Berkeley SafeTREC

SAFE TRANSPORTATION RESEARCH AND EDUCATION CENTER

PS22021

CITY OF CLAREMONT

COMPLETE STREETS SAFETY ASSESSMENT

Issues, Opportunities, and Suggested Strategies

Assessment Team

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October 2022

This report was produced in cooperation with the City of Claremont. Funding for this program was provided by a grant from the California Office of Traffic Safety, through the National Highway Traffic Safety Administration. Opinions, findings, and conclusions are those of the authors and not necessarily those of the University of California and/or the agencies supporting or contributing to this report.

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FINAL REPORT

OCTOBER 2022

ASSESSMENT TEAM

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EXECUTIVE SUMMARY

The City of Claremont requested that SafeTREC at the University of California, Berkeley conduct Complete Streets Safety Assessment (CSSA) study for various locations within the city.

A team of two safety experts conducted the CSSA. They visited the City of Claremont and conducted a walking audit on March 03, 2022. The objectives of the CSSA are to improve pedestrian and bicycle safety and to enhance walkability and accessibility for all pedestrians and bicyclists in Claremont.

This report is organized into the following chapters:

- Chapter 1 is an introduction to the Complete Streets Safety Assessment for the City of Claremont.
- Chapter 2 presents benchmarking analysis results and suggestions for potential improvement from the benchmarking analysis.
- Chapter 3 presents field walking audit results and suggestions for potential improvements from the audit.

Benchmarking Analysis of Policies, Programs, and Practices

To assess pedestrian safety conditions in Claremont, the expert team conducted a benchmarking analysis to understand how the city's existing conditions compared with current best practices. Through a pedestrian and bicycle safety assessment questionnaire conducted with city staff, the expert team identified the city's pedestrian and bicycle policies, programs, and practices and categorized them into three groups:

- Key strengths (areas where the city is exceeding national best practices)
- Enhancement areas (areas where the city is meeting national best practices)
- Opportunity areas (areas where the city appears not to meet national best practices)

While suggestions are provided for each category, cities have differing physical, demographic, and institutional characteristics that may make certain goals or policies more appropriate in some jurisdictions than others. Ultimately, city staff may determine where resources and efforts are best placed for meeting local development and infrastructure goals for pedestrians and bicyclists.

A discussion of the city's pedestrian and bicycle safety policies, programs, and practices, and suggestions for potential improvement or further enhancement to the city's existing programs and policies are presented in *Chapter 2*

Walking Audit Focal Areas

Per the city's request, the following three (3) corridors were studied in this assessment:

1. Condit Elementary School:
   a) Scripps Drive intersection
   b) Signalized crosswalk
   c) Drop-off / pickup activity
   d) Hood Drive intersection

2. Mountain View Elementary School:
   - Santa Clara Avenue
   - Mountain Ave. and Santa Clara Ave. intersection

3. El Roble Intermediate School:
   - Butte Street / 8th Street intersection
   - Between 7th and Harrison Streets
   - Harrison Ave. at Mountain Ave.

Many of the strategies suggested in this report are appropriate for grant applications, including Office of Traffic Safety (OTS) or Active Transportation Program (ATP) funding. The strategies may also be incorporated into a bicycle or pedestrian master plan, documents that could set forth bicycle, pedestrian, and streetscape policies for the city, identify, and prioritize capital improvement projects.

The suggestions presented in this report are based on limited field observations and time spent in Claremont by the CSSA evaluator. These suggestions, which are based on general knowledge of best practices in pedestrian and bicycle design and safety, are intended to guide city staff in making decisions for future safety improvement projects in the city, and they may not incorporate all factors which may be relevant to safety issues in the city.

As this report is conceptual in nature, conditions may exist in the focal areas that were not observed and may not be compatible with suggestions in this report. Before finalizing and implementing any physical changes, city staff may choose to conduct more detailed studies or further analysis to refine or discard the suggestions in this report, if they are found to be contextually inappropriate or appear not to improve bicycling safety or accessibility due to conditions including, but not limited to, high vehicular traffic volume or speeds, physical limitations on space or sight distance, or other potential safety concerns.

1. INTRODUCTION

1.1. OBJECTIVE OF THE ASSESSMENT

The City of Claremont requested that the Safe Transportation Research and Education Center (SafeTREC) at University of California, Berkeley conduct a Complete Streets Safety Assessment (CSSA) for areas within the city. The objective of the CSSA is to improve safety and accessibility for all people walking and bicycling in and around the city. This assessment emphasizes safety and mobility issues associated with pedestrians and bicyclists, including a focus on older and younger road users.

1.2. ASSESSMENT APPROACH

The SafeTREC Safety experts conducted a pre-visit telephone interview with city staff on February 22, 2022. They conducted a walking audit at various locations in Claremont on March 03, 2022. Positive practices, as well as pedestrian and bicycle safety and accessibility issues were identified at the field audit.

1.3. ACKNOWLEDGEMENT

We would like to thank the following city staff members, who contributed to the wide range of topics addressed in this report, including providing local important context that informed the site selection and recommendations of this report:

- Maria B. Tipping, P.E., City Engineer, Community Development Department
- Vincent Ramos, Associate Engineer, Community Development Department

1.4. DISCLOSURES

The benchmarking analysis aims to provide the city with information on current best practices and how the city compares. Cities have differing physical, demographic, and institutional characteristics that may make certain goals or policies more appropriate in some jurisdictions than others. Ultimately, city staff will determine where resources and efforts are best utilized to meet local development and infrastructure goals for people walking and biking.

The suggestions presented in this report are based on limited field observations and limited time spent in the City of Claremont by the CSSA evaluator. These suggestions, which are based on general knowledge of best practices in pedestrian and bicycle design and safety, are intended to guide city staff in making decisions for future safety improvement projects in the city, and they may not incorporate all factors, which may be relevant to the pedestrian and bicycle safety issues in the city.

As this report is conceptual in nature, conditions may exist in the focal areas that were not observed and may not be compatible with suggestions in this report. Before finalizing and implementing any physical changes, city staff may conduct more detailed studies or further analysis to refine or discard the suggestions in this report if they are found to be contextually inappropriate or appear not to improve pedestrian and bicyclist safety or accessibility due to conditions including, but not limited to, high vehicular traffic volume or speeds, physical limitations on space or sight distance, or other potential safety concerns.

2. BENCHMARKING ANALYSIS RESULTS AND SUGGESTIONS

2.1. BENCHMARKING ANALYSIS OF POLICIES, PROGRAMS, AND PRACTICES

To assess pedestrian and bicycle safety conditions in the City of Claremont, the CSSA team first conducted a benchmarking analysis to understand how the city's existing conditions compared with current national best practices including consistency with the Safe System approach as shown here. Through a holistic view of first anticipating human mistakes and keeping impact energy levels on the human body at tolerable levels, the Safe System approach aims to eliminate fatal and serious injuries for all road users.[1]

The Safe System Approach
Source: Fehr & Peers for FHWA

City's staff responses were analyzed with a benchmarking matrix, as shown in Table 2-1, which lists the benchmarking topics that fall under the following categories:

- Enhancing Safety through Accessibility
- Policies and Programs
- Safety Implementation Plans and Policies
- Safety Data Collection and Assessment
- Pedestrian and Bicycle Network Planning and Design
- Pedestrian and Bicycle Support Programs

The CSSA team also reviewed the local agency's website and relevant documents. The CSSA team identified the local agency's pedestrian and bicycle policies, programs, and practices and categorized these into three groups:

- Key strengths (areas where the city is exceeding national best practices)
- Enhancement areas (areas where the city is meeting national best practices)
- Opportunity areas (areas where the city appears not to meet national best practices)

While suggestions are provided for each category, cities have differing physical, demographic, and institutional characteristics that may make certain goals or policies more appropriate in some jurisdictions than others. Ultimately, Local agency staff may determine where resources and efforts are best placed for meeting local development and infrastructure goals for pedestrians and bicyclists.

[1] https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf

Based on the city's staff responses to the questionnaire, each topic receives one of those three ratings and is highlighted in green in the table below. This analysis shares information on current national best practices and how the city compares.

The items in Table 2-1 are further elaborated on in the following sections, which provide a description for each benchmarking topic. The topics incorporate the Safe System elements (Safe Road Users, Safe Vehicles, Safe Speeds, Safe Roads, and Post-Crash Care) while also incorporating best practices related to access and comfort for people walking and bicycling. Suggestions for better aligning with best practice benchmarks are also noted and the city could consider implementing them as they determine appropriate.

Table 2-1: Summary of Programs, Policies, and Practices Benchmarking Analysis for the City of Claremont

Benchmark Topic	Key Strength	Enhancement	Opportunity
Enhancing Safety through Accessibility			
Safe Road Users, Safe Roads			
Implementation of Americans with Disabilities Act (ADA) Improvements	Uses state-of-the-practice (PROWAG) ADA improvements with consistent installation practices The city has ADA standards and follows Caltrans and Green Book ADA standards. A CIP project designed to address ADA improvements is implemented every year.	Has clear design guidelines but no regular practices for ADA compliance	Has minimal design guidelines and practices related to ADA requirements
ADA Transition Plan for Streets and Sidewalks	Has ADA transition plan in place and an ADA coordinator	Partial or outdated ADA transition plan or an ADA coordinator	No transition plan or ADA coordinator
Ensure Safety for All Users is Prioritized, and Accessibility Maintained, During Construction and Road Maintenance Projects	Has a policy in place that details how to maintain accessibility and provide designated space for people biking and walking through a Construction Management Plan (CMP)	Occasionally requires a CMP or has outdated CMP guidelines	No CMP guidelines

Benchmark Topic	Key Strength	Enhancement	Opportunity
Policies and Programs			
Safe Road Users, Safe Roads, Safe Vehicles			
Roadway Safety Coordinator	Has a Roadway Safety Coordinator on staff who manages the agency's pedestrian and bicycle programs (e.g., Complete Streets Program and/or Vision Zero Program) and helps with capacity building of staff	Occasionally uses a part-time contract coordinator	Does not have a Roadway Safety Coordinator
Formal Advisory Committee	Has a formal, active/on-going Transportation Advisory Committee guided by a charter or mission that includes the safety of vulnerable road users and whose activities focus on improving pedestrian and bicycle safety. The city has a formal Traffic and Transportation Commission that meets monthly. The Commission addresses all transportation related items including bicycle and pedestrian safety.	Has an ad-hoc Transportation Advisory Committee or one not guided by a charter or mission that specifically includes safety of vulnerable road users. Note: Local Agency's Planning Commission may act as Transportation Advisory Committee	Does not have a Transportation Advisory Committee
Equitable Community Engagement Strategy that Includes Community Based Organization (CBO) Involvement	Has an equity-focused public engagement strategy and, along with a local CBO, creates opportunities for public engagement on walking and biking topics through a variety of community-specific formats (e.g., venues, times of day, languages). Community engagement is an on-going process and does not only happen during the duration of the project, but also leading up to and after the project is completed (e.g., 311 app).	Has an equitable public outreach strategy, but formal community engagement events happen on a project-by project basis and/or without CBO partnerships.	Does not have a formal public involvement or feedback process for bicycle/pedestrian planning or safety

Benchmark Topic	Key Strength	Enhancement	Opportunity
Traffic Calming or Speed Management Program	Has a speed management program that is reviewed annually alongside the CIP project list. Major arterials and neighborhood corridors include proactive speed management strategies and countermeasures are implemented to reach safe target speeds	Has a traffic calming program but funding and implementation of countermeasures are ad-hoc and reactive	Explores traffic calming features other than speed humps
Speed Limit Setting	Regularly surveys speed and identifies locations with high deviation from target speeds. Agency uses best practices for speed management in combination with allowances from AB 43 to lower speed limits. Implementing lower speed limits is done using a consistent approach that prioritizes areas with historic under investment. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB43	Seeks to include 15 mph speed limits in school zones or commercial corridors.	Continues to use the 85th percentile to set speed limits.
Safe Routes to Schools	Has an ongoing Safe Routes to Schools program that is included as part of the agency's safety monitoring and is integrated with other policies and programs	Has obtained funding for recent projects, but has no communitywide Safe Routes to Schools program	Does not have a Safe Routes to Schools program and has not obtained recent funding
Systemic Signalized Intersection Enhancements	Has a systemic signalized intersection enhancement program that follows a Safe System-based framework and proactively implements FHWA's Proven Safety Countermeasures to manage speed and crash angles and consider risk exposure. The city has an annual CIP that provides signalized intersection improvements to update technology and safety practices.	Reactively implements Proven Safety Countermeasures at signalized intersections	Does not routinely implement proven safety countermeasures (LPIs, protected left turns, roundabouts, medians, countdown signals, etc.) at signalized intersections.

Benchmark Topic	Key Strength	Enhancement	Opportunity
Systemic Enhancements for Uncontrolled Crossings	Has a crosswalk enhancement program that proactively implements a Safe Transportation for Every Pedestrian (STEP)-consistent countermeasure at uncontrolled crossings.	Has a crosswalk policy that is STEP-consistent but is only reactively to implementing Proven Safety Countermeasures	Does not have a policy or set practices for addressing crosswalk installation or enhancements using Proven Safety Countermeasures
Safety-focused Curbside Management	Has curbside management policy in place that prioritizes pedestrian and bicyclist safety, and provides driver education programs for fleet drivers	Has a curbside management program in place, but without a focus on safety	No curbside management program or policies in place
Facilities Supporting Micromobility	Has micromobility policy in place that prioritizes low stress facilities in areas with micromobility use (e.g., downtown areas) and speed regulators in geofenced locations. Micromobility is built into network planning and design for all projects with retail or in urban space	Requirements for micromobility are noted on a project-by-project basis	No micromobility policies are in place
Connected and Automated Vehicle (CAV) Readiness	Has policy that strategizes preparation to meet and address oncoming challenges posed by CAV technology. As CAV technology is deployed, it is imperative to have strategies in place that discuss the interface between technology and human road users, the role of smart infrastructure, and the need for physical separation of AVs and vulnerable road users	Has EV charging policy and curbside management guidance, but not a full CAV readiness plan	No policy around CAV readiness

Benchmark Topic	Key Strength	Enhancement	Opportunity
Heavy Vehicle Fleets and Truck Routing	Has policy that identifies various future fleet incorporation and funding (e.g., research on what type of fleet (Hydrogen Fuel Cell vs. Electric) best fits the agency) as well as identification of routes within city boundaries dedicated to buses, trucks, and other heavy vehicles. Identifying specific truck routes allows for parallel routes that can be identified as pedestrian and bicycle corridors	Has future fleet incorporation identified, but does not have a robust heavy vehicle and truck routing plan	No policy around future fleets and truck routing
Public Advertisements Supporting Safety Culture	Regularly runs culturally relevant and accessible education campaigns and outreach through various communication tools (e.g., bus and bus shelter ads, radio, social media)	Culturally relevant and accessible education campaigns occur on a project-by-project basis	Does not implement culturally relevant and accessible education campaigns
Safety Implementation Plans and Policies			
Safe Road Users, Safe Roads, Safe Vehicles			
Adopted Safety Plan	Has an approved Local Road Safety Plan (LRSP) or other Caltrans-approved safety report that identifies funding sources and prioritization of projects within underserved communities. Safety upgrades are noted on the agency's High-Injury Network (HIN) and tied into repaving projects, CIP updates, etc.	Has received funding for a Safety Plan, which is underway and not yet adopted. Receives grant funding and/or developer fees, but projects are not tied to the High Injury Network or underserved communities	Does not have an LRSP or other Caltrans-approved Safety Plan. Moderately successful in obtaining grant funding or has trouble spending funds when given grants. Or unable to secure grants The city is working with the San Gabriel Valley Council of Governments and neighboring cities at developing a LRSP for the cities.

Benchmark Topic	Key Strength	Enhancement	Opportunity
Safe System Policy	Has a Safe System policy with redundancy built in for transportation projects with a checklist for the full set of incorporation of the Safe System elements. The policy includes all users and modes, affects new construction and maintenance, considers local context, and provides guidance for implementation	Has a Safe System policy, but does not identify how redundancy can be incorporated through the Safe System elements	Does not have a Safe System policy
Safety Data Collection and Assessment			
Safe Road Users			
Collection of Pedestrian and Bicyclist Volumes	Collects pedestrian and bicyclist volumes routinely with intersection counts and has a GIS database of counts. Database identifies key origin and destination locations that identifies patterns and needs in agencies policies and programs, especially in underserved communities	Collects pedestrian and bicyclist volumes on a project-by-project basis, but not routinely. Key origins and destinations are identified in a Bike, Pedestrian, or Active Transportation Plan, but need to be updated	Does not collect pedestrian and bicycle volumes
Inventory of Bikeways, Parking, Informal Pathways, and Key Bicycle Opportunity Areas	Maintains and routinely updates an AI-based inventory of missing and existing bikeways in GIS and includes bikeway projects in the CIP	Has a partial, static inventory of missing facilities and opportunity areas through Bike, Pedestrian, or Active Transportation Plans	Does not have an inventory of missing/existing bikeways, parking, informal pathways, or key bicycle areas
Inventory of Sidewalks, Informal Pathways, and Key Pedestrian Opportunity Areas	Maintains and routinely updates an AI-based inventory of missing and existing sidewalks and crosswalks in GIS and includes sidewalk and crosswalk projects in the CIP	Maintains an inventory of missing sidewalks, crosswalks, informal pathways, or pedestrian opportunity areas	Does not have an inventory of missing sidewalks, crosswalks, informal pathways, or pedestrian opportunity areas
Traffic Control Audit (Signs, Markings, and Signals)	Maintains and updates an inventory of signs, markings, other countermeasures, and signals (including phasing) in GIS	Has some GIS-based inventories of signs, markings, other countermeasures, and signals	Does not have a GIS-based inventory of signs, markings, countermeasures, and signals The city is in the process of developing an RFP to engage a consultant to develop this sign program

Benchmark Topic	Key Strength	Enhancement	Opportunity
Crash History and Crash Reporting Practices	Employs a data-driven systemic safety or Vision Zero approach to regularly analyze crash data. Crash reporting is shared to key stakeholders in real time and reporting details are consistent through the agency	Reviews data only following fatalities or other high-profile incidents	Does not have set practices for data review
Surrogate Safety Measures for Proactive Monitoring	To inform safety projects, agency uses community feedback tools such as Street Story and innovative data collection techniques such as hard breaking, speed, and near miss data	Uses surrogate safety measures on a project-by-project basis	Does not use surrogate safety measures as part of data collection and assessment process
Updated Safety Action Plan	Has an LRSP that identifies routine data collection and assessment. Prioritized project list is updated based on crash data assessment	Completes crash data assessment on a project-by-project basis. Does not have an action plan that identifies regularity of assessment	Crash data assessment is ad-hoc and dependent on grant funded projects
Pedestrian and Bicycle Network Planning and Design			
Safe Road Users, Safe Roads			
Complete Streets Policy	Has a Complete Streets policy that includes all users and modes, affects new construction and maintenance, considers local context, and provides guidance for implementation	Has a Complete Streets policy that is narrow in scope or applies only to public works projects	Does not have a Complete Streets policy
Active Transportation Plans	Has a recently updated Active Transportation Plan (or similar) with strategic prioritized list of projects that reflects current best practices (e.g., Level of Traffic Stress analysis, inclusion of Class IV protected bicycle facilities)	Has a Pedestrian or Bicycle Master Plan but it may be outdated and/or no recent projects from the Plan have been completed	Does not have a Pedestrian or Bicycle Master Plan

Benchmark Topic	Key Strength	Enhancement	Opportunity
Existing bike network	Existing bike network includes best practice low stress facilities such as protected bikeways, bike boulevards, and protected intersections citywide or countywide	Bike network primarily includes Class I, II, and III facilities. There are gaps within the bike network and facilities do not accommodate all users	Bike network is not regularly maintained, or routes are unclear to users
Existing pedestrian facilities	Existing pedestrian facilities includes low stress facilities and frequent use of landscape strips, medians, frequent crosswalks, and roadways are primarily two-to-four lane roads	Narrow sidewalks or sidewalk gaps, crosswalks with few or no safety enhancements, crosswalks are minimal, and roadways are primarily arterials	Missing key marked crosswalks and sidewalks, with few ADA improvements and no safety enhancements, and no pedestrian countdown signals
Bike Network Implementation Practices	Age 8 to 80 bicyclist considerations are included in the agency's policies and level of traffic stress is considered. A Bike or Other Safety Plan identifies low stress networks and funding mechanisms to implement a low stress network city- or countywide	Spot locations have been identified through safety plan(s) for a low stress network. Plan also identifies additional proven countermeasures to be implemented as part of the project	Treatments are implemented where they fit within the right-of-way and vehicle LOS is not affected The city uses the Complete Streets Policy to address countermeasures/improvements.
Pedestrian Network Implementation Practices	Pedestrian priority areas (PPA) are identified in a safety plan and the agency has policies prioritizing PPAs, crosswalk spacing, and design enhancements.	Spot PPA locations have been identified through safety plan(s). Plan also identifies additional proven countermeasures to be implemented as part of the project	Treatments are implemented on a project-by-project basis
Design guidelines and standards	Uses national best practices focused on bicycle and pedestrian safety for roadway and facility design guidelines and standards	Local standards reference national best practices, but are static or out of date, with minimal customized design policies for pedestrian and bicycle accommodations	Does not have comprehensive design guidelines or standards for pedestrian or bicyclist treatments
Roadway Surfaces for Bicycle Facilities	Roadway resurfacing projects and debris removal are prioritized for bicycle routes.	Roadway surface is acceptable on bicycle routes and routine maintenance, including debris removal, occurs.	Roadway surface conditions are poor on some bicycle facilities and maintenance is not prioritized for bicycle facilities

Benchmark Topic	Key Strength	Enhancement	Opportunity
Attention to Bicycle Crossing Barriers	Separated bikeways and other innovative treatments, including geometric enhancements, are provided at intersections and interchanges	Higher-stress bike treatments are installed at some intersections and interchanges	Bike treatments are not installed at intersections or through interchanges
Attention to Pedestrian Crossing Barriers	Has a recently updated policy and comprehensive inventory of barriers. Has design guidelines and funding in place for addressing barriers	Has no policy, but has identified some barriers and taken steps to improve pedestrian access	Does not have a policy or practices for addressing barriers to walking
Intersection Control Evaluations	Uses intersection control evaluations to assess alternative traffic control (e.g., roundabout, signal, stop signs) performance (safety, ped/bike, etc.) and select appropriate control based on desired performance.	Uses relaxed warrants for traffic signals and/or all-way stops. If asked to by community or stakeholder may consider a roundabout or neighborhood traffic circle.	Uses MUTCD Warrants and/or does not have a practice of using Intersection Control Evaluations
Sidewalk furniture or other sidewalk zone policies	Design standards require implementation of the sidewalk zone system. Does not allow apron parking or attached (unbuffered) sidewalks anywhere.	Design standards require implementation of the sidewalk zone system in some districts (e.g., CBD, neighborhood commercial, etc.).	There are no design standards requiring implementation of the sidewalk zone system.
Pedestrian and Bicycle Support Program			
Safe Road Users, Safe Speeds, Safe Roads, Post-Crash Care			
Street Tree Requirements	Has a street tree ordinance that improves pedestrian safety and access. The ordinance includes details on debris maintenance and actions to take when sidewalk buckling occurs	Has a street tree ordinance, but it does not improve pedestrian safety or access	Does not have a street tree ordinance
Bicycling Supportive Amenities and Wayfinding	Bicycle supportive amenities (parking, routing/wayfinding, water fountains, repair stations) are found communitywide	Some bicycle supportive amenities are found in key areas	Bicyclist supportive amenities are not provided in the community
Bicycle Parking Requirements	A bicycle parking ordinance is enforced for all development and a program is in place to install and maintain public bike parking in existing development	A bicycle ordinance for off-street parking is in place but no requirement exists to install parking for existing development	No bike parking ordinance or program in place

Benchmark Topic	Key Strength	Enhancement	Opportunity
Pedestrian and Bicycle Safety Education Program	Pedestrian and bicycle education programs are data-driven and focused on local safety context; education programs are customized for different groups. The program includes education for drivers/motorists.	Has some traffic safety education programs that address pedestrians and bicyclists	Does not have pedestrian and bicycle safety education programs
Enforcement	Police Department applies for annual OTS funding, and conducts sustained and data-driven enforcement efforts focused on education, behavior, and locations related to most severe bicycle and pedestrian crashes; enforcement is effective is KSI crashes decrease and there is lower racial disproportionality in traffic citations	Police Department conducts some data-driven enforcement activities related to bicyclist and pedestrian safety	Enforcement is not data-driven or Police Department does not have Traffic Safety Officer(s) Police Department has very limited resources. They conduct enforcement as schedule permits
Pedestrian Walking Audit Program	Has significant and ongoing programs that include regular walking audits	Has no safety program, but has conducted walking audits sporadically	Does not have a pedestrian safety program and has not conducted a walking audit
Bicycling Safety Audit Program	Has significant and ongoing programs which include bicycling audits	Has some programs and may have conducted a bicycling audit	Does not have bicycling safety audit programs
General Plan: Provision for Pedestrian and Bicycle Nodes	Pedestrian and bicycle nodes are identified, and pedestrian-oriented policies are in place for these nodes	Pedestrian and bicycle nodes are identified, but pedestrian and bicycle accommodations are not	Pedestrian and bicycle nodes are not identified
General Plan: Safety Element	On safety evacuation routes, agencies should identify creative solutions on how to evacuate residents safely and efficiently while maintaining and implementing low stress pedestrian and bicycle facilities	Safety Element does not identify the need to maintain low stress facilities and come up with creative solutions that does not prohibit the implementation of low-stress facilities on evacuation routes	Safety Element does not mention pedestrian and bicycle facilities on evacuation routes

Benchmark Topic	Key Strength	Enhancement	Opportunity
Bike Ordinances (Sidewalk Riding)	Local ordinances allow for context-specific flexibility in sidewalk riding policies and enforcement (e.g., is there an adjacent bike facility?)	Local ordinance does not include section on sidewalk riding	Ordinances mandate that bikes are not allowed on sidewalks under any circumstances
Vehicle Miles Traveled (VMT) Mitigation Strategies	Has a VMT Mitigation Strategy that uses the most recent guidance from CAPCOA to measure potential impacts of pedestrian and bicycle facilities	Mitigation measures identified in CAPCOA are used independently on a project-by-project basis	Does not use CAPCOA mitigation strategies
General Plan: Densities and Mixed-Use Zones	Has moderate to high densities in the CBD and mixed-use zones and progressive parking policies, and transportation impact analysis for new development prioritizes safety	Has moderate densities with separate uses; transportation impact analysis considers safety	Has low densities with separate uses; transportation impact analysis relies on LOS
Specific Plans, Overlay Zones, and Other Area Plans	Bicyclist and pedestrian-oriented design, walkability, or placemaking is stressed in the plans	Plans require bicycle and pedestrian accommodations, and placemaking	Plans do not address bicyclist or pedestrian needs or do not exist
Historic Sites	Cultural and historic preservation plans include a wayfinding, bicycle, and walkability focus	Historic areas have been identified, and pedestrian and bicycle access are addressed	No plan is in place, and little consideration is given for pedestrian and bicycle access in historic areas
Economic Vitality	Has several business improvement districts, an established façade improvement program, and progressive downtown parking policies	Has a business improvement district, façade improvement program, or downtown parking policies	Does not have business improvement districts, a façade improvement program, or downtown parking policies
Post-Crash Care	Agency has an adopted LRSP or Caltrans-approved Safety Plan that identifies the importance of post-crash care and how the agency will implement identified countermeasures; this includes resources for medical rehabilitation, on-going advocacy group engagement (i.e., Mothers Against Drunk Driving, Families for Safe Streets), and resources for the adjudication process to ensure offenders receive proper sentencing and treatment	The adopted LRSP or Caltrans-approved Safety Plan is vague or does not include an Action Plan that identifies countermeasure implementation	The adopted LRSP or Caltrans-approved Safety Plan does not include action items and implementation strategies surrounding post-crash care The city does not have a LRSP

Benchmark Topic	Key Strength	Enhancement	Opportunity
Proactive Approach to Institutional Coordination	Has identified obstacles and proactive coordination with advocacy groups and public health services where multiple facility owners (such as Caltrans or school districts) are involved, and has implemented efforts to overcome barriers	Has reactive coordination with advocacy groups and public health services with facility owners	Projects requiring cross-jurisdictional coordination are rarely coordinated and implemented
Coordination with Emergency Response	Emergency response is involved in all aspects of bicycle/pedestrian facility planning and design (including pilot testing), and they balance response times with bicyclist/pedestrian safety. Agency also works with emergency response to implement policies providing information on traffic incident management	Emergency response is involved in some aspects of bicycle/pedestrian facility planning and design	Emergency response is not involved in bicycle/pedestrian facility planning and design
Coordination with Health Agencies	Coordinates regularly with health agencies in the planning of bicycle and pedestrian facilities and/or programs and collection of crash data	Health agencies have programs to promote healthy lifestyles through active transportation	Health agencies are not involved in bicycle/pedestrian safety or active transportation
Coordination with Transit Agencies	Bicycles are accommodated on all transit vehicles with overflow capacity available. The agency partners with transit providers to ensure safe and comfortable routes for biking and walking to transit stops and stations, including on roadways with both frequent bus service and bicycle facilities	Bicycles are accommodated on buses only, with accommodation limited to rack capacity. Some transit stops and stations safe and comfortable routes for biking and walking access	Bicycles are not accommodated on transit. There are few bicycle and pedestrian accommodations for accessing transit stops and stations

Implementation of Americans with Disabilities Act (ADA) Improvements (Key Strength)

Implementation of ADA improvements is key to making walking accessible and safe for everyone, regardless of ability or age.

The City of Claremont has ADA standards and follows Caltrans and Green Book ADA standards. A CIP project designed to address ADA improvements is implemented every year. The city uses audible pedestrian signals, directional curb ramps, high-contrast truncated domes, and occasionally, contrasting edge bands at commercial driveways and intersections.

Suggestions for Potential Improvement

- Continue adding ADA ramps at intersections that currently lack them and upgrade non-complaint ramps
- Develop an ADA improvement program for items such as dual curb ramps, truncated domes, and audible pedestrian signals that applies consistent treatments. The program may provide an inventory, prioritization plan, and funding source for such improvements.

ADA Transition Plan for Streets and Sidewalks (Key Strength)

ADA Transition Plans identify gaps and issues in the city's current ADA infrastructure, prioritize projects for implementation, and set forth the process for bringing public facilities into compliance with ADA regulations. Transition Plans typically a range of locations, such as public buildings, sidewalks, ramps, and other pedestrian facilities. Some cities also have ADA Coordinators, who are responsible for administering the Plan and reviewing projects for accessibility considerations.

Suggestions for Potential Improvement

- Consider prioritizing sub-areas within the city that exhibit greatest pedestrian activity.
- Expand the ADA Transition Plan to include the public right-of-way, particularly the downtown area, other priority development areas, bus stops, and schools.
- Provide ADA standards and best practice training for engineering staff at all levels.

Ensure Safety for All Users is Prioritized, and Accessibility Maintained, During Construction and Road Maintenance Projects (Opportunity)

It is vital to ensure that dedicated space is maintained for vulnerable users during construction and road maintenance projects.

The city uses the CA MUTCD to address temporary traffic control during constructions, which includes pedestrian and bicycle accommodations.

Suggestions for Potential Improvement

- Create a policy that details how to maintain accessibility and provide designated space for pedestrians and bicyclists through a Construction Management Plan (CMP)
- Cities that have created a CMP include:
    - http://www2.oaklandnet.com/oakca1/groups/pwa/documents/memorandum/oak062315.pdf

Roadway Safety Coordinator (Opportunity)

A roadway safety coordinator provides guidance for pedestrian/bicycle planning efforts and oversees implementation of programs and helps with capacity building of staff. In a sampling of pedestrian-oriented California cities, a common denominator among cities (with a population over 100,000) is a full-time pedestrian/bicycle coordinator.

The city does not have a roadway safety coordinator, but the city's Engineering Division staff and its consultants manage the pedestrian and bicycle programs.

Suggestion for Potential Improvement

- Include dedicated time for a pedestrian and bicycle staff person to write grants for both capital projects and ongoing funding for walking and biking related programs and optics as well as to liaison with local non-profit, advocacy groups, and schools.

Formal Advisory Committee (Key Strength)

Advisory committees serve as important sounding boards for new policies, programs, and practices. Responding to public concerns through public feedback mechanisms represents a more proactive and inclusive approach to bicycle and pedestrian safety compared to a conventional approach of reacting to crashes.

The city has a formal Traffic and Transportation Commission that meets monthly. The Commission addresses all transportation related items including bicycle and pedestrian safety. The city also has a Bicycle Pedestrian Advisory Group which meets quarterly to discuss bicycle and pedestrian safety and proposed projects.

Equitable Community Engagement Strategy that Includes Community Based Organization (CBO) Involvement (Enhancement)

Having multiple touch points with the community creates transparency and open lines of communication between the Local Agency staff, residents, and businesses. Different kinds of formats and venues for public involvement and feedback allows for broader participation from the community. Consideration of local demographics (e.g., languages spoken) and the easiest formats for people to participate (e.g., online, in person but in the course of their daily activities, or at city-organized meetings) are important for meaningful and productive community dialogue.

Community engagement is an on-going process and does not only happen during the duration of the project, but also leading up to and after the project is completed.

The city has an equitable public outreach strategy, but formal community engagement events happen on a project-by project basis and/or without CBO partnerships.

Suggestion for Potential Improvement

- Add “safety” or bicycle and pedestrian specific issues as the “work type” when people place a pin in 311 for easy coding and understanding of issues.
- Provide quarterly or annual updates to the community on the “state of walking and biking,” including recently completed projects, anticipated timeline for upcoming projects, and what the Local Agency plans to fund.
- Provide notices and interpretation in the most commonly spoken languages.
- Agencies that have an equitable community engagement strategy:
    - LA DOT Livable Streets: https://ladotlivablestreets.org/content-detail/Dignity-Infused-Community-Engagement-Strategy#:~:text=The%20Vision%20Zero%20Dignity%2DInfused,into%20the%20technical%20planning%20process

Traffic Calming or Speed Management Program (Key Strength)

Traffic calming programs and policies set forth a consensus threshold on neighborhood requests and approvals, as well as standard treatments and criteria.

The city has a speed management program that is reviewed annually alongside the CIP project list. Major arterials and neighborhood corridors include proactive speed management strategies and countermeasures are implemented to reach safe target speeds. The city has a Complete Streets Policy that is used to prepare the CIP. The city also explores traffic calming features other than speed humps.

Suggestion for Potential Improvement

- Increase the amount of dedicated funding available for traffic calming each year.
- Expand the city’s traffic calming toolbox to include other tools, such as raised crosswalks, raised intersections, chicanes, and traffic diverters. The Local Agency should review their speed management program annually alongside the CIP project list to identify major arterials and neighborhood corridors to include proactive speed management.
- Expand the city’s practices to include proactive traffic calming measures instead of only responding to community requests. The Local Agency could consider allocating a portion of funding to proactive traffic calming, such as on bicycle boulevard streets or safe routes to schools, and then allocate the remaining funding to react to specific community requests.

- Refer to the following resources for traffic calming best practices:
  - www.trafficcalming.org
  - Traffic Calming Guidelines from the City of Danville (https://www.danville.ca.gov/DocumentCenter/View/139/NTMP-Guidelines-Booklet-PDF)
  - Neighborhood Traffic Management Program from the City of Anaheim (https://www.anaheim.net/2841/NTMP3)
  - ITE Technical Resources — Traffic Calming Measures: (https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures/)

Speed Limit Settings (Key Strength)

Agencies should regularly survey speeds and identify locations with high deviation from target speeds. Local municipalities use best practices for speed management from AB 43 to lower speed limits. Implementing lower speed limits is done using a consistent approach that prioritizes areas with historic under investment.

The city regularly surveys speed and identifies locations with high deviation from target speeds and continues to use the 85th percentile to set speed limits. It employs comprehensive practice to proactively review speed limits and considers traffic calming before raising speed limits in pedestrian or bicycle zones.

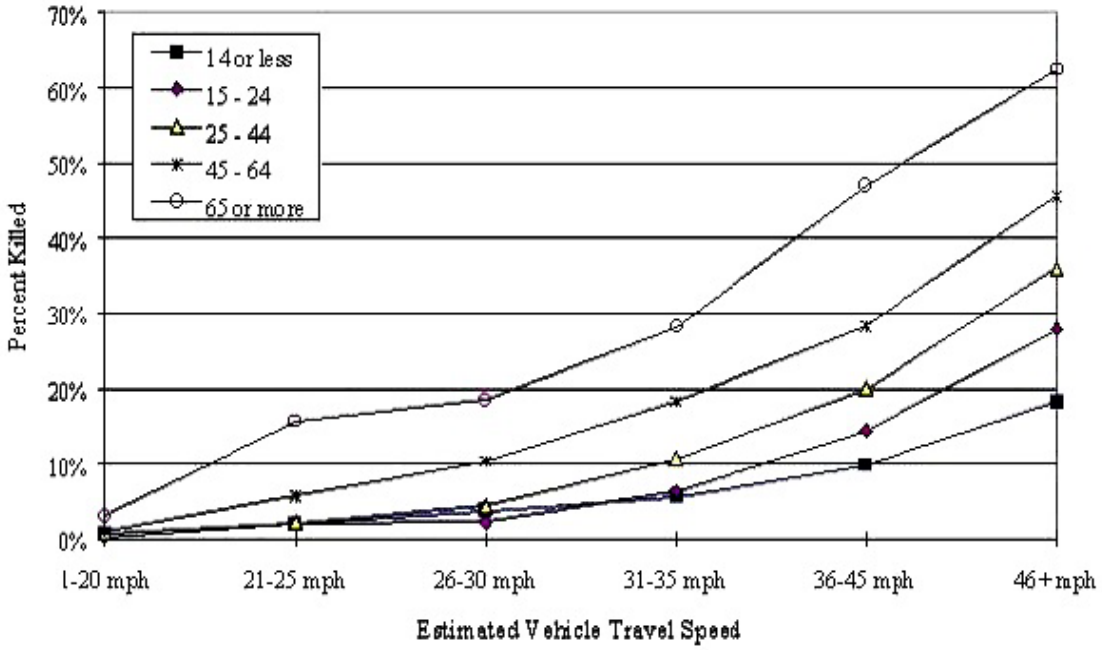


Figure 2-1. Relationship between Vehicle Speed, Victim Age, and Fatalities

Suggestions for Potential Improvement

- Install traffic calming measures, signal coordination, and similar tools to maintain slower speeds appropriate for an urban community, particularly on streets that will be reviewed in the next speed survey.
- After complete streets improvement and other safety improvements are installed, conduct off-cycle speed surveys to review the speed limit and see if it needs to be reduced based on the improvements.
- Consider pedestrian volumes and known complete streets safety issues when setting speed limits and employ traffic calming strategies in locations where speed surveys suggest traffic speeds are too high for pedestrian and bicyclist safety.
- Ensure complete streets design standards have appropriate target design speeds for urban areas and do not contribute to a routine need for traffic calming.
- Consider the use of 15 MPH school zones.
- Additional information on AB 43 can be found here:
    - https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB43
    - San Francisco's Speed Limit Setting in Business Districts: https://sfmayor.org/article/san-francisco-lowers-speed-limits-targeted-business-districts-under-new-state-law

Safe Routes to Schools (Enhancement)

Safe Routes to School (SRTS) programs encourage children to safely walk or bicycle to school. The Marin County Bicycle Coalition was an early champion of the concept, which has spread nationally (refer to best practices at *www.saferoutestoschools.org*). SRTS programs are important both for increasing physical activity (and reducing childhood obesity) and for reducing morning traffic associated with school drop-off (as much as 30% of morning peak hour traffic).

The City of Claremont obtained funding for recent projects but has no communitywide Safe Routes to Schools program.

Suggestion for Potential Improvement

- Form an ongoing steering committee for the program (or each school) comprised of Local Agency staff, school district staff, PTA leaders, and other stakeholders that meets regularly to monitor efforts and identify new opportunities.
- Consider a safe route to school plan for all schools that is integrated with other policies and programs to conduct walk audits, identify recommended safety improvements, and secure funding for those improvements.

Systemic Signalized and Unsignalized Intersection Enhancements

The city has a systemic signalized intersection enhancements program that follows a Safe System-based framework and proactively implements FHWA's Proven Safety Countermeasures to manage speed and crash angles and considers risk exposure. The city has an annual CIP that provides signalized intersection improvements to update technology and safety practices.

For the uncontrolled crossings, the city does not have a policy or set practices for addressing crosswalk installation or enhancements using Proven Safety Countermeasures.

Suggestion for Potential Improvement

- Develop a citywide crosswalk policy for the installation, removal, and enhancement of crosswalks at controlled and uncontrolled location. Ensure that it is consistent with best practices and recent research. This includes removing crosswalks only as a last resort and providing midblock crossings where they serve pedestrian desire lines.
- Consider developing a treatment selection "tool" to assist staff with the identification of applicable treatments in a given context.
- When crosswalk enhancements are identified, add them to a prioritized list that will be upgraded over time as funding is available.

FHWA resources include:

- Federal Highway Administration Safe System-Based Framework and Analytical Methodology for Assessing Intersections: https://safety.fhwa.dot.gov/intersection/ssi/fhwasa21008.pdf
- Federal Highway Administration Proven Safety Countermeasures https://safety.fhwa.dot.gov/provencountermeasures/
- Federal Highway Administration STEP Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations: https://safety.fhwa.dot.gov/ped_bike/step/docs/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf
- National Cooperative Highway Research Program Application of Pedestrian Crossing Treatments for Streets and Highways: http://www.trb.org/Publications/Blurbs/175419.aspx

Safety-focused Curbside Management (Opportunity)

Shared mobility services are transportation services — typically offered by private companies — that offer ride-hail services (e.g., Lyft or Uber) for both solo and pooled trips, bike share, and scooter share. Policies for shared mobility services can allow agencies to encourage, prohibit, or direct how they want shared mobility to work in their agency. They can allow for curb space management, clear organization of sidewalk space, and encourage (or discourage) private

vendors to come to the city/county. Curb space management is a practice that requires curb access to be planned, designed, operated, and maintained to enable curb utilization with safe, convenient, and multimodal access for all transportation users and provides driver education programs for fleet drivers.

The City of Claremont has no curbside management program or policies in place.

Suggestion for Potential Improvement

- Adopt a curb management plan to designate how the Local Agency will prioritize and proactive plan for curb uses (e.g., parking, passenger loading, commercial loading, ADA loading and parking, bicycle parking, bus-only lanes) and to make sure that the curb has the highest and best use of space.
- Consider micro-mobility policies (e.g., permitting, enforcement) in place to prioritize pedestrian and bicyclist safety and keep the sidewalk organized and usable for people of all abilities.
- Curbside management policy and education resources:
    - NYC Vision Zero Education: https://www1.nyc.gov/content/visionzero/pages/education
    - NYC Vision Zero Outreach: https://www1.nyc.gov/site/tlc/about/tlc-vision-zero-outreach.page
    - NYC Vision Zero Safety Toolkit for Trucks: https://www1.nyc.gov/content/visionzero/pages/trucks

Policies Supporting Micromobility (Enhancement)

Micromobility should prioritize low-stress facilities in areas with high micromobility use and built into network planning and design for all projects with retail or in urban space.

The city has a micromobility policy in place, and requirements for shared micromobility are noted on a project-by-project basis.

Suggestions for Potential Improvement

- Create a micromobility policy and implement speed regulators in geofenced locations
- NACTO Resources include:
    - https://nacto.org/wp-content/uploads/2019/09/NACTO_Shared_Micromobility_Guidelines_Web.pdf

Connected and Automated Vehicle (CAV) Readiness (Opportunity)

As CAV technology is deployed, strategies and readiness to discuss the interface between technology and human road users, the role of smart infrastructure, and the need for physical separation of AVs and vulnerable road users.

The city has no policy around C/AV readiness.

Suggestions for Potential Improvement

- Create a policy that strategizes the oncoming challenges posed by CAV technology
- FHWA Resources include:
    - https://www.fhwa.dot.gov/policy/otps/policyanalysis.cfm

Heavy Vehicle Fleets and Truck Routing (Key Strength)

As the conversation around heavy vehicle fleets and truck routings are changing, local jurisdictions must be prepared to identify incorporation of these fleets along with funding. Identifying dedicated routes or boundaries within city/county boundaries allows for parallel routes of pedestrian and bicycle corridors.

The city has a policy that identifies various future fleet incorporation and funding on what type of fleet (best fits the agency) as well as identification of routes within city boundaries dedicated to buses, trucks, and other heavy vehicles.

Suggestions for Potential Improvement

- Create a policy that identifies future fleet incorporating, funding, and dedicated routes for daily use

Public Advertisements Supporting Safety Culture (Enhancement)

Culturally relevant and accessible education campaigns and outreach should occur regularly and on various platforms.

Additional resources on successful safety culture campaigns can be found below:

- Stick to the Limits San Francisco: https://www.sticktothelimitsf.org/

Adopted Safety Plan (Opportunity)

A Local Road Safety Plan (LRSP) or Caltrans-approved safety report identifies dedicated, annual funding stream for bicycle and pedestrian projects within underserved communities. Bicycle and pedestrian projects can also be integrated in the other work that the Local Agency does, including repaving and other routine maintenance of the roadway network.

The city is working with the San Gabriel Valley Council of Governments and neighboring cities at developing a LRSP for the cities.

The dedicated annual funding stream that the city uses for bicycle and pedestrian projects are:

- General City Funds
- Local and regional impact fees
- County tax measure funds
- Local tax measure funds

The city also applies for the following grant:

- Active Transportation Program (ATP)

Suggestion for Potential Improvement

- Partner with other agencies and continue applying for grant funding for both infrastructure and non-infrastructure projects.
- Integrate bicycle and pedestrian projects into the site plan review process for new development.
- Secure additional funding for repaving projects to allow for “quick build” projects and other bicycle and pedestrian safety improvements to be integrated into those projects.
- Establish a dedicated funding source for pedestrian and bicycle projects.

Safe System Policy

A Safe System policy with redundancy built in for transportation projects includes all users and modes, affects new construction and maintenance, considers local context, and provides guidance for implementation.

The City of Claremont does not have a safe system policy.

Collection of Pedestrian and Bicyclist Volumes (Opportunity)

Pedestrian and bicyclist volume data, along with a GIS database, is important for understand where people walk and bike. This establishes baseline data prior to project implementation and can help prioritize projects, develop crash rates, and determine appropriate bicycle and pedestrian infrastructure. The database helps to identify patterns and needs of underserved communities in local jurisdictions policies and programs.

The city collects pedestrian and bicyclist volumes on a project-by-project basis, but not routinely. The types of counts are Intersection turning movement, Cordon (corridor), and Pedestrian/bicycle counts collected as part of Transportation Impact Studies.

Suggestions for Potential Improvement

- Routinely collect pedestrian and bicycle volumes by requiring them to be counted in conjunction with manual intersection turning movement counts. https://mtc.ca.gov/sites/default/files/4_AOC_Tech_Transfer_Seminar_Banner_06032013.pdf

- Geocode pedestrian volume data with GIS software along with other data such as pedestrian control devices and crashes to analyze data for trends or hotspots related to pedestrian safety.

Inventory of Bikeways, Parking, Informal Pathways, and Key Bicycle Opportunity Areas (Key Strength)

The city maintains and routinely updates an inventory of missing and existing bikeways in GIS and includes bikeway projects in the CIP.

Suggestions for Potential Improvement

- Migrate the inventory of bikeways, bike parking, and future bike improvements into a GIS format for quick mapping and sharing.

- Identify a staff person responsible for maintaining the GIS data set.

Inventory of Sidewalks, Informal Pathways, and Key Pedestrian Opportunity Areas (Key Strength)

A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, and so on. This data set can be available on the Local Agency's website for knowledge sharing with the public as well as agencies.

The city maintains and routinely updates an AI-based inventory of missing and existing sidewalks and crosswalks in GIS and includes sidewalk and crosswalk projects in the CIP.

Suggestion for Potential Improvement

- Create a city- or countywide inventory of existing and missing sidewalks, informal pathways, and key pedestrian opportunity areas in GIS.

- Consider establishing a program to work with property owners to repair damaged sidewalks outside their property. This can be a condition for the sale of the property.

Traffic Control Audit (Signs, Markings, and Signals) (Opportunity)

Cities have a wide variety of traffic control devices that regulate how bicyclist and pedestrians should use the street and interact safely with drivers. However, some cities do not have inventories how, when, and where this is installed. Creating a database of this information allows the city staff to know where infrastructure may be out of date or in needed of updates. For example, countdown signals are important pedestrian safety countermeasure. The 2012 California *Manual of Uniform Traffic Control Devices* (MUTCD) requires the installation of

countdown pedestrian signals for all new signals. Likewise, the CA MUTCD also requires installation of bike detection at all actuated signals. Bike detection is a basic building block of the bike network to make sure that bikes can trigger the traffic signal. Inventorying bike detection and countdown signals allows the Local Agency's staff to approach safety from a systems perspective and develop projects to close gaps in biking and walking infrastructure over time.

The city does not have a GIS-based inventory of signs, markings, countermeasures, and signals.

The city is in the process of developing an RFP to engage a consultant to develop their sign program.

Suggestion for Potential Improvement

- Develop a citywide crosswalk inventory in GIS and maintain it over time. This would allow for a systemic safety approach to enhancing crosswalks and allow the Local Agency to prioritize all crosswalk enhancement projects city- or countywide for implementation over time and as money is available.
- Ensure that locations with pedestrian desire lines have safe crosswalks. An updated crosswalk policy can help determine the appropriate crossing treatment at uncontrolled locations without marked crosswalks.
- Include maintenance records within the GIS database inventory of signs, markings, and signals.
- Develop a proactive monitoring program for ensuring the quality and proper functioning of traffic control devices.

Crash History and Crash Reporting Practices (Enhancement)

Safety is typically approach through both proactive and reactive measures. Identifying and responding to crash patterns on a regular basis and in real time is an important reactive approach to bicycle and pedestrian safety, which may be combined with other proactive measures. This is the traditional way most cities have approached safety. However, many are now looking to proactive safety to address safety issues on a system wide basis. This is often paired with a policy goal of getting to zero fatality or severe injury crash (commonly referred to as "Vision Zero").

The city reviews crash data only following fatalities or other high-profile incidents. It uses local data from Police Services or similar (not TIMS/SWITRS).

Suggestion for Potential Improvement

- Adopt a data driven systemic safety approach, which would include a systems approach to identifying, prioritizing, and ultimately implementing safety countermeasure and/or a formal commitment to Vision Zero.

- Work with elected officials and department heads to adopt a Vision Zero policy formally stating the Local Agency's commitment to reducing the number of traffic-related fatalities and severe injuries to zero.

- Additionally, with sufficient pedestrian volume data, the Local Agency could prioritize crash locations based on crash rates (i.e., crashes/daily pedestrian volume), a practice that results in a more complete safety needs assessment. Treatments could then be identified for each location and programmatic funding allocated in the Local Agency's Capital Improvements Program (CIP).

    - The City of Sacramento's Pedestrian Master Plan includes a section on how to prioritize locations based on crash rates: http://www.cityofsacramento.org/transportation/engineering/publications.html

Surrogate Safety Measures for Proactive Monitoring (Enhancement)

Innovative data collection techniques such as hard breaking, speed, and near miss data can provide additional insights into crashes. Community feedback tools such as Street Story can assist local jurisdictions to collect data.

The city uses surrogate safety measures on a project-by-project basis and community feedback.

Suggestion for Potential Improvement

City staff may consider using the Street Story Tool developed by UC-Berkeley SafeTREC for crowdsourcing:

- https://safetrec.berkeley.edu/tools/street-story-platform-community-engagement

Complete Streets Policy

Complete Streets Policies are formal statements showing a local agency's commitment to planning and designing for all modes of travel and travelers of all ages and abilities.

Active Transportation Plan (Enhancement)

This type of plan includes a large menu of policy, program, and practice suggestions, as well as site-specific (and prototypical) engineering treatment suggestions. Bicycle and Pedestrian Master Plan(s) documents a jurisdiction's vision for improving walkability, bikeability, and bicycle and pedestrian safety; establish policies, programs, and practices; and outline the prioritization and budgeting process for project implementation. The city has a Pedestrian or Bicycle Master Plan, but it may be outdated and/or no recent projects from the Plan have been completed.

Suggestion for Potential Improvement:

- Implement the low-hanging projects in the Bicycle and Pedestrian Master Plan and seek grant funding for major projects.

- Pursue additional funding opportunities for programs identified by the Plan.
- Provide regular updates to the Plan, including bicycle and pedestrian facilities and design guidelines that address the needs of bicyclists and pedestrians of all ages and abilities
- Develop high injury networks for walking and biking to identify routes with the highest incidences of fatal and severe injuries for pedestrians and bicyclists. This will create a systematic safety analysis that can help in prioritizing limited resources.
- Consider identifying existing and missing bicycle and pedestrian infrastructure for safety improvement.

Existing Bike Network (Enhancement)

Innovative features such as protected bikeways, bike boulevards, and protected intersections city- or countywide can decrease the level of traffic stress experienced by bicyclists, make biking more comfortable, and — in so doing —appeal to a wide range of bicyclists. Level of traffic stress refers to the level of comfort or discomfort a bicyclist might experience. Research conducted by the Mineta Institute in San Jose establishes levels of traffic stress on a scale for 1 to 4 with LTS 1 at the level that most children can tolerate and LTS 4 at the level characterized by "strong and fearless" cyclists (see: http://transweb.sjsu.edu/project/1005.html). A bicycle network that is attractive to the majority of the population would have low stress and high connectivity.

The city's existing bike network primarily includes Class I, II, and III facilities. There are gaps within the bike network and facilities do not accommodate all users.

Suggestion for Potential Improvement:

- Continue to identify funding sources and implement the proposed projects identified in the Bicycle and Pedestrian Master Plan.
- Develop design standards for bike boulevards, trails, paths, and landscaping for bicycle network.
- Create a GIS data for existing bike network to identify gaps and opportunities for improvements.

Existing Pedestrian Facilities (Key Strength)

The city's existing pedestrian facilities includes low stress facilities and frequent use of landscape strips, medians, frequent crosswalks, and roadways are primarily two-to-four lane roads.

Suggestion for Potential Improvement:

- Continue to identify funding sources and implement the proposed projects identified in the Bicycle and Pedestrian Master Plan.

- Create a GIS database for existing pedestrian infrastructure to identify gaps, inventory assets, and create opportunities for systemic safety analysis of all crosswalks.

Bike and Pedestrian Network Implementation Practices (Opportunity)

Considering the safety and comfort of people walking and biking leads to better projects that can encourage new walking and biking trips and enhance safety for active transportation users today and in the future.

Bicycle Level of Traffic Stress (LTS) was originally developed by researchers at the Mineta Transportation Institute. LTS assesses the comfort and connectivity of bicycle networks.

The city uses the Complete Streets Policy to address countermeasures/improvements.

Suggestion for Potential Improvement:

- Prioritize bicycle projects to align with roadway resurfacing and projects that are near school sites.
- Identify pedestrian priority areas and have a policy in place around crosswalk spacing and design enhancements
- Secure enough funding for repaving and other complete streets projects to allow for installation of protected bike and pedestrian facilities and intersection improvements.
- Prioritize Use LTS to strategically implement bikeways and traffic calming treatments that would improve LTS of existing bikeways.

Design Guidelines and Standards (Key Strength)

Design guidelines and development standards create a clear set of documents that guide how all transportation improvements should be installed citywide. As a result, they can create a consistent, high-quality biking and walking experience.

The city uses national best practices focused on bicycle and pedestrian safety for roadway and facility design guidelines and standards.

The city considers reducing vehicle speeds, intersection safety, driver intrusion into bicycle facility, reducing the number of vehicle travel lanes, narrowing vehicle travel lanes, and removing on-street parking, reducing the bicyclist level of stress on each roadway, reducing the bicyclist level of stress at crossings, and improving access to key destinations when making design decisions.

The city uses NACTO Urban Bikeway Design Guide, NACTO Urban Street Design Guide, AASHTO Guide for the Development of Bicycle Facilities, AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, FHWA Separated Bike Lane Planning and Design Guide, Caltrans DIB 89 Class IV Bikeway Guidance, and CA MUTCD and the Highway Design Manual when making design decisions.

Suggestion for Potential Improvement

- Consider adopting national bicycle and pedestrian safety best practices for roadway and facility design guidelines and standards:
    - NACTO Urban Street Design Guide: http://www.nyc.gov/html/dot/downloads/pdf/2012-nacto-urban-street-design-guide.pdf
    - CROW Design Manual for Bicycle Traffic
    - FHWA Separated Bike Lane Planning and Design Guide https://nacto.org/wp-content/uploads/2016/05/2-4_FHWA-Separated-Bike-Lane-Guide-ch-5_2014.pdf
    - MassDOT Separated Bike Lane Planning & Design Guide https://www.mass.gov/lists/separated-bike-lane-planning-design-guide
    - ITE Recommended Practice for Accommodating Pedestrians and Bicyclists at Interchanges
    - AASHTO Guide for the Development of Bicycle Facilities https://nacto.org/wp-content/uploads/2015/04/AASHTO_Bicycle-Facilities-Guide_2012-toc.pdf

AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities https://transops.s3.amazonaws.com/uploaded_files/Update%20of%20the%20AASHTO%20Guide%20for%20the%20Planning%2C%20Design%2C%20and%20Operation%20of%20Pedestrian%20Facilities.pdf

Roadway Surfaces for Bicycle Facilities (Enhancement)

The quality of a roadway surface along bikeways is an important consideration when choosing to bike. Rough surface in a bike lane creates an uncomfortable bicycling experience and may also pose safety hazards.

The City of Claremont keeps the roadway surface is acceptable on bicycle routes and routine maintenance, including debris removal, occurs.

Suggestion for Potential Improvement:

- Prioritize maintenance of roadways where bicycle facilities are present, particularly for closing gaps in the bikeway network or where improved pavement quality is needed on popular bicycle routes.
- Prioritize debris removal on roadways where bicycle facilities are present.
- Assess the needs for new and enhanced crosswalks and curb ramps with each repaving project. Include consideration of lane reductions and quick build projects such as paint and plastic median refuges and bulb outs; high-visibility crosswalks; and advanced yield markings.

Attention to Bicycle and Pedestrian Crossing Barriers (Enhancement)

Crossing barriers — such as railroads, freeways, and major arterials — may discourage or even prohibit bicycle access and are often associated with vehicle-bicycle crashes. Large intersections and interchanges and uncontrolled crossings can often deter bicyclists due to high speeds, high number of conflict points with vehicles, and high level of exposure. Identifying and removing barriers and preventing new barriers is essential for improving bicyclist safety and access. Crossing barriers also discourage or even prohibit pedestrian access and can create safety challenges for pedestrians. These can be similar to the biking barriers or present additional challenges.

At City of Claremont, higher-stress bike treatments are installed at some intersections and interchanges. The city has no policy but has identified some barriers and taken steps to improve pedestrian access.

The city uses the following crossing treatments at uncontrolled crossings: advance yield limits, high visibility crosswalk striping, and restricting parking at crosswalk to increase visibility of crossing.

Suggestion for Potential Improvement:

- Use green routinely to highlight conflict zones at large intersection and interchanges. See Oakland's bicycle lane striping guidance for more information: http://www2.oaklandnet.com/government/o/PWA/o/EC/s/BicycleandPedestrianProgram/OAK024653
- To slow speeds at critical intersections, use smaller corner radii using small design vehicles appropriate for urban areas and updated standard plans to reflect this.
- Review design of slip/trap-right lanes at intersections and implement improvements.
- Implement best practice guidance on bicycle accommodation through interchanges and expressways, as appropriate, using the ITE's *Recommended Practice: Guidelines to Accommodate Bicyclist and Pedestrians at Interchanges* plus consideration of protected bike lane design.
- Identify and create an inventory of pedestrian barriers with targeted recommendations for phased improvements.
- Consider pedestrian barriers and needs in doing bicycle barriers assessment.

Intersection Control Evaluation (Key Strength)

Providing alternative traffic controls such as roundabouts, signals, and stop signs may improve pedestrian and bicycle safety by reducing speeds and controlling vehicle conflicts. Installing bicycling signals and limiting stop signs on bicycle routes may enhance bicycle mobility and safety. The CA MUTCD defines warrants for installing signals and stop signs.

The city uses intersection control evaluations to assess alternative traffic control performance, and select appropriate control based on desired performance.

The city's actuated signalized intersections are designed to include bicyclist detection on all actuated phases, additional time is added to the green phase to account for bicyclist speeds, accommodation of left-turning bicyclists, tightened ramp and corner radii to reduce vehicle speeds, and maximum length of a bicycle lane on approach between two vehicle travel lanes of 200 feet or less.

Suggestion for Potential Improvement

- Develop specific signal and stop sign warrants that are pedestrian- and bicycle-friendly.

Sidewalk Furniture or Other Sidewalk Zone Policies (Opportunity)

Street furniture encourages walking by accommodating pedestrians with benches to rest along the route or wait for transit; trash receptacles to maintain a clean environment; street trees for shade, and so on. Uniform street furniture requirements also enhance the design of the pedestrian realm and may improve economic vitality.

The city has no design standards requiring implementation of the sidewalk zone system.

Suggestion for Potential Improvement

- Adopt a Street Furniture Ordinance to include locations and furniture amenities other than those associated with transit stops, as appropriate.

Street Tree Requirements (Opportunity)

Street trees enhance the pedestrian environment by providing shade and a buffer from vehicles, which increase pedestrian safety. Street trees may also enhance property values, especially in residential neighborhoods. However, street trees, when improperly selected, planted, or maintained, may cause damage to adjacent public utilities.

The city does not have a street tree ordinance.

Suggestion for Potential Improvement

- Develop a Street Tree Ordinance to provide guidance on permissible tree types and permitting requirements, also specifying a requirement for new trees plantings associated with development projects.

Bicycling Supportive Amenities and Wayfinding (Enhancement)

In addition to designating roadway or paths in a bicycle network, supportive amenities (including parking, water fountains, and maintenance stations) can encourage bicycling. Wayfinding can both encourage bicycling and enhance safety by navigating cyclists to facilities that have been enhanced for bicyclist use or to local retail opportunities for economic growth.

The city has some bicycle supportive amenities which are found in key areas.

Suggestion for Potential Improvement:

- Create and deploy a bicycle wayfinding strategy citywide as recommended in the Bicycle and Pedestrian Master Plan, as well as a Biking Guide.
- Develop a Biking Guide that includes a bike map and bicycle locker and rack locations.

Bicycle Parking Requirements (Opportunity)

Safe and convenient bicycle parking is essential for encouraging bicycle travel (especially in-lieu of vehicle travel). Bicycle parking can also facilitate last-mile connections between two modes, such as bicycle parking at a transit station. To be effective, bicycle parking needs to be visible and secure and have enough capacity to accommodate bicycle demand, both long-term and short-term. Long-term and short-term parking can be implemented through a bicycle parking ordinance as in the City of Oakland (see details at http://www2.oaklandnet.com/Government/o/PWA/o/EC/s/BicycleandPedestrianProgram/OAK024596).

The city has no bike parking ordinance or program in place.

The city requires new office and commercial developments to provide short term bike accommodations. The city has no bike parking requirements for new multi-family residential developments

Suggestion for Potential Improvement:

- Implement short-term and long-term, secured bicycle parking at all new development, consistent with the Bicycle and Pedestrian Master Plan and the APBP Bicycle Parking Guidelines, 2nd edition.
- Site bicycle racks to be convenient for bicyclists, out of the way of pedestrians, and with good visibility for security, consistent with the APBP Bicycle Parking Guidelines, 2nd edition.
- Consider implementation of “branded” racks for the city (with a unique design or city symbol).

Pedestrian and Bicycle Safety Education Program (Opportunity)

Engineering treatments are often not enough on their own to realize full safety benefits associated with the treatment. Safety education programs complement engineering treatments and increase compliance. Education campaigns target drivers and people of all ages, especially school-age children where safe walking and biking habits may be instilled as lifelong lessons.

The city does not have pedestrian and bicycle safety education programs.

Suggestion for Potential Improvement

- Conduct a formal education campaign targeting people driving, walking, and biking about street safety. This includes advertisements on buses and bus shelters, an in-school curriculum, community school courses, public service announcements, and many other strategies. Consider a focus on speed and safe driving.

Enforcement (Opportunity)

Enforcement of pedestrian and bicycle right-of-way laws and speed limits is an important complement to engineering treatments and education programs.

The city's police department has very limited resources. They conduct enforcement as schedule permits.

The 3-Es of Pedestrian Safety:

Engineering

Education

Enforcement

Suggestion for Potential Improvement

- Implement sustained pedestrian safety enforcement efforts and involve the media. Use enforcement as an opportunity for education by distributing pedestrian safety pamphlets in-lieu of, or in addition to, citations. The Miami-Dade Pedestrian Safety Demonstration Project provides a model for the role of media in the sustained effectiveness of enforcement. Information is available at: *http://www.miamidade.gov/MPO/docs/MPO_ped_safety_demo_eval_report_200806.pdf.*

- Train officers in pedestrian safety enforcement principles. The Madison, Wisconsin Department of Transportation has developed a DVD in collaboration with the Madison Police Department to train traffic officers in pedestrian and bicycle issues (for more information see *http://www.walkinginfo.org/library/details.cfm?id=2865*). The Bicycle Transportation Alliance in Portland, Oregon offers Pedestrian Safety Enforcement Training (for more information on this five-hour course see: *http://www.bta4bikes.org/at_work/pedestriangrants.php).*

- Establish a radar gun check-out program for trained community volunteers to record speeding vehicles' license plate numbers and send letters and/or document occurrences. Radar gun check-out programs are available in Albany, Pleasanton, and Thousand Oaks, California, among other cities (for more information on the Pleasanton program see: *http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2004/04/07/MNG8N6/04/07/MNG8N6 1MGG1.DTL).*

Pedestrian Walking Audit Program (Enhancement)

Walking audits provide an interactive opportunity to receive feedback from key stakeholders about the study area and to discuss the feasibility of potential solutions. They can be led by Local Agency staff, advocacy groups, neighborhood groups, or consultants.

The city has no safety program but has conducted walking audits sporadically.

Suggestion for Potential Improvement

- Include regular walking audits in city- or countywide pedestrian safety program, based on the suggestions of this CSSA. This effort may complement other "green" or health-oriented programs within the city.

Bicycling Safety Audit Program (Enhancement)

When city staff and key stakeholders ride along study corridors and experience key route and crossing challenges and best practices, consensus is more readily reached on a vision and action plan for safety enhancements.

The city has some programs and may have conducted a bicycling audit.

- Include regular bicycling audits in the city- or countywide bicycle safety programs. Encourage interdepartmental participation.
- Routinely conduct bicycle safety audits of key corridors throughout the city/county, including those with recent improvements, those with heavy bicycle demand, and those with high crash rates.
- Collaborate with schools on projects beyond the school district boundaries.

2.1.1. General Plan: Provision for Pedestrian and Bicycle Nodes (Key Strength)

Planning principles contained in a local agency's General Plan can provide an important policy context for developing pedestrian-oriented, walkable areas. Transit-oriented development, higher densities, and mixed uses are important planning tools for pedestrian-oriented areas. The General Plan identifies pedestrian priority areas, which are zones in which high volumes of pedestrian traffic are encouraged and accommodated along the sidewalk.

In the city's General Plan, pedestrian and bicycle nodes are identified and pedestrian-oriented policies are in place for these nodes.

Suggestion for Potential Enhancement

- Create an overlay district for pedestrian priority areas with special pedestrian-oriented guidelines, such as relaxing auto Level of Service standards and prioritizing pedestrian improvements. Prioritize sidewalk improvement and completion projects in these nodes.
- Utilize vehicle miles traveled (VMT) for future transportation impact analysis.

General Plan: Safety Element (Opportunity)

SB 99 and AB 747 are legislation around safety evacuation during natural disasters. Local jurisdictions should identify creative solutions on how to evacuate residents safely and efficiently while maintaining and implementing low stress pedestrian and bicycle facilities.

The Safety Element of the city's General Plan does not mention pedestrian and bicycle facilities on evacuation routes.

Bike Ordinances (Sidewalk Riding) (Key Strength)

The city's local ordinances allow for context-specific flexibility in sidewalk riding policies and enforcement.

Suggestion for Potential Improvement:

- Consider an optional helmet ordinance for adults.
- Consider allowing for context-specific flexibility in sidewalk riding policies and enforcement

Vehicle Miles Traveled (VMT) Mitigation Strategies (Enhancement)

A VMT Mitigation Strategy should use the most recent guidance from California Air Pollution Control Officers Association (CAPCOA) to measure potential impacts of pedestrian and bicycle facilities.

- CAPCOA Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity: https://www.caleemod.com/documents/handbook/full_handbook.pdf

The mitigation measures identified in CAPCOA are used independently on a project-by-project basis by the city.

General Plan: Densities and Mixed-Use Zones

Planning principles contained in a local agency's General Plan can provide an important policy context for developing bicycle-oriented and walkable areas. Transit-oriented development, higher densities, and mixed uses are important planning tools for pedestrian-oriented areas.

Suggestion for Potential Improvement

- Utilize vehicle miles traveled (VMT) for future transportation impact analysis.
- Consider allowing moderate to high densities in the downtown and mixed-use zones as well progressive parking policies, such as shared parking and demand-based pricing.
- Consider multi-modal trade-offs in the transportation impact analysis for new development, so that the safety and needs of people walking and biking is weighed heavily, and vehicular delay is not the primary performance measure.

- Ensure that wide sidewalks, high quality, protected bike lanes, and intersection safety improvements are included with all new development projects, particularly where densities are higher

- Strongly weigh walking and biking performance measures as well as safety metrics in determining appropriate intersection improvements and street design.

Specific Plans, Overlay Zones, and Other Area Plans (Key Strength)

The city's specific plans stress bicyclist and pedestrian-oriented design, walkability, or placemaking.

Suggestion for Potential Improvement

- Emphasize bicyclist and pedestrian-oriented design, walkability, and/or placemaking in all new specific plans, overlay zones, and other area plans.

Historic Sites (Enhancement)

Historic walking routes or bike trails, such as the famous Freedom Trail in Boston, encourage active transportation and enhance economic vitality. The city has identified historic areas, and pedestrian and bicycle access are addressed.

Suggestion for Potential Improvement

- Continue to implement the goals, policies and programs that support walking trips included in the Historic Preservation and Community Design Element of the General Plan to showcase natural or local sites of interest, and link key features of the Local Agency. Maps of the tour route and historic documentation materials could be made available online or as a mobile app in addition to wayfinding signs, maps, and plaques could also be provided throughout the Local Agency. Consider other areas of the city/county for walking tours and historic signs.

Consider upgrading History Walk signs with larger text to improve legibility and wayfinding.

Economic Vitality (Opportunity)

Improving bicycle and pedestrian safety and walkability can enhance economic vitality. Similarly, enhancing economic vitality through innovative funding options such as Business Improvement Districts (BIDs), parking management, and facade improvement programs can lead to more active areas and encourage walking and bicycling.

Sample store facades

The city does not have business improvement districts, a façade improvement program, or downtown parking policies

Suggestion for Potential Improvement

- Activate the built environment in business areas through BIDs and façade improvement programs.
- Use wayfinding, walking routes, and events to direct pedestrians to commercial areas throughout the area.
- Install bicycle parking in commercial areas and provide safe, comfortable bike facilities in commercial areas to make it convenient and fun to get to local businesses.

Post-Crash Care (Opportunity)

An agency's adopted LRSP or Caltrans-approved Safety Plan should include resources for the agency to implement identified countermeasure for medical rehabilitation, on-going advocacy group engagement, and resources for the adjudication process to ensure offenders receive proper sentencing and treatment.

The city does not have a LRSP.

Proactive Approach to Institutional Coordination (Key Strength)

Institutional coordination associated with multiple agencies and advocacy groups is a critical part of the work of any municipality. Non-local control of right-of-way and differing policies regarding pedestrian and bicyclist accommodation can make the work complex.

The city has identified obstacles and proactive coordination with advocacy groups and public health services where multiple facility owners (such as Caltrans or school districts) are involved and has implemented efforts to overcome barriers.

Suggestion for Potential Improvement

- Work with the local school districts to establish a policy on neighborhood-sized and oriented schools as part of a Safe Routes to School policy.
- Work with the school districts to establish suggested walking routes and address potential barriers to pedestrian or bicycle access.

Coordination with Emergency Response (Opportunity)

Emergency response requires special roadway design considerations that sometimes conflict with bicycle and pedestrian treatments. One example is the design of turning radii at intersections. Bicyclists and pedestrians benefit from the reduced vehicle speeds of smaller radii, but larger vehicles, such as fire trucks, have more difficulty performing the turn within the smaller space. These conflicts require consensus building between the Local Agency and the respective departments. Consensus building could include pilot testing of alternative treatments, such as a model traffic circle in an open field.

At the city, emergency response is not involved in bicycle/pedestrian facility planning and design.

Suggestion for Potential Improvement:

- Include the Fire Department early in the process as a stakeholder in the Williams Street and Bancroft Street separated bikeway projects to ensure access needs are accommodated.
- Balance the trade-off between traffic calming safety treatments such as roundabouts or partial street closures and longer emergency response times.
- Encourage emergency and transit responders to participate in test runs of roadway designs that are aimed to reduce speed and improve bicycling access.
- Implement policies providing information on tragic incident management

Coordination with Health Agencies (Opportunity)

Involving non-traditional partners such as public health agencies, pediatricians, etc., in the planning or design of pedestrian and bicycle facilities may create opportunities to be more proactive with pedestrian and bicycle safety, identify pedestrian and bicycle safety challenges and education venues, and secure funding. Additionally, under-reporting of pedestrian-vehicle and bicycle-vehicle crashes could be a problem that may be partially mitigated by involving the medical community in pedestrian and bicycle safety planning.[2]

At the City of Claremont, health agencies are not involved in bicycle/pedestrian safety or active transportation.

Coordination with Transit Agencies (Key Strength)

Providing safe and comfortable biking and walking routes to transit stops and stations, and the ability to take bicycles on-board transit vehicles increases the likelihood of multi-modal trips.

In the City of Claremont, bicycles are accommodated on all transit vehicles with overflow capacity available. The agency partners with transit providers to ensure safe and comfortable routes for biking and walking to transit stops and stations, including on roadways with both frequent bus service and bicycle facilities.

Suggestion for Potential Improvement:

- Work with transit agencies, Caltrans, and other relevant partners to improve access and safety to stations and bus stops.

[2] Sciortino, S., Vassar, M., Radetsky, M., and M. Knudson, "San Francisco Pedestrian Injury Surveillance: Mapping, Underreporting, and Injury Severity in Police and Hospital Records," *Accident Analysis and Prevention*, Volume 37, Issue 6, November 2005, Pages 1102-1113

3. COMPLETE STREETS AUDIT RESULTS AND SUGGESTIONS

3.1. OVERVIEW

Complete Streets audits are typically conducted as an initial step to improve the street environment for all travel modes within the selected area. Many individuals can participate: residents, stakeholders, and affiliated individuals. During the audits, positive practices are observed and issues and opportunity areas are noted. Observations are made of the interactions among motorists, pedestrians, and bicyclists. Observations are based on the behavior of these different road users, particularly at intersections. For each opportunity area, the group discusses possible suggestions to address safety and operational concerns. Complete Streets audits are highly interactive, with many field observations. The audits are a means to observing and learning how to “see through the eyes of pedestrians and bicyclists.”

This chapter presents observations and suggestions made during field observations conducted on February 28 and March 3, 2022.

Suggestions in this chapter are based on best practices and discussions with participants regarding local needs and feasibility. These suggestions are based on limited field observations and time spent in and around the city by the CSSA evaluators. These suggestions are intended to guide city staff in making decisions for future safety improvement projects; they may not incorporate all factors relevant to pedestrian and bicycling safety issues in the city. This report is conceptual in nature, and conditions may exist in the focus areas that were not observed and may not be compatible with suggestions presented below. Before finalizing and implementing any physical changes, city staff may choose to conduct more detailed studies or further analysis to refine or discard the suggestions in this report, if they are found to be contextually inappropriate or appear not to improve bicycling or pedestrian safety or accessibility due to conditions including, but not limited to, high vehicular traffic volume or speeds, physical limitations on space or sight distance, or other potential safety concerns.

3.2. FOCUS AREAS

City staff requested reviews of the three focus areas listed below, all of which are public schools.

Table 3-1: Focus Areas

#	Focus Area	Segments	Issues and opportunities
1	Condit Elementary School	a) Scripps Drive intersection	Vehicle-pedestrian conflicts
		b) Signalized crosswalk	Visibility, median refuge opportunity
		c) Drop-off / pickup activity	Infrastructure and non-infrastructure opportunities
		d) Hood Drive intersection	Opportunity for improved crosswalk
2	Mountain View Elementary School	Santa Clara Avenue	2 uncontrolled crosswalks
		Intersection of Mountain Ave. and Santa Clara Ave.	
3	El Roble Intermediate School	Butte Street / 8th Street intersection	a) Connection to school bike cage b) Opportunity for enhanced crosswalk
		Between 7th St. and Harrison Avenue	c) Bike lane gap closure
			d) Off-street path opportunity
		Harrison Ave. at Mountain Ave.	

Figure 3-1 highlights these focus areas on a map.

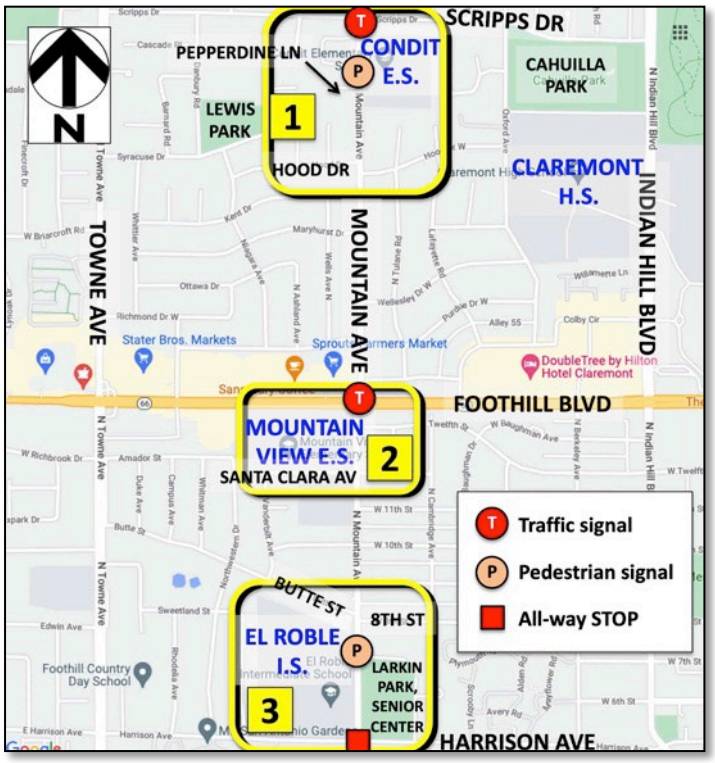


Figure 3-1: Map of Focus Areas

The evaluators explored each focus area with city staff on the field visit day. Observations were conducted after public schools returned to in-person classes. However, because the Covid-19 pandemic was still underway what was observed may not reflect pre-pandemic peak period operation.

The following illustrated subsections address the three focus areas listed and mapped above. Each contains an overview, observations and notes (including from staff), analysis, and suggestions.

This chapter concludes with section 3.3, General Suggestions, which presents several treatments relevant to the focus areas that could also be considered for citywide application.

3.2.1. FOCUS AREA #1: Condit Elementary School

Overview

City staff requested a review of four sub-areas or concerns near Condit Elementary School:

a) Scripps Drive / Mountain Avenue intersection
b) Signalized crosswalk at school's south driveway
c) Drop-off / pickup activity including suggestions for reducing vehicle volume
d) Hood Drive intersection (south of campus)

Figure 3-2 shows the school campus in the context of the nearby street network and two city parks. Cahuilla Park is adjacent to the north edge of the Claremont High School campus.

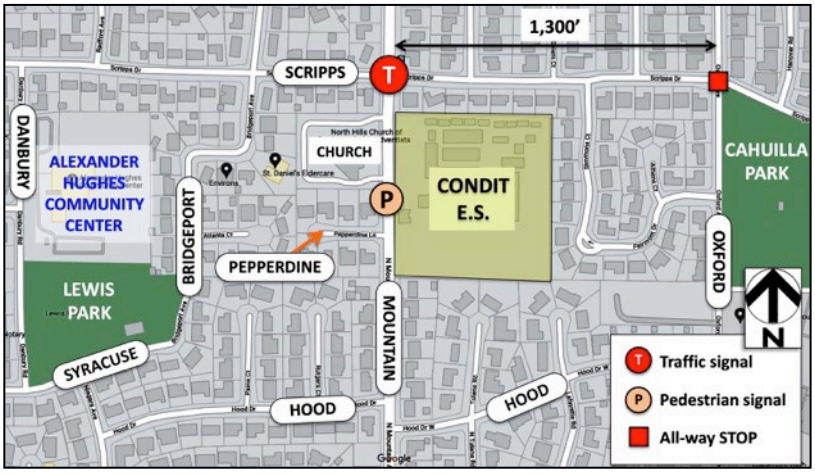


Figure 3-2: Condit Elementary School vicinity

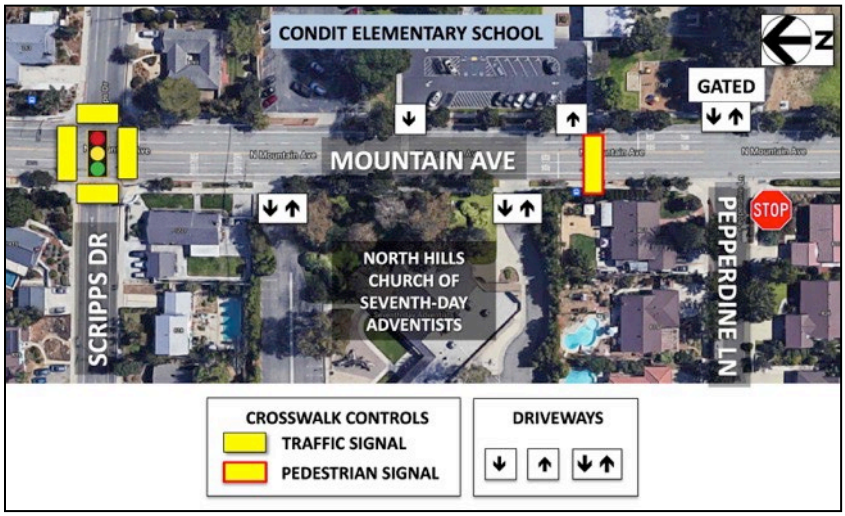


Figure 3-3: Condit Elementary School detail

As shown in Figure 3-3, the campus fronts on the east side of Mountain Avenue for approximately 650' beginning one house lot south of Scripps Drive. Across the street is a church with two full-movement driveways, and Pepperdine Lane -— a dead-end street onto which houses face on both sides. The school's counterclockwise (northbound) internal drop-off / pick-up area has an entry driveway just south of the church's south driveway. Just south of that entrance there is a signalized pedestrian crosswalk.

Mountain Avenue near the school is 56' wide, with two travel lanes (21' total) and a 7' parking shoulder in both directions, no bike lanes, and no center turn lane. Phase 1 of the city's Mountain Avenue Project re-striped the identical-width segment between Harrison Avenue and Foothill Boulevard to add a center turn lane, with each direction having one travel lane, a bike lane and a parking shoulder. Phase 2 of that project will implement the same transformation between Foothill and Base Line Road, which includes Condit Elementary segment.

Claremont has an established recreational bicycling culture, and several adult bicyclists were seen on Mountain Avenue during field observations.

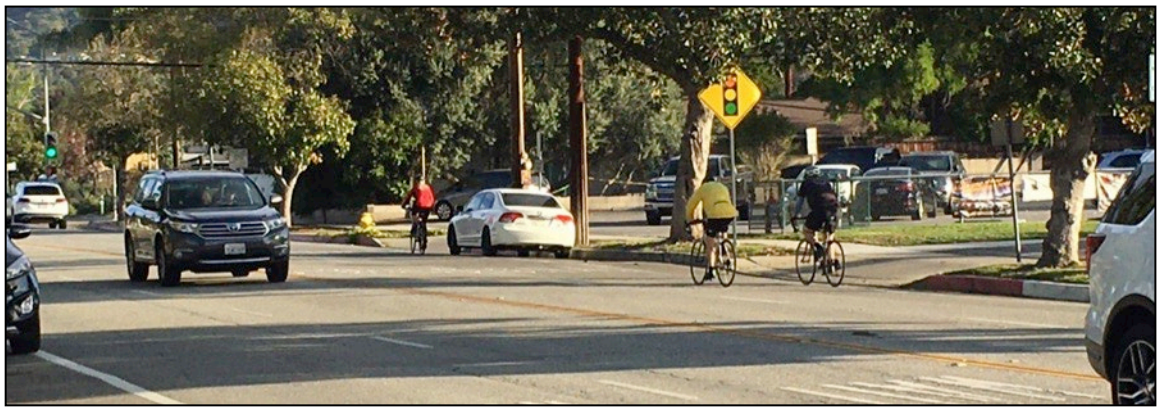


Figure 3-4: Adult bicyclists northbound on Mountain Avenue at Condit Elementary

Scripps Drive near Mountain Avenue is 40' wide and has one travel lane and a striped parking shoulder in each direction, with Shared Lane Markings ("sharrows") centered in the travel lanes.

Scripps Drive intersection (sub-area A)

Observations

Many motorists and pedestrians en route to and from the school traverse the signalized intersection at Scripps. Arriving students and parents approach the intersection from the west, north and east. The field team observed many parents walking children to school, and older children walking with friends and younger siblings.

All four corners have pedestrian call buttons mounted on the signal mast arm poles but also provide a separate pair of buttons on separate posts adjacent to the pedestrian waiting area behind the diagonal curb ramps. The latter is a best practice that benefits persons using wheelchairs and others with reduced mobility.

Left turn movements on all four approaches have no arrow indication; they are controlled permissively by the circular (round) indications that also control the through and right-turn movements. The field team noted that these permissive left turns conflict with same-direction pedestrian crossing movements.

City staff said that it is planned to add a 5-second Leading Pedestrian Interval (a.k.a. "Pedestrian Head Start") phase to the crosswalk cycles. This signal option is described in section 3.3, General Suggestions.

Analysis

Pedestrian crossing distance and pedestrian phase duration could be substantially reduced if the corners were bulbed-out to the depth of the parking lanes that are present on both streets. A "quick-build" of Pedestrian Safety Zones (painted curb extensions) could be implemented to evaluate the benefits of this treatment. See section 3.3, General Citywide Suggestions, for details of that treatment.

The city could also consider whether implementing protected or protected-permissive left turn phasing (i.e., adding a turn arrow on the signal face) on one or more approaches would benefit pedestrian safety.

Suggestions

Table 3-2: Suggestions for Scripps Drive / Mountain Avenue intersection

#	Location	Item	Suggestion
1	Corners	Parking lanes	Consider installing Painted Safety Zones at all four corners.
2	Left turns	Arrow indications	Consider whether adding a left turn arrow (and a protected-permissive or fully protected left turn phase) would benefit pedestrian safety.

Signalized mid-block crosswalk at school's south driveway (sub-area B)

Observations

A marked mid-block crosswalk is in place just south of the school's entry driveway, north of Pepperdine Lane. There is currently no other enhanced crosswalk between Scripps Drive and Foothill Boulevard.

The crosswalk has yellow "ladder"-style high-intensity markings, and advance limit lines approximately 30'-35' upstream in on both approaches. The two mast arm assemblies each have an overhead "PED CROSSING" sign and two signal faces — one on the end of the mast arm and one on the pole. Pedestrian call button assemblies with large low-actuation-force buttons are mounted on the poles.

The upstream curbs are painted red. Upstream to the south (i.e., northbound) beyond the red-curbed segment, the parking lane is signed "2-Hour Parking Monday-Friday." Immediately upstream to the north (i.e., southbound) there is a Foothill Transit stop for bus route 292.

A crossing guard operates the crosswalk during school arrival and dismissal periods.

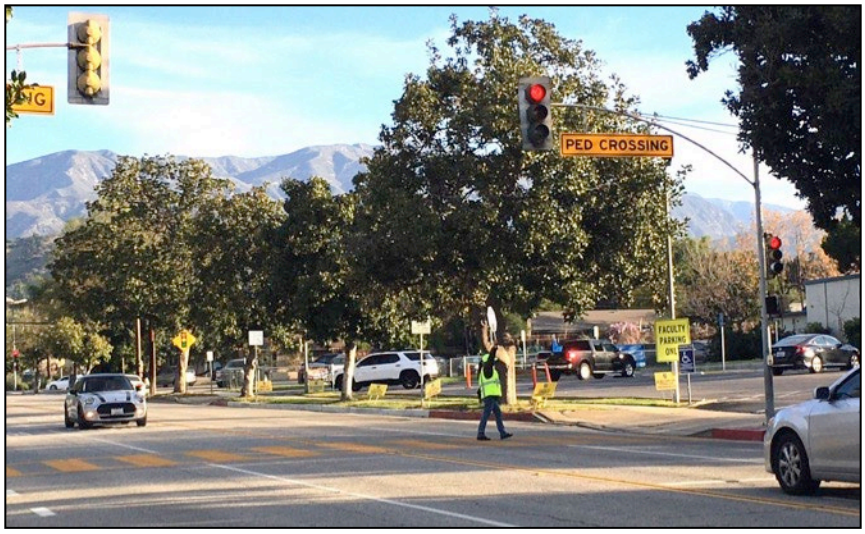


Figure 3-5: Signalized mid-block crosswalk at Condit Elementary

The crosswalk has no curbside school crosswalk warning sign assemblies, but that is appropriate because the traffic control is a signal, at which approaching drivers are required to stop on red, not simply yield.

As noted above, the city plans to re-stripe this segment of Mountain Avenue with a center turn lane, and with one travel lane, a bike lane, and a parking shoulder in each direction.

Analysis

Although the overhead yellow "PED CROSSING" signs are not in the current California MUTCD, such signs are used by many local agencies at signalized mid-block pedestrian crossings. The CA MUTCD does have two overhead signs for crosswalks (Figure 3-6) but their "yield" message is inappropriate for a *signalized* crosswalk, again because of the stop-on-red requirement.

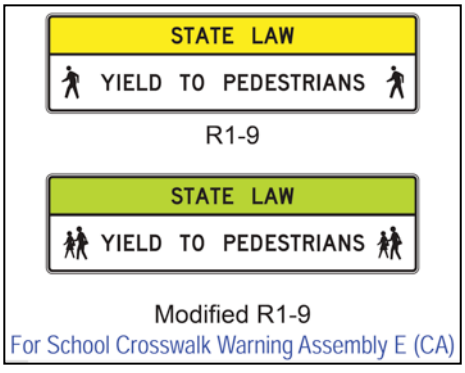


Figure 3-6: California MUTCD overhead signs for crosswalks

Because all four crosswalks at the Scripps intersection are signal-controlled, the only pedestrians that need to cross Mountain Avenue at this signalized mid-block crosswalk are those originating on the west side south of Scripps. That includes those arriving from the south via the west

sidewalk, and also parents and students who drop off and pick up along the west curb, in the church's parking lot, or on west side-streets such as Pepperdine and Hood.

Suggestions

Table 3-3: Suggestions for Signalized Mid-Block Crosswalk

#	Item	Suggestion
1	Median refuge	When a center turn lane is added, add protective islands on both side of the crosswalk in that lane, to protect slow pedestrians.
2	Curb extensions	Consider adding curb extensions to shorten the crosswalk and to enable pedestrians preparing to cross to see and be seen by drivers — perhaps after the street is re-striped with bike lanes. (A curb extension should not extend into a bike lane. It is fairly typical to provide at least 1' of horizontal clearance between a curb extension and a bike lane.)

Drop-off / pickup activity including suggestions for reducing vehicle volume (sub-area C)

Observations

The evaluators only observed morning vehicle drop-off activity in front of the school and at the Scripps Drive intersection for about 30 minutes and had only one technical suggestion for improving operations along the front of the school. That would be to physically prevent pedestrians from crossing the middle of the school's internal driveways by installing a fence along the street sidewalk.

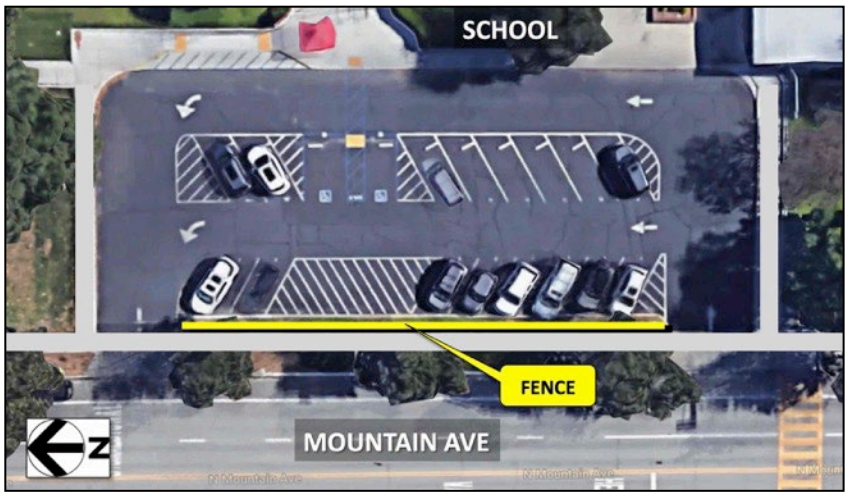


Figure 3-7: Concept for fence to channelize pedestrians to parking lot edges

The evaluators also shared the concept of a Walking School Bus — an organized group walk to school, typically escorted by trained adults, with a predefined route and schedule, and optionally with a wagon or cart to transport student belongings. Parents can meet the "bus" anywhere along the route on foot, bicycle or motor vehicle, knowing that their child will be under adult supervision.

This can free up many useful hours for parents. Details and a downloadable guide are available at http://www.walkingschoolbus.org/.

Staff said that an informal Walking School Bus had been pilot-tested at Sumner Elementary School, organized by a parent.

The evaluators also brought up the concept of a designated remote drop-off / pick-up area, from which a walking school bus (or individual parents escorting children) could walk the rest of the way to and from the school. Two potential locations near Condit Elementary are:

- Lewis Park/Hughes Community Center (north side of Syracuse Drive / Bridgeport Avenue), just 1,800' from the school (10 minutes at a moderate walking speed of 3 feet per second / 180 feet per minute)
- Cahuilla Park (east side of Oxford Drive and/or south side of Scripps Drive). The Scripps/Oxford intersection is 1,450' from the campus (8 minutes at 3 ft./sec.).

Figure 3-8: Waking School Bus (Portland Tribune photo)

Suggestions

Table 3-4: Suggestions for School Commute to Condit Elementary

#	Item	Suggestion
1	Walking School Bus	Consider organizing one or more Walking School Buses for Condit Elementary, perhaps starting with a one-time pilot test, then perhaps a weekly or monthly day, then full operation.
2	Remote drop-off and pick-up	Consider designating curbside areas for remote student drop-off / pick-up at Lewis Park/Hughes Community Center and / or Cahuilla Park, on the curbside segments described above, served by a Walking School Bus.

Hood Drive intersection (sub-area D)

Analysis

Hood Drive intersects Mountain Avenue at a pair of offset T intersections. The west T is 50' north of the east T.

As shown in Figure 3-9, Syracuse Drive, Niagara Avenue, and the west and east legs of Hood form the only direct low-traffic east-west alternative to Scripps Drive between Towne Avenue and Oxford Drive (Claremont High School). Making it easy for pedestrians, bicyclists and scooter users to cross Mountain Avenue at Hood would benefit active transportation in this part of Claremont and might significantly reduce driving to the High School.

Figure 3-9: Low-traffic route between Towne and Oxford via Hood Drive

At any T intersection where the T's leg is the minor street, the left leg typically has significantly lower left-turn volume (hence left-turn vehicle-pedestrian conflict volume) than the right leg. This suggests the south leg of Hood's east (southern) T for an improved crosswalk.

Suggestions

Figure 3-10 depicts a concept for when Mountain Avenue is re-striped with a center lane and bike lanes, has these features:

- High-visibility ("ladder") crosswalk markings
- Median refuge islands in the center turn lane
- Curb extensions at both ends of the crosswalk
- Crosswalk warning sign assemblies (1-sided on curb extensions, 2-sided on median)

NOTE: Extension lines and lane arrows are included to illustrate traffic movements and are not required for installation.

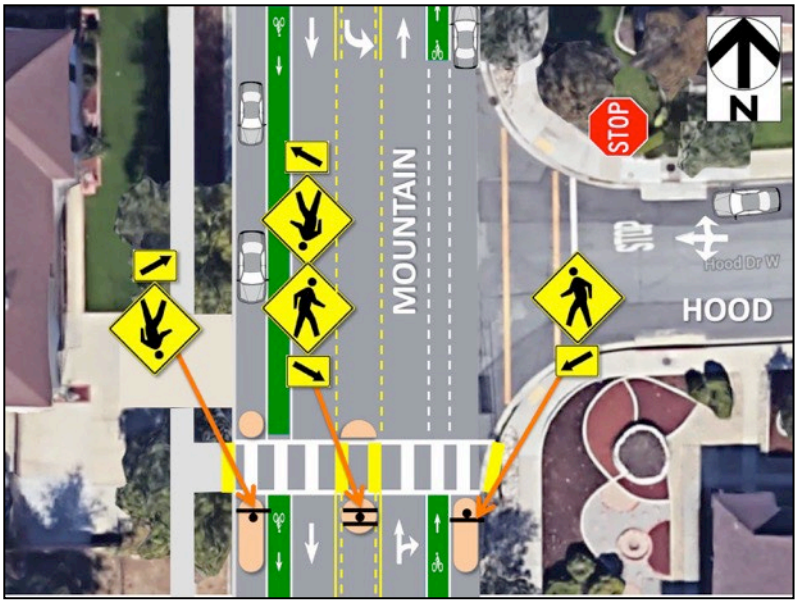


Figure 3-10: Concept for uncontrolled crosswalk at Hood Drive / Mountain Avenue

3.2.2. FOCUS AREA #2: Mountain View Elementary School

Uncontrolled crosswalks on school frontage

Mountain View Elementary School occupies the rectangle formed by Foothill Boulevard, Mountain Avenue, Santa Clara Avenue and the prolongation of Northwestern Drive. There are two uncontrolled mid-block crosswalks on Santa Clara Avenue at the school — one just west of the west (exit) driveway (just east of Vanderbilt Avenue), and one just east of the east (entrance) driveway. Figure 3-11 locates these (orange); Figure 3-12 shows the east crosswalk.

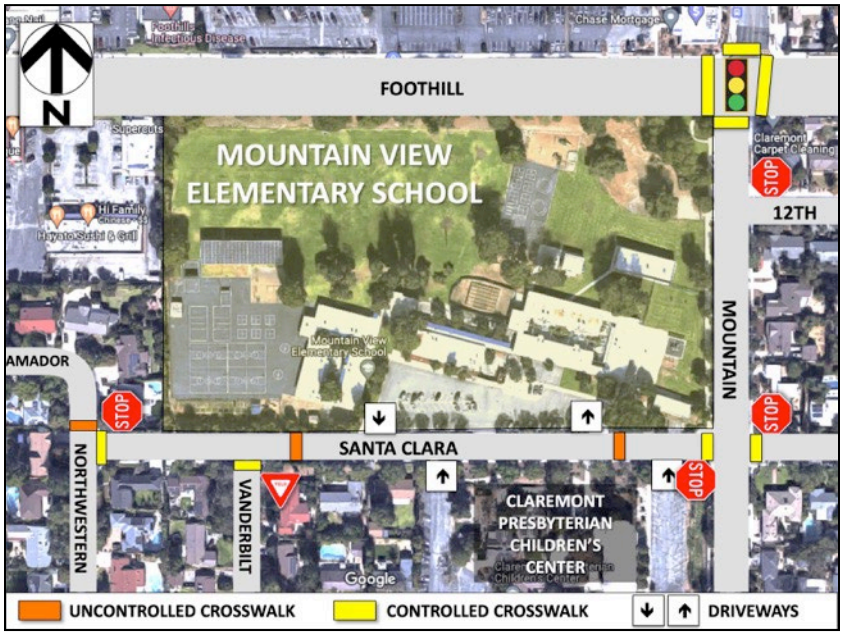


Figure 3-11: Mountain View Elementary School vicinity

Figure 3-12: Mid-block uncontrolled crosswalk at school's entry driveway

Observations and Analysis

Both uncontrolled mid-block crosswalks have these appropriate features:

- Parallel-type curb ramps on both sidewalks
- High-visibility yellow “ladder” markings
- A yellow tubular flexible marker in the middle of the street
- Red curb (parking prohibited) or a driveway for at least one car length upstream

However, neither currently has crosswalk warning signs.

Suggestions

Table 3-5: Suggestions for Mid-block Crosswalks at Mountain VIEW ELEMENTARY

#	Item	Suggestion
1	Upstream curbside islands	Consider installing islands in the parking lane adjacent to the crosswalk (upstream unless there is a driveway there), spaced away from the curb for drainage, to: • Physically protect pedestrians within the parking-lane segments of the crosswalk • Prevent vehicle parking or standing that blocks sightlines • Provide a more visible location for warning signs than on the sidewalk (and avoid obstructing any of the sidewalk width)
2	Warning signs	Consider installing 2-sided school crosswalk warning sign assemblies on the islands (S1-1 School Pentagon + W16-7p Downward Pointing Arrow, or CA-specific SW23-2 (CA)).
3	Mid-street markers	Consider replacing with 2-sided R1-6 State Law / “YIELD TO PEDESTRIANS IN CROSSWALK” signs.

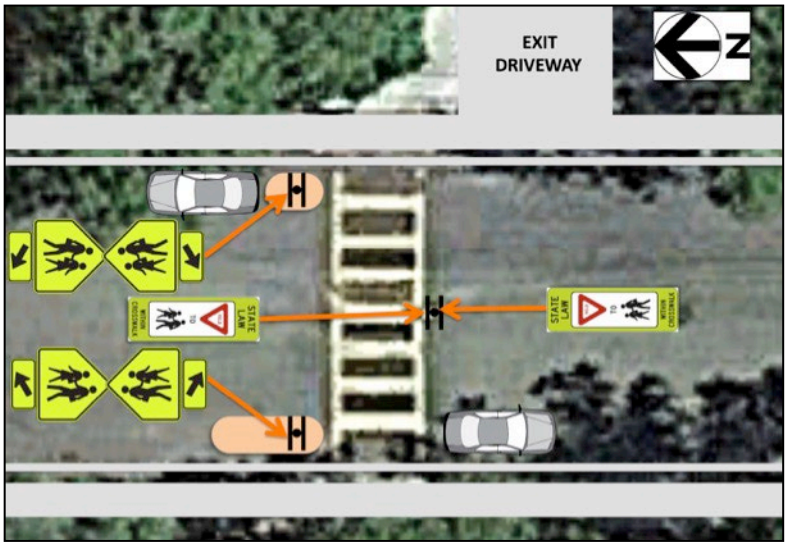


Figure 3-13: Concept for islands and signs

Uncontrolled crosswalks across Mountain Avenue

Santa Clara Avenue intersects Mountain Avenue just east of the school at a two-way STOP-controlled intersection. Both controlled crosswalks across Santa Clara have high-visibility yellow (school) "ladder" markings. The uncontrolled crosswalks across Mountain are not marked or signed.

Mountain has one travel lane and an unbuffered bike lane in each direction, and a center turn lane. The north leg has a southbound right turn lane with flexible delineators along the turn lane line, and no east-side parking lane. The south leg has parking on both sides, and single-sided W11-2 Pedestrian Warning signs at both corners.

a) Aerial

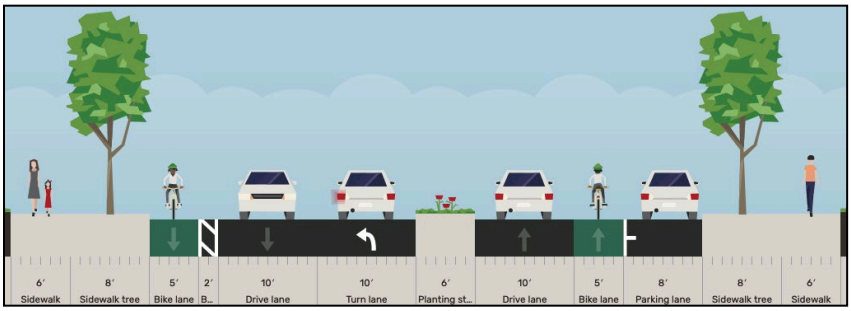
b) Southbound approach

Figure 3-14: Mountain Avenue at Santa Clara Avenue - existing

Analysis and Suggestions

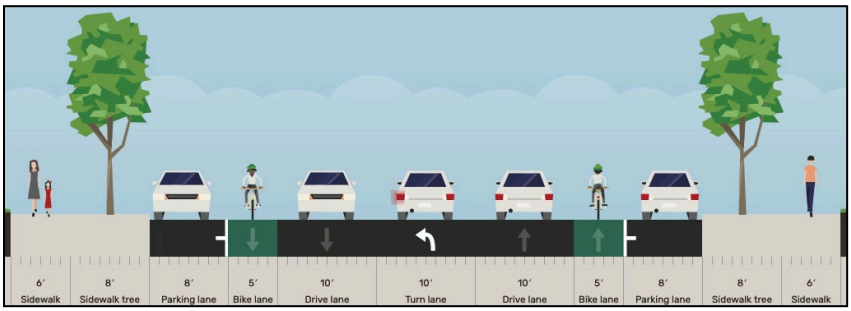
On Santa Clara Avenue, curb extensions could shorten the west and east crosswalks.

On the south leg across Mountain, a median refuge island could be added to facilitate crossing without having to walk to Foothill, by reusing the width of the west parking lane (the adjacent church has parking lots). A 6' refuge comfortably protects an adult pushing a stroller.

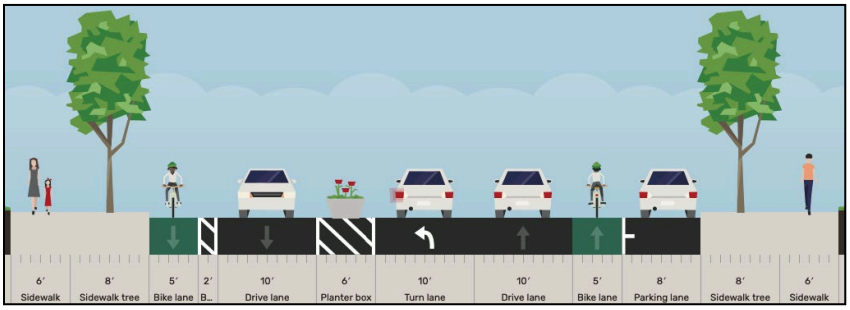


c) Concept 2 — median refuge between northbound turn and through lanes

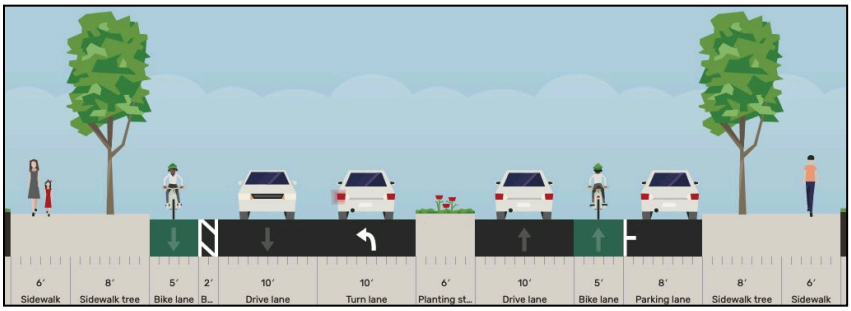
Figure 3-15 shows existing and conceptual layouts, without the warning sign assemblies that would be suggested (see Figure 3-10 — Hood Drive / Mountain Avenue concept).



a) Existing



b) Concept 1 — median refuge between travel directions



c) Concept 2 — median refuge between northbound turn and through lanes

Figure 3-15: Mountain Avenue south leg at Santa Clara Avenue — median refuge concepts

The northbound parking lane could optionally be replaced by an 8’ curb extension to further reduce crossing distance. The adjacent (southeast corner) house has ample curbside parking available on Santa Clara Avenue, where its front walkway is located.

Both concepts would offset (laterally shift) the southbound through and bike lanes across the intersection. The 2’ buffer along the bike lane somewhat reduces the travel lane offset. Lane extension lines would guide southbound traffic.

3.2.3. FOCUS AREA #3: El Roble Intermediate School

Overview

This focus area includes the following sub-areas:

Butte Street / 8th Street intersection

a. Shared-use connection on west sidewalk between Butte and school bike cage
b. Opportunity for enhanced uncontrolled crosswalk across Mountain Avenue

Between 7th Street and Harrison Avenue

c. Bike lane gap closure on Mountain Avenue
d. Off-street path opportunity along school frontage
e. Harrison Ave. at Mountain Ave.

Figure 3-16 is an overview of these areas.

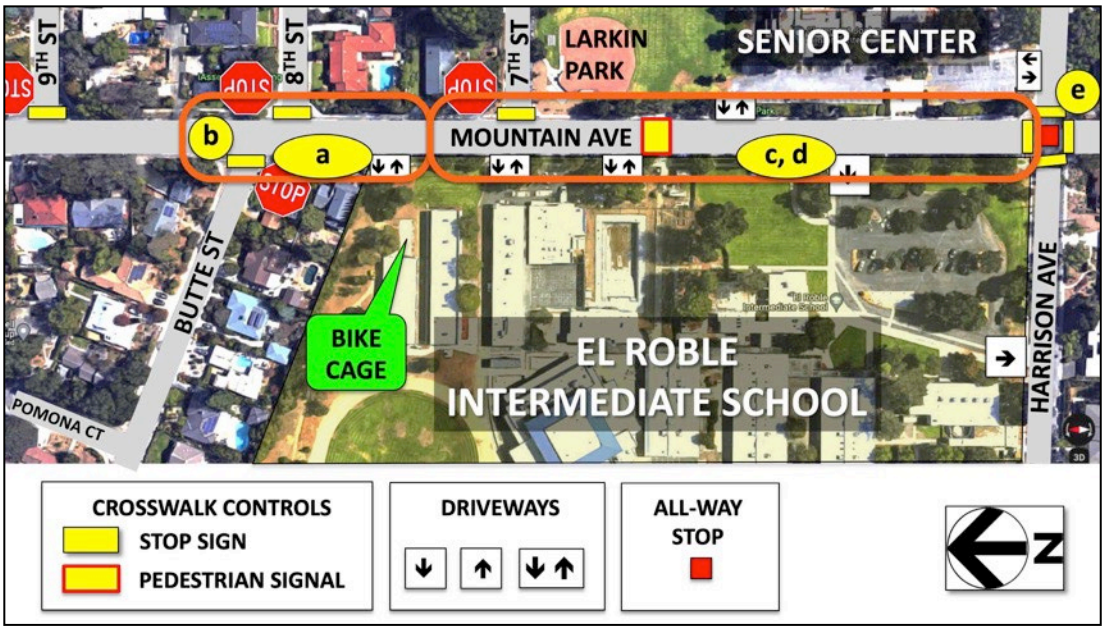


Figure 3-16: El Roble Intermediate School vicinity

Bicycle connection between Butte Street and bike cage driveway (sub-area A)

Observations

The school provides a fenced bike enclosure adjacent to the northeast corner of the northernmost building (green callout in Figure 3-16). It can be accessed from Mountain Avenue's west sidewalk and also from the southbound bike lane via a school driveway just south of the second house south of Butte Street.

As shown in Figure 3-17, pavement markings in the southbound bike lane and the adjacent parking lane tell southbound bicyclists in the bike lane to use the northernmost school driveway to reach the bike cage. The adjacent sidewalk is 5’ wide and has a 6.5’ wide planting strip.

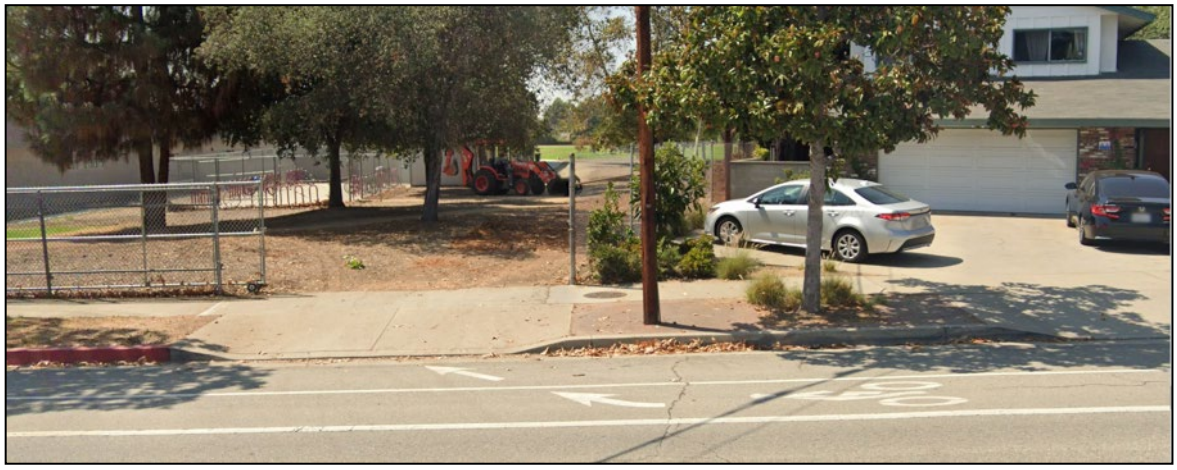


Figure 3-17: Southbound bike lane and parking lane at bike cage driveway

The southbound parking lane visible in the above figure is posted “No Standing” during AM arrival and PM dismissal periods. Standing means that the vehicle is stationary but “attended” attended (i.e., driver present at the wheel, engine running). During those periods the parking lane is well-used by a queue of parent vehicles that creeps forward slowly. Figure 3-18, looking south at Butte, shows the parking lane at a non-peak time when parking is allowed. During AM arrival and PM dismissal periods, the pickup truck and the vehicles ahead of it would be creeping forward, preparing to drop off or pick up students.

Figure 3-18: Southbound at Butte — bike lane and parking / queuing lane

Analysis

Arriving students with bicycles may approach the bike cage from the four compass directions, either on a street or on one of that street's sidewalks. All nine combinations listed below currently involved challenges:

#	Approaching	…on…	Issues
S1	Southbound on Mountain	Southbound bike lane	Crossing the advancing southbound vehicle queue*
S2		West sidewalk	Too narrow for shared use (~165' from Butte)
E1	Eastbound on Butte Street…	…eastbound lane	To southbound bike lane: Requires crossing the parking lane vehicle queue *twice* To west sidewalk: See above (too narrow)
E2		…south sidewalk	
E3		…north sidewalk	Use west crosswalk at Mountain, then see above
N1	Northbound on Mountain	West sidewalk	Too narrow for shared use south of bike cage
N2		Northbound bike lane	No support for crossing Mountain at 8th / Butte
N3		East sidewalk	
W	Westbound on 8th Street	(Street or sidewalk)	

** Other than the bike and arrow markings shown in* Figure 3-17*, drivers advancing in the parking lane are not informed that same-direction bicycles may cross in front of them.*

Suggestions

Widening the west sidewalk between Butte and the bike cage driveway by repurposing the planting strip (see Figure 3-19) would address S1, S2, E1, E2 and E3. Bicyclists southbound on Mountain bound for the bike cage would leave the street at Butte's south corner and use the widened sidewalk, as would any bicyclist eastbound on Butte.

Widening the west sidewalk along the school frontage north of Harrison to support shared use by bicyclists would support approach N1. That change is discussed in sub-area "D" below.

The remaining approach scenarios involve crossing Mountain. Sub-area "B", discussed next, suggests an enhanced north-leg crosswalk at Butte that could be used by pedestrians and also by bicyclists arriving either northbound on the east side of Mountain or westbound on 8th.

Improving north crosswalk at Butte Street (sub-area B)

Analysis

There is a signal-controlled crosswalk across Mountain approximately midway between Butte and Harrison (the approximate campus midpoint), but no controlled or enhanced crosswalks to the north until Foothill Boulevard. Butte and 8th Streets connect east-west between Towne Avenue and Indian Hill Avenue (similar to how Syracuse / Niagara / Hood connect between Towne and Oxford near Condit Elementary). Installing an enhanced crosswalk at Butte / 8th would support

this important cross-town active transportation connection and would enable student bicyclists to reach the school's bike cage from east of Mountain.

Suggestion

Consider installing an enhanced uncontrolled crosswalk on the north leg at Butte as shown in Figure 3-19. Because 8th Street is offset to the south of Butte, southbound left-turners into 8th would still have two car lengths of storage in the center lane south of the median islands.

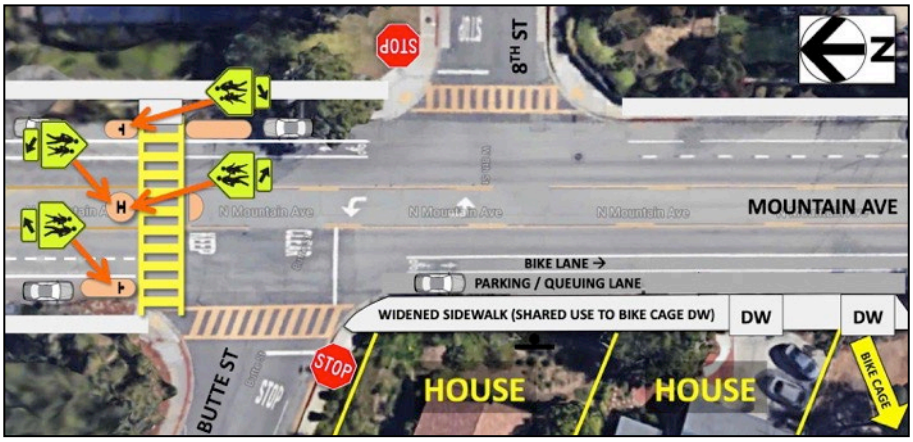


Figure 3-19: Concept for Mountain / Butte / 8th and bike cage access

The concept does not show Rectangular Rapid Flashing Beacons (RRFBs) on the crosswalk warning sign assemblies; however, these could be incorporated at initial installation or after a period of observation to gauge motorist yielding compliance.

With such a crosswalk in place across Mountain, student bicyclists departing the bike cage for destinations to the north or east could use the west sidewalk to Butte, the west and north crosswalks, then either continue north on the east-side bike lane or east sidewalk or backtrack on the east sidewalk to 8th Street to proceed east.

Bike lane gap along school frontage (sub-area C)

Observations

The lane layout shown in Figure 3-19 continues south to the signalized crosswalk located between 7th Street and the north driveway of Claremont Joslyn Senior Center 500' north of Harrison Avenue. Between the crosswalk and Harrison the layout is as shown in Figure 3-20(a):

- The northbound parking lane and bike lane are the same as to the north
- The widths of the southbound bike and parking lanes combine to become a right turn lane serving the school's parking entrance.
- The southbound lanes just south of the crosswalk measure 11' (center turn), 10' (through), and 12' (right turn).

- The center lane just south of the crosswalk serves southbound left turns into the Senor Center's north driveway but is unused between that driveway and the school parking lot driveway. South of that driveway it serves northbound left turns into the driveway, then southbound left turns onto Harrison.

Proceeding north from Harrison, the east curb is red (no parking) for 145', white (loading) for 175', red for 32' (fire hydrant), white (loading) for 45', and red up to the Senior Center driveway.

The west (southbound) curb is red for approximately 350', from about 3 car lengths north of the school's parking lot driveway to Harrison. 230' of that is south of the school's driveway.

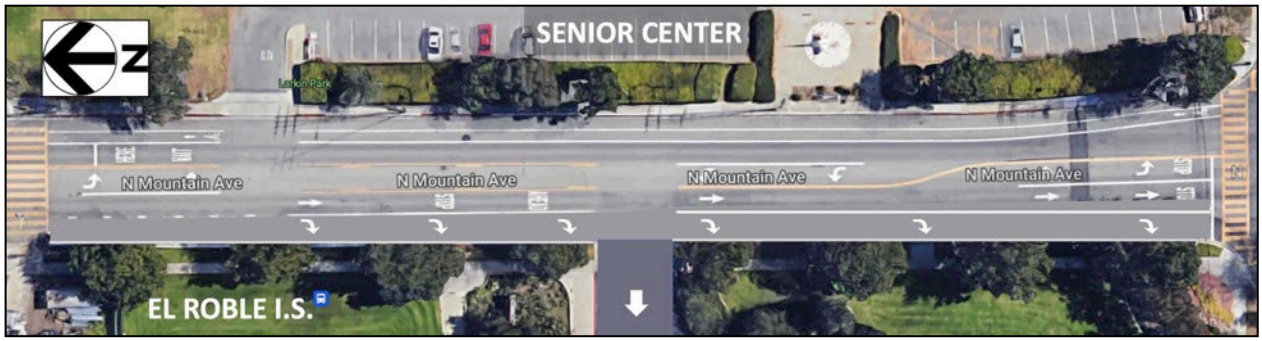
Analysis

If the lanes south of the crosswalk could shift at least 5' eastward, the southbound bike lane could potentially extend to Harrison. Two factors suggest that this may be possible:

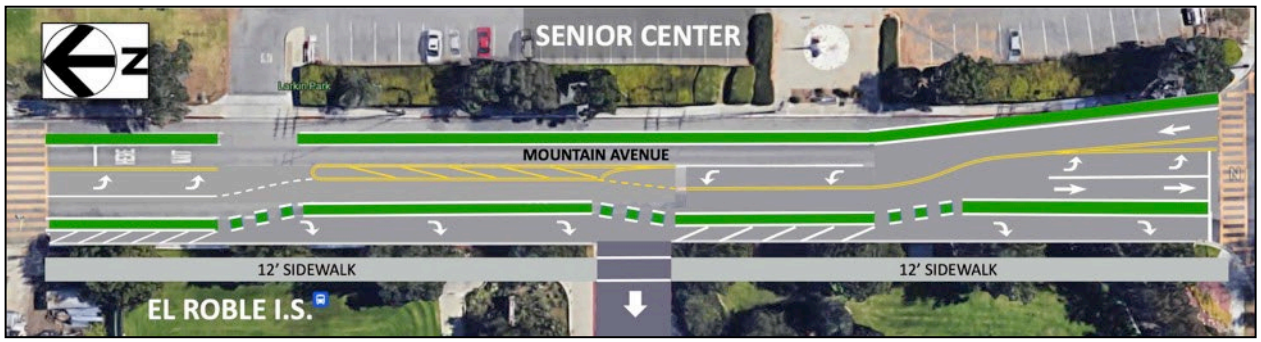
- The east-side parking lane (8' wide) is unused (red curb) for 145' north of Harrison.
- The southbound right turn onto Harrison may only need a few car lengths of storage because the intersection is all-way STOP controlled, so right turners only conflict with one vehicle (westbound through or northbound left turn).

Figure 3-20(b) shows an initial concept, not to scale (not created with dimensioned CAD).

Suggestions



a) Existing



b) Concept

Figure 3-20: Mountain Ave. between signalized crosswalk and Harrison Ave.

Off-street path opportunity along school frontage (sub-area D)

Observations

Along almost the entirety of the school's 925' frontage between Harrison and the two house lots near Butte Street, Mountain Avenue's 5' wide west sidewalk is buffered from the street by a 6.5' planting strip with mature trees. There are deep lawns behind the sidewalk between Harrison and the signalized crosswalk (520') and north of 7th Street (150').

Analysis

If the sidewalk along the campus was widened to 12' or more, into the lawn areas, it could support shared use by bicyclists. This would enable students originating south of Harrison to reach the school's bike cage (north end of frontage) by leaving the street at the Mountain / Harrison intersection and using the west-side sidewalk path.

However, bicyclists crossing the campus center, opposite 7th Street and Larkin Park, would conflict with pedestrians in the cross-direction (i.e., walking between the school buildings and the street). If a second bike cage were added just south of the small west-side parking lot in this area, i.e., approximately 70' north of the signalized crosswalk, student bicyclists originating from the south would not need to continue north to the existing (north-end) bike cage.

Suggestions

- Consider widening the west sidewalk along the school frontage to 12' or more.
- Consider adding a second bike cage just south of the small west-side parking lot.

Figure 3-20(b) shows the widened sidewalk but not the additional bike cage.

Mountain Avenue / Harrison Avenue intersection (sub-area E)

Observations

Mountain Avenue intersects Harrison Avenue at an all-way STOP-controlled four-leg junction. All four crosswalks have high-visibility yellow (school) "ladder" markings.

Mountain's south leg and both legs of Harrison are 40' wide with parallel parking on both sides and no bike lanes.

Mountain's north leg is 64' wide at Harrison, and the east crosswalk is aligned parallel to the east curb of the south leg. The northbound direction has a parking lane, a bike lane and a travel lane. The southbound direction has a left turn lane, a through lane, and a right turn lane. The through lane's right side approximately aligns with the south leg's west curb. To the north, Mountain tapers in from the east to a width of 54' along the school frontage.

Analysis and suggestions

Suggestions for the north leg are presented in the preceding subsection in the context of providing a bike lane in the southbound direction.

This report's analysis does not incorporate any plans that may exist for Mountain Avenue south of Harrison (i.e., between Harrison and Bonita) or for Harrison near Mountain. Absent such plans, opportunities may exist to shorten the intersection's east, west and south crosswalks by adding curb extensions.

Corner	Extension	Notes
NE	Into Harrison	The proposed shift of the northbound bike lane to the east curb would preclude a curb extension into Mountain.
NW	Into Harrison	Southbound right turn lane precludes extension into Mountain.
SE	Both streets	There are parking lanes on both sides of this corner.
SW	Into Harrison	Keeps existing minimal offset of southbound through movement.
	Also into Mountain?	If additional offset of southbound through is acceptable

Figure 3-21 shows the existing intersection and rough sketch concepts for potential curb extensions. The southwest corner extension does not incorporate the "Also into Mountain?" projection.

a) Existing b) Curb extension concepts

Figure 3-21: Mountain Avenue / Harrison Avenue

These curb extensions could be pilot-tested with the quick-build "Painted Safety Zone" approach described in the "General Citywide Suggestions" section that follows.

3.3. GENERAL CITYWIDE SUGGESTIONS

The following general suggestions for physical enhancements may be appropriate citywide or in the focal areas. These are discussed in detail below.

Table 3-6: General Suggestions for Physical Enhancements

Pedestrian	Details
Advance Limit Lines	Install 4' in advance of the limit line or first crosswalk line on STOP and signal-controlled approaches, to deter motorists from encroaching into the crosswalk or blocking sightlines to low pedestrians such as wheelchair users.
Corner curb extensions	Enable pedestrians to make a starting decision where they can see and be seen. Calm inbound right turns by reducing the physical radius. Shorten crosswalks.
Interim curb extensions	Consider Painted Safety Zone / Interim Curb Extension treatments at locations where the need is current but hardscape curb extensions are subject to future funding.
Crosswalk markings	At uncontrolled crosswalks, incorporate wide longitudinal elements (e.g., "ladder rungs") to enable approaching drivers to recognize the crosswalk earlier.
Leading Ped. Interval	Display WALK phase (typically) 3 seconds before same-direction green indication, so pedestrians can occupy the curb lane.
Center islands on side streets	Calm inbound turns. May enable bicyclists preparing to turn left or proceed through to wait further forward than they otherwise would.
Left-side warning signs: symbol orientation	Pedestrian symbol (W11-2) or trail crossing signs (W11-15) installed on the left side of street may depict users approaching, just as the W16-7p Downward Pointing Arrow always points into the approach. (MUTCD 2A.06 Design of Signs specifically allows mirror images. However, sign catalogs may not designate a unique product code.)
Left-side signs on medians	At uncontrolled locations where it is feasible to add a raised median to protect a sign, do this so that each approach sees a pair of warning signs on its side of the street.
Upstream sightlines	Prohibit parking for at least 1 car length upstream of crosswalk, to keep sightlines open to approaching traffic. A curb extension can ensure compliance and is a good place for crosswalk warning signs. "Bike corrals" (in-street racks) can also utilize this area.
Yield Lines	Install on multi-lane approaches to uncontrolled crosswalks, 20'-50' before the crosswalk.
Directional curb ramps	Provide 2 ramps per corner, aligned with sidewalks, rather than diagonal ramps.
Accessibility	Ensure that signal actuation is ADA compliant, including pushbutton height.
Centerline	Install no-passing (double yellow) centerline 50' back from crosswalk.

Advance Limit (Stop) Lines

On approaches to crosswalks that are controlled by signals or STOP signs, installing an advance limit line a short distance (typically 4 feet) before the crosswalk can remind motorists to stop far enough back that their vehicle's front end does not encroach into the crosswalk. Such encroachment can be a safety issue at multi-lane approaches when the front end of a vehicle waiting can hide a low pedestrian (child or wheelchair user) approaching across another lane.

MUTCD Section 3B.16 Stop and Yield Lines applies. Guidance Paragraph #10 states:

> *10 If used, stop and yield lines should be placed a minimum of 4 feet in advance of the nearest crosswalk line at controlled intersections, except… at mid-block crosswalks.*

Corner curb extensions

At intersections with conventional corners and no curb extensions, pedestrians preparing to cross a street typically make their crossing decisions before stepping off the curb, i.e., while on the sidewalk. Due to substantial corner radii at most intersections, this places them over 10 feet outside of the first travel lane they will enter. Corner curb extensions (bulb-outs) enable pedestrians to safely make their decision near the outside travel lane, where they are more visible to approaching motorists and also have a considerably shorter distance to cross. Raised curb extensions also enable crosswalk warning sign assemblies to be installed closer to the travel lanes where they are more visible to motorists. One resource for curb extensions is NACTO's Urban Street Design Guide section:

https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/

Curb extensions attached to the street's existing curb can be expensive to construct because they must preserve drainage along the street and provide accessible slopes and curb ramps. However, the same safety benefits can be obtained with less expense and without modifying drainage if the extension area is segmented into "floating" islands between which pedestrians including wheelchair users travel at existing street grade.

"Temporary Traffic Calming Curbs" (Calgary, AB)

Figure 3-22: Segmented floating corner island treatment

Interim curb extensions

Many cities are now deploying treatments consisting only of painted lines, colored paint or epoxy fill, and tubular delineators to rapidly and inexpensively create corner-bulb installations in advance of funding availability for hardscape versions (Figure 3-23). These go by various names such as "Painted Safety Zones" (San Francisco), "Painted Curb Extensions" (Pasadena), "Painted Bulbouts" (Denver) and "Interim curb bulbs" (Seattle).

San Francisco MTA writes:

> Painted safety zones are painted road areas that wrap around sidewalk corners to make pedestrian crossing intersections more visible to people driving. Painted safety zones are often flanked by delineators (white posts) and encourage people who drive to slow down, especially when making turns.
>
> https://www.sfmta.com/getting-around/walk/pedestrian-toolkit

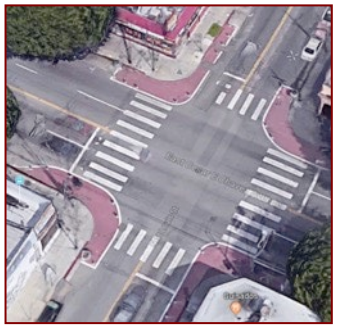
Seattle DOT (SDOT) writes:

> Interim curb bulbs may be appropriate in locations where there is a safety need and a permanent solution is not feasible in the short term, and/or where there is a planned capital improvement within 5 years. At intersections with curb and gutter, an interim curb bulb can only be done [where] there are existing curb ramps. In some cases, curb bulbs may also be integrated with bioretention to manage storm water runoff from the right-of-way.
>
> https://streetsillustrated.seattle.gov/urban-design/adaptive-design/intersection-treatments/

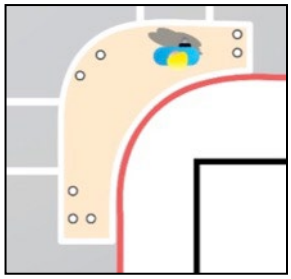
Crosswalk marking patterns — high visibility and contrast edge

The standard crosswalk-marking scheme at controlled approaches has 2 transverse lines and no fill pattern. Many cities use the standard pattern at controlled approaches and a high-visibility pattern at uncontrolled approaches. The following description from San Francisco MTA's crosswalk design guidelines describes the safety advantages of high-visibility markings:

> *Because of the low approach angle at which drivers view pavement markings, the use of longitudinal stripes in addition to or in place of the standard transverse markings can significantly increase the visibility of a crosswalk to oncoming traffic. While research has not shown a direct link between increased crosswalk visibility and increased pedestrian safety, high-visibility crosswalks have been shown to increase motorist yielding and channelization of pedestrians, leading the Federal Highway Administration (FHWA) to conclude that high-visibility pedestrian crosswalks have a positive effect on pedestrian and driver behavior.*



Los Angeles (Cesar Chavez & St Louis)



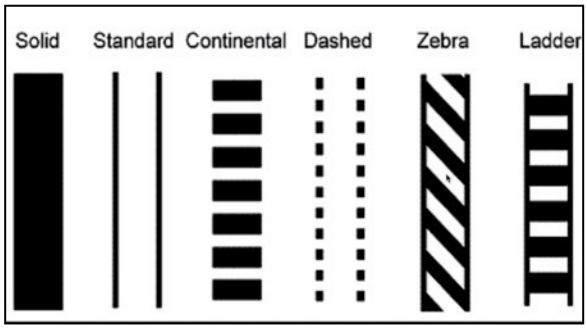
Pasadena Street Design Guide

Los Angeles — Pico & Curson

San Francisco (16th St & Kansas St)

Seattle (Burke-Gilman Trail & 40th Ave NE & NE 52nd Pl)

Figure 3-23: Paint-and-delineator curb extensions



(Figure 12 from FHWA report HRT-03-100, "Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations Final Report and Recommended Guidelines")

Figure 3-24: Crosswalk marking patterns (FHWA)

Table 3-7 lists suggested treatments for several crosswalk elements.

Table 3-7: Suggested Crosswalk Treatments

	Approach	Controlled		Uncontrolled	
Elements	**Median**	**None or painted**	**Raised**	**None or painted**	**Raised**
Crosswalk markings		2-line		High-visibility (ladder)	
Warning signs at crosswalk		None		Curbside, 2-sided ("2-sign")	Curbside: 1-sided Median: 2-sided ("4-sign")
RRFBs on crosswalk signs		None		If needed	
Advance markings & signs		Advance limit line 4' upstream		Yield line 20'-50' upstream R1-5 Yield Here signs at yield lines	
Advance warning signs		None		If needed, per MUTCD	

Low-vision pedestrians (persons who are not completely blind) benefit from a continuous "contrast edge" for guidance when crossing streets. The solid transverse lines in the "solid", "standard", "zebra" and "ladder" patterns provide this; the "continental" and "dashed" patterns do not. For all crosswalks at uncontrolled approaches that currently use the continental pattern, it is suggested to add two solid transverse lines to create a ladder pattern.

In prior decades, "artistic" crosswalks were constructed in which the transverse border was a wide cast concrete strip with no retroreflective white marking (12-inch line). Over time the contrast between these strips and the middle of the crosswalk is reduced so the strips no longer provide an effective contrast edge for low-vision pedestrians. 12-inch transverse lines (white for non-school crosswalks, yellow for school crosswalks) may always be incorporated.

Leading Pedestrian Interval

Leading Pedestrian Interval (LPI) traffic signal phasing displays the pedestrian signal's WALK indication for 3-7 seconds before the green indication for same-direction traffic. LPI gives pedestrians a head start to occupy the crosswalk before turning vehicles. A 2000 study by the Insurance Institute for Highway Safety (IIHS) found that LPI reduces conflicts between turning vehicles and pedestrians.

> *Field Evaluation of a Leading Pedestrian Interval Signal Phase at Three Urban Intersections*. Van Houten, Retting, Farmer, Van Houten. Transportation Research Record (TRR) 2000.

It is suggested that the city consider implementing LPI at signals with high pedestrian activity, prohibiting right-turn-on-red as needed per recent research findings.

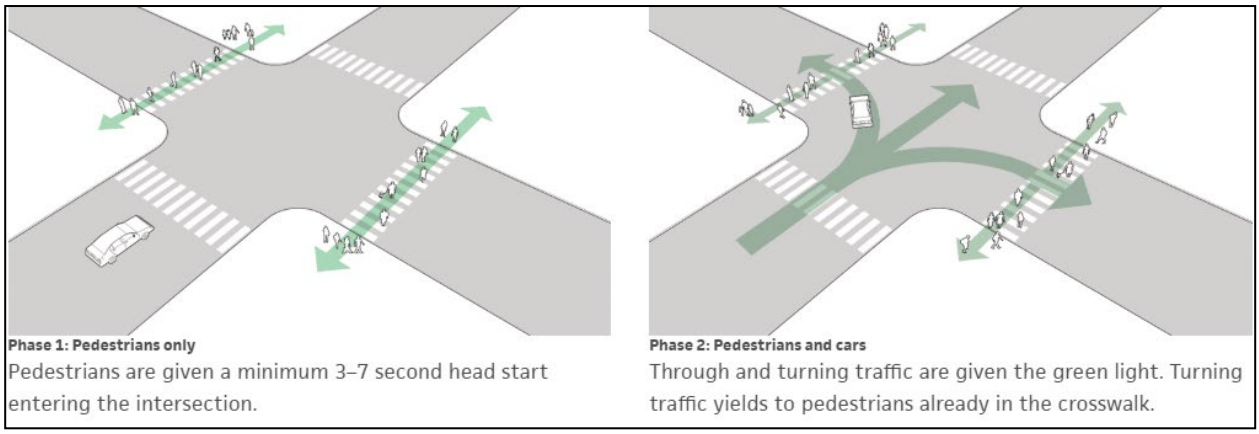


Figure 3-25: Leading Pedestrian Interval phases

Center islands on side streets

Adding pill-shaped center islands just behind the crosswalks side streets at some intersections can improve safety in several ways:

- Calm right turns from the major street
- Calm left turns onto the major street
- Calm through movements on the side street
- Provide a modest refuge for pedestrians crossing the side street, especially slow ones
- Enable the limit lines to be moved forward for better sightlines
- Provide a sheltered place for bicycle users approaching on the side street to prepare to cross or enter the major street

Figure 3-26 shows such an island on a 40-foot residential street in Sunnyvale CA (Canary Drive, at Inverness Way). The island is 6 feet wide and 20 feet long.

Figure 3-26: Median island on residential street (Canary at Inverness, Sunnyvale CA)

Berkeley SafeTREC

SAFE TRANSPORTATION RESEARCH AND EDUCATION CENTER

(SAFETREC)

UNIVERSITY OF CALIFORNIA, BERKELEY

About the Safe Transportation Research and Education Center (SafeTREC)

Founded in 2000, SafeTREC is part of the University of California, Berkeley, affiliated with the School of Public Health and the Institute of Transportation Studies, with additional partnerships with the Department of City and Regional Planning, Public Policy, and Transportation Engineering. SafeTREC helps the California Office of Traffic Safety (OTS) administer its Community Pedestrian and Bicycle Safety Training workshops and support various safety initiatives from other California agencies, including the California Department of Transportation (Caltrans), by providing programs such as:

- Community Pedestrian and Bicycle Safety Program
- Complete Streets Safety Assessments
- Global Road Safety
- Tribal Road Safety
- Collaborative Sciences Center for Road Safety

SafeTREC's mission is to reduce transportation-related injuries and fatalities through research, education, outreach, and community service.

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