WALNUT CREEK

Pedestrian Safety Assessment

Issues, Opportunities, and Recommended Strategies

by

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November 2008

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Funding for this Pedestrian Safety Assessment 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 organizations listed in this report.

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EXECUTIVE SUMMARY

The City of Walnut Creek requested that the Institute of Transportation Studies Technology Transfer Program, University of California Berkeley (www.techtransfer.berkeley.edu) conduct a pedestrian safety assessment (PSA). A team of two pedestrian safety experts conducted the PSA for Walnut Creek in September 2008 and prepared this report. The objectives of the PSA are to improve pedestrian safety and to enhance walkability and accessibility for all pedestrians.

Walnut Creek has a population of approximately 64,500 residents. Based on the 2006 California Office of Traffic Safety (OTS) safety rankings of California cities, Walnut Creek ranked 16 out of 103 California cities in the same population group for the number of pedestrian collisions by average population in 2006 (with 1st being the worst and 103rd the best). Historical collision data was requested from Walnut Creek to identify locations with a high incidence of pedestrian collisions. From 2006 to 2008, the highest number of pedestrian-vehicle collisions (2) occurred at the following locations:

- Botelho Drive at California Boulevard
- Broadway at Lincoln Avenue
- Broadway at Civic Drive
- I-680 NB Off-ramp at Olympic Boulevard
- Locust Street at Mount Diablo Boulevard
- Main Street at Cypress Street
- Olympic Boulevard at California Boulevard

Three of these intersections are along Broadway and two are along California Boulevard. Broadway and California Boulevard are streets that border the downtown pedestrian district and have dual, conflicting functions – carrying traffic around downtown efficiently and service pedestrians accessing the pedestrian district. Locust Street at Mount Diablo Boulevard is the historic border of the pedestrian district and also carries high volumes of traffic. Finally, Main Street at Cypress Street is within the pedestrian district. So five of the six top pedestrian-vehicle collision locations are within or at the edge of the pedestrian district. It is very likely that these intersections have high collision numbers because they also have high pedestrian volumes.

Chapter Two provides an overview of collision data for Walnut Creek, including maps of pedestrian-vehicle collision locations.

The remainder of this report presents the results (findings and recommendations) derived from: (i) a benchmarking analysis of the City's existing pedestrian programs, policies, and practices, and (ii) a field walking audit in the Downtown Core.

Policies, Programs, and Practices Benchmarking

A pedestrian safety interview was conducted with City staff in advance of the PSA field visit to gain an understanding of the existing pedestrian policies, programs, and practices in Walnut Creek. This interview formed the basis for a benchmarking process that categorized the City's programs, practices, and policies into three categories: key strengths (areas where the City is exceeding national best practices), ideas for enhancements (where the City is meeting best practices), and opportunity areas (where the City is not meeting best practices). The results of the benchmarking analysis are summarized in the below table.

TABLE E-1
SUMMARY OF PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS FOR WALNUT CREEK

Benchmark Topic	Key Strength	Idea for Enhancement	Opportunity
Updated ADA Transition Plan for Streets and Sidewalks	X		
Adoption of Bicycling Parking Requirements	X		
Collision History and Collision Reporting Practices	X		
Support for Downtown Festivals	X		
General Plan: Provision for Densities and Mixed-Use Zones	X		
General Plan: Designates Pedestrian Nodes	X		
Use of Leading Pedestrian Intervals	X		
Adoption of Open Space Requirements	X		
Proper Use of Pedestrian Traffic Control Devices (Signs, Markings, and Signals)	X		
Provision of Public Art	X		
Pedestrian-Oriented Speed Limits and Speed Survey Practices	X		
Use of Street Furniture Requirements	X		
Street Tree Requirements	X		
Traffic Management Procedures	X		
Pedestrian-Oriented Traffic Signal and Stop Sign Warrants	X		
Implementation of Americans with Disabilities Act (ADA) Improvements		X	
Attention to Crossing Barriers		X	
Enforcement		X	
Proactive Approach to Institutional Challenges		X	
Inventory of sidewalks, informal pathways, and key pedestrian opportunity areas		X	
Use of Neighborhood-sized Schools		X	

TABLE E-1 (CONTINUED)
SUMMARY OF PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS FOR WALNUT CREEK

Benchmark Topic	Key Strength	Idea for Enhancement	Opportunity
Adoption of Newspaper Rack Ordinance		X	
Collection of Pedestrian Volumes		X	
Availability of Pedestrian Walking Tours		X	
Pedestrian Accommodation in Planned Unit Developments (PUDs)		X	
Public Involvement and Feedback Process		X	
Safe Routes to School Program and Grant Funding		X	
Transportation Demand Management Programs		X	
Crosswalk Installation, Removal, and Enhancement Policy			X
Coordination with Health Agencies			X
Design Guidelines to Support Mixed-Uses and Pedestrian Orientation			X
Preparation of a Pedestrian Master Plan			X
Pedestrian Safety Education Program			X
Adoption of a Transit First Policy			X

Source: Fehr & Peers, 2008

The purpose of this analysis is not to be critical of a jurisdiction's practices; rather, it is to provide jurisdictions with information on current best practices and how they compare. 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 and leadership should determine where resources and efforts are best placed for meeting local development and infrastructure goals for pedestrians.

Walking Audit Recommendations

A walking audit was conducted in the Downtown Core, as determined in coordination with City staff.

The walking audit identified positive practices and pedestrian safety and accessibility issues in this focus area. The observations made during the walking audit were used to suggest policies and physical improvements that can enhance pedestrian safety and accessibility, and in some instances, economic vitality.

Key findings from the Walnut Creek walking audit include:

- Potential redevelopment sites offer significant opportunities for new paseos, public art, fountains, and streetscape improvements. Many informal paseos could also be upgraded with landscaping and wayfinding to increase pedestrian connectivity. A proposed "Fountain Walk" could connect public art and fountains via paseos, creating an attractive route that may encourage more walking in the Downtown area.

- Large, auto-dominated intersections on the periphery of Downtown may benefit from the installation of bulb-outs, ADA upgrades, streetscape improvements, and signal timing adjustments (such as leading pedestrian intervals).

- Several new or enhanced midblock crosswalks would better connect paseos and other pedestrian nodes.

- Crosswalks at uncontrolled intersections, especially across North Broadway and Mount Diablo Boulevard, could be enhanced to improve visibility and driver yielding behavior.

Detailed recommendations are summarized graphically in two large-scale figures in Appendix C (corresponding to the northern and southern sections of the Downtown). A narrative description of walking audit observations and recommendations is presented in Chapter Four (beginning on page 30).

Many recommendations in this report will be good candidates for grant applications, in particular for OTS funding. These recommendations may also be used as the starting point for a *Pedestrian and Streetscape Master Plan*, a document that would set forth pedestrian and streetscape policies for the City and identify and prioritize capital projects.

Recommendations are based on field observations and best practices in pedestrian design and safety. Conditions may exist in the focus areas that were not observed and are not compatible with recommendations in this report. Before recommendations are implemented, City staff should conduct further analysis to ensure that the recommendations are contextually appropriate and do not inappropriately impact pedestrian safety or accessibility from issues including, but not limited to, vehicular traffic, physical characteristics, unsafe conditions, or improper implementation.

1. INTRODUCTION

1.1 OBJECTIVE

Walnut Creek requested that the Institute of Transportation Studies Technology Transfer Program, University of California Berkeley (www.techtransfer.berkeley.edu) conduct a pedestrian safety assessment (PSA). The objectives of the PSA are to improve pedestrian safety and to enhance walkability and accessibility in the City for all pedestrians, through:

Walnut Creek, as seen from Mount Diablo,
Image source: Wikipedia.com

- Recommending improvement measures at high pedestrian collision locations, and
- Reviewing the City's existing pedestrian programs, policies, and practices by benchmarking analysis.

1.2 EVALUATION APPROACH

Prior to visiting the City, the PSA Team (Team) conducted a pre-visit interview with City staff and received a response to the questions via email on July 30, 2008. The results from this interview provided input into the benchmarking analysis. The Team visited the City on September 17-18, 2008. In the morning of the first day, we held a meeting with City staff to discuss initial results from the benchmarking analysis and logistics for the two-day field visit.

The Team conducted a walking field audit of the City's Downtown Core the afternoon of the first day. Walking audit participants included City staff from the City Planning and Public Works Departments, a representative from the Downtown Business Association and Transportation Commission, and a City resident. Participants are listed in Section 1.4 below.

The walking audit began with an introduction to pedestrian safety, where the Team presented a series of photograph examples to illustrate typical areas of concern for walkability as well as best practices for pedestrian safety and accommodation. During the walking audit, participants carried clipboards with aerial photographs of the walking audit focus area as well as notepaper and a "five questions to consider for walkability" checklist. The Team collected note pages from all participants at the end of the day and included in the summary of recommendations.

The Team held an exit meeting on the second day of the field visit with City staff. This meeting included a presentation of the draft recommendations for site-specific improvements based on the results of the walking audits. The results, along with the final benchmarking results, were presented to the Walnut Creek Transportation Commission on October 16, 2008.

1.3 ORGANIZATION OF THIS REPORT

Chapter Two presents background information on pedestrian safety in Walnut Creek, including the safety rankings for Walnut Creek, the top locations for pedestrian-involved collisions, and locations where pedestrian fatalities occurred (from 2003 to 2008). Chapter Three presents findings and recommendations from the benchmarking analysis. Chapter Four presents the findings and recommendations from the walking audit.

There are four appendices in this report. Appendix A presents a glossary of pedestrian improvement options, Appendix B is a resource list, Appendix C includes large size graphics with walking audit recommendations, and Appendix D is a technical memorandum summarizing additional analysis performed at the City's request regarding sidewalk crowding.

1.4 ACKNOWLEDGEMENTS

Walnut Creek staff members contributed to the wide range of topics addressed in this report. In particular, they organized a successful two-day field visit, which included the following participants:

- Mark Clar, resident
- Emily Chang, Executive Director, Downtown Business Association and Transportation Commissioner
- Heather Ballenger, Public Services Director, City of Walnut Creek
- Rafat Raie, Traffic Engineer, City of Walnut Creek
- Yun Na Rhee, Assistant Engineer, City of Walnut Creek

2. BACKGROUND

2.1 PEDESTRIAN SAFETY OVERVIEW FOR WALNUT CREEK

Walnut Creek is Contra Costa County's largest business and entertainment hub. It is also home to approximately 64,500 residents. The City is located in the East Bay region of the San Francisco Bay. Based on the California Office of Traffic Safety (OTS) ranking statistics, the City ranked 16 out of 103 California cities in the same population group for the number of pedestrian collisions by average population in 2006 (1 being the worst ranking). As noted later in this section, almost all of the highest collision locations are in and adjacent to the Downtown Core, which the City considers its pedestrian district. This district has experienced unprecedented economic development and has densities, parking conditions, pedestrian congestion and other conditions found normally in major urban cites. It is likely that the fairly high (poor) rating of the City with respect to pedestrian-related collision per resident is largely a function of the sheer number of pedestrians in Walnut Creek, many of whom are visitors and employees of the downtown core. In 2006, 31 pedestrian collisions occurred in the City. One of these collisions resulted in a pedestrian fatality.

The 2006 OTS safety rankings for Walnut Creek are shown in Tables 2-1 and 2-2. A city with the worst safety record (i.e., the highest rate) receives rank #1. On the other hand, higher numeric ranks indicate better safety records (i.e., lower rates).

Based on these rankings, the areas of highest concern for traffic safety in Walnut Creek in 2006 were:

- Pedestrians
- Older pedestrians (ages 65+)
- Speed-related collisions (which may be correlated with the disproportionate number of pedestrian-vehicle collisions)

This pedestrian safety assessment and this report emphasize safety issues associated with pedestrians (including a focus on older pedestrians through recommended treatments such as road diets, bulb outs, and median refuge islands). Speed-related collisions are also addressed with recommendations in Chapters Three and Four.

TABLE 2-1. WALNUT CREEK SUMMARY STATISTICS

Year	County	Population	Population Group	Daily Vehicle Miles Traveled (VMT)
2006	Contra Costa	65,494	C	1,059,976

Source: California Office of Traffic Safety, http://www.ots.ca.gov/Media_and_Research/Rankings/default.asp

TABLE 2-2. WALNUT CREEK TRAFFIC COLLISIONS AND RANKINGS, 2007			
TYPE OF COLLISION	**VICTIMS KILLED & INJURED**	**RANKING BY DAILY VEHICLE MILES TRAVELED (of 103 cities)**	**RANKING BY AVERAGE POPULATION (of 103 cities)**
Total Fatal and Injury	**359**	**79 (77 percentile)**	**29 (28 percentile)**
Alcohol Involved	23	91 (88 percentile)	64 (62 percentile)
HBD (Had Been Drinking) Driver < 21	2	75 (73 percentile)	67 (65 percentile)
HBD Driver 21 - 34	6	83 (81 percentile)	63 (61 percentile)
Pedestrians	**31**	**49 (48 percentile)**	**16 (16 percentile)**
Pedestrians < 15	3	80 (78 percentile	70 (68 percentile)
Pedestrians 65+	**8**	**17 (17 percentile)**	**5 (5 percentile)**
Bicyclists	9	93 (90 percentile)	86 (83 percentile)
Bicyclists < 15	2	92 (89 percentile)	82 (80 percentile)
Composite		**86 (83 percentile)**	**41 (40 percentile)**
Speed Related	**73**	**55 (53 percentile)**	**23 (22 percentile)**
Nighttime (9:00pm - 2:59am)	23	87 (84 percentile)	51 (50 percentile)
Hit and Run	13	87 (84 percentile)	71 (69 percentile)
DUI ARRESTS	396		
Source: California Office of Traffic Safety, http://www.ots.ca.gov/Media_and_Research/Rankings/default.asp			

2.2 HIGH PEDESTRIAN COLLISION LOCATIONS

The Walnut Creek Public Works Department provided pedestrian-vehicle collision data for the period from June 2006 to June 2008. The top locations for such collisions are shown in Table 2-3. Primary and cross street locations for the two pedestrian fatalities during this period are presented in Table 2-4. Figure 2-1 on the following page provides a map of pedestrian-vehicle collisions from June 2006 to June 2008.

TABLE 2-3. TOP PEDESTRIAN-VEHICLE COLLISION LOCATIONS IN WALNUT CREEK JUNE 2006 TO JUNE 2008	
Intersection	**Number of Collisions**
Botelho Drive at California Boulevard	2
Broadway at Lincoln Avenue	2
Broadway at Civic Drive	2
I-680 NB Off-ramp at Olympic Boulevard	2
Locust Street at Mount Diablo Boulevard	2
Main Street at Cypress Street	2
Olympic Boulevard at California Boulevard	2

TABLE 2-3 (CONTINUED). TOP PEDESTRIAN-VEHICLE COLLISION LOCATIONS IN WALNUT CREEK JUNE 2006 TO JUNE 2008

Intersection	Number of Collisions
Broadway at Newell Avenue	1
Broadway at Arroyo Way	1
Broadway at Carlback Avenue	1
Broadway Plaza at Mount Diablo Boulevard	1
California Boulevard at Bonanza Street	1
California Boulevard at Civic Drive	1
California Boulevard at Pringle Avenue	1
Civic Drive at Parkside Drive	1
Main Street at Arroyo Way	1
Main Street at Botelho Drive	1
Main Street at Broadway Plaza	1
Main Street at Ygnacio Valley Road	1
Mount Diablo Boulevard at Main Street	1
Mount Pisgah Road at Alta Vista Drive	1
Mount Pisgah Road at Mount Diablo Boulevard	1
Newell Avenue at Newell Hill Place	1
Olympic Boulevard at Locust Street	1
Parkside Drive at Lawrence Way Onramp	1
Sierra Lane at Walker Avenue	1
Wiget Lane at Blackstone Drive	1
Ygnacio Valley Road at San Carlos Drive	1

Source: Walnut Creek Public Works and Fehr & Peers

Notes: This list is based on number of collisions and does not adjust for vehicle or pedestrian volumes (exposure). Midblock collisions were mapped to the nearest intersection.

TABLE 2-4. PEDESTRIAN FATALITY LOCATIONS, JUNE 2006 TO JUNE 2008

Primary Street	Nearest Cross Street
Main Street	Geary Road
Main Street	Second Avenue

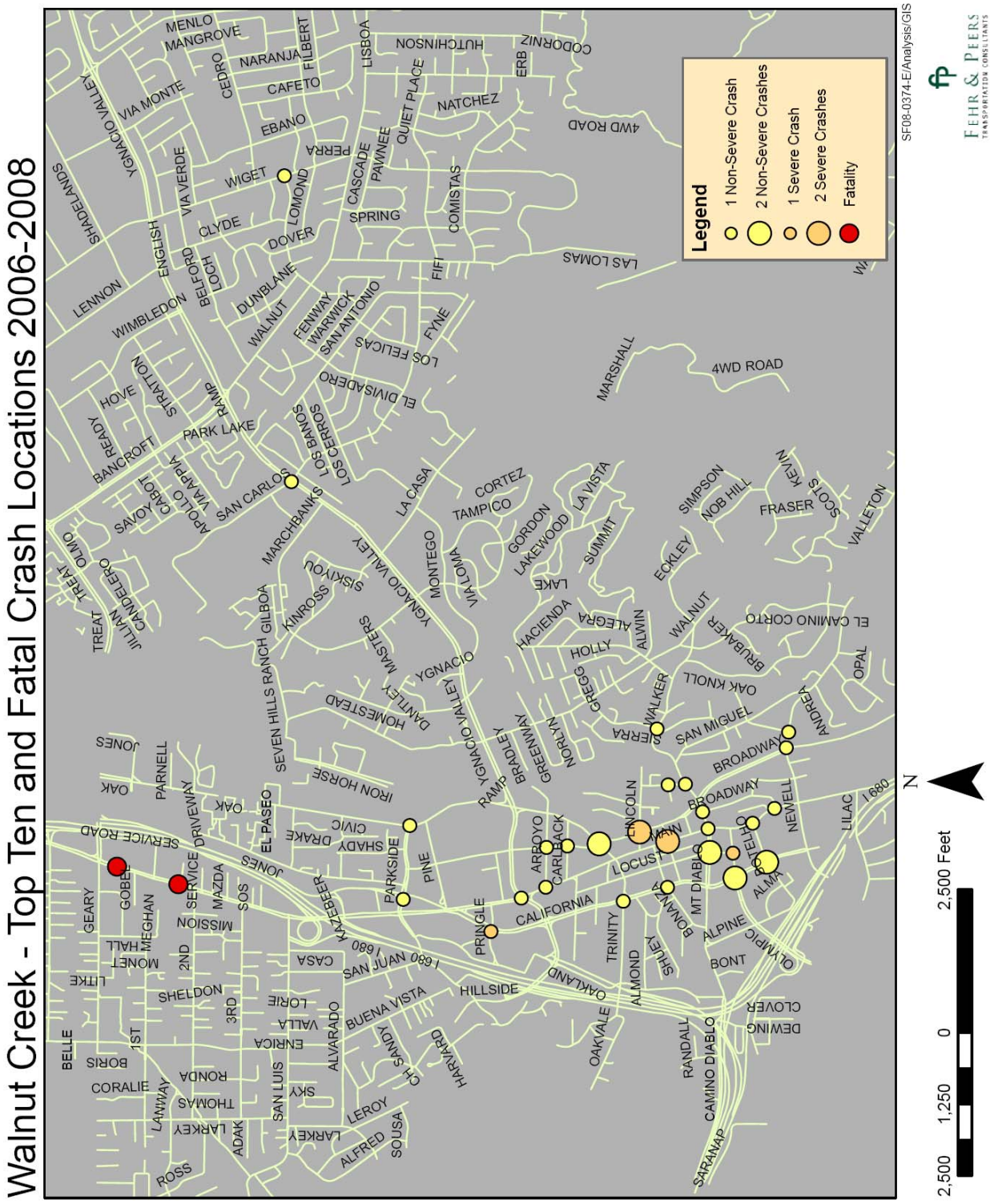
Source: Walnut Creek Public Works and Fehr & Peers

Of the seven locations tied for the most collisions (two), three of these intersections are along Broadway and two are along California Boulevard. Broadway and California Boulevard are streets that border the downtown pedestrian district and have dual, conflicting functions – carrying traffic around downtown efficiently and service pedestrians accessing the pedestrian district. Locust Street at Mount Diablo Boulevard is the historic border of the pedestrian district and also carries high volumes of traffic. Finally, Main Street at Cypress Street is within the pedestrian district. So five of the six top pedestrian-vehicle

collision locations are within or at the edge of the pedestrian district. It is very likely that these intersections have high collision numbers because they also have high pedestrian volumes.

This pedestrian safety assessment addressed prototypical locations on many of the high collision corridors in the City, including California Boulevard, Broadway, Civic Drive, Olympic Boulevard, Locust Street, Mount Diablo Boulevard, Main Street, Cypress Street, Broadway Plaza, and Bonanza Street. Of the top high pedestrian collision locations, Locust Street at Mount Diablo Boulevard, Main Street at Cypress Street, Olympic Boulevard at California Boulevard, Broadway Plaza at Mount Diablo Boulevard, California Boulevard at Bonanza Street, Main Street at Broadway Plaza, Mount Diablo Boulevard at Main Street, and Olympic Boulevard at Locust Street were included in the Walking Audit, which focused on the Downtown Core.

Figure 2-1 Pedestrian-Vehicle Collisions, June 2006 to June 2008



3. BENCHMARKING ANALYSIS – RESULTS AND RECOMMENDATIONS

Prior to the two-day visit to the City, the Team conducted an in-depth interview with City staff regarding the City's pedestrian safety policies, programs, and practices. The City's responses were analyzed with a benchmarking matrix, as shown in Table 3-1. The City's policies, programs, and practices were compared with national best practices. The table below shows areas where Walnut Creek exhibits key strengths, ideas for enhancements (about average with other cities but could be improved), and opportunity areas (areas for significant improvement). The results in Table 3-1 are further elaborated in the following sections.

The Team presented the results of this benchmarking analysis to City Staff on Day One of our visit and to the Transportation Commission on October 16, 2008.

TABLE 3-1
SUMMARY OF PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS FOR WALNUT CREEK

Benchmark Topic	Key Strength	Idea for Enhancement	Opportunity
Updated ADA Transition Plan for Streets and Sidewalks	X		
Adoption of Bicycling Parking Requirements	X		
Collision History and Collision Reporting Practices	X		
Support for Downtown Festivals	X		
General Plan: Provision for Densities and Mixed-Use Zones	X		
General Plan: Designates Pedestrian Nodes	X		
Use of Leading Pedestrian Intervals	X		
Adoption of Open Space Requirements	X		
Proper Use of Pedestrian Traffic Control Devices (Signs, Markings, and Signals)	X		
Provision of Public Art	X		
Pedestrian-Oriented Speed Limits and Speed Survey Practices	X		
Use of Street Furniture Requirements	X		
Street Tree Requirements	X		
Traffic Management Procedures	X		

TABLE 3-1 (CONTINUED)
SUMMARY OF PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS FOR WALNUT CREEK

Benchmark Topic	Key Strength	Idea for Enhancement	Opportunity
Pedestrian-Oriented Traffic Signal and Stop Sign Warrants	X		
Implementation of Americans with Disabilities Act (ADA) Improvements		X	
Attention to Crossing Barriers		X	
Enforcement		X	
Proactive Approach to Institutional Challenges		X	
Inventory of sidewalks, informal pathways, and key pedestrian opportunity areas		X	
Use of Neighborhood-sized Schools		X	
Adoption of Newspaper Rack Ordinance		X	
Collection of Pedestrian Volumes		X	
Availability of Pedestrian Walking Tours		X	
Pedestrian Accommodation in Planned Unit Developments (PUDs)		X	
Public Involvement and Feedback Process		X	
Safe Routes to School Program and Grant Funding		X	
Transportation Demand Management Programs		X	
Crosswalk Installation, Removal, and Enhancement Policy			X
Coordination with Health Agencies			X
Design Guidelines to Support Mixed-Uses and Pedestrian Orientation			X
Preparation of a Pedestrian Master Plan			X
Pedestrian Safety Education Program			X
Adoption of a Transit First Policy			X

Source: Fehr & Peers, 2008

3.1 KEY STRENGTHS

(a) ADA Transition Plan for Streets and Sidewalks

An ADA Transition Plan identifies barriers to individuals with accessibility and describes the modifications necessary to remove the barriers. Transition Plans are legally-required documents under the ADA Act of 1990.

Walnut Creek employs the following practices, in-line with federal and state guidelines:

- The City has an ADA Coordinator and an ADA Transition Plan last updated in August 2005.
- The Transition Plan addresses buildings, parks, playgrounds, working within the *right-of-way*, and sidewalks, including curb ramps and obstacles.
- The Transition Plan requires current ADA standards to be applied with new development, with street overlays, and at designated high-need locations.

(b) Bicycle Parking Requirements

Bicyclists become pedestrians after parking their bicycles or when walking their bicycles along pedestrian facilities. Safe and convenient bicycle parking is essential for encouraging bicycle travel (especially in lieu of vehicle travel).

The City has bicycle parking requirements in the Municipal Code. The policy requires a standard green rack.

<u>Recommendation for Further Enhancement</u>
Consider developing a "branded" rack to enhance branding of the Downtown area.

(c) Collision History and Collision Reports

The City employs geocoding and comprehensive monitoring using Crossroads software, which allows for more proactive pedestrian safety projects and best practices such as crash typing for countermeasure selection.

<u>Recommendation for Further Enhancement</u>
Comprehensive collision monitoring could also include a field inventory of collision locations, including pedestrian volume counts. With sufficient pedestrian volume data, the City could prioritize collision locations based on collision rates (i.e., collisions/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 City's Capital Improvements Program (CIP). Pedestrian volume data recently collected for the Downtown is a significant effort in this direction.

(d) Design Policies and Development Standards

Design policies and development standards can improve the pedestrian walking experience, encourage walking, enhance economic vitality, and offer funding opportunities for pedestrian improvements. Walnut Creek has the following current practices and policies:

- The City has a traffic impact fee program that includes some pedestrian project (the majority of the projects are for roadway improvements)

- The City has a long practice of designing for pedestrians. New development applications are reviewed for pedestrian components.

- The City has adopted street standards, which indicate the width of the street and *right-of-way* for developments.

Recommendation for Further Enhancement:
Develop multi-modal guidelines for the conduct of Traffic Impact Studies in the City to establish by ordinance a nexus between impact fees and pedestrian improvements.

Recommendation (3.3e – Pedestrian Master Plan and Downtown Core Streetscape Master Plan) below could also dramatically enhance the City's current practices with respect to securing fronting improvements appropriate to the context and pedestrian volumes in the Downtown Core.

(e) Downtown Festivals

Downtown festivals with street closures encourage walking and a "park once" environment. They also enhance the economic vitality of Downtown.

Image source: www.zvents.com

Recommendation for Further Enhancement
Consider opportunities for additional festivals.

(f)* General Plan*: Densities and Mixed-Use Zones

Strong pedestrian-oriented policies in the *General Plan* have resulted in a walkable, vibrant Downtown. These policies include:

- Densities in the City are varied from single family homes to dense residential projects in the Downtown area.

- In the Core Area, a large amount of the Commercial Downtown Area was re-designated (with the adoption of *General Plan* 2025) to Mixed Use – Commercial Emphasis.

- Other land use designations in the Core Area include Mixed-Use Residential Emphasis and Mixed Use – Golden Triangle (area near the BART station).

- The City is focusing on redevelopment of the BART station area

Recommendation for Further Enhancement

Extend transit orientation and mixed use zoning beyond the Downtown to target neighborhood centers and transit corridors.

(g)* General Plan*: Pedestrian Nodes

In addition to pedestrian-oriented densities and mixed uses, the *General Plan* identifies pedestrian nodes and encourages pedestrian-oriented development:

- The City has three parking structures in the district to encourage people to "park once and walk," and a fourth is being constructed at the new City Library site. The City is also using more valet parking operations, which further enhance the park once philosophy.

- The City has also invested in infrastructure to enhance the pedestrian environment and encourage walking, such as bulb-outs at corners, enhanced crosswalk and sidewalk materials, decorative and pedestrian-focused streetlights, wider sidewalks where pedestrian use is anticipated to be greater, etc.

- Specific Plans are establishing additional opportunities to acquire "through-block" pedestrian passageways, or paseos, and additional street-level plazas and other street amenities that enhance the pedestrian environment.

(h) Leading Pedestrian Intervals (LPI) and Pedestrian Scrambles

Leading Pedestrian Intervals (LPI) provide pedestrians with a "head start" signal timing before vehicles on the parallel street are allowed to proceed through an intersection. A 2000 study by the Insurance Institute for Highway Safety found the LPI reduces conflicts between turning vehicles and pedestrians by enhancing the visibility of the pedestrian in the crosswalk.[1] These intervals are employed in the City and additional installations are recommended (note that based on recent research right turns on red may need to be prohibited with LPI installation outside the Downtown Core).[2]

A Pedestrian Scramble, or an exclusive pedestrian phase, removes pedestrian-vehicle conflicts at an intersection by allowing pedestrians to cross in any direction while vehicles in all directions have a red signal. Intersections with high volumes of turning traffic and high pedestrian volumes can benefit significantly from the scramble. The City is considering installing scrambles at several locations in the Downtown Core. Recommendation installation locations are included in Chapter Four.

(i) Open Space Requirements

Walnut Creek residents rate open space as among the City's key assets and needs. The *General Plan* focuses on conserving and enhancing open space. The City requires a park acquisition development fee for master planned communities based on projected populations. Developers can provide a park on site or pay an in-lieu fee.

Recommendation for Further Enhancement:
Require an open space fee or on-site provision for all land use types, not just residential development.

(j) Pedestrian Traffic Control Devices

The City has good record keeping of all changes to traffic control devices and a robust maintenance program. The City also employs best practices through the use of LED displays and pedestrian countdown signals.

[1] Van Houten, R.; Retting, R.A.; Farmer, C.M.; and Van Houten, J. 2000. Field evaluation of a leading pedestrian interval signal phase at three urban intersections. *Transportation Research Record* 1734:86-92.
[2] Hubbard, S, Bullock, D and J. Thai, Trial Implementation of a Leading Pedestrian Interval: Lessons Learned, ITE Journal, October 2008, pp. 32-41.

Recommendation for Further Enhancement:
Upgrading to a GIS-based inventory would enable more efficient project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc. This inventory could also include signs and markings and a record of maintenance requests.

(k) Public Art

Public art is present throughout Walnut Creek and a walking tour and walking tour map are available. Public art encourages walking by improving the pedestrian realm and walking experience.

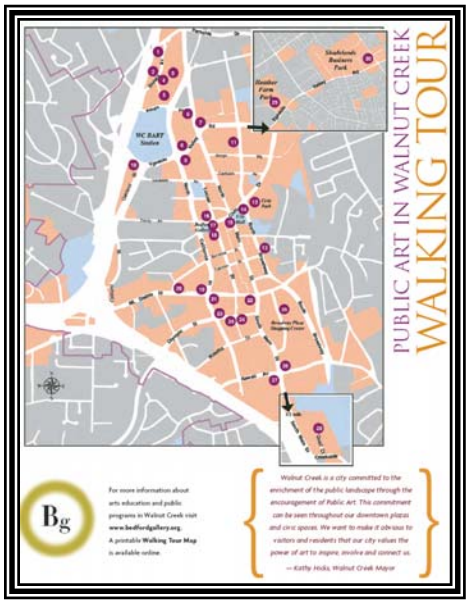


Image source: www.bedfordgallery.org

Recommendation for Further Enhancement:
The "Fountain Walk" recommended later in this report (Section 3.3g, below) would enhance public art in Walnut Creek.

(l) Speed Limits and Speed Surveys

As shown in the following image, pedestrian fatality rates increase exponentially with vehicle speed. Thus, reducing vehicle speeds in pedestrian zones is one of the most important strategies for enhancing pedestrian safety. While Walnut Creek follows best practices for setting speed limits by considering pedestrian volumes, the City still experiences significant conflicts between pedestrians and fast-moving vehicles at the edges of the Downtown Pedestrian Core, as illustrated with collision data.

Recommendation for Further Enhancement:
Consider redesigning streets on the edges of the Downtown Core to better integrate vehicle and pedestrian needs in this area.

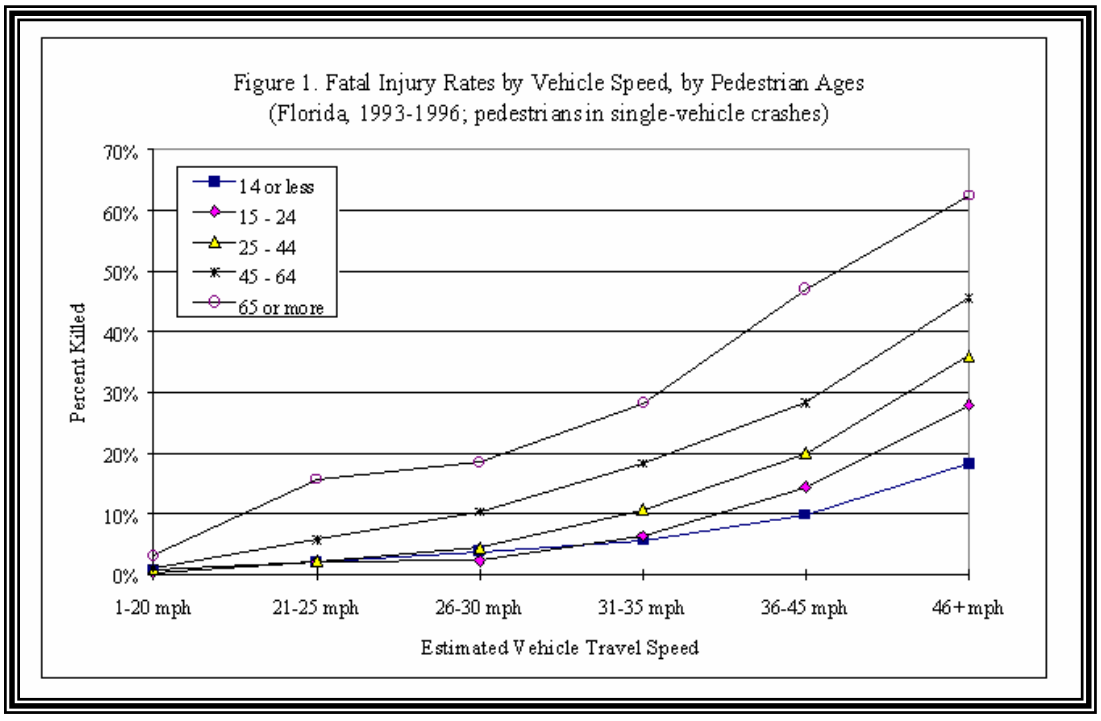


Image source: http://www.nhtsa.dot.gov/people/injury/research/pub/Image3.gif

(m) Street Tree Requirements

Street trees enhance the pedestrian environment by providing shade and a buffer from vehicles. 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.

In Walnut Creek, when a tree is removed, the arborist requires a replacement tree (15 gallon) if there is room on the site. For businesses, the City requires additional landscaping if a tree is removed and not replaced, or the business may pay an in-lieu fee to the City's tree fund.

When a tree is damaged, the City is responsible if it is a City-owned (or required) street tree. This is determined by a City tree inventory. If it is not in the inventory, the arborist looks at the pattern of trees on the street. If they are all the same species, the City assumes they are City trees.

The City has a practice of saw cutting to repair tree-related sidewalk damage instead of grinding.

Recommendation for Further Enhancement:
Additional trees, landscape buffers, and landscaped medians are recommended in specific locations throughout Downtown (see Walking Audit results).

(n) Traffic Management Procedures

Traffic management procedures guide the City towards a consensus threshold on neighborhood traffic calming requests and approvals, as well as standard treatments and criteria. Existing practices include:

- Established procedures for responding to speeding concerns and requests for traffic control devices.
- Existing traffic management program funded by the City's Capital Improvement Program, traffic impact fees, and grants.
- Enforcement, education, and engineering as the basic criteria for these efforts.
- Use of speed humps discouraged because of quality of life issues.

Best practices resources include www.trafficcalming.org and the City of Sacramento's *Traffic Calming Guidelines,* available online at http://www.cityofsacramento.org/transportation/dot_media/engineer_media/pdf/trafficcalming.pdf.

(o) Traffic Signal and Stop Sign Warrants

Providing all-way stop control (or stop signs for every approach) at an intersection improves pedestrian safety by providing assigned *right-of-way*, improving visibility, and reducing pedestrian and vehicular conflicts. Balancing the needs of pedestrians with those of autos is a key consideration. The typical resources for traffic engineers – the Manual of Uniform Traffic Control Devices (MUTCD) and California Supplement to the MUTCD – are often inappropriate for pedestrian districts.

Walnut Creek has the following practices regarding all-way stop control:

- All-way stop control warrants consider pedestrian activity levels.
- Warrants balance pedestrian and vehicle needs.

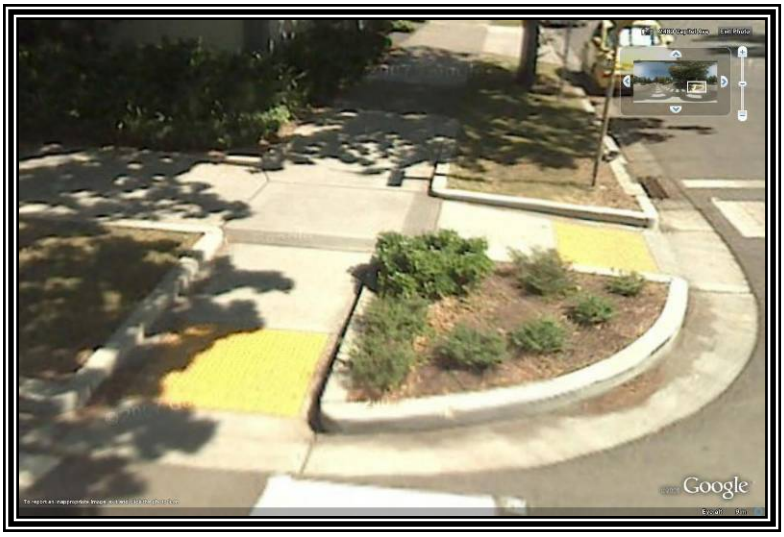
3.2 IDEAS FOR ENHANCEMENTS

(a) ADA Improvements

Compliance with ADA guidelines is important not only to enhance community accessibility, but to improve walking conditions for all pedestrians.

Walnut Creek employs the following ADA practices, in-line with federal and state guidelines:

- The City has ADA standards for on street/off street parking, pedestrian access, truncated domes, curb ramps, signage, sidewalks, and building requirements that are regulated by the ADA.
- In general, improvements to existing facilities undergo ADA upgrades.
- New streets and developments must follow the latest ADA standards.
- Audible pedestrian signals (APS) are utilized throughout the City and considered at locations through requests sent to the ADA Coordinator.



<u>*Recommendations for Further Enhancement:*</u>

- *Provide a stated goal of two curb ramps per corner in the Transition Plan. The above photograph illustrates this technique on a corner with a small radii.*
- *Provide on-street ADA parking on request and where doing so would provide the most convenient parking option to persons with disabilities.*

(b) Enforcement

Enforcement of pedestrian right-of-way laws and speed limits is an important complement to engineering treatments and education programs. The Walnut Creek Police Department is currently involved in meetings as needed with other City departments to discuss planning, design, and construction of facilities.

<u>*Recommendations for Further Enhancement:*</u>

- *Conduct routine pedestrian sting operations.*

- *Share police resources with neighboring cities. The Cities of Sunnyvale and Hermosa Beach, California, among others, participate in police sharing with other cities to enhance policy resources for activities such as pedestrian stings.*

- *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. 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).*

- *Enhance the involvement of the Police department in planning and design of pedestrian facilities.*

(c) Institutional Challenges

Numerous agencies have jurisdiction over components of the Walnut Creek transportation network, including Caltrans, BART, Wheels, Benicia Breeze, Fairfield/Solano Transit, and Vallejo Transit. Institutional challenges associated with multiple agencies include non-local control of right-of-way and differing policies regarding pedestrian accommodation. For example, Caltrans policies have historically restricted proposals for bulbouts, wider sidewalks, and other pedestrian-oriented improvements.

Successful cross-institution collaboration efforts in Walnut Creek include:

- The City has a good working relationship with the County Connection bus service (the service has the second-highest ridership in the County).

- The City has successfully worked with BART and the developer for a Transit Village at the BART station.

- The City owns and maintains signals at many on and off-ramps, in some cases taking over the signals from the County (i.e. on Treat Boulevard).

- The City collaborates with the County and operates some County signals in order to maintain good corridor flow.

The City has identified the following institutional challenges:

- The Congestion Management Program (CMP) limits pedestrian improvement options on regionally significant streets.

- Pedestrian-vehicle conflicts exist at the off-ramps from I-680, but a solution has not been reached between the City and Caltrans.

Recommendation for Further Enhancement:
Recent Context Sensitive Solutions (CSS) and Routine Accommodations policies within Caltrans (see revised Deputy Directive 64: http://www.calbike.org/pdfs/DD-64-R1.pdf) now require the agency to consider multimodal needs and engage in collaborative community planning. These new policies may reduce institutional challenges, and the City should work with Caltrans and other agencies to identify new opportunities for joint planning of transportation facilities in Walnut Creek.

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

The City has recently collected Downtown pedestrian data (volumes and sidewalk widths) and has a GIS inventory.

A GIS-based inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc.

Recommendation for Further Enhancement:
The Downtown inventory should be expanded Citywide.

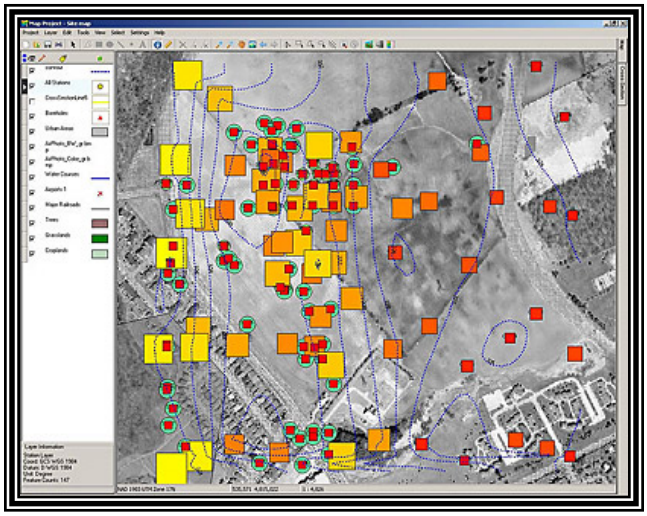


Image source: www.mpassociates.gr

(e) Neighborhood-Sized Schools

Having neighborhood-sized schools, as opposed to mega schools on the periphery, is a key ingredient for encouraging walking and bicycling to school. Especially as schools reach the end of their service life, a neighborhood-sized school policy in Walnut Creek will be important.

Recommendation for Further Enhancement:
The City should work with the school district to establish policies for school location.

(f) Newsrack Ordinance

Newsracks may obstruct walkways and reduce accessibility and pedestrian conspicuity when ordinances are not in place. A Newsrack Ordinance improves the pedestrian realm by reducing clutter and organizing sidewalk zones. The Newsrack Ordinance details size, location, and maintenance requirements.

The City does not currently have a policy or standard for newsracks. However, most newsracks throughout the Downtown are well-organized. The racks are provided by *Contra Costa Times* with space leased to other vendors.

Recommendation for Further Enhancement:
Establish a Newsrack Ordinance. This policy may be included within the recommended Pedestrian and Streetscape Master Plan.

(g) Pedestrian Volume Inventory and Collection Practice

The City currently collects pedestrian volumes on a case-by-case; however, traffic volumes are routinely collected with traffic impact analyses and other traffic studies.

After a data collection effort this summer, the City now has a pedestrian volumes database (geocoded) for the Downtown.

Recommendation for Further Enhancement:
As part of a new City Routine Accommodations Policy, pedestrian and bicycle volumes could be collected with any traffic volume collection effort.

(h) Pedestrian Walking Tour

Downtown Walnut Creek has several fountains and paseos that could be showcased through a new "Fountain Walk." This walk would build on the existing "Creek Walk" and include several new fountains and paseos. With wayfinding maps and signs, this walk could encourage walking in Downtown and enhance economic vitality.

Additionally, the City's Public Information Officer currently offers a tour of Walnut Creek historic sites for 2nd graders. The tour route and materials could be made available online for a broader audience. Wayfinding signs, maps, and plaques could also be provided.

As mentioned above, a Public Art Walk is currently sponsored by a local art gallery (Bedford Gallery).

Recommendation for Further Enhancement:
Establish a pedestrian-oriented tour of key sites within Walnut Creek. A suggested route for this tour is included in the recommendation graphics in Appendix C.

(i) Planned Unit Developments

Image source: www.ci.walnut-creek.ca.us

The City has been using Planned Unit Development (PUD) zoning to approve certain residential developments since the 1970s. Hundreds of units are found in these PUD zones, mostly in the lower density areas of the City. Most are of these developments make no special accommodations for pedestrians, and are indistinguishable from standard zoning districts, except many include dedications of reserved open space areas, especially in hillside areas. A large number of these PUD zones do not include sidewalks, as they are located in the hillier and more "rural" areas of Walnut Creek.

Recommendation for Further Enhancement:

Develop a checklist for development review to consider:

- *Cul-de-sacs*
- *Connections to transit*
- *Sidewalk widths*
- *Connections to open space*
- *Pedestrian amenities*

Sample "Smart Growth Scorecards," which may serve as a model for this checklist, are available online at http://www.smartgrowthgateway.org/howsmart.shtml.

(j) Public Involvement and Feedback Process

Responding to public concerns through advisory groups and public feedback mechanisms represents a more proactive and inclusive approach to pedestrian safety compared to the conventional approach of reacting to pedestrian collisions. The City has a general "comments and suggestions" feedback page on the City's website, but no specific webform for pedestrian issues. Additionally, the City has a Transportation Commission but no pedestrian specific advisory committee.

Recommendations for Further Enhancement:
A specific pedestrian advisory committee (or subcommittee of the Transportation Commission) could focus on reviewing development of the Pedestrian and Streetscape Master Plan *and responding to the feedback received via the webform and other mechanisms.*

A web-based public feedback process would assist in the prioritization of pedestrian safety projects. Similar to a "report a pot hole" webform, this web-based feedback process would enable citizen input on key locations for pedestrian safety improvements, including new crosswalks, speed enforcement or traffic calming, or educational campaign venues.

Image source: www.ci.walnut-creek.ca.us

(k) Safe Routes to School Program and Grant Funding

Safe Routes to School (SR2S) programs encourage children to safely walk and bike to school. The Marin County Bicycle Coalition pioneered the concept, which has spread nationally (see best practices at http://www.saferoutestoschools.org). Safe Routes to School 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 AM peak hour traffic). Funding for Safe Routes to School programs and/or projects is available at the state (http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/sr2s.htm) and federal (http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/srts.htm) levels.

The City does not have a SR2S program but recently completed a SR2S project on Buena Vista Avenue. The City also recently completed an inventory of all schools, including signage, crosswalks, crossing guards, and traffic control devices. The City funds 15 school crossing guards and most schools have maps identifying recommended walking and biking routes.

Recommendation for Further Enhancement:
A formal SR2S program would identify and prioritize education, enforcement, engineering, and encouragement efforts Citywide. The program could also set policy direction for crossing guard locations, etc. The State of California provides the following criteria for the placement of school crossing guards in the MUTCD 2003 California Supplement:

"Adult school crossing guards normally are assigned where at least 40 school pedestrians over the course of two hours each day cross a public highway on the way to or from school. Guards also should be considered when special situations make it necessary to assist elementary school pedestrians in crossing the street.

In some cases, [when] a change in the school crossing location is underway, prevailing conditions require crossing supervision until the change is completed, so a guard should be considered. Additional criteria

are provided for specific situations, including uncontrolled crossings, stop sign-controlled crossings and traffic signal-controlled crossings. The criteria are based on vehicular traffic volume, vehicle speed and the number of vehicular turning movements."[3]

(l) Transportation Demand Management (TDM)

Transportation Demand Management (TDM) programs encourage multi-modal travel by incentivizing non-auto options. As new development occurs, TDM programs can be expanded, formalized, and strengthened. Existing TDM efforts in the City include:

- The City has a TDM Program for City employees but no official TDM Coordinator. The program subsidizes BART tickets for City employees and provides time off to City employees using alternative modes (1/2 hour every week).
- John Muir Hospital has a TDM Program as a traffic mitigation measure.
- Macerich, owners and operators of the Broadway Plaza Shopping Center, will have a TDM Program with new development

Image source: www.511contracosta.org

Recommendations for Further Enhancement:

- *Establish Citywide TDM policies as conditions of approval for development.*
- *Establish a Transportation Management Association (TMA) for the Downtown to coordinate parking, transit, and other TDM strategies and policies in the Downtown core.*

3.3 OPPORTUNITY AREAS

(a) Crossing Barriers

Crossing barriers such as railroads, freeways, and major arterials, may discourage or even prohibit pedestrian access. Additionally, crossing barriers are often associated with vehicle-pedestrian collisions (including severe injuries and fatalities). Identifying and removing barriers, as well as preventing new barriers, is essential for improving walkability and pedestrian safety.

Walnut Creek does not have a formal policy for identifying and addressing barriers.

Recommendations for Further Enhancement:

- *Inventory existing pedestrian barriers*
- *Establish a policy for pedestrian crossings at barrier locations*

[3] http://www.saferoutesinfo.org/guide/crossing_guard/identifying_the_locations_where_adult_school_crossing_guards_are_needed.cfm

(b) Crosswalk Installation, Removal, and Enhancement Policy

The City has no formal policy regarding crosswalks. By establishing a formal policy for crosswalk installation, removal, and enhancements, the City could provide transparency in decision-making and adopt best practices in pedestrian safety and accommodation.

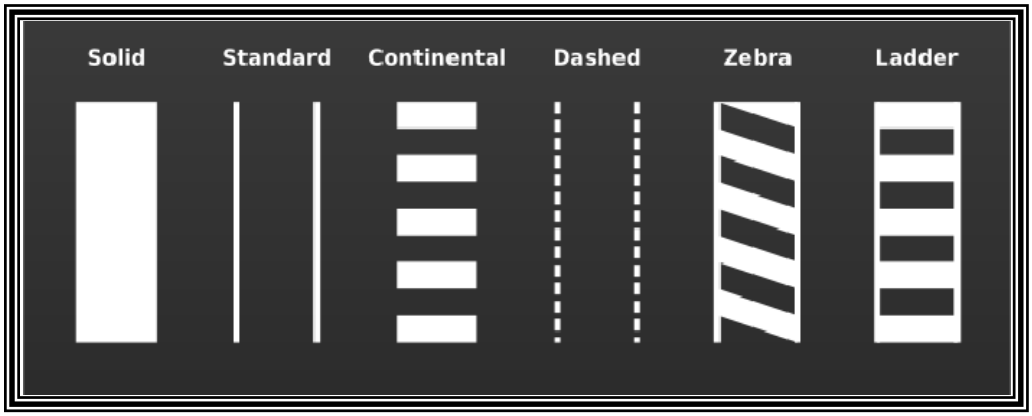


Image source: FHWA, Planning and Designing for Pedestrian Safety Course, 2008

Recommendation for Further Enhancement:

Establish a crosswalk policy to address:

- *Installation*
- *Removal*
- *Enhancements*

This policy could be included in a Pedestrian Master P*lan for the City. Excel-based crosswalk treatment selection tools are available on the PSA resources page at http://cpsa.webexone.com.*

(c) Health Agencies

Involving non-traditional partners such as Emergency Medical Service (EMS), Public Health, pediatricians, etc., in the planning or design of pedestrian facilities may create opportunities to be more pro-active with pedestrian safety, identify pedestrian safety challenges and education venues, and secure funding. Additionally, under-reporting of pedestrian-vehicle collisions is a documented problem (as much as 21% of collisions) that can be mitigated by involving the medical community in pedestrian safety planning.[4]

Currently, health agencies are not involved in the planning or design of pedestrian facilities in Walnut Creek.

Recommendation for Further Enhancement:
Involve Health Agencies (including EMS) in the planning or design of pedestrian facilities.

[4] 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

(e) Pedestrian Master Plan and Downtown Core Streetscape Master Plan

This report would include a large menu of policy, program, and practices recommendations, as well as site-specific (and prototypical) engineering treatment recommendations. To move forward with the recommendations, a prioritized implementation list and budget will be required. A *Pedestrian (or Pedestrian/Bicycle) Master Plan* would document the City's vision for improving walkability and pedestrian safety, establish policies, programs, and practices, and outline the prioritization and budgeting process for project implementation. Combining this with a *Downtown Core Streetscape Master Plan* would address other recommendations in this report, including street furniture, street tree, and bicycle parking ordinances as well as sidewalk widths and usage.

Recommendation for Further Enhancement:
Develop a Pedestrian and Streetscape Master Plan *to prioritize and implement capital and maintenance projects. Development of this Plan is high on the City's list of priorities.*

To meet the City's specific needs, the Master Plan *should address:*

- *Pedestrian accommodations during construction*
- *Street trees and street furniture standards and requirements*
- *Pedestrian connectivity*
- *Consistency*
- *Interdepartmental Coordination*

(f) Pedestrian Safety Education

Education is a critical element for a complete and balanced approach to improving pedestrian safety. Education campaigns should focus on pedestrians of all ages, especially emphasizing education of schoolchildren, where safe walking habits may be instilled as lifelong lessons. The City has not conducted pedestrian safety campaigns.

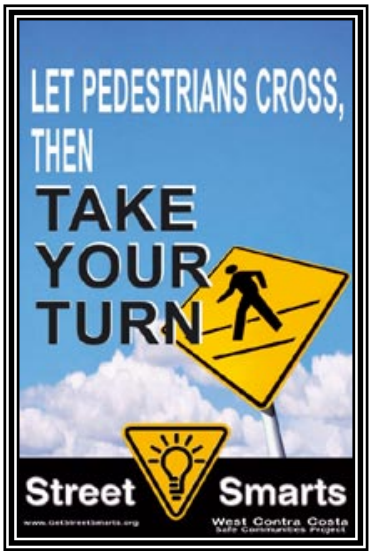


Image source:
http://www.getstreetsmarts.org

Recommendations for Further Enhancement:

- *Develop a curriculum for schools and community centers*
- *Provide brochures*
- *Conduct educational campaigns*

Campaigns may include advertisements on buses and bus shelters, an in-school curriculum, community school courses, public service announcements, and/or brochures, among many other strategies. The Street Smarts program in San José, California, provides a model pedestrian safety education program (see http://www.getstreetsmarts.org/ for details).

The Bicycle Transportation Alliance has developed a pedestrian safety curriculum for 2nd-3rd graders, which incorporates physical education, health, and social responsibility (see http://www.bta4bikes.org/docs/PedSafetyCurriculumFinal.doc). Other safety curriculum resources are available here: http://www.saferoutespartnership.org/state/5638/5722.

Pedestrian safety brochures are available at http://safety.fhwa.dot.gov/media/brochures.htm and http://www.aaafoundation.org/products/index.cfm?button=free.

Image source: www.all-transit.com

(g) Transit First Policy

In areas with a Transit-First Policy (such as San Francisco and Oakland, California), transit mobility is prioritized over vehicle mobility. This may include techniques such as transit signal priority and/or queue jump lanes at congested intersections.

Recommendations for Further Enhancement:
Establish a Transit-First Policy for transit-oriented areas in Walnut Creek, such as Downtown as well as key bus route corridors.

San Francisco's policy is available online at http://www.sfmta.com/cms/bcomm/3179.html

4. WALKING AUDITS RESULTS AND RECOMMENDATIONS

Walking audits are typically conducted as a preliminary step in efforts to improve the pedestrian environment within the selected area. Many individuals can participate in a walking audit as a group: community residents, stakeholders, and affiliated individuals. During a walking audit, positive practices are observed and issues and opportunity areas are noted. Observations are based on how motorists are behaving around pedestrians, and how pedestrians are behaving, especially at intersections (for example, if pedestrians are crossing at unmarked locations to avoid certain intersections, why might they feel the need to do so?). For each opportunity area, the group discusses possible recommendations to address pedestrian safety concerns. Walking audits are highly interactive, with many observations and "teachable moments" explored during the walk. They are a means to observing and learning how to "see through the eyes of the pedestrian."

This chapter presents the observations and recommendations made during the walking audit conducted in Walnut Creek. Recommendations are based on best practices and discussions with the multidisciplinary participant group regarding local needs and feasibility. A glossary of the candidate treatment options is presented in Appendix A.

Conditions may exist in the focus areas that were not observed and are not compatible with recommendations in this report. Before recommendations are implemented, it is the responsibility of City staff to conduct further analysis to ensure that the recommendations are contextually appropriate and do not negatively impact pedestrian safety or accessibility from issues including, but not limited to: vehicular traffic, physical characteristics, unsafe conditions, or improper implementation.

The evaluation team worked with City staff to select the focus area for the walking audit based on the following criteria:

- Importance of the study: no other project has specifically addressed pedestrian safety needs in the area
- Demonstrated pedestrian safety concerns
- Presence of children and senior pedestrians
- Proximity to key generators, such retail corridors, transit, and employment centers
- Availability of prototypical sites for broader Citywide application of recommendations

The walking audit study area was gleaned from the above criteria and was defined by a loop route within the Downtown Core as shown in Figures 4-1 and 2.

The following sections present the key issues identified during the walking audit. Recommendations are presented to respond to the issues at each site. Two focus area summary graphics (north and south) are also presented with a compilation of all recommendations. The graphics are available in large format in Appendix C.

Figure 4-1 Walking Audit Route (North)

Figure 4-2 Walking Audit Route (South)

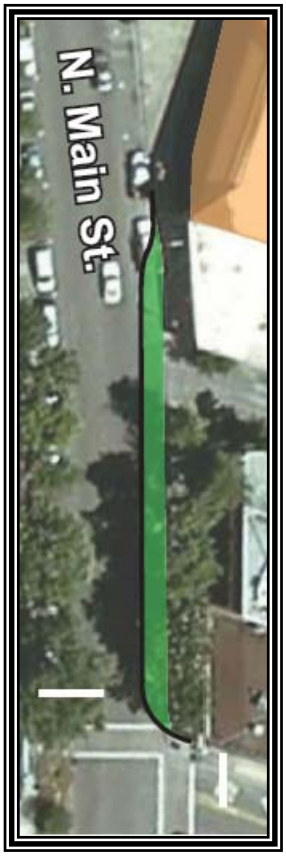
NORTH MAIN STREET AND CIVIC DRIVE

The walking audit began outside of City Hall at the corner of North Main Street and Civic Drive.

Observations: Decorative sidewalk pavement, beautiful landscaping, and street furniture make this an attractive area for pedestrians. However, this location has long crossings because of the intersection geometry and multiple lanes on Civic Drive.

Recommendations:

- *Construct bulb outs on the southwest and southeast corners of North Main Street and Civic Drive.*
- *Provide advance stop bars on Civic Drive.*
- *Realign the crosswalk on the easterly approach of Civic Drive and the southerly approach of Main Street to shorten crossing distances.*



NORTH MAIN STREET NORTH OF LINCOLN AVENUE

Observations: Throughout this stretch of sidewalk, dense urban trees, many shopping and dining destinations with great awnings, and sidewalk activity make this area a bustling pedestrian zone. As a bi-product of this success, sidewalk widths through this section do not support sidewalk café seating, business signs, and other desirable uses for the businesses located here.

Recommendation:

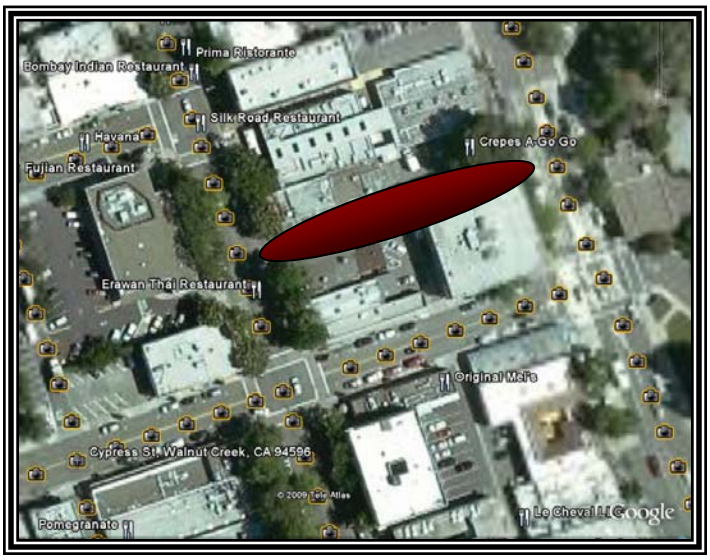
- *Widen the easterly sidewalk along North Main Street from Lincoln Avenue to north of the paseo.*

PASEO BETWEEN NORTH MAIN STREET AND NORTH BROADWAY, NORTH OF CYPRESS STREET

Observations: This is one of many paseos in the Downtown that provide for more direct walking paths in mostly pleasant environments, but is not signed and a pedestrian pathway through the parking lot is not provided.

Recommendations:

- *Provide sidewalk and wayfinding through parking lot.*
- *Remove one parking space on west side of parking lot to eliminate backing into sidewalk concerns.*



NORTH BROADWAY AND LINCOLN AVENUE

Observations: At this location, traffic speeds are managed to calm traffic and marked crosswalks are provided on all approaches. However, the geometry of this intersection creates long crosswalks. Vehicles encroach on the crosswalk when turning right on red.

Recommendations:

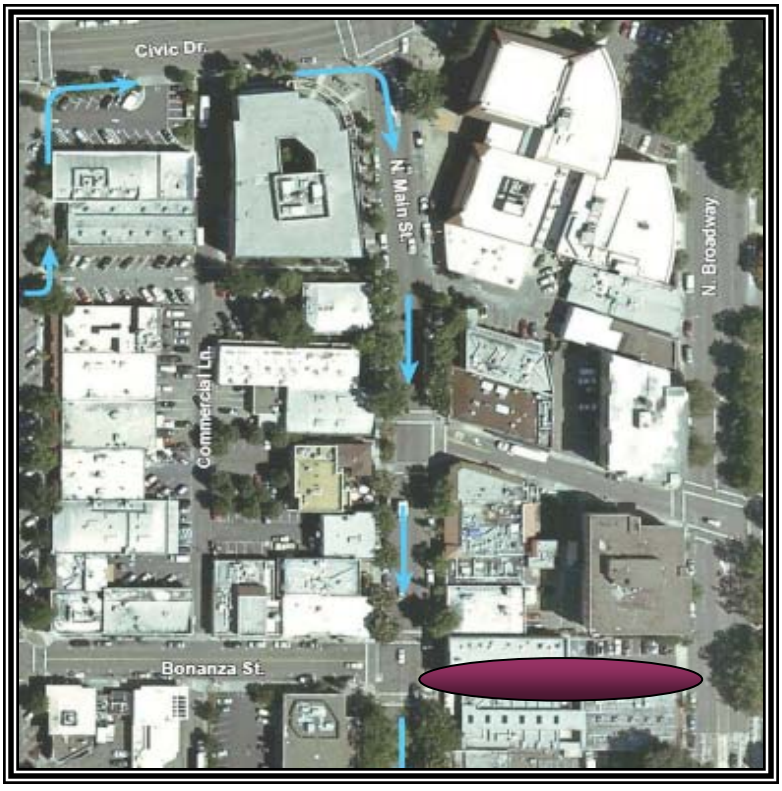
- *Construct bulb outs on the northwest and southwest corners.*
- *Provide high visibility crosswalks.*
- *Provide advance stop lines on each approach to the intersection.*

PASEO BETWEEN NORTH MAIN STREET AND NORTH BROADWAY AT BONANZA STREET

Observations: This paseo provides an important connection between the shopping and restaurant district with off-street parking, but is not well signed.

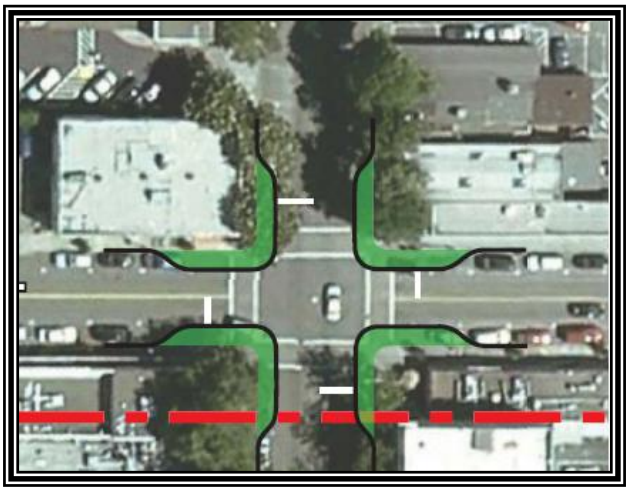
Recommendation:

- *Provide wayfinding along corridor.*



NORTH MAIN STREET AND CYPRESS AVENUE

Observations: Textured pavement crosswalk treatments extend the pedestrian realm across the street at all four crosswalks. The crosswalks are appropriately enhanced with white, marked crosswalks to ensure visibility. Because of heavy parking and traffic volumes through this locations, pedestrians may be blocked by parked vehicles and vehicles may encroach into crosswalks when turning.



Recommendations:

- *Construct bulb outs at all four corners of intersection.*
- *Provide advance stop bars at all approaches to intersection.*

NORTH BROADWAY AND CYPRESS AVENUE

Observations: The eastern leg of this intersection accesses adjacent parking and includes a real-time parking occupancy sign at the entrance (reducing cruising for parking).

This intersection has long crossings, especially across North Broadway. Turning vehicles do not consistently yield to pedestrians in the crosswalks. Pedestrian pushbuttons are not ADA-compliant.

Recommendations:

- *Construct bulb outs on the northwest and southwest corners of North Broadway and Cypress Avenue.*
- *Provide ADA electronic pushbutton upgrades to appropriate height and location (one per crossing).*
- *Provide a leading pedestrian interval.*

NORTH BROADWAY AND DUNCAN STREET

Observations: This crosswalk is an uncontrolled crosswalk on a multi-lane road. In-pavement flashers and decorative pavement enhance the pedestrian environment. While a median exists on North Broadway north of this location, it does not extend to this crossing. A curve to the south of the crossing may limit visibility. This location would benefit by extending the excellent pedestrian and landscaping treatments from the Liberty Bell Plaza and Broadway Plaza areas north.

Recommendations:

- *Realign the sidewalk along the east aside of North Broadway in advance of the crosswalk using a landscape treatment similar to the approach to Liberty Bell Plaza to the south.*
- *Provide a median with public art along North Broadway on the northerly approach to Duncan Street.*
- *Construct a bulb out on the east side of North Broadway.*

- *Install advance yield bars on both approaches along North Broadway.*
- *Install "Caution vehicles may not stop" signs at pedestrian push buttons.*
- *Provide guide strips (truncated domes) on the east side of North Broadway as sidewalk deviates from a straight path.*
- *Provide advance crosswalk sign with stutter flash on the southerly approach along North Broadway.*

NORTH BROADWAY AND MOUNT DIABLO BOULEVARD

Observations: Street trees and landscaping enhance the pedestrian environment at this intersection. Medians and "pork chop" islands also provide important pedestrian refuges. However, turning vehicles encroach into the crosswalks on all four approaches. Vegetation on the northwest corner reduces the visibility of pedestrians crossing the southbound free right turn lane to the pork chop island. High traffic volumes exist at this location and crosswalks are long.

Recommendations:

- *Trim vegetation on northwest corner to improve sightlines.*
- *Relocate push button in median of Broadway for wheelchair access.*
- *Install advance stop lines at all approaches to intersection.*

LIBERTY BELL PLAZA

Observations: This is an excellent public gathering space with occasional programmed activities (the space is owned by the City) but no regular vendors, etc.

Recommendations: Allow street vendors with possible street entertainment in Liberty Bell Plaza.

MOUNT DIABLO BOULEVARD AND BROADWAY PLAZA

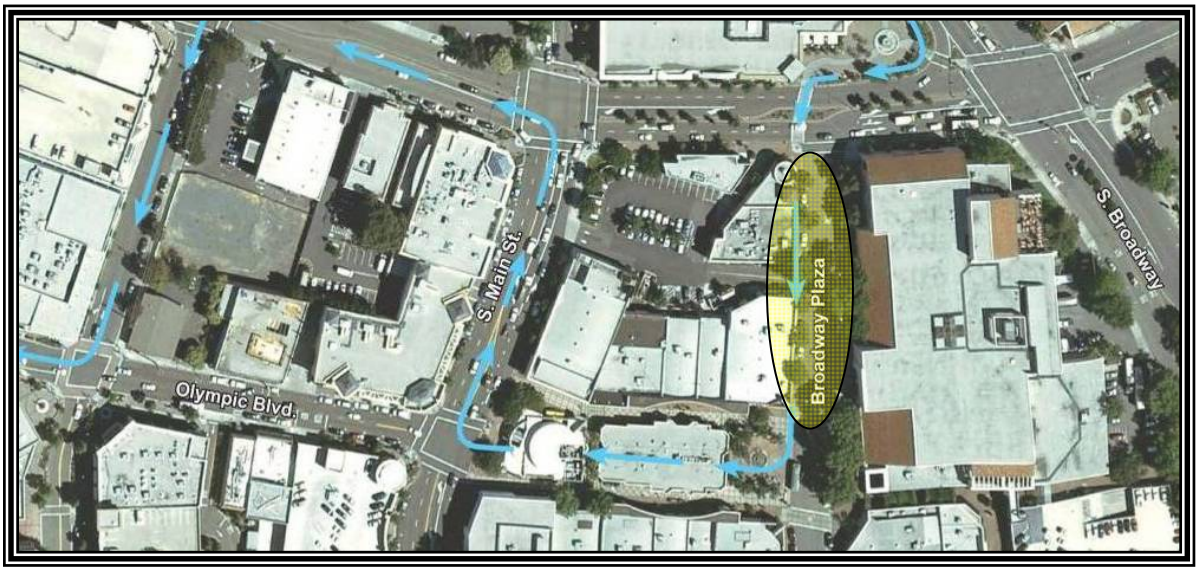
Observations: This is a heavily used, important crosswalk connecting the "old Downtown" with the "new Downtown." Motorists typically yield the right-of-way to pedestrians (likely because of the high volume of pedestrians). However, the multi-lane road may create multiple threat situations. During holiday shopping season pedestrian volumes may significantly impede vehicle throughput on this arterial.

Recommendations:

- *Consider providing a crossing guard during holidays for the crosswalk across Mount Diablo Boulevard.*
- *Install advance yield bars for vehicles on Mount Diablo Boulevard.*

BROADWAY PLAZA SOUTH OF MOUNT DIABLO BOULEVARD

Observations: This plaza is a key pedestrian hub for the City with excellent landscaping, benches, and decorative sidewalk pavement, but sidewalks along this stretch are very narrow for the heavy pedestrian volumes, restricting uses.



Recommendations: Widen sidewalk along the west side of Broadway Plaza, removing on-street parking as required.

SOUTH MAIN STREET AND OLYMPIC BOULEVARD

Observations: Broadway Plaza forms the eastern leg of this intersection and the vibrant shopping district continues in all directions. However, the resulting heavy pedestrian volumes lead to sidewalk crowding and significant vehicle-pedestrian conflicts.

Recommendations:

- *Install high visibility crosswalks across all approaches.*
- *Install advance stop bars at all approaches.*
- *Provide a pedestrian scramble signal phase.*

SOUTH MAIN STREET AND MOUNT DIABLO BOULEVARD

Observations: Curb extension/ bulb outs are present on some, but not all, corners. Pedestrians may be blocked by parked vehicles. Crossings are long across Mount Diablo Boulevard.

Recommendations:

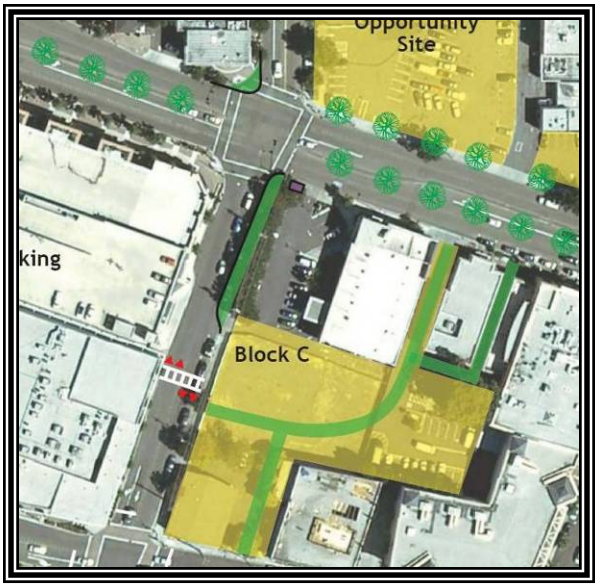
- Construct bulb outs on northwest and northeast corners.

LOCUST STREET AND MOUNT DIABLO BOULEVARD

Observations: At this location, Block C, on the east side of Locust Street, is a proposed redevelopment site. This site features a fishpond within a secret garden in the center of the block, which should be highlighted with the redevelopment. This stretch of Mount Diablo Boulevard is missing the median and street trees provided in adjacent blocks. A signal box blocks the sidewalk on the southeast corner of this intersection. Locust Street has a very narrow sidewalk on the eastern side.

Recommendations:

- *Install median with street trees on Mount Diablo Boulevard and provide street trees along the northern sidewalk.*
- *Provide a bulb out on the northwest corner.*



- *Relocate signal box on southeast corner of Locust Street and Mount Diablo Boulevard.*
- *Widen sidewalk along east side of Locust Street between Mount Diablo Boulevard and Block C development area by removing on street parking and incorporating wider sidewalks into the Block C development.*
- *Construct a new paseo through Block C development area.*
- *Install a mid-block crosswalk with advance yield bars at the new paseo entrance on Locust Street.*

LOCUST STREET AND OLYMPIC BOULEVARD

Observations: This intersection, next to the movie theatre, features excellent landscaping and decorative pavement treatments in the crosswalks. However, heavy pedestrian volumes lead to sidewalk crowding and significant vehicle-pedestrian conflicts. The existing crosswalk pavement treatment should be repeated at similar crosswalks throughout the Downtown area. The appropriate white striping is provided to accentuate the pavement treatment.

Recommendations:

- *Provide a pedestrian scramble signal phase.*
- *Install advance stop bars on all approaches.*

SOUTH CALIFORNIA BOULEVARD AND OLYMPIC BOULEVARD

Observations: This intersection efficiently serves heavy vehicle volumes but is also a key gateway to the pedestrian nodes along Olympic Boulevard to the east. Turning vehicles encroach into the crosswalks on all four approaches. Vegetation on the northwest corner reduces the visibility of pedestrians crossing the southbound free right turn lane to the pork chop island. Additionally the pork chop refuge is smaller than desirable. Large corner radii lead to high-speed turns. The intersection geometry results in long crosswalks.

Recommendations:

- *Consider providing a leading pedestrian interval.*
- *Restore sight lines on northwest corner for the crosswalk across the free right turn.*
- *Enlarge the pedestrian "pork chop" island on the northwest corner and provide an advance yield bar for vehicles turning right.*
- *Construct a bulb out on the southwest corner.*
- *Re-align the crosswalk on the*

southerly approach of California Boulevard.

- *Provide advance stop bars.*

NORTH CALIFORNIA BOULEVARD AND MOUNT DIABLO BOULEVARD

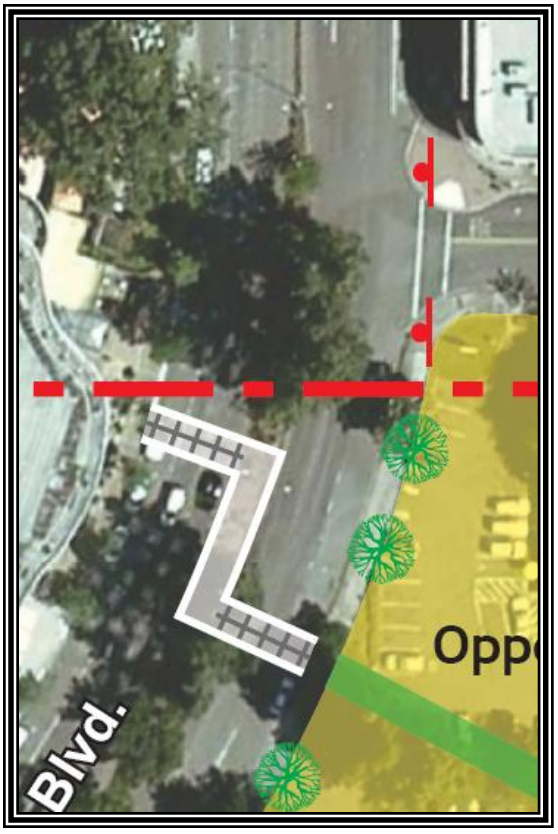
Observations: This intersection serves significant vehicle traffic on both North California Boulevard and Mount Diablo Boulevard. Long crosswalks traverse multiple travel lanes in all directions and wide corner radii encourage high-speed turns. Along the north side of Mount Diablo Boulevard and the east side of North California Boulevard, the potential redevelopment parcel offers an opportunity to provide streetscape improvements.

Recommendations:

- *Construct bulb out on southwest corner, closing the unneeded, right-most receiving lane.*
- *Provide street trees along Mount Diablo Boulevard and North California Boulevard on the northwest corner.*

NORTH CALIFORNIA BOULEVARD SOUTH OF CYPRESS AVENUE

Observations: This midblock location lies along a pedestrian desire line between the office complex and restaurants/ other attractions. The location is far enough from signalized crossings to encourage jaywalking and in fact a fence was built because of this concern. However, this fence also blocks the legal (but unmarked) crossings at Cypress Avenue. With the potential redevelopment of the opportunity site on the east side of North California, the desire to cross at this location is expected to increase.



Recommendations:

- *With or before redevelopment of the opportunity site, install a staggered, high visibility, signalized*

midblock crosswalk across North California Boulevard south of Cypress Avenue. Coordinate the signals with adjacent signals in each travel direction.

- *Install barriers and "crosswalk closed" signs at the Cypress Avenue unmarked crosswalks.*
- *Construct a paseo through the potential development site to connect with Locust Street.*

NEW PASEO BETWEEN NORTH CALIFORNIA BOULEVARD AND LOCUST STREET

Observations: The potential redevelopment of the parcel on North California Boulevard south of Cypress Avenue offers an opportunity for a new paseo to connect North California Boulevard to Locust Street and conveniently serve pedestrian demand to the shops and restaurants on Locust Street. Pedestrian accessibility would be greatly enhanced by shorter blocks and/or paseos through large blocks such as this.

Recommendations:

- *Construct new paseo connecting North California Street to Locust Street through the development area.*
- *Install a high visibility, lighted crosswalk across Locust Street at the paseo entrance with advance yield bars.*

LOCUST STREET MIDBLOCK CROSSING SOUTH OF CIVIC DRIVE

Observations: This midblock crossing has high visibility striping appropriate for an uncontrolled crossing on a two-lane road. The tree canopy may cause nighttime visibility issues. The adjacent parking lot creates pedestrian-vehicle conflicts with vehicles backing into the crosswalk.

Recommendations:

- *Ensure adequate nighttime lighting is provided for the crosswalk.*
- *Install advance yield bars.*
- *Remove one parking space on the southern side of parking lot (to prevent backing into the sidewalk)*

PASEO BETWEEN LOCUST STREET AND NORTH MAIN STREET SOUTH OF CIVIC DRIVE

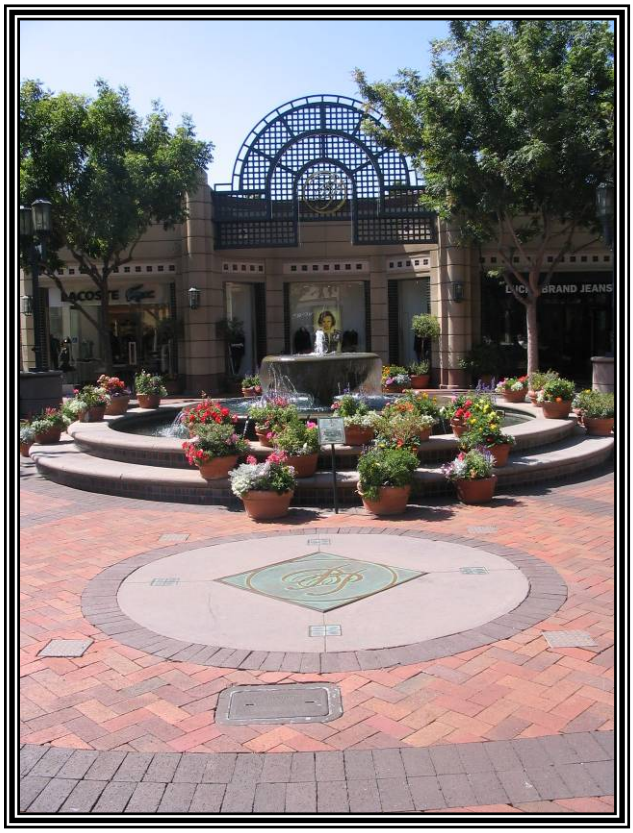
Observations: This paseo exists informally as a path between buildings and through parking lots. Given the large block sizes in this area, a designated paseo with wayfinding and a separated pedestrian path would enhance route connectivity for pedestrians and efficiently link key destinations.

Recommendation:

- *Extend Paseo through the parking lot and provide wayfinding.*

FOUNTAIN WALK

Observations: Downtown Walnut Creek has several unique fountains and paseos that could be showcased through a new "Fountain Walk." This walk would build on the existing "Creek Walk" and include several new fountains and paseos. With wayfinding maps and signs, this walk could encourage walking in Downtown and enhance economic vitality.



Recommendation:

Establish a Fountain Walk to connect the existing fountains and paseos throughout Downtown and provide additional fountains and paseos as noted on the Recommendations figure. Provide a map and wayfinding signs to encourage use of the walk. A suggested route and recommended locations for new fountains are included in the recommendation graphics in Appendix C.

APPENDIX A

GLOSSARY OF CANDIDATE TREATMENT OPTIONS

PEDESTRIAN IMPROVEMENT MEASURES			
Measure	**Description**	**Benefits**	**Application**
Traffic Control Countermeasures			
Traffic Signal or All-Way Stop	Conventional traffic control devices with warrants for use based on the Manual on Uniform Control Devices (MUTCD)	Reduces pedestrian-vehicle conflicts and slows traffic speeds	Must meet warrants based on traffic and pedestrian volumes; however, exceptions are possible based on demonstrated pedestrian safety concerns (collision history)
Hawk Beacon Signal	HAWK (High Intensity Activated Crosswalks) are pedestrian-actuated signals that are a combination of a beacon flasher and a traffic control signal. When actuated, HAWK displays a yellow (warning) indication followed by a solid red light. During pedestrian clearance, the driver sees a flashing red "wig-wag" pattern until the clearance interval has ended and the signal goes dark.	Reduces pedestrian-vehicle conflicts and slows traffic speeds	Useful in areas where it is difficult for pedestrians to find gaps in automobile traffic to cross safely, but where normal signal warrants are not satisfied. Appropriate for multi-lane roadways.
Overhead Flashing Beacons	Flashing amber lights are installed on overhead signs, in advance of the crosswalk or at the entrance to the crosswalk.	The blinking lights during pedestrian crossing times increase the number of drivers yielding for pedestrians and reduce pedestrian-vehicle conflicts. This measure can also improve conditions on multi-lane roadways.	Best used in places where motorists cannot see a traditional sign due to topography or other barriers.
Stutter Flash	The Overhead Flashing Beacon is enhanced by replacing the traditional slow flashing incandescent lamps with rapid flashing LED lamps. The beacons may be push-button activated or activated with pedestrian detection.	Initial studies suggest the stutter flash is very effective as measured by increased driver yielding behavior. Solar panels reduce energy costs associated with the device.	Appropriate for multi-lane roadways.
In-Roadway Warning Lights	Both sides of a crosswalk are lined with pavement markers, often containing an amber LED strobe light. The lights may be push-button activated or activated with pedestrian detection.	This measure provides a dynamic visual cue, and is increasingly effective in bad weather	Best in locations with low bicycle ridership, as the raised markers present a hazard to bicyclists. May not be appropriate in areas with heavy winter weather due to high

PEDESTRIAN IMPROVEMENT MEASURES			
Measure	**Description**	**Benefits**	**Application**
			maintenance costs. May not be appropriate for locations with bright sunlight. The lights may cause confusion when pedestrians fail to activate them and/or when they falsely activate.
High-Visibility Signs and Markings	High-visibility markings include a family of crosswalk striping styles including the "ladder" and the "triple four." One style, the zebra-style crosswalk pavement markings, were once popular in Europe, but have been phased out because the signal-controlled puffin is more effective (see notes). High-visibility fluorescent yellow green signs are made of the approved fluorescent yellow-green color and posted at crossings to increase the visibility of a pedestrian crossing ahead.	FHWA recently ended its approval process for the experimental use of fluorescent yellow crosswalk markings and found that they had no discernable benefit over white markings.	Beneficial in areas with high pedestrian activity, as near schools, and in areas where travel speeds are high and/or motorist visibility is low.
In-Street Pedestrian Crossing Signs	This measure involves posting regulatory pedestrian signage on lane edge lines and road centerlines. The In-Street Pedestrian Crossing sign may be used to remind road users of laws regarding *right-of-way* at an unsignalized pedestrian crossing. The legend STATE LAW may be shown at the top of the sign if applicable. The legends STOP FOR or YIELD TO may be used in conjunction with the appropriate symbol.	This measure is highly visible to motorists and has a positive impact on pedestrian safety at crosswalks.	Mid-block crosswalks, unsignalized intersections, low-speed areas, and two-lane roadways are ideal for this pedestrian treatment. The STOP FOR legend shall only be used in states where the state law specifically requires that a driver must stop for a pedestrian in a crosswalk.
Pedestrian Crossing Flags	Square flags of various colors, which are mounted on a stick and stored in sign-mounted holders on both side of the street at crossing locations; they are carried by pedestrians while crossing a roadway.	This measure makes pedestrians more visible to motorists.	Appropriate for mid-block and uncontrolled crosswalks with low visibility or poor sight distance.
Advanced Yield Lines	Standard white stop or yield limit lines are placed in advance of marked, uncontrolled crosswalks.	This measure increases the pedestrian's visibility to motorists, reduces the number of vehicles encroaching on the crosswalk, and improves general pedestrian conditions on multi-lane	Useful in areas where pedestrian visibility is low and in areas with aggressive drivers, as advance limit lines will help prevent drivers from encroaching on the crosswalk. Addresses the multiple-threat collision on multi-lane

PEDESTRIAN IMPROVEMENT MEASURES			
Measure	**Description**	**Benefits**	**Application**
		roadways. It is also an affordable option.	roads.
Geometric Treatments			
Pedestrian Overpass/ Underpass	This measure consists of a pedestrian-only overpass or underpass over a roadway. It provides complete separation of pedestrians from motor vehicle traffic, normally where no other pedestrian facility is available, and connects off-road trails and paths across major barriers.	Pedestrian overpasses and underpasses allow for the uninterrupted flow of pedestrian movement separate from the vehicle traffic.	Grade separation via this measure is most feasible and appropriate in extreme cases where pedestrians must cross roadways such as freeways and high-speed, high-volume arterials. This measure should be considered a last resort, as it is expensive and visually intrusive.
Road Diet (aka Lane Reduction)	The number of lanes of travel is reduced by widening sidewalks, adding bicycle and parking lanes, and converting parallel parking to angled or perpendicular parking.	This is a good traffic calming and pedestrian safety tool, particularly in areas that would benefit from curb extensions but have infrastructure in the way. This measure also improves pedestrian conditions on multi-lane roadways.	Roadways with surplus roadway capacity (typically multi-lane roadways with less than 15,000 to 17,000 ADT) and high bicycle volumes, and roadways that would benefit from traffic calming measures.
Median Refuge Island	Raised islands are placed in the center of a roadway, separating opposing lanes of traffic with cutouts for accessibility along the pedestrian path.	This measure allows pedestrians to focus on each direction of traffic separately, and the refuge provides pedestrians with a better view of oncoming traffic as well as allowing drivers to see pedestrians more easily. It can also split up a multi-lane road and act as a supplement to additional pedestrian tools.	Recommended for multi-lane roads wide enough to accommodate an ADA-accessible median
Staggered Median Refuge Island	This measure is similar to traditional median refuge islands; the only difference is that the crosswalks in the roadway are staggered such that a pedestrian	Benefits of this tool include an increase in the concentration of pedestrians at a crossing and the	Best used on multi-lane roads with obstructed pedestrian visibility or with off-set intersections

PEDESTRIAN IMPROVEMENT MEASURES			
Measure	**Description**	**Benefits**	**Application**
	crosses half the street and then must walk towards traffic to reach the second half of the crosswalk. This measure must be designed for accessibility by including rails and truncated domes to direct sight-impaired pedestrians along the path of travel.	provision of better traffic views for pedestrians. Additionally, motorists are better able to see pedestrians as they walk through the staggered refuge.	
Curb Extension	Also known as a pedestrian bulb-out, this traffic-calming measure is meant to slow traffic and increase driver awareness. It consists of an extension of the curb into the street, making the pedestrian space (sidewalk) wider.	Curb extensions narrow the distance that a pedestrian has to cross and increases the sidewalk space on the corners. They also improve emergency vehicle access and make it difficult for drivers to turn illegally.	Due to the high cost of installation, this tool would only be suitable on streets with high pedestrian activity, on-street parking, and infrequent (or no) curb-edge transit service. It is often used in combination with crosswalks or other markings.
Reduced Curb Radii	The radius of a curb can be reduced to require motorists to make a tighter turn.	Shorter radii narrow the distance that pedestrians have to cross; they also reduce traffic speeds and increase driver awareness (like curb extensions), but are less difficult and expensive to implement.	This measure would be beneficial on streets with high pedestrian activity, on-street parking, and no curb-edge transit service. It is more suitable for wider roadways and roadways with low volumes of heavy truck traffic.
Curb Ramps	Curb ramps are sloped ramps that are constructed at the edge of a curb (normally at intersections) as a transition between the sidewalk and a crosswalk.	Curb ramps provide easy access between the sidewalk and roadway for people using wheelchairs, strollers, walkers, crutches, handcarts, bicycles, and also for pedestrians with mobility impairments who have trouble stepping up and down high curbs.	Curb ramps must be installed at all intersections and midblock locations where pedestrian crossings exist, as mandated by federal legislation (1973 Rehabilitation Act and 1990 Americans with Disabilities Act). Where feasible, separate curb ramps for each crosswalk at an intersection should be provided rather than having a single ramp at a corner for both crosswalks.

PEDESTRIAN IMPROVEMENT MEASURES			
Measure	**Description**	**Benefits**	**Application**
Raised Crosswalk	A crosswalk whose surface is elevated above the travel lanes.	Attracts drivers' attention; encourages lower travel speeds by providing visual and tactile feedback when approaching the crosswalk.	Appropriate for multi-lane roadways, roadways with lower speed limits that are not emergency routes, and roadways with high levels of pedestrian activity, such as near schools, shopping malls, etc.
Improved Right-Turn Slip-Lane Design	Right-turn slip lanes (aka channelized right-turn lanes) are separated from the rest of the travel lanes by a pork chop-shaped striped area. This measure separates right-turning traffic and streamlines right-turning movements. Improved right-turn slip lanes would provide pedestrian crossing islands within the intersection and be designed to optimize the right-turning motorist's view of the pedestrian and of vehicles to his or her left.	This measure reduces the pedestrian's crossing distance and turning vehicle speeds.	Appropriate for intersections with high volumes of right-turning vehicles.
Chicanes	A chicane is a sequence of tight serpentine curves (usually an S-shape curve) in a roadway, used on city streets to slow cars.	This is a traffic-calming measure that can improve the pedestrian environment and pedestrian safety.	Chicanes can be created on streets with higher volumes, given that the number of through lanes is maintained; they can also be created on higher-volume residential streets to slow traffic. Chicanes may be constructed by alternating parallel or angled parking in combination with curb extensions.
Pedestrian Access and Amenities			
Marked Crosswalk	Marked crosswalks should be installed to provide designated pedestrian crossings at major pedestrian generators, crossings with significant pedestrian volumes (at least 15 per hour), crossings with high vehicle-pedestrian collisions, and other areas based on engineering judgment	Marked crosswalks provide a designated crossing, which may improve walkability and reduce jaywalking.	Marked crosswalks alone should not be installed on multi-lane roads with more than about 10,000 vehicles/ day. Enhanced crosswalk treatments (as presented in this table) should supplement the marked crosswalk.

PEDESTRIAN IMPROVEMENT MEASURES			
Measure	**Description**	**Benefits**	**Application**
Textured Pavers	Textured pavers come in a variety of materials (for example, concrete, brick, and stone) and can be constructed to create a textured pedestrian surface such as a crosswalk or sidewalk. Crosswalks are constructed with the pavers, or can be made of stamped concrete or asphalt.	Highly visible to motorists, this measure provides a visual and tactile cue to motorists and delineates a separate space for pedestrians, as it provides a different texture to the street for pedestrians and motorists. It also aesthetically enhances the streetscape.	Appropriate for areas with high volumes of pedestrian traffic and roadways with low visibility and/or narrow travel ways, as in the downtown area of towns and small cities.
Anti-Skid Surfacing	Surface treatment is applied to streets to improve skid resistance during wet weather. This is a supplementary tool that can be use to reduce skidding in wet conditions.	Improves driver and pedestrian safety.	Appropriate for multi-lane roadways and roadways with higher posted speed limit and/or high vehicle volumes or collision rates.
Accessibility Upgrades	Treatments such as audible pedestrian signals, accessible push buttons, and truncated domes should be installed at crossings to accommodate disabled pedestrians.	Improves accessibility of pedestrian facilities for all users.	Accessibility upgrades should be provided for all pedestrian facilities following a citywide ADA Transition Plan.
Pedestrian Countdown Signal	Displays a “countdown” of the number of seconds remaining for the pedestrian crossing interval. In some jurisdictions the countdown includes the walk phase. In other jurisdictions, the countdown is only displayed during the flashing don’t walk phase.	Increases pedestrian awareness and allows them the flexibility to know when to speed up if the pedestrian phase is about to expire.	The forthcoming 2009 MUTCD is expected to require all pedestrian signals to incorporated countdown signals within ten years. The signals should be prioritized for areas with pedestrian activity, roadways with high volumes of vehicular traffic, multi-lane roadways, and areas with elderly or disabled persons (who may walk slower than others may).
Transit			
High-Visibility Bus Stop Locations	This measure should include siting bus stops on the far side of intersections, with paved connections to sidewalks where landscape buffers exist.	Provides safe, convenient, and inviting access for transit users; can improve roadway efficiency and driver sight distance.	Appropriate for all bus stops subject to sight distance and right-of-way constraints.

PEDESTRIAN IMPROVEMENT MEASURES			
Measure	**Description**	**Benefits**	**Application**
Transit Bulb	Transit bulbs or bus bulbs, also known as nubs, curb extensions, or bus bulges are a section of sidewalk that extends from the curb of a parking lane to the edge of the through lane.	Creates additional space at a bus stop for shelters, benches, and other passenger amenities.	Appropriate at sites with high patron volumes, crowded city sidewalks, and curbside parking.
Enhanced Bus Stop Amenities	Adequate bus stop signing, lighting, a bus shelter with seating, trash receptacles, and bicycle parking are desirable features at bus stops.	Increase pedestrian visibility at bus stops and encourage transit ridership	Appropriate at sites with high patron volumes

APPENDIX B

RESOURCE LIST

RESOURCE LIST
A Guide for Reducing Collisions Involving Pedestrians (NCHRP Report 500) http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v10.pdf
Pedestrian and Bicycle Information Center http://www.walkinginfo.org/
National Center for Safe Routes to School http://www.saferoutesinfo.org/
Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations (HRT-04-100) http://www.thrc.gov/safety/pubs/04100/index.htm
How to Develop a Pedestrian Safety Action Plan (FHWA-SA-05-12) http://www.walkinginfo.org/pp/howtoguide2006.pdf
Improving Pedestrian Safety at Unsignalized Crossings (NCHRP Report 562) http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf
Road Safety Audits: Case Studies (FHWA-SA-06-17) http://safety.fhwa.dot.gov/rsa/rsa_cstudies.htm
Pedestrian Road Safety Audit Guidelines and Prompt Lists *http://drusilla.hsrc.unc.edu/cms/downloads/PedRSA.reduced.pdf*
PEDSAFE: The Pedestrian Safety Guide and Countermeasure Selection System (FHWA-SA-04-003) http://www.walkinginfo.org/pedsafe/
Pedestrian and Bicycle Crash Analysis Tool (PBCAT) http://www.bicyclinginfo.org/bc/pbcat.cfm
FHWA, *A Resident's Guide for Creating Safe and Walkable Communities* http://safety.fhwa.dot.gov/ped_bike/ped/ped_walkguide/index.htm
FHWA, *Pedestrian Safety Guide for Transit Agencies* (FHWA-SA-07-017) http://safety.fhwa.dot.gov/ped_bike/ped/ped_transguide/
FHWA Pedestrian Safety Training Courses: Developing a pedestrian safety action plan (two-day course) *next California course: http://www.google.com/calendar/embed?src=lssandt@email.unc.edu* Designing for pedestrian safety (two-day course) *next California course: http://www.google.com/calendar/embed?src=lssandt@email.unc.edu* Planning and designing for pedestrian safety (three-day course) *next California course: http://www.google.com/calendar/embed?src=lssandt@email.unc.edu*
adapted from FHWA *Pedestrian Road Safety Audit Guidelines and Prompt Lists*

APPENDIX C

RECOMMENDATION GRAPHICS


City of Walnut Creek
Pedestrian Safety Assessment
Walking Audit Route (North)
Existing Fountain
Fountains Walk
Development Sites
Changed Curb Line
N
NOT TO SCALE
Walnut Creek Library
City Hall
Lesher Center for the Arts
Parking
Opportunity Site
Begin
End
N. Broadway
N. Main St.
Civic Dr.
Commercial Ln.
Locust St.
Bonanza St.
Cypress Ave.
N. California Blvd.
Creek
Matchline
Good parking sign with space numbers
Improve paseo
Provide wayfinding
Provide ADA electronic pushbutton upgrades. Provide Leading Pedestrian Interval.
Provide sidewalk and wayfinding
Remove parking space
Provide wayfinding
Remove parking space in short term
Extend paseo
New Water Feature
Ensure adequate night time lighting
New Water Feature
Recently improved


City of Walnut Creek
Pedestrian Safety Assessment
Walking Audit Route (South)
Existing Fountain
Fountains Walk
Development Sites
Changed Curb Line
NOT TO SCALE
Matchline
Provide median with public art
Parking
Provide push buttons. Install "Caution vehicles may not stop" sign
Provide guide strips
Provide advance crosswalk sign with clutter flash
Trim vegetation to restore sight lines
Relocate push button
S. Broadway
Parking
Expand sidewalk and remove parking
New Water Feature
N. Broadway
Broadway Plaza
Duncan St.
Parking
Allow street vendors with possible street entertainment
Consider crossing guard during holidays
Neiman Marcus
Existing Paseo
Existing Paseo
Provide scramble phase
N. Main St.
S. Main St.
Cypress Ave.
Commercial Ln.
Parking
Opportunity Site
Relocate signal box
Block C
Construct new paseo
Olympic Blvd.
Parking
Parking
Locust St.
Construct new paseo
Crosswalk closed
Opportunity Site
New Water Feature
Mt. Diablo Blvd.
Parking
Planned crosswalk
Provide scramble phase
Parking
Parking
N. California Blvd.
S. California Blvd.
Consider Leading Pedestrian Interval
Restore sight lines

APPENDIX D

SIDEWALK CROWDING TECHNICAL MEMORANDUM

FEHR & PEERS
TRANSPORTATION CONSULTANTS

MEMORANDUM

Date: November 3, 2008

To: Rafat Raie and Yun Na Rhee, City of Walnut Creek

From: Meghan Mitman, Matthew Ridgway, and Seth Andrzejewski

Subject: ***Sidewalk Crowding Analysis for Downtown Walnut Creek***

SF08-0374E

As a component of the Walnut Creek Pedestrian Safety Assessment (PSA), City Staff requested the PSA evaluators analyze sidewalk width, pedestrian volumes, and associated crowding in the Downtown Core of Walnut Creek. This memo summarizes this analysis.

DATA AND GIS INPUT LAYERS

The City of Walnut Creek provided the following Geographic Information System (GIS) layers based on recent data collection efforts:

- Pedestrian volumes in select crosswalks in the Downtown Core
- Sidewalk widths (curb to building face) for select sidewalk sections in the Downtown Core
- Allowable floor area ratios (FAR) for Downtown buildings

The allowable FARs were 2.0 for all buildings. Existing FARs were not available as a GIS layer, so FAR was not included in this analysis.
We supplemented the above data with a GIS layer of City streets. We also distributed the crosswalk volumes to adjacent sidewalks (assuming a 50/50 split on the feeding and receiving sidewalks where applicable) to create a sidewalk pedestrian volume GIS layer for the Downtown Core.

EXISTING CONDITIONS ANALYSIS

The above input layers were used to create the following maps:

- Existing sidewalk widths
- Existing pedestrian volumes on sidewalks
- Existing pedestrian volumes/ sidewalk widths (crowding index)

The three maps are shown on the following pages.

Figure 1. Existing Sidewalk Widths

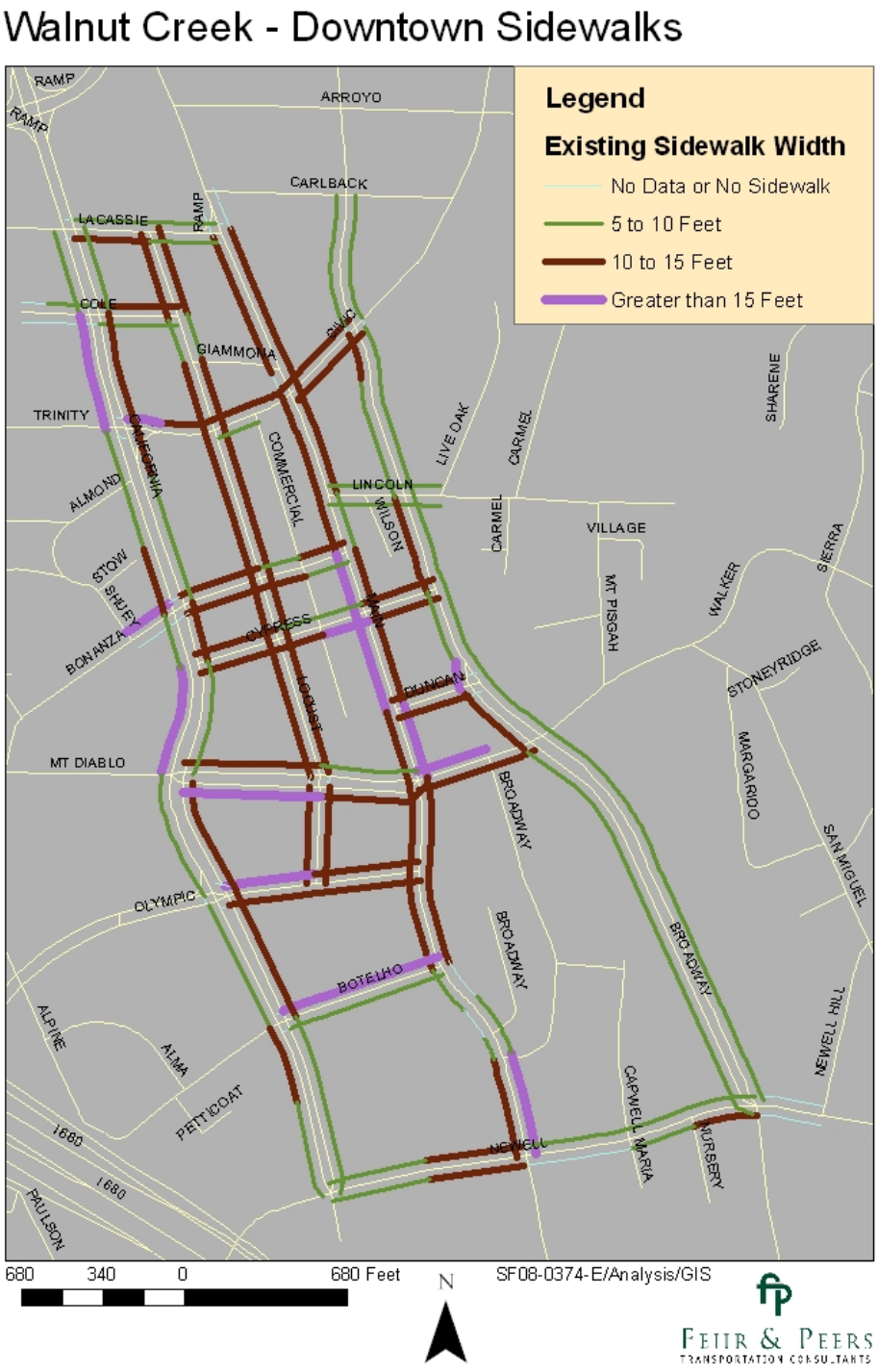


Figure 2. Existing Hourly Pedestrian Volumes on Downtown Sidewalks

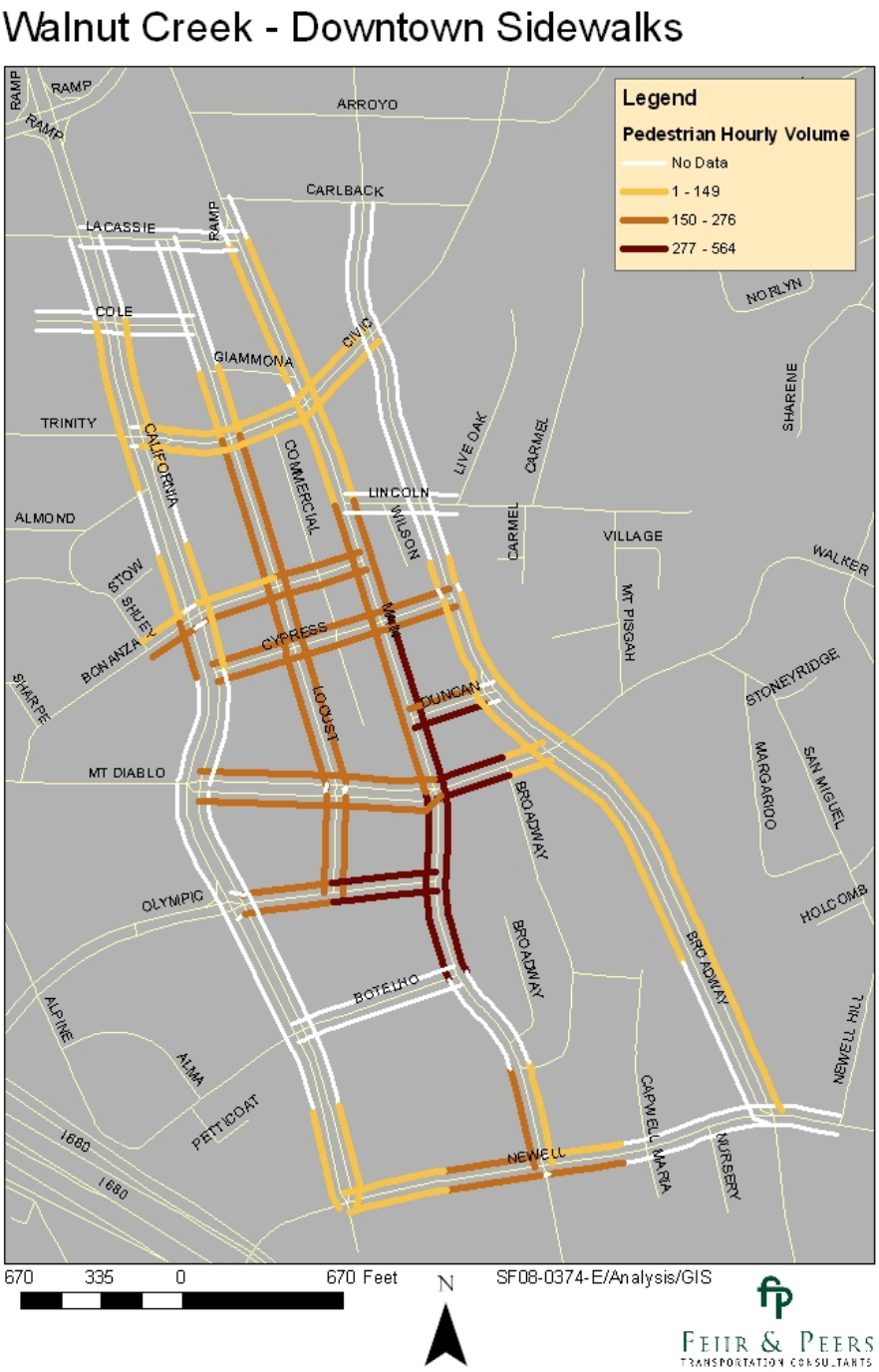
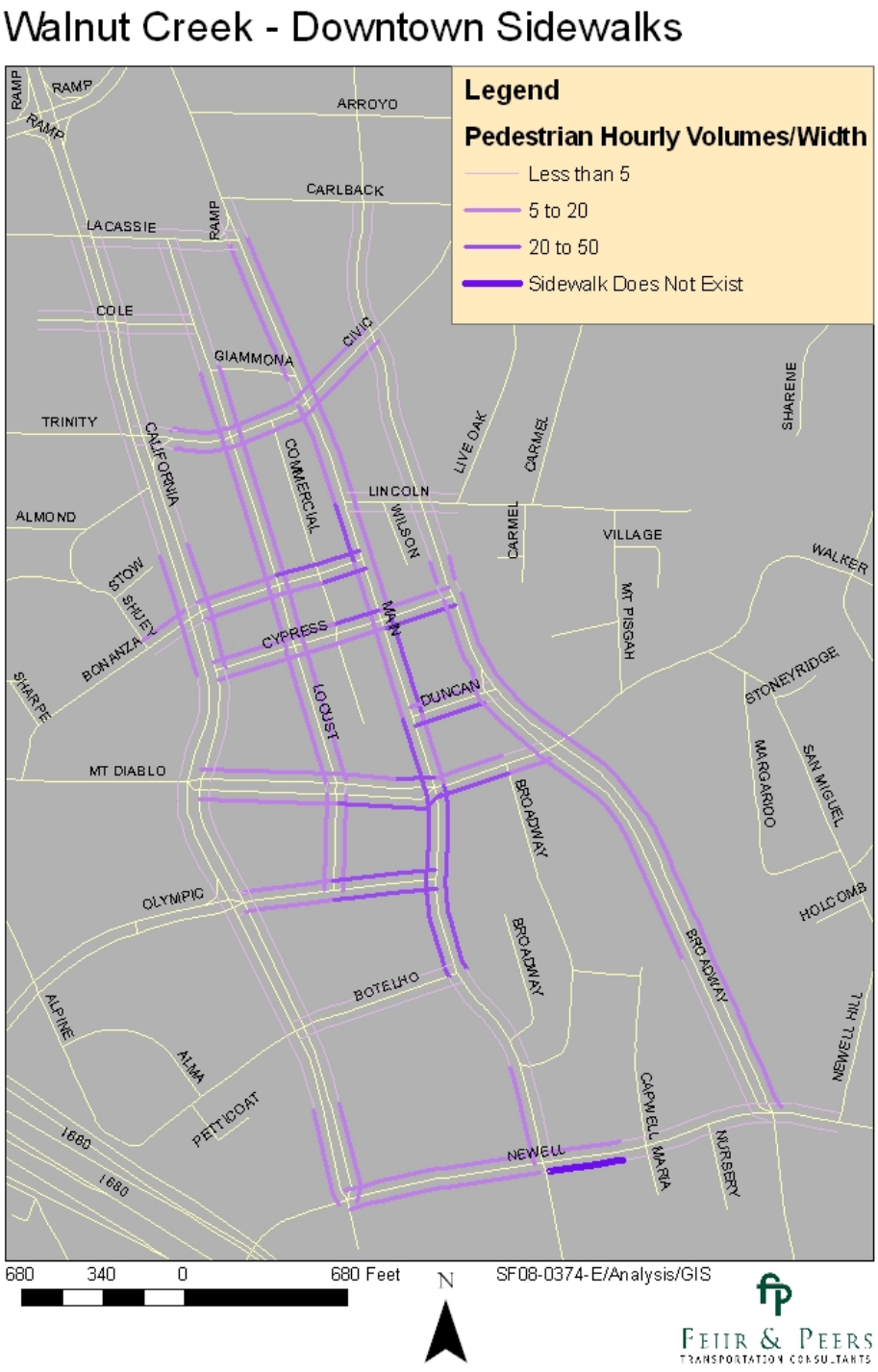


Figure 3. Existing Hourly Pedestrian Volumes/ Sidewalk Width (Crowding Index)



RECOMMENDATIONS

Based on the existing conditions analysis, several locations within Downtown Walnut Creek would benefit from wider sidewalks. This is especially true for areas where sidewalk cafes or other street furniture uses are desirable, and for areas on the periphery where limited pedestrian crossing times at signals may create crowding on corners and encourage jaywalking.

Given significant opportunities for development within the Downtown, we recommend that the City establish a sidewalk width and use policy. Such a policy would better enable the City to request sidewalk widths and uses with new development.

Such a policy could be included within the recommended *Pedestrian and Streetscape Master Plan*.

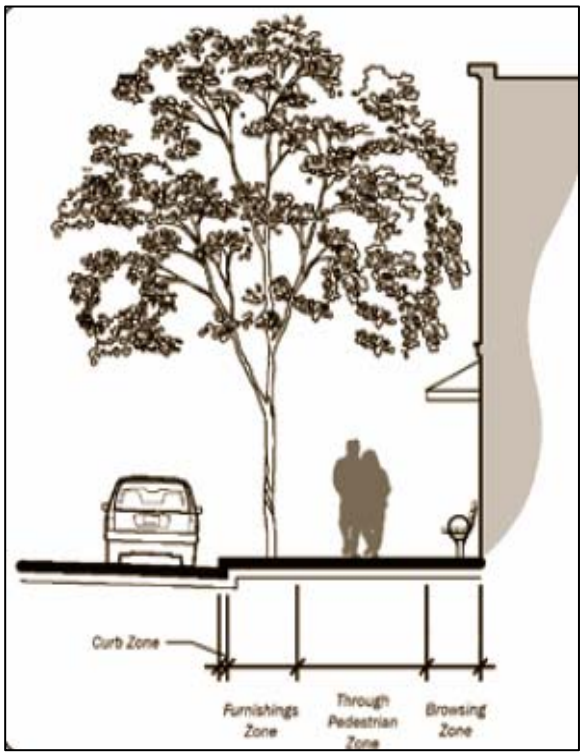


Figure 4. Sidewalk Zones

DRAFT POLICY GUIDELINES

We recommend the sidewalk policy include a zone system, proscribing minimum widths and appropriate uses for each zone, as illustrated in Figure 4.

Width guidelines could include the following:

Sidewalk Width	Sidewalk Use
Less than 10 feet	Landscape strip (furnishings zone) if hourly pedestrian volume/ sidewalk width (crowding index) < 20. Otherwise reserve the sidewalk width for through and browsing zones only.
10 to 15 feet	Landscape strip and café seating (enhanced browsing or furnishings zone) if crowding index < 20.
Greater than 15 feet	Landscape strip and café seating

Draft recommendations for preferred sidewalk widths throughout Downtown based on the existing conditions analysis are presented on the following page.

Figure 5. Preferred Sidewalk Widths (Draft)