ED (12.5%)	$ 940,000	$ 1,150,000
DESIGN	PS&E (17.5%)	$ 1,320,000	$ 1,610,000
DESIGN	RIGHT OF WAY (2%)	$ 160,000	$ 200,000
CM	CONSTRUCTION (19%)	$ 1,430,000	$ 1,740,000
TOTAL DELIVERY COST		**$ 3,850,000**	**$ 4,700,000**
TOTAL PROJECT COST		**$ 11,400,000**	**$ 13,850,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana Vision Zero

Tustin Ave (17th St to Fairhaven Ave)

(Feasibility Opinion of Probable Cost)

MARK THOMAS

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	34	$ 8,000	$272,000
2	Install Concrete - Median Curb	CY	222	$ 1,230	$273,060
3	Install Concrete - Curb and Gutter	CY	109	$ 1,040	$113,360
4	Install Concrete - Sidewalk	CY	156	$ 850	$132,600
5	Install Concrete - Driveway	CY	12	$ 850	$10,200
6	Install Concrete - Textured Pavment	CY	109	$ 890	$97,010
7	Roadway Excavation	CY	5045	$ 110	$554,950
8	Remove Concrete	CY	429	$ 340	$145,860
9	Hot Mix Asphalt	TON	557	$ 140	$77,980
10	Base Repair (HMA)****	TON	1910	$ 140	$267,400
11	Slurry	TON	470	$ 600	$282,000
12	CL2 Aggregate Base	CY	2068	$ 130	$268,840
13	Signing and Striping	LS	1	$ 113,600	$113,600
14	Centerline Hardening	EA	8	$ 5,000	$40,000
15	Landscape	SF	23243	$ 8	$185,944
ELECTRICAL					
16	New Signal	EA	2	$600,000	$1,200,000
17	Signal Modifications	EA	2	$250,000	$500,000
18	RRFB System	EA	1	$45,000	$45,000
				SUBTOTAL	**$4,579,804**
19	Minor Items (10% of Items 1-18) *	LS	1	$458,000	$458,000
				SUBTOTAL	**$5,037,804**
20	Mobilization (10% of Items 1-19)	LS	1	$504,000	$504,000
				SUBTOTAL	**$5,541,804**
				CONTINGENCY (30%) **	$1,662,600
				CONSTRUCTION SUBTOTAL	$7,204,404
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$7,204,404**
				Right of Way/Temporary Construction Easement*=	**$300,000**
				GRAND TOTAL=	**$7,504,404**

* Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

** This feasibility level estimate includes a 30% contingency intended to compensate for the use of preliminary and limited information.

*** Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location. An additional $150K of ROW acquisition and roadway easment is estimated for the sidewalk extension.

**** Assumes 8% of project area reicieving Slurry Seal treatment will require Base Repair.

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

1st St (Fairview St to Bristol St)

(Corridor Safety Enhancements including: Median Islands, Curb Extensions, Directional Curb Ramps, Bike Lanes, and Bike Crossings)

MARK THOMAS

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)*
	TOTAL CONSTRUCTION COST	$ 5,400,000	$ 6,570,000
	TOTAL RIGHT OF WAY COST	$ 390,000	$ 480,000
	TOTAL CAPITAL OUTLAY COSTS	**$ 5,790,000**	**$ 7,050,000**
DESIGN	PA/ED (12.5%)	$ 730,000	$ 890,000
DESIGN	PS&E (17.5%)	$ 1,020,000	$ 1,250,000
DESIGN	RIGHT OF WAY (2%)	$ 120,000	$ 150,000
CM	CONSTRUCTION (19%)	$ 1,110,000	$ 1,360,000
	TOTAL DELIVERY COST	**$ 2,980,000**	**$ 3,650,000**
	TOTAL PROJECT COST	**$ 8,800,000**	**$ 10,700,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana Vision Zero

1st St (Fairview St to Bristol St)

(Feasibility Opinion of Probable Cost)

MARK THOMAS

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	63	$ 8,000	$504,000
2	Install Concrete - Median Curb	CY	227	$ 1,230	$279,210
3	Install Concrete - Curb and Gutter	CY	142	$ 1,040	$147,680
4	Install Concrete - Sidewalk	CY	277	$ 850	$235,450
5	Install Concrete - Textured Pavment	CY	129	$ 890	$114,810
6	Roadway Excavation	CY	4355	$ 110	$479,050
7	Remove Concrete	CY	846	$ 340	$287,640
8	Hot Mix Asphalt	TON	608	$ 140	$85,120
9	Base Repair (HMA)****	TON	2059	$ 140	$288,260
10	Slurry	TON	507	$ 600	$304,200
11	CL2 Aggregate Base	CY	1958	$ 130	$254,540
12	Signing and Striping	LS	1	$ 110,700	$110,700
13	Centerline Hardening	EA	8	$ 5,000	$40,000
14	Landscape	SF	17616	$ 8	$140,928
DRAINAGE					
15	Minor Drainage	EA	8	$20,000	$160,000
				SUBTOTAL	**$3,431,588**
16	Minor Items (10% of Items 1-15) *	LS	1	$344,000	$344,000
				SUBTOTAL	**$3,775,588**
17	Mobilization (10% of Items 1-16)	LS	1	$378,000	$378,000
				SUBTOTAL	**$4,153,588**
				CONTINGENCY (30%) **	$1,246,100
				CONSTRUCTION SUBTOTAL	$5,399,688
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$5,399,688**
				Right of Way/Temporary Construction Easement*=**	**$390,000**
				GRAND TOTAL=	**$5,789,688**

* Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

** This feasibility level estimate includes a 30% contingency intended to compensate for the use of preliminary and limited information.

*** Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

**** Assumes 8% of project area reicieving Slurry Seal treatment will require Base Repair.

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Euclid St (Hazard Ave to McFadden Ave)

(Corridor Safety Enhancements including: Median Islands, Bike Lanes, Bike Crossings, Curb Extensions, Directional Curb Ramps and Protected Corners)

MARK THOMAS

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)*
	TOTAL CONSTRUCTION COST	$ 8,230,000	$ 10,010,000
	TOTAL RIGHT OF WAY COST	$ 410,000	$ 498,828
	TOTAL CAPITAL OUTLAY COSTS	**$ 8,640,000**	**$ 10,509,000**
DESIGN	PA/ED (12.5%)	$ 1,080,000	$ 1,320,000
DESIGN	PS&E (17.5%)	$ 1,520,000	$ 1,850,000
	RIGHT OF WAY (2%)	$ 180,000	$ 220,000
CM	CONSTRUCTION (19%)	$ 1,650,000	$ 2,010,000
	TOTAL DELIVERY COST	**$ 4,430,000**	**$ 5,400,000**
	TOTAL PROJECT COST	**$ 13,100,000**	**$ 15,950,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana Vision Zero

Euclid St (Hazard Ave to McFadden Ave)

(Feasibility Opinion of Probable Cost)

MARK THOMAS

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	57	$ 8,000	$456,000
2	Install Concrete - Median Curb	CY	281	$ 1,230	$345,630
3	Install Concrete - Curb and Gutter	CY	153	$ 1,040	$159,120
4	Install Concrete - Sidewalk	CY	293	$ 850	$249,050
5	Install Concrete - Textured Pavment	CY	69	$ 890	$61,410
6	Cold Plane	SQYD	47822	$ 6	$286,929
7	Roadway Excavation	CY	3773	$ 110	$415,030
8	Remove Concrete	CY	612	$ 340	$208,080
9	Hot Mix Asphalt	TON	11485	$ 140	$1,607,900
10	CL2 Aggregate Base	CY	2186	$ 130	$284,180
11	Signing and Striping	LS	1	$ 93,700	$93,700
12	Centerline Hardening	EA	12	$ 5,000	$60,000
13	Landscape	SF	20174	$ 8	$161,392
ELECTRICAL					
14	New Signal	EA	1	$600,000	$600,000
				SUBTOTAL	**$4,988,421**
DRAINAGE					
15	Minor Drainage	EA	12	$20,000	$240,000
				SUBTOTAL	**$5,228,421**
16	Minor Items (10% of Items 1-15) *	LS	1	$523,000	$523,000
				SUBTOTAL	**$5,751,421**
17	Mobilization (10% of Items 1-16)	LS	1	$576,000	$576,000
				SUBTOTAL	**$6,327,421**
				CONTINGENCY (30%) **	$1,898,300
				CONSTRUCTION SUBTOTAL	$8,225,721
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$8,225,721**
				Right of Way/Temporary Construction Easement*=**	**$410,000**
				GRAND TOTAL=	**$8,635,721**

* Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

** This feasibility level estimate includes a 30% contingency intended to compensate for the use of preliminary and limited information.

*** Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Greenville St (MacArthur Blvd to Warner Ave)

MARK THOMAS

(Corridor Safety Enhancements including: Median Islands, Class II/III/IV Bikeways, Bike Crossings, Curb Extensions, Directional Curb Ramps, Railroad improvemnts and a Lane reduction)

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)*
TOTAL CONSTRUCTION COST		$ 7,020,000	$ 8,530,000
TOTAL RIGHT OF WAY COST		$ 390,000	$ 474,495
TOTAL CAPITAL OUTLAY COSTS		**$ 7,410,000**	**$ 9,005,000**
DESIGN	PA/ED (12.5%)	$ 930,000	$ 1,140,000
DESIGN	PS&E (17.5%)	$ 1,300,000	$ 1,590,000
DESIGN	RIGHT OF WAY (2%)	$ 150,000	$ 190,000
CM	CONSTRUCTION (19%)	$ 1,410,000	$ 1,720,000
TOTAL DELIVERY COST		**$ 3,790,000**	**$ 4,640,000**
TOTAL PROJECT COST		**$ 11,200,000**	**$ 13,650,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana Vision Zero

Greenville St (MacArthur Blvd to Warner Ave)

(Feasibility Opinion of Probable Cost)

MARK THOMAS

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	52	$ 8,000	$416,000
2	Install Concrete - Median Curb	CY	131	$ 1,230	$161,130
3	Install Concrete - Curb and Gutter	CY	135	$ 1,040	$140,400
4	Install Concrete - Sidewalk	CY	250	$ 850	$212,500
5	Install Concrete - Driveway	CY	6	$ 850	$5,100
6	Install Concrete - Textured Pavment	CY	76	$ 890	$67,640
7	Cold Plane	SQYD	13347	$ 6	$80,082
8	Roadway Excavation	CY	2354	$ 110	$258,940
9	Remove Concrete	CY	496	$ 340	$168,640
10	Hot Mix Asphalt	TON	3420	$ 140	$478,800
11	Base Repair (HMA)****	TON	741	$ 140	$103,740
12	Slurry	TON	183	$ 600	$109,800
13	CL2 Aggregate Base	CY	1005	$ 130	$130,650
14	Signing and Striping	LS	1	$ 50,800	$50,800
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Bikeway Delineators	EA	181	$ 225	$40,725
17	Landscape	SF	10134	$ 8	$81,072
18	Railroad Improvement	LS	1	$ 1,000,000	$1,000,000
ELECTRICAL					
19	Signal Modification	EA	3	$250,000	$750,000
				SUBTOTAL	**$4,276,019**
DRAINAGE					
20	Minor Drainage	EA	9	$20,000	$180,000
				SUBTOTAL	**$4,456,019**
21	Minor Items (10% of Items 1-20) *	LS	1	$446,000	$446,000
				SUBTOTAL	**$4,902,019**
22	Mobilization (10% of Items 1-21)	LS	1	$491,000	$491,000
				SUBTOTAL	**$5,393,019**
				CONTINGENCY (30%) **	$1,618,000
				CONSTRUCTION SUBTOTAL	$7,011,019
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$7,011,019**
				Right of Way/Temporary Construction Easement*=**	**$390,000**
				GRAND TOTAL=	**$7,401,019**

* Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

** This feasibility level estimate includes a 30% contingency intended to compensate for the use of preliminary and limited information.

*** Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location. An additional $50K of ROW acquisition and roadway easment is estimated for the sidewalk extension.

**** Assumes 8% of project area reicieving Slurry Seal treatment will require Base Repair.

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Main St (1st St to 17th St)

(Corridor Safety Enhancements including: Median Islands, Curb Extensions, and Directional Curb Ramps)

MARK THOMAS

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost	Escalated Cost (2028)*
TOTAL CONSTRUCTION COST		$ 4,890,000	$ 5,950,000
TOTAL RIGHT OF WAY COST		$ 370,000	$ 460,000
TOTAL CAPITAL OUTLAY COSTS		**$ 5,260,000**	**$ 6,410,000**
DESIGN	PA/ED (12.5%)	$ 660,000	$ 810,000
DESIGN	PS&E (17.5%)	$ 930,000	$ 1,140,000
DESIGN	RIGHT OF WAY (2%)	$ 110,000	$ 140,000
CM	CONSTRUCTION (19%)	$ 1,000,000	$ 1,220,000
TOTAL DELIVERY COST		**$ 2,700,000**	**$ 3,310,000**
TOTAL PROJECT COST		**$ 8,000,000**	**$ 9,750,000**

* Assumes escalation of 4% per year. No Adjustments in escalation for time between design and construction were made.

Santa Ana Vision Zero
Main St (1st St to 17th St)
(Feasibility Opinion of Probable Cost)

MARK THOMAS

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	72	$ 8,000.00	$576,000
2	Install Concrete - Median Curb	CY	119	$ 1,230.00	$146,370
3	Install Concrete - Curb and Gutter	CY	98	$ 1,040.00	$101,920
4	Install Concrete - Sidewalk	CY	152	$ 850.00	$129,200
5	Install Concrete - Textured Pavment	CY	102	$ 890.00	$90,780
6	Cold Plane	SQYD	35145	$ 6	$210,867
7	Roadway Excavation	CY	1771	$ 110.00	$194,810
8	Remove Concrete	CY	449	$ 340.00	$152,660
9	Hot Mix Asphalt	TON	8256	$ 140.00	$1,155,840
10	CL2 Aggregate Base	CY	1048	$ 130.00	$136,240
11	Signing and Striping	LS	1	$ 79,700.00	$79,700
12	Landscape	SF	8948	$ 8.00	$71,584
DRAINAGE					
13	Minor Drainage	EA	3	$20,000	$60,000
				SUBTOTAL	**$3,105,971**
14	Minor Items (10% of Items 1-13) *	LS	1	$311,000	$311,000
				SUBTOTAL	**$3,416,971**
15	Mobilization (10% of Items 1-14)	LS	1	$342,000	$342,000
				SUBTOTAL	**$3,758,971**
				CONTINGENCY (30%) **	$1,127,700
				CONSTRUCTION SUBTOTAL	$4,886,671
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$4,886,671**
				Right of Way/Temporary Construction Easement*=**	**$370,000**
				GRAND TOTAL=	**$5,256,671**

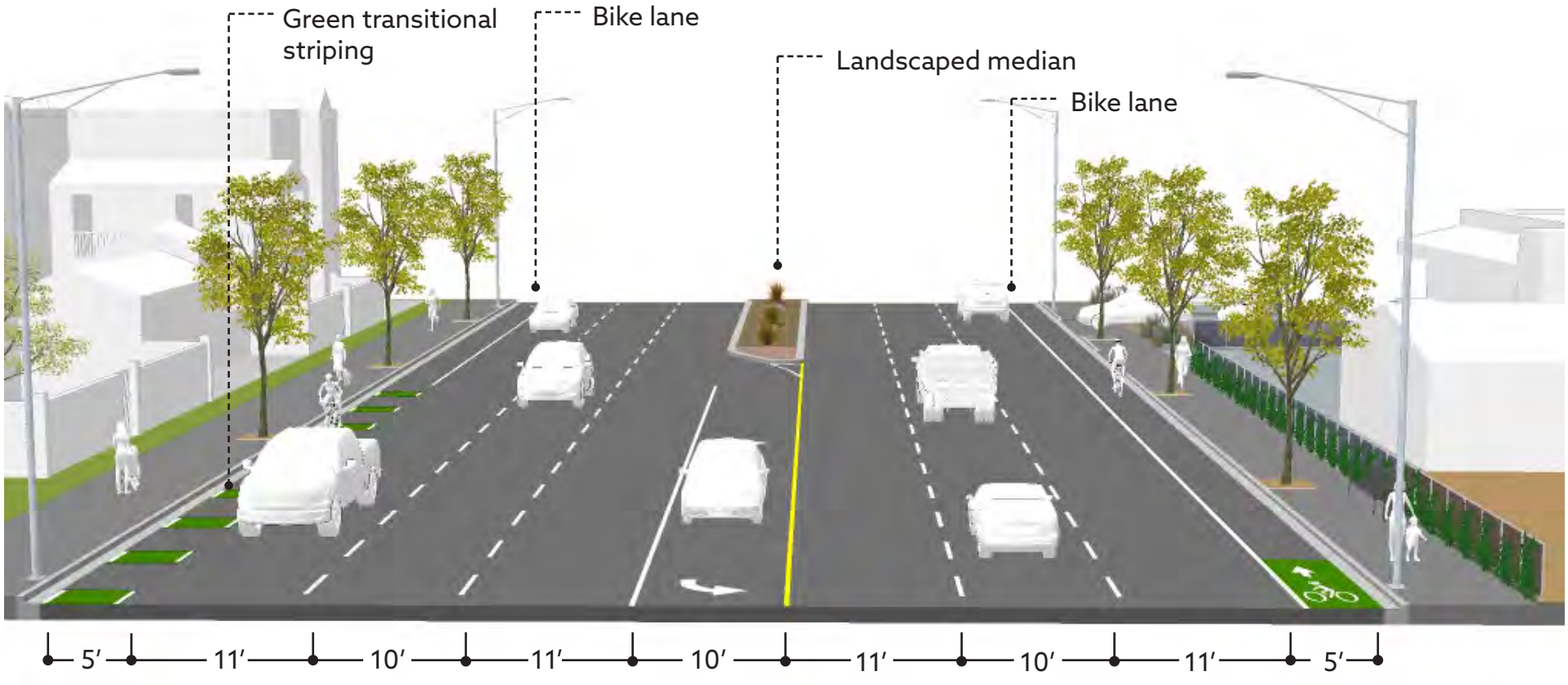
* Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

** This feasibility level estimate includes a 30% contingency intended to compensate for the use of preliminary and limited information.

*** Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

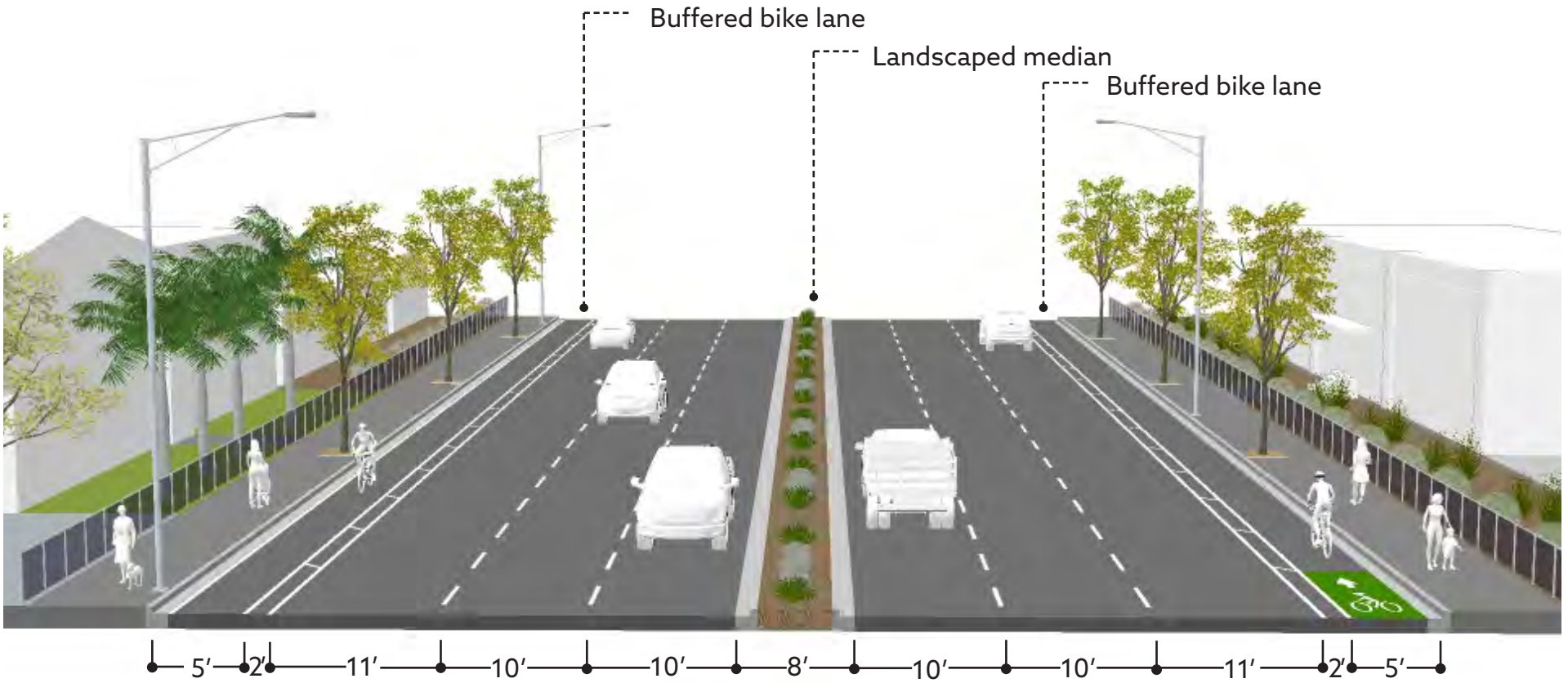
General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Attachment C – Project Renderings



SCALE: 1″= 50′

SAVZ Corridor - 1st Street between Forest Avenue and Pacific Avenue

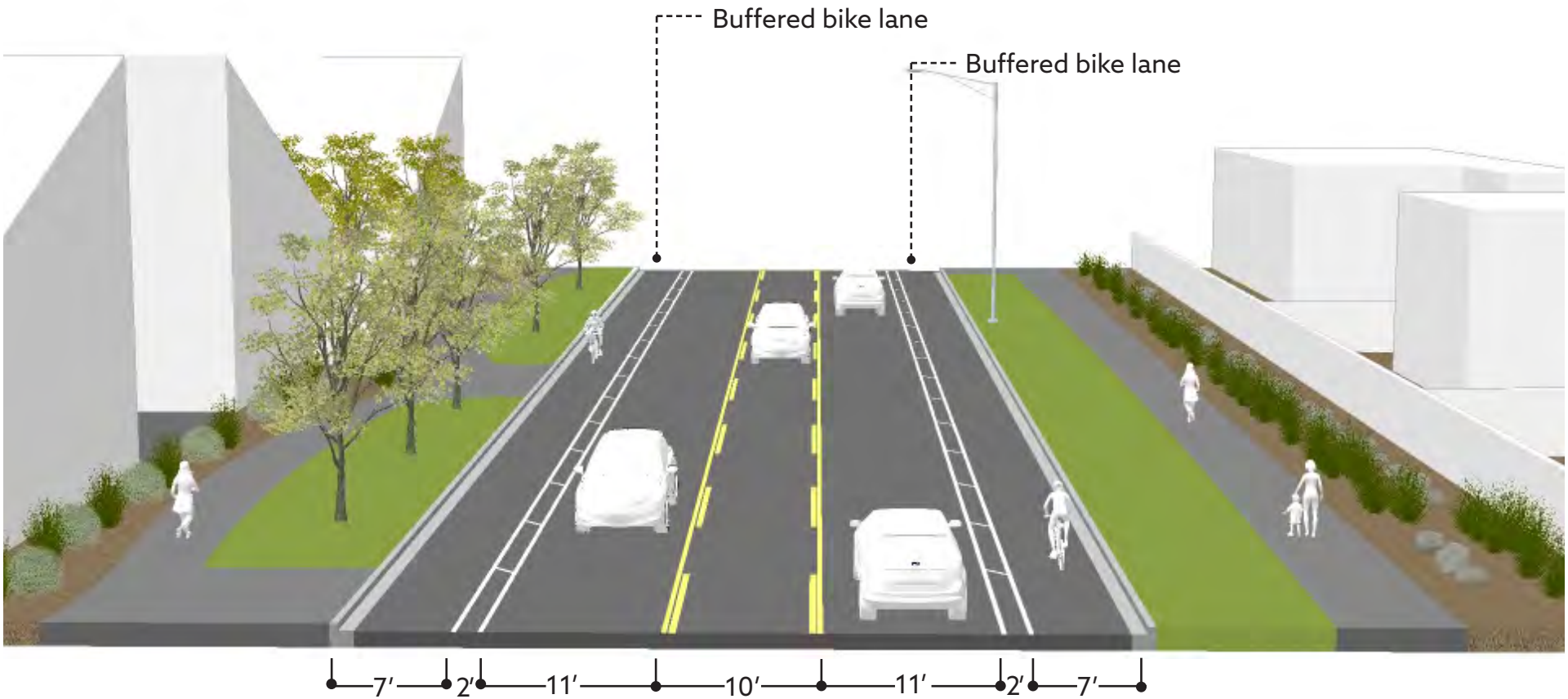


Santa Ana VISION ZERO

SANTA ANA

SCALE: 1″= 50′

SAVZ Corridor - Euclid Street between West 2nd Street and West 3rd Street



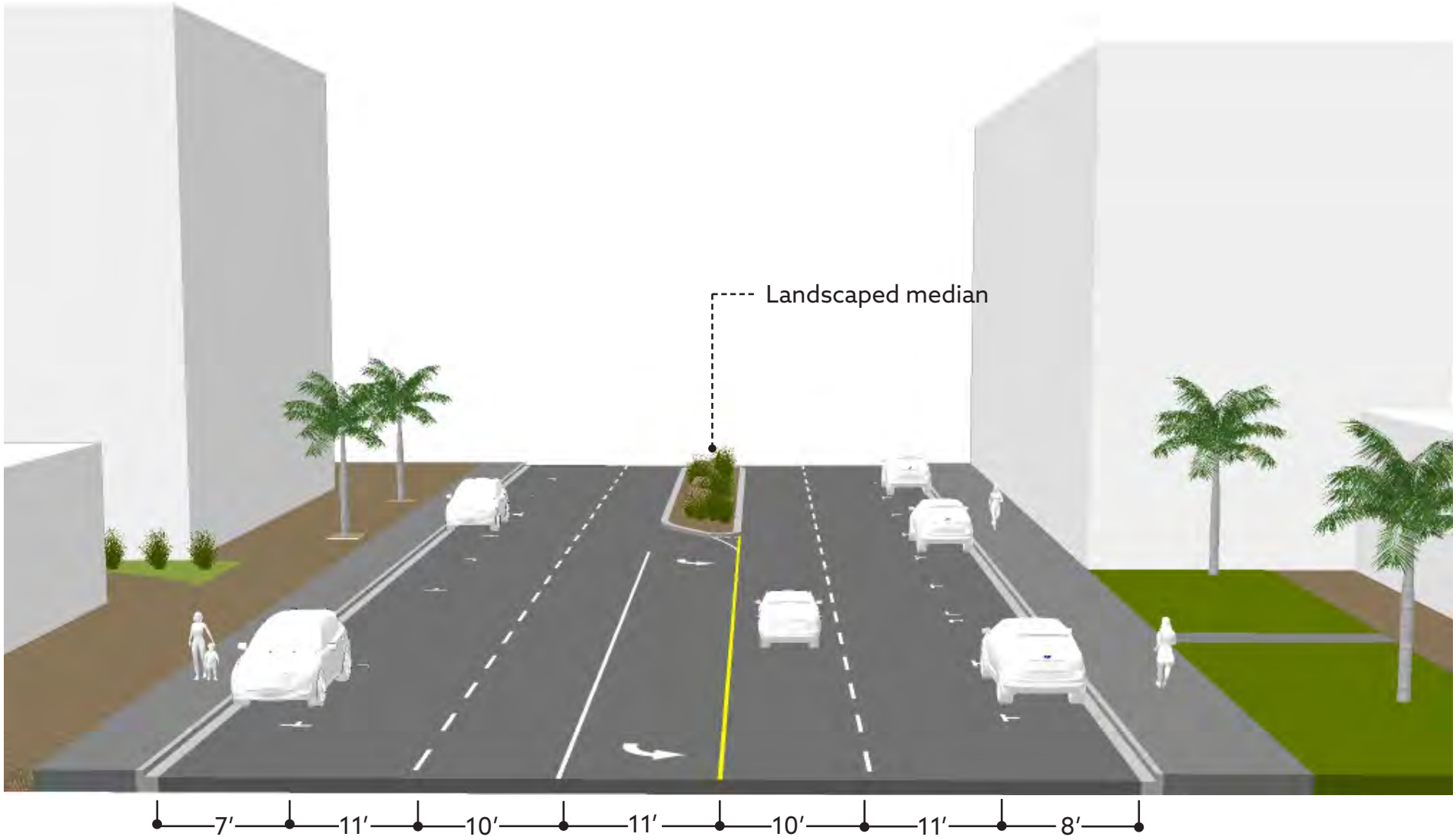
N

Santa Ana
VISION ZERO

SANTA ANA

SCALE: 1″= 50′

SAVZ Corridor - Greenville Street between Meadowwood and Hall Avenue



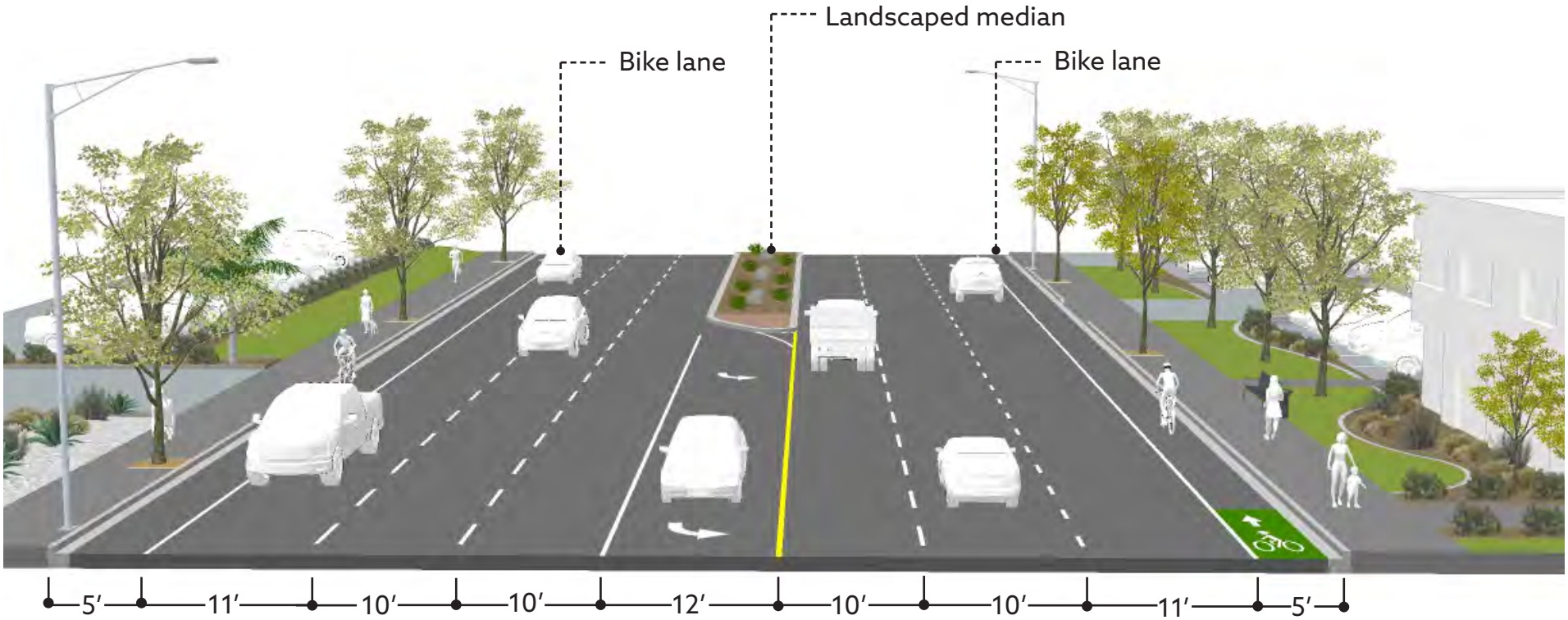
N

Santa Ana VISION ZERO

SANTA ANA

SCALE: 1″= 50′

SAVZ Corridor - Main Street between 10th Street and 11th Street



SCALE: 1″= 50′

SAVZ Corridor - Tustin Avenue north of Catalina Avenue

Appendix E. Cost Estimates for Projects 6-20

Santa Ana Vision Zero

Grand Ave from Century HS to Edinger Ave

MARK THOMAS

(Corridor Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class IV Bike Lanes, Continuous Sidewalks, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	12	$ 8,000	$96,000
2	Install Concrete - Median Curb	CY	15	$ 1,500	$22,500
3	Install Concrete - Truck Apron Curb	CY	21	$ 1,500	$31,500
4	Install Concrete - Curb and Gutter	CY	194	$ 1,080	$209,520
5	Install Concrete - Sidewalk	CY	75	$ 1,040	$78,000
6	Install Concrete - Driveway	CY	150	$ 1,040	$155,897
7	Install Concrete - Textured Pavment	CY	94	$ 1,130	$106,220
8	Install Concrete - Truck Apron	CY	33	$ 1,860	$61,380
9	Roadway Excavation	CY	1381	$ 260	$359,135
10	Remove Concrete	CY	750	$ 400	$299,933
11	Hot Mix Asphalt	TON	295	$ 345	$101,775
12	Slurry	TON	135	$ 790	$106,780
13	Base Repair (HMA) ****	TON	550	$ 345	$189,750
14	Raised Bike Path (HMA)	TON	314	$ 345	$108,330
15	CL2 Aggregate Base	CY	722	$ 180	$130,049
16	Signing and Striping	LS	1	$ 27,300	$27,300
17	Centerline Hardening	EA	4	$ 5,000	$20,000
18	Rubber Hump	EA	101	$ 200	$20,200
19	Bus Stop Improvements	EA	4	$ 30,000	$120,000
ELECTRICAL					
20	Signal Modification	EA	1	$250,000	$250,000
DRAINAGE					
21	Drainage Improvements	LS	1	$180,000	$180,000
				SUBTOTAL	**$2,674,269**
22	Minor Items (15% of Items 1-21) **	LS	1	$402,000	$402,000
				SUBTOTAL	**$3,076,269**
23	Mobilization (10% of Items 1-22)	LS	1	$308,000	$308,000
				SUBTOTAL	**$3,384,269**
				CONTINGENCY (35%) ***	$1,184,500
				CONSTRUCTION SUBTOTAL	$4,568,769
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$4,568,769**
				Right of Way/Temporary Construction Easement*=	**$210,000**
				GRAND TOTAL=	**$4,778,769**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location. An additional $130K of roadway easment is estimated for the Continuous Sidewalk.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Fairview St from Edinger Ave to St Andrew Pl

MARK THOMAS

(Corridor Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class I Bike Path, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	18	$ 8,000	$144,000
2	Install Concrete - Median Curb	CY	21	$ 1,500	$31,500
3	Install Concrete - Truck Apron Curb	CY	13	$ 1,500	$19,500
4	Install Concrete - Curb and Gutter	CY	128	$ 1,080	$138,024
5	Install Concrete - Sidewalk	CY	81	$ 1,040	$84,240
6	Install Concrete - Textured Pavment	CY	37	$ 1,130	$41,810
7	Install Concrete - Truck Apron	CY	15	$ 1,860	$27,900
8	Roadway Excavation	CY	557	$ 260	$144,820
9	Remove Concrete	CY	881	$ 400	$352,400
10	Hot Mix Asphalt	TON	213	$ 345	$73,485
11	Slurry	TON	147	$ 790	$116,130
12	Base Repair (HMA) ****	TON	598	$ 345	$206,310
13	CL2 Aggregate Base	CY	511	$ 180	$91,980
14	Signing and Striping	LS	1	$ 25,400	$25,400
15	Multi-use Path (HMA)	TON	711	$ 345	$245,295
16	Centerline Hardening	EA	4	$ 5,000	$20,000
17	Rubber Hump	EA	35	$ 200	$7,000
18	Bus Stop Improvements	EA	2	$ 30,000	$60,000
ELECTRICAL					
19	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$2,079,794**
20	Minor Items (15% of Items 1-19) **	LS	1	$312,000	$312,000
				SUBTOTAL	**$2,391,794**
21	Mobilization (10% of Items 1-20)	LS	1	$240,000	$240,000
				SUBTOTAL	**$2,631,794**
				CONTINGENCY (35%) ***	$921,200
				CONSTRUCTION SUBTOTAL	$3,552,994
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$3,552,994**
				Right of Way/Temporary Construction Easement*=	**$400,000**
				GRAND TOTAL=	**$3,952,994**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location. An additional $300K of roadway easment is estimated for the Multi-use Path.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Bristol St from Segerstorm Ave to Alton Ave

MARK THOMAS

(Corridor Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class IV Bike Lanes, Continuous Sidewalks, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	21	$ 8,000	$168,000
2	Install Concrete - Median Curb	CY	103	$ 1,500	$154,500
3	Install Concrete - Truck Apron Curb	CY	25	$ 1,500	$37,500
4	Install Concrete - Curb and Gutter	CY	189	$ 1,080	$204,120
5	Install Concrete - Sidewalk	CY	66	$ 1,040	$68,640
6	Install Concrete - Driveway	CY	70	$ 1,040	$72,774
7	Install Concrete - Textured Pavment	CY	128	$ 1,130	$144,640
8	Install Concrete - Truck Apron	CY	23	$ 1,860	$42,780
9	Roadway Excavation	CY	1959	$ 260	$509,340
10	Remove Concrete	CY	423	$ 400	$169,200
11	Hot Mix Asphalt	TON	511	$ 345	$176,295
12	Slurry	TON	167	$ 790	$131,930
13	Base Repair (HMA) ****	TON	677	$ 345	$233,565
14	Raised Bike Path (HMA)	TON	357	$ 345	$123,165
15	CL2 Aggregate Base	CY	802	$ 180	$144,360
16	Signing and Striping	LS	1	$ 44,500	$44,500
17	Rubber Hump	EA	41	$ 200	$8,200
18	Centerline Hardening	EA	8	$ 5,000	$40,000
19	Bus Stop Improvements	EA	1	$ 30,000	$30,000
DRAINAGE					
20	Drainage Improvements	LS	1	$201,000	$201,000
ELECTRICAL					
21	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$2,954,509**
22	Minor Items (15% of Items 1-21) **	LS	1	$444,000	$444,000
				SUBTOTAL	**$3,398,509**
23	Mobilization (10% of Items 1-22)	LS	1	$340,000	$340,000
				SUBTOTAL	**$3,738,509**
				CONTINGENCY (35%) ***	$1,308,500
				CONSTRUCTION SUBTOTAL	$5,047,009
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$5,047,009**
				Right of Way/Temporary Construction Easement*=	**$230,000**
				GRAND TOTAL=	**$5,277,009**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location. An additional $130K of roadway easment is estimated for the Continuous Sidewalk.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

4th St from Minter St to Garfield St

MARK THOMAS

(Corridor Safety Enhancements including: Curb Extensions, Directional Curb Ramps, Class IV Bike Lanes, Continuous Sidewalks, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	20	$ 8,000	$160,000
2	Install Concrete - Truck Apron Curb	CY	12	$ 1,500	$18,000
3	Install Concrete - Curb and Gutter	CY	176	$ 1,080	$190,080
4	Install Concrete - Sidewalk	CY	65	$ 1,040	$67,600
5	Install Concrete - Truck Apron	CY	21	$ 1,860	$39,060
6	Install Concrete - Driveway	CY	141	$ 1,040	$146,640
7	Install Concrete - Textured Paving	CY	64	$ 1,130	$72,320
8	Roadway Excavation	CY	1528	$ 260	$397,280
9	Remove Concrete	CY	501	$ 400	$200,400
10	Hot Mix Asphalt	TON	234	$ 345	$80,730
11	Slurry	TON	68	$ 790	$53,720
12	Base Repair (HMA) ****	TON	277	$ 345	$95,565
13	Raised Bike Path (HMA)	TON	257	$ 345	$88,665
14	CL2 Aggregate Base	CY	692	$ 180	$124,560
15	Signing and Striping	LS	1	$ 24,500	$24,500
16	Rubber Hump	EA	81	$ 200	$16,200
17	Landscape	SF	1496	$ 8	$11,968
DRAINAGE					
18	Drainage Improvements	LS	1	$143,000	$143,000
ELECTRICAL					
19	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$2,180,288**
20	Minor Items (15% of Items 1-19) **	LS	1	$328,000	$328,000
				SUBTOTAL	**$2,508,288**
21	Mobilization (10% of Items 1-20)	LS	1	$251,000	$251,000
				SUBTOTAL	**$2,759,288**
				CONTINGENCY (35%) ***	$965,800
				CONSTRUCTION SUBTOTAL	$3,725,088
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$3,725,088**
				Right of Way/Temporary Construction Easement*=	**$240,000**
				GRAND TOTAL=	**$3,965,088**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location. An additional $110K of roadway easment is estimated for the Continuous Sidewalk.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

17th St from Ross St to Broadway

MARK THOMAS

(Corridor Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class IV Bike Lanes, Continuous Sidewalks, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	20	$ 8,000	$160,000
2	Install Concrete - Median Curb	CY	102	$ 1,500	$153,000
3	Install Concrete - Truck Apron Curb	CY	25	$ 1,500	$37,500
4	Install Concrete - Curb and Gutter	CY	156	$ 1,080	$168,480
5	Install Concrete - Sidewalk	CY	69	$ 1,040	$71,760
6	Install Concrete - Driveway	CY	100	$ 1,040	$104,000
7	Install Concrete - Textured Pavment	CY	161	$ 1,130	$181,930
8	Install Concrete - Truck Apron	CY	26	$ 1,860	$48,360
9	Roadway Excavation	CY	2241	$ 260	$582,660
10	Remove Concrete	CY	440	$ 400	$176,000
11	Hot Mix Asphalt	TON	417	$ 345	$143,865
12	Slurry	TON	98	$ 790	$77,420
13	Base Repair (HMA) ****	TON	398	$ 345	$137,310
14	Raised Bike Path (HMA)	TON	247	$ 345	$85,215
15	CL2 Aggregate Base	CY	1052	$ 180	$189,360
16	Signing and Striping	LS	1	$ 40,600	$40,600
17	Rubber Hump	EA	60	$ 200	$12,000
18	Landscape	SF	4809	$ 8	$38,472
19	Centerline Hardening	EA	4	$ 5,000	$20,000
20	Bus Stop Improvements	EA	3	$ 30,000	$90,000
DRAINAGE					
21	Drainage Improvements	LS	1	$202,000	$202,000
ELECTRICAL					
22	Signal Modification	EA	2	$250,000	$500,000
				SUBTOTAL	**$3,219,932**
23	Minor Items (15% of Items 1-22) **	LS	1	$483,000	$483,000
				SUBTOTAL	**$3,702,932**
24	Mobilization (10% of Items 1-23)	LS	1	$371,000	$371,000
				SUBTOTAL	**$4,073,932**
				CONTINGENCY (35%) ***	$1,425,900
				CONSTRUCTION SUBTOTAL	$5,499,832
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$5,499,832**
				Right of Way/Temporary Construction Easement*=	**$220,000**
				GRAND TOTAL=	**$5,719,832**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location. An additional $100K of roadway easment is estimated for the Continuous Sidewalk.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Harbor Blvd and 1st St Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class II/II/IV Bike Facilities, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	8	$ 8,000	$64,000
2	Install Concrete - Median Curb	CY	30	$ 1,500	$45,000
3	Install Concrete - Truck Apron Curb	CY	12	$ 1,500	$18,000
4	Install Concrete - Curb and Gutter	CY	19	$ 1,080	$20,520
5	Install Concrete - Sidewalk	CY	35	$ 1,040	$36,400
6	Install Concrete - Textured Pavment	CY	48	$ 1,130	$54,240
7	Install Concrete - Truck Apron	CY	9	$ 1,860	$16,740
8	Roadway Excavation	CY	254	$ 260	$66,040
9	Remove Concrete	CY	89	$ 400	$35,600
10	Hot Mix Asphalt	TON	93	$ 345	$32,085
11	Slurry	TON	53	$ 790	$41,870
12	Base Repair (HMA) ****	TON	215	$ 345	$74,175
13	CL2 Aggregate Base	CY	113	$ 180	$20,340
14	Signing and Striping	LS	1	$ 8,400	$8,400
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Rubber Hump	EA	13	$ 200	$2,600
17	Bus Stop Improvements	EA	3	$ 30,000	$90,000
ELECTRICAL					
18	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$896,010**
19	Minor Items (15% of Items 1-18) **	LS	1	$135,000	$135,000
				SUBTOTAL	**$1,031,010**
20	Mobilization (10% of Items 1-19)	LS	1	$104,000	$104,000
				SUBTOTAL	**$1,135,010**
				CONTINGENCY (35%) ***	$397,300
				CONSTRUCTION SUBTOTAL	$1,532,310
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,532,310**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,572,310**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

17th St and Grand Ave Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class III Bike Routes, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	8	$ 8,000	$64,000
2	Install Concrete - Median Curb	CY	34	$ 1,500	$51,000
3	Install Concrete - Truck Apron Curb	CY	13	$ 1,500	$19,500
4	Install Concrete - Curb and Gutter	CY	13	$ 1,080	$14,040
5	Install Concrete - Sidewalk	CY	26	$ 1,040	$27,040
6	Install Concrete - Textured Pavment	CY	23	$ 1,130	$25,990
7	Install Concrete - Truck Apron	CY	10	$ 1,860	$18,600
8	Roadway Excavation	CY	225	$ 260	$58,500
9	Remove Concrete	CY	64	$ 400	$25,600
10	Hot Mix Asphalt	TON	94	$ 345	$32,430
11	Slurry	TON	50	$ 790	$39,500
12	Base Repair (HMA) ****	TON	201	$ 345	$69,345
13	CL2 Aggregate Base	CY	90	$ 180	$16,200
14	Signing and Striping	LS	1	$ 15,900	$15,900
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Rubber Hump	EA	4	$ 200	$800
17	Bus Stop Improvements	EA	2	$ 30,000	$60,000
ELECTRICAL					
18	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$808,445**
19	Minor Items (15% of Items 1-18) **	LS	1	$122,000	$122,000
				SUBTOTAL	**$930,445**
20	Mobilization (10% of Items 1-19)	LS	1	$94,000	$94,000
				SUBTOTAL	**$1,024,445**
				CONTINGENCY (35%) ***	$358,600
				CONSTRUCTION SUBTOTAL	$1,383,045
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,383,045**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,423,045**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Harbor Blvd and McFadden Ave Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class II/IV Bike Lanes, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	8	$ 8,000	$64,000
2	Install Concrete - Median Curb	CY	32	$ 1,500	$48,000
3	Install Concrete - Truck Apron Curb	CY	13	$ 1,500	$19,500
4	Install Concrete - Curb and Gutter	CY	20	$ 1,080	$21,600
5	Install Concrete - Sidewalk	CY	43	$ 1,040	$44,720
6	Install Concrete - Textured Pavment	CY	68	$ 1,130	$76,840
7	Install Concrete - Truck Apron	CY	13	$ 1,860	$24,180
8	Roadway Excavation	CY	273	$ 260	$70,980
9	Remove Concrete	CY	104	$ 400	$41,600
10	Hot Mix Asphalt	TON	99	$ 345	$34,155
11	Slurry	TON	47	$ 790	$37,130
12	Base Repair (HMA) ****	TON	192	$ 345	$66,240
13	CL2 Aggregate Base	CY	138	$ 180	$24,840
14	Signing and Striping	LS	1	$ 7,100	$7,100
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Rubber Hump	EA	31	$ 200	$6,200
17	Bus Stop Improvements	EA	2	$ 30,000	$60,000
ELECTRICAL					
18	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$917,085**
19	Minor Items (15% of Items 1-18) **	LS	1	$138,000	$138,000
				SUBTOTAL	**$1,055,085**
20	Mobilization (10% of Items 1-19)	LS	1	$106,000	$106,000
				SUBTOTAL	**$1,161,085**
				CONTINGENCY (35%) ***	$406,400
				CONSTRUCTION SUBTOTAL	$1,567,485
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,567,485**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,607,485**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

1st St and Flower St Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class II Bike Lanes, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	8	$ 8,000	$64,000
2	Install Concrete - Median Curb	CY	19	$ 1,500	$28,500
3	Install Concrete - Truck Apron Curb	CY	13	$ 1,500	$19,500
4	Install Concrete - Curb and Gutter	CY	13	$ 1,080	$14,040
5	Install Concrete - Sidewalk	CY	21	$ 1,040	$21,840
6	Install Concrete - Textured Pavment	CY	29	$ 1,130	$32,770
7	Install Concrete - Truck Apron	CY	12	$ 1,860	$22,320
8	Roadway Excavation	CY	192	$ 260	$49,920
9	Remove Concrete	CY	54	$ 400	$21,600
10	Hot Mix Asphalt	TON	65	$ 345	$22,425
11	Slurry	TON	45	$ 790	$35,550
12	Base Repair (HMA) ****	TON	180	$ 345	$62,100
13	CL2 Aggregate Base	CY	75	$ 180	$13,500
14	Signing and Striping	LS	1	$ 14,000	$14,000
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Rubber Hump	EA	14	$ 200	$2,800
17	Bus Stop Improvements	EA	1	$ 30,000	$30,000
ELECTRICAL					
18	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$724,865**
19	Minor Items (15% of Items 1-18) **	LS	1	$109,000	$109,000
				SUBTOTAL	**$833,865**
20	Mobilization (10% of Items 1-19)	LS	1	$84,000	$84,000
				SUBTOTAL	**$917,865**
				CONTINGENCY (35%) ***	$321,300
				CONSTRUCTION SUBTOTAL	$1,239,165
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,239,165**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,279,165**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.
An additional $300K of roadway easment is estimated for the Multi-use Path.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Edinger Ave and Maple St Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Directional Curb Ramps, Class II Bike Lanes, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	6	$ 8,000	$48,000
2	Install Concrete - Median Curb	CY	20	$ 1,500	$30,000
3	Install Concrete - Truck Apron Curb	CY	19	$ 1,500	$28,500
4	Install Concrete - Curb and Gutter	CY	19	$ 1,080	$20,520
5	Install Concrete - Sidewalk	CY	31	$ 1,040	$32,240
6	Install Concrete - Textured Pavment	CY	4	$ 1,130	$4,520
7	Install Concrete - Truck Apron	CY	58	$ 1,860	$107,880
8	Roadway Excavation	CY	366	$ 260	$95,160
9	Remove Concrete	CY	80	$ 400	$32,000
10	Hot Mix Asphalt	TON	62	$ 345	$21,390
11	Slurry	TON	32	$ 790	$25,280
12	Base Repair (HMA) ****	TON	128	$ 345	$44,160
13	CL2 Aggregate Base	CY	137	$ 180	$24,660
14	Signing and Striping	LS	1	$ 5,700	$5,700
15	Landscape	SF	2440	$ 8	$19,520
16	Rubber Hump	EA	9	$ 200	$1,800
17	Bus Stop Improvements	EA	1	$ 30,000	$30,000
DRAINAGE					
18	Minor Drainage	LS	1	$20,000	$20,000
				SUBTOTAL	**$591,330**
19	Minor Items (15% of Items 1-18) **	LS	1	$89,000	$89,000
				SUBTOTAL	**$680,330**
20	Mobilization (10% of Items 1-19)	LS	1	$69,000	$69,000
				SUBTOTAL	**$749,330**
				CONTINGENCY (35%) ***	$262,300
				CONSTRUCTION SUBTOTAL	$1,011,630
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,011,630**
				Right of Way/Temporary Construction Easement*=	**$50,000**
				GRAND TOTAL=	**$1,061,630**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Segerstrom Ave and Bear St Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class II/IV Bike Lanes, and Bike Crossings)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	6	$ 8,000	$48,000
2	Install Concrete - Median Curb	CY	28	$ 1,500	$42,000
3	Install Concrete - Truck Apron Curb	CY	7	$ 1,500	$10,500
4	Install Concrete - Curb and Gutter	CY	11	$ 1,080	$11,880
5	Install Concrete - Sidewalk	CY	20	$ 1,040	$20,800
6	Install Concrete - Textured Pavment	CY	29	$ 1,130	$32,770
7	Install Concrete - Truck Apron	CY	5	$ 1,860	$9,300
8	Roadway Excavation	CY	250	$ 260	$65,000
9	Remove Concrete	CY	52	$ 400	$20,800
10	Hot Mix Asphalt	TON	74	$ 345	$25,530
11	Slurry	TON	30	$ 790	$23,700
12	Base Repair (HMA) ****	TON	121	$ 345	$41,745
13	CL2 Aggregate Base	CY	74	$ 180	$13,320
14	Signing and Striping	LS	1	$ 5,000	$5,000
15	Centerline Hardening	EA	3	$ 5,000	$15,000
16	Landscape	SF	1130	$ 8	$9,040
ELECTRICAL					
17	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$644,385**
18	Minor Items (15% of Items 1-17) **	LS	1	$97,000	$97,000
				SUBTOTAL	**$741,385**
19	Mobilization (10% of Items 1-18)	LS	1	$75,000	$75,000
				SUBTOTAL	**$816,385**
				CONTINGENCY (35%) ***	$285,800
				CONSTRUCTION SUBTOTAL	$1,102,185
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,102,185**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,142,185**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Flower St and MacArthur Blvd Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class III Bike Routes, and Bike Crossings)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	8	$ 8,000	$64,000
2	Install Concrete - Median Curb	CY	33	$ 1,500	$49,500
3	Install Concrete - Truck Apron Curb	CY	14	$ 1,500	$21,000
4	Install Concrete - Curb and Gutter	CY	21	$ 1,080	$22,680
5	Install Concrete - Sidewalk	CY	25	$ 1,040	$26,000
6	Install Concrete - Textured Pavment	CY	27	$ 1,130	$30,510
7	Install Concrete - Truck Apron	CY	15	$ 1,860	$27,900
8	Roadway Excavation	CY	222	$ 260	$57,720
9	Remove Concrete	CY	72	$ 400	$28,800
10	Hot Mix Asphalt	TON	103	$ 345	$35,535
11	Slurry	TON	39	$ 790	$30,810
12	Base Repair (HMA) ****	TON	160	$ 345	$55,200
13	CL2 Aggregate Base	CY	100	$ 180	$18,000
14	Signing and Striping	LS	1	$ 4,900	$4,900
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Bus Stop Improvements	EA	2	$ 30,000	$60,000
ELECTRICAL					
17	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$802,555**
18	Minor Items (15% of Items 1-17) **	LS	1	$121,000	$121,000
				SUBTOTAL	**$923,555**
19	Mobilization (10% of Items 1-18)	LS	1	$93,000	$93,000
				SUBTOTAL	**$1,016,555**
				CONTINGENCY (35%) ***	$355,800
				CONSTRUCTION SUBTOTAL	$1,372,355
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,372,355**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,412,355**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

MacArthur Blvd and Raitt St Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class IV Bike Lanes, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	8	$ 8,000	$64,000
2	Install Concrete - Median Curb	CY	30	$ 1,500	$45,000
3	Install Concrete - Truck Apron Curb	CY	19	$ 1,500	$28,500
4	Install Concrete - Curb and Gutter	CY	16	$ 1,080	$17,280
5	Install Concrete - Sidewalk	CY	28	$ 1,040	$29,120
6	Install Concrete - Textured Pavment	CY	52	$ 1,130	$58,760
7	Install Concrete - Truck Apron	CY	24	$ 1,860	$44,640
8	Roadway Excavation	CY	256	$ 260	$66,560
9	Remove Concrete	CY	71	$ 400	$28,400
10	Hot Mix Asphalt	TON	98	$ 345	$33,810
11	Slurry	TON	42	$ 790	$33,180
12	Base Repair (HMA) ****	TON	170	$ 345	$58,650
13	CL2 Aggregate Base	CY	120	$ 180	$21,600
14	Signing and Striping	LS	1	$ 7,100	$7,100
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Bus Stop Improvements	EA	2	$ 30,000	$60,000
ELECTRICAL					
17	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$866,600**
18	Minor Items (15% of Items 1-17) **	LS	1	$130,000	$130,000
				SUBTOTAL	**$996,600**
19	Mobilization (10% of Items 1-18)	LS	1	$100,000	$100,000
				SUBTOTAL	**$1,096,600**
				CONTINGENCY (35%) ***	$383,900
				CONSTRUCTION SUBTOTAL	$1,480,500
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,480,500**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,520,500**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Dyer Rd and Flower St Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class II/III Bike Facilities, Bike Crossings, and Conflict Striping)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	8	$ 8,000	$64,000
2	Install Concrete - Median Curb	CY	27	$ 1,500	$40,500
3	Install Concrete - Truck Apron Curb	CY	13	$ 1,500	$19,500
4	Install Concrete - Curb and Gutter	CY	13	$ 1,080	$14,040
5	Install Concrete - Sidewalk	CY	21	$ 1,040	$21,840
6	Install Concrete - Textured Pavment	CY	38	$ 1,130	$42,940
7	Install Concrete - Truck Apron	CY	8	$ 1,860	$14,880
8	Roadway Excavation	CY	191	$ 260	$49,660
9	Remove Concrete	CY	38	$ 400	$15,200
10	Hot Mix Asphalt	TON	76	$ 345	$26,220
11	Slurry	TON	36	$ 790	$28,440
12	Base Repair (HMA) ****	TON	145	$ 345	$50,025
13	CL2 Aggregate Base	CY	85	$ 180	$15,300
14	Signing and Striping	LS	1	$ 5,000	$5,000
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Bus Stop Improvements	EA	2	$ 30,000	$60,000
ELECTRICAL					
17	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$737,545**
18	Minor Items (15% of Items 1-17) **	LS	1	$111,000	$111,000
				SUBTOTAL	**$848,545**
19	Mobilization (10% of Items 1-18)	LS	1	$85,000	$85,000
				SUBTOTAL	**$933,545**
				CONTINGENCY (35%) ***	$326,800
				CONSTRUCTION SUBTOTAL	$1,260,345
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,260,345**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,300,345**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Santa Ana Vision Zero

Flower St and Alton Ave Intersection

MARK THOMAS

(Intersection Safety Enhancements including: Protected Corners, Directional Curb Ramps, Centerline Hardening, Class II/IV Bike Lanes, and Bike Crossings)

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	9	$ 8,000	$72,000
2	Install Concrete - Median Curb	CY	8	$ 1,500	$12,000
3	Install Concrete - Truck Apron Curb	CY	13	$ 1,500	$19,500
4	Install Concrete - Curb and Gutter	CY	21	$ 1,080	$22,680
5	Install Concrete - Sidewalk	CY	35	$ 1,040	$36,400
6	Install Concrete - Textured Pavment	CY	14	$ 1,130	$15,820
7	Install Concrete - Truck Apron	CY	11	$ 1,860	$20,460
8	Roadway Excavation	CY	288	$ 260	$74,880
9	Remove Concrete	CY	71	$ 400	$28,400
10	Hot Mix Asphalt	TON	110	$ 345	$37,950
11	Slurry	TON	30	$ 790	$23,700
12	Base Repair (HMA) ****	TON	124	$ 345	$42,780
13	CL2 Aggregate Base	CY	68	$ 180	$12,240
14	Signing and Striping	LS	1	$ 4,500	$4,500
15	Centerline Hardening	EA	4	$ 5,000	$20,000
16	Rubber Hump	EA	23	$ 200	$4,600
17	Bus Stop Improvements	EA	2	$ 30,000	$60,000
ELECTRICAL					
18	Signal Modification	EA	1	$250,000	$250,000
				SUBTOTAL	**$757,910**
19	Minor Items (15% of Items 1-18) **	LS	1	$114,000	$114,000
				SUBTOTAL	**$871,910**
20	Mobilization (10% of Items 1-19)	LS	1	$88,000	$88,000
				SUBTOTAL	**$959,910**
				CONTINGENCY (35%) ***	$336,000
				CONSTRUCTION SUBTOTAL	$1,295,910
GRAND TOTAL					
				CONSTRUCTION SUBTOTAL=	**$1,295,910**
				Right of Way/Temporary Construction Easement*=	**$40,000**
				GRAND TOTAL=	**$1,335,910**

* Right of way/TCE's for driveway closures, curb ramps, new signal equipment, conforms, etc. have been estimated at $10K/Location.

** Minor items (for example, fencing, signage, sidewalk repair, utility adjustments, etc.) have been estimated by using a percentage.

*** This feasibility level estimate includes a 35% contingency intended to compensate for the use of preliminary and limited information.

**** 8% of project area is assumed to require Base Repair

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included. Utility improvements such as water, communication, gas, etc. are not included in these estimates.

Appendix F. Priority Projects and Equity Map